

## Factors Influencing Business Respondents' Decision to Adopt Web Returns

Zoë Dowling<sup>1</sup>, Kristin Stettler<sup>2</sup>  
Added Value, Los Angeles<sup>1</sup>  
U.S. Census Bureau, Washington D.C.<sup>2</sup>

### Abstract

The World Wide Web presents a new mode for data collection for business statistics and one that appears to offer many improvements to current methods; that of improving data quality and timeliness as well as the potential to reduce survey costs. Whilst Web reporting may be advantageous to the statistical agencies, it is necessary to ask how respondents view this new option. What expectations do they have of the Web as a mode of response, what design and functionality features make it worthwhile. It is also necessary to establish what features they consider to be undesirable and would prompt them to drop out of the survey. Finally would the respondent, given the choice to complete a Web questionnaire, over a paper or telephone version, choose the Web option?

The data gathered demonstrates that, on the whole, respondents are receptive to the idea of returning their data via the Web. Some concerns around security and workflow issues were raised. Expectations of the Web questionnaire varied owing to a number of factors ranging from computer competency levels to perception of the task. In general, ease of use was the most commonly cited expectation.

**Keywords:** Web Surveys, Respondent Perspective, Mandatory Surveys, Visual Design, Functionality

### 1. Introduction

Since the early 1990s, the use of electronic data collection has been explored by many national statistical institutes (NSIs) around the world. These electronic options include questionnaires within email/email attachments, dedicated software provided to respondents and, an option that is now becoming more widespread, Web-based questionnaires (see, for example, Best, 2003; Burnside & Farrell, 2001; Hak *et al.*, 2003; Kerssemakers, 2003; McBeth *et al.*, 2001; Roos, 2003). The drivers leading the development and implementation of electronic data collection tend to be similar and include expectations for cost savings, improved data quality and timeliness (Aplin, 2000; Baird *et al.*, 2002; Haraldsen, 2004; Labillois, 2002). In addition, NSIs perceive these electronic options as a

means to reduce respondent burden by providing choice to respondents in their method of return.

Research into, and implementation of, electronic options have verified some of these expectations, such as increased timeliness of response and publication of results (for example Haraldsen, 2004; McBeth *et al.*, 2001). However, the introduction of these options also brings difficulties, such as data security concerns and problems with integration into their existing data processing systems (for example Kerssemakers, 2003). Issues have also surfaced at the user (respondent) level in terms of the design and functionality of these electronic instruments. These include frequent requests for print functions, extended help facilities, multiple sessions, and in some cases reduction of burdensome edit checks (for example Burnside & Farrell, 2001; Hak *et al.*, 2003). Finally, take up rates for newly implemented electronic options is often poor (Roos, 2002).

The factors leading NSIs to Web data collection, noted above, are those of improvements in quality and timeliness as well as cost savings and a reduction in response burden. However, less understood is the respondents' perspective and the factors that influence their decision to adopt Web returns. This paper, drawing upon recent qualitative research with UK Office for National Statistics and US Census Bureau<sup>1</sup> respondents, explores respondents' reactions and comments to prototype Web questionnaires in order to address this issue<sup>2</sup>.

### 2. Methodology

#### 2.1 The UK Research

The first data source comes from semi-structured, face-to-face qualitative interviews that were undertaken with current respondents to ONS mandatory business

---

<sup>1</sup> See Dowling (2007) for more details of this research.

<sup>2</sup> "This report is released to inform interested parties of (ongoing) research and to encourage discussion (of work in progress). Any views expressed on (statistical, methodological, technical, or operational) issues are those of the author(s) and not necessarily those of the U.S. Census Bureau."

surveys. Two surveys were chosen to form part of the research, a monthly survey (Monthly Inquiry into the Distribution and Service Sectors, MIDSS) and an annual survey (E-Commerce). Eligible businesses were purposively sampled from the Interdepartmental Business Register and a recruiting letter, signed by the head of the Business Data Division, was sent to selected businesses and included a return slip asking for a reply within a set time period. Telephone follow-ups were made to non-responders (of which there were many).

The interviews were conducted in two phases over six months, from March to October 2004. The first phase, between March and June, involved sixteen respondents to the short-term survey, MIDSS, and the second, taking place between July and October, focused upon the annual survey, E-Commerce. A total of thirty businesses participated in this research. The interviews were centred around the following themes:

- The processes that businesses go through in completing the current paper questionnaire
- Current use of, and perceptions of, the internet within businesses
- Expectations of, and design and functionality features of, a Web version of the questionnaire.

An interview guide was drawn up in order to steer the flow of the interview and ensure that relevant themes were covered. The interviews were conducted at the business, usually in the office of the survey respondent. An illustration of how the questionnaire could look on the Web was viewed on a laptop brought along to the interview. Web prototypes, which were essentially the paper version in HTML format, with some use of features such as automatic routing and edit checks, were introduced later in the interview, when discussing design and functionality aspects of Web questionnaires.

## 2.2 The US Research

The second source of data comes from a usability project at the US Census Bureau for two annual economic (business) surveys that were being migrated to the Census Bureau's in-house Web data collection application, Census Taker. The migration of these two annual surveys, the Annual Trade Survey (ATS) and the Annual Retail Trade Survey (ARTS), is an early step being taken by the Economic Programs Directorate in placing all of their annual economic surveys in this Web application.

