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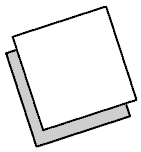

Assessing service quality on the Web: evidence from business-to-consumer portals

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Abstract *The article explores the quality dimensions that the visitors of national and foreign business-to-consumer portals use to assess the performance of their service offering. Based on the SERVQUAL model and previous research on Web site evaluation and quality, the paper identified three quality dimensions that proved to be stable across sites' nationality and user profiles. Several implications are drawn from these results for both Web site marketers and future academic research.*

Introduction

Marketing on the Internet has been a topical issue for the past few years as the use of the Web develops exponentially. Yet the latest trends show that the growth of e-markets is below expectations and many e-companies are disappearing as fast as they grew. Many recent failures seem to occur because e-companies fail to deliver real added value services to the customer and to meet his/her expectations (Zott *et al.*, 2000). So the crucial issue for "dot com" companies becomes to find a sustainable competitive advantage and a profitable business model (Mass, 2000; de Figueiredo, 2000).

Service companies are particularly concerned for the Web, since their immaterial content, especially when it is information intensive, can easily be delivered via the Web. The press, the encyclopaedia and the distribution of music are examples of markets that have been seriously affected by the Internet.

Business-to-consumer portals

In this paper we focus on a particular "100 percent information content" and "100 percent Web-based" service activity, the business-to-consumers portals, in order to investigate how their customers perceive the quality of their offering.

We believe that portals are e-service firms of particular interest for two main reasons: first, portals are among the very first and the most typical "dot com" companies and are considered as a major Internet market structure (Mahadevan, 2000). Their added value to the consumer is to assist them in finding their way on the Internet. Having started as search engines, progressively they have developed into sites where one can not only locate sites on a particular topic, but also get information and news of general interest, free e-mail, Web page creation, greetings cards, as well as more or less direct e-commerce applications (e.g. promotions and special offers,

auctions, e-shopping) (Enos, 2001). This way they have practically become gates to the e-commerce and the digital economy, playing thus an important role in the development of the use of Internet in general and of the e-commerce in particular. Indeed, nowadays, 35 percent of the traffic enjoyed by e-shops is generated through Web portals (Regan, 2001).

Traffic maintenance

Second, in order to be successful, portals have to create and maintain as much traffic as possible. Consequently, their success is based on attracting and keeping visitors. In fact, achieving both it is possibly more important for business-to-consumers (B2C) portals than for any other type of ''dot com'' company. As a consequence, given the harsh competition among portals, the quality of the services offered by B2C Web portals is equally critical as it is for any other service firm, since it helps them to enjoy both the offensive (capturing customers) and the defensive (retaining customers) effects of delivering high-quality services (Zeithaml *et al.*, 1996) and satisfying the customer in order to ensure repeated visiting (''purchase'') (Micek, 2001).

This particular role of portals, together with the lack of research on the subject, led us to the investigation of the quality of their service offering. Thus, the scope of this paper is to investigate B2C portals' quality from the customer's perspective, a field where empirical studies are extremely rare.

Alternative approaches on Web site quality

Although the literature on service quality is abundant (Parasuraman *et al.*, 1991, 1985; Cronin and Taylor, 1992; Asubonteng *et al.*, 1996; Zeithaml *et al*., 1996; Carman, 1990), very little work has been done on the assessment of the quality of services delivered over the Web.

Web site quality

Indeed, the literature on the quality of Web sites is limited and extremely disparate. Some studies have focused on particular aspects of a site, namely, interactivity, navigation, functionality, usability, efficiency and reliability with automatically and manually collected data (Bauer and Scharl, 2000). Another pilot study of business-to-business (B2B) sites used case studies to examine a model with five broad categories of quality: home page design; overall site design and performance; text content; audio-visual elements; and interaction and involvement (Evans and King, 1999). A different direction was pursued by Chen and Wells (1999). Considering a Web site as a new medium, they adapted the approach of measuring the attitude towards advertising to develop a scale for measuring the quality of a Web site. Using a convenience sample of students, the authors identified three main elements of quality: entertainment (the degree to which navigating through the site is amusing or humorous); informativeness (the degree to which the site offers the information sought by the visitor); and organisation (the site's structure). Finally, in a recent article on satisfaction with e-shops (Szymanski and Hise, 2000), the authors combined data from focus groups and survey; to suggest a model of quality drivers comprised of convenience, merchandising (product offering and product information), site design and financial security.

A second stream of research on the quality of a Web site can be found in more ''classic'' sources concerning information technology (IT) and information systems (IS). These approaches are mainly based on the technology acceptance model (TAM) as it has been related to the case of the Internet (Lederer *et al*., 2000). Originally the TAM was designed to assess the performance of software and IT adoption. Later attempts however sought to adapt it in order to evaluate the performance and the quality of a Web site (Lin and Lu, 2000; Moon and Kim, 2001). This stream of research has also resulted in various dimensions which are supposed to comprise the notion of

quality of a Web site. Information quality, system quality, use quality, playfulness, response time, system availability, perceived usefulness and ease of use are the major dimensions according to this approach (Liu and Arnett, 2000; Lin and Lu, 2000). Nonetheless, one has to concede the technology orientation of these studies, while both the market and the visitor of the site are basically not considered in the studies which have followed this approach (Lindroos, 1997; Bauer and Scharl, 2000).

