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# WEB SITE QUALITY: CROSS-CULTURAL COMPARISON OF U.S. AND GERMAN BUSINESS CUSTOMERS

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## Abstract

*The quality of Web sites has been the focus of much attention as of late. Research has focused on the business-to-consumer arena. Of equal interest, however, is the quality of Web sites in the business-to-business realm. This paper takes a currently validated measure of business-to-consumer Web site quality (WebQual™) and applies it to the business-to-business realm in order to study the cross-cultural differences and similarities of Siemens Corporation's U.S. and German business customers.*

## Introduction

Brick-and mortar companies have expanded into the Internet in order to make it easier for their customers to do business with them (Seybold 1998). Industrial markets' complex products and services require a sound understanding of customers' needs and intentions. Using the Internet instead of traditional channels of doing business with a company does not automatically mean a benefit to customers.

One subdivision of the Siemens Corporation is the world's largest provider of technical services. This company is at the initial stage of implementing E-Business applications. One of the company's short-term goals is to improve its existing Web site by adding features that provide value to Siemens' customers. Due to the complexity of the technical services the company offers, the question arises which services and information about technical services should be offered via the new Web site, and which business processes do the customers prefer to conduct through traditional channels.

This paper describes the requirements business-to-business customers in the industrial services industry have with regard to doing business electronically. The goal of this research is to investigate cultural differences and similarities of these customers' requirements regarding business-to-business Web sites in the technical services industry, so that these similarities and differences can be considered when developing a new Web site. The findings are based on a survey that samples U.S. and German customers of Siemens' technical services division.

Cultural research has identified four national culture dimensions: power distance, uncertainty avoidance, individualism-collectivism, masculinity-femininity (Hofstede 1980). According to this study the Americans and Germans differ in individualism-collectivism (being the extent to which the members of a culture act as individuals or as members of cohesive groups) and uncertainty avoidance (being the extent to which the members of a culture feel threatened by uncertain or unknown situations). U.S. citizens are considered to be more individualistic (US scored 91 and Germany scored 67 on Hofstede scale) and uncertainty-avoiding (US scored 46 and Germany scored 65 on Hofstede scale) than Germans. These cultural differences are hypothesized to affect the evaluation of the U.S. and German customers with regard to their perception of Web site quality. The findings will assist in launching Web site(s) that appropriately address cultural emphases.

## Study

For the development of a new, high-quality Web site it is important to know the strengths and weaknesses of the current Web site as perceived by customers. This knowledge helps to prevent inefficiencies and high costs when developing a new Web site

(Loiacono 2000). In order to determine the strengths and weaknesses of a Web site a quantitative Web site quality measure is needed. Such a measure, WebQual™ (Loiacono 2000), was employed in this study.

WebQual™ identifies 12 dimensions of Web site quality: informational fit to task, interaction, trust, response time, design appeal, intuitiveness, visual appeal, innovativeness, flow – emotional appeal, integrated communication, business processes, and substitutability (Table 1). Each dimension of WebQual™ is represented by three statements, which subjects responded to using a 7-point Likert scale (1 being strongly agree to 7 being strongly disagree).

An online questionnaire based on WebQual™ was used in this study (<http://www.siemens.de/questionnaire>, and <http://www.siemens.de/fragebogen>). A sample of 167 German customers and 236 U.S. customers of Siemens’ Industrial Services division evaluated the company’s current Web site. In addition, telephone interviews were conducted to better understand the quantitative data collected and to probe the findings further.

**Table 1. Twelve Dimensions of Web Site Quality (Loiacono 2000) and Preliminary Results**

Dimension	Description of Concept	Average Score of U.S. Respondents	Average Score of German Respondents	t-Test Probability
1. Informational Fit to Task	Relates to the ability of the Web site to meet the consumer’s informational needs.	4.46	4.74	0.5227
2. Interaction	Relates to the ability of consumers to interact with the Web site to receive tailored/personalized information or service.	4.78	4.73	0.9124
3. Trust	Relates to the concern for security and information privacy.	5.06	5.05	0.9812
4. Response Time	Relates to the time that it takes consumer to download and interact with Web site.	5.43	6.03	0.0363*
5. Design Appeal	Relates to the aesthetic “beauty” of a Web site as well as the navigational system.	5.00	5.53	0.1060
6. Intuitiveness	Relates to the ease of using/interacting the Web site.	5.54	5.82	0.4379
7. Visual Appeal	Relates to the Web site’s visual appeal.	5.33	5.47	0.6453
8. Innovativeness	Relates to the Web site’s uniqueness and creative feel.	5.06	5.05	0.9937
9. Flow-Emotional Appeal	Relates to the emotional affect the Web site has on consumers.	4.26	4.59	0.3676
10. Integrated Communication	Relates to the relationship the Web site has with respect to other forms of media (radio, television, etc.).	5.00	5.24	0.5225
11. Business Processes	Relates to the relationship the Web site has with respect to the company’s business processes (e.g., purchasing over the Web site).	4.04	3.69	0.3668
12. Substitutability	Relates to the use of the Web site as an alternative means of interacting with the company.	4.69	3.67	0.0338*
Overall Score		58.65 (4.89)	59.62 (4.97)	0.7707

\* statistically significant at the .05 level

## Preliminary Findings

Though this research is still in progress, the preliminary findings are presented here. Twenty-four U.S., and 22 German customers have responded so far. At least 60 subjects is the targeted sample size. Average scores for each dimension and an average overall score for the Web site (being the sum of the average dimension scores) were calculated. Based on these currently available data two-tailed, two-sample t-Tests were conducted for each dimension and the overall score to determine differences in the average scores of German customers and U.S. customers. The average scores and test results are shown in Table 1.

