December 2001

Information Quality and the Internet: A Critical Incident Approach

Barbara Klein
University of Michigan-Dearborn

INFORMATION QUALITY AND THE INTERNET: A CRITICAL INCIDENT APPROACH

Barbara D. Klein
University of Michigan–Dearborn
bdklein@umd.umich.edu

Abstract

Although research has been conducted on user perceptions of the quality of information available through the Internet, there is little theory available to guide researchers studying the factors that affect these perceptions of information quality. The study proposed here will use the critical incident technique to develop a theoretical model of factors affecting perceptions of the quality of information accessed using the Internet. The results will guide future research and provide guidance for educators and managers seeking to sensitize users to the strengths and weaknesses of information accessed through the Internet.

Introduction

Information quality problems may occur with information published on the Internet (Hawkins 1999; Pack 1999). If information quality problems are not understood by users, decision making and business performance may be affected (Fuld 1998; Keltner 1998).

Some authors have suggested guidelines for evaluating information published on the Internet (e.g., Alexander and Tate 1999; Hawkins 1999). It has also been found that users find the web to be less authoritative and credible than other types of information systems (Rieh and Belkin 1998). However, little is known about how users evaluate information that they access using the Internet. The study described in this paper aims to improve our understanding of how users evaluate the quality of information that they access through the Internet.

Literature Review

Information quality is generally thought of as a multi-dimensional concept. For example, Huh et al. (1990) define four dimensions of information quality: accuracy, completeness, consistency, and currency. Wang and Strong (1996) developed a framework of fifteen dimensions of information quality (believability, accuracy, objectivity, reputation, value-added, relevancy, timeliness, completeness, appropriate amount of data, interpretability, ease of understanding, representational consistency, concise representation, accessibility, and access security).

Klein (forthcoming) used the Wang and Strong (1996) taxonomy to conduct a survey comparing user perceptions of information accessed through the Internet and through traditional sources of information such as books, journals, magazines, and newspapers. The survey results indicate that believability, timeliness, relevancy, accessibility, and appropriate amount are the highest rated data quality dimensions for Internet sources of information. Statistically significant differences (p<.05) were found for the ratings of Internet and traditional text sources for six of the data quality dimensions: accuracy, objectivity, reputation, timeliness, appropriate amount, and representational consistency. Traditional text sources were given higher ratings than Internet sources on four data quality dimensions: accuracy, objectivity, reputation, and representational consistency. Internet sources were given higher ratings than traditional text sources on two data quality dimensions: timeliness and appropriate amount (Klein, forthcoming).

Research Objectives

Although taxonomies of information quality have given us a powerful tool for understanding user perceptions of information quality on the Internet, theoretical frameworks to guide further study are limited. The objective of the study proposed here is to develop a theoretical understanding of the factors that influence user perceptions of Internet-based information quality. The study will focus on five aspects of information quality: accuracy, completeness, relevance, timeliness, and amount of data.

Research Methodology

The methodology used in this study is based on the critical incident technique developed by Flanagan (1954). Since the development of the methodology, it has been used to study a variety of issues such as health care (Allery et al. 1997; Cheek et al. 1997), teaching and learning (Ellinger et al. 1999; Preskill 1996), and customer satisfaction (Meuter et al. 2000). This study follows Cheek et al. (1997) in viewing critical incidents as collections of similar incidents.

Two groups of subjects will complete a critical incident questionnaire. The first group of ninety subjects will be asked about critical incidents related to their use of the Internet in general (see Table 1). A second group of ninety subjects will be asked about critical incidents related to their use of the Internet for a specific course assignment that required the use of the Internet for conducting research (see Table 2). Both groups will be asked questions related to five dimensions of information quality: accuracy of information, completeness of information, relevance of information, timeliness of information, and amount of information.

Table 1. Critical Incident Questions Asked About Use of the Internet in General

Have you had any problems with the accuracy of information from Internet sources that you have used? ____ Yes   ____ No If yes, please describe your problems below.
Have you had any problems with the completeness of information from Internet sources that you have used? ____ Yes   ____ No If yes, please describe your problems below.
Have you had any problems with the relevance of information from Internet sources that you have used? ____ Yes   ____ No If yes, please describe your problems below.
Have you had any problems with the timeliness of information from Internet sources that you have used? ____ Yes   ____ No If yes, please describe your problems below.
Have you had any problems with the amount of data available from Internet sources? ____ Yes   ____ No If yes, please describe your problems below.

