SUMMARY

The Internet is profoundly changing the way we communicate with one another. One of the most recent new uses of the World Wide Web is as a survey platform. Internet-based surveys, although still in their infancy, are becoming increasingly popular because they are believed to be faster, better, cheaper, and easier to conduct than surveys that use more-traditional telephone or postal mail methods. Based on the evidence in the literature and real-life case studies, this report examines the extent to which these claims hold true. Specifically, it analyzes the advantages and disadvantages of using the Internet—both e-mail and the Web—to conduct research surveys.

This report provides practical information on design and implementation for researchers who are thinking about using the Internet in their survey activities or who are planning to conduct an Internet survey. In addition to our review of the literature on Internet surveys, we base our analysis on a number of other sources, including several institutions with experience in conducting surveys on the Internet, individual researchers who have relied on Web surveys in their studies, and our own personal experiences.

This report addresses three main questions that researchers face with regard to Internet surveys:

- When should an Internet-based survey be considered?
- What type of Internet survey is appropriate for a particular study?
- How should an Internet survey be designed and implemented?

WHEN SHOULD AN INTERNET SURVEY BE CONSIDERED?

Internet surveys may be preferable to mail or telephone surveys in the following cases:

- **The survey can be conducted with a convenience sample.** In a convenience sample, the probability with which a respondent is selected into the sample may not be known. Often, respondents "self-select" into the survey. For example, advertising on Web pages, in newsgroups, and in traditional media can be used to attract a large number of survey respondents.

- **The survey is being conducted in an organization that has a list of e-mail addresses for the target population.** The benefits in terms of cost and timeliness are greatest when the target population can be contacted initially by e-mail. The U.S. Air Force, for example, maintains a standardized e-mail address system, as well as detailed information about individuals on their e-mail list. Such plusses make the Web a logical choice for a survey mode.

- **The target population represents a small slice of the total population.** Contacting very small slices of the population via random digit dialing (RDD) phone surveys is very inefficient and therefore costly. Mail surveys in this case would be less costly but equally inefficient. In pre-recruited panels (in which potential survey respondents are recruited in advance for multiple surveys), the information obtained from panel participants allows for targeting subpopulations directly. The advantages in using prerecruited panels may make it more cost-efficient to contract with a commercial Web survey company that can target any subpopulation directly from its panel database.

- **The sample size is moderately large.** Generally, Web surveys have a larger initial start-up cost than mail or phone surveys, but they have a lower marginal cost per survey respondent. Therefore, the Web is not a cost-efficient medium for surveys with a small number of respondents. Quantifying "small" is difficult and estimates vary considerably with the assumptions being made. In one case, we estimated that adding a Web response option to an existing mail survey is cost effective when at least 580 completed questionnaires are obtained over the Web.

- **The survey contains questions of a particularly sensitive nature.** There may be a bias toward socially acceptable answers (as opposed to more-honest answers that may be less socially acceptable) in surveys in which the interviewee has direct contact with an interviewer. To avoid this bias, Web surveys, as well as mail surveys, are an option.

- **The survey contains a large number of important open-ended questions.** Unlike with mail surveys, Web surveys incur no coding or editing costs because responses are received electronically. There is also some evidence that respondents give longer answers to open-ended questions in electronic surveys than open-ended questions in printed surveys.

- **The survey is a multimedia survey or contains interactive elements.** There is no way, other than using the Web, to conduct a survey with interactive elements at a reasonable cost.

WHAT TYPE OF INTERNET SURVEY IS APPROPRIATE FOR A PARTICULAR STUDY?

There are two main types of survey samples: convenience samples and probability samples. (We also discuss also a hybrid approach that combines the two.) *Convenience samples* arise from uncontrolled instrument distribution or self-selection (that is, volunteering) into a survey. Convenience samples are often less costly to generate than probability samples, but statistical inference becomes problematic. Convenience samples are useful to researchers in developing research hypotheses, defining ranges of alternatives, and conducting qualitative data analysis. With certain assumptions, convenience samples can be useful for model-based inference.

Probability samples (also called *random samples*) are samples in which the probability with which an individual was selected into the sample can be determined. Probability samples can be classified into three types: those taken from *closed populations* (such as from organizations that maintain lists of their members in some form), *general populations,* and *pre-recruited panels.* In closed populations, it is often possible to draw a probability sample that allows for contacting potential survey respondents via e-mail. This capability makes a Web survey particularly easy to conduct.

In general populations, an e-mail directory of the population does not exist. Without such a list, it is impossible to determine the selection probabilities; therefore, it is not possible to draw a probability sample from a general population. If a probability sample is desired from a general population, the population must be contacted by mail or by phone. The only possible exception to this is with pre-recruited panels. If an appropriate pre-recruited panel exists for the population of interest, it is possible to send the panel invitations via e-mail to participate in a survey.

We also investigated whether it is possible to combine a convenience sample and a probability sample to achieve better results. The hope was that if the bias of estimates from the convenience sample was not too large, then the combined sample might be more precise than the probability sample. We found that it is not useful to combine the samples unless the bias from the convenience sample is known to be very small and the probability sample has at least several thousand responses. Because the size of the bias is not known in advance and probability samples are often smaller in size, this theory is not useful in practice.

HOW SHOULD AN INTERNET SURVEY BE DESIGNED AND IMPLEMENTED?

Based on our experience with Web surveys, we provide a number of tips on design and implementation, which are briefly listed here and discussed in Chapter Five.

In designing an effective Web survey questionnaire, we recommend the following:

- List only a few questions per screen.
- Eliminate unnecessary questions.
- Use graphics sparingly.
- Be aware of how respondents may interpret questions in light of accompanying graphics.
- Use matrix questions sparingly.
- Reduce response errors by restricting response choices.

