

**WEB DATA COLLECTION FOR MANDATORY BUSINESS SURVEYS:  
AN EXPLORATION OF NEW TECHNOLOGY AND EXPECTATIONS**

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## **ABSTRACT**

The internet has grown exponentially over the last decade and has become integrated into business and society at unprecedented levels. In line with growing, and in some cases extensive, use by other survey research groups government National Statistical Institutes (NSIs) are beginning to employ the Web as a new mode of data collection. This thesis is an exploratory investigation into the expectations surrounding the implementation of internet technology for mandatory business surveys.

The research employs a Science and Technology Studies perspective rather than the traditional social and cognitive approaches most often used in methodological research, allowing the topic to be examined in a holistic manner. This approach provides insights into the underlying views and assumptions that NSIs and respondents hold about the Web, which in turn affect the many methodological issues surrounding Web data collection.

Documentary sources and ethnographic data are used to explore developments at NSIs. The respondents' perspective is explored through qualitative interview data, gathered by semi-structured interviews undertaken with current respondents to UK Office for National Statistics mandatory business surveys.

The findings suggest that both NSIs and respondents bring their own set of expectations to Web data collection and by and large these expectations overlap. The expectations are influenced by public discourse surrounding the Web, which affect the way in which NSIs and respondents perceive the new mode of data collection. Rhetoric surrounding internet technology is apparent, with both NSIs and respondents suggesting a willingness to adopt Web data collection on the premise that it is both efficient and symbolises progress. The findings also illustrate that respondents bring their own set of background knowledge and experiences to the response process, demonstrating the complexity of response. All of these findings have implications that go beyond mandatory business surveys to survey research as a whole.

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## LIST OF ABBREVIATIONS

<b>ABI</b>	Annual Business Inquiry
<b>ABS</b>	Australian Bureau of Statistics
<b>ARPA</b>	Advanced Research Project Agency
<b>ARTS</b>	Annual Retail Trade Survey
<b>ASHE</b>	Annual Survey of Hours and Earnings
<b>ATS</b>	Annual Trade Survey
<b>BACS</b>	Banks Automated Clearing System
<b>BES</b>	Business Expectations Survey (Australia)
<b>BDD</b>	Business Survey Division (former division at the ONS)
<b>BLS</b>	Bureau of Labor Statistics (US)
<b>BoT</b>	Board of Trade (UK)
<b>BSO</b>	Business Statistics Office (UK)
<b>CAQDAS</b>	Computer-Assisted Qualitative Data Analysis
<b>CAI</b>	Computer-Assisted Interviewing
<b>CAPEX</b>	Capital Expenditure Index
<b>CAPI</b>	Computer-Assisted Personal Interviewing
<b>CASE</b>	Collaborative Awards for Science and Engineering
<b>CASI</b>	Computer-Assisted Self Interviewing
<b>CATI</b>	Computer-Assisted Telephone Interviewing
<b>CERN</b>	<i>Conseil Européen pour la Recherche Nucléaire</i> (European Laboratory for Particle Physics)
<b>CSAQ</b>	Computerized Self-Administered Questionnaire
<b>CSO</b>	Central Statistics Office
<b>DAPRA</b>	Defence Advanced Research Project Agency
<b>DBM</b>	Diskette By Mail
<b>DCI</b>	Data Collection Initiatives (ONS)
<b>DTI</b>	Department of Trade and Industry (UK)
<b>ECOM</b>	E-Commerce Survey
<b>EDC</b>	Electronic Data Collection
<b>EDI</b>	Electronic Data Interchange
<b>EPOS</b>	Electronic Point of Sale
<b>ESRC</b>	Economic and Social Research Council (UK)

<b>ETA</b>	Electronic Transactions Act (Australia)
<b>EUROSTAT</b>	Statistical Office of the European Communities
<b>FES</b>	Family Expenditure Survey
<b>FTP</b>	File Transfer Protocol
<b>GAAP</b>	Generally Accepted Accounting Principles
<b>GDP</b>	Gross Domestic Product
<b>GHS</b>	General Household Survey
<b>GSS</b>	Government Statistical Service
<b>GSSD</b>	Government Social Survey Department
<b>HTML</b>	HyperText Mark-up Language
<b>HTTP</b>	Hypertext Transfer Protocol
<b>IAS</b>	Internet Activity Survey (Australia)
<b>ICR</b>	Intelligent Character Recognition
<b>ICT</b>	Information Communication Technologies
<b>IDBR</b>	Inter-departmental Business Register
<b>IDUN</b>	<i>Informasjon og Datautveksling med Næringslivet</i> (Information and Data Exchange with Businesses) (Norway)
<b>IE</b>	Microsoft Internet Explorer
<b>IRIS</b>	Interactive Registration of International Trade Statistics
<b>ISP</b>	Internet Service Provider
<b>IVR</b>	Interactive Voice Response
<b>JANET</b>	Joint Academic Network
<b>LDS</b>	Labour Disputes Survey
<b>LFS</b>	Labour Force Survey
<b>OECD</b>	Organisation for Economic Co-operation and Development
<b>ONS</b>	Office for National Statistics (UK)
<b>OPCS</b>	Office of Population Censuses and Survey (UK)
<b>QSI</b>	Quarterly Stocks Inquiry
<b>PDF</b>	Portable Document Format
<b>M3</b>	Manufacturers' Shipments, Inventories, and Orders Survey (US)
<b>MIDSS</b>	Monthly Inquiry into Distribution and Services Sector
<b>NES</b>	New Earnings Survey
<b>NSF</b>	National Science Foundation (US)
<b>NSI</b>	National Statistical Institute
<b>PAYE</b>	Pay As You Earn
<b>PRES</b>	Personalised Reporting and Exchange Services

<b>PRODCOM</b>	Products of the European Community
<b>QSFS</b>	Quarterly Survey of Financial Statements
<b>RDD</b>	Random Digit Dialling
<b>RTS</b>	Retail Trade Survey
<b>RSI</b>	Retail Sales Index
<b>SCOT</b>	Social Construction of Technology
<b>SGML</b>	Standard Generalised Mark-up Language
<b>SIC</b>	Standard Industrial Classification
<b>SIRS</b>	Secure Internet Response Site
<b>SME</b>	Small and Medium-sized Enterprise
<b>SNZ</b>	Statistics New Zealand
<b>SSD</b>	Social Survey Division (former division at the ONS)
<b>SST</b>	Social Shaping of Technology
<b>STS</b>	Science and Technology Studies
<b>TCP/IP</b>	Transmission Control Protocol/Internet Protocol
<b>TDE</b>	Touch-Tone Data Entry
<b>URL</b>	Universal Resource Locator
<b>USENET</b>	User's Network
<b>VAT</b>	Value Added Tax
<b>WWW</b>	World Wide Web
<b>XML</b>	Extensible Mark-up Language



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# CHAPTER ONE

## INTRODUCTION

### 1.1 Introduction

How do we view the impact of technology on survey data collection? For some, each new wave of technological innovation brings new opportunity, offering new ways to enhance and extend survey capabilities. For others, each such innovation is viewed as a portend of the end of surveys as we know them. More often than not, the voices of the proponents of technological innovation and change drown out those of the detractors in the rush to adopt the latest technology. (Couper, 2005:486)

New technologies, both past and present, have had great influence on surveys and the organisations undertaking such research. It has been suggested that over the past 30 years computer technology has been the leading factor in the improvement and advancement of survey research (Kalton, 2000:3). In this time, a new technology has been adopted in data collection methods every decade, with computer-assisted telephone interviewing (CATI) in the 1970s, computer-assisted personal interviewing (CAPI) in the 1980s and the use of the internet for email and later Web surveys in the 1990s. As Couper (2005:486) notes, each of these developments have their champions and their detractors with the rhetoric surrounding these new technologies remaining constant; this is ‘the next big thing’.

The adoption of a new technology for survey research presents many methodological unknowns that can affect the vital elements of validity and reliability of the results. Thus, these new methods are often subject to extensive methodological research in order to understand the implications of employing the technology. However, the adoption of a new technology is not simply a case of the best succeeding over other inferior technologies. Rather the adoption of a new technology is surrounded by complex and intertwining social, political and economic factors, which leads to the technology both shaping and being shaped by this process of adoption. “...[P]eople, institutions, companies, and society at large, transform technology, any technology, by appropriating it, by modifying it, by experimenting with it” (Castells, 2001:4).

The implementation of a new technology for survey research is no exception. In this way, it is important to investigate not just the methodological issues surrounding the new mode but



also the social context within which it will be used and the way this in turn shapes understandings of the relevant methodological issues. This thesis considers the adoption of one such new technology, the Web, within government mandatory business surveys. This chapter opens the discussion by outlining the history of internet as a technology and as a research tool. This is followed by a brief introduction to the use of the technology in mandatory business surveys and the key aims and objectives of the thesis. The final section provides an overview of each chapter in the thesis.

## **1.2 A Brief History of the Internet**

The beginnings of the internet can be traced back as early as mid-1960, when remote access to another computer, although possible, was a technical and cumbersome process (Jordan, 1999:33). The internet emerged from a United States military project, DAPRA (Defence Advanced Research Projects Agency). The ultimate aim of this project is somewhat contested in the literature. On a basic functional level, the internet was developed in order to facilitate communication between researchers working in computer laboratories at different geographic locations (Beckett, 2000:13/14; Jordan, 1999:33). The method of packet switching was developed, which involves dividing the information that is being transmitted into small parts (packets) and then reassembled when it reaches its destination (Beckett, 2000). The packets are transmitted via routers where an alternative route or routes can be used should the most direct route be unavailable thus permitting communication and information exchange to continue uninterrupted.

In December 1969, the first connection of this network took place, linking together 4 US university computer systems, namely University of California Los Angeles, Stanford, University of California Santa Barbara and the University of Utah (Slevin, 2000:31). Three years later, more than 37 US universities were linked to the network, then known as the ARPANET, with the numbers rapidly increasing thereafter (Winder, 1994:2). Initially, use of the APRANET was limited to specialised groups, such as computer professionals, engineers and scientists, who all had to learn to manoeuvre themselves around a very complex, non-user friendly system. In the twenty years following the linking of these university computers, the system experienced tremendous growth with various agencies devoting large amounts of time and funding to its development. Despite the later appropriation of the internet for business and commerce, this community was not involved in its initial development. As Castells (2001:22) comments, “in sum, all the key technological developments that led to the internet were built around government institutions, major universities and research centres”.



In the early years, the most rapid expansion of the internet took place within the US. At the beginning of 1983, the TCP/IP (Transmission Control Protocol/Internet Protocol) architecture, developed by Kahn and Cerf at Stanford, was universally adopted (Hauben & Hauben, 1998). In 1985, the US National Science Foundation (NSF) created the NSFNET, which consisted of five supercomputer centres containing resources that were available to US educational institutions. The NSFNET later took over the ARPANET, whose defence background meant that its information was surrounded in “red tape” (Winder, 1994:3) A year later, the NSF funded and managed the development of a 56 kbps backbone (Winston, 1998:332). This backbone and the financial support provided by the NSF for the next 10 years (amounting to \$200 million) opened up opportunities for public and commercial use of the system, which soon became known as the internet (Misa, 2004:253). The personal computer and modem allowed the development and growth of bulletin boards and electronic discussion forums, such as USENET (User’s Network) (Slevin, 2000:32). In Europe, several countries developed their own internal networks – each with their own aims. Often these networks were created for specific communities. A prime example of this is JANET (Joint Academic Network) in the UK, established in 1984 to provide an inter-connecting wide-area network for the academic community (Leiner, 1993:18).

The internet, as it developed, became more user-friendly with the standardisation of many commands for various applications, such as email, telnet and FTP (Howe, 2006). Various organisations and universities worked to develop the technology and the potential that it promised. A number of attempts to create indexes for the information available on the network saw the formation of applications such as Archie (McGill University) and later Gopher, a system developed to aid access to files and information on the University of Minnesota’s local network. Gopher soon grew into an application that allowed the user to move through many different networks (not just Minnesota University's network) in the search for information from one basic menu (Winder, 1994:5). Further enhancements of Gopher were created with Veronica (Nevada University) and Jughead (University of Utah), providing searchable indexes of Gopher menus (Howe, 2006). Nevertheless, these developments were insufficient as many of the networks were incompatible (Jordan, 1999:42). This problem was solved in the early 1990s with the emergence of the World Wide Web.

The Web was developed by Tim Berners-Lee, who was then an employee of, CERN, a European scientific organisation to facilitate easy collaboration on global scientific projects



(CERN, 2006). Berners-Lee (1999:3) writes “inventing the World Wide Web involved my growing realisation that there was a power in arranging ideas in an unconstrained, weblike way”; essentially storing information in a non-hierarchical manner that would be easily retrievable. The Web, or the W3 as it was first known, created an easy and consistent system allowing scientists to access data and information in a simple and effective manner (CERN, 2006). The Web is a combination of computer networks and hypertext, which is “text with links to further information, on the model of references in a scientific paper or cross-references in a dictionary” (CERN, 2006). The Web is an information structure whereby information is stored on servers and is transmitted by the internet using the protocol, HTTP (HyperText Transfer Protocol). The standard language of a Web document is HTML (Hypertext Mark-up Language) and each 'page' has its own unique address, known as a URL (Universal Resource Locator).

The Web's rapid growth commenced in 1993 with the appearance of the first graphical browser, Mosaic, which opened up the internet and the Web to the general public. Netscape was released the following year and became immensely popular, whilst Microsoft's Internet Explorer was released in July 1995. In the US, 1995 also saw the transfer of responsibility for the internet backbone from the government owned and operated NSFNET to private, for-profit, Internet Service Providers (ISPs), which enabled homes, schools and businesses to become connected to the internet (Misa, 2004:255). Today, the Web has become integrated, and some may argue integral, in society and business. This adoption and integration has led to its uses in numerous ways, most of which were unintended and unforeseen by the initial developers of the technology. The use of the Web for survey research is one such example.

### **1.3 The Internet and Research**

As we noted above, the commercialization of the internet backbone infrastructure and the subsequent appearance of ISPs opened up the internet to the general public and the number of users grew exponentially. This in turn opened up the internet both as an area for research and as a research tool. The internet as an area of research has grown vastly over the past 10 years and is beginning to be recognised as a field in its own right. Research in this area is interdisciplinary and spans many topics, including uses and perceptions of the technology at home, in the work place and educational environments, as well as extensive research on legal, economic and political implications of the technology and its uses (Rice, 2005). The ever-growing number of internet users has also opened up the potential for online data collection, for both qualitative and quantitative research. Qualitative methods include



asynchronous and synchronous interviews as well as virtual participant observation. Quantitative methods include email and, the focus of this thesis, Web surveys.

One of the first papers on internet (email) survey research was published in 1986 (Kiesler & Sproull) but it was the early to mid-1990s before research on this area was undertaken in earnest. The market research community was the first early, and soon prolific, user of the new technology. This community immediately recognised the potential for reduced costs and increased speed of surveys conducted in this manner. This is reflected by much of the early literature, which originated from this community (for example, Comley, 1996; Mehta & Silvadas, 1995; Tse *et al.*, 1995; Weible & Wallace, 1998). The very early literature mostly focuses upon email surveys but in the late 1990s, the Web soon surpassed email as the tool of choice. Many of these early studies (on both email and Web surveys) considered the immediate problems of sampling and recruitment; how to locate and contact the target population when using internet methods. Despite the limited numbers and diversity of internet users, researchers were confident about its future use: "...as one understands the sampling issues and access constraints, the internet can fulfil an important role in data collection"(Bauman *et al.*, 1998). Other predominate areas of early research focused upon the general advantages and disadvantages of the new technology as a research tool, which included factors such as response rates and speed of response (for example, Coomber, 1997; Swoboda *et al.*, 1997; Witmer *et al.*, 1999). As the 1990s progressed, the focus expanded to include factors such as quality, costs, and numerous papers on mixed mode methods (for example, Schaeffer & Dillman, 1998; Smith, 1997; Yun & Trumbo, 2000).

The Web continues to develop both as a technology and as a mainstream medium for communication and information. It is used in social, economic and political contexts. With this development and growth, the Web's potential as a research tool also continues to develop and grow and does so in conjunction with increasing understanding of the methodological implications of the new technology.

#### **1.4 New Technology in Mandatory Business Surveys**

National Statistical Institutes (NSIs) are following the growing use of the Web for survey data collection. The adoption of a new technology, as noted at the beginning of this chapter, is complex with both the technology and the organisation shaping and being shaped by the other. Keller & Willeboordes of Statistics Netherlands (2000:403) suggest that "the emergence of new information technologies urges statistical offices to critically review the



methodology and organisation of their statistical processes”. In the same vein, Parent & Jamieson of Statistics Canada (2000:383) comment that “the emergence of technology in all aspects of data collection, has radically changed the way we plan, design and execute survey activities”.

The political and economic factors surrounding the use of new technologies as well as the resulting changes to both the survey and the research organisation is apparent in the historical development of the general population census. Campbell-Kelly (1996:35) notes that “while there can be no question that the British census suffered from severe bureaucratic inertia, the adoption of new technology was not a black and white issue but one which has to be related to crises in information processing, the goals of the organisation, and external pressures”. The (eventual) adoption of new information technology processes in undertaking the British census, which was highly contested both politically and economically, ultimately changed the structure, administration and workings of the organisation.

Today, NSIs adopting new technologies no doubt face similar political, economic and ideological considerations. Further, a new technology is often surrounded by its own rhetoric and, as we saw in the beginning of this chapter, the internet is no exception. Woolgar (2002:9) refers to such discourse around the internet as ‘cyberbole’, an “exaggerated depiction (hyperbole) of the capacities of cyber-technologies”. In this way, the adoption of the technology is often undertaken with certain expectations that are derived from the discourse surrounding the technology.

This thesis explores the implementation of a new technology for data collection, drawing together the three areas of mandatory business surveys, the Web as a mode for data collection, and the social dimensions of the Web as new technology. The research employs a holistic approach, considering the methodological and contextual aspects of Web data collection from both the NSIs and their respondents’ perspective. Considering the internet as a social entity and gaining an understanding of the social dimensions surrounding the technology, from both the perspective of the survey organisation and the respondent, will assist our understanding of the methodological issues surrounding the new survey mode.

The key aim of the research is to investigate expectations surrounding the new mode from both sides; the NSIs implementing the new technology and the respondents adopting it. As a result, the main research question asks, “How are expectations of Web data collection formed by NSIs and their respondents?” This is followed by a subsidiary question, “How far



do these expectations align?”. The UK Office for National Statistics (ONS) provides the main setting for the research, which came about as part of an Economic and Social Research Council (ESRC) funded CASE studentship with the ONS as the collaborative partners.

### **1.5 Overview of Chapters**

The first literature review chapter, **Chapter Two, Mandatory Business Surveys: an overview** provides an introduction to mandatory business surveys, their key characteristics as well as key issues in their data collection methodology. The chapter opens with a brief history of official surveys in the UK, after which some of the technical developments in survey research over the past 30 years are considered. This is followed by an outline of the key characteristics of mandatory business surveys before turning to a review of three important areas in business data collection; the response process, response burden, and questionnaire design. Through the review of this literature, the chapter shows how business survey methodology, and in particular data collection methodology, has been largely neglected until recent years. It illustrates various gaps in the current understanding of the response process, including response burden, and the design of business questionnaires.

The following chapter, **Chapter Three, Web Data Collection: practical and theoretical considerations**, offers a review of the current Web data collection literature, highlighting the numerous new design choices and their known, and unknown, implications that face researchers when using this mode. From this literature, we see how the use of a new mode can have unknown effects upon measurement error, item non-response as well as overall response rates. We also see that current research into Web surveys is generally undertaken using a quantitative experimental design. This type of research undoubtedly provides valuable insights into methodological considerations. However, it does not take into account the social and cultural position of the Web and so provides only part of the story. Therefore, the second part of the chapter explores theoretical perspectives from Science and Technology Studies in order to provide the tools to understand the social and cultural aspects surrounding Web data collection in subsequent chapters. From this literature, we begin to see where expectations surrounding the new mode could be influenced by the public discourse arising from the internet’s technological action frame.

**Chapter Four, Methodology** provides an account of the methodology and methods employed in order to answer the research questions. This chapter begins by outlining the development of the research and research questions. These research questions and the desire



to gain a holistic view of Web data collection from both the NSI and respondent's perspective, necessitated an explorative, qualitative examination of the topic, using ethnographic and interview methods as well as some documentary sources. The chapter also provides detailed information on the two ONS mandatory business surveys used in the interviews with current respondents. This includes descriptions of the surveys, paper questionnaires and Web prototypes employed in the interviews as visual aids.