WebQual model

An attempt to integrate the market and the visitor in the models regarding the quality of Web sites can be found in the WebQual model. This model tries to adapt the SERVQUAL model to the Web context, suggesting a method for assessing the quality of an organization's e-commerce offering (Barnes and Vidgen, 2001a, b). Starting by developing the model on business schools' Web sites, the authors refined, adjusted and completed the scales as they applied it to auctions sites and to e-bookstores. The latest version of the WebQual instrument comprises three quality dimensions, namely, usability, information and interaction which are measured using 22 items.

However, one has to bear in mind that SERVQUAL requires context-specific adaptations before it can be effectively employed (Parasuraman *et al.*, 1991; Andaleeb and Baser 1994; Asubonteng *et al.*, 1996). For instance, the dimensions as well as the weight of individual dimensions are expected to differ depending on the industry context. For instance, while the issue of transactions security may be something important for the banking industry, it is not necessarily considered equally important (if at all) in the laundry industry.

Virtual service encounter

Considering now the case of Web sites, the virtual service encounter is greatly different from the physical encounter occurring in "bricks and mortar" exchange settings. In the virtual world, the encounter lacks any physical tangibles and the element of human interaction. In addition, the dimensions of reliability, responsiveness and assurance take quite a different content during the virtual encounter. On a Web site, there is no physical surrounding, no front line personnel and the customer has to assume a lot more control of the service delivery process. On the other hand, the customer's technology infrastructure (speed, graphics quality and software of the customer's equipment, type of connection, speed and reliability of the ISP and the network, etc.) is not under the control of the service provider, although it influences significantly the visitor's perception of quality (Evans and King, 1999). Finally, customer involvement is relatively high as portals deliver, according to Lovelock's classification, non-standardized services to persons (Lovelock, 1983).

To summarize, while B2C portals are in fact just another type of service company, the virtual context of their operations influences the nature of the encounters they have with their customers in four ways:

(1) lack of physical surroundings;

(2) increased customer participation in the development – provision of the service;

(3) greater customer involvement; and

(4) dearth of control over the compatibility between the provider's and the customer's technological compatibility during the encounter.

In turn, the different context of the virtual encounters that are developed between the provider and the customer affect the latter's perceptions of the

service quality offered by the former, since the quality perceptions of the customer, when compared to those derived from non-virtual encounters, are formed by a different set of variables (Czepiel *et al.*, 1985; Mohr and Bitner, 1995).

Study objectives

Thus, our study was designed to meet two main objectives. The first objective is to establish the dimensions which underlie the notion of quality for Web portals. The second objective is to examine whether these dimensions vary across portal users so as to become a useful segmentation instrument.

Research methodology

Research population, sample size and data collection

The quantitative data used to meet our objectives were secured by means of a structured questionnaire which was posted on the Web site of the university. In developing the questionnaire, we employed the Delphi technique to derive the scales for Web portal quality and we also pre-tested the relevant questions to ensure that respondents would be able to understand them. A more detailed discussion on this issue is offered in the variables measurement section of the manuscript.

Sampling

The population for this research was defined to include Greek Internet users. In order to draw the sample we contacted the three larger Internet service providers (ISP) of Greece who agreed to cooperate and provided us with 3,300 electronic mail addresses of their customers which were randomly generated. However, 871 mails were returned because the address was incorrect. Thus, the effective size of the sample was reduced to 2,429 sample units.

Respondents received an electronic letter which, while seeking to explain the purpose and the value of this project, invited them to participate in the study. The letter concluded with a link to the site of the university where the questionnaire was posted. Two outbound waves produced 429 and 174 fully usable questionnaires or a response rate of about 25 percent. Table I summarizes the basic demographic characteristics of the initial sample as well as those of the respondents. As can be noted from Table I, the sample is rather skewed towards males in the age group between 25 and 45 years old and of higher education. However, this description fits the profile of Greek Internet users, as described from recent public data (Karanatsi, 2001).

In order to estimate the degree of possible bias in the data caused by those who failed to return the questionnaire (Armstrong and Overton, 1977), one alternative is to track those responding to the initial mailing and those

		Sample n = 2,429 (%)	Respondents n = 871 (%)
Gender	Male	80	85
	Female	20	15
Education	Low (High school and lyceum)	20	17
	Middle (college)	30	20
	High (university)	50	63
Age groups	Up to 24	20	16
	25-34 years	40	45
	35-44 years	30	33
	45 years and older	10	6

Table I. Demographic characteristics of the respondents

responding to later efforts and compare the means or other appropriate statistics of the two groups (Churchill, 1991). In our case, differences between the first wave (early) and the second wave (late) respondents were insignificant, indicating that the variables measured in this study are not valued differently between respondents and non-respondents.