An expert review of both prototype instruments was undertaken and recommendations were made to the

relevant subject matter staff and the Census Taker programmers. Changes were made to the Web questionnaire. Twenty businesses were purposively selected and recruited (generally current respondents to the surveys) by telephone to participate in the usability interviews. The interviews were carried out during May - June 2005, and took place in a number of locations: the local DC area, Los Angeles, Minneapolis and New York.

Like the UK research, the interviews were semi-structured, lasted approximately an hour and were held in the respondent's office. Unlike the UK research, the prototype questionnaire was placed in a live system, Census Taker, which was already in use for a number of surveys. Thus instead of bringing a laptop into the interview, the respondent's computer was used to access the internet and view the questionnaire online. The primary aim of the interviews was to identify any usability issues that the respondents had whilst moving through the Web questionnaire. They were asked to access the Census Taker website and then complete various tasks whilst providing feedback. Towards the end of the interview, after the usability element was complete, the participants were asked some questions, drawn from the UK interview guide, about their views on using the Web as a means of response to these surveys.

Before turning to the findings, it is worth considering the limitations of the research arising both from sampling bias and from the nature of qualitative research. The UK sample was compiled using business' prior response to ONS surveys and in many cases, previously expressed desire to respond via the Web. Likewise, those US respondents agreeing to participate in the research were receptive to the new mode. This sampling method resulted in the data gathered being broadly limited to respondents who are interested in adopting the Web as a mode of response. Similarly, the use of a qualitative methodology limits the generalizability of the findings to the wider population. Nevertheless, the findings obtained provide useful insights into the expectations of those respondents who are willing to adopt the Web as a means to return their data.

## 3. Prototype Visual Design and Functionality

During analysis of the research data, it became apparent that participants were evaluating the prototypes and the potential of Web data collection according to a number of frameworks (see Figure 1 for a visual representation of these frameworks). The first framework, their relationship with the NSI and their role as a respondent, reflects their interactions with the

agency, mostly occurring through the questionnaire(s). The second framework, their relationship with their company and their role as an employee, reflects their position as an individual completing the questionnaire on behalf of their company and how this role and relationship are negotiated. The third framework concerns their individual working practices. This reflects how individuals perform the task, manage their workflow and so on. The fourth and final framework reflects their experience and knowledge as a Web user.

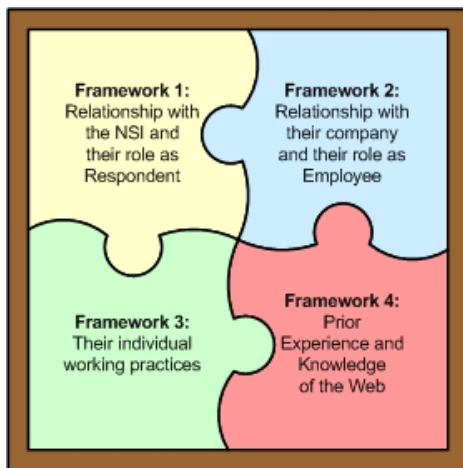


Figure 1: Participant Frameworks for Evaluating Prototypes

### 3.1 Moving Through the Questionnaire

All participants in the UK research were asked to look at the relevant prototype and have a trial run of completing the questionnaire by entering (fictitious or actual) data. Immediately after this trial run, the large majority of participants from both sets of interviews shared the same sentiment of 'yeah, it was fine'. Other comments included that it was 'easy' and 'straightforward'. Some participants remarked that the prototype was really no different from completing it on paper. However, this comment was often qualified by 'I would rather do it that way than filling out a [paper] form'. For the ATS and ARTS surveys in Census Taker, the usability respondents were generally complimentary about the visual design as well.

One of the key differences between paper and Web questionnaires is the ability to incorporate functionality elements such as edit checks and automatic routing. The ability to employ such elements is seen as one of the main benefits of Web data collection for government statistical agencies and is anticipated to provide cleaner data and decrease item non-response, thus improving data quality. However, increased functionality introduces additional design complexity

that does not exist in paper questionnaires and increases burden on the Web questionnaire designer. This would also increase the pressure on the technical infrastructure necessary to deal with the added capacity.

Within both UK prototypes, it is possible to use the 'tab' key to move from question to question. This feature was noticed and praised by several participants, in particular those completing the MIDSS prototype.

*"One thing I dislike on websites is say you have got a lot of fields to fill in and they have got information boxes and so you are sort of using the tab and it goes to the information box. You just want to go duh-duh tab, duh-duh tab, duh-duh tab and you suddenly find you are getting the information and you are going to have to escape out of that. So in the end you end up going like that [uses mouse to select field] to get to the next box, which takes much longer so if you have sort of pure fields that you can tab through the lot it is very, very useful."*

Participants' working practices (framework 3) are an important element in evaluating the usefulness and usability of the prototypes. The significance of the tab function for the participants could be attributed to the fact that they are mostly accountants who employ the tab function regularly in order to navigate around financial spreadsheets (often in Excel). However, tabbing around Web pages is also common and it is possible that the participants' are drawing upon their experiences of the Web (framework 4). Regardless of the reason, it is clear that even seemingly minor functionality features can have a big impact upon the positive and negative perception of the Web questionnaire by respondents. Designers need to weigh up if and how to use such features, which may please some respondents but mystify others. The survey population influences such choices and this example illustrates that it may not always be prudent to design for the lowest common denominator as costs may be incurred if a significant group of experts are exasperated by the design.