The first analysis chapter, **Chapter Five, Electronic Data Collection within National Statistical Institutes: a snapshot**, explores the institutional perspective for Web data collection by investigating the use of three types of electronic data collection (of which the Web is one) within eight National Statistical Institutes and the drivers leading their use. This chapter draws upon documents and personal communication with various NSI members. Technology shapes and is shaped by organisations and their practices. This chapter unravels the underlying drivers and expectations that NSIs bring to Web data collection. The technical action frame and resulting public discourse surrounding the internet can be seen to be a key factor in the implementation of Web data collection. Expectations for the new mode show evidence of the public discourse, or cyberbole, surrounding the internet.

**Chapter Six, The Task at Hand**, turns to the interview data with current respondents to ONS mandatory business surveys. This chapter provides a contrast to the institutional perspectives of response and offers an account of the response process as described by the interview participants. The chapter begins by introducing the participants and then explores the way in which respondents currently approach the task of response, building a holistic picture of the task from their perspective. The participants' account is considered in the light of the literature reviewed in Chapter Two. From this we see that the model for response burden is incomplete and can be built upon. Response is not simply about one individual sitting in front of one survey instrument, the process is more complex than this suggests.

**Chapter Seven, The Prototype Web Questionnaires**, begins by considering the historical and social context within which the Web questionnaire will be completed. We see that all of the participating businesses have had an internet connection for a number of years and that most of the participants are comfortable with using the Web, both for personal and professional purposes. The second section considers the participants' comments and reactions to the prototype Web questionnaires. This shows that respondents' expectations of Web data collection are derived from four different frameworks. These frameworks are: their role as a respondent and their relationships with the NSI, their role as an employee and their

relationship with their company and other employees, their own working practices and finally, their previous use and experiences with the Web. These frameworks are at times interconnected and at other times at odds with one another. As with the previous chapter, this chapter builds upon the picture of response demonstrating the multi-layered process with respondents negotiating different roles, which all impact upon their expectations of Web data collection.

The final analysis chapter, **Chapter Eight, Web Data Collection: the respondents' perspective**, considers the broader ideological factors that influence respondent expectations for Web data collection. The chapter explores four such factors that are identified from the interview data, namely 'easier and quicker', 'saving resources', 'it's the way of the future' and 'the paperless office'. The chapter concludes that these factors can be placed into two broad categories of the 'Web as efficient' and the 'Web as progress'. They emerge from the respondents' perception of the new technology, fuelled by public discourse, as well as their own experiences with the Web.

The thesis concludes with **Chapter Nine, Web Data Collection: new technology and new expectations**, which draws together all that we have learned about Web data collection within mandatory business surveys. The chapter considers NSI and respondent expectations around Web data collection. It explores both the origins of these expectations and how far the expectations from each side align with one another. Here we see that both sets broadly align, with NSIs and respondents viewing Web data collection as efficient and symbolising progress. Further, the expectations on both sides are greatly influenced by the public discourse surrounding the internet. In this way, we see that the cultural context is of vital importance and cannot be ignored in any survey. In addition, response is multi-faceted with respondents drawing upon their own sets of background knowledge and experiences, as well as the context within which they are providing the information. These findings could be applied beyond mandatory business surveys to social surveys.



## **CHAPTER TWO**

### **MANDATORY BUSINESS SURVEYS: AN OVERVIEW**

#### **2.1 Introduction**

Official business statistics provide extensive and wide-ranging data on businesses, thereby yielding a picture of national economic activity and performance. Business statistics enables “the appreciation of economic trends and the provision of a statistical service for industry and for the discharge by government departments of their functions” (United Nations Statistics Division, 2006). These statistics are generally collected by National Statistical Institutes (NSIs), which often carry out a large number of business surveys per year. For example, in the United Kingdom the Office for National Statistics (ONS) conducts over 90 business surveys per year (Smith *et al.*, 2003:257). NSIs face a number of challenges when conducting these surveys, working within demanding parameters. The statistics are to be of high quality, have high integrity and be carried out in the most efficient manner (HM Treasury, 2006).

This chapter provides a review of official business surveys and outlines the main challenges facing the NSIs and methodologists. The chapter begins with a brief history of UK government surveys, followed by examples of ONS business surveys and a discussion on the key features that characterise these surveys. The second section provides a detailed discussion of three important issues surrounding data collection for business surveys; the response process, response burden and questionnaire design.

#### **2.2 History of UK Government Business Surveys**

Historically, the collection of government statistics within the UK has been dispersed amongst the numerous government departments and agencies that undertake surveys and information gathering relevant to their respective areas of responsibility. The first population census took place in 1801 by the newly created Census Office and took place every 10 years thereafter, although it was only in 1920 that the Census Act formalised the requirement to undertake a census every decade. Until that point, each census required a special Act of Parliament, which also included agreement on the provision of funds for the census (Campbell-Kelly, 1996:24). Records for births, marriages and deaths began in 1837 with the creation of the General Register Office.



The first government statistical department was established in the 1830s, as was the first professional society (Moss, 1991). The collection of social and economic data continued to develop and expand through the 19<sup>th</sup> Century, often by separate statistical units attached to government departments. However, the early history of these activities is not well documented, particularly with regards to economic data. This has been compounded owing to the many changes that have taken place over the years. Responsibility for surveys has changed, either by moving them from one department to the next or the creation, cessation or mergers of departments. For example, the Board of Trade (BoT), which originated in the 17<sup>th</sup> Century, was responsible for many of the early economic surveys, some of which continued through the late 20<sup>th</sup> Century. However functions of the BoT were taken over by the newly formed Department of Trade and Industry in 1970 (Department of Trade and Industry, 2006). This department split in 1974 to form three separate departments; the Department of Industry, the Department of Trade and the Department of Prices and Consumer Protection. In 1979, responsibilities of the latter department were returned to the Department of Trade. Five years later, in 1984, the Departments of Industry and Trade were merged to form the Department of Trade and Industry (DTI) (Department of Trade and Industry, 2006). This is just one example of the changing responsibilities of government departments.

In 1941, after many years of calls for measures to unify government surveys, the Central Statistical Office (CSO) was established with the aim of co-ordinating the different statistical information gathered by the various government departments. The Government Social Survey also began in 1941, initially as the Wartime Social Survey. It was originally housed in the Home Intelligence Division of the Ministry of Information. However, in 1945 the Ministry of Information was disbanded and replaced by the newly formed Central Office of Information. The following year, after much discussion, the Social Survey was transferred to this new office (Moss, 1991:14/15). Another key event in the 1940s was the 1947 Statistics of Trade Act, which provides the necessary legislation enabling the collection of such information from businesses. A survey conducted in accordance with this Act makes response a mandatory requirement. Voluntary versus mandatory is an important issue in data collection and the mandatory nature of many official business surveys is a key characteristic of these surveys and will be explored shortly.

In the late 1960s, government statistics were revisited again, resulting in major organisational changes. In 1967, the Social Survey gained independence and became the Government Social Survey Department (GSSD). Around this time, the Business Statistics Office (BSO) was created to bring together the collection of economic statistics. The BSO



was initially part of the BoT, which, as we saw earlier, became part of the DTI. The role of the CSO was expanded in the management of government statistics. At the same time, the Government Statistical Service (GSS) was created to “improve coordination in the management of government statistics and to develop a cadre of professional statisticians across government” (HM Treasury, 1998). The decision to create the GSSD was quickly revisited and in 1970 the GSSD and the General Register Office merged to form the Office of Population Censuses and Surveys (OPCS) (Moss, 1991:72/73).

Major changes in the organisation of government statistics occurred again 20 years later in 1989 when the BSO was merged with the CSO, which occurred after increasing concerns about the quality of government statistics during this decade. This merger integrated business statistics from the BSO and the Retail Prices Index, which had been undertaken previously by the Employment Department. Further changes continued in the early 1990s, with the establishment of the CSO as an ‘executive agency’, which increased the focus on quality for both government and non-government users (HM Treasury, 1998). In 1995 the ‘Official Statistics Code of Practice’ was adopted. This code of practice details the guiding principles surrounding official statistics in the UK, namely:

- Valued for relevance, integrity, quality and accessibility
- Produced in the interests of all citizens by protecting confidentiality, and balancing the needs of users against the burden on providers
- Enhanced through integration, accumulation and innovation; and by efficiency in costs, and fairness in prices (National Statistics, 2004b)

Also in 1995, of particular importance to business statistics, the work of the Statistical Division of the former Department of Employment was transferred to the CSO (Smith *et al.*, 2003:257). The following year, 1996, the CSO merged with OPCS to form the Office for National Statistics (ONS). This merger brought business surveys, social surveys and the general population census together under one umbrella. At this time, the position of National Statistician was also created. The National Statistician is the Director of the ONS and the head of the GSS, which remains the major provider of official statistics in the UK.

Despite all these organisation changes, many surveys were created and remain in place, although not always in the same guise. The first Census of Production was undertaken by the BoT in 1907. The Census of Production is a full industrial census covering ‘almost all of manufacturing, the extractive industries and the public utilities of gas, electricity and water’ (Central Statistical Office, 1996:9). The Census eventually became an annual endeavour and was joined with construction in the 1970s to become the Annual Census of Production and



Construction. In 1998, the Annual Business Inquiry was created, joining the Annual Census of Production and Construction, the Annual Employment Survey and the Distribution and Services Inquiries (Brown & Dowsett, 2005:5). Another survey that has a long history, but this time one that has remained largely intact since its inception, is the Labour Disputes Survey (LDS). The LDS gathers data on work stoppages as a result of strike action and has done so since 1891 (Brown & Dowsett, 2005:4).

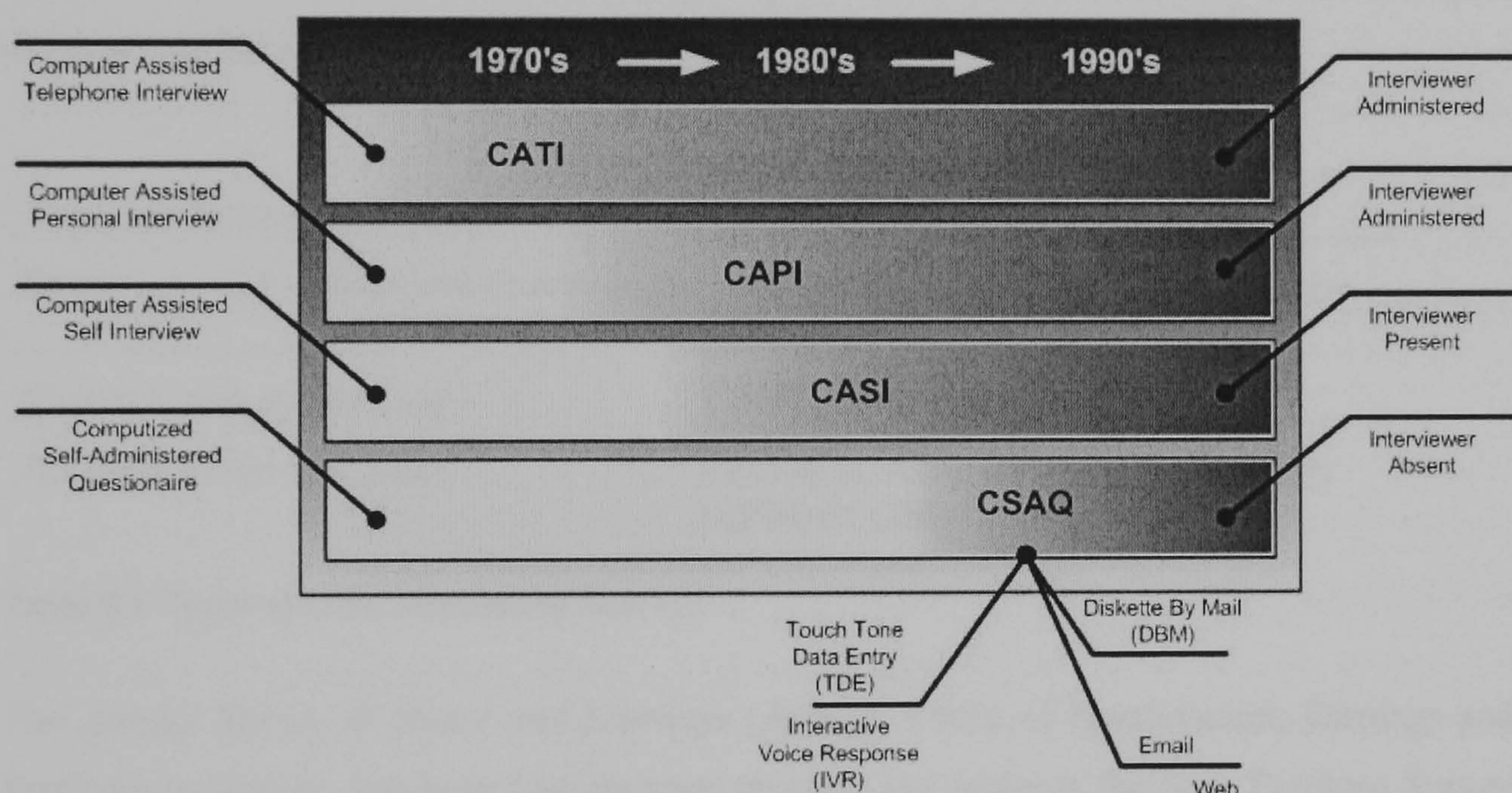
The second half of the 20<sup>th</sup> century was an intensive period for government surveys with the start of many of the major continuous social surveys, such as the Family Expenditure Survey (FES) in the 1950s and General Household Survey (GHS) together with the Labour Force Survey (LFS) in the early 1970s. Many economic surveys also began during this time, for example the Bank of England began collecting data on unit, investment and property unit trusts in the early 1960s (Brown & Dowsett, 2005). At the same time extensive methodological research focused on the development and refinement of sampling methods and statistical analysis. The widespread availability of computers and computing power assisted this development, bringing further changes to sampling as well as analysis methods and procedures. Computers made feasible (in time and money) some of the things foreseen by the great pioneers of the first half of the century. In the 1970s computing power began to double approximately every two years. This rapid growth is often cited as Moore's Law, after electronic pioneer and co-founder of Intel, Gordon Moore, who observed that the speed of computer chips double at this pace (Misa, 2004).

Data collection methods also developed considerably over this time, again assisted by the growth and ever-increasing availability of computer technology, which led to various CAI (computer-assisted interviewing) methods. The first of these is computer-assisted telephone interviewing (CATI) where survey interviews are conducted over the telephone and the data inputted into computers. Today these systems also manage call scheduling and case administration (Nicholls *et al.*, 1997:222). CATI was devised in the early 1970s and during that decade went on to become a widely used research tool in the US but it was only in the early 1980s that it gained extensive use in Europe (Couper & Nicholls, 1998:5). The 1970s also saw the development and use of Random Digit Dialling (RDD), which is a probability sampling method whereby a computer generates a list of telephone numbers within a particular geographic location (Bryman, 2004:115).

The emergence of laptops, in the mid-1980s, led to the general use of computer-assisted personal interviewing (CAPI) in survey research. The development of CAPI was initially



hindered by the limited capabilities of the first laptops in terms of memory and speed, not to mention the size and weight of the machine (Couper & Nicholls, 1998:6). The early to mid 1990s, however, saw computer-assisted survey research become the norm, particularly in government agencies. At this time, Touch Tone Data Entry (TDE) and Interactive Voice Response (IVR) were also introduced. TDE is an automated telephone system whereby computerised questions are played over the telephone to the respondent, who uses a number pad to indicate their answers (Tourangeau *et al.*, 2002). At their own convenience, respondents call a specified telephone number, usually toll-free, which activates the pre-recorded interview session. Respondents are first asked to enter their unique ID number on the touchtone keypad, after which they are taken through the set questions. IVR is similar in that it also uses the telephone but, as its name suggests, relies on voice recognition rather than the keypad.



**Figure 2.1 Typology of CAI**

Large-scale social surveys have benefited a great deal from this research, particularly with the introduction of CAPI. In the UK, CAPI has been used for major national social surveys since its introduction in the Labour Force Survey in 1990, after which it spread rapidly to all ONS social surveys and to government surveys conducted by other organisations (Manners, 2003; Martin & Manners, 1995). Business surveys did not benefit from the early CAI methods but during the 1990s, NSIs have been exploring the use of other electronic data collection methods for these surveys, such as diskette by mail (DBM), TDE as well as the focus of this thesis, the Web. However, implementation and take up of these electronic



modes have been slow in comparison with other research groups, such as market researchers. We return to NSI use of electronic data collection for business surveys in Chapter Five.

### 2.3 Examples of ONS Business Surveys

Business surveys are undertaken on a monthly, quarterly and/or annual basis, depending upon the requirement for the data. In the past, virtually all data for business surveys were collected by means of paper-based questionnaires mailed to the sampled business. However, over the past 10 years, TDE has been increasingly offered for the smaller (usually monthly) surveys that do not require extensive information, often only two to four items.

The following table shows the types of statutory business surveys undertaken at the ONS together with an example of an individual survey within the classification. These examples are explained in more detail below.

Type of Mandatory Survey	Example
Employment, Earnings and Productivity	Annual Survey of Hours and Earnings (ASHE)
Financial and Accounting	Retail Sales Inquiry (RSI)
Business Prices and Sales	Products of the European Community (PRODCOM)

**Table 2.1 Types of ONS Mandatory Surveys**

The *Annual Survey of Hours and Earnings* (ASHE), a type of Employment, Earnings and Productivity survey, has been implemented recently and replaces the New Earnings Survey (NES). The survey, involving a sample of one percent of employees, provides UK data on employee earnings (limited to adults whose pay for the survey pay period was not affected by absence), sex and full-time or part-time working hours. This data is further broken down by geographic areas, occupations (including occupation by region), industry and six age groups (Bird, 2004). Numerous bodies make use of the information; the Department of Work and Pensions, the Treasury, the Office of the Deputy Prime Minister, the Low Pay Commission, the DTI and the Cabinet Office as well as other groups, such as solicitors (Brown & Dowsett, 2005:2). Data is gathered through postal paper questionnaires. It is a mandatory survey; respondents (businesses) are legally required to comply with the request for data.



The *Retail Sales Inquiry (RSI)*, within Financial and Accounting, is a sample survey of 5,000 businesses in the UK, including large retailers and a representative panel of smaller businesses. Data is collected on a monthly basis using both mail questionnaires and TDE. The Retail Sales Index is generated from the survey, which is a key indicator of economy progress and is “indirectly used to calculate quarterly consumer spending on retail goods and the output of the retail sector which feed into the compilation of the National Accounts” (National Statistics, 2002a). The RSI began in 1954 as a voluntary survey, becoming mandatory in 1992 as part of a programme aimed at improving economic statistics (Brown & Dowsett, 2005:39).

*Products of the European Community (PRODCOM)*, within Business Prices and Sales, commenced in 1993 and is part of a harmonised system across the European Community that gathers and makes available production statistics (National Statistics, 2005b). The data contributes to National Accounts and the Producer Price Index. EUROSTAT (the Statistical Office of the European Communities) and the DTI also make use of the data (Brown & Dowsett, 2005:47). Data is collected on both a quarterly and an annual basis from UK manufacturers by means of a self-administered, paper questionnaire received through the post.<sup>1</sup> 4,500 businesses, selected from the Inter-Departmental Business Register (IDBR), are included quarterly and 25,000 annually. Again, this is a mandatory survey.

These examples illustrate the types of business surveys undertaken, their frequency, size and mode of data collection as well as providing a flavour of the uses and users of business statistics. The examples also point to a number of the distinctive features of business surveys; for example, the very large sample sizes or the mandatory requirement. We will now turn our attention to a more detailed discussion of these key characteristics.

## **2.4 Key Characteristics of Business Surveys**

As we have seen above, business surveys can be identified by a number of key characteristics. This section begins by outlining these characteristics, followed by a discussion on methodological research for these surveys. Before doing so, it is worth noting that despite the presence of key characteristics, business statistics are largely similar to social surveys. This includes the basic design process (sampling, question development and questionnaire design), the data collection phase, data editing and imputation, analysis and the

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<sup>1</sup> A paper questionnaire can be interview-administered or self-completed. All references to a paper questionnaire in this thesis refers to self-completion documents sent and returned by mail.



publication of the results. As with any survey type, business surveys also aim to limit survey errors (coverage, sampling, non-response and measurement errors), obtain good quality whilst producing timely and relevant data as cost-effectively as possible. Over the past 50 years, it is social surveys, however, that have benefited from vast amounts of research with business surveys left somewhat behind. This is both within research undertaken specifically for business surveys and in drawing upon research undertaken for social surveys. Lynn (in the discussion on the paper by Smith *et al.*, 2003:293) observes of business and social surveys, “although the two types of surveys have important differences, they also have much in common and there are many ways in which both can gain from the sharing of knowledge, expertise, procedures, resources and infrastructure”.