Variables measurement

Dimensions of portals quality

To derive the measure for the quality of a portal, as we have already mentioned, we employed the Delphi technique in order to first identify relevant dimensions for assessing the quality of a Web portal and, second, help in developing the wording of the items. The panel of experts required for this technique comprised of two professors of the informatics department of the university, the three Heads of the Development Department and the three Heads of the Customers Service Department of the ISP who had agreed to assist us in this project. Each expert was presented with an initial list of potential dimensions of quality for B2C portals and a number of items worded to capture different aspects of each dimension. The original list relied on the SERVQUAL measurement suggested by Parasuraman *et al.* (1991). However, since SERVQUAL has been criticized for being industry specific (Andaleeb and Baser, 1994; Asubonteng *et al*., 1996), we sought to adjust the original items in order to capture notions relevant to the Web context and to portals' quality dimensions To do this, we took into consideration the WebQual model (Barnes and Vidgen, 2001a, b). During the first round of interviews, we asked the experts to comment on both the dimensions and the wording of the items while inviting them to suggest alternatives and/or complementary ones.

Generating items

Once the first round was completed, the answers were aggregated and a second list with quality dimensions and items was developed. During a second round of contacts, each expert was presented with the list we developed based on the first round and was invited to reconsider his/her initial stance. Through this procedure we ended up with a battery of 14 items.

Then, prior to posting it, the questionnaire was pre-tested in order to assess the ability of the respondents to understand and answer the items. The pretest involved 30 undergraduate and 20 post-graduate students of the university. This led to minor adjustments of the original wording for some (five) of the initial items. The final product was the items we included in the study, each measured using a seven-point scale. A detailed list of the items, along with descriptive statistics, is provided in Table II.

Alternative uses of the Internet

Parsimony

In developing a list of the alternative uses we asked the 50 students to describe different uses of Internet. Their answers were coded to achieve some parsimony and grouping of like answers but also to retain enough variety and ensure richness (Churchill, 1979). A student assistant assigned codes to the responses. These were then reviewed and further consolidated by the authors for increased parsimony, resulting in a total of 34 alternative uses.

The alternative uses were then sorted by frequency of times each one was mentioned. Every alternative use mentioned by three or more students (an arbitrary limit designed to cull down the number of alternative uses of Internet to a more workable number) was considered a potential use and

Measure of B2C Web portal quality[a]	Mean	Std. deviation
Please evaluate the portal you visit most frequently in terms of:		
The technology it employs	5.5580	1.0701
The design of its pages	5.3499	1.1472
The speed at which the pages load	5.0306	1.3200
The functionality of the portal	5.4200	1.1136
The degree to which information is updated	5.7675	1.1512
The degree to which information offered is complete	5.5540	1.1374
The degree to which information offered is reliable	5.6039	1.1241
The degree to which information is covering your personal interests	5.1235	1.1804
The degree to which the pages match your personal style – preference	4.9602	1.1488
The degree to which e-mails and queries are responded to promptly	4.7398	1.5718
The overall concern for the user	4.6844	1.3858
The degree of accessibility to the portal's personnel	4.6617	1.6477
The degree of transactions security	5.0594	1.5480
The degree of personal information security	4.9044	1.8007

Note: [a]All items were measured using a seven-point scale anchored 1 = ''poor''; 7 = ''excellent''

Table II. Descriptive statistics regarding Web portal quality

included in the questionnaire. Through this process, 11 major uses of Internet met the criteria and were selected to be included in the questionnaire (see Table AI for alternative uses and their descriptive statistics). Churchill (1979, p. 68) stresses the importance of starting with a large pool of potential indicators, retaining items with ''slightly different nuances of meaning'', and later refining these measures using purification techniques.

Data analysis

Dimensions of Web portal quality

The first phase of the analysis sought to examine the dimensions of quality for the Greek portals.

User-related issues

At a first level, we examined the simple arithmetic mean of each of the 14 items we included in the study. Interestingly enough, the portals score better in the aspects that are not directly related to the user-visitor of the site (see Table II): keeping the information up to date; ensuring the reliability of the information; using modern technology; offering complete information and creativity of the design are the five characteristics in which the most popular portals excel. On the other hand, user-related issues received the relatively worst scores: the degree of accessibility to the portal's personnel; the overall concern for the user; the responsiveness to e-mails and queries; the degree of personal information security as well as the degree to which the pages of the portal match the user's personal style and preference, were the characteristics for which the respondents gave the lowest scores.

This fact appears to be a strong indicator of product orientation (Gounaris and Avlonitis, 1999), suggesting that the top management of B2C portals is probably more focused on the service they offer, its features and the technology they employ rather than on the needs of their ''customers'' and the service experience they deliver. Also, the fact that most of the quality measures in the extant literature are internally oriented with an emphasis on the technical aspects of the service strengthens this possibility. This is indeed

interesting to note, although further probing of the issue is beyond the scope of this study.

Principal Components Factor Analysis

The next phase of the analysis involved bi- and multi-variate techniques. An examination of the correlation matrix of the 14 items used to assess the quality of the services offered by Internet portals revealed that it would be possible to derive distinctive quality dimensions underlying the original items. To exploit this possibility we performed a Principal Components Factor Analysis. This analysis is particularly useful when the researcher seeks to identify underlying factors that potentially characterize a specific group of variables. Table III shows the results of that analysis.

The analysis produced three specific factors, dimensions of quality, explaining 65.4 percent of the total variance in the original variables, while all the items but one, ''Security for personal information'', load clearly to distinctive factors. This particular item, which was loading on two factors, was excluded from further analysis.