Movement through the E-Commerce and Census Taker prototypes is influenced by the built-in edit checks. As we shall see shortly, these participants were generally happy with the edit checks. However, they are designed in such a way that respondents are unable to proceed with the questionnaire until they have provided answers for all questions on the page. This feature proved problematic. One UK respondent felt that there would be difficulty if a respondent was unable to answer the question. A 'don't know' option is not provided, nor the ability to leave an answer empty and so they are forced to provide an answer:

*"Maybe some companies might not know, for some of the questions, what the answers are. They might not have a technical person and they just use their server provider for support and they wouldn't know [for example] if they had access to the internet from their laptop...You couldn't proceed, then you are stuck and there is no option."*

In certain situations, the ability for respondents to see all the questions before answering can be undesirable. However, this may not be an issue in business surveys. Rather, it may be advantageous for respondents to move around the questionnaire freely, allowing them to answer what they can whilst gaining a better understanding of the total requirement. Business respondents often want to review the entire questionnaire before they start in order to gain a sense of the information needed, whether this information has to be obtained from another person/department, how long it is likely to take to get the information and how long completion is likely to take.

In Census Taker, the US Census Bureau's Web application, respondents must use the navigation buttons within the application to return to a previous page with their entered data intact. If a respondent uses the browser back button, the previous page appears without their data. This can be confusing and frustrating to respondents as they are used to using the back button in their everyday use of the Web (framework 4).

### 3.2 Automatic Routing

The E-Commerce prototype, as we saw earlier, makes use of automatic routing where respondents are taken to the next relevant question according to the answer that they have just provided. Many of the participants did not directly comment upon this feature, although those who did consider it to be another benefit of online completion:

*"That is quite nice you are not kind of worrying about 'Should I fill that in' and it avoids all that sort of complicated form that we have all filled in when it says 'If you answer 'yes' go straight to question number'."*

Participants, drawing upon their experience and knowledge of computer and Web-based applications (framework 4), know that automatic routing is possible and indeed desirable. From the comments made, as well as the lack of comments around this feature, automatic routing appears to be a feature that respondents expect to find in Web questionnaires.

The use of automatic routing, however, makes the use of question numbers counterproductive. Automatic routing may take a respondent directly to question number 7 when the previous question that she completed was question number 5. It is known that repeat respondents often refer back to previous returns in order to assist them with completion or, as seen in the interviews, a respondent may wish to print out a paper version of the questionnaire. (This is discussed in detail shortly.) In either of these scenarios, it is possible that the lack of question numbers could create an element of confusion or add extra burden to the task. In the interviews, when asked about the lack of question numbers, few participants felt it would be an issue. However, this is something that needs to be investigated in practice in order to determine whether it will be problematic or not.

### 3.3 Edit Checks

The appearance of edit checks seemed to be expected by the participants. Overall, the participants for both MIDSS and E-Commerce reacted favourably to the checks. Relating to their role as a respondent and their relationship with the ONS (framework 1), there is a general feeling that:

*...It is better to get it right when you submit it.*

Almost without exception, participants are keen to get it right the first time and avoid telephone calls from the ONS to query their response and therefore revisit the same survey twice. As one MIDSS respondent points out:

*It is sensible. No, it is useful. At least you can go back and get it right. Well otherwise you would be sitting there, if you did it on paper and you couldn't add up the total, send it in and they phone you back saying this doesn't add up, which one is right. It is much easier if you just get a prompt like that saying you have got it wrong and you can change it now.*

The data gathered indicates that respondents are likely to perceive edit checks as an expected, and necessary, part of Web data collection. However, these checks should not be overly burdensome to the respondent.

Despite the universal approval of the checks, the importance of them being employed in a way that is both understandable and useful for the respondent became apparent. An example of the edit checks needing to be understandable can be seen in the initial design of the MIDSS 'total number of employees' check. The first 5 MIDSS participants experienced this check as 3 separate pop-up windows with somewhat confusing text, which was subsequently modified. Those participants that encountered this text seemed to

feel it was testing their ability rather than assisting them:

*It was testing me.*

Poorly designed checks, such as this one, are likely to cause problems and frustrate the respondent. In contrast, the participants who experienced the revised version were able to move through this check with increased ease.

Secondly, respondents desire maximum usefulness from edit checks. A number of participants indicated that they would like an error to be flagged immediately rather than waiting until they have completed the questionnaire and are prepared to submit.

*I would say edits should be sitting in place. So, you know, I have put a stupid month in there, I would like that kicked out straight away*

*I think if you were making a systematic error, you would want to know straight away. I can't think what it would be but I suppose going back to entering dates or numbers, pounds, or something.*

Drawing upon prior experience with Web applications (framework 4), participants deduce that immediate consistency checks are possible and in their minds desirable. This type of check could reduce response burden by ensuring that they get it right immediately, rather than having to revisit such questions.

In Census Taker, respondents are able to move past an unresolved edit by checking the "Ignore Problems" option that becomes available in the navigation box at the bottom of the page when such a problem is encountered. In the Census Bureau research, it became apparent that the page-by-page edit checks would be frustrating for respondents who were just moving through the questionnaire to investigate the information requirement. Furthermore, many participants had difficulty seeing the "Ignore Problems" option. Respondents are able to submit the questionnaire with unresolved edits. However, some participants felt that they should not be able to submit the questionnaire with problems. The reactions to the edit checks by participants in the US research were not negative *per se*, rather it was in the way that they are presented.

Overall, the way edit checks are employed needs to be carefully considered. NSIs need to decide whether respondents are going to be forced to answer all questions (something that is not possible in paper questionnaires), whether a 'don't know' option is included in such questions, or whether respondents will be able to move through and submit the questionnaire with edit errors. Nonetheless, the

acceptance of edit checks and the apparent expectation that they are in place is an important finding. Moreover, the expectations for edit checks broadly align with agency expectations of improving data quality through Web data collection. The reader is referred to Anderson et al (2004) for more information about guidance for writing edit messages.