A very important characteristic is the mandatory nature of many business surveys. As we saw earlier in section 2.2, the British government introduced legislation in 1947 making response compulsory for certain surveys. When a survey is carried out in accordance with this Act, the respondent (in this instance the business) is legally obliged to complete and return the questionnaire. In the UK, mandatory surveys can only be carried out by its NSI, the ONS. With the exception of the population census, no social surveys are mandatory; however, the law does not prohibit them from being made compulsory. Mandatory surveys, however, do not inevitably achieve 100% response rates. Response depends upon a number of factors including burden on the respondent, which will be discussed in-depth shortly. Response rates are also dependent upon the NSI’s policy on pursuing non-responders, which in turn often depends upon the time and resources available as well as the NSI’s judgement of how such pursuit will be perceived in the political culture and the attendant risk to longer-term statistical interests. The ONS pursues key persistent non-responding businesses in the courts but it does not pursue all non-responders.

Businesses differ in size (often determined by employee numbers) and distribution. The number of very small businesses greatly outweighs the number of large and very large businesses. Very large companies within an economically advanced country account for the majority of the country’s economic activity but the number of small companies far outstrips the number of these large companies. To illustrate this point by employee size, in the UK there are 1,851,235 businesses with less than 20 employees, 181,105 businesses with 20-249 employees and 9,800 businesses with more than 250 employees (National Statistics, 2004d:85). These 9,800 businesses employ more than half of the 28.5 million employees in the country. Such businesses are known, in business surveys, as ‘key respondents’ and are vital to the accuracy of the statistics produced. This is unlike social surveys where each



person in the population of interest holds equal importance. In this sense, this varying size and distribution of businesses is a key characteristic of business surveys.

Official business survey samples involve many thousands of units. Some monthly and quarterly surveys gather data from around 35,000 businesses, for example the Quarterly Capital Expenditure and Stocks Inquiries have a set sample size of 32,000 per data collection period whilst the Monthly and Quarterly Inquiries into Distribution and Services Sectors has a set sample size of 30,000 businesses per period (Smith *et al.*, 2003:258). All of these surveys are undertaken by the ONS. Such large samples are also found in many large-scale social surveys.

Respondents to business surveys are reporting on behalf of their company “as the establishment’s representative” and not as an individual (Edwards & Cantor, 1991:215). This impacts upon the response process, as we will investigate in the next section, however, it is important to recognise that the survey is still completed by an individual and therefore many elements of the response process remains similar to social surveys.

Business surveys also tend to rely on “information systems” within the company to obtain the relevant and correct response (Edwards & Cantor, 1991:214). As such, the respondents generally have to consult records or generate reports in order to complete the questionnaire as opposed to relying on memory. Again, this has a direct impact upon the response process. The need for respondents to consult records is a key feature within business surveys but it should be noted that it is not unique as some social surveys also require this of their respondents.

We have seen above that business surveys are characterised by the following key features: the size and distribution of businesses, the use of very large samples, the use of business records to assist response, the respondent reports on behalf of his or her business and the mandatory nature of many business surveys. Combined, these features present challenging issues to business survey researchers. However, historically its methodology can be viewed as the poor relative of social survey methodology with comparatively little research undertaken in this area. There are a few exceptions, such as work by Don A Dillman, however this is rare (Dillman, 1996, 2000b; Dillman *et al.*, 2005; Dillman *et al.*, 2004).

Jones (2005) argues that a number of factors are thought to be responsible for this lack of research. Firstly, business survey respondents are often professionals, generally accountants,



and as a result are perceived to be able to deal with complex requests for data. This is a point to which we will return when investigating questionnaire design. Secondly, the relatively good response rates achieved through their mandatory nature may have acted as a disincentive for methodological research to bring improvements to the surveys. Finally, a belief that business surveys are fundamentally different to social surveys has meant that they have failed to draw upon the far greater amount of research that has been carried out for social surveys. For example, within the ONS the language used within the business survey world is often different to that in social surveys. Surveys are known as inquiries, questionnaires as forms and respondents as contributors, although this is slowly changing. This difference in language presented an obstacle to business surveys in learning anything from research undertaken on social surveys.

In 1988, the US Federal Committee on Statistical Methodology (1988:1) highlighted the lack of common research into business survey methodology stating, “There are few commonly accepted approaches to the design, collection, estimation analysis, and publication of establishment surveys. Establishment [business] surveys abound in rich variety with little standardisation of design, practice, and procedures. Little standardisation occurred both inter- and intra-agency”. In the early 1990s, individual official business surveys in the UK (then undertaken by the BSO) were overseen by statisticians, who made relevant methodological decisions. These decisions were “often dependent on the knowledge and preferences of the statistician concerned” (Smith *et al.*, 2003:258). Despite the lack of standards and methodological rigour flagged in the late 1980s by the Federal Committee, it was a number of years before substantial research was undertaken into business survey methodology. In the UK, a concentrated effort for research and development on ONS business surveys was instigated in the mid-1990s and continues to this day (Smith *et al.*, 2003).

It is generally accepted that further research is still vital. Much of the research in the 1990s focused upon sampling procedures, stratification and estimation. Also, during this time the ONS made impressive progress in data capture with document imaging – implementing optical scanning of returned paper questionnaires making use of Intelligent Character Recognition (ICR), allowing for much of their data capture to be done electronically (Baird *et al.*, 2002:5). However, little work was undertaken in questionnaire design. Smith *et al.* (2003:266) state, “the design of the questionnaires was largely constrained by the requirements of the optical character recognition systems...little time was devoted to optimizing the questionnaires from the viewpoint of the respondent”.



Growing demands placed upon NSIs provide a further impetus for research. Increased efficiency is seen as a primary goal for NSIs, which includes improving the timeliness of the data outputs together with an emphasis on data quality, making cost (monetary) savings and reducing burden on the respondents. The World Wide Web now presents a new mode for data collection and one that may offer improvements to current methods. As we will see in Chapter Five, much promise has been attributed to the new technology and as such many NSIs consider it will have a substantial (positive) impact upon surveys in general and business surveys in particular.

This section has illustrated the types and kinds of surveys and survey themes undertaken by NSIs. It has also provided an overview of the key characteristics found in business surveys. We have seen that business survey researchers have learned little from social survey methodology, despite the many similarities between the two types of surveys. In the following section, we turn our attention to a more detailed examination of two specific areas within survey methodology; those of the response process (including response burden) and questionnaire design as applied to business surveys.

## **2.5 The Response Process**

There has been much research into response for social surveys where methodologists have explored factors that affect response and response rates; for example, respondent characteristics (such as age, gender, marital status), the impact of the interviewer (in face-to-face interviewer assisted questionnaires) and the use of incentives (monetary, prize-draw, gift, etc). Certain theories have been used to assist understanding of the response process. Dillman (1978) applied social exchange theory to survey response. This theory centres on the costs and benefits for an individual within human interaction. Dillman suggests that survey response rates will be improved if the costs for the respondent are minimised, rewards are maximised and trust has been established. If the costs seem great (for example, time to complete the questionnaire) and the rewards seem little (for example, there is no incentive or the value of the survey is in question) respondent motivation will be affected, which in turn affects the quality of the final data.

In the late 1970s and early 1980s researchers began to consider the application of cognitive psychology in survey research in order to understand better the response process. In the late 1970s, the UK Social Science Research Council organised the first conference bringing together cognitive psychologists and survey researchers to discuss survey measurement error



(Tourangeau *et al.*, 2000:313). In the following years a number of similar conferences took place in the US and Germany. Of particular note is the 1983 National Science Foundation funded Advanced Research Seminar on Cognitive Aspects of Survey Methodology organised by the US Committee on National Statistics. The initial seminar took place in June 1983 with a follow-up in January 1984. The objective of these seminars was to “foster a dialogue between cognitive scientists and survey research and to develop ideas and plans for collaborative research” (Jabine *et al.*, 1984:1). One outcome from this group was applying cognitive science to assist understanding of the steps that respondents go through when completing a survey. In a paper prepared for the seminar, Tourangeau (1984) presented a cognitive model of the response process for social surveys. The model, which remains influential to this day, consists of four steps; namely

- i. comprehension
- ii. retrieval
- iii. judgement
- iv. response.

*Comprehension* involves respondents understanding what the question means and what information is sought. It also refers to understanding of instructions. *Retrieval* occurs when respondents recall relevant information from their memory. Respondents then form a *judgement* on the appropriateness of the recalled information, assessing its comprehensiveness and relevance. Finally, the respondents communicate a *response* to the question using the most appropriate response category. Whilst these steps appear to be successive, respondents may undertake these steps consecutively or concurrently. Additionally, they may omit or revisit certain steps (Tourangeau *et al.*, 2000:15). Key to the response process is the interaction between the respondent and the questionnaire. Certain characteristics of the respondent affect the response process, including respondent motivation to complete the questionnaire, their cognitive skills, values and attitudes (Edwards & Cantor, 1991:213). Likewise, elements of the questionnaire affect the process; such as question wording, question order and overall questionnaire appearance, which will be discussed in greater detail later in this chapter.

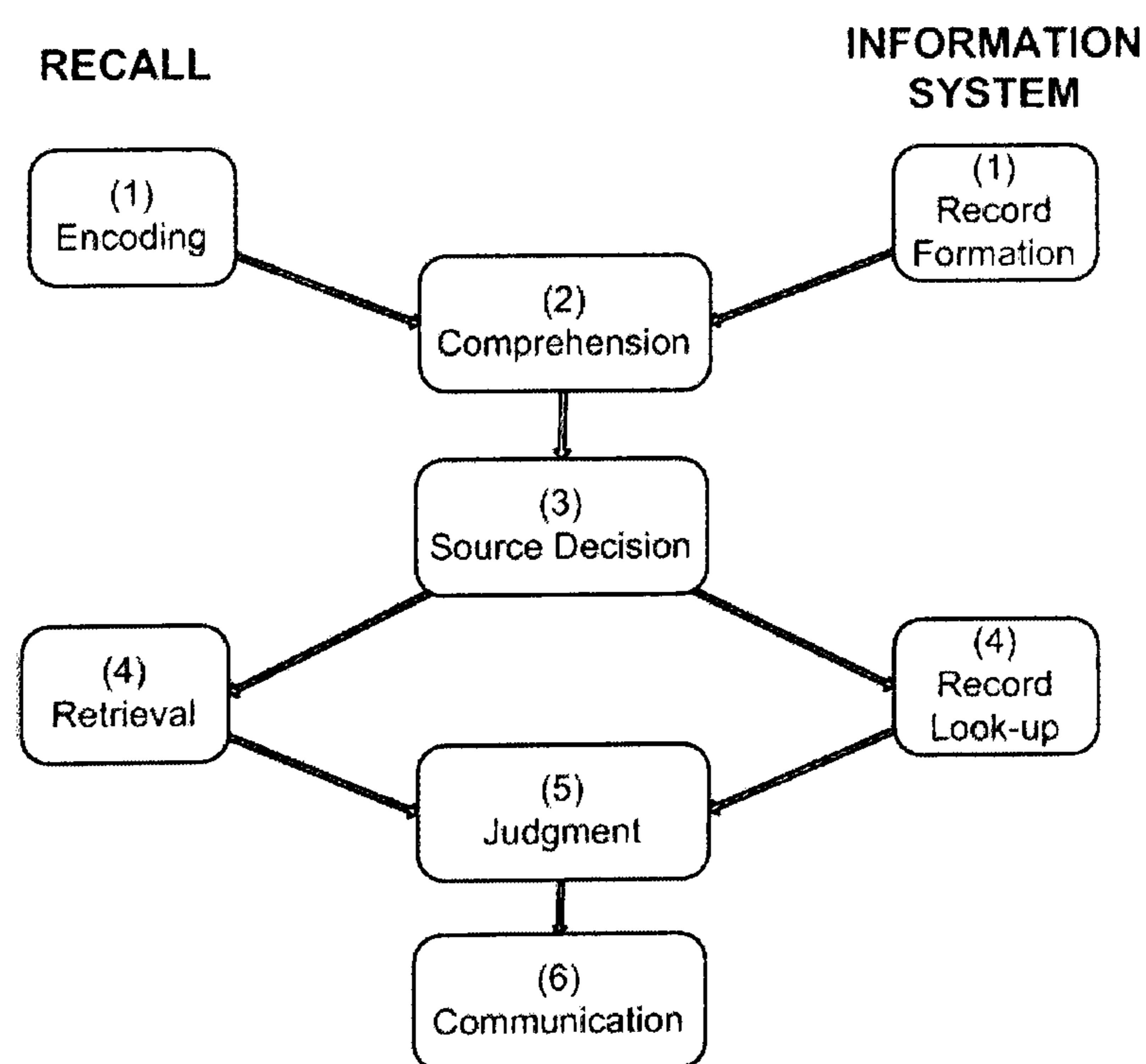
Eisenhower *et al.* (1991) added to Tourangeau’s four steps by inserting ‘encoding’ at the beginning of the model. This pertains to the respondent’s “knowledge to answer survey questions”, that is to say how information and memories are stored and employed. At the same time as this work, Edwards & Cantor (1991) offered the first model on the response process for business surveys. They utilised the now five-step response model as the basis for



their model whilst making some modifications and introducing a further step so that the model adequately reflects the complexities faced by business respondents. Their model appears as follows:

- i. record formation (encoding)
- ii. comprehension
- iii. source decision – memory or records
- iv. record look-up (retrieval)
- v. judgement
- vi. communication.

Edwards & Cantor (1991:222-226) outline the importance of respondent selection within the response process and the potential for measurement error; noting that the respondent’s functional role (impacting upon knowledge to respond), their level of authority (decision making powers) and their position relative to the information system within the business, impact upon the respondent’s ability to participate in the survey. The record look-up stage involves respondents retrieving information from an information system, which is affected by their relationship to the system, the timing of the record look-up and ‘rehearsal’ of record look-up process (whether it is a routine inquiry or not) (Edwards & Cantor, 1991:226-228). The diagram below, reproduced from Edwards & Cantor (1991:232), clearly illustrates the cognitive steps in the process and shows the various choices that the respondent has, for example whether to use memory/recall or information systems/business records in order to respond.



**Figure 2.2 “General model of survey response process for factual information”**  
reproduced from Edwards & Cantor (1991:232)

In 2000, Seymor Sudman, Diane Willimack and colleagues put forward an up-dated version of Edwards and Cantor's model based upon their research with 30 large US companies that respond to Census Bureau business surveys. Sudman *et al.* (2000:2) proposed a "hybrid response model for establishment surveys". This version of the model comprises of eight steps, detailed as follows:

- i. encoding of information in company records
- ii. selection and identification of the respondent or respondents
- iii. assessment of priority
- iv. comprehension of the data request
- v. retrieval of relevant information from existing company records
- vi. judgement of the adequacy of the response
- vii. communication of the response
- viii. release of the data.

Willimack & Nichols (2001) develop the model further, offering conceptual foundations to support the supplementary steps and some modifications to the model. These modifications occur in two places; step i becomes "encoding in memory/record formation" and they insert 'from memory and/or' to step v, so it reads "retrieval of relevant information from memory and/or existing company records". Thus, the model now reads as follows:

- i. encoding in memory/record formation
- ii. selection and identification of the respondent or respondents
- iii. assessment of priority
- iv. comprehension of the data request
- v. retrieval of relevant information from memory and/or existing company records
- vi. judgement of the adequacy of the response
- vii. communication of the response
- viii. release of the data.

In terms of encoding (step i) Willimack & Nichols (2001:2) suggest, "the respondent's 'knowledge to answer questions' also includes knowledge of the business' various records and information systems, along with company structure". That is to say, respondents also need to have familiarity with company records in order to know whether/where relevant data can be retrieved in order to answer the question. The availability of the information is directly linked to the record keeping within the company, which is generally directed by such requirements as business managements, various government and non-government



requirements, and standards provided by 'Generally Accepted Accounting Principles' (GAAP).

Willimack & Nichols (2001:3) also note that information systems are not necessarily uniform across a company (particularly large organisations), so a respondent's access to certain systems may be restricted, for example Finance, Human Resources and IT departments. This often leads to multiple respondents completing a single questionnaire, which can be done with a primary respondent who enters responses provided by other groups in the company ("local data providers" Willimack & Nichols, 2001:3) or the questionnaire can be passed around different departments with multiple respondents completing various segments.

Willimack & Nichols continue with Cantor & Edwards' discussion on respondent selection (which the former include as the second step in their model) and the implications for measurement error. Both sets of authors highlight the necessity for the 'most knowledgeable' respondent who has access to the relevant information systems. However, in light of the existence of multiple local data providers to a questionnaire, Willimack & Nichols (2001:4) suggest that the respondent selected to complete the questionnaire should be an individual who has "broader knowledge of the existence of a variety of types of requested data...(and) the ability to gather the requested data from multiple sources in the technical core".

They further note that this capability is generally linked to an individual's position within the business. Such individuals have the authority to decide upon survey participation, respondent selection and the priority level of responding over other tasks. The outcome of the priority assessment can have an impact upon respondent motivation, which again has implications for measurement error. On this basis, 'assessment of priorities' is included as step three in their response process model. The third and final step that the Sudman/Willimack model incorporates to the response process is step eight 'release of the data'. Here Willimack & Nichols (2001:5) note that it is "not uncommon for the authority figures to re-enter the response process prior to releasing the data to statistical agencies", whereby they appraise the completed questionnaire before allowing its return.

The cognitive model presented by Tourangeau (1984) into the response process as well as subsequent research illustrates the various tasks involved in completing a questionnaire. Cognitive models of response are now the dominant approach among survey response methodologists. The model for the response process in business surveys demonstrates the



additional, more complex tasks that business respondents are required to negotiate in order to respond to the survey. As the authors proposing these models are at pains to emphasise, each of these steps increases the likelihood of measurement error. The models also provide an indication of the burden placed upon business respondents in the completion of these questionnaires. The following section provides a review of response burden, discussing both perceived and actual burden as well as new research that introduces a new concept of “total survey burden”.

## 2.6 Response burden

Traditionally response burden has been defined and measured as the time that it takes a respondent to complete a questionnaire (Haraldsen, 2004:397). Within the ONS, response burden for business surveys has been measured as the time it takes the respondents to complete the questionnaire and “assuming if the number of questions is increased or decreased that burden will increase or decrease *pro rata*” (Eldridge *et al.*, 2000:310). This approach, whilst in part useful, does not take into consideration the number of surveys that businesses are required to complete. Other NSIs make use of “number of survey requests received by a given company” as a way to measure respondent burden for businesses (Hak *et al.*, 2003b:1725). This approach leads to an emphasis placed upon sampling methods in order to reduce the amount that a company is included in these surveys. Again, this approach is only in part useful as to fully measure response burden both of these factors need to be taken into consideration.

In the late 1970s (social) survey researchers began moving away from a time oriented indicator of response burden and became interested in the notion of ‘perceived’ burden, which considers other factors prevalent during completion of a questionnaire. Bradburn (1978) offers one of the first papers deliberating response burden in this manner. He (1978:35) notes that whilst there is limited discussion on this issue within the literature (this remains somewhat true today), in practice researchers are attentive to items that can increase response burden within a survey and do what they can to eliminate, or at the very least reduce, these problem areas.

Bradburn (1978:36) outlines four factors that can increase burden within a survey; namely (i) the length of the interview (or questionnaire length for self-administered surveys), (ii) the amount of effort required of the respondent, (iii) the amount of stress on the respondent, and (iv) the frequency with which the respondent is interviewed. Bradburn suggests that the



impact of these factors varies between respondents, with some individuals perceiving certain factors as more burdensome than others. A prevailing and important premise throughout Bradburn's paper surrounds the respondent's perception of the importance of the research. In his conclusion, Bradburn (1978:39) writes "respondents seem to be willing to accept high levels of burden if they are convinced that the data are important". These ideas concur with Dillman's (1978; 2000a) use of social exchange theory and his total/tailored design principles, outlined at the beginning of this section.