With regard to the results of the analysis, the first factor comprises the dimension of a portal's quality which is related to customer care and the reduction of the perceived risk of using a portal, encompassing issues such as the concern shown for the user, the ease with which the user can communicate with the customer service personnel of the portal, the promptness of the latter to reply to users' questions and the security of the transactions.

Information benefit

The second dimension of portals' quality recapitulates the information benefit the user receives by using a portal. The emphasis of this dimension is on personal value (covering personal interests; detailed and complete information; matching personality and lifestyle) and on value of the information that the user gets when visiting a particular portal (reliable information; up-to-date information).

Finally, the third dimension revealed by the analysis comprises the technology-enabled benefits that allow the user to better use and interact

Factors	Variables	Loadings
F1: customers care and risk reduction benefit	Concern for the user	0.867
(28.6 percent of variation)	Ease to communicate with the portal's service personnel	0.849
	Security of transactions	0.801
	Respond promptly to queries and e-mails	0.724
	Security for personal information[a]	0.648
F2: information benefit	Reliable information	0.859
(26.1 percent of variation)	Complete information	0.839
	Covering personal interests	0.762
	Security of personal information[a]	0.626
	Up-to-date information	0.557
	Information matching personality and lifestyle	0.549
F3: interaction facilitation benefit	Portal's technology	0.824
(20.7 percent of variation)	Portal's design	0.782
	Portal's speed	0.611
	Portal's functionality	0.572

Notes: [a]Indicates item(s) loading on multiple factors which was omitted from further analysis in order to purify the measures

Table III. Greek Internet portals' quality: exploratory factor analysis

with a portal. The focus here is on whether the pPortal delivers its services using technology solutions which facilitate the interaction between the user and the site (e.g. speed and functionality), while the site's design does not encumber the navigation through the pages and the various topics covered by the portal.

Generic quality dimensions

Having identified a generic set of quality dimensions for the Greek portals, we repeated the same analysis for the foreign portals. The reasoning for this was twofold. One reason is that the design and the general set-up of Web pages involves a significant degree of art and personal creativity by the developer of the page. To this end, it may be possible that cultural differences between national and international Web pages developers are reflected on the portal's Web page and, hence, may influence the users' perceived quality.

According to Parasuraman *et al.* (1985), when companies develop the service they offer, they "translate" customers' expectation into service specifications. Since empirical studies have demonstrated that service quality is not dependent only on the sector but also on the cultural context (Ford *et al.*, 1993), one can reasonably expect that the quality offered by the service provider will also be influenced by the provider's culture which is incorporated in the company's offering during this "translation" phase. Some evidence of cultural influences on the perceptions of Web sites has already been established (Fink and Laupase, 2000). Consequently, if the Greek users' perceived dimensions of quality for the international portals were identical with these for the Greek portals, then the measures of quality would be culture-free, as far as the supplier of the service is concerned. This was the second reason why we asked respondents to evaluate not only Greek but also international portals they use. Table IV depicts the results of this analysis.

As can be seen from Table III, the factor analysis resulted again in three main factors, each of which is comprised of the same items, although the loadings of each item on each factor differ.

Convergent and discriminant validity

Having established that the main quality dimensions for both Greek and foreign portals are the same, we proceeded with the next phase of analysis,

Factors	Variables	Loadings
F1: customers care and risk reduction benefit	Concern for the user	0.732
(24.5 percent of variation)	Ease to communicate with the portal's service personnel	0.890
	Security of transactions	0.626
	Respond promptly to queries and e-mails	0.792
	Security for personal information[a]	0.755
F2: information benefit	Reliable information	0.827
(25.3 percent of variation)	Complete information	0.890
	Covering personal interests	0.667
	Up-to-date information	0.560
	Information matching personality and lifestyle	0.616
F3: interaction facilitation benefit	Portal's technology	0.842
(16.6 percent of variation)	Portal's design	0.639
	Portal's speed	0.585
	Portal's functionality	0.662

Table IV. Foreign Internet portals' quality: exploratory factor analysis

i.e. examination for unidimensionality and convergent and discriminant validity using confirmatory factor analysis. This analysis is used to empirically confirm the factor structure (Sharma, 1996). It is used because, contrary to exploratory factor analysis, it allows the researcher to hypothesize a specific factor structure and then test whether the data confirm it.

Correlation coefficients

In Figure 1 we present a graphical representation of the factor structure along with pertinent statistics. To help in the interpretation of the statistics presented in Figure 1, we use different fonts (bolded, italics, both) to describe the correlation coefficients between the factors, the multiple square correlation which describes the percentage of variance of each item that is accounted for by the variance in the factor to which it loads, as well as standardized regression coefficients between each item and the factor in which it is loaded.

The goodness of fit index (GFI) and the squared multiple correlations were used to identify the final set of items representing the dimensions of service quality. Though the overall chi-square test of the three factors model was statistically significant (χ^2 = 102,730 , 52 d.f.) the GFI of 0.97 and the root mean square residual (RMSEA) of 0.040 suggested a good model fit. A four factors model of service quality was also tested. However, a chi-square test with the three factors model suggested acceptance of the latter.

