Chapter VI
Dual–Mode Electronic Survey Lessons and Experiences

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ABSTRACT

This chapter presents a number of insights gained from a dual-mode survey of software designers recently conducted in Ireland. It describes the sampling method, pilot test procedures, response patterns, and the mechanisms engaged to authenticate participants and to filter duplicate responses. An outline is also given of how various factors with potentially beneficial affects on response rates were considered, as well as a breakdown of costs. Finally, the paper concludes with a summary of the main lessons learned.

INTRODUCTION

A substantial problem with survey-based research in recent years is dropping response rates, now typically of the order of 10% for postal questionnaires. Web-based surveys are less costly to implement than mail surveys, and have been found to yield faster, more complete and more accurate responses (Klassen & Jacobs, 2001; McCoy & Marks Jr., 2001; Schaefer & Dillman, 1998). In addition, they offer the advantages of real-time response validation, automated data entry, and programmable context-sensitive skip patterns. It would, therefore, appear that the Web has the potential to be the saviour of survey-based research. However, the rigorous execution of a Web-based survey necessitates a thorough consideration not just of methodological issues, but also technological, ethical, and cultural aspects (Lang, 2002). This chapter reports on the experiences gained from a recent dual mode (Web+mail) survey of software designers in Ireland that yielded an overall response rate of 52% (45% usable).

Design and Administration of Survey Instrument

Sampling Procedures

In software design research, as in other domains, the definition of accurate sampling frames is often difficult. The starting point in compiling our sample was to collate a list, drawing from several industry databases, that included software devel-

opment organizations as well as large organizations likely to have internal IT departments (e.g., banks). This list was then systematically refined by visiting the Web sites of these organizations to (1) filter out those organizations not engaged in the sort of activities we were interested in, and (2) verify contact names and addresses. The eventual sample comprised 438 organizations.

When selecting a research sample, it is important that all members of a population have a fair and equal chance of being included or else "coverage" error may occur, potentially giving rise to bias (e.g., demographically skewed data). For Web-based surveys of the general public, coverage error is likely to be high because respondents are typically younger, better educated, more computer-oriented, and more affluent than society as a whole (Batagelj & Vehovar, 1998; Zhang, 1999). However, this was not a problem for us because our survey was aimed at software designers, all of whom had access to and were familiar with the Web.

Pilot Testing

Web-based technologies are continuously changing at a rapid pace, and users are adopting these changes at different rates. It is, therefore, imperative that Web-based surveys be adequately pilot tested on a variety of browsers and operating systems. What the designer of a Web survey sees on his screen may be very different to what the respondent sees because of differences between device characteristics, visual distances, text wrapping, fonts, special characters, plug-ins and media formats, and support for languages such as Java, Javascript, and CSS (Bertot & McClure, 1996; Dillman & Bowker, 2001; Smith, 1997; Stanton & Rogelberg, 2001).

For our survey, the following measures were executed

- The questionnaire was tested in various browsers (Microsoft Internet Explorer v5.0, v6.0; Netscape Navigator v4.7, v6.2; Mozilla; Konqueror; Opera), operating systems (Microsoft Windows 95, 98, NT, 2000; Red Hat Linux; Apple Macintosh OS7), and screen resolutions (800×600, 1024×768, 1152×864). According to global Web statistics from http://www.thecounter. com over the period of the survey, these tests covered about 95% of all permutations;

- All HTML and CSS code was tested using the W3C validation service (see http://validator.w3.org/);

- As the Web server was a Linux machine (i.e., case sensitive file names), it was necessary to ensure that the URL and username-password would function correctly, regardless of whether they were typed in lower case, upper case, or the most likely combinations thereof. The Web server was also configured to return customized error pages rather than the unhelpful "404 File Not Found" default message;

- The Web server was apollo.university.edu[1], but an alias of http://www.apollo.university. edu was also set up because some users might expect a URL to commence with "http://www" and, therefore, experience an error if they wrongly entered it as a prefix;

- External access was tested to ensure there were no problems with firewalls or domain name servers;

- Web server performance was tested for download time, connection time, number of timeouts, and other critical parameters, using a monitoring tool from http://www. netmechanic.com;

- The e-mail merge message used in the second follow-up round was tested by sending it to colleagues in order to ensure that features such as text wrapping and clickable URL links worked properly in a variety of e-mail readers (e.g., Microsoft Outlook, Eudora, Mozilla Thunderbird, Webmail). Underscores were not used in URLs because

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