Research into respondent burden for social surveys continued but it was only in the early 2000s that any real dialogue surfaced for business surveys and much of the discussion has emerged within the context of moving to electronic (Web) data collection. The new mode may bring fresh opportunities to reduce response burden. Further, the new mode also encourages business survey designers to look at what social survey designers have found when researching Web data collection. Haraldsen (2004) undertakes a detailed and important discussion of response burden in a paper entitled 'Identifying and Reducing Response Burden in Internet Business Surveys'. Haraldsen (2004:398) offers that the term 'response burden' is linked to the respondent's experience, stating:

...the issue is not whether the total burden is high or low, but whether the burden takes precedence over the advantages and other positive aspects of the survey. We have highlighted this point by using the phrase "burden and gratifications" in the model. A term covering both positive and negative reactions to the survey is also *user experience*, which may be defined as "the balance between perceived burden and gratifications associated with the information requests made in questionnaires".

Haraldsen, building upon a response burden model created by Fisher & Kydonieffs (2001 cited in Haraldsen, 2004), proposes that the survey properties (number of questions, content of the questionnaire, flow of questions and elements in each question and the layout of the questionnaire) lead to the respondent's 'perceived burden and gratifications' (upon which the respondent characteristics impact). This in turn affects data quality. Ultimately, Haraldsen seems to be suggesting that the design elements within a survey (the survey properties) should be considered a fundamental factor in determining perceived burden. This understanding of design elements affecting response burden is well known in social research methodology.

As noted above, Haraldsen's discussion of response burden was made whilst considering internet (Web) data collection. What he does not consider is how the extra steps of the response process within business surveys, for example the information retrieval element,



impacts upon response burden. This element is explored in US Census Bureau research by Hak *et al.* (2003b:1725), who remark at the outset that “business respondents’ activities at each step of this [Sudman/Willimack response] model, and the interplay amongst them, may contribute positively or negatively to burden”. This research found that the number of survey requests and the level of difficulty involved in completing the questionnaire (availability and accessibility of the data within their information systems) were forerunners in contributing to response burden (Hak *et al.*, 2003b:1730). Thus, we begin to see that multifaceted elements surround response burden in business surveys.

A recent addition to the research on response burden has been collaborative research undertaken between three NSIs, Statistics Norway, Statistics Sweden and the UK ONS, which has led to the development of a ‘Total Business Survey Burden’ model. This research investigated ‘burden’ not just as that experienced by the respondent but how it is experienced through all steps and all parties in the survey life cycle. The resulting model identifies “the creation and flow of burden between all the actors (the stakeholder(s), the survey organisation, business(es), gatekeeper(s) and respondent(s)) in the survey process” (Jones *et al.*, 2004:1). The diagram below, created by Jones *et al.*, is a visual representation of sources of burden and their movement through the survey process.

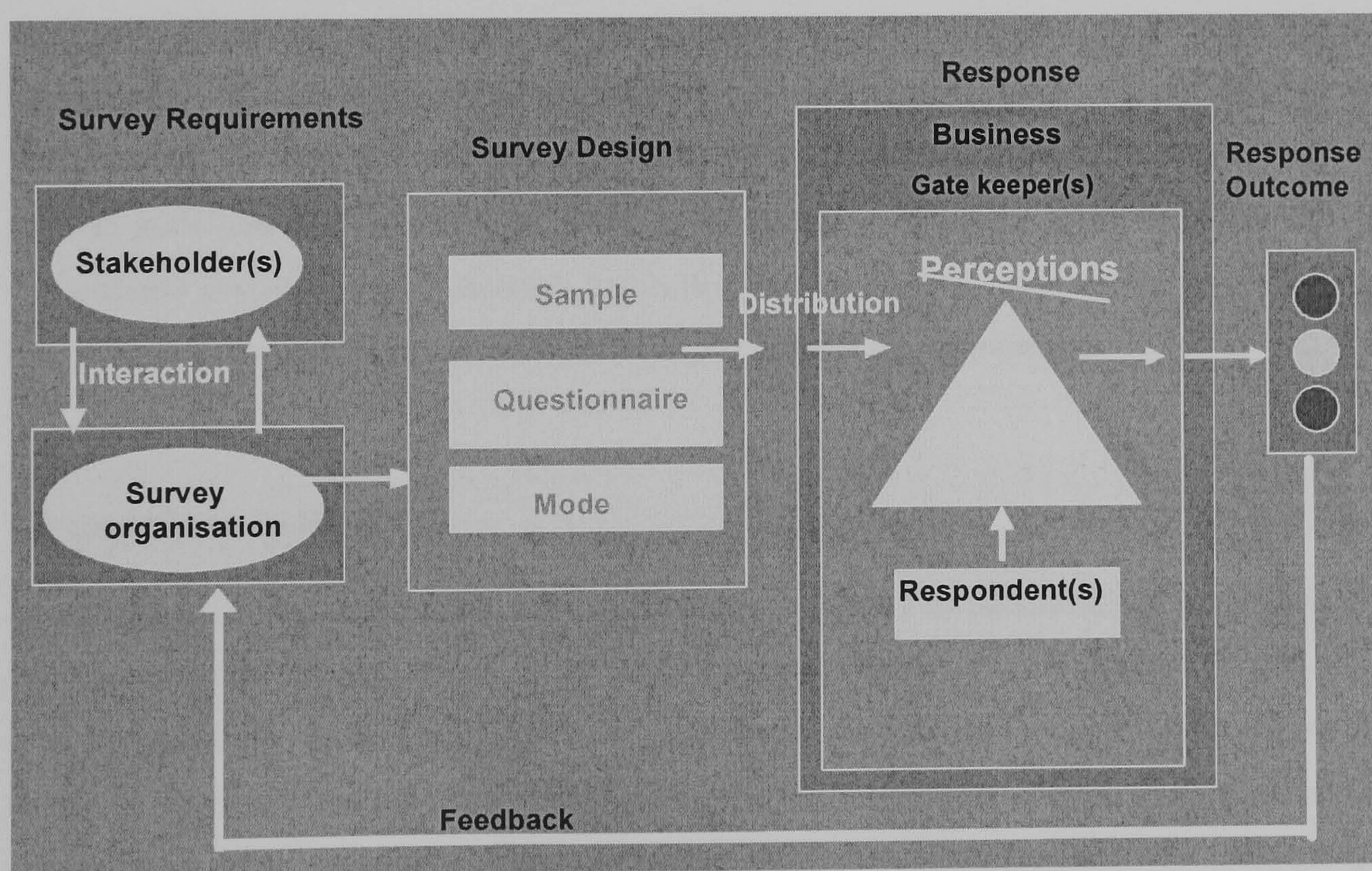


Figure 2.3 Total Business Survey Burden (reproduced from Jones *et al.*, 2004)



Jones *et al.* (2004:3) suggest that burden initially stems from stakeholders and the survey organisation (in this instance the statistical agency), who name and negotiate the survey requirements. The next step in the process, and the origins of further burden, is the survey design stage, which leads to the response process (data collection phase). The 'response outcome' follows with feedback received by the survey organisation and the stakeholders, thereby completing the cycle.

The current literature reconfirms and builds upon Bradburn's 1978 paper. However, further research is required to consider the processes, perceptions, interest and competence of respondents and their companies in order to address adequately and, hopefully reduce response burden. In this vein Haraldsen (2004:408) notes:

But what we have not learned very much about yet, is how the respondents' perceptions and attitudes towards the questionnaire are coloured by their initial interest and competence, and by the time and technology they have available. Even less is known about the effects that company characteristics and decision processes have on the respondents' available time and technology, interest in statistical surveys and response competence.

The response process involves multiple steps on behalf of the respondent and, as we have seen earlier, additional steps are required for the successful completion of business surveys. We have also seen that various factors contribute to response burden, again amplified in business surveys by the complexities involved in responding. One aspect that is known to affect greatly the response process, and hence response burden, is the questionnaire. Factors such as poor question construction, cluttered/complicated appearance and insufficient/over complicated instructions all increase the burden experienced by the respondent. As such questionnaire design is a key consideration. It is to this which we now turn.

## **2.7 Questionnaire Design**

It has long been established that the questionnaire is critical in obtaining valid and reliable survey data. Researchers aim to understand the best means of constructing a valid and reliable instrument for collecting data with a view to minimise measurement error, increase response rates and overall data quality (Berdie *et al.*, 1986:ix). Research into question construction and questionnaire design for social surveys has been substantively enriched by the application of cognitive psychological theories and pre-testing techniques from the late 1970s (Kalton, 2000:5).



Stanley Payne's (1951) classic book, *The Art of Asking Questions*, was one of the first texts to emphasise the need for careful deliberation when composing questions, an emphasis clearly echoed by Sudman & Bradburn (1982:1) who open their book by stating that it is a "crucial element in maximizing the validity of survey data obtained by a question asking process". Payne's work and that of subsequent authors (for example Dillman, 1978, 2000a; Fowler, 1998; Oppenheim, 1966, 1992; Sudman & Bradburn, 1982) have assisted in the development of guiding principles for compiling questions. Such principles include:

- Questions should not be too long.
- Avoid double-barrelled questions.
- Avoid double negatives.
- Avoid acronyms, abbreviations, jargon and technical terms.
- Avoid the dangers of alternative usage/ambiguity of words.
- Avoid leading or loaded questions.
- Avoid vague questions.
- Avoid over-challenging respondents.
- The use of punctuation must be carefully considered.

These points illustrate a number of the various factors that need to be considered when constructing questions. However, as Dillman (1978:96) points out, many of these guidelines are incompatible; for example, the use of simple words conflicts with keeping question length to a minimum and that of not talking down to respondents. Bradburn & Sudman (1991:35) discuss this issue noting:

There is clearly tension between the desire to simplify language, shorten the questions to promote comprehension, and reduce the mental work needed to interpret question and the desire to limit the possible interpretation of questions so that respondents are all thinking about the same thing when answering the question.

The literature on self-administered questionnaire design is rather dated and somewhat sparse and "few systematic efforts have been made to derive principles for designing self-administered questionnaires from relevant psychological or sociological theories" (Jenkins & Dillman, 1997:165). Many texts do address the importance of appearance but limit their discussion to a few pages. Oppenheim's (1992:105) discussion of questionnaire appearance is simply:

...there have been many experiments with general layout, typeface, colour and quality of paper etc. in the case of postal questionnaires. No clear general conclusions have emerged; it is best to aim at a relatively 'conservative' but pleasant appearance.



Despite an overall lack of literature in this area, it is well documented that the design of self-administered questionnaires is important in maximising response rates. There is no interviewer present to persuade the respondent to participate in the study, nor to provide instructions or clarify meanings. Thus it is imperative that all aspects of the questionnaire serve to motivate the respondent to complete the task. In this vein, the provision of, and positioning of, instructions are an essential element of questionnaire design as a whole. Respondents should be provided with clear instructions at all stages – from the initial introduction to the survey to individual questions or response formats. Mangione (1995:74) recommends that instructions should be “precise, short, and clearly visible”, warning of the perils of bewildering questionnaires that lack instructions, which ultimately increase non-response rates.

Until the mid 1990s, it seems many of these design principles were ignored in the development of business surveys. Indeed Dippo *et al.* (1995:297) write “until recently, little research has been conducted on the causes of measurement error in business surveys: the strategies used in designing data collections were relatively *ad hoc*”. This is a point echoed nearly 10 years later by Willimack *et al.* (2004:386), who note that quality concerns in business surveys have generally been centred around coverage error, non-response, sample design and timeliness of data release. Much of the emphasis within NSIs is placed upon post-data collection cleaning and processing rather than upon the actual data collection instrument, as a result many of the basic principles discussed above were broken in business questionnaires. For example, long or double-barrelled questions were not uncommon and questions often contain jargon. As noted in section 2.5, most business respondents are professionals/accountants and therefore assumed to be able to understand specialist terms and also able to retrieve easily the necessary information (Dippo *et al.*, 1995:284).

In UK business surveys, historically questions have been developed in the BSO by statisticians without testing whether respondents understood what information was required (Eldridge *et al.*, 2000:307). This also meant that it was not known whether respondents were able to provide the information, as companies may not have that information in their records. The ONS is not alone in this lack of testing. Many business surveys are cramped; both in an attempt to make the questionnaire appear shorter but also to save on paper and postage costs. In addition, instructions are often placed in separate booklets and, like question wording, are not routinely subject to extensive testing (Willimack *et al.*, 2004:395).



Jones (2005) presents the following example, illustrating a few of the design problems discussed above, noting that the question has “unclear data requirements, separate instructions, respondent coding, and no identification of item non-response”.

**7. Collective agreement** (see page 5, guidance note 7)

If the employee's pay is set with reference to a collective agreement please look at the enclosed guidance notes and enter the appropriate code in the box.

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**Figure 2.4 Illustration of poor question design**

The guidance notes for this question is located in a separate instructions booklet (see Figure 2.5 below). This illustration is helpful in understanding difficulties faced by respondents as a result of question construction and questionnaire design.

**7. Collective agreement**  
If the employee's pay is set with reference to any collective agreement, please enter the appropriate number from the list below:

<p><b>British Broadcasting Corporation</b> 465 National joint agreement</p> <p><b>Local authorities' service England and Wales</b> 448 Local Authority Single Status National Agreement 442 Craft and associated employees INC</p> <p><b>Scotland</b> 470 Local authority single status agreement 417 Craft operatives INC</p> <p><b>London Regional Transport</b> 420 Railways, general and operating grades</p> <p><b>National Health Service</b> 429 Hospital doctors and dentists 430 Other doctors and dentists 431 Administrative and clerical staffs Whitley Council 432 Nurses and midwifery staff 433 Ancillary staffs Whitley Council 434 Maintenance staff 427 Professional and technical staff A Whitley Council 428 Professional and technical staff B Whitley Council 463 Ambulance men Whitley Council</p> <p><b>Police and Fire Services</b> 456 Police service - ranks below superintendent only 457 Fire service - operational ranks below station officer 458 Fire service - operational ranks from station officer to senior divisional officer 459 Fire service - control room and non-operational staff</p> <p><b>Prison Service</b> 415 Prison service - prison officers</p> <p><b>Civil Service</b> 412 Inland Revenue</p>	<p><b>Post Office</b> 491 Royal Mail clerical 492 Royal Mail supervisory/specialist 493 Royal Mail engineering and allied 494 Royal Mail manuals 495 Counters clerical 496 Parcelforce manuals</p> <p><b>Teaching England and Wales</b> 435 Primary, secondary and special schools 438 Staff in sixth form colleges INC</p> <p><b>Scotland</b> 437 Primary and secondary schools SINCE</p> <p><b>Universities (old)</b> 460 Clinical academic staff 461 Computer operators 466 Academic and academic related staff 467 Clerical staff 468 Technical staff 469 Manual staff</p> <p><b>Universities (new)</b> 470 Administrative, professional, technical and clerical staff 471 Lecturers 479 Manual staff</p> <p><b>Others (not included in other categories listed)</b> 401 National/industry agreement 402 District agreement 403 Company agreement 404 Establishment agreement 405 National/industry agreement supplemented by district, company or establishment</p>
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**NB.** If the employee's pay is set with reference to a collective agreement, and that agreement does not fall under any main category use those listed under "Others".

Abbreviations:  
INC - (National) Joint Negotiating Committee/Council      JC - Joint Committee or Joint Conference  
SINC - Scottish National Negotiating Committee

**Figure 2.5 Guidance notes**



We have seen earlier that some authors suggest that the lack of methodological research for business surveys can be attributed in part to the reliance upon the compulsory nature of these surveys. Dillman (2000b) argues that over the past 20/30 years government business surveys have been steered by a traditional Cost-Compensation Model, which aims to curtail financial costs. He (2000b:3) suggests that this has had an impact upon questionnaire design and survey implementation leading to the reliance on “the influence of government authority in general...and mandatory authority in particular”. The mandatory nature of the surveys compensates for poor survey design features, which, as Dillman continues, “individually, are likely to delay and/or decrease response”.

Dillman goes on to outline 10 practices and assumptions that he believes characterise this model, which include items such as ‘questionnaires should have as few pages as possible; otherwise response rates will go down’, ‘a strong preference is assumed to exist among respondents to business questionnaires for matrices or row/column question formats’, and ‘detailed instructions for answering establishment [business] surveys should be provided in separate instruction books’. Ultimately, Dillman (2000b:9) argues that whilst the Cost-Compensation model is understandable for government surveys – undeniably cost-efficiency is a responsibility of an NSI (Griffiths & Linacre, 1995:673) – it is a ‘one-size fits all’. Dillman recommends a Tailored Design approach (2000a). In addition, he suggests that the use of multiple modes of data collection, in the form of TDE and the Web, will be a welcome supplement to business surveys.

NSIs themselves recognise that much improvement is necessary in the design of business questionnaires and are reviewing both their questionnaires and processes accordingly. The production of quality results is a real concern and it is acknowledged that revisiting their questionnaires will lead to improvements. Nichols & Willimack (2001) (from the US Census Bureau), undertook research within businesses with the aim of understanding how businesses comprehend questionnaires by conducting internal focus groups with selected businesses in order to explore various issues such as questionnaire elements, instructions, organisational response strategies and terms. Griffiths & Linacre (1995:675) of Statistics Australia, discuss the problem of difficult economic concepts that are often used in questionnaires, which respondents are assumed to understand. This negatively affects data quality. Along the same lines, with a view to reduce respondent burden and improve data quality, in the early 2000s Statistics Sweden began a complete overview of all their questionnaires. This review aims to obtain “a more uniform appearance, making it easy for respondents to recognise the features of a Statistics Sweden questionnaire...all questionnaires and their instructions will also be



reviewed from a measurement point of view” (Statistics Sweden, 2005:4). Like Statistics Sweden, the ONS is also undertaking various review programmes to improve business surveys. One such initiative involves reviewing all written communication with respondents. This is called the ‘Respondent Orientated Communication Project’, which includes the business survey front page, first, second and final reminder letters, flyers and Chief Executive letters (Williams & Draper, 2004:12).

Another initiative at the ONS, involves the full review and overhaul of individual questionnaires. In some cases, this has led to questionnaires increasing in length as a result of including instructions/extra information within the body of the questionnaire and the creation of clear routing instructions. Interestingly, *in-situ* testing of the redesigned questionnaires found no increase in burden, nor did respondents comment upon the increased number of pages. However, increasing the length of the questionnaire also increases the survey costs, which is problematic for NSIs. For example, the New Earnings Survey (now known as the Annual Survey of Hours and Earnings outlined earlier in this chapter) jumped from two pages to six pages after a review, which also included the introduction of new questions. This number of pages increased the survey costs to an unacceptable level and therefore the questionnaire design was revisited again, resulting in a four page questionnaire (Jones *et al.*, 2005:5).

Another issue emerges with the redesigning of the questionnaire, this time one that may negatively impact respondents. Business respondents are known to keep copies of their completed questionnaires and consult them whilst completing the current questionnaire. Therefore any changes can throw the respondents off track. Willimack *et al.* (1999:892) suggest that “maintaining consistent design, layout and item numbering relative to previous forms will reduce (some type of) measurement error”. However, this is not always feasible when redesigning a questionnaire.

## **2.8 Conclusion**

This chapter has provided an introduction to business surveys undertaken by government NSIs. The key characteristics of this type of survey and the challenges that these features present have been outlined, together with a review of important data collection issues in business surveys; the response process, response burden and finally the questionnaire.



The available literature shows that whilst business surveys have suffered neglect in many areas, particularly measurement error derived from questionnaire design, NSIs are now undertaking extensive reviews in order to address and improve their procedures where necessary. In addition these reviews often take into consideration the response process and respondent burden. The failure to draw from the more extensive research undertaken on social survey methodology is also being reversed with the awareness that business surveys share many similar characteristics with social surveys.

Business surveys are characterised by a number of key features and these features directly impact upon the entire process. For example, the individual completing the questionnaire does so on behalf of her business. She may need to seek authorisation before releasing the data, which adds a step to the response process. She is also likely to consult information systems and/or other individuals/departments in order to answer questions correctly. Again this has an impact upon the response process. These examples illustrate the importance of understanding how respondents complete the questionnaire and take into account the environment within which the questionnaire arrives.

In addition to the key characteristics of business surveys, NSIs undertaking the research operate within certain parameters and this also affects the entire process. Thus when investigating the implementation of a new mode of data collection, it is important to take a holistic approach to build a picture that incorporates the researchers perspective (in this instance the NSIs) and the respondents' perspective (in this instance the individuals within the business responsible for completing survey requests).