Validity

Convergent and discriminant validity were evaluated by calculating the average variance extracted (AVE) for each factor. Convergent validity is established if the shared variance accounts for 0.50 or more of total variance. Discriminant validity is evident when AVE for each construct is greater than the squared correlation between that construct and any other construct in the

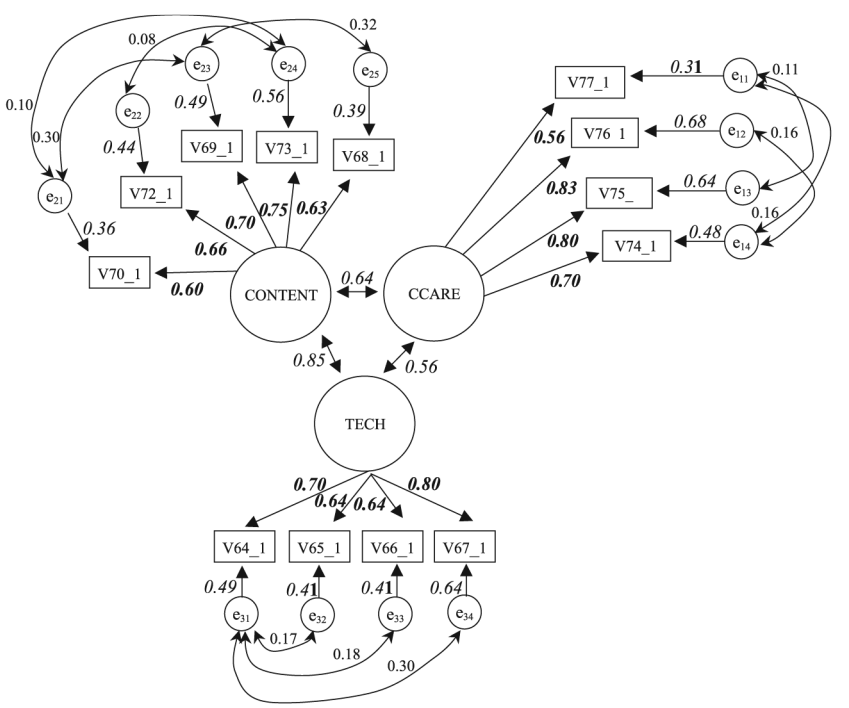

Figure 1. Confirmatory factor analysis for portal quality

model (Fornell and Larcker, 1981). The results (shown in the Appendix) confirm both the convergent and discriminant validity of the model presented in Figure 1.

Consistency

Internal consistency was assessed by means of the Cronbach's alpha coefficient (Nunnally, 1978). Values were calculated for each of the three factors included in the model which we presented in Figure 1. The results (see Table AII) attest to the high internal consistency of the instrument in that all values are above the suggested 0.70 level for scale robustness (Nunnally, 1978).

Having established the discriminant and the convergent validity as well as the internal consistency of the constructs, the next step involved the development of scales for each construct as the simple arithmetic mean of the items comprising each construct. Thus CCARE was developed to measure the dimension captured by the first factor, i.e. customer care and risk reduction benefit, CONTENT was developed to measure the dimension captured the second factor, i.e. information benefits and TECH was developed to measure the dimension captured by the third factor, i.e. interaction facilitation benefit. These three scales were used in subsequent analysis.

Groups of users depending on usage purpose and demographic characteristics

Another part of the analysis sought to examine the possibility of grouping the respondents according to the reasons for which they use the Internet in general as well as on their demographic characteristics. Cluster analysis was used for that purpose.

Data clustering

For the clustering of the data we used the Quick Cluster routine of SPSS. The objective of Quick Cluster is to form a predetermined number of clusters from a large sample such that the clusters display a high degree of internal similarity while being distinct from each other. Because the number of clusters is predetermined for Quick Cluster, there can be a problem in identifying the number of clusters necessary to give a good solution for any set of data. In our analyses, we examined the three-, four- and five-clusters solutions. The three-clusters solution resulted in large clusters with unacceptably diverse membership while the five-clusters solution did not significantly improve the description of the data. Thus, the four-clusters solution was tentatively adopted.

To test the clarity of the four clusters solution we ran chi-square tests for each of the original variables and across each cluster. This analysis revealed that the four-clusters solution was fitting the data in a meaningful way. Table V summarizes the results of this analysis.

As can be seen from Table V, the first cluster consists mainly of young students with low personal income who make systematic use of the Internet mainly for general education purposes, electronic commerce, e-mails and gaming. The second cluster comprises mainly employees from the private sector, with a middle or college level education, who have a relatively low income. This group of respondents falls mainly within the 25-34 age group and, when compared to the other three groups, it contains a significant proportion of female Internet users. They are more likely to use the Internet for keeping up-to-date with current developments, to retrieve information concerning their hobbies or for communicating with other members of the international Web community and chatting.

