The Impact of Different Media Use on Service Quality: An Empirical Investigation of End-User Satisfaction in Help-Desk Based on SERVQUAL

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ABSTRACT

In this paper, we investigated the relationship between different media use and customer satisfaction in help desk service. Different dimensions of customer satisfaction were derived based on SERVQUAL (Parasuraman et al. 1985): reliability, empathy, assurance, tangibles, and responsiveness. The results support our hypotheses that use of conventional media is related to help desk satisfaction through reliability and empathy and electronic media shows a higher satisfaction in tangibles and assurance. Also, hybrid media users show a higher satisfaction in reliability and responsibility. The results suggest that automating help desks should be considered as a way to provide more various options to end-users.

INTRODUCTION

IT support for end-users emerges as one of the leading concerns in an organization. Continuous adapting and updating of new technologies have made organizations develop effective and efficient help desk service challenging (Whiting, 1997). Organizations look for new ways to provide a better help desk service to satisfy the growing demands and expectation of customers. A number of commercial products using artificial intelligence techniques such as expert systems and case-based reasoning have become more popular. Outsourcing the help desk function also has become a viable option for many organizations (Chalos and Sung, 1998). The move to the help-desk automation and remote on-line troubleshooting based on Internet-based products usually means that more and more help-desk services are computer-based rather than human-based.

In the face that end users satisfaction has become strategic imperative in the business, the primary concern here is how to evaluate these new technology-enabled tools (e.g. e-mail and the Internet) with conventional media support (e.g., telephone, face-to-face) to provide more effective and efficient end-user support.

The main purpose of this article is to investigate the effects of different media on end-users' satisfaction in help desk service. More specifically, we will relate the use of different media use along the dimensions of reliability, empathy, assurance, tangible, and responsiveness based on SERVQUAL (Parasuraman et al. 1985). The major theme of this paper is to show that use of each media is related to different dimensions of customer satisfaction. The results of this study should enable organizations to better design their help desk functions..

LITERATURE REVIEW

Most early studies on media choice have paid attention to social presence and media richness theory. The researchers define social presence as "the degree to which a medium permits communicators to experience others as being psychologically present" (Short et al., 1976; Fulk et al., 1987), or "the degree to which a medium is perceived to convey the actual presence of the communicating participants" (Short et al., 1976). Social presence theorists also claimed "communication media differ in their capacity to transmit information about facial expression, direction of looking, posture, dress and nonverbal, vocal cues."

According to the social presence theory, communication media are perceived as rating in social presence. For example, conventional media such as face-to-face and group meetings are perceived as ranking high in social presence. By contrast, electronic media such as early e-mail and computer based on written documents are poorly perceived in terms of social presence. Therefore, social presence theorists claimed that conventional media are more appropriate for tasks requiring high social presence, whereas electric media and written letters are more appropriate for tasks with low social presence requirement.

Unlike the social presence theory, the media richness theory focuses on communication media characteristics (Hiltz & Turoff, 1981; Rice, 1984, 1987; Rogers, 1986; Daft and Lengel, 1984, 1986, Lengel and Daft, 1988). That is, researchers seek an answer as to why organizations process information. They suggest that when equivocality is high, organizations allow for rapid information cycles among managers, typically face-to-face and telephone, and prescribe fewer rules for interpretation (Weick, 1979; Daft and Lengel, 1984).

Media richness theorists suggested that rich media, such as face-to-face and telephone, facilitate the immediate exchange of a wide range of communication cues, while leaner media such as e-mail, written roles and regulations, letters, and written notes allow exchange of a restricted range of such cues over a longer period (Daft and Lengel, 1986).

This theory is based on task variety and task analyzability; Task variety is "the frequency of unexpected and novel events that occur in the conversation process (Daft & Lengel, 1986, p. 554)" and task analyzability refers to "the degree to which tasks involve the application of objective, well-understood procedures that do not require novel solution." The media richness theorists posed that richer media are more appropriate for unanalyzable tasks such as resolving disagreement, making important decision, generating ideas and exchange of confidential/sensitive information, whereas leaner media are more appropriate for analyzable tasks such as exchanging routine information, clarifying confusing viewpoints, and exchanging urgent/timely information.