#### 4. Desired Functionality

Most of the participants in the research, with the notable exception of the sole proprietor, seemed to be proficient, regular users of the Web. From early on, it was apparent that they frequently looked beyond what was presented to them in the prototypes and were seeking additional, often more advanced, features. Accordingly, many of the participants' comments about the prototypes were centred on functionality elements that were *not* incorporated rather than those elements that were incorporated into the design. It is to these that we now turn.

##### 4.1 Automatic Computation of Totals

Automatic summation was considered important by participants in the US Census Bureau research. Totals can be calculated in Census Taker, however, respondents must click on 'next' and send their data back to the server for the calculation to be made. This system is in place as in-page calculation would require the use of Java Script. Census Bureau interpretation of Section 508, a U.S. Federal law requiring Web sites to be accessible to people with disabilities, precludes the use of Java Script.

The ability for the MIDSS questionnaire to sum totals automatically was by far the most often requested functionality element in these interviews. In the MIDSS interviews, some participants, reaching the question asking for 'total number of employees' deliberately entered an incorrect total in order to see what would happen. Others were surprised that the totals were not automatically entered for them:

*Oh doesn't it add it up for me?*

*If they could add it up. That was all, I was expecting it to have some sort of a basic arithmetic because it is a such a simple thing to program into it.*

Participants clearly drew upon their knowledge and use of similar applications (framework 4), both Web and desktop, and almost across the board they felt that such functionality should be incorporated.

#### 4.2 Inclusion of Previously Provided Information

The other commonly requested functionality for MIDSS, also requested in the US Census Bureau research, is the inclusion of previously provided information wherever possible. In both sets of interviews, this request was made when participants reached the final section of the questionnaire that asks for contact details. The rationale behind their request is that the agency already has this information and therefore it makes sense to populate the answer fields accordingly. The participants noted that they could modify the fields should any details have changed, such as a different person completing the questionnaire or a change in address/telephone number, and so on.

The participants' comments on the insertion of previously provided information showed a range of views, all with the perspective that it is something that the agency could do to make their life easier (framework 1). Here participants also showed consideration of their role as an employee and their working relationships (framework 2) as well as implicit reference to experience with password protected Web environments, which save data (framework 4). Some participants felt that the inclusion of default values would be a bonus feature:

*I was just thinking that automatic defaults to my name, my job title, my telephone number and my email address so that if you know, obviously if there was a staff change and somebody else takes it over and they can change the default but yeah it would be nice not to have to fill that in every time.*

Another respondent suggested that it would be useful if the previous month's turnover figure appeared in the questionnaire.

*It would be clever if it could remember what you put in the previous month so it just came up automatically.*

This feature could be useful for respondents to be reminded of the information that they provided in the previous return. Likewise, many of the US participants asked that last year's information could be shown in the current questionnaire, as this would help them remember how they completed the questionnaire the previous year and allow them to check and compare both years' data. Such requests relate to framework 3, their own working practices as well as their relationship with the agency (framework 1). Participants are again looking to the agency to make the task as easy as possible.

Whilst the inclusion of previously provided information and some default values may help speed up the task for the respondent, there are methodological and security issues to consider before

populating fields with contact details, dates and previous return data. Prior population of the contact details fields and asking respondents to verify that they are correct may carry some risk that the respondent does not update these fields when necessary. The use of default dates for the turnover period could lead to more serious problems as respondents may not realise they need to change the default dates to match their company's dates or they simply may not bother in order to save time. This has been shown to affect overall survey results (Pafford, 1988).

Finally, it is unclear whether providing details of the respondent's previous return is beneficial or problematic. It may help respondents to keep track of the information that they have provided and allow them to see if the information is radically different from one return to the next – and hence catch computational errors in advance of submission. However, providing previous data may perpetuate computational errors from one return to the next. Implementing such a system would be a question of trading-off different types of errors that arise in the different approaches. Research needs to be undertaken to assess their overall impact.

#### 4.3 Ability to Print

The ability to print at various stages in the response process surfaced as another important feature. Firstly, the facility to print a blank questionnaire was requested by many of the participants. For E-Commerce participants, the rationale behind this was multi-purposed. The request reflects their working practices (framework 3), enabling them to see all the questions, provisionally complete the questionnaire and/or take a copy of the questionnaire when consulting other people in the company.

*I know this will sound stupid but probably the first thing I would do is print it off. You can read it online but if you wanted to scribble notes on it or go and see this person or something like that, or reminders for yourself, you would tend to put them on to the hard copy.*

A point alluded to earlier is that a printed copy of the entire E-Commerce questionnaire is going to differ from the online version as the online version employs automatic routing and as a result has no, or different, question numbers. Whether this would be problematic for respondents is an open research question. In addition, the agency would need to decide how it would offer this printed version. Most logically it

would be a PDF<sup>3</sup> version of the paper questionnaire. However, this could give rise to the possibility that respondents, after completing the paper copy, decide to post this copy back rather than returning to the Web version (completing it and submitting online). The desire to print a blank copy of the questionnaire does raise the question of why such respondents would bother with the Web at all. One response to this is that printing a blank copy simply mirrors some respondents' working practices (framework 3) of photocopying the paper questionnaire and completing it in draft before writing answers neatly in the original copy, something we investigate further shortly.