	Younger systematic user	Female Internet user	Professional user	Leisure and entertainment user	Total sample	χ^2	Sign
Gender							
Males	92.1	80.4	95.8	91.5	88.9	21.922	0.000
Females	7.9	19.6	4.2	8.5	11.1	21.922	0.000
Occupation							
Public sector employee	1.6	8.9	6.7	18.8	11.1	17.344	0.001
Private sector employee	9.5	53.1	20.5	37.3	33.6	59.938	0.000
Self-employed	1.6	26.8	41.6	23.7	28.3	37.382	0.000
Student	73.0	1.1	0.0	8.5	11.3	278.484	0.000
Education							
Low (primary school)	0.0	0.0	0.0	1.7	0.2	6.930	n.a.
Middle (high school)	27.0	13.4	9.0	6.8	12.8	15.388	0.002
College	9.5	24.6	18.1	25.4	20.3	8.003	0.046
University	42.9	34.6	39.8	40.7	38.3	1.860	0.602
Post graduate studies	17.5	27.4	31.3	25.4	27.2	4.542	0.209
Monthly income (IN GDR, €1 = GDR347)							
Up to 200,000	81.0	5.0	2.4	16.9	15.8	238.499	0.000
201-400,000	6.3	53.6	27.7	32.2	35.3	53.868	0.000
401-600,000	4.8	24.0	26.5	11.9	20.8	17.123	0.001
601-800,000	6.3	5.6	12.0	8.5	8.4	5.083	0.166
801-1,000,000	0.0	2.8	12.7	6.8	6.4	18.969	0.000
1,001-3,0000,00	1.6	5.0	11.4	11.9	7.7	9.817	n.a
3,001,000 plus	0.0	3.9	6.1	11.9	5.6	9.970	n.a
Age							

(continued)

Table V. Profiling the Greek Internet users

	Younger systematic user	Female Internet user	Professional user	Leisure and entertainment user	Total sample	χ^2	Sign
15-24	82.5	2.8	0.6	15.3	14.3	283.408	0.000
25-34	15.9	96.6	0.0	50.8	45.6	350.271	0.000
35-49	0.0	0,0	88.0	27.1	34.7	337.888	0.000
50-64	1.6	.6	6.4	11.8	5.4	22.283	0.000
64 plus	0.0	0.0	0.0	0.0	0.0	n.a	
Frequency of Internet use							
Daily	96.8	89.9	84.9	96.6	89.9	14.372	
2-3 times per week	3.2	8.9	12.7	3.4	8.8		
Once per week	0.0	1.1	2.4	0.0	1.3		
Reason for Internet use							
Entertainment	38.1	25.7	22.9	84.7	33.8	82.996	0.000
General education	83.1	20.1	38.0	31.7	36.0	77.095	0.000
News	46.0	68.2	30.7	73.2	44.3	70.898	0.000
Hobbies	36.5	81.3	27.7	26.4	35.1	65.579	0.000
Gaming	37.9	2.2	3.6	15.9	9.0	77.213	0.000
E-purchases	78.3	12.8	13.3	6.0	20.3	139.862	0.000
Investments	7.9	8.9	16.9	28.8	14.1	17.474	0.001
E-mail	98.5	84.4	80.1	82.3	84.4	11.120	0.011
Communication – chatting	34.9	74.3	18.1	22.6	29.1	73.883	0.000
Information for personal interests	63.5	76.0	93.3	78.2	77.3	15.644	0.001
Information on soft/hardware	38.1	34.1	93.2	39.2	43.9	67.665	0.000

Table V.

The third cluster is mainly comprised of self-employed professionals who usually have completed a post-graduate degree and have a middle to high personal income. They fall within the 34-45 age group and they are regular users of the Web. They get connected either to keep track of their investments, or to find information concerning their personal/professional interests or to stay informed with new software and hardware. Finally, the fourth group is mainly comprised of employees of either the public or the private sector, of relatively older age and with relatively higher income. They also make systematic use of the Internet which, however, it is mainly oriented towards entertainment activities or investment tracking.

Four user groups

Having identified four distinctive groups of Internet users, the last phase of the analysis sought to examine whether different dimensions of the portals' quality were more important for the different groups of users. Table VI summarizes the results of the analysis of variance we performed for this purpose. As it can be seen from Table VI, none of the three dimensions of Web portal quality is found to be more important than the others for any of the four distinctive groups that the cluster analysis has suggested.

Discussion

This paper had two objectives. The first was to examine the dimensions which underlie the notion of quality for Web portals. As we have previously discussed in detail, existing literature on Web sites' quality and evaluation is very disparate and limited, both in scope and in size. More importantly, most of the existing research has measured specific aspects of a site or the quality of specific types of Web sites; yet a site for e-banking is something entirely different from a site designed to sell books through the Internet which, again, it is completely different from a Web portal. In addition, to the best of our knowledge, no research has addressed the particular case of portals, although such sites play a major role in the Internet market.

Similarities with WebQual

Our findings regarding the quality dimensions of a Web portal (customer care and risk reduction benefit, information benefit and interaction facilitation benefit) do not coincide completely with the quality dimensions suggested by previous studies although some similarities with those identified in the WebQual model are present:

(1) Our first factor, customer care and risk reduction benefit, has many common elements with the WebQual interaction dimension, such as security of transactions and of personal information, prompt delivery, and communication with the organization.

