A Method for Collecting Case Study Information via the Internet

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Abstract

The Internet is rapidly becoming *the* communications infrastructure. With its advantages of speed, availability, and `different time, different place' mode of communication, it can be successfully harnessed to accomplish tasks that previously required face-to-face meetings. Such meetings can consume large travel budgets and staff time, and therefore alternative mechanisms that achieve the same results for less cost should be welcomed. One of these new uses of the Internet is to collect case study material. This paper presents a method that has been successfully employed by the author to collect 15 case studies of X.500 implementations. The method described herein consists of three phases: preparation, correspondence and documentation phases. Each of the phases is described, and the author also presents useful tips that he gained during the course of his studies. The method should provide future researchers with a framework which can be successfully employed to productively utilise the resources of the Internet.

1 Introduction

The traditional approach to collecting case study material is to conduct structured interviews with individuals, and to read documentation appertaining to the case.

With the global inter-connectivity provided by the Internet [8, 9], and with the standardised electronic mail protocols of SMTP [1] and X.400 [2, 6] that are available over the Internet, it is now possible to conduct case studies and surveys electronically via electronic mail without the necessity of holding face to face meetings. The savings in both travel time, and in travel and subsistence expenses, are enormous. Electronic mail provides a zero cost option for both. Not only that, but distance is no longer a barrier to conducting case studies. It is as easy to perform inter-continental case studies as intra-country studies, providing that both the interviewer and interviewee are in electronic mail contact. Out of 15 case studies performed by the author, no less than 8 countries spanning 3 continents were represented.

The additional benefit that electronic mail affords of `different place, different time' means that the interviewee can respond to the interviewer's questions in his/her own time, often using several short sessions over a period of several days, without needing to schedule a specific time for `the interview'. Finally, the documentation appertaining to the case study no longer needs to be posted or hand carried to the interviewer, since file transfer over the Internet using the FTP protocol is a suitable and cheaper alternative.

The method used by the author for carrying out a series of case studies via the Internet is documented here, and this may prove to be a useful template for future researchers.

2 Timescales

The author carried out a survey of X.500 [3, 4] pilot projects, over a 3 month period in 1994, as shown in Table 1. On many of these days, the research involved less than one hour's actual work, and was spent in responding to and in generating new electronic mail messages.

Detailed time sheets were kept. The actual time spent by the author on collecting and documenting the 12 cases over the 3 month period, was 12 days (note that the author had to spend zero time on the knowledge building task, as this had already taken place over the previous 10 years!). One year later, the original respondents were invited to update their case studies, and 3 new cases (shown by * in Table 1) were also added. This work extended over a 6 week period, and took the author 5 days in total to complete. The resulting survey was then published [5].

Organisation	**Sector**	**Country**
Control Data Systems	Software Supplier	US
Digital Equipment Corporation	Computer Manufacturer	Switzerland
Edinburgh University	Education	UK
Electricity de France*	Electric Power Generator	France
EUNet	Network Services Supplier	Germany
INESC	Computing Research	Portugal
Ministry of Agriculture and Fisheries	Government	UK
National Health Service*	Health	UK
North American Space Agency	Space R&D	US
Southern Company	Electric Power Generator	US
SURFnet	Network R&D	Netherlands
UK MoD*	Government	UK
University of Adelaide	Education	Australia
University of Texas	Education	US
US DoD	Government	US

Table 1 Organisations participating in the X.500 survey

3 Method

The Internet case study method involves three phases: the preparation phase, the correspondence phase and the documentation phase, as shown in Figure 1. Each phase has its own difficulties, but the first two phases rely more heavily on third party involvement and are therefore somewhat out of the control of the researcher. The first two phases can thus be a

frustrating experience, unless the researcher is previously prepared for it, and has the patience to absorb it.

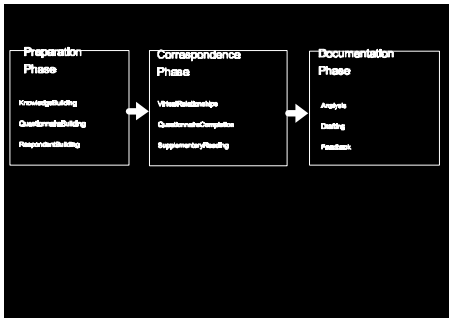

Figure 1 Method for Conducting Internet Case Studies

4 Preparation Phase

The three tasks in the preparation phase are: knowledge building, questionnaire building, and respondent building.

4.1 Knowledge Building

The author must become an expert in the area in which he/she wishes to perform the case studies, before embarking upon them. If the author is to enter into an intelligent dialogue with the respondents, who by their very professional activities are necessarily experts in the cases to be studied, then this task is a fundamental foundation on which to build the subsequent tasks of this method. In most cases, the respondents will be very busy people, undertaking their normal professional duties, and it is therefore an imposition on them to expect them to take time out to help a (possibly unknown) researcher build up a set of case studies. The minimum that a respondent can expect from a researcher, is that he/she is already knowledgeable about the subject area.

4.2 Questionnaire Building

Many texts have been written about the construction of structured questionnaires [e.g. 10, 11, 12]. A balance has to be struck between, on the one hand brevity, which encourages the respondent to answer the questionnaire, and on the other hand completeness, which ensures that the researcher has enough information from which to build the case study [13]. Collecting data by questionnaires over the Internet is different from face to face interviews for a number of reasons. Firstly, in the face to face approach the author almost certainly has some prior knowledge of the case to be studied, and certainly has links within the organisation which is to be studied. The questionnaire can therefore be more easily tailored to the respondent. In the

Internet approach this is not necessarily true. The researcher may be interviewing someone from an organisation he/she has never met before or has no prior knowledge of. (This is one of the advantages of the Internet, in that new virtual relationships can be more easily fostered than in real life. Links are more easily established - but they are also more easily broken). The questionnaire is therefore more difficult to tailor. Secondly, through the use of Internet mailing lists, a researcher may obtain several respondents from different organisations working on related although dissimilar projects. The questionnaire has to be general enough to be able to cater for this.