Although these two theories tried to explain end users' media choice, authors of many empirical studies have suggested that media choice cannot be logically explained or predicted by considering only the inherent richness or social presence of medium and the characteristics of the task (Markus, 1988; Rice & Shook, 1990; Zmud, Lind & Young, 1990; Yates & Orlikowski, 1992; Trevino & Webster, 1992; King and Xia, 1997).

Moreover, as information technology has developed, electronic media increase their richness through messenger service such as call

and page functions. According to critical social theory, Ngwenyama and Lee (1997) point out instances of communication richness in electronic mail communications that would escape detection in not just media richness theory perspective but also in critical social theory.

Since this media richness theory is only partially supported by empirical tests and current trend aforementioned, it is likely that other factors or dimensions might affect end-users' media choice. In order to overcome media richness theory' criticisms, we adopted the service quality (SERVQUAL), created by Parasuraman et al. (1985), who theorized that regardless of type of service, customers used basically similar criteria in evaluating service quality and that these criteria span virtually all aspects of service.

In their 1988 research, Parasuraman et al. (1985) presented a 22-item scale consisting of five service quality dimensions, which guarantee end users' satisfaction, including:

- Tangible: physical facilities, equipment, and appearance of personnel.
- Reliability: ability to perform the promised service dependably and accurately.
- Responsiveness: willingness to help customers and provide prompt service.
- Assurance: knowledge of employees and their ability to inspire trust and confidence.
- Empathy: the provision of caring individualized attention customer.

HYPOTHESES DEVELOPMENT

To investigate the relationship between media choice and end-user perception of help desk functions, a research model was developed as shown in table1 and Figure 1. In this model, we used five constructs from SERVQUAL (Paraguayan, Zenithal, and Berry, 1991) that are thought of as closely related to end-user satisfaction with help desks: reliability, empathy, assurance, tangibles and responsiveness

We adapted SERVQAUL constructs to media choice criteria over the commonly used equavocality and uncertainty, or analyzability and diversity. Reliability is defined as the degree of feeling that customer service shows sincere interest in customer service, and that they will solve the problem correctly the first time, and in a timely fashion. Empathy consist of the degree of feeling that customer service shows a personal interest, politeness, and is perceived by customers as displaying personal attention. Assurance refers to the degree of feeling customer service gives customers a confidence on the transaction, in terms of feeling that staff are knowledgeable about transaction and that customers can feel safe about the privacy of transacted information. Tangibles is considered as the ability of customer service to project that it uses modern-looking equipment, is visually appealing, and exhibits increasingly aesthetic attention to materials. Reliability consists of the ability of customer service to provide service in a timely fashion, and that they show sincere interest and can correctly diagnose and solve the problem on the first try. Responsiveness is defined as the degree of feeling that customer service provides prompt service, ready to respond requests, and is never too busy to respond to requests.

Our research predicts that as electronic media are being used organization-wide, and enhancing their richness through social and technology systems (Ngwenyama and Lee 1997) end users media choice is no longer determined by analyzability and variety, media richness and management problem, nor uncertainty reduction and equivocality resolution. Therefore, we will investigate whether their different media choice patterns make end-users feel different levels of perception of satisfaction. In this research, we define different media choice pattern as hybrid, conventional, and electronic groups.

We have also adopted and developed Kydd and Ferry (1991) and Daft and Legal (1986)'s continuum of communication media. This is, following SERVQUAL, we believe that communication media differ in their relative abilities to increase reliability, empathy, assurance, tangibles and responsiveness (See Figure 1 and Table 1). This means that electronic media such as e-mail and Internet (e.g., FAQs) are more

efficient in perceiving assurance, tangibles and responsiveness (within bandwidth), while they are inefficient for communicating reliability and empathy. Similarly, conventional media such as face-to-face and telephone are effective in terms of reliability, empathy and responsiveness (out of bandwidth), but are less effective for assurance, and tangibles.

As King and Xia (1997) suggested, individual's media experiences are important when individuals choose or use communication media, differences in the relative strengths of the media shown in Figure 1 could incur different media choice through end-users experience when they use customer service. This paper focuses on differences of perception of service quality from customers' choosing various media. As presented in Table 1, five media including conventional and electronic media, offer combinations with various strengths and weaknesses. On the basis of the literature, we derive the relationship between media choice and different aspects of perception of help desk function.