		Sum of squares	d.f.	Mean square	F	Sig.
Content	Between groups	0.122	3	0.040	0.066	0.978
	Within groups	285.390	463	0.616		
	Total	285.512	466			
CCARE	Between groups	0.145	3	0.048	0.096	0.962
	Within groups	232.539	463	0.502		
	Total	232.684	466			
TECH	Between groups	0.943	3	0.314	0.434	0.729
	Within groups	335.463	463	0.725		
	Total	336.406	466			

Table VI. Differences in perceived importance of the Web portal's perceived quality (ANOVA)

(2) Our second factor, information benefit, comprises common aspects with the WebQual information dimension, such as believable, relevant and timely information.

(3) Our third factor, interaction facilitation benefit, is quite close to the WebQual usability dimensions including aspects such as ease of use and navigation, and appropriate design.

Homogeneous market

A second objective of this research was to examine whether different segments of the market hold a different perspective of the quality dimensions which characterize a Web portal. Our findings seem to support that it is a rather homogeneous market since the perception of a portal's quality does not diverge among distinct groups of consumers. This, however, is not a surprising finding since the Internet has just entered the development phase in the Greek market. Hence, the majority of users are basically innovators who, despite their different demographic profiles or the services they seek from a Web portal, have similar expectations and perceptions of the quality that a portal offers. It is quite likely that, as the use of the Internet will diffuse and larger proportions of the population will get connected, the market for Web portals will become more segmented and, consequently, more heterogeneous.

Given the two objectives of the study, the contribution of our research for academia is the confirmation that measuring quality of the services delivered in the virtual economy is not less complex than it is when evaluating the quality of the services offered in the traditional economy. While there might be some common dimensions regarding the quality in the Web and across different types of sites, there are also specific elements of quality which differ depending on the specific users' needs and the sector of economic activity for which the site is built. To ignore the fundamental reason(s) for which a site is visited, the benefits sought by the visitor when using a particular site and how these benefits are translated into specific quality dimensions could lead to a myopic, technology-driven definition of the site's quality. This, in turn, might lead companies that compete through the Internet to eventually adopt a technology (or product) rather than a market orientation.

Market-oriented approach

Hence, research should focus not merely on bringing to light general and usually technically oriented dimensions of a site's quality but, rather, it should attempt to pinpoint the specific dimensions depending on the benefits sought by the users of a site (Silverman and Grover, 1995), given the purpose (or sector of economic activity) of the site (Evans and King, 1999) and, thus, adopt a more market-oriented approach in defining quality over the Internet.

Our findings would also seem to suggest that there is not such a thing as a "universal perception" of the quality of the various sites on the Internet. This is in line with pertinent research in the broader domain of quality which has demonstrated that the perceived dimensions of quality vary across industries (e.g. Teas, 1993; Babakus *et al.*, 1995, Homburg and Rudolph, 2001).

The findings of this study are also significant for practitioners. A deeper understanding of the reasons why individuals visit a Web site will benefit companies which have already developed sites by allowing them to understand the quality elements of their sites and, consequently, improve the quality of their interaction with their customers through the Web. As far as the companies competing in the new economy offering Web portal services are concerned, an important implication is related to the quality elements

their users employ in order to assess the quality of their experience. Thus, companies offering Web portal services may wish to re-evaluate their Web sites and attempt to measure their customers' perception of the quality they offer along the three benefits-related dimensions that this study has revealed.

Reconsider marketing strategy

Moreover, companies offering Web portals services should reconsider their marketing strategy. As this study suggests, the nature of the demand is rather homogeneous among different market groups, at least at specific phases of the adoption and diffusion curve. This is particularly true for companies aiming at attracting and sustaining customers/users from markets where the Internet is still in the early phases of its adoption. For companies facing such a homogeneous pattern of preferences and demands, delivering customer satisfaction is the key to market share growth and to a stronger market position (Gounaris *et al.*, 2001). Hence, one could argue that further growth and a stronger market position is, at least in such market conditions, directly related to the adoption of a more market-oriented approach in doing business in general, and in managing the quality of the service offered in particular.

The findings are also significant for companies competing through Internet in other economic sectors. The findings of this research may be considered as a motive to probe the behavior of their users and attempt to understand the dimensions on which the visitors evaluate the quality of the company's site. More specifically, the findings of this study would seem to suggest the relinquishing of a blanket approach and a technical orientation in defining and measuring the quality of the offer. Instead, a more market-oriented approach in defining their site's quality might unveil hidden aspects of their users' perceived quality and, thus, allow them to better align their offering with their targeted market's expectations.

Limitations and future research

Early phases

Alas our findings are not free of limitations. The most important one refers to the degree of Internet adoption in the Greek economy. As pointed out earlier, the Internet is still in the early phases of its adoption. On the other hand, one should keep in mind that the diffusion and adoption of the Internet, like any other innovation, goes through its own life-cycle. Presently, it is true that Greece, like many other countries (e.g. Italy, Spain), would appear to be in the development phase while other countries (the USA, Canada) have probably already entered the maturity stage. Hence, it might be possible that the quality elements that this study has revealed will alter as the users of Web portal services become more experienced and familiar with the medium and as their expectations regarding the service offerings evolve (Parasuraman *et al*., 1988). Thus, one could argue that this study offers a first insight into the quality dimensions from the users' perspective of B2C portals during the early stages of Internet adoption. This, however, does not diminish the value and the contribution of the study. The globalization of the world economy means that many companies become, or will become at some point in the visible future, interested in various international markets which are found in different phases of adopting various technologies, including the Internet. Should a company decide to delay entering international markets until these markets have reached a certain level of maturity which will resemble the conditions with which the company is familiar, it runs the risk of giving away those markets to its competition, domestic and international.