- Force answers only on rare occasions.

- Make error or warning messages as specific as possible.

- Always password-protect Web surveys.

- Ensure that respondents' privacy and their perception of privacy are protected.

- Provide some indication of survey progress.

- Allow respondents to interrupt and reenter the survey.

- Carefully handle respondents who fail a screening test.

- Give respondents something in return.

- Take advantage of the media's presentation capabilities.

We also offer the following suggestions on automating the survey instrument:

- Automate skip patterns.

- Automatically validate input, if possible.

- Take advantage of the electronic media's ability to track respondent behavior.

- Take into account the cost of automation.

In implementing and fielding the survey, we suggest the following guidelines:

- Thoroughly test the survey.

- If a large number of respondents are contacted via e-mail, stagger the e-mail invitations.

- Enable respondents to report problems.

- Anticipate potential changes while the survey is in the field.

- Make sure that researchers or survey sponsors can access the Web survey during the fielding.

- Remember to follow up on incomplete surveys.

ARE INTERNET SURVEYS FASTER, BETTER, CHEAPER, OR EASIER TO CONDUCT?

The benefits of Internet-based surveys are often exaggerated. The most commonly heard claim is that Internet surveys are always faster, better, and cheaper than conventional survey methods. Also, because it is relatively easy to create Web sites, it is often assumed that Web surveys are easier for researchers to field and easier for respondents to complete. This report offers important qualifications to these claims.

Are They Faster?

Web surveys are conducted much more quickly than mail or phone surveys when respondents are contacted initially by e-mail. If respondents are initially contacted by mail or phone (instead of by e-mail) for a Web survey, at best only a marginal improvement in overall response times can be expected.

In response to a congressional inquiry, for example, the U.S. Air Force Survey Branch completed an Air Force–wide survey in just 11 days, including design and analysis. The Surveys Branch uses e-mail as the contact mode and the Web as the response mode. In a RAND study of college students and college-bound youth, respondents were contacted by mail and encouraged to respond via the Web. An additional mail response option was sent 35 days after the first mailing. The survey was fielded for a total of 90 days, with a number of mail responses arriving after the 90 days were up.

When a probability sample is required for a general population (such as college-age youth), an e-mail sample frame (an e-mail address directory, for example) is usually not available. However, if a panel of respondents who can serve as the sample frame has already been built, Web surveys can be conducted very quickly indeed. Commercial Web survey companies, such as Knowledge Networks and Harris Interactive, generally field a survey for approximately ten days. Faster turnaround times are possible, but at the expense of a lower response rate.

Are They Better?

The presence of numerous surveys on the Web that are used purely for entertainment purposes can easily cloud one's opinion regarding the quality of Web surveys. With research surveys, the quality of the survey process is at least as important as the number of surveys that are fielded. The number of fielded surveys affects only the statistical error (or variance); the quality of the survey process affects a number of other errors (which collectively might be called "bias").

It is possible with Web surveys to obtain probability samples, which for many research projects are indispensable. When an e-mail sample frame exists, it is fairly easy to obtain a probability sample. When an e-mail sample frame does not exist, obtaining a probability sample for conducting a Web survey is just as difficult as it would be with a mail or phone survey. As far as response rates are concerned, it appears that when only one response option is given, mail response rates are higher than Web or e-mail response rates. When respondents are contacted by postal mail rather than by e-mail, it is desirable to give respondents the option of responding by either the Web or by postal mail to avoid low response rates.

Are They Cheaper?

The general perception that Web surveys are much cheaper to conduct than mail surveys is not necessarily true. There are three main cost components in conducting surveys: mailing, data entry, and labor (design and operations). Cost savings with Web surveys are greatest if respondents can be contacted initially via e-mail. Then there are no mailing or phone costs associated with the invitation to participate in the survey. In addition, Web surveys incur virtually no coding or data-entry costs because the data is captured electronically. Taken together, the savings from these two cost components reduce the per-unit or marginal cost.

Labor costs, however, can be high with Web surveys. The one-time cost for constructing a Web survey is substantial, particularly in cases in which the survey designer has no prior experience with Web surveys. The literature typically neglects labor costs and therefore often concludes that electronic surveys are much cheaper than surveys conducted using more-traditional modes.

Because Web surveys have a higher one-time cost and a lower marginal cost than mail surveys, neither mail surveys nor Web surveys are clearly better than the other in terms of cost. It appears that Web surveys become more economical than mail surveys only when the number of responses reaches a certain threshold—somewhere between a few hundred and a thousand—and in a mixed-mode setting in which the fielding sequence is designed to encourage response via the Internet and avoid incurring costs from using a conventional mode until it is absolutely necessary. However, unanticipated technical problems are likely to arise when a researcher has no prior experience with Web survey programming. Such problems can easily eliminate all potential cost benefits from using the Web.

Are They Easier to Conduct?

Implementing a Web survey is a more technically complicated process than implementing a mail or telephone survey. Survey designers need to specifically address many details related to the technical control of Web surveys (for example, how the respondent will move backward and forward among questions, how to enable input validation, how to use passwords, determining which questions will not be optional), which are either much simpler to address or are not required at all with conventional survey modes. Web surveys also require extensive pretesting to ensure that the questions elicit the desired information and the program works properly across various hardware and software configurations. For survey teams without Web survey experience, these steps often call for more work rather than less.

Our analysis suggests that Web surveys will become more widely used but are unlikely to entirely replace traditional survey modes. Instead, they will become one of a range of survey tools, with their own distinct advantages and disadvantages. For research surveys, the Internet will most likely be used in combination with the telephone or postal mail for best results.