Some Experimental Surveys on the WWW Environments in Japan

Osamu Yoshimura[1] and Noboru Ohsumi[2]

[1] Okayama University
  3-1-1 Tsushima-naka Okayama-shi 700-8530, Japan
  (e-mail: osamu@cc.okayama-u.ac.jp)
[2] The Institute of Statistical Mathematics
  4-6-7 Minami-Azabu, Minato-ku Tokyo 106-8569, Japan
  (e-mail: ohsumi@ism.ac.jp)

Abstract. To assess and analyze the characteristics of surveys on the World Wide Web as objectively as possible, we simultaneously conducted some experimental surveys on three Web sites and two ordinary surveys. A comparison of survey results revealed some interesting characteristics of surveys conducted on the Web. There were stable, uniform and systematically biased responses among the three Web sites surveyed, in spite of the low response rates. In addition, respondents to the Web surveys had a general tendency to participate in surveys conducted through the WWW. The findings imply that in Web surveys, it may be feasible and beneficial to conduct longitudinal surveys.

1 Background and objective of the study

In Japan, World Wide Web surveys have suddenly become popular without enough discussion about 'what a Web survey is' or 'how the survey should be conducted'. As a result, surveys have been conducted not only by researchers, but also by corporations or individuals who, although familiar with the use of the Internet, are not specialized in research. This has led to the present chaotic situation where the activity of scientific research is confused with the mere collection or retrieval of information.

Taking into account this situation, in 1997, we conducted 12 trial surveys on the Web with the cooperation of a survey company, to learn about what would be observed when a survey was conducted using the Internet (Ohsumi, 1997, 1998; Yoshimura et al., 1998). The findings of the surveys led us to conclude that it would be necessary to compare Web surveys at different sites in order to inquire further into characteristics of surveys on the Web.

In this study, we conducted four successive Web surveys at three distinct web sites, using the same questions at each site. These surveys were compared with two ordinary sample surveys. The main points of the survey plan were:

1. Comparing the results of Web surveys administered almost simultaneously at three different Web sites and in which the same questionnaires were used.

2. Conducting the survey four times, with the fourth a repetition of the first survey.
3. Conducting two ordinary surveys (for example, omnibus surveys with interviewing) at two different sites at about the same time, using questionnaires as similar as possible to those used in the Web surveys.

1.1   Types of web-based surveys in Japan

To situate our experimental Web survey on the spectrum of contemporary Web survey types, we have classified existing Web surveys in Japan into three types according to their methods of securing respondents.

Type 1 – Panel style: Finds registrants by 'want ad' or announcement on the Web, and conducts several successive surveys targeting all registrants. The number of respondents obtained through this technique would be several thousand.

Type 2 – Resource style: Finds registrants by 'want ad' or announcement on the Web, and selects actual targets from among them. The number of respondents may vary from 10,000 to more than 100,000. This is the main type used in Web-based survey services and is classified into the following methods:

a) Intra-resource open method: Asks the registrants for cooperation through banner ads or other means, but does not request each of the registrants to participate.

b) Attribute-narrowing-down method: Narrows down the survey population by attributes including gender, age or vocation. Sends e-mail requesting cooperation. Often halts the survey when the desired number of answers is attained.

c) Sampling method: Selects respondents at random from among the registrants. Sends e-mail requesting cooperation.

Type 3 – Open style: Publishes the questionnaires on the Web and asks for cooperation by banner ads or other means. Does not sample individuals. Often used in Internet user-profile surveys conducted by sites well known for their search services.

2   Method

2.1   Survey methods

The actual surveys were carried out with the collaboration of companies A, B, and C, each with Web survey environments of their own. Company D uses a survey system with some answer-only communication devices connected to telephone lines. The methods used (types of Web surveys) and the target respondents for each site are as follows:

Company A: Four Web surveys, Panel style, 4,000 registrants.

Company B: Four Web surveys, Resource style with sampling method, random sample of 5,000 selected from 21,867 registrants for each of the four surveys.

Company B: Three conventional sample interview surveys, with random samples of 1,075, 900 and 900 drawn from population of eligible voters living within 30 km of the Tokyo metropolitan area.

Company C: Four Web surveys, Resource style with sampling method, random sample of 10,000 drawn from 55,714 registrants for each of the four surveys.

Company D: Two conventional sample surveys using answer-only communication devices installed in homes, random sample of 750 drawn from population of eligible voters living within 30 km of the Tokyo metropolitan area for each of the two surveys.

2.2   Survey periods and questionnaires

The Web surveys were conducted four times, each for the duration of at least one week, and within the same time period, from February to March 1999. The themes of the four successive surveys were: 'Awareness of daily life' (*the first survey*), 'The Internet environments' (*the second survey*), 'various commercial products and services' (*the third survey*), and a repetition of the first survey (*the fourth survey*). The second survey assumed respondents use the Web daily, so the same questionnaire cannot be used in ordinary sample surveys.

2.3   Some notes on each survey

The Web surveys on Sites B and C employed the intra-resource sampling method, where respondents were randomly sampled from the database of registrants on the server machine. That is, all the registrants were assumed to be a discrete pseudo-population, from which three kinds of schedule samples were randomly extracted. Where registrants were included in more than one sample, we referred to these as 'overlapped samples'. A request was made to registrants in each of the three samples to participate in the first, second and third surveys, and to the registrants participating in the first survey to take part in the fourth survey, which was a repetition of the first. For the panel-style survey on Site A, we requested all the registrants to participate as respondents in every survey.