Furthermore, one has also to bear in mind that the perceived dimensions of quality are culture bound (Asubonteng *et al.*, 1996). Hence, it might also be possible that the dimensions of quality that this study has identified are

modified, to a greater or lesser extent, depending on the cultural context of the market (Fink and Laupase, 2000). Consequently, the findings of this research should be cautiously adopted.

Future research

Nonetheless, both issues can be easily resolved by future research which is particularly welcome and strongly invited before any generalizations can be made. In fact, it is our hope that this study will stimulate a systematic exploration of the notion of quality in the Internet but from a customer's perspective. To this end, future researchers may wish to repeat this study within markets where The Internet is more widely adopted and both the consumers and the providers of the services are more familiar with it. Moreover, future research which will replicate this study in different cultural contexts but with similar levels of Internet adoption is also keenly recommended before any generalizations can be made and conclusions can be drawn.

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Appendix. Descriptive statistics regarding the alternative uses of the Internet

	Frequency	Percent
E-mail	511	84.7
Research	459	76.1
Information about computers	262	43.4
News	260	43.1
Entertainment	213	35.3
Education	213	35.3
Hobby	208	34.5
Chat	188	31.2
Shopping	118	19.6
Investment	82	13.6
Games	50	8.3

Table AI. Alternative uses of Internet

CONTENT		CCARE		TECH				
Rel	AVE	Rel	AVE	Rel	AVE	$(Corr)^2$	Conv	Disc
0.81	0.80	0.81	0.81	0.76	0.79	0.67, 0.51, 0.67	Yes	Yes

Notes: Abbreviations: CCARE = customer care and risk reduction; CONTENT = information benefit; TECH = interaction facilitation benefit; Rel = Cronbach Alpha coefficient; AVE = average variance extracted = Σ(standard loadings)^2/Σ(standard loadings)^2 + $\Sigma\epsilon ij$; Conv = convergent validity (AVE > 0.50); Disc = discriminant validity = AVE/($Corr^2$) >1; $(Corr)^2$ = highest $(Corr)^2$ between factor of interest and remaining factors

Table AII. Reliability and validity assessment of the Web portal quality scale

This summary has been provided to allow managers and executives a rapid appreciation of the content of this article. Those with a particular interest in the topic covered may then read the article in toto *to take advantage of the more comprehensive description of the research undertaken and its results to get the full benefit of the material present*

Executive summary and implications for managers and executives

The role of the Internet portal

Portals help users to find their way around the Internet. Having started as search engines, they have developed into sites where one can not only locate sites on a particular topic, but also get information and news of general interest, free e-mail and the opportunity for e-shopping. Some 35 per cent of the traffic enjoyed by e-shops is generated through Web portals. Successful portals have to create and maintain as much traffic as possible, so they must be able to attract and keep visitors. Gounaris and Dimitriadis explore how customers of business-to-consumer Internet portals perceive the quality of their service offering.

Encounters with customers take place in a virtual context

While business-to-consumer portals are just another type of service company, the virtual context of their operations influences the nature of the encounters they have with their customers. These encounters lack any physical tangibles and the element of human interaction. The customer has to assume a lot more control of the service-delivery process. The dimensions of reliability, responsiveness and assurance differ during a virtual encounter from during a ''bricks and mortar'' exchange. The customer's technology infrastructure (speed, graphics quality, type of connection, reliability of the Internet service provider and so on) is not under the control of the service provider, but does significantly influence the visitor's perception of quality. The customer's involvement is relatively high as portals deliver non-standardized services.

Key quality dimensions

The authors' research reveals three key quality dimensions:

(1) Customer care and risk-reduction benefit. This covers aspects such as concern for the user, ease of communication with the portal's service personnel, prompt response to queries and e-mails, and the security of transactions and of personal information.

(2) Information benefit. The information provided should be reliable, complete, up to date, and cover the personal interests and lifestyle of the user.

(3) Interaction facilitation benefit. This embraces the portal's technology, design, speed and functionality.

The Greek context

The research also reveals that the perception of a portal's quality does not diverge among distinct groups of customers. However, the research was carried out in Greece, where the Internet has just entered the development phase. Most Greek users are therefore innovators with similar expectations and perceptions of quality. As more of the population gets connected, the market for portals is likely to become more segmented and heterogeneous.

The need for more of a market orientation

The findings appear to suggest that there is no such thing as a ''universal perception'' of the quality of Internet sites. While getting the technology right is, of course, important, the authors argue the need for companies that

compete through the Internet to adopt more of a market orientation, and to pay greater attention to the benefits sought by users of a site, given the purpose (or sector of economic activity) of the site. A deeper understanding of the reasons individuals visit a Web site will benefit companies that have already developed sites by enabling them to understand the quality elements of their sites and, consequently, improve the quality of their interaction with their customers through the Web.

(A précis of the article ''Assessing service quality on the Web: evidence from business-to-consumer portals''. Supplied by Marketing Consultants for Emerald.)