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Using Electronic Surveys to Collect Data: Experiences from the Field

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Abstract

This paper presents 3 case studies detailing Web surveys initiated over the past 18 months. Because there is a natural fit between Web surveys and IT research, we recommend that researchers consider Web surveys, especially if the survey population is centered around IT professionals, who can be assumed to have ready access to the Web, and if the researcher utilizes surveys often enough so that the use of this medium is less expensive and less time consuming than paper-based surveys.

Introduction

A great deal of the research in information systems (IS) is conducted utilizing surveys. This method of data collection can be time consuming and costly, especially when large survey mailings are needed. Not only do researchers have to factor the monetary cost of the paper, envelopes, postage, etc., but they also have to factor the cost in time to enter the data into a software package where statistical analysis can be accomplished. The use of electronic surveys not only reduces the monetary cost, but also reduces the time cost because the responses are in digital format (Couper, 2000). This technique also reduces the errors associated with keying in data. Although electronic surveys can reduce cost and errors, there are some tradeoffs, such as respondent access or familiarity with the Web.

Background

Research that specifically relates to the electrical collection of survey data through the Web is relatively sparse. There are some published articles in peer reviewed journals and edited books (see Zhang, 2000 for a review) and numerous conferences sponsored by groups and associations who are interested in this method of collecting data (i.e., The Association for Survey Computing, The Methodology and Statistics International Conference, The Association of Internet Researchers). However, the work in this area has not yet risen to the point where researchers can utilize the Web as a survey data collection instrument with the same confidence that is afforded to the collection of survey data through paper surveys.

Utilizing paper surveys as a method of collecting data has a rich history of methodological research that provides the survey researcher with an understanding of its potential positive and negative elements (Fowler, 1993, 1995). Moreover, paper survey research methods are generally accepted and understood by the surveyed population (Church, 1993). However, paper survey methods are also plagued by problems that make this method of research difficult. Collecting data through mass paper mailings can be very expensive, especially when the researcher is attempting to collect data from overseas locations. Further, paper surveys have a history of low response rates that have put into question the representation of the sample from the sampling frame (Fox, et al., 1988). Finally, paper survey research can include slow response times that extend the research project beyond expected project times (Oppenheim, 1992). This often results in multiple mailings of surveys to the sampling frame with only small increases in survey responses.

Utilizing Web surveys as a research tool does not have the rich history of methodological research that is enjoyed by paper survey methods. However, utilizing the Web to collect survey data may assist with some of the previously mentioned issues of paper survey methods.

Pros and Cons of Electronic Surveys

Paper surveys have traditionally been used in IS research. Although costly and time consuming, much has been be learned from this technique. Electronic surveys introduce a fast, economical way to collect data using surveys. The expansive growth of the Internet allows one to conduct a variety of electronic surveys, including email and Web (Cook, et. al., 2000).

Pros

Money - If survey research is the major methodology used, or if a large mailing is desired, the cost of a computer server and the necessary software to produce electronic surveys can be less expensive than the cost of printing and mailing a paper survey. This is especially true for large-scale surveys and international mailings.

Speed - Because there is minimal waiting time between emailing a URL and receiving the electronic survey, the time to complete data collection is considerably less. Moreover, if contact is made through email with a link to the survey site, the chance of having the respondent complete the survey immediately is potentially high. In addition to the actual time to complete data collection, much time is saved in data entry. This is because the responses are in digital format, so no manual data entry is necessary.

Contact - The intended respondent is easier to contact by email. Oftentimes with paper surveys, a secretary or assistant handles the mail. If this person has been instructed to eliminate such mailings, the respondent does not have the opportunity to complete the survey. Although it is easy to delete an incoming email message, at least the intended recipient is the one making the choice to complete the survey.

Accurate - The data is more accurate. This is because the data is delivered from the Web automatically into the survey database. This digital coding avoids human errors often introduced in a manual coding process.

Customization – Online surveys have the ability to be customized for each respondent. This can easily be done based on the responses to previous questions. Oftentimes if a certain question is answered in the affirmative, the respondent is required to enter different information than if the question was answered negatively. For example, if a respondent states they have a specific type of system in place in their organization, the next set of questions could investigate system attributes. If the respondent answers negatively to the above example question, it would be unnecessary to include those questions. This is not possible through paper surveys.

Time Stamps – The ability to use time stamps allows the researcher to determine the amount of time each page was open. This also provides insight into the time taken to complete the entire survey. Time stamps are an advantage over paper surveys because the researcher is able to determine if the survey was completed in an unusually short time, which could be a potential bias.

Complete Responses – Some surveys are always removed from analysis because respondents fail to complete vital questions. Using online surveys, required questions can be used so that no vital information is missing. A message will pop up when the respondent attempts to move to the next page in the survey without completing all questions. This allows the respondent to make the necessary adjustments to the unanswered questions.

Incomplete Responses - If a respondent decides to stop completing a paper based survey, he discards the survey. However, if the same respondent decides to stop completing the survey online, the answers completed to that point are still captured. This ability to capture incomplete surveys allows the researcher to determine if there is a pattern to the incomplete responses. Perhaps a section of the survey is too taxing, or confusing. For example, if this occurs in a pilot test, a quick change in the survey is possible before collecting the main study data.