Until this point, there has been limited mention of electronic data collection for business surveys. Nevertheless, there is a clear movement towards implementing this as part of NSIs' data collection toolkit, for example the increasing use of TDE. Recent developments in the implementation of electronic data collection (EDC) for business surveys, within eight NSIs, are discussed in Chapter Five, together with the drivers pushing forward the use of EDC. New technologies have had a significant impact upon data collection for government social surveys; in particular the adoption of CAI during the 1990s. It is possible that new technologies will bring important developments to business surveys. This thesis focuses upon one such new technology, the Web, as a new mode for data collection. Before considering Web data collection for business surveys, the following chapter addresses some practical and theoretical considerations associated with this new mode.



## **CHAPTER THREE**

### **WEB DATA COLLECTION: PRACTICAL AND THEORETICAL CONSIDERATIONS**

#### **3.1 Introduction**

The advent of the internet (and the Web in particular) has provided social researchers with a new tool for data collection. Market researchers, academics and, as alluded to in the previous chapter, NSIs are interested in this new mode of data collection. However, Web surveys are fraught with methodological questions. These questions cover a spectrum of areas ranging from coverage, sampling and non-response to questionnaire design, security and mode effects (when used as part of a mixed mode design).

A Web-only survey has to contend with problematic issues around coverage and sampling. In terms of coverage, the internet does not reach all corners in society and it is uncertain when (if) internet coverage will become universal, despite its rapid growth over the past 10 years. As seen in Chapter One, until the mid-1990s, access to the internet was restricted mainly to academic, military and research organisations. However, the release of the first commercial Web browser made general public access to the internet a reality (Castells, 2001:17). Just over ten years later, millions of businesses, organisations and individuals enjoy internet access. In the UK, a recent release from the ONS (National Statistics, 2006) indicates that 29 million or 63% of adults have accessed the internet.

Sampling is even more problematic. Email addresses, which would be the most obvious way of compiling a sample, are not held by everyone. Individuals, who do possess an email address, often have multiple addresses and can change these frequently. In addition to this, lists of email addresses are not placed into comprehensive, up-to date directories. A more fundamental problem, however, is that “the structure of the internet addresses is not emerging in a way that allows them to be sampled so that an early one-to-one correspondence with households is achieved, as was once the case with the telephone” (Dillman, 2000a:356). Thus the development of a sampling system, such as Random Digit Dialling (RDD) developed for the telephone, is not possible. Coverage and sampling issues in Web-based surveys has led to extensive use of opt-in panels for such research. The methodological implications of panels (in particular panel effects and sampling bias), together with non-coverage and sampling issues, receive extensive attention in the current



literature (Best *et al.*, 2001; Bradley, 1999; Comley, 2000; Couper, 2001; Givens *et al.*, 2002; Miller *et al.*, 2002; Schonlau *et al.*, 2002; Vehovar *et al.*, 1999; Witte *et al.*, 2000).

Given the present problems with non-coverage and sampling, many surveys using the Web for data collection also employ other modes; as we shall see in later chapters this is the route taken by NSIs. Mixed-mode methods may be able to overcome these issues but considerable uncertainties around questionnaire design and mode effects remain. Studies into mixed-mode surveys are beginning to receive substantial consideration in the Web survey literature. However, as de Leeuw (2005:235) comments, methodological guidance concerning quality in such mixed mode research is sparse, with a few exceptions by authors such as Couper and Dillman (Couper *et al.*, 1999; Dillman, 2002; Dillman *et al.*, 2001). Mixed mode surveys can occur in a variety of formats and in different phases of the research; for example, in recruitment and follow-up stages as well as approaches, such as one mode for one set of respondents and a different mode for another set.

The use of these methods comes with their own benefits and problems. Multiple modes may allow the researcher to reduce non-response or reach different populations but each mode creates differences in the questionnaire design, and as noted above, increase the potential for measurement error. A good example of differences between modes is the conversion of 'check all that applies' format questions in a paper (or Web) questionnaire to a 'yes/no' format for a telephone questionnaire. Dillman & Christian (2005:37) write that the conversion to the 'yes/no format' often results in the individual items being selected more frequently than in the 'check all that applies' format. One recent study on 'check all that applies' and yes/no (forced choice) format in Web surveys had results that are consistent with Dillman & Christian's noted above. Smyth *et al.* (2006) found that more responses were selected in the forced choice format questions. They conclude that this method is likely to be preferable as it seems to encourage deeper consideration of the questions and less acquiescence, whilst not suffering from increased item non-response. This brief example clearly illustrates the problems associated with mixed mode surveys in general. The newness of the Web as a mode for data collection means that potential mode effects are often unknown.

The design of a Web questionnaire, whether as part of a mixed or single mode of data collection, brings its own issues. Numerous design and functionality choices are available, many of which are not available or feasible in other more traditional modes. Consequently, the design of a Web questionnaire, whether being employed as the sole means of data



collection or as part of mix-mode data collection, is beset with decisions. It is important to note that these choices may have considerable impact upon the success of the Web questionnaire, from the respondent's initial view through to the final submission of the questionnaire. Finally, the social setting within which the survey is to be completed also influences survey response, although this dimension is not often overtly considered within survey methodology. In this way, it is useful to take a step away from detailed methodological considerations and consider the social dimensions surrounding this new survey technology.

This chapter reviews the current literature on Web questionnaire design. It considers the methodological concerns that are explicitly linked with the design of a Web questionnaire, illustrating the issues that are being raised in the ongoing discussions about this new mode. The review is undertaken within the context of the substantial body of literature that exists within social research for survey design. However, for reasons of space, it does not discuss this literature unless it is being disputed, altered or helps address significant issues in Web questionnaires<sup>2</sup>. This review of the literature specific to Web questionnaires is useful in highlighting the many methodological concerns surrounding the new mode, providing a contextual backdrop for the subsequent analysis chapters.

The chapter begins by considering the overall questionnaire design (scrolling or paging). This is followed by a discussion on various aspects of the questionnaire, including response formats, visual elements and instructions. Then the potential difficulties caused by the respondent's computer equipment used to view the questionnaire are discussed. The final section in this chapter outlines perspectives from Science and Technology Studies (STS). These perspectives are useful when considering the social dimensions of Web data collection and its implementation by NSIs and take-up by respondents.

### **3.2 Scrolling versus Paging Questionnaires**

Web questionnaires can be designed in two different ways. The first, often referred to as a scrolling, static or one-page design, entails the questionnaire appearing on one page with the respondents using the scroll bar on the right-hand side for navigation. The questionnaire is only submitted once it has been completed in its entirety. This facilitates offline completion, a factor that may be of importance to respondents who pay for their internet connection. The

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<sup>2</sup> "Mail and Internet Surveys: The Tailored Design Method" (Dillman, 2000a) offers a good starting point for positioning Web questionnaires (and data collection) within the wider literature.



other option available is an interactive approach, otherwise referred to as 'multiple-page' or 'paging' design. The questionnaire is presented to respondents page-by-page with each page displaying one or a set of questions. Once the respondent has completed the page, the submit button is clicked and the next question (set of questions) is downloaded and so on until the questionnaire is complete.

The main difference between these two methods is that in the first (scrolling design) the respondents are able to see the entire questionnaire at once. They are able to scroll up and down and view/complete questions in whatever order they desire. In contrast, a paging questionnaire limits the number of questions that respondents can view at one time. In some instances this can be advantageous. Researchers may use this design with the intention of limiting order effects, by preventing respondents from seeing questions and/or moving on before completion of the first set. Another advantage of a paging questionnaire is that it allows the use of complex skip patterns such as those used in CAPI and CASI questionnaires. In general, it is more sophisticated than the one-page, scrolling, design. However, a paging design may not always be the best option. For instance, the scrolling design is visually more similar to traditional pencil-and-paper questionnaires and so may be best used when mail questionnaires are also employed (i.e. mixed mode) for data collection. Manfreda *et al.* (2002:6) recommend that, when using a scrolling design, the Web questionnaire should be "short, simple and without complex skip patterns". As a rule of thumb, Dillman (2000a:379/95) suggests that questions should be presented in a similar way to a paper questionnaire. This, he argues, is similar to the majority of Web pages. Limiting the interactivity in a Web questionnaire ensures that those respondents with lower bandwidth (i.e. dial up connection) and computing power will not be frustrated by load time. However, Conrad *et al.* (2003:3) argue that interactive features in a Web survey can be created with relatively simple programming, either in HTML or Java Script. They add: "by treating the Web as if it were paper, one fails to capitalise on features that may potentially improve data quality".

Manfreda *et al.* (2002:7/8) undertook an experiment to compare scrolling and paging designs. The experiment aimed to measure differences in the effect of these approaches. Their results show that a paging design involves longer completion times, as much as 30% longer than the scrolling questionnaire. The authors had assumed that there would be a larger number of partial non-response from the paging design because of the longer download time but this hypothesis was not confirmed. Instead, they found that scrolling design has a higher item non-response than the paging approach. From this experiment, it would seem that a



paging design is preferable in order to minimise item non-response. However, when using this design other issues arise, namely: What is the optimum number of questions to ask per page? Should a progress indicator be included?

### *3.2.1 Number of Questions Per Page?*

There has been limited research on whether it is best to include several questions on a page or just one question. Those that ask only one question run the risk of increasing completion time, as the respondent has to receive and transmit multiple pages in order to complete the questionnaire. Other questionnaires place a group of questions on one page. This can be a particular section of the questionnaire or a group of questions with the same type of response option (i.e. matrix or grid – this is discussed in more detail in the following section on response formats). Couper *et al.* (2001:235/6) suggest that having more than one item on a screen reduces both response time and download time. Further, they found that “not only does the multiple-item version appear to take less time, but it also appears to result in fewer non-substantive answers” (Couper *et al.*, 2001:246).

Reips (2002:78) warns of the dangers of using more than one question per page, reporting that “whether multiple questions are asked on the same or a different Web page can lead to different answers. This seems to be due to varying cognitive contexts evoked by the questions themselves.” Although it is worth noting that he advises that these results come from preliminary work on context effects and the experiments need to be replicated in order to confirm the findings. However, if context effects are a concern, it seems prudent to offer only one question per page. Manfreda *et al.* (2002:15) also recommend using this latter approach when analysing Web and telephone survey results together.

### *3.2.2 Progress Indicators?*

Scrolling questionnaires allow the respondent to see the questionnaire in its entirety and therefore gauge how long it will take to complete. A paging design, on the other hand, offers no indication of its length. At any given point during completion, respondents are unaware of how far they have proceeded through the questionnaire. It is possible that these respondents will abandon the questionnaire as a result of not knowing its length. Due to this problem various authors have recommended the use of progress indicators (Dillman, 2000a:397; Schonlau *et al.*, 2002:47; & Vehovar *et al.*, 1999:238). These indicators can be presented in



various formats – textual and/or graphical to show how much the respondent has completed or how many questions are left to answer.

However, caution needs to be displayed when designing such indicators. Couper *et al.* (2001) conducted an experiment where respondents were randomly assigned into two groups, one that completed a questionnaire *with* a (graphic) progress indicator and one that completed the questionnaire *without* one. The authors compared the number of abandonments and completion rates under the two conditions. Although the group with the progress indicator had a higher response rate, it was not as large as the authors had hypothesised (Couper *et al.*, 2001:243). The study also revealed that the progress indicator increased download time, leading Couper *et al.* (2001:247) to suggest that the advantages may have been counteracted by the longer download time associated with the use of the progress indicator.

Another potential drawback of progress indicators (textual or graphical) occurs when the respondent perceives their advancement through the questionnaire to be slow. Coupled with this is the problem raised by questionnaires with several skip patterns – in this instance progress indicators can only approximately signify the respondents position in the questionnaire. One solution to this, recommended by Schonlau *et al.* (2002:48), is to supply a table of contents providing information on the various sections in the survey, thus giving the respondents some idea of where they are in the questionnaire. Dillman (2000a:398) recommends the use of textual progress indicators as it functions uniformly in all hardware and software conditions. This would also create uniformity in a mixed mode context (e.g. paper and Web).

More recent research on progress indicators undertaken by Conrad *et al.* (2005) found that overall progress indicators increase completion rates. Further, the use of intermittent progress indicators may be a good alternative in providing respondents information on their progress through the questionnaire, whilst not discouraging them when progress is slow. The authors (2005:1924) reflect that when designing a Web questionnaire, researchers need to find a balance between giving over-optimistic feedback on the respondent's progress and not providing feedback that would be encouraging to the respondent, concluding that "the use of progress indicators should be a design decision: not using them should be as deliberate as using them".



### 3.3 Response Formats

Different types of questions require different types of answers. This leads the researcher to make different decisions in terms of design; that is, to the presentation of the answer options, viz. the response format. Ultimately, the researcher is responsible for deciding which response format best suits the question. Mangione (1995:13) suggests much of this may be down to “personal preference or the dictates of your analysis plans”.

In terms of Web surveys, the way in which response formats are presented can, but not always, differ from established formats (such as paper-and-pencil or CAI). Respondents may be asked to illustrate their answer by ticking the relevant box in a multiple-choice question. Or, in either open or partially closed questions, a text entry box may be provided for respondents to impart information. These are common to both pencil-and-paper questionnaires as well as CAI. Certain response formats are only possible in CAI, for example the use of drop-down boxes. Web surveys can make use of all of these options. They also have the potential for more innovative methods, such as sliding scales, where the respondent moves the pointer to the position on the scale that reflects his or her answer (see, for example, Cook *et al.*, 2001). Within the Web questionnaire design literature, there is an on-going debate over the merits/shortcomings of the various response formats (most notably radio buttons and drop-down boxes) and which of these produces superior results. The following section offers a brief review of this literature.

Radio buttons are similar to tick boxes in paper-and-pencil mail questionnaires. All answer options are visible to the respondent. This may be advantageous in reducing mode effects when conducting a mixed mode survey, using both mail and Web questionnaires (Dillman, 2000a:392). However, a potential drawback of radio buttons is that although answers can be changed, they cannot be erased. Once an option is clicked upon, the respondent is committed to providing an answer (although not necessarily the first one that was selected). This requirement to provide an answer suggests that dropout rates may increase as respondents may object and decide to quit the survey. However, Heerwegh & Loosveldt (2002:478) found that despite offering a ‘no answer’ option, and so overcoming this problem, completion rates did not increase.

Drop-down boxes are advantageous over radio buttons in that they have a faster download time, which is potentially important for those respondents who have a dial-up connection and for those who pay for their online time. An experiment found that questionnaires with drop-down boxes downloaded 19 seconds faster than those with radio buttons (Heerwegh &



Loosveldt, 2002:471). Another advantage of using drop-down boxes is that the questionnaire appears to be substantially shorter than those using radio buttons. However, as Dillman (2000a:392) argues, this may make it difficult for respondents to gauge their progress through the questionnaire, a factor that may affect drop-out rates. A second disadvantage of the use of drop-down boxes is that respondents are required to click twice to select their answer but only once for radio buttons, thus increasing response burden (Heerwegh & Loosveldt, 2002:471). Further, the content of the visible line in drop-down boxes is of great importance. Those showing an answer option such as 'strongly agree' as opposed to the instruction 'click here' may "result in people inadvertently selecting the default category because they think they have already responded to that box" (Dillman, 2000a:392). This clearly has effects on the validity and reliability of both the data-capturing tool and the data gathered.

Couper *et al.* (2001:247) investigated the use of radio buttons versus both long and short-text entry boxes. Interestingly, they found that those with radio buttons took longer to complete than both long and short-text entry boxes (183 seconds vs. 180 and 168 respectively). However, their results showed less missing data for the questionnaires with radio buttons than those with the text entry boxes. Overall, the text entry boxes produced more accurate data although differences between the long and short entry boxes were noted. Open-text questions, although not presenting any problems in terms of download time, are not exempt from other problems. Knapp & Heidingsfelder (2001:226), who analysed the drop-out rates of several studies, found that drop-out rates increased during open-text questions and multiple questions. One study obtained four times the dropout level for open-text questions than simple questions received. To return to Couper *et al.*'s (2001:250) experiment, the authors conclude "that relatively minor formatting changes could have an impact on the responses to a survey question". In a similar vein, Heerwegh & Loosveldt (2002:478) conclude that there is no real evidence supporting either drop-down boxes or radio buttons in favour of the other. Rather like Couper *et al.*, they suggest that the choices a researcher makes during the questionnaire design depends on that particular research.

Another type of standard response format to be investigated for Web usage is the placement of answer options in a matrix (briefly discussed in the previous section on questions per screen). Gräf (2002:56) in pretest laboratory research found that this format is unsuitable for two reasons. Firstly, the layout increases the possibility of response bias. The question text is placed at the left-hand side of the screen and the answer columns start next to this and continue until the end of the right-hand side of the screen. This, Gräf (2002:56) argues,



places too much cognitive burden on the respondents as they have to position the mouse and click on the desired answer: “The effort involved in positioning the cursor answer in each row is more costly than continuing in the same or neighbouring column for each row”. The second problem with this response format, Gräf (2002:57) argues, occurs with the diminishing connection between the question and answer options, as the respondent moves from the left to the right hand-side of the screen. It is likely that the answer to the question will be distorted by the appearance of simultaneous items in the respondent’s view, such as the answer options for the questions above and below. Gräf concludes that the matrix format should be avoided and instead each question should be asked independently.

Comley (2000) observes that complex grids negatively affect response rates, a point reiterated by Schonlau *et al.* (2002:43), who suggest that matrix questions should be used in moderation. They also point out that the appearance of a matrix question may vary depending on the respondent’s Web browser. (The effects of different computer hardware and software on the appearance of Web questionnaires will be discussed later in this chapter.)

Finally in this section on response formats, we turn to the issues around ‘no opinion’ response options. It is generally recommended in pencil-and-paper questionnaires that respondents are offered a ‘don’t know’ or ‘decline to answer’ option. Oppenheim (1992:129) argues that this option is important by asking the question: “do we really want to obtain ‘forced’ responses which are virtually meaningless?” In some instances, a researcher may decide not to offer these answer options. In paper-and-pencil questionnaires, this does not prevent a respondent from leaving the question blank. In contrast to this, in Web surveys it is possible to program the questionnaire in a way that prevents respondents from moving on until they provide an answer.<sup>3</sup> This raises interesting questions. It is likely that forcing responses will encourage not just meaningless responses as Oppenheim claims, but will prompt respondents to quit the survey altogether. To deal with this problem, Schonlau *et al.* (2002:45) recommend that answers are forced only on rare occasions. The authors suggest that it is preferable to deal with item non-response than to overall non-response. That said, including a ‘no opinion’ answer option does create some difficulties for researchers in that this may increase satisficing by respondents (Krosnick, 1991). de Rouvray & Couper (2002a) undertook an experiment in an attempt to find the best method of dealing with ‘no opinion’ responses. They tested four ways of dealing this:

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<sup>3</sup> In order to program such a mechanism, it is likely (although not exclusively) that a paging questionnaire design is used.



Version 1	'decline to answer' option for every question.
Version 2	'decline to answer' option for every question with a prompt when a respondent did not choose any of the answers (including 'decline to answer').
Version 3	'decline to answer' option displayed in slightly lighter and smaller font.
Version 4	no 'decline to answer' with a prompt when a respondent did not choose any of the answers.

**Table 3.1** Web experiment on 'no opinion' responses (adapted from de Rouvray & Couper, 2002b:4)

The results of this study found that providing a prompt following an unanswered question was most successful. This is a technique similar to that employed in interviewer-administered questionnaires. However, the authors do warn that as this was a short survey, with respondents answering an average of fourteen questions, the extent to which these findings can be generalised is limited (de Rouvray & Couper, 2002b:7).

The above discussion highlights the need for further research in the area of response formats. The likelihood of the various answer options increasing measurement error and the quality of data achieved is not always known. Thus, there is a need for caution when choosing a particular response format.

Once the response format has been chosen, the positioning and alignment of the answer options within the selected format is equally important. Tourangeau *et al.* (2004) undertook six experiments embedded in a Web survey and found that "respondents make inferences about the meaning of survey items based on visual cues such as the spacing of the response options, their order or the groups of questions". This concurs with what researchers know about the effect of visual elements in paper questionnaires. The impact of visual elements goes beyond those found in response formats. The Web, more so than other survey modes, allows the easy addition of colour and graphics with minimal, if any, increased survey cost. The use of these visual elements, like many of the other design choices that have been discussed to this point, raise methodological questions. It is to these that we now turn.