For these reasons the author used the approach of building a complete (and possibly overly complex) questionnaire, so that every respondents situation could be catered for, but enclosed with this a covering letter that invited the respondents to use the Pireto principle when answering the questionnaire i.e. it may take you 20% of your time to answer 80% of the questions, and this will be good enough for the researcher if you have insufficient time to complete all of the questionnaire.

4.3 Respondent Building

This is perhaps that most difficult task in the Preparatory Phase, simply because the researcher does not have total control of the outcome. The aim of this task is to get the electronic mail addresses of respondents who are willing to take time out to answer your questionnaire. There are many paths to obtaining these illusive electronic mail addresses, but the author has found that Internet special interest groups, IETF working groups [7] and discussion lists provide a fruitful supply of respondents, primarily because the people on these lists are interested in the subject matter that they contain. Other avenues that researchers might try are: personal contacts, product suppliers (for customer reference sites), and WWW searches. But the paths are not always fruitful, nor do they always lead to a successful outcome. Many blind alleyways can be traversed. It is not uncommon to be referred from one person to another within an organisation, until you either draw a blank (and in the Internet world this can be an unacknowledged message) or are referred back to someone you have previously contacted.

In the case studies conducted by the author, over one hundred organisations were contacted, and over 150 potential respondents were electronically mailed. These ranged from personal contacts, to customer reference sites, to Internet mailing lists. Dozens of electronic mail messages were either not responded to, or were rejected by a remote message handling system with a diagnostic message implying that the respondent's electronic mail address was unknown. Eventually 30 respondents agreed to participate in the case studies and they were sent the questionnaire. Of these, 15 replies were eventually received.

It must be re-iterated that the respondents were all busy people, sometimes having project deadlines and other deliverables to meet, and therefore completing the questionnaire of a UK academic was not always high on their list of priorities. For this reason, researchers should look for some benefit that the respondents might gain from their participation in the case studies. In the X.500 case studies conducted by the author, each participant was sent a completed set of the case studies, along with an analysis which contained the critical success factors for implementation. This information could clearly be of benefit to the respondents and

to their organisations, and it would probably be a year or more before the cases were finally published in an academic journal (assuming of course that they were accepted for publication after peer review).

5 Correspondence Phase

This phase is the most rewarding phase of building the case studies, as it is during this phase that virtual relationships are built up with the respondents, that interesting completed questionnaires are received, that additional supplementary reading is received, and the researcher feels that real progress is being made towards completing the case studies after all the hard work that has been put into the preparatory phase.

Never-the-less there are some words of caution that can be given to the inexperienced Internet researcher. Building up virtual relationships can require just as much patience, sensitivity and good humour as building up a face-to-face professional relationships. Correspondence on the network should be just as polite as normal correspondence. The term 'netiquette' has been coined for etiquette on the network [14]. Please don't assume that the respondents will drop everything and reply to your questionnaire immediately. It may take a week or two before you hear anything. In this case gentle reminders may be sent to the respondents, but the researcher must remain sensitive to the fact that the respondents are probably very busy people in which the questionnaires rank with a low priority.

Sometimes the returned questionnaires will only be partially completed, at other times you may not get a completed questionnaire at all. In several cases the author received lots of documents via FTP instead of completed questionnaires, and the case study material had to be painstakingly extracted from these.

In many cases a researcher may find that the received responses are missing answers to a few vital questions. In this case, it would be perfectly proper to ask a respondent if they would be good enough to answer one or two additional simple questions. The author found that this was usually very successful in gaining a response, primarily because the respondent could usually send an answer from his electronic mail application within a matter of seconds.

Expect some drop outs during this phase. Respondents who might have initially appeared willing to answer the questionnaire may have got cold feet once they actually saw it, or a new project might suddenly have been launched at work, or someone became ill and work had to be reassigned - there may be plenty of good reasons why a researcher does not get a 100% response rate. In the X.500 case studies performed by the author, a 50% response rate was received from respondents who volunteered to complete the questionnaire.

6 Documentation Phase

The final phase of case study preparation via the Internet is the documentation phase. The researcher needs to assemble all his electronic responses, read them, analyze them, and then

produce his/her draft case studies. During the analysis it will probably become apparent to the researcher that some supplementary pieces of information from the respondents are still missing. Do not mind. Insert blank text, questions or prompts into the relevant pieces of text, ready for the respondents to complete when they review their draft cases. When the draft case studies are complete (along with any embedded questions), send each of the respondents his/her own case study to review. Not only is this courteous to the respondents, since it allows them to vet information about their organisations before it is published, but it is also scientifically beneficial, as it ensures that the researcher's interpretation of the documentation is correct. The current author found this feedback loop to be essential when completing the X.500 case studies, because useful additional supplementary information, and corrections, were received from the respondents.

Finally, when the feedback has been received and merged into the completed case studies, the researcher is then ready to attempt publication. If the researcher has agreed to provide the respondents with their own preview copy of the case studies, then now is the time to send it to them. It is much better to give them this preview copy as soon as it is completed, rather than waiting for the critical review from an academic journal to be incorporated. Not only does this satisfy the respondents that the case study work has been completed, but it also allows them to gain immediate benefit from the work. After all, they were prime collaborators. A refereed copy can always be sent to them some months later once the researcher has been successful in getting the case studies published.

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