The critical incidents collected in this study will be analyzed using content analysis. Factors affecting user perceptions of the accuracy, completeness, relevance, timeliness, and amount of Internet-based information will be identified. A theoretical model to guide future studies will be developed and specific research propositions to be tested in future studies will be proposed.

Conclusion

Little is currently known about the factors affecting user perceptions of the quality of Internet-based information. The proposed study addresses this research gap through an analysis of critical incidents collected from users of the Internet about information quality. The results of the study will guide future research and provide guidance for educators and managers seeking to sensitize users to the strengths and weaknesses of information accessed through the Internet.

Table 2. Critical Incident Questions Asked About Use of the Internet for a Specific Course Assignment

Did you have any problems with the accuracy of information from Internet sources that you used for the course project? ____ Yes   ____ No If yes, please describe your problems below.
Did you have any problems with the completeness of information from Internet sources that you used for the course project? ____ Yes   ____ No If yes, please describe your problems below.
Did you have any problems with the relevance of information from Internet sources that you used for the course project? ____ Yes   ____ No If yes, please describe your problems below.
Did you have any problems with the timeliness of information from Internet sources that you used for the course project? ____ Yes   ____ No If yes, please describe your problems below.
Did you have any problems with the amount of data available from Internet sources for the course project? ___ Yes ____ No If yes, please describe your problems below.

References

Alexander, J.E., and Tate, M.A. *Web Wisdom: How to Evaluate and Create Information Quality on the Web*, Mahwah, NJ: Lawrence Erlbaum Associates, 1999.

Allery, L.A., Owen, P.A., and Robling, M.R. "Why General Practitioners and Consultants Change Their Clinical Practice: A Critical Incident Study," *British Medical Journal* (314), 1997, pp. 870-874.

Cheek, J., O'Brien, B., Ballantyne, A., and Pincombe, J. "Using Critical Incident Technique to Inform Aged and Extended Care Nursing," *Western Journal of Nursing Resarch* (19:5), 1997, pp. 667-682.

Ellinger, A. D., Watkins, K. E., and Bostrom, R. P. "Managers as Facilitators of Learning in Learning Orgainzations," *Human Resource Development Quarterly* (10:2), 1999, pp. 105-125.

Flanagan, J. C. "The Critical Incident Technique," *Psychological Bulletin* (51), 1954, pp. 327-358.

Fuld, L.M. "The Danger of Data Slam," *CIO* (11:23), 1998, pp. 28-33.

Hawkins, D.T. "What is Credible Information?," *Online* (23:5), 1999, pp. 86-89.

Huh, Y.U., Keller, F.R., Redman, T.C., and Watkins, A.R. "Data Quality," *Information and Software Technology* (32), 1990, pp. 559-565.

Keltner, K.B. "Networked Health Information: Assuring Quality Control on the Internet," *Federal Communications Law Journal* (50:2), 1998, pp. 417-439.

Klein, B. D. "User Perceptions of Data Quality: Internet and Traditional Text Sources," *Journal of Computer Information Systems*, forthcoming.

Meuter, M.L., Ostrom, A.L., Roundtree, R.I., and Bitner, M.J. "Self-Service Technologies: Understanding Customer Satisfaction with Technology-Based Service Encounters," *Journal of Marketing* (64), 2000, pp. 50-64.

Pack, T. "Can You Trust Internet Information?," *Link-up* (16:6), 1999, p. 24.

Preskill, H. "The Use of Critical Incidents to Foster Reflection and Learning in HRD," *Human Resource Development Quarterly* (7:4), 1996, pp. 335-347.

Rieh, S.Y., and Belkin, N.J. "Understanding Judgment of Information Quality and Cognitive Authority in the WWW," *Journal of the American Society for Information Science* (35), 1998, pp. 279-289.

Wang, R.Y., and Strong, D.M. "Beyond Accuracy: What Data Quality Means to Data Consumers," *Journal of Management Information Systems* (12:4), 1996, pp. 5-34.