### 3.4 Visual Elements

The use of both colour and graphics has been addressed in some detail within the literature. Currently, two main positions exist on the use of colour and visual elements in Web surveys. Dillman (2000a) maintains that, as with mail questionnaires, Web questionnaire design should remain conservative until further research has been undertaken to establish the effects of colour and graphics. He claims that not only are the visual design guidelines developed for mail questionnaires applicable to Web questionnaires but also that the use of mouse and keyboard, cursor and scroll bar make the Web version more visually complex. Thus, Dillman (2000a:382) recommends that colour and graphics should be kept to a minimum so that “figure/ground consistency and readability are maintained, navigational flow is unimpeded, and measurement properties of the questions are maintained”.

Couper (2001:12), on the other hand, whilst cautious about unknown effects on measurement error, discusses the vast opportunities for colour and graphical images. Graphics can be used to supplement questions or even form the basis of a question. They can also be used as motivational tools for respondents, or be irrelevant to the survey content (e.g. banner advertisement from survey sponsors). Despite being more open to the visual elements, Couper (2001:12/3) warns that although psychological research has found that verbal and visual information is processed simultaneously, the intended effects may not be achieved. For example, clarifying a question on ‘eating out’ with a picture may produce different responses depending on the image used (e.g. a fast food outlet versus a fine-dining restaurant). Such research provides an indication of the importance of the cultural context within which the survey is being completed.

Another warning about the extended use of graphics comes from Vehovar *et al.* (2002:238), who maintain that the use of graphics will generally increase download time of the questionnaires, which may lead to an increase in non-response rates. Two reasons for this are given. The first concerns the respondent’s computer equipment – they may not have sufficient memory for the graphics to download and so will have to abandon the survey. Alternatively, the download time may be augmented to a level that induces respondents to quit. It is also on the basis of download time that Schonlau *et al.* (2002:42) suggest that Web surveys should be kept as simple as possible. The authors recommend that if a ‘fancy’ design is used, then the respondents should be given the choice to complete without graphics. It would seem, however, that caution is necessary if taking this option. Researchers need to be sure that having two versions of the questionnaire do not create measurement error between versions.



Not all the literature on the use of colour and graphics in Web questionnaires is negative. Manfreda *et al.* (2002:9/10) conducted an experiment on the use of 'logotypes' (small pictures) both to illustrate questions and act as a motivational tool. Whilst they found that the use of these logotypes increased abandonment (both computer equipment and payment for internet services playing a role), the experiment also established that logotypes were successful in increasing respondent motivation – item non-response was lower with logotype questions. Further, Manfreda *et al.* (2002:11) state that “graphics in the form of logotypes illustrating survey questions positively affect measurement error”. Respondents without the logotypes were more likely to opt for a non-committal answer than those with the logotypes. The authors suggest this is due to the logotypes clarifying whether or not the respondent knew the answer. These findings are interesting as they provide a preliminary indication that visual images may be a positive addition to Web surveys.

The use of graphics in Web surveys appears to create a number of unknowns, the most important of which is linked to measurement error. The problems associated with increased download time as a result of low bandwidth may disappear over time as more and more individuals connect to the internet via broadband. Regardless of this, the possibility of measurement error associated with their use suggests that researchers should be cautious about including graphics in their design. Certainly, this is an area that requires further research, particularly as the Web develops and the use of multi-media becomes feasible within questionnaires.

### **3.5 Instructions and Help Options**

The provision of instructions is an essential element within questionnaire design as a whole. Web surveys face two difficulties concerning the use of instructions and help options. Firstly, they are similar to mailsurveys in that there is no interviewer present to provide additional information or explain troublesome words. Therefore, as with mail questionnaires, extra attention must be paid to the instructions to ensure they clearly inform the respondents about how to complete their task.

The second obstacle arises with the mode of questionnaire administration – computer-assisted Web interviewing. The respondents' level of computer literacy may vary vastly, thus their ability to provide information to the system may be compromised. When designing Web questionnaires it is important to take this into account; that is, to provide instructions



for those with low literacy levels, whilst not placing a burden on those with advanced levels (Dillman, 2000a:390). One way of dealing with this is to offer extra help that remains concealed until the respondent requests it. For example, this can be done by providing a hyperlink from a potentially troublesome word to an explanation that appears in a pop-up box when the hyperlink is clicked with the mouse. Hoorgendorn (2001:2) employed such a technique in an “assets and liabilities” questionnaire, which contained some complex financial terminology with which not all respondents would be familiar. He found that nearly a quarter of the respondents made use of the help feature. Hoogerdoorn (2001:7) notes that whilst the option was useful for those who made use of it, there is no information on those that did not.

Research into the clarification of word meanings has been undertaken in CASI. Schrober *et al.* (2000) compare two experiments undertaken by the authors at different times. The first experiment uses a headset through which a computer-generated voice asks questions and respondents answer, or request clarification, by speaking into the headset. The second experiment, of particular relevance to Web surveys, varies in the way in which clarification is offered to participants. In this experiment, five different conditions were tested:

Clarification appeared...	User Instructed that...
1) None	N/A
2) At user's request	Clarification essential
3) At user's request	Clarification available
4) When user is slow or at user's request	Clarification essential
5) When user is slow or at user's request	Clarification available

**Table 3.2 CASI experiment on clarification of word meanings** (adapted from Schober *et al.*, 2000:449)

In conditions 4 and 5, if the user was slow to respond, the system would initiate clarification by a pop-up window, this is in contrast to conditions 1 to 3 where users had to request clarifications themselves by clicking on the relevant button. Overall, this study showed that the availability of clarification increased respondent accuracy. However, respondents were more likely to seek clarification when they were told it was essential, as opposed to merely available (condition 2 versus condition 3) and as a result accuracy of answers was better for condition 2. At the same time, the authors point out that whilst accuracy was increased, the



task of obtaining clarification increased response time (Schober *et al.*, 2000:449). This study also highlights various ways in which clarification can be offered via clicking 'help buttons'.

Recent experimental research undertaken by Conrad *et al.* (2006) follows on from this work and investigates the use (and non-use) of clarification in Web questionnaires. The first experiment (out of two) found that respondents rarely sought definitions for terms. However, those that did were more likely to seek clarification again when they found the initial definition to be useful. In addition, respondents were more likely to obtain clarification when it involved little effort (one click as opposed to multiple clicks). The benefits of seeking clarification appear to have been over-shadowed by the effort involved in doing so.

The second experiment followed on from the first by investigating ease of obtaining clarification. This experiment tested 3 conditions whereby clarification would be obtained; by means of 1 click, 2 clicks and 'rollover'. Respondents can see clarification of a term by simply rolling over the term with their mouse and the text appears "as 'hovering text' in front of the questionnaire, much as help is often provided in conventional desktop programs" (Conrad *et al.*, 2006:258). In this experiment, the authors also investigated usefulness of definitions. This experiment found that respondents increased their requests for definitions by four times when the rollover method was available. The authors note that some of these rollover requests for definitions may have been accidental. However, even if this is the case, they found that respondents did take the rollover definitions into consideration when providing their answers.

In concluding, Conrad *et al.* (2006:264) suggest it is possible that respondents may not use interactive features within Web surveys, even if these are provided. This may be reflective of general Web usage. Web pages are often filled with a plethora of information available simply by a click of a mouse. It may be that users are less inclined to follow these links. Whatever the case, if a researcher wishes a respondent to see a definition of a term or instructions within a questionnaire, it may be best for these to be positioned within the text of the questionnaires, as done in mail surveys. This method is recommended by Dillman (2000a:392), who warns that the pressing of help buttons (or the appearance of floating windows) increases respondent burden and is also more complex in terms of computer skill.

Earlier discussions on other aspects of Web questionnaires have shown that download and completion time is of considerable concern to respondents, particularly those who pay for internet access. This holds true for instructions and help features, hence when designing



these features, the researcher needs to take this in account. In addition, different computer capacities and settings of respondents are factors to consider.

### 3.6 Computer Equipment

The last part of this section outlines the difficulties that can be encountered when respondents view the questionnaire on their computer. Currently, a substantial hurdle facing designers is the changes that can occur to the appearance and functioning of a Web questionnaire by the type and abilities of computer and software that a respondent uses to view the survey. The questionnaire's appearance may change, hence that not all respondents view it in its original (and intended) form. As Couper (2001:13) notes, "one of the basic tenets of survey measurement is the notion of standardisation". If respondents are viewing a 'modified' questionnaire, this raises questions about the validity and reliability of the data gathered. Changes to the questionnaire include the following: questions may be wrapped, response formats disarranged and, depending on screen resolution, the colours may change. Older, slower computers may not be able to cope with advanced graphics, and coupled with this, the type of internet connection that a respondent uses (i.e. dial-up) increases problems when downloading and completing the questions (particularly with a paging questionnaires).

Couper (2001:13/4) highlights three problems that can occur with browsers: 1) the security settings can be modified by users, 2) the size of the browser window as well as font size may be adjusted, and 3) the colours within the browser can be personalised by users. Another example of a browser causing difficulties, noted by Comley (2000:4), arises when questionnaires that rely on cookies are used with framed websites and viewed in Netscape. In this instance, the questionnaire may not work. These are not the only factors that can affect a Web questionnaire but merely serve to illustrate a few of many challenges facing these surveys.

There are some ways to address (if not eliminate) the problems surrounding respondent computer equipment. In order to tackle insufficient memory and/or download times (for dial-up users), two different designs of the questionnaire can be offered to the respondent at the start of the survey. One with more advanced features, such as the use of Java Script, and the other, a 'simple' HTML version, that is only text based. The recent Norwegian population census (Haraldsen *et al.*, 2002:1) employed this technique for members of the public who chose to respond over the internet. Those Norwegians with any edition of Microsoft Internet Explorer (IE), using MS Windows and who have enabled their browser to accept Java Script,



were directed to the advanced version. All other internet respondents were directed to the simple version. One in five internet respondents were directed to the simple version (or four in five completed the advanced questionnaire) (Haraldsen *et al.*, 2002:8). However, rather than establishing that those completing the simple version were inexperienced users, the results indicate the opposite. The respondents in this group were more likely to have cable internet connection, had similar degrees of interest<sup>4</sup> and were slightly more experienced and competent in their internet use (Haraldsen *et al.*, 2002:9).

The authors offer two explanations for these findings. Firstly, the more experienced users (that is those who were directed to the simple version) use more advanced and uncommon browsers. Secondly, the latest edition of IE, version 6.0 was released just before the census. This leads Haraldsen *et al.* (2002:9) to speculate that advanced users may have already installed the upgrade, which in turn would lead them to the simple version of the census (as the advanced version supported IE only until version 5.0).

If creating two versions is not feasible (or concerns over increased measurement error by non-standardisation is a factor) then the following steps during pre-testing, recommended by Schonlau *et al.* (2002:51/2), are advisable:

- Testing using different computing platforms, both Mac and PC, with various hardware configurations.
- Testing with different browsers, including early and later version of Internet Explorer, Netscape Navigator/ Communicator, and the AOL browser.
- Testing with different connection speeds. One respondent's online experience may be very different from another's depending on his or her internet connection. In particular, the survey should be tested with slow modem connections.
- Testing of skip patterns (particularly when the survey might be filled out in more than one session, test skip patterns in the second session that depend on answers in the first session).
- After the initial responses arrive, double-check to see that no obvious errors were overlooked.

As broadband internet connections become widespread some of the above issues may become redundant. However, there is always going to be variety in computer capacity, Web browsers, security features (such as blocking pop-up windows and cookies), and so on. As a

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<sup>4</sup> The measures used for 'interest' in their study were: number of accesses for home in last seven days and time used on the Web when last connected.



result, survey researchers must consider such factors when designing their Web questionnaire.

It is certain that the Web holds great potential for innovative designs, at minimal cost in both time and expense. As with CAPI/CASI questionnaires, complex routings can be employed, as well as the multiple uses of (advanced) colours and graphics. However, as we have seen, various problems are presented by Web surveys. Difficulties can arise at various stages in the design, starting with the type of design employed (scrolling or paging), followed by the effects of various response formats, the positioning and format of instructions as well as the use of visual images. Further, the possibility of respondents viewing a distorted questionnaire may be a sizable concern in terms of standardisation. Although research has and continues to be undertaken in these areas, it appears it will be some time before conclusive answers emerge. In the meantime, Web questionnaire designers need to use the various available options with caution.

This section has illustrated the numerous detailed methodological considerations that surround the Web as a mode for survey data collection. As a relatively new mode of data collection, on-going methodological research will continue to enrich our understanding of the threats of measurement error and develop Web questionnaires into a robust method of data collection. However, the research reviewed reveals a gap in the literature. Such methodological studies address very detailed aspects of the questionnaire but fail to consider the social dimensions within which the questionnaire will be completed. Woolgar (2002:14) notes, “the uptake and use of the new technologies depend crucially on local social context”. The likelihood for a respondent using the Web to complete a questionnaire and their subsequent interaction with that questionnaire are linked with their perception, experience and expectations of the Web. The final section of this chapter (3.7) considers perspectives from Science and Technology Studies. These are useful in understanding technology and technological change.

### **3.7 Perspectives from Science and Technology Studies**

Science and Technology Studies (STS) is an interdisciplinary field bringing together disciplines such as anthropology, history, philosophy and sociology in investigating the workings of technology. STS perspectives, which this thesis draws upon, all have the underlying premise that “science and technology are thoroughly social activities” (Sismondo,



2004:10). Society shapes, and is shaped by, technology. This section explores what this means and how this perspective can be applied usefully to survey research.

Before considering STS approaches, it is first worth considering an opposing view, that of technological determinism. Technological determinism, a perspective with a long history, depicts technology as having an independent influence on society and the development, adoption and growth of a particular technology. “At its simplest, technological determinism portrays technology as an exogenous and autonomous development which coerces and determines social and economic organisations and relationships” (Grint & Woolgar, 1997:11). The independent nature of the technology, within this perspective, means that only the best and the most appropriate technology survives and becomes successful. The technology itself determines the “shape and content of society” (Grint & Woolgar, 1997:12).

Today technological determinism is unpopular and few academics openly subscribe to it in this form. The most commonly cited contemporary authors associated with this perspective are Robert Heilbroner and Langdon Winner (Sismondo, 2004:83). However, these authors are not unmovable in their position. Heilbroner, who is often referred to as a staunch supporter of the perspective, concedes that society does have an impact upon technology (Sismondo, 2004:83).

Academics may be turning their backs on technological determinism but it remains prevalent within the way that society thinks and talks about technology. MacKenzie (1996:5) comments: “the idea that technological change is just ‘progress’ and that certain technologies triumph simply because they are the best or the most efficient, is still widespread”.

Within academic circles, it is generally recognised that a technology does not simply triumph over another technology because it is superior. Schwartz Cowan (1985:201) documents the case of gas and electric refrigerators, arguing that the success of one technology over another involves “economic decisions made by complex social institutions operating over long periods”. In the case of the refrigerator, a gas powered model, which was invented at the same time as the electric refrigerator in the early 1900s, is more durable and quieter than its electric counterpart. The electric model eventually succeeded as a result of the extensive (and expensive) development and marketing campaign undertaken by General Electric and a few other equally large and powerful companies.



The above example is an illustration of how technology is not independent of society. This was recognised by the development of an opposing perspective to technological determinism. In the late 1970s, the Social Construction of Technology (SCOT) emerged as a response to technological determinism and emphasises the social nature of technologies (Sismondo, 2004; Williams & Edge, 1996). This perspective originates from several traditions, including history, information studies and organisational studies. Key writers, who have developed this perspective are Trevor Pinch and Wiebe Bijker. The contention of SCOT is that “science and technology are both socially constructed cultures and bring to bear whatever cultural resources are appropriate for the purposes at hand” (Pinch & Bijker, 1984:404). This is to say that science and technology are not independent of society and culture but are parts of society.

Jackson *et al.* (2002:237-8) outline four main assumptions of this constructionist view. Firstly, “constructionism denies technological determinism”. We have already noted above that SCOT rejects technological determinism. Different viewpoints within this perspective do so to varying degrees. Secondly, “constructionism recognises the interplay and interdependence of social and technical elements.” Technology is understood as a group of dynamically (inter)connected social and technical elements. Thirdly, “constructionism denies that technologies are ever complete.” Technologies continue to transform and develop over a period of time. A consequence of this ever-changing nature means that technologies are difficult to describe. Finally, “constructionism redirects attention from products to processes.” Social constructionism focuses upon the processes surrounding a particular technology rather than the actual technology itself.

The Social Shaping of Technology (SST) is a branch of SCOT, which emphasises that technology does not shape society but rather society shapes technology. Bijker & Law (2000:5) argue that historical, economic, political, psychological and sociological factors are all involved in the shaping of technology. These existing social, economic and political structures are influencing elements that shape the development, adoption and use of technology. MacKenzie (1996:14), another influential author in this field, takes this a step further:

Technologies are not neutral servants of whatever social or political order chooses to adopt them. Their adoption and operation often involves changes to that order – changes that are not automatic consequences of new technology but must themselves be engineered, often in the face of conflict and resistance.

The social shaping of technology is a dynamic process, which can involve changes to both the technology and also to the society within which they are being developed and adopted. Earlier in this chapter in section 3.2, we saw that Dillman (2000a:379/95) advocates the use



of a scrolling design for Web questionnaires, arguing that this is similar to paper versions as well as the majority of Web pages. In this way it is more intuitive for respondents. This argument takes into account respondents' prior experience of paper questionnaires and the Web. The social experience of Web pages shapes and influences the design of the Web questionnaire.

The success of a particular technology is closely linked with the expectations associated with that technology's future. MacKenzie (1996:8) argues that "expectations about the future are often integral to technological success or failure". Positive expectations about the future of the technology are necessary for the success of the technology. A conviction in its future success motivates creators and investors to continue with development and end users to adopt the technology. Brown & Michael (2003) discuss the 'Sociology of Expectations' and how positive expectations about a technology's future are crucial in providing energy and drive to its future. One example they cite is Al Gore's description of the internet as the 'information superhighway'. This, Brown & Michael (2003:6) argue, provided momentum by "popularising a linear future necessity, a techno-metaphorical 'conduit' to the future of the internet itself". As later chapters explore, expectations about the future of the internet influence the implementation and adoption of the new mode by NSIs and the survey respondents.

The belief and future expectations surrounding a technology can lead to it being 'talked-up'. Guice (1999:81) discusses the talking-up of trends, explaining that "when a trend is not yet established, it must be 'talked up' to reach the forefront of discussion, elaboration and use. Arguments can contribute to the institutionalization of the new concepts, and lay the groundwork for new technologies and enterprises." Thus we can say that new technologies are talked-up by different groups, such as its inventors and investors as well as governments and organisations. This, like the expectations discussed above, propels the technology into the public domain and advances its position in society.

A technology, as a result of social shaping, can change or be used in ways that are unintended and often unforeseen. Bijker & Law (2000:8) comment that technologies are "subject to contingency as they are passed from figurative hand to hand, and so are shaped and reshaped. Sometimes they disappear altogether: no one felt moved, or was obliged, to pass them on. At other times they take novel forms, or are subverted by users to be employed in ways quite different from those for which they were originally intended." The internet is an example of a technology that, as it is developing and being integrated further into society,



is being used for dramatically different purposes from what the original creators intended. As noted in Chapter One, the use of the internet for survey research is one example of an unintended application of the technology.

Social shaping is not only useful to describe technologies through their invention and initial development but also can be used to consider the growth and use of the technology once it is in the public domain. The internet is not a tangible object, being a mass of computers connected via the TCP/IP protocol. This connection allows communication between computers by various platforms, including email, file transfer protocol (FTP) and the World Wide Web. However, conceptually it is understood in a myriad of ways. It can be argued that the way in which technology is perceived and used is dependent upon the individual or indeed the cultural perspective from which it is being used. MacKenzie (1996:6) states, “different people may see a technology in different ways, attach different meanings to it, want different things from it, assess it differently”. In this way, different people’s understanding and use of the internet can vary from person to person. Further, an individual’s use of the internet may differ from one access point to another. She may make use of it in her workplace for professional purposes and make use of it at home as a leisure activity. Her perception of the internet may change from access point to access point. Considering this within the realms of survey research and methodology, it is important to ask how respondents perceive Web data collection. This social dimension may affect response in a way not anticipated by the researchers making use of the mode.

### *3.7.1 Computerization Movements*

Computerization Movements, a perspective developed by Iacono & King (1996; 2001), attempts to explain the processes involved in the widespread adoption of computers and computer systems. This perspective employs the concept of a social movement describing collective action taken by a group of people who share a goal specific to that group, for example the feminist movement. Iacono & King (1996:89) state that the “advocates of computerization focus on the creation of a new revolutionary, world order where people and organisations use state-of-the-art computing equipment and the physical limitations of time and space are overcome”. Followers of this movement, as alluded to in this quote, promote a technological utopian view of the future. They believe the adoption of the technology will solve society’s problems and lead to a successful, flourishing society (Kling, 1996:42).