The request for printing the questionnaire was not limited to the E-Commerce interviews. This was also found in the Census Bureau research where participants expect printing to be easy (it is possible but participants did not always find how to do so). Further, these participants also wanted the option to print and review a completed questionnaire and their data before submitting it to the Census Bureau.

In addition to the ability to print a blank questionnaire, both sets of interview participants wanted the option to print and/or electronically save the completed questionnaire. This is in line with respondents keeping photocopies of the questionnaires that they mail back to the NSI. Participants highlighted the importance of retaining this ability when returning their questionnaire electronically. Many were particularly in favour of saving it to their hard-drive or network but at the same time also wanted the option to print. From one ONS respondent:

*Yes because at the moment we do keep this once we send, we keep a copy of this for example, so there is a copy of some kind of back up in the office should they lose it, should they phone me back and say we have not received...anything could have happened so yes it would be nice if we could, yeah have both option to print and to save to file because then it is up to us to know which way we want to use it. So it would be nice to have both. Both systems.*

Requests for a printed or saved copy of the completed questionnaire reflect both the participant's relationship with the NSI (framework 1) and their role as an employee (framework 2).

## 5. Logistical Elements of Web Returns

During the interviews, participants were quick to ask about the more logistical aspects of Web data

collection, including how they would be informed that a return was due, login and submission. These elements are discussed in turn.

### 5.1 Email vs. Postal Survey Requests

In the UK study, most participants were happy with the idea of receiving an email reminder, which was often perceived as preferable to a paper reminder:

*...they send me out an email with the link to the website for me to just go in and fill out that form. That is perfect and I wouldn't mind at all if I got constant email reminders about that. That would be absolutely fine.*

*Definitely. I would ban all communications in any other way except in email if I had my way.*

Not all the feedback on email reminders was positive. A few participants were wary that emails are easy to be forgotten as their inbox fills up. This is in contrast to paper, which is a tangible object on their desk:

*It is different when you physically have got a bit of paper on your desk. You do tend to think oh gosh, you know, when you move it, you realise you have got it to do. And you could get it lost in your inbox, yeah.*

Again, this illustrates how participants evaluated the prototypes with reference to their working practices (framework 3) and how Web data collection would work for them, or in the above respondent's case, might not work for them.

A few of the Census Bureau participants felt that email notification may be undesirable as the notification may go unattended whilst a person is on leave or the notification may not reach the company if the person has left. These participants suggested that the Census Bureau ask for a back-up email address. This concern that the notification does not reach the company on time or at all reflects the participant's management of their role as a respondent and their role as an employee (frameworks 1 and 2). Currently, email notification is not permitted at the Census Bureau due to security and confidentiality concerns.

### 5.2 Login/Corporate ID

During the interviews for the ONS surveys, participants were also quick to ask about the logistics of accessing the questionnaire; whether they would require a login and how this would work. Some participants, chiefly those in larger companies, asked about having a corporate username and password. Once logged in, they would like to see all the surveys that their business is required to complete, what

---

<sup>3</sup> PDF = Portable Document Format created by Adobe Acrobat

questionnaires have been completed and what are outstanding, together with the due dates. This would facilitate management of the ONS requirements (framework 1) within the company as a whole (framework 2). If this is not possible on a corporate level, a useful alternative would be a departmental username and password.

*What would be most useful would be to have a departmental ID. So whether it was me or somebody who took my position there would be something that would say SFCA-AF, which is our department really. And so that would be the logon, the current contact details would be there and that would have my name and my position but the ID would relate to this department and this department would accept responsibility for the set of forms that we have agreed that I am completing currently, whether that be three or four and those forms would be listed or attached to that ID.*

One reason behind the request for a corporate ID is the concern that not all the ONS questionnaires are reaching the appropriate person in the business to undertake the task. A few participants are concerned that questionnaires are passed from desk to desk and eventually end up at the bottom of somebody's in-tray or drawer. Security was another reason behind this request. One respondent commented that a corporate or department ID managed by a predetermined individual may be more secure than separate, individual username and passwords:

*I think the danger if you don't have a user administrator system is that people pass the user ID and password around as the task moves around and then you have lost the basic security.*

It seems that the Web offers the potential for businesses to streamline agency survey requests allowing them to monitor all their responsibilities with ease as it is placed in the one location. These suggestions again bring us back to the notion of the 'responsible respondent' whereby participants displayed overt interest in meeting the survey deadline and meeting them in a timely and organised fashion. At the same time, such measures may reduce burden by streamlining the process, which would go some way to addressing both agency and respondent expectations of Web data collection reducing response burden.

### 5.3 Multiple Sessions

The final logistical functionality discussed was the facility to exit a partially completed questionnaire and return at a later stage to complete it, i.e. multiple sessions. Many of the MIDSS participants felt that as the questionnaire is so short they would complete it in

one go. Therefore, the ability to have multiple sessions is not essential as it does not affect their working practices (framework 3). However, when considering relationships within their company (framework 2), it emerged that multiple sessions could be beneficial.

*I mean obviously for this I wouldn't need to, although I might. I mean if I haven't had a reply from HR about the employees and I have the turnover or vice versa, then it would be quite nice to fill it in, part of it and come back to it.*

The E-Commerce participants were divided between those who feel they would complete it in one sitting and those that felt multiple sessions are necessary.

*It would bother me if there wasn't a save option because then I'm minimizing it and I would come in the next day but I wouldn't like that so I'd have to do that for the next hour, even if I had things other things to do.*

This respondent did not want to leave the questionnaire open in his browser as this poses a security risk for his company (framework 2). At the same time, his working practice (framework 3) may mean that he cannot complete the task in one sitting. Regardless of their positions, most participants felt this would be a useful feature for these surveys.