Cons

Medium - Paper surveys have a long research history of the appropriate methods for survey development and initiation (Converse & Presser, 1986). The medium is easily understood and people have the tools necessary to take advantage of this methodology. Online surveys do not enjoy the same history of research and not all users have the necessary tools to complete them.

Web Users - Some potential respondents may not have access to Web. Although a point was made earlier that IT samples should include people with ready access to the Web, it is possible for some of the respondents to not have fast, reliable access.

Access - Many databases and published books have mailing addresses so identifying potential survey participant is relatively easy. Unfortunately, email addresses are more difficult to locate. In addition, email addresses, like Web addresses, change frequently. This makes identifying potential respondents more difficult.

Time – A paper-based survey can be completed at any time. There is no need to have an active Internet connection. This allows more freedom for the respondent in completing the survey.

Bandwith – Slow speeds of connection may be a problem when accessing some Websites. However, this should not be of too much concern because of the text format of Web surveys. Generally, photos and other graphical icons are not necessary.

Web Survey Experiences

In the past 18 months, we have conducted three online surveys. These research surveys will now be summarized in accordance with some of the previously identified issues.

Research Study 1

The intent of this research study was to pool multiple opinions about business processes in order to develop a comprehensive item list. The sample consisted of top level managers from over 2,000 firms in North America. Because of the lack of research in Web surveys, we decided to allow the respondents to choose either traditional paper-based surveys or a Web-based survey designed in Lotus Notes. Although the Lotus Notes interface for collecting data was somewhat difficult to administer, the survey format was well received by the participants. Because the survey was originally sent in paper form with the option of completing by hand or by the Web, little *money* was saved in survey supplies. However, the *accuracy* of the data was higher for those responding by the Web. This was because many of the hand-written responses were difficult to read. In addition to the accuracy of the data, the *speed* of responses was much faster for the Web surveys than for the paper-based surveys. Finally, the number of *complete responses* was much higher for the Web responses. Some of the paper-based responses left some questions incomplete.

Interestingly, only 10% of the responses decided to complete the survey over the Web. However, because of the diversity of the survey respondents, we had no method of determining their access to the Web as a resource and being that the survey contained many extended comment fields, we believe people preferred to hand-write their responses. Other plausible reasons also surfaced, such as the portability of paper surveys, discomfort with utilization of the Web, etc.

Research Study 2

The intent of this research was to identify organizational factors that influenced individuals decision processes. The sample was drawn from over 500 individuals from one large organization. The research question revolved around the use of Web-based IT system which enabled us to initiate the survey solely through the Web.

This survey used a software package called ColdFusion (Allaire Corp) that has the capability to build and administer data collection instruments across the Web. This software collects data and automatically places it into a database. A quick transfer of the data into Excel or other software packages is possible, thus, removing possible data entry problems and increasing *accuracy*. Because ColdFusion is specifically built to collect data on the Web, this Web survey instrument was much easier to administer than Lotus Notes. In addition to the benefits outlined in research study 1, we were able to *contact* the potential respondents by email. This shortened the data collection time to less than 3 weeks. A final benefit of this research study was the ability to see *incomplete responses.* In the pilot test of the instrument, it was observed that respondents would consistently discontinue completing the survey at a certain point. We assumed that the instructions were too confusing at this juncture and adjusted them accordingly before the main study. This correction resulted in an small number of incomplete responses in the main data.

Research Study 3

The intent of this research was to investigate the effect of cultural characteristics on IT use. The pilot study sample consisted of approximately 800 undergraduate and graduate business students at a large Northeastern university. The intent of the pilot was to ascertain the psychometric properties of the scales. Because the system under investigation was an online IT teaching tool

available to all students, a Web survey was implemented. This data collection also used ColdFusion (Allaire Corp). The benefits of this survey were low cost (*money*), *speed* of responses, email *contact*, *accurate* data, *customized* survey pages, and more *complete responses*. In addition, *time stamps* allowed us to identify respondents who completed the survey much quicker than the average respondent. Approximately 25 responses, or 5% of the responses were removed for completing the 60 item survey in less than 5 minutes. The was done because of the potential bias of respondents who complete the survey without fully reading the questions. Finally, an examination of *incomplete responses* allowed us to determine that there was no major flaws in the instructions or the format of the survey.

This methodology will be used when completing the main study. This will allow a large savings in *money* because the target population is located in several locations throughout the world.

Summary

If adequate time is spent in designing the survey and selecting an appropriate sample, an online survey can be a low-cost, fast way of collecting data. In a field such as IS, where much research is focused on surveying users and managers of IT, an online survey may be a natural fit. Unlike other disciplines, such as sociology, many times it can be assumed that companies and respondents have access to the Web.

For the reasons we addressed in this paper, we recommend that IT researchers consider utilizing the Web as a tool to collect survey data. This methodology is not appropriate for all researchers nor all research studies. However, the positive effects as addressed in this paper can provide for faster, more cost-effective research studies.

Limitations and Call for Research

This paper contains anecdotal evidence of some issues surrounding the use of Web surveys in IT research. If this medium is to be adopted as a viable research methodology, research should be completed to empirically compare paper-based and Web-based surveys and investigate potential biases. It is our hope that researchers continue to study this important method of collecting survey data.

References

References available upon request.