Computerization, according to this perspective, can be seen on three levels; technological action frames, public discourse, and organisational practices. These three levels are interlinked – the first (technological action frames) shapes the second (public discourse) and in turn the second level shapes the third (organisational practices). Technological action frames are “multi-dimensional composite understandings – constituted and circulated in language – that legitimate high levels of investment for potential users, and form the core ideas about how a technology works and how a future based on its use should be envisioned” (Iacono & Kling, 2001:98). Decisions on what the technology is and how it is to be used, as well as the language used to describe the technology are all undertaken in the technological action frames. Public discourse, the second level, allows the widespread dissemination of the understandings of the technology that are developed in the technological action frame. This is done by the government, media and professional groups. Finally, the third level, organisation practices, is on a local stage. This is how individuals and organisations implement the first two levels into practice within their environment.

At the local level, the expectations surrounding the new technology are not always met. However, knowledge about problems encountered at this level often does not return to the public domain (Hine, 2006:30). This said, intermittently failures do become public. Heath *et al.* (2000:300) writes: “it is increasingly recognised that the financial and organisational benefits of new technologies, especially information technologies, have been widely exaggerated and that many tools and technologies fail to enhance the activities for which they are designed”. Heath *et al.* (2000:310), conducting ethnographic work, cite examples such as the development of an electronic system at the London Stock Exchange, TAURUS, which was abandoned after it became apparent the system would not meet user requirements. Woolgar’s (2002:9) notion of cyberbole, introduced in Chapter One, can be applied here. (Increased) efficiency is often used within public discourse around internet technology and as this research by Heath *et al.* (2000) shows, this expectation is not always realised.

The use of the technology on the local level can also give rise to new understandings of the technology, by virtue of the problems encountered and changed expectations. These new or modified understandings can lead to a new discourse, which can lead to the development of a new technological action frame (Iacono & Kling, 2001:99). However, as with any unmet expectations and difficulties encountered, the new discourses may not reach the public domain.



Local level adoption of a new technology, which this thesis is investigating, requires the presence of advocates of the technology. The presence of these advocates or champions is necessary as they promote the use of the technology and help create an understanding of how it can be used in their particular organisation. “Champions advance the arguments for particular technologies and shape technological action frames which show people what to do with them” (Hine, 2006:35).

Often a social movement will invoke a counter movement. In this vein, Iacono & Kling (1996:99) suggest that we would expect to have a counter-Computerization Movement. They note, however, that a counter-Computerization Movement has not emerged. Iacono & Kling suggest that a counter-movement would have to be based upon anti-technological utopian perspective (for example, the Industrial Revolution Luddites). The few communities that support such beliefs are in the minority and marginalised. Any opposition to the Computerization Movement is generally based upon particular issues and generally does not have widespread support (Iacono & Kling, 1996:100).

Applying Computerization Movements to the focus of this thesis, Web data collection, we have two local level groups – NSIs, who are implementing the new technology as part of their data collection toolkit, and the businesses that respond to these surveys. The understandings that both of these groups hold about the internet, gained from the public discourse emerging from the technological action frame, will influence their adoption, expectations and experiences of Web data collection. At the same time, we would expect to see local champions of the technology, who campaign for the adoption of the new technology in their organisation (either the NSI or the business).

### **3.8 Conclusion**

This chapter began by discussing the numerous methodological considerations surrounding the implementation of Web data collection, ranging from the basic design choices of scrolling or paging, to the use of response formats and visual elements within the questionnaire. It is worth noting that all of this (valuable) main-stream research on Web questionnaire design is undertaken for voluntary, social surveys; that is to say, they are completed by an individual answering for themselves on a voluntary basis. Business surveys are different in this respect as they are completed by an individual on behalf of their company. Non-compliance with the survey request can have legal ramifications. It is necessary to ask whether these elements necessitate a change in any of the design choices.



The concluding section of this chapter considered perspectives from STS. Social construction and social shaping theories of technology explain and illustrate the complexities involved in the creation and adoption of new technologies. These perspectives argue against the notion that technology is independent of the social setting within which it is used and that it shapes society. Rather we see that society influences and shapes the development of technology. Furthermore that society itself can be shaped by the technology.

Knowledge and understanding of the methodological issues surrounding Web data collection is essential when designing a Web question, whether as part of a single or mixed mode design. However, in addition to the methodological issues, it is also important to consider the social aspects of Web data collection. We need to understand the way in which the various groups (governments, NSIs, Web survey methodologists and businesses/respondents) are constructing the new survey technology. Within this, we need to investigate whether there is any cultural variability in perceptions of the internet and within their expectations of the new mode.

It is important to remember that technology is not simply computing technology. Surveys are also technologies. As we can see from the development of the general population census during the 19<sup>th</sup> Century briefly introduced in Chapter One (Campbell-Kelly, 1996), the social, political and economic context shape their development. Both the survey researchers and the respondents use the new technology with their own particular attitudes, expectations and assumptions. Understanding the social dimensions, within which the new technology is implemented and adopted, will help us better understand the methodological issues surrounding Web data collection.

In order to gain an understanding of these social dimensions and examine Web data collection in a holistic manner, it is necessary to shift from the traditional quantitative experimental and cognitive approaches to methodological research and employ explorative, qualitative methods. Heath *et al.* (2000:303) write "...we can only understand technologies, and the various formalisms which may be involved, by considering how they feature within practical action and with regard to circumstances in which mundane activities are produced. ...it is necessary to turn away from the experimental, the cognitive and the deterministic, to the naturalistic, the social and the contingent". The following chapter describes the methodology used in this research to investigate the expectations surrounding the implementation of Web data collection for mandatory business surveys.



## **CHAPTER FOUR**

### **METHODOLOGY**

#### **4.1 Introduction**

The previous chapters have introduced mandatory government surveys and the Web as a method for data collection. These chapters have illustrated gaps within both sets of literatures. We have seen that historically data collection methodology for government mandatory business surveys has been neglected. In recent years, NSIs have implemented various programmes of research that consider areas such as the response process and questionnaire design, in order to address this problem. The introduction of Web data collection forms a part of the improvement programmes. As we have seen in the previous chapter, Web data collection brings many methodological issues to consider. Further, the social dimensions of the new technology may influence these methodological considerations.

Drawing these issues together, this thesis explores the use of a new technology, the Web, as a new data collection mode for mandatory business surveys. In particular, the thesis investigates the expectations for this new method by the NSIs implementing the new technology and the respondents adopting it. The main research question asks, “How are expectations of Web data collection formed by NSIs and their respondents?” This is followed by a subsidiary question, “How far do these expectations align?” This chapter details the development of the research, the research design, and methodology employed to gather and analyse the data that help to answer these questions.

#### **4.2 The Natural Development of the Research**

This research is undertaken as part of an Economic and Social Research Council (ESRC) CASE studentship. A CASE, or collaborative, studentship is a partnership between an academic department and a commercial or public/voluntary partner. The research is jointly designed, and supervised, by these partners. This studentship was developed around the use of Web data collection within the UK Office for National Statistics (ONS). The initial proposal sought to investigate the feasibility of CAPI and CASI questionnaires over the Web for government *social* surveys. However, in the months that followed the start of the studentship, the ONS began its modernisation programme; a multi-phase and lengthy endeavour. The modernisation programme impacted upon the studentship and the ability to



undertake the research as initially envisaged. Consequently, the focus of the research, the research questions, and subsequently the research design, evolved from the original focus of Web data collection for social surveys.

At the outset, directed by the original PhD proposal, I anticipated being involved with a Web data collection pilot led by the (formerly named) Social Survey Division (SSD) at the ONS. The SSD had undertaken some preliminary work in this area; a number of questions regarding internet usage within the household had been incorporated into the Omnibus survey.<sup>5</sup> This included a question asking whether respondents would agree to participate in a Web survey trial at a later stage and if so, they were asked to provide an email address. The data gathered on internet coverage and use within the household, as well as the database of email addresses, were seen as a starting point for trials within the SSD.

I went into the ONS London office one day a week (mostly on Fridays) for the better part of a year, during which time I learned about the ONS; the organisation and its workings as well as the requirements and inhibitors to Web data collection. It is useful to consider these weekly visits as an ethnography, where I was a participant observer and kept a diary of the days spent in the ONS offices. I came to know the organisation; its culture, functions, workings, etc, of which I had no prior knowledge, through experiencing the environment in a normal working day, reading news items on the intranet and interacting with various staff members, some of whom were involved in the consideration of Web data collection and many that were not. The interaction with staff members, both through formal meetings and informal conversations, fed into my growing understanding of the processes, negotiations and ultimately difficulties, involved in the implementation of a new mode of data collection within such a large organisation. I also devoted time to learning and understanding the current data capturing processes for social surveys. As part of this, I learned basic programming of questionnaires in Blaise.<sup>6</sup> In addition, frequent meetings (both formal and informal) with my ONS supervisor were very helpful in understanding and learning about the organisation.

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<sup>5</sup> The Omnibus Survey is a “multi-purpose survey developed by ONS for use by non-profit making organisations” [www.statistics.gov.uk](http://www.statistics.gov.uk)

<sup>6</sup> This is the software, developed by Statistics Netherlands, used by the SSD for both their CAPI and CATI interviews. An internet version of Blaise (Blaise IS) has been developed and it is anticipated that it will be the software employed for Web data collection.



#### *4.2.1 A Pivotal Experience*

Several months into the studentship, I went on a field visit with a CAPI interviewer for the General Household Survey. I also listened to CATI interviews for the Labour Force Survey. These experiences emerged as pivotal in shaping the direction of the research. The CAPI and CATI experiences highlighted issues that I had not previously considered. In both instances, I saw firsthand the impact of the interviewer's personality on good response rates and low dropouts. Secondly, questions surrounding the acceptability of Web data collection to respondents emerged during the CAPI field visit. The following excerpt from my field notes of that day illustrates one woman's thoughts on responding via the Web:

At the end of the interview, she (one of the respondents) asked, in quite a friendly manner, if I was training to become an interviewer. Barry (the CAPI interviewer) interjected that no, I am from head office and I'm thinking to the future about Web surveys. This led to a discussion between Barry and the woman, who was quite adamant that Web surveys would not work. "What happens if you need clarification and also, you would have to pay to complete the survey" (obviously referring to pay per minute internet access; they had a computer in the house but I didn't find out if it was Web enabled). She also stressed that she would consider their household fairly well educated and they would not be interested in completing such a questionnaire online therefore she couldn't imagine anyone else being interested in doing so either. The woman was quite set in her beliefs and seemed rather 'aggressive' in her view that Web surveys would not be appropriate. This was a change from her earlier demeanour when asking if I was learning to be an interviewer (23<sup>rd</sup> May 2003).

These field visits brought forth the idea of acceptability. It may not simply be a case of 'if you build it, they will come'. Researchers cannot assume that respondents will use the Web simply if it is offered. In addition to acceptability, household surveys face additional problems of internet connectivity and the lack of an interviewer.

In the months leading up to the field visits, the complex path towards Web data collection, and even pilot research, within an NSI had become apparent. In terms of information technology, it is necessary to have a system that can meet the various demands that Web data collection entails. For example, it would have to be able to cope with large volumes of incoming data, possibly over a short period of time. Further, data security is a major concern for NSIs as they have very stringent data confidentiality requirements. Web data collection is a particularly problematic issue in this way. In addition, the modernisation programme at the ONS increased the obstacles to even pilot research being undertaken for Web data collection.



#### *4.2.2 The Shift to Business Surveys*

Not long after these field visits, I began to investigate Web data collection for business surveys and spent time learning about the current data collection procedures used by the then named Business Data Division (BDD). At that time (mid 2003) a leading driver for Web data collection in business surveys was the e-government's targets of 100% options and 50% take-up of electronic interaction with respondents, which were to be met by the year 2005. Thus, there was imminent pressure on the BDD to undertake research and development into Web data collection.

In the course of my initial investigations into the BDD, and as we have already seen in Chapter Two, I learned that they did not have a strong history of methodological work in terms of 'form' (questionnaire) design. Their expertise lies in their forms processing unit, where they have extensively researched and implemented sophisticated optical scanners, which capture respondents' handwritten answers extremely quickly and with a high degree of accuracy. It emerged that the Data Collection Initiatives (DCI) branch of the BDD had undertaken a few attempts at Web data collection trials; the successes and failures of which will be detailed in the following chapter. However, suffice to say at this point that these pilots were in planning as early as 1999 so Web data collection was not a new field of interest in this division.

It was during this time that I brought together the three areas of Web data collection, business surveys and questions surrounding respondents; their acceptance and expectations of the new mode. In addition, the apparent difficulties surrounding the implementation of Web data collection raised questions about expectations from the NSI's perspective. The difficulties of implementation and a key driver were already hinted at in the initial proposal, which read:

Web surveys are already common, though far from dominant, in market research, where there is not the same requirement for probability sampling that official statistics demands. One among several forces driving the development of Web-CASE for official statistics despite serious obstacles is the government's commitment to use the WWW as a means to foster communication with the British public (Modernising government. White Paper, March 1999: Chapter 5, Information Age Government).

At the end of my first year, I wrote a proposal combining these issues, which was subsequently accepted by both the ONS and my academic supervisors.



### 4.3 Research Design

The questions that emerged during the first year of the PhD are exploratory and descriptive. These led to the development of a qualitative study as opposed to hypothesis testing and a survey design. The research design was influenced from both the literature on business surveys and Science and Technology Studies (STS). Within the business survey literature, the value of an explorative approach became apparent. In particular, a study undertaken by Nichols & Willimack (2001) (from the US Census Bureau), in considering how businesses understand questionnaires, used a “broader interpretation of cognitive research” in their research methods, by undertaking qualitative interviews within the business premises. The authors found this method to be informative, noting “investigating broad issues relating to companies’ organisation, information structure and statistical reporting processes from the respondents’ perspectives provides a foundation for subsequent research to improve the quality of business surveys on several fronts”. The desire to examine the topic holistically and consider the social dimensions of Web data collection as well as the methodological issues further suggested a qualitative approach.

In order to address the research questions it was necessary to investigate two areas. The first brings together developments in electronic data collection within NSIs and uncovering the drivers (and expectations) leading these developments. This was achieved by email correspondence with 8 NSIs, through which I gathered documents pertaining to their use of Web and other electronic data collection. The contacts for these NSIs were gathered by a snowballing technique, starting with contacts from the ONS. In addition to the documents, I also posed several questions to the individuals responding to my information request. The answers to these questions provided some insight, albeit unofficial, into the implementation of Web data collection at these NSIs.

The second and focal aspect of the study, understanding the respondents’ perspective, was explored by interviewing current respondents to ONS mandatory business surveys. In order to investigate respondent expectations of Web data collection, and how it would fit into their current response process, it was important to speak with them at length and on their own ground (i.e. within their business). As Silverman (2000:283) notes, qualitative research provides researchers the opportunity to “...focus on actual practice *in situ*...” and this is an important element within this research. Therefore, face-to-face interviews were conducted in the business offices of 30 respondents that had recently completed one of two surveys. Half of the interviews were conducted with current respondents to the Monthly Inquiry into the



Distribution and Services Sector (MIDSS). The other half of interviews were carried out with respondents to the 2004 E-Commerce survey.

The two surveys chosen to form part of the research, MIDSS and E-Commerce, were selected for a number of reasons. Firstly, they represent two main types of surveys undertaken by the BDD – monthly, continuous surveys or short-term surveys, and annual surveys. Monthly surveys are short (generally consisting of 2 to 3 questions) and sampled businesses receive the questionnaire once a month for a fixed period of time of no less than 15 months, depending on the business size. Annual surveys are generally complex and lengthy (with questionnaires consisting of multiple sections and numerous questions) and, as their name suggests, are conducted on a yearly basis. The ONS conducts a third type of survey, which is also an annual survey but consists of multiple repetitions - i.e. businesses receive  $x$  number of the same form (depending upon the size of the business) and  $x$  amount of employees are sampled to complete the questionnaires. This survey type was not included in this research due to its complexity.

The contrast between the first two survey types presented an interesting issue. Originally, it was anticipated that the research would focus on annual surveys as they raise the most questions, and perhaps promise, in terms of Web questionnaire design. However, when deciding which survey to use in the research the Head of the BDD discussed the short-term surveys and noted that a Web option for these would be most beneficial for the ONS, as they are a large number (roughly 550,000) of the 1.8 million questionnaires sent out annually. Questionnaire design and functionality features are limited in these short questionnaires and it is possible that businesses may feel it is not worthwhile to return their data over the Web. On the other hand, as businesses are committed to participating for an extended period, they may see fit to invest the time required into responding via the Web. Further, they may consider this a preferred method of responding to the survey. Consequently, the most beneficial and interesting option was to investigate two surveys; one short-term and one annual. There is very little literature (even from the NSIs) on the use of Web data collection for short, continuous surveys, which presented an additional reason for including a short-term survey in the research. The specific surveys, described in detail below, were chosen by the ONS on the basis that they were seen as most suitable for Web data collection.



### *4.3.1 The Surveys*

MIDSS, as its name suggests, is a monthly survey that gathers turnover figures for the distribution and services sector. There are 96 service industries included in the survey, as defined by the Standard Industrial Classification (SIC). The sectors covered are motor trades, wholesale, hotels and restaurants, transport and postal services, renting, computer and related activities, research and development, business services, health, sewage and refuse disposal, recreation and other services. This list illustrates the wide-ranging types of businesses receiving the questionnaire. MIDSS is a mandatory survey and, as with all mandatory ONS surveys, businesses are liable for penalties should they fail to comply with the request for data.

The MIDSS sample is drawn from the Inter-Departmental Business Register (IDBR), which is an extensive list of UK businesses maintained by the ONS. The IDBR, which holds over 2 million entries, maintains records of all businesses registered for Value Added Tax (VAT), all businesses operating a Pay As You Earn (PAYE) scheme, and those registered with HM Revenue and Customs.<sup>7</sup> Additional entries are made by including incorporated businesses registered at Companies House. Thus the IDBR holds a list of businesses that constitutes nearly 99% of the UK's economic activity (National Statistics, 2002b). In terms of sampling, the size of the business is an important consideration. No universal definition of business size exists, i.e. what makes up a small, medium or large company, but often they are categorised by the number of employees. The categories adopted by the European Union, for statistical purposes, are as follows: businesses with 0 – 49 employees are categorised as small, those with 50 – 249 employees as medium and those with 250+ employees as large. Using these categories 99.3% of UK businesses are small, 0.6% (or 26,000) are medium-sized and 0.1% (6,000) are large (National Statistics, 2004c).

Stratified sampling, by number of employees, is used in order to create the MIDSS sample. Stratified sampling entails dividing the population into a number of strata (based on a predetermined factor(s), in this case employee numbers) and random sampling is undertaken in each strata (Moser & Kalton, 1971:85). Businesses with more than 100 employees within the distribution and services sector are permanently included in the survey, although for some industries the limit is raised to 250 employees. As discussed in Chapter Two, these key

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<sup>7</sup> Many of the UK's very small businesses are not registered for VAT (this is not compulsory unless turnover is more than 56,000 GBP per year) or PAYE schemes (often because the business comprises of a self-employed individual with no or only part-time employees), which results in their omission from the IDBR. Current estimates suggest that there are 4.3 million businesses in the UK (Department of Trade and Industry, 2005)



respondents are vital because their turnover represents a large proportion of the economic activity for these industries. A random sample is taken from three other strata created from the remaining medium and small businesses. In industries where the full-time inclusion point is 100 employees, the strata are 0-9, 10-19 and 20-99. When the full-time inclusion point is 250 employees, the strata are 0-9, 10-19 and 20-249. The sampled businesses are included for a period of 27 months with the exception of very small businesses (under ten employees), which are only included for 15 months after which they will not be included in any (not only MIDSS) survey sample for at least three years. Approximately 30,000 businesses are sampled into this survey per period. Analysed data for the MIDSS survey feeds into the Index of Services, which is used by the Bank of England, the Treasury, Media, City and the ONS Executive. The data also informs the Gross Domestic Product (GDP).