Overall, it appears that the facility for multiple sessions should be integrated into the original Web questionnaire design, regardless of the questionnaire length. Census Taker does allow for multiple sessions, with data saved as respondents move from page to page, although not all respondents were certain that this was true.

### 5.4 Confirmation of Submission

UK participants were anxious that they would receive some sort of confirmation that their return had been received by the ONS after they have clicked the submit button.

*I would not like to click on a submit button and get no message back. A message is absolutely essential.*

*[I would expect to see] something like automatic e-mail or something that says that it has been sent successfully.*

Confirmation following the submission of information is relatively common in Web applications (for example, after completing an online purchase). It was clear that some participants were alluding to such experiences (framework 4) and wished to see something similar in the ONS context. Some participants took the confirmation email idea further



and suggested that it could contain a summary of the answers that they provided.

Confirmation that the data has been received was also an important issue for the US participants. However, the wording on the page following submission did not reassure participants that their data had been sent and received. These participants wanted clear wordings for both submitting the data and confirming that it has been received, for example, clicking upon a button that says "Submit Data", which is then followed by a page stating "Your Data has been Received". In addition to this, these participants requested email confirmation, which they could save for future reference. (As noted earlier, however, email contact with Census Bureau respondents is not currently permitted.<sup>4</sup>)

### 5.5 Contacting the NSI

Within the US research, the ability for respondents to contact the Census Bureau via a secure message is an available feature in the Census Taker prototypes<sup>5</sup>. Overall, respondents felt this is a nice feature and some said they would prefer to use this method of communication instead of the telephone. One participant commented:

*Often it is difficult to get the right person on the phone so this would be great.*

However, the participants felt that this method would only be useful if they received a response from the Census Bureau within a reasonable amount of time, preferably within 1 business day. In addition, most participants still wanted the option of contacting the Census Bureau by telephone, commonly provided on all Census Bureau economic surveys. Participant preference on the communication method with the Census Bureau reflects both framework 1, their role as a respondent, and framework 3, their individual working practices. Further, in order to contact the Census Bureau, participants have to click on an icon saying 'Send Us a Secure Message'. Participants often overlooked this, saying that they were looking for something saying 'Contact Us', wording that is commonly used on websites (framework 4).

<sup>4</sup> Security of data and respondent information at the Census Bureau, like all other NSIs, is of utmost concern and remains an important issue to take into account in designing Web instruments.

<sup>5</sup> Additionally, the Census Bureau's Business Help Site will soon have a "Secure Message Center" to allow for private, secure communication with respondents via the Web.

Several US participants also asked whether there would be the facility to request an extension on the Web questionnaire. A few felt this would be particularly useful because they would have some sort of documentation (proof) that they requested and received an extension. Such requests reflect the legal obligation to respond to the survey and draw upon frameworks 1 and 2, their roles and responsibilities as a respondent and as an employee. Options for respondents to request an extension or a re-mail of their form or check the status of their filing are currently being considered for Census Taker.

## 6. Supplemental Features

The Web offers features that are difficult and/or costly or simply not possible to use in other modes. This final section considers one such feature that would be too difficult, if not impossible, to carry out by other modes. That is presenting respondents with feedback on the data that they have submitted.

### 6.1 Rewards/Feedback

During the discussion with ONS respondents on submission and what would follow once the submit button has been clicked, one suggested that the next page would be a good place to provide respondents with further information on the survey that they have completed. This could include an indication of where and when the results will be published.

*I think at the end...for it to actually tell you what's going to happen to that information. I think it would be quite useful at the end because at the beginning you don't know what the questions are so you don't know whether you are interested in where it's going to end up or not. Once you've answered them you're going to know, okay, actually I'd be quite interested to answer that so maybe I can have a look at it... It doesn't need to be lengthy, just quick notes to say, in August 2005 this information will be published and you will be able to view it at blah blah. Or if you would like to register to receive an email to tell you when it's completed. Those sorts of things and hyperlinks to take you to various places.*

This idea of the Web being used as an instrument to disseminate the results of the survey that they have just completed, as well as information on the ONS and other surveys, was discussed with every UK participant. It is noteworthy that the above respondent made the suggestion without prior prompting, indicating real interest in this feature. For the other participants, the idea was firstly outlined in order to gauge whether this would be at all useful and whether they thought that they would make use of it. If the

participant was receptive to the idea, it was explored further to discover what information they would like to receive and how they would like it presented to them. The discussion ranged from the provision of direct links to the analysed data to a tailored Web page with data relevant to the respondent's company.

In general, participants responded very favourably to these ideas. More often than not, a feedback page was seen as something that could be of interest, even if only on a personal level. Additionally, participants also felt that it would be like receiving a thank you and may lead to heightened interest in the next ONS questionnaire that they are required to complete.

*I mean something like that, in the back of your mind, you are thinking well I can see something that I have gained from having done this. You know just a little, whatever it was. If it was something like that, at least you would take interest in doing it next time.*

In this way, feedback could act as an incentive to completing the survey and add a positive element on how respondents perceive the agency (framework 1).

Participants from the smallest companies were most likely to feel that feedback would be directly useful to their business as it may provide easy access to information that they do not currently receive.