Figure 1: Continuum of communication media in help desk
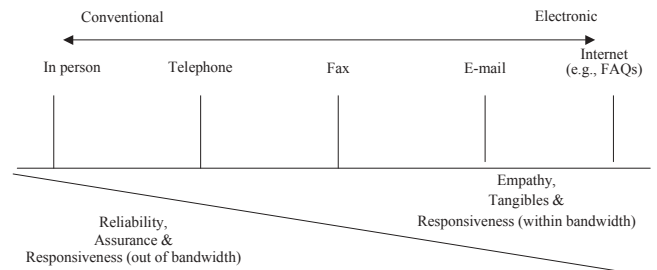
Note: Adapted from Kydd and Ferry (1991), who adapted the their framework from Daft and Lengel (1986)

Table 1: Factors influencing perceptiosn of service qulity: A comparison of conventional and electronic media

| Factors | Communication Media | | | | |
| | Conventional | | | | Electronic |
	Face to Face	Telephone	Fax	E-mail	Internet (e.g., FAQs)
Reliability	1	2	3	4	5
Empathy	1	2	3	4	5
Assurance	5	4	3	2	1
Tangibles	5	4	3	2	1
Responsiveness (Within bandwidth)	5	4	3	2	1
(Out of bandwidth)	1	2	3	4	5

Note: Adapted from Chidambaram and Jones (1993)
Key qualities of these five media are presented on table 1 (the lower, the better)

As shown Table 1, conventional media provide end users with an ability to increase reliability and empathy, because they allow end users to exchange a variety of verbal and non-verbal information (1993). Specially, face-to-face has the ability to allow a broad range of communication stimuli and responses so as to make end-users perceive a personal interest, politeness and attention, and get first solving problem, sincere interest and immediate answers without ambiguity. They also permit richer affection than do electronic media. For example, conventional media are often considered as a more natural form of group interaction than comparable non-in person forums (Daft and Lengel, 1986). In other words, electronic media are regarded as less effective media for intense socio-emotional interaction involving heated debates, negotiation, and decision-making.

On the basis on the literature reviewed above, we hypothesize that conventional media is positively associated with perception of reliability and empathy among service quality constructs. (See Figure 1). Hence:

Ha: The use of conventional media is more strongly related to Reliability than the use of electronic media.

Hb: The use of conventional media is more strongly related to Empathy than the use of electronic media.

On the contrary, we could argue that electronic media increase assurance and tangibles. For example, written document such as e-mail and Internet (FAQ) help end users to deal with the dual themes juxtaposed by Daft and Lengel (1986). Electronic media allow end-users to focus their idea or problem (Zigurs, et al., 1988) and leave evidence of communication. Thus, end-user can get obtain confidence, safety, and transaction knowledge.

In addition, the Internet can provide end-users with a strong visual performance. For example, when an end user shops in an Internet shopping mall, they can see modern-looking equipment such as pictures and product prototype information. Hence:

Hc: The use of electronic media is more strongly related to Reliability than the use of conventional media.

Hd: The use of electronic media is more strongly related to Tangible than the use of conventional media.

As shown Table 1, electronic media offer customers an ability to input comments anonymously and are easy to access (Zigurs, et al., 1988). These characteristics encourage end-users to easily lodge some complaints, so that they can receive prompt service. However, electronic media have narrower bandwidth and have more time lags than conventional media do (Chidambaram and Jones, 1993). Thus, we assume that hybrid media users (people who select mixed media determine this based on problems or their own experience) have higher perception than conventional media users or electronic media users do.

He: There is no difference in the responsiveness between conventional media and electronic media users, but there is a difference between hybrid media users and conventional media users, and between hybrid media users and electronic media users.

RESEARCH METHOD AND ANALYSES

This survey utilizes a 7-point Likert type scale. To develop constructs and investigate the hypotheses, this study uses cluster analysis, factor analysis and one-way ANOVA.

First we conducted a pilot test using a web-based survey (see www.ait.unl.edu/sglee) and refined the pilot survey through the discussion with MBA students. Finally, we completed our questionnaire. The survey was redistributed to 1,000 MBA students in Korea during the spring of 2001. This study tests the aforementioned hypotheses with 222 samples. The return rate was 22.2 percent.

