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# Web-based Surveys: Reaching Potential Respondents On-Line

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The popular business press has closely monitored the rapid ascension of electronic commerce over the past few years. We are well aware of the explosion in B2C and B2B Web-enabled commerce. In most cases, the Web is helping us to fulfill transactions in a new, more efficient way. But the Web is also helping researchers to realize new, more efficient ways to conduct the business of research. One such use of the Web is for survey administration.

Questions remain regarding the viability of Web-based surveys among prospective users. This article presents the common motivations for and reservations concerning administering research surveys on-line. Advantages and disadvantages of online survey methodology are reviewed. This article also provides a brief overview of the process and lessons learned from the authors' recent experience with this emerging research mechanism.

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### A Look at the Positives

The primary advantages of Web surveys over conventional mail surveys include speed, convenience and, for the time being, novelty. The ability of survey administrators to post a survey to the Web and make it immediately accessible to potential respondents is a considerable advantage. Obviously, effort must first be made to create awareness among the sample frame of the availability of the instrument and the means to find it. Upon achieving this initial contact, however, there is a definite benefit associated with informing the individual respondent that the survey is readily available with a simple click of the mouse—providing access to the instrument immediately upon garnering the interest of the respondent. Conducting the initial contact may be performed by any one of several means: phone, fax, mail or e-mail. E-mail has the advantage of providing a hypertext link to the Web survey. The researcher also enjoys the benefit of speed upon the submission of completed Web surveys—avoiding the usual lead-time involved with collection by mail.

This Web-based approach can also prove more convenient for survey respondents and researchers than conventional paper surveys. Respondents may appreciate improved access to the survey (assuming the respondent has Web access). The instrument can be accessed at home or in the office without the hassle of carrying it about. In addition, respondents can direct others to the site should the survey call upon the input of multiple constituents. Along similar lines, researchers can tailor the on-line survey instrument to enhance respondent comprehension, enhancing the quality of the respondent's input. For instance, the site can be offered in multiple languages, providing respondents with the

choice of a preferred language for survey completion. In addition, the survey can embed message bubbles that respondents can access (as needed) by simply hovering the mouse arrow over a particular field on the survey screen. The content of these message bubbles may include definitions of terms or instructions for survey completion. So, there is the opportunity to provide additional information on the Web without cluttering the appearance of the survey.

The Web-based instrument can also be designed to allow the respondent to navigate the survey such that he/she sees only the questions or sections relevant to the particular respondent. Based upon responses to critical, guiding questions that determine the applicability and relevance of specific survey items, the survey can be designed to capture all relevant data with the least time and confusion. The survey may also be designed to automatically check the responses for completeness upon submission, minimizing the missing data problem that ultimately reduces the usable sample sizes in most research.

Providing a survey that is easy to access, navigate, and complete is obviously important to researchers seeking improved response rates. But there are also several benefits of convenience for Web-based survey researchers. One benefit is found with enabling the site to write data directly to a database upon survey submission. Automatic data dropping can alleviate the time-consuming and potentially error-prone practice of manual data entry. This on-line database can be particularly valuable to the geographically-dispersed research team. A password-protected database can allow research team members in various locales to access an individual survey or the entire data file without requiring snail mail or multiple emails.

Finally, the relative newness of the Web-based survey approach may also prove advantageous to survey administrators. Given the growing belief that today's business managers and executives are becoming "over-surveyed," researchers are looking for any means to gain the interest and subsequent participation of potential survey respondents. The novelty can also prove disadvantageous, however, given fear among many of potential security violations. So long as security and respondent

confidentiality are maintained, Web-based surveys can prove extremely advantageous. Unfortunately, with each advantage comes an accompanying set of disadvantages. A few have already been acknowledged. A more exhaustive delineation of these disadvantages is provided in the next section.

### And Now for the Negatives

In order to provide the desired elements of speed and consistency, considerable upfront effort must accompany the Web-based survey. Designing a survey that is appealing to respondents and provides the desired utility for the research team can prove to be a physically taxing and fiscally expensive undertaking. Yet, depending on a wide range of factors, the cost of a Web-based survey may be lower than that found with other methods. These factors include the length of the survey, the complexity of the survey, the number of respondents in the sample frame, the location of these potential respondents (domestic vs. international), and the ability to develop the site and data collection mechanisms in-house as opposed to outsourcing these services. Beyond developing the survey and posting it to a site, it is extremely important to have reliable servers as well as skilled individuals to maintain the site, databases, and servers given that the Web-based approach can be prone to technological failure. Therefore, a total cost analysis is necessary to compare survey alternatives when cost is a factor. This analysis should incorporate the costs of development, administration (survey distribution and data collection), and data entry—everything affected by the choice of the collection medium from the point of survey creation through data analysis.

Beyond cost and technological considerations, one must ultimately offer a survey instrument that fulfills the researcher's needs, is easy to use, and assures respondents that their submitted information will remain safely guarded. To revisit the novelty factor (a potential advantage of Web-based surveys), one must also realize the risk perceived by many respondents. The newness of the medium not only instills the natural fear of security violations but also suggests that not all prospective re-

spondents will even have the means or willingness to complete an on-line survey. When this proves to be the case, alternative survey procedures must be available for those who would prefer a mail, fax, or telephone survey. A sample composed only of those willing to complete the Web-based instrument is prone to potential bias. Care must always be taken to gather samples representative of the target population.

Attention now turns to the authors' recent experience in Web survey administration.