*If it is on the Web and we could see some results we would probably keep a copy so we could have a look and benchmark ourselves... It would be interesting for us to compare against (others) and maybe to use it for decision-making.*

In contrast, some participants from the larger companies were doubtful that such feedback would be of any real relevance to them in their job or their company because they have departments who collate similar information. Others said that whilst it would not be relevant to them they would be likely to forward the information to different people/departments in the company that could make use of it.

*There may be some other people who may be interested in that. Certainly not me personally but there may be other people who may be interested in that, yes.*

Both of these participants were evaluating the possibility of feedback with reference to their business (framework 2).

Finally, participants from all business sizes commented that the more specific the feedback to their industry, the more useful it would be to them and their business.

*Yeah, I mean industry specific would be quite handy, not that we want to spy on competitors or anything but just generally see how companies in that group are doing overall.*

Overwhelmingly, as the above quotations illustrate, participants understood the idea of a feedback facility as an incentive to complete the questionnaire and a reward for doing so. NSIs generally are unable to offer any kind of financial incentive to respondents and in the US, incentive use must be well justified and approved by the Office of Management and Budget. It seems that readily accessible results, particularly if they could be tailored to the respondent's company, are an incentive that they could offer and one that would be appreciated by the respondents. For Census Bureau economic Web surveys, respondents must enter the Web survey through the Census Bureau's Business Help Site. This is accessed via the Census Bureau Web page, which provides links to all published Census Bureau data sources.

## 7. Conclusion

This paper considers respondents' reactions and comments to prototype Web questionnaires with a view to understanding the factors involved in their decision to adopt Web returns. The research shows that a number of factors are involved in this decision. Firstly, we see that response to a survey is managed within several sets of relationships, such as between the NSI and the respondent, and the respondent and their company. It is also influenced by individual working practices and prior experiences with questionnaire completion as well as the mode of response. In this way, we see that response is multi-faceted and needs to be considered as such. Respondents to government business surveys are individuals with different positions, and varying degrees of seniority and experience. On a personal basis, these respondents have varying social-demographic backgrounds, and different personality traits and characteristics. All of these elements influence how they approach and respond to surveys, as do elements such as response burden. Similarly, these elements influence how they perceive Web data collection. The various frameworks, influencing the way within which the participants evaluated the Web prototypes, illustrate this point well (see Figure 2 below).

The reactions and opinions of participants to the prototype questionnaires corroborate existing research as well as introduce new findings. Research from NSIs has shown that respondents' desire features such as multiple sessions and printing abilities. However, it is

not documented that respondents *expect* to see certain functionality features. Edit checks, for example, are viewed as a useful and necessary aspect of Web questionnaires that can help them complete the task correctly at the first attempt. This is not to say that over-burdensome or confusing edit checks would be acceptable. The provision of other features such as previously provided data and automatic computation of sums are considered possible and desirable. The visual design does not appear to matter greatly. Undoubtedly, respondents will expect the questionnaire to be professional and understandable. Most importantly, it is essential that the questionnaire is user-friendly, as should the process of solicitation, login and submission. In addition, whilst respondents range from very inexperienced to very proficient Web users, those in the latter category are likely to desire sophisticated features incorporated into the design, placing additional demands upon the questionnaire designers. Overall, the Web is seen as a way for the agency to make the task easier and simpler, which, to a certain extent, aligns with NSIs' hope of Web data collection reducing respondent burden.

The visual and functionality elements discussed in this paper contemplate very specific, detailed aspects of Web questionnaires and through these elements, we begin to see how Web data collection would be acceptable and useful for respondents. We also see how their expectations of the design and functionality elements are formed by drawing upon their different roles (as respondent and employee) and also their working practices and experiences. This paper shows that for respondents, the detailed elements of Web returns combined is a leading factor in their decision to adopt such a mode of response; that is 'It's in the Detail'.

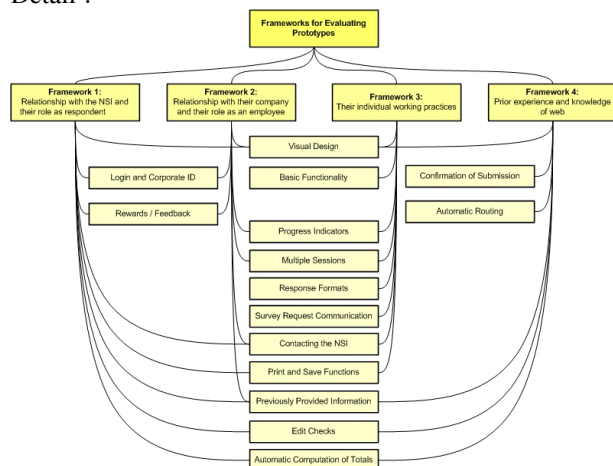


Figure 2: Interlinking nature of Respondent Frameworks illustrated their evaluation of Web data collection

However, this is just one aspect of Web data collection and one set of factors that influence respondents' decisions to take up this mode. There are other contributing factors influencing their overall perception and acceptance of Web data collection<sup>6</sup>. Firstly, respondents' perceive online completion and submission as being 'easier and quicker'. Secondly, like NSIs, respondents' wish to save resources, both from a government and a business perspective. Thirdly, respondents' perception and understanding of computer and internet technology can lead them to consider Web data collection as an inevitable part of the future. Finally, respondents' wish to reduce the volume of paper in their office and, for some, it is encompassed by their aspirations for a paperless office.