Significant differences assuming a level of significance of  $\alpha = 0.05$  could only be identified for the dimensions "Response Time" and "Substitutability." Whereas the U.S. respondents evaluated the response time of the Web site with a lower score than the German respondents, they assessed its substitutability with a higher score. The greatest similarities in the evaluation of the Web site were identified for the dimensions "Innovativeness," "Trust," and "Interaction."

The online questionnaire also included additional questions about customers' experiences, behaviors, and intentions with regard to Electronic Commerce (doing business electronically). Based on the initial findings of the online questionnaire depth interviews (Churchill 1991) were conducted via telephone to get more specific insights into customers' requirements with regard to the new Web site. German and U.S. customers were interviewed who indicated in the online questionnaire that they were willing to participate in a subsequent telephone interview.

Five U.S. and eight German respondents have been interviewed so far. Interview respondents were engineers who had been using the Internet to obtain information about certain products and services and to compare the offerings of different suppliers, but not to purchase products or technical services online. The majority of the U.S. as well as German interviewees expressed that they would like to see more technical information on the Web site such as product specifications. They also stated that more graphic and multimedia illustrations of products and services would be desirable as supportive features that make new products and technical services more tangible. The majority of German, but none of the U.S., interviewees mentioned that they would like to see a more detailed list of Siemens contact persons and their scope of expertise on the Web site, so that they can directly call an expert by phone when they have a specific request.

The substitutability dimension was addressed in the telephone interviews with the question, in which cases the interviewee would prefer interacting with Siemens via the Internet to contacting a sales representative via telephone. The initial response to that question differed between U.S. and German respondents. Three of the five U.S. respondents directly answered with a detailed description of the cases in which they preferred using the Internet to using the telephone. In contrast to that six of the eight German respondents immediately said that they definitely preferred using the phone and that they could not imagine a situation where it could be easier to use the Internet in this regard.

After further probing however it was revealed that both U.S. and German interviewees possessed similar preferences. Using the telephone is preferred whenever specific requests and questions occur that potentially require additional discussion. In cases where unequivocal information is requested that does not require additional conversation such as general product and service information, and the availability, delivery times, and prices of products the respondents would like to use the Internet to contact Siemens. In this context all respondents appreciated the idea of using a customized Web site.

## Implications

This research (in progress) has identified many similarities of Web site quality perception of U.S. and German business-to-business customers in the technical services industry. Especially with regard to the WebQual™ dimensions "Innovativeness," "Trust," and "Interaction" both customer groups' perceptions of the Web site were nearly identical. Also the dimensions "Visual Appeal," "Informational Fit to Task," and "Integrated Communication" had t-Test probabilities higher than 0.5. This implies that Siemens can address those dimensions in the same fashion for both customer groups when the company develops its new Web site. Different approaches might be appropriate with regard to the two dimensions, in which U.S. and German customers differed significantly in their evaluations. Possible reasons for the difference in the perception of the Web site's response time are being investigated. The difference in perception of substitutability is discussed here.

German customers have a more conservative attitude towards using the Internet as a substitute for contacting a representative in the traditional way via telephone. This more conservative attitude may be due to German customers feeling more threatened than the U.S. customers by the idea of using a new medium (the Internet) instead of traditional methods of contacting their suppliers (Daft & Lengel, 1987 and Rice, 1990). This matches the findings of cultural research that Germans have a higher uncertainty-avoidance than U.S. Americans. However, after probing the German interviewees - about benefits of using the Internet for

contacting Siemens in certain situations, they revealed similar opinions as the U.S. interviewees. Both groups stated that the Internet is the preferable medium for contacting suppliers in cases where unequivocal information is requested that does not require any additional discussion.

The findings thus far suggest that other than language differences one Web site for both national customer groups (U.S. and German) could be used. Regardless of nationality, business-to-business customers require similar service via the Web site and evaluate it in a similar fashion. But management must take care to proactively, especially in Germany, communicate the benefits of using the new, improved Web site for certain business processes such as requesting information on availability, delivery times, and prices of products, and the status of orders, to its business customers.

## Limitations and Future Research

There are two major limitations to this research. The first is the sample chosen. Given the use of Siemens Industrial Services, we were limited to a convenience sample selected by Siemens' marketing organization. This limits the generalizability of the finding to the general populace of business-to-business sites.

Second is the limited number of subjects. Only 24 U.S. and 22 German customers have responded to the questionnaire so far. The sample size of both groups can be argued to be too small in order to determine statistically valid conclusions with a t-Test. Furthermore, five (U.S.) and eight (German) telephone interviews in addition to the quantitative analysis only gives some initial impressions of cultural differences but does not allow us to generalize the findings. We continue to collect surveys from U.S. and German customers using the same methodology in order to gain a larger sample size for further testing. We hope to gain a sample size of at least 30 U.S. and 30 German business customers.

The development of WebQual™ was based on users' perceptions of the quality of business-to-customer Web sites. In this study it is applied to measure the quality of a business-to-business Web site. Therefore the next step, after a significantly enough sample is obtained, is to use Structural Equation Modeling to determine if this business-to-consumer Web site quality measure holds within the business-to-business arena.

If current findings hold true with the larger sample, the reasons for the different perceptions of the WebQual™ dimensions "Response Time" and "Substitutability" and the implications of these differences can be probed further and used to improve and communicate the benefits of the new Web site with appropriate cultural emphases.

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