### Our Experience

Our research team used a Web-based survey for an in-depth study of service performance in an industrial service context. We surveyed CEOs of service-providing firms along with the major customers of these firms. Considerable effort was concentrated on research to determine *how* to use the Internet for data collection. In the past, some researchers have used Web pages that send e-mail messages with the data back to the researchers (Brennan, Rae, & Parackal, 1999) while others, ourselves included, have the data from the scrolling Web page go directly into a database when the respondent clicks the "submit" button.

Initially, we had three main questions: (1) how to avoid losing data, (2) how to track respondents, and (3) how to handle those respondents without on-line access. We were concerned that respondents may not be able to answer all the questions in one sitting and unlike a mail questionnaire, where one can answer a few more questions when time permits, an on-line survey would require greater effort if the respondent could only complete it in a single occasion. To avoid losing data or making the respondents start over with each visit, we asked the respondents to self-select a login ID and password. This process enabled the respondents to login and continue with the survey at their convenience. Because we did not use "cookies" as our tracking mechanism, we hoped that respondents would be able to start the survey at work and, if necessary, finish it at home without experiencing frustration or losing data.

Among the many concerns of Web-based surveys is the authentication of the respondent. Our initial login screen asked

for basic demographic information about the respondent and their company. This combined information about the respondent and their customized login was believed to reduce the likelihood of an unintended person answering the questionnaire.

In hindsight we realized that it would be more secure to have the questionnaire separated into sections and have a separate submit button for each section to avoid risk of dropped data "packets" during transmission. The separate "pages" of the questionnaire would have allowed us to use pop-up error messages when answers to questions were missed. This would have saved us a great deal of follow-up effort to obtain the missing data. In a related area, we had a concern about receiving the data transmissions. If after clicking the "submit" button, a respondent quickly switched Web sites we feared that data might be lost. To reduce the likelihood of this problem, we included a statement at the end of our survey asking the respondent to wait a few seconds after clicking submit.

Another issue was related to respondent company technology and the technological "savvy" of the respondents. We could not determine in advance the number of potential respondents who may have problems with the on-line survey. Therefore, we developed a plan to either fax or mail the questionnaire if the respondent preferred a "hard" copy of the survey. As noted above, we anticipated the occasional problem with this on-line approach because some respondents may not have Internet access, or may have a browser that did not generate the same layout we designed for our survey. We also thought that by targeting more senior-level executives, they might not have the need or time to become comfortable with the Internet. However, Oppenheim and Sherr (1999) addressed this last point when they referenced a PriceWaterhouse L.L.P. study, which indicated that upper-level managers perceive themselves as possessing good or excellent computer skills. Additionally, Oppenheim and Sherr (1999) reported that PriceWaterhouse further indicated that these managers were frequent Internet patrons (with on-line activity in excess of 10 days per month). However, our experience indicates that many executives still prefer to respond to hard copy surveys

rather than go on-line, since we faxed surveys to nearly half our respondents. Because we had approximately half of our respondents answer the traditional way, we were not able to fully capitalize on the advantage of having data entered directly into the database.

As other researchers have found (e.g., Brennan et al., 1999), it is difficult to encourage a quick response to surveys both mail and on-line. Repeated e-mails, faxes and telephone calls were required to achieve the 50% response rate for one sample and 83% response rate for an accompanying paired sample in our study. Therefore, some form of incentive is needed to encourage responses. In our study, we offered "advanced" reports of our analysis to firms to encourage their response, which proved helpful in gaining the participation of many.

Collected data is always a valuable commodity. Great care was taken to prevent the loss of data upon its collection. We backed up the Access database frequently to avoid loss of data on the Web server. Additionally, we periodically examined the database to ensure that the data entered in a Web page was correctly placed in the Access database.

### Future Considerations

While our initial venture into on-line data collection was a success, there were a few key changes that will be incorporated in future efforts. The first point is to more fully consider the implications of having a survey available on-line for anyone to access. While the collected data were closely guarded, the site itself was open to anyone who might stumble across it. For that reason, verification of responses was required to ensure that only the firms we contacted completed the survey. Passwords and other options to protect the survey and the code associated with the Web design are needed. We did not consider the ease with which others could acquire our questionnaire from its URL before we started the survey. Additionally, we were concerned that people may have found our survey Web page through a search of the Web. However, we attempted an on-line search and did not find our Web site.

As more researchers pursue Internet data collection efforts, more firms are developing Web-hosting options for research-

ers who do not have in-house Web expertise. These Web-survey companies provide a wide range of efforts from simply converting a researcher's paper survey to the Web and storing their data, to actually providing expertise in the format and arrangement of questions. This proliferation of new services requires today's researcher to carefully evaluate the different options and opportunities available that were not available even a year ago.

Overall, using the Internet to collect survey data was a worthwhile experience. While nearly an equal number of respondents used more traditional methods (mail and fax) to complete the survey, we believe that in the future, more respondents will appreciate the convenience of Web-based surveys. Feedback from respondents who used the Web was generally positive. It is our belief that, upon incorporating the experience from our first effort, the Web-based approach will continue to be an even more viable way to collect data in a timely, efficient and effective manner.

### References

- Brennan, M., Rae, N., & Parackal, M. (1999). Survey-based experimental research via the Web: Some observations. *Marketing Bulletin*, 10, 83-92.
- Oppenheim, L., & Sherr, M. K. (1999). Gathering customer perceptions over the Internet. *Medical Marketing and Media*, 34(2), 50-58. ■

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