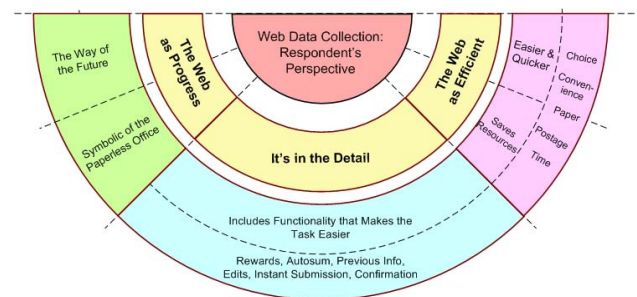


Figure 3: Web Data Collection: the Respondent's Perspective

These factors are interlinked. The use of the Web, in the respondent's eyes, will result in both a reduction in paper, thereby working towards the ideal of a paperless office, as well as saving financial resources for both the government and their business. The notion of a 'paperless office' is linked with certain perceptions and expectations of technology and its future in society. The notion that it is 'easier and quicker' to complete an online questionnaire is also linked with perceptions of the technology and with saving time resources.

These factors can be placed into two broad themes: namely the 'Web as Efficient' and the 'Web as Progress'. Respondents have clear ideas about the need for, and desirability of, efficiency, which in their eyes the Web appears to promise. This corroborates with NSI expectations of efficiency within survey costs and timeliness. The notion of the 'Web as Progress' is apparent within the respondents' perception of the Web; both by the language used when discussing the Web and their belief in its future position within society. The respondents' clearly consider the 'Web as

<sup>6</sup> These factors are considered in detail in Dowling (2007).

Progress', which again relates with NSIs' perceptions of the technology and its future role in data collection. The respondents' decision to adopt Web returns then, is a combination of these three factors: the 'Web as Efficient', the 'Web as Progress' and 'It's in the Detail' (as illustrated in Figure 3 above). NSIs may not have control over the first two factors but the third factor is of vital importance. The research findings indicate that if NSIs, in the eyes of the respondents, do not get the details (such as automatic sum of totals, edit checks, previously provided information, instant submission, confirmation of submission and rewards) right, respondents' may decide to abandon Web returns. These detailed elements must meet their expectations in terms of usefulness, usability, and so on. Finally, this paper clearly demonstrates that in order for methodologists to gain full understanding of the issues, questionnaires and response need to be considered in context, holistically, rather than in isolation.

### Acknowledgements

The UK Ph.D. research is a result of an Economic and Social Research Council (ESRC) CASE scholarship in conjunction with the UK Office for National Statistics, undertaken at the University of Surrey, Guildford.

### References

- Anderson, A.E., Murphy, E., Nichols, E., Sigman, R., Willimack, D.K. 2004, "Designing edits for electronic surveys: Issues and guidelines.," presented to the Annual Conference of the American Association for Public Opinion Research, May, Phoenix, Arizona.
- Aplin, E. (2000). *Statistical EDR: The Australian Experience*.
- Baird, D., Thomas, P., Herbert, J., & Jones, J. (2002). *The Data Collection Innovation Programme* (Internal document). London: Office for National Statistics.
- Best, P. (2003, 29th October). *Breaking New Ground in Data Collection: Electronic Data Reporting at Statistics Canada*. Paper presented at the Statistics Canada International Methodology Symposium.
- Burnside, R., & Farrell, E. (2001). *Electronic Data Reporting - recent developments at the Australian Bureau of Statistics*. Paper presented at the Statistics Canada Symposium 2001, Achieving Data Quality in a Statistical Agency: a methodological perspective.
- Dowling, Z. (2007). *Web Data Collection for Mandatory Business Surveys: an exploration of new technology and expectations*. Unpublished Ph.D. thesis, University of Surrey, Guildford.
- Hak, T., Anderson, A. E., & Willimack, D. (2003). *Determinants of Web Reporting: A Qualitative Survey of Mode Selection*. Paper presented at the Proceedings of the Federal Committee on Statistical Methodology Research, Washington, DC.  
[http://www.fcsm.gov/03papers/Hak\\_Anderson.pdf](http://www.fcsm.gov/03papers/Hak_Anderson.pdf).
- Haraldsen, G. (2004). Identifying and Reducing the Response Burden in Internet Business Surveys. *Journal of Official Statistics*, 20(2), 393-410.
- Kerssemakers, F. (2003, 21st-23rd May). *Developing CASI Standards at Statistics Netherlands*. Paper presented at the 8th International Blaise Users Conference (IBUC), Copenhagen.
- Labillois, T. (2002). The integration of Electronic Data Reporting (EDR) and other new systems in the ongoing collection process. Retrieved December, 2002, from  
[www.codacmos.eu.org/dissemination%20material/data%20collection%20statistics%20canada.pdf](http://www.codacmos.eu.org/dissemination%20material/data%20collection%20statistics%20canada.pdf)
- McBeth, N., Pitts, S., & Johnston, S. (2001). *Statistics New Zealand: recent developments in electronic data collection*. Paper presented at the Statistics Canada Symposium 2001, Achieving Data Quality in a Statistical Agency: a methodological perspective. [www.statcan.ca](http://www.statcan.ca).
- Pafford, Bradley V. (1988). "The Influence of Using Previous Survey Data in the 1986 April ISP Grain Stocks Survey." United States Department of Agriculture, National Agricultural Statistics Service, Research and Applications Division, NASS Research Report Number SRB-88-01.
- Roos, M. (2002, 13th-15th February). *Recruiting Internet Respondents*. Paper presented at the Statistical Commission and Economic Commission for Europe Conference of European Statisticians, Geneva, Switzerland.
- Roos, M. (2003). *NL Electronic Data Collection Tools International Trade*: Statistics Netherlands.