In terms of computer proficiency of participants, most participants were proficient: power-users (11.3%), above-average (20.7%), average (41.0%), below-average (18.5%) and novice (9.4%), 2.7 percent of participants did not respond to this question. In the job career, the participants were various: manufacturing (20.3%), financing/banking (1.4%), transportation (12.2%), information technology (1.8%), retailing (12.0%), communications (3.2%), education (35.6%), health care (5.1%), others (7.4%) and no response (2.7%).

In order to examine hypotheses, we performed a cluster analysis. We grouped based on face-to-face, telephone, fax, e-mail, and Internet. Table 2 shows the results of this cluster. We identified three groups of end-users: one group utilizing all of these media, another group mostly users of electronic media such as e-mail and Internet, the other group using telephone and face to face. We named the first group hybrid group (HG), second group electronic group (EG), and third group conventional group (CG). The numbers of end-users are 55, 95, and 54, respectively.

Secondly, we performed a factor analysis using measures related to service perception constructs to assess the reliability of the multi-item scales. Table 3 shows the factor analysis results. Factor analysis is commonly used to reduce a set of variables to underlying factors in generally linear combinations of original variables, creating a clear structure, and suggesting clear discriminant validity for these constructs. These five factors account for more than 78.36% of the observed variance. The loading of each of the 15 measures on its respective factor is well over 0.40, and the eigenvalues of each con-

Table 2: Cluster analysis of end-users, media choice program

Frequency mean	Hybrid	Electronic	Conventional
Face to face	**4.58**	1.63	**1.89**
Telephone	**4.93**	4.79	**5.22**
Fax	**4.24**	1.69	1.57
Email	**4.55**	5.38	2.44
Internet	**5.11**	5.93	1.85
Total number	(55)	(95)	(54)

Table 3: Factors analysis of independent variables

	Tang.	Resp.	Assu.	Reli.	Empa.
The medium you use the most will increase visual attention using materials such as pamphlets or public relations.	.854				
The medium you use the most makes you feel customer service is visually appealing.	.838				
The medium you use the most makes you feel customer service has modern-looking equipment	.780				
The medium you use the most makes you feel customer service is never too busy to respond to your requests.		.906			
The medium you use the most makes you feel customer service is always ready to respond your request.		.813			
The medium you use the most makes you feel customer service provides a prompt service		.774			
The medium you use the most makes you feel customer service make you feel safe with your transactions			.839		
The medium you use the most makes you feel customer service gives you a confidence about the transaction			.784		
The medium you use the most makes you feel customer service has a knowledge about your transactions.			.598	.420	
The medium you use the most makes you feel that customer service provides the service just in time.				.834	
The medium you use the most makes you feel that customer service will solve the problem right the first time.				.774	
The medium you use the most makes you feel that customer service shows sincere interest in customer service.			.447	.594	
The medium you use the most makes you feel that customer service is polite to you.			.454	.476	.420
The medium you use the most makes you feel that customer service shows an personal interest					.847
The medium you use the most makes you feel customer service tries to pay personal attention.					.771
Eigenvalue	2.506	2.476	2.462	2.404	1.906
Percentage of Variance Explained	16.708	16.504	16.416	16.028	12.705

struct is above 1. The results of factor analysis describe the measures chosen are true constructs, because there are relatively high correlations between measures of the same construct using different methods and low correlations between measures of construct that are expected to differ (Cronbach, 1971; Campbell and Fiske, 1959).

After testing the internal validity of each multi-item scales, we summed questionnaires' value of each constructs Finally, we conducted a one-way ANOVA to detect difference of end-users perception among the three groups.

In general, survey results demonstrate that user of conventional media are positively related to help desk perception through reliability. However, empathy is not different from the different media-using groups. Electronic media has a higher perception in terms of tangibles with significance even through assurance is not significant. Finally, the hybrid media user group has a higher perception among reliability and responsibility than other two groups (conventional and electronic group) have (see Table 4).