3   Survey results

3.1   Trends in response rates

We first examined the trends in response rates and re-response rates—one of the most important points for Web surveys. In each of the Web surveys,

the response rate was below 20%, and for every site, particularly Sites B and C, the response rate for the first survey was the highest; the response rates for the second and the third surveys were lower. This is partly because the questionnaire was longer in the second and the third surveys.

Re-response rate is defined as the response rate where the respondents of the first survey also become respondents in the fourth survey. In these cases, the re-response rate was high. Re-response rates for Sites A, B and C were about 64.0%, 71.4% and 69.9%, respectively. Members of an 'overlapped sample' were invited to participate in more than two different surveys, located on Sites B and C. The rate of the virtual respondents within an overlapped sample, calculated from the results of four surveys, is shown below (in parentheses). As a reference, the rate of the virtual respondents for the surveys on Site A are also shown, where all the registrants were asked to participate in all four surveys:

Site B: Requested twice (25.2%), three times (29.7%, 29.5%), four times (34.3%).

Site C: Requested twice (13.9%), three times (17.9%, 17.3%), four times (21.5%).

Site A: Requested four times (30.7%).

This result shows that over 70% of registrants did not respond to any of the four survey invitations. It must be noted that tens of thousands of registrants will not necessarily yield the same number of opinions.

3.2   Some other characteristics of the surveys

We also encountered phenomena that should be considered, although are difficult to deal with.

(1) Undelivered mail: Throughout the surveys on Site B about 15% of mail messages were undelivered.

(2) Multiple responses: Multiple response means that the same respondent gives a response several times in one survey. The survey results for Sites A and B show that there were about 5% multiple responses.

(3) Non-registrant responses: In the surveys on Site B, although a few responses from non-registrants were found, the rate was not large overall. In the surveys on Sites A and C, in which respondents are cross-checked with the registration information on the databases and identified after they have accessed the Web pages, there were no such responses.

(4) Systematic bias between schedule and collected samples: For each of Sites A, B, and C, the response rate of the 30–40 year age cohort was greater than that in the schedule samples.

(5) Differences among demographic items: Comparing the registered and collected samples for the demographic items on each site, we could not determine whether variations occurred by mistake or on purpose. However, for every site, a few respondents had altered some of their registered demographic details.

3.3   Typical personality characteristics of the respondents

Specific tendencies and features found in the answers to questionnaires quoted from other surveys led us to imagine the typical respondent's personality as follows:

- not satisfied in his or her present state (about life style, life stage, and so on);
- has high regard for his or her own hobbies or tastes;
- prefers simple or casual human relations to intimate ones; and
- has high confidence in, or expectations about technology.

Generally, respondents seemed to be more self-centered, or concerned with their own actions, than self-helpful, or wishing to achieve some benefit for themselves. Even though they are likely to pursue their own advantage, they do not appear to be fundamentally self-helpful people.

3.4   Survey over-participation in surveys

Respondents were asked how frequently they participated in research or questionnaire surveys. Most respondents answered 'Once a month or more': 63.6% for Site B, 77.4% for Site C, and 79.7% for Site A. As for the question about their registration, more than 10 respondents who participated in the Site A surveys were also registrants of the Site C survey. Taking this into consideration, as well as the fact that the rate of participation by virtual respondents is about 30%, we can see that an unexpectedly limited number of people participated in various surveys and made repeated responses.

4   Conclusion and future directions of Web survey

Our results clearly show that Web surveys have problems of identifying respondents and establishing representativeness of survey samples. The respondents to Web surveys seem to be neither representative of the general population, nor of registrants of a Web survey service site. However, if we accept that it is possible to discuss the effective and practical use of Web surveys in spite of such problems, we must at least consider the following.

(1) Incentives and the size of questionnaires: Too many questionnaires with poor incentives produce negative reactions among registrants. If they feel that sending their answers costs them too much, they may try to recoup their losses. However, that does not mean that excessive incentives are preferable, as this could endanger the reliability of the survey results.

(2) Allaying distrust: The respondents seem to have much greater distrust of the Internet than might be expected. In response to the question 'About the information distribution on the Net' in the second survey, many expressed hope for some limitation to anonymity, or recognition of their input, and some regulation of the uses of the Internet. Further, responses to the survey question about the conditions necessary for agreeing to participate in the Web

surveys were: 'The researchers are reliable' (60%) and 'The aim and objective of the survey is understandable' (70%). To obtain reliable results through Internet surveys, there must be mutual trust between survey researchers and respondents.

(3) Disclosure of survey results: More than 40% of the respondents from the second survey indicated that to be informed of the results was one of the necessary conditions for participating in surveys. The rate was as high as that to the option 'Not so many questions'.

(4) Identification of respondents: Many Web surveys use e-mail addresses for identifying respondents. However, our survey results showed that an e-mail address cannot necessarily identify a particular person, because:

- less than 20% of respondents had only one e-mail address; and
- about 20% of respondents shared an e-mail address with others.

Therefore, we must seek some means of tracing back and identifying respondents, such as sending requests for participation by mail.

(5) Problems caused by conflicts among surveys by different sites: Our results show that several sites are sharing comparatively few groups of respondents. For respondents, the sites that can promise great benefits at low cost are preferable. At present, the sites seem to be competing for registrants, but when it comes to the quality of survey results, they will be competing for a higher response rate. We are afraid that a competition to provide incentives may cause a serious deterioration in the environment. It may become necessary for incentives to be regulated in some way.

In conclusion, we propose that, to appropriately interpret and use survey results, it is necessary to understand the characteristics of respondents and how typical they are of the Internet user population on occasions when surveys are taken. In this sense, we need 'longitudinal surveys' to clarify the characteristics of the respondents on the Web, rather than a single-shot survey seeking ad hoc responses.

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