FINDINGS

Results of the ANOVA partially proved that because the spoken word is expressive, conventional media have more ability as a medium to allow a broad range of communication stimuli and responses. The

Table 4: Results of a one-way ANOVA by different media choice group with LSD

Dependent Variable	(I) Cluster Number of Case	(J) Cluster Number of Case	Mean Difference (I-J)	Std. Error	Sig.
Reliability	**HG**	**EG**	**2.3101**	**.585**	**.001***
	HG	**CG**	**1.4992**	**.660**	**.011****
	EG	**CG**	**-0.8109**	**.588**	**.089***
Empathy	HG	EG	0.7780	.621	.211
	HG	CG	0.8098	.702	.250
	EG	CG	0.0318	.624	.959
Assurance	HG	EG	0.5674	.539	.294
	HG	**CG**	**1.0773**	**.616**	**.082***
	EG	CG	0.5099	.542	.348
Tangibles	HG	EG	0.3510	.613	.568
	HG	**CG**	**1.8725**	**.701**	**.008****
	EG	**CG**	**1.5215**	**.617**	**.015****
Responsiveness	**HG**	**EG**	**1.4674**	**.651**	**.025****
	HG	**CG**	**1.9082**	**.740**	**.011****
	EG	CG	0.4409	.655	.502

*** 0.001 level.　　**** 0.05 level　　* 0.10 level

Table 5: Results of hypotheses

Hypotheses	Condition (mean / Ranks)	Hypotheses Supported or not?	Statistically Supported or not?
Hypo. a (Reliability) **Rank**	**HG (13.25) EG (10.94) CG (11.76)** **1　　　3　　　2**	**Yes**	**Yes**
Hypo. b (Empathy) **Rank**	HG (11.27) EG (10.49) CG (10.46) **1　　　2　　　3**	No	No
Hypo. c (Assurance) **Rank**	HG (11.14) EG (11.57) CG (11.06) **1　　　2　　　3**	Yes	No
Hypo. d (Tangibles) **Rank**	**HG (11.37) EG (11.02) CG (9.50)** **1　　　2　　　3**	**Yes**	**Yes**
Hypo. e (Responsive.) **Rank**	**HG (12.59) EG (11.12) CG (10.68)** **1　　　2　　　3**	**Yes**	**Yes**

results did not confirmed Daft and Lengel's (1986) theory that conventional media perceived by end-users as the "warmest" media permitting the exchange of a wide range of socio-emotional communication. However, If we carefully look at the measurements in reliability and empathy, more open-ended communication makes end-users feel personal interest, politeness and attention, and get immediate problem solving response with an expression of sincerity rather than impersonal ambiguity (Chapanis, et al., 1972,1977), even though empathy is not statistically significant.

As shown in Table 5, electronic media partially provides end users with the ability to increase assurance and tangibles. In hypothesis 2c and 2d, we proposed that electronic media have higher assurance and tangibles than conventional media. The results of ANOVA and Rank proved that e-mail and Internet' FAQ have higher tangibles with statistical significance even though assurance is not significant. This results means that electronic media make end-users to focus their idea or problem so that end-users can obtain transaction safety, confidence of problem solving and knowledgeable information with an evidence of communication. In case of tangibles, the Internet and e-mail can provide end-user with showing strong visual performance using figures, tables and prototyping product.

Finally, we claim that there is no difference between electronic media and conventional media in responsiveness because responsiveness depends on bandwidth. If problem and query is in within prepared bandwidth, electronic media can lead to timely solutions (Lee et al 2001). However, when the problem is not within bandwidth, it takes much more time than conventional media time lag. Because of these characteristics, we believed hybrid media users, who choose media depending on the situation, have higher satisfaction of responsiveness. The results indicated that hybrid group receives prompt service with statistical significance.

In this result, we found an interesting aspect in reliability and responsiveness that the hybrid group who use various types of communication media has the highest perception on satisfaction. The results of this study imply that organizations should be encouraged to design their help desk with more care and attention.

CONCLUSION

As we expected, customers have different perceptions of various different media: higher reliability from conventional media, such as face-to-face and telephone, and higher tangibles and assurance for electronic media, such as e-mail and Internet (e.g., FAQ/Q&A), etc. Specifically, the hybrid group has higher levels of reliability and responsiveness. These perceptions may lead organizations to prepare different medium for a different tasks or use mixed purpose.

The results of this study have some important theoretical implications. First, we applied the concept of media choice to the domain of the help desk service. Second, our research incorporated SERVQUAL theory into media selection mechanism.

The practical implication of our study is that by understanding what kinds of perceptions customers have for each medium and their behavioral pattern, organizations may be able to provide better help desk service, which is critical in the competitive business world.

REFERENCES

Full paper and references are available upon request from authors.

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