The E-Commerce survey is an annual survey created to measure business use of Information Communication Technologies (ICT). This includes computers, internet connectivity, company websites as well as electronic business activity. This is a relatively new survey that commenced in the year 2000, developed partly in order to meet EU statistical requirements. A sample of around 9,000 businesses from most economic sectors are included in this survey and, like MIDSS, businesses of a certain size are permanently included; in this instance, those with 1,000 or more employees. Those with less than 1,000 employees are randomly sampled from the IDBR. Data from the E-Commerce survey are used internally in the ONS, by government departments such as the DTI and the Office of the E-Envoy, as well as by businesses and researchers. Some non-UK users include EUROSTAT, and the Organisation for Economic Co-operation and Development (OECD).

#### **4.4 Sampling**

The businesses sampled and recruited to participate in the interviews were selected and contacted by the ONS. This course of action was decided upon by the ONS in order to prevent any confidentiality issues from arising. Purposive sampling was conducted by members of the IDBR team, who used the IDBR to identify businesses participating in the selected surveys. The list of current respondents was narrowed down by geographical location, keeping to the south of England and Wales. This allowed travel to and from the interviews within the space of a day and minimised associated costs. The list also identified business size in order to create a mix of small, medium and large businesses. The final list of businesses selected for recruitment was drawn up using the IDBR team's knowledge of the businesses and their past history in responding to the mandatory survey.



## **4.5 Recruitment**

Selected businesses were sent a solicitation letter (see Appendix A) inviting them to participate in the research. The letter was written and signed by the Head of the BDD and provided details of the research. The letter included a return slip, whereby the respondents could indicate whether or not they were willing to participate in the research or not, as well as a pre-paid envelope. Businesses were requested to respond within a fixed date.

Both the method of sampling and the recruiting of participants were not ideal. As per the agreement allowing the research to proceed with their authorisation, the ONS was very much in control for this part of the research. They were, understandably, very aware of the response burden that they already place upon businesses and wanted to have full control over which businesses were contacted and which were not. Further, it was initially suggested that businesses, which did not respond to the request, would not be re-contacted. In the end a number of businesses were contacted telephonically in a follow-up to non-response. In most cases, these were businesses that had previously expressed an interest in responding via the Web.

I was only allowed to contact businesses once they had agreed to participate in the research. Whilst I have concerns about the selection criteria for businesses and also about the lack of follow-up of non-responders, the fact that the research was undertaken under the auspices of the ONS and that they sent out the solicitation letter undoubtedly provided access to businesses that would not have been gained otherwise.

Recruitment was divided into two phases, determined by survey types. The first phase, centring around the MIDSS survey, began in March 2004. 39 businesses, selected by the IDBR team, were sent a solicitation letter by the Data Collection Initiatives (DCI) team. This mailing produced 7 participants and 2 more were recruited via follow-up telephone calls (made by a member of the DCI team). A second batch of businesses were selected and contacted 6 weeks later. However, none of these businesses sent back the return-slip and all businesses from this second batch received a follow-up telephone call. This resulted in 7 businesses agreeing to participate in the research.

The second phase of recruitment, focusing on the E-Commerce survey, began in May and followed the same process. 49 businesses, selected by the IDBR team, were sent a solicitation letter. All of these businesses received follow-up telephone calls, which resulted



in 6 successful recruitments. A second batch of letters was sent to 25 businesses, who all received follow-up telephone calls. This provided the remaining 8 participants.

The businesses that received the MIDSS questionnaire were all part of the distribution and services sector. The E-Commerce survey is not limited to industry type and therefore this diversified the field somewhat. In total, I visited 4 builders' merchants, 3 steel merchants, 3 computer/IT-related companies, 3 food-related businesses (2 manufactures and 1 import), 2 petroleum companies, 2 research companies and 2 publishers. The remaining 11 businesses were as follows: an adhesives manufacturer, an advertising publication, a chemicals and plastic manufacturer, an insurance broker, a management firm, a marquee-hire business, a paper manufacturer, a private health care provider, a shipping company, a telecommunications company, and a tourism company. The businesses were generally located in the south east of England, most within a 65-mile radius of London. More specifically, 10 of the businesses were located within the M25 area, 4 of which were in central London. 13 businesses were located in small and medium-sized towns and cities. 3 businesses were situated in rural locations within this 65-mile radius of London. The remaining 4 interviews took place further afield, with 1 business located in the South of Wales, 1 near Birmingham, and 2 near Peterborough.

	MIDSS	E-COM
Small (<50)	5	4
Medium (50-249)	2	3
Large (250-999)	7	3
Very Large (>1000)	2	4

**Table 4.1 Typology of interviewed businesses by size**

Within these interviews, there was a reasonable spread in terms of business size, something we have already seen to be important. Making use of the EU categories discussed earlier, 16 of the businesses interviewed had more than 250 employees, 5 were in the 50-249 category and 9 had less than 50 employees. Breaking this down one stage further, 6 out of the 16 large businesses had more than 1000 employees. At the other end of the spectrum, 4 out of the 9 small businesses had less than 20 employees.



#### **4.6 Interviews**

The interviews were conducted in two phases over six months, from March to October 2004. The first phase, between March and June, involved respondents to the short-term (MIDSS) survey. The second phase took place between July and October with the interviews focusing upon the annual survey, E-Commerce.

The interviews were centred around the following themes:

- i. The processes that businesses go through in completing the current paper questionnaire
- ii. Current use of, and perceptions of, the internet within businesses
- iii. 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 (see Appendix B). This was in accordance with Kvale's (1996:31) definition of focusing within interviews, whereby the interviews were "neither strictly structured with standardised questions nor entirely 'non-directive'". The interviews were conducted more as a conversation rather than a question and answer session; although a certain degree of the latter was unavoidable.

The interviews were conducted within the businesses premises, usually (but not always) in the office of the individual completing the survey. After obtaining expressed consent from the interviewees, the interviews were digitally recorded. To supplement the recordings, handwritten observations were taken, noting the environment and the participant's non-verbal response to the visual material.

#### **4.7 Visual Aids**

The interviews included the use of visual prompts, which proved to be a fundamental feature of the interviews. At the beginning of the interview, participants were shown a (paper) copy of the mandatory survey being discussed. It was anticipated that this would act as an 'icebreaker' (by taking the focus off themselves) and also jog the participant's memory about the content of the survey and their previous experience of responding. In addition to this, an illustration of how the questionnaire could look on the Web was viewed on a laptop that I brought along to the interview. The Web illustrations were introduced later in the interview,



when discussing design and functionality aspects of Web questionnaires. The Web illustrations are essentially prototype Web questionnaires, created by a computer programmer within the DCI team, whose brief was to create Web versions of the questionnaires in time for the interviews. It is important to emphasise the use of these prototypes as visual aids that stimulate conversation as opposed to actual usability testing of a working instrument.

There is not an extensive literature on the use of visual prompts within interviews. As Hurworth (2003) notes “in comparison with other data collection methods, only a relatively small amount has been written concerning the use of the visual medium for research...” The main body of literature on visual materials in qualitative interviews is dated, although it appears to be making a re-appearance, and often focuses on images gathered through the course of the research. This can be either photographs/video recordings taken by the researcher, or photographs/drawings made by the participant (see for example Banks, 2001; Harrison, 2002; and Hurworth, 2003). However, the usefulness of visual starters in qualitative interviews has been seen in some research. Lorentzson & Trelle (1999), in their research focusing upon health and health education, showed pictures introducing the theme to participants at the beginning of the interview. The authors (1999:442) comment that “the picture opened them up in a more relaxed way than any well-prepared explanation of what was expected in the interview would have done”.

#### *4.7.1 The Paper Questionnaires*

The basic MIDSS questionnaire is very short, consisting of four items (see Appendix C for a full version of the questionnaire). Respondents are first asked to enter the ‘Period’; that is the start and end dates of the monthly period being reported. Respondents are then asked to provide their total turnover for this period. If this figure differs greatly from their previous response, or if the turnover is null, respondents are asked to provide an explanation in the following box. Finally, the respondent’s contact details (name, position, telephone, fax and email address) and signature are required. Every three months (quarterly) an additional item is included in the questionnaire. In this case, respondents are first asked to provide employee details broken down as follows: ‘full-time males’, ‘part-time males’, ‘full-time females’, ‘part-time females’ and ‘total all employees’. There are several variations of the questionnaire, tailored for the specific industry type to which that particular version is being sent. For example, travel agents and advertising companies receive non-standard forms.



The main E-Commerce questionnaire is 12 pages long and comprises of the following six sections:

- A. Your Business (includes questions on computers, internet access, and technologies such as email and electronic data interchange)
- B. Your Employees (percentages of employees' use of ICTs)
- C. Orders Placed by Your Business (types and monetary value as percentage of total orders placed)
- D. Orders Received by Your Business (types and monetary value as percentage of total orders placed)
- E. Payments Made or Received using ICTs
- F. Electronic Links (both within the business and with other businesses)
- G. Interaction with Public Authorities.

A shorter version of the questionnaire, comprising only of sections A and B, is sent to Financial Institutions. Both versions include a final item asking how long it has taken the respondent to complete the questionnaire, followed by name, position and contact details. (See Appendix D for a full version of the questionnaire.)

Both the E-Commerce and MIDSS questionnaires are printed on white A4 paper with text written in black and red. These colourings are standard for ONS questionnaires, designed as such for the optical scanners, whereby red text and boxes 'drop-out' when scanned. The front pages hold a similar format with the National Statistics logo printed on the top left-hand corner and the name of the survey on the top right-hand corner. The name and address of the respondent follows, with space for the respondent to make amendments (for example if the form has been passed on to a different person in the company than the one named by the ONS or the company address is incorrect). Underneath, the company name for which the questionnaire is to be completed, is listed side-by-side with the ONS postal address. The remainder of the front page provides other information such as a contact name and telephone number, the date by which the form should be returned, notice on the mandatory nature of the survey and confidentiality assurance. Finally, some general information about the survey is provided. Figures 4.1 below show the front page of the 2003 E-Commerce survey and the MIDSS reminder questionnaire respectively. These images show both the layout and colour scheme (black and red on white paper) in ONS survey front pages (see Appendices C & D for full size examples).



**national STATISTICS**  
**E-COMMERCE SURVEY - 2003**  
 Notice is given under section 1 of the Statistics of Trade Act 1947  
 PLEASE USE BLACK INK TO COMPLETE THIS FORM  
 Write any changes to your name/address in this box only

TO BE COMPLETED FOR: FROM: Office for National Statistics  
 A Government Executive Agency  
 NEWPORT  
 NP10 8XG

YOUR CONTACT FOR HELP AND QUERIES:

PLEASE COMPLETE AND RETURN THIS FORM VIA POST OR FAX BY

Informal estimates are acceptable if exact figures are not available.  
 Notes are enclosed to help you complete the form or you may telephone your contact named above.

**IMPORTANT:**

- Your response to this survey is very important whether you carry out e-commerce or not.
- Failure to make a return can incur penalties under section 4 of the Statistics of Trade Act 1947.
- It is *illegal* for us to reveal your data or identify your business to unauthorised persons.

**FOR YOUR INFORMATION:**

- The results of the survey are used to monitor the UK's progress in its development and use of e-commerce. The data will also be invaluable for businesses to benchmark themselves against their industry's trends. Comparisons with other European Member States are also available by visiting the website of the European Statistical Office (Eurostat) <http://europa.eu.int/comm/eurostat>
- The 2002 results were published during the Autumn of 2003 on the National Statistics website: [www.statistics.gov.uk/about/methodology\\_by\\_theme/e-commerce\\_returned\\_statistics\\_data.asp](http://www.statistics.gov.uk/about/methodology_by_theme/e-commerce_returned_statistics_data.asp)
- The numbers of businesses and questions are kept to the minimum required to produce reliable results.
- Copies of our code "Maintaining the Confidentiality of Data" are available on request.
- If you wish to use our Minicom service for the deaf please telephone 01633 812399.

THANK YOU FOR YOUR CO-OPERATION

1 03 E-COM 18701011 187T1A

E-Commerce 2003 Cover Page

**national STATISTICS**  
**Monthly inquiries into the distribution and services sector**  
 Notice is given under section 1 of the Statistics of Trade Act 1947  
 PLEASE USE BLACK INK TO COMPLETE THIS FORM  
 Write any changes to your name/address in this box only

TO BE COMPLETED FOR: FROM: Office for National Statistics  
 A Government Executive Agency  
 NEWPORT  
 NP10 8XG

YOUR CONTACT FOR HELP AND QUERIES:

**REMINDER - YOUR FORM SHOULD HAVE BEEN RETURNED BY**  
 Our records show that we have not yet received your return for this inquiry.  
 Please complete and return this form immediately via post or fax.

Please disregard this reminder if your return was posted recently.  
 Informal estimates are acceptable if exact figures are not available.  
 If you have any queries you may telephone your contact named above.

**IMPORTANT:**

- Failure to make a return can incur penalties under section 4 of the Statistics of Trade Act 1947.
- It is *illegal* for us to reveal your data or identify your business to unauthorised persons.

**FOR YOUR INFORMATION:**

- The numbers of businesses and questions are kept to the minimum required to produce reliable results.
- The monthly turnover figures will contribute to early estimates of Gross Domestic Product.
- Copies of our code "Maintaining the Confidentiality of Data" are available on request.
- If you wish to use our Minicom service for the Deaf please telephone 01633 812399.

WE WOULD APPRECIATE YOUR CO-OPERATION

1 00 MIDDS 009001013 09R01A

MIDSS Reminder Cover Page

Figure 4.1 Examples ONS business survey cover page

Guidance notes for the E-Commerce questionnaire and a glossary of terms are included in the questionnaire booklet, located after the front page and before the body of the questionnaire. "Notes to help you complete the form" for the MIDSS questionnaire are printed on a separate A4 sheet and included in the mail-out envelope. However, specific instructions and explanations, such as 'please X one box only' or "Include: laptops. Exclude: the use of electronic tills which are only used for monetary transactions (EPOS) and computer controlled machinery", are integrated in the body of both questionnaires. Both surveys enclose an addressed, pre-paid envelope for respondents to return their completed questionnaire.

The use of the paper questionnaires as a visual prompt, shown as an opener to the interview, was useful in clearly establishing the specific ONS survey to be discussed. Most, if not all, of the medium and large business participants complete several ONS surveys per year. The appearance of the questionnaire often also provoked responses such as 'ah yes, *very* familiar with that', stated in a manner that implied burden. This facilitated questions probing into their perception of the task and response burden.



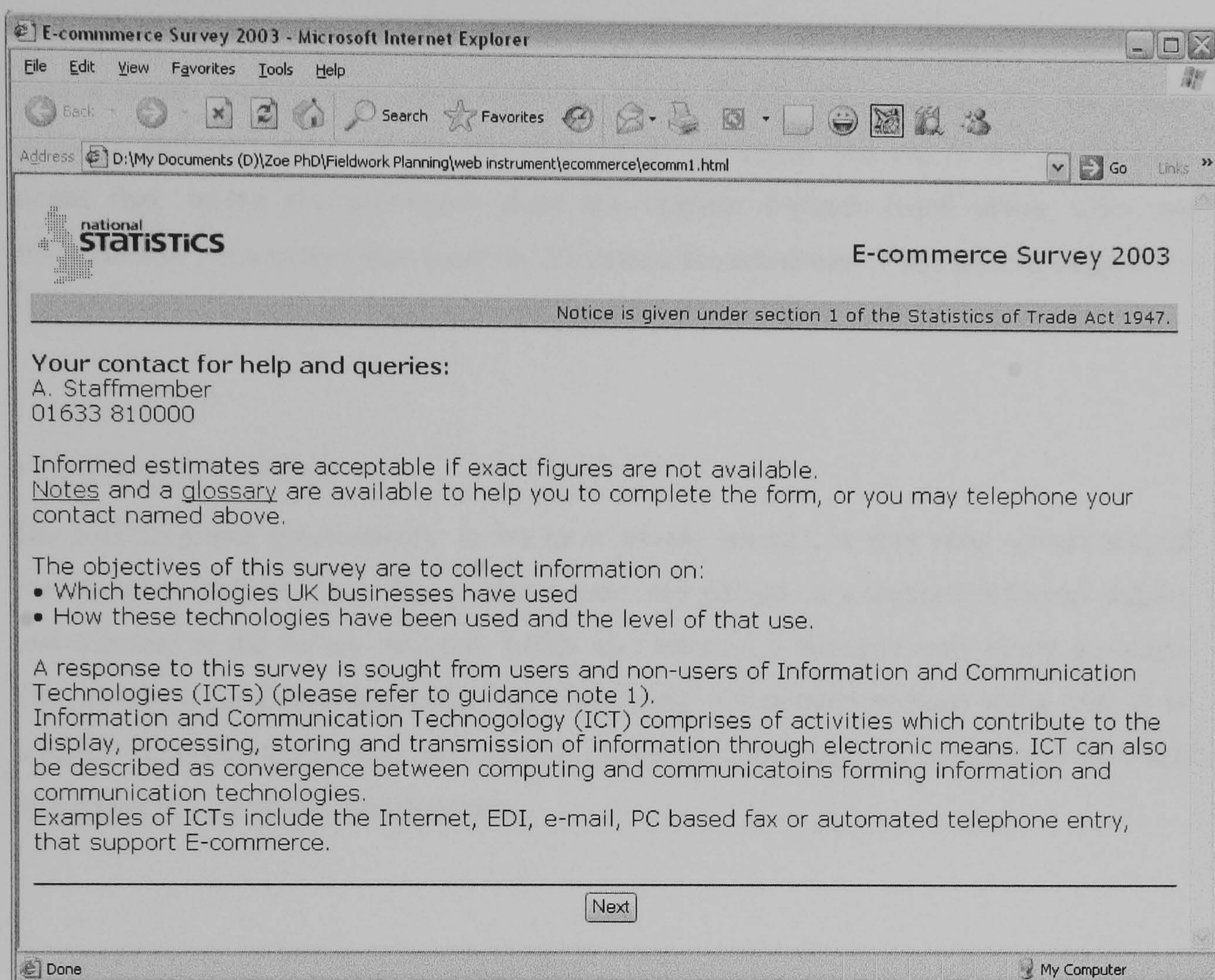
#### *4.7.2 The Web Questionnaire Prototypes*

The key purpose of the interviews was to discuss the possibility of Web data collection with current respondents to ONS surveys. In order to facilitate this, two prototypes of what the respective questionnaires could look like on the Web were created by a computer programmer within the DCI team. There was limited time between selecting the surveys for the study, subsequent recruitment and the first interviews. Thus, the main concern in the development of the prototypes was to have them ready in time for the interviews. As with the sampling and recruitment process, I had no input into the design of the prototype; the programmer made the decisions on design and functionality features.

This section outlines the various design and functionality elements incorporated in the two prototypes; beginning with uniform elements found in each. It is important to note that, whilst these descriptions move from top to bottom, respondents are unlikely to view them in such a linear manner. For example, they may start in the middle of the screen and work around from there. Further, there may be elements that they do not see or register.

The visual elements offered in the prototypes are simple and the design is relatively conservative. (See Figure 4.2 below for a screen shot of the E-Commerce opening page.) The prototypes were created using the same colours; blue text on a white background, which is consistent with the ONS website ([www.statistics.gov.uk](http://www.statistics.gov.uk)). Bold is used for emphasis. Headings are in bold placed within a blue shaded block that runs the full width of the page. Dark blue lines are also used to define sections within a page. The ONS logo is placed at the top left-hand corner of every page and the name of the survey is opposite, on the top right-hand side. On the opening (index) page of each prototype, information on the mandatory nature of the survey (Notice is given under section 1 of the Statistics of Trade Act 1947) is placed in a shaded blue block and right justified so it appears directly below the survey name. Underneath this are contact details of an ONS contact person and telephone number. Respondents are then advised that informed estimates are acceptable and links to the relevant notes/guidance pages follow.





**Figure 4.2: E-Commerce opening screen**

The prototypes both employ radio button response format for yes/no answer options. The only other response format utilised is text entry boxes of varying lengths. These are used as answer fields for dates, numeric data and a longer comment box. Links to the guidance notes, by means of hyperlinked words identified by being underlined and in a light blue colour, appear only at the beginning of both prototypes and are not found elsewhere. When the link is clicked, a new browser window opens and the relevant information is displayed. This information is presented in a similar manner as found in the paper versions. On the main questionnaire window a followed link changes from blue to purple. Finally, both prototypes make use of edit checks to verify the information provided by the respondent. These checks verify various elements, ranging from missing data/item non-response to inconsistent timeframes and totals.

In Chapter Three, we learned that Web questionnaires can be created in two ways; scrolling and paging designs. Both of these designs were utilised in the creation of the prototypes owing to the different characteristics of the surveys used in the study. MIDSS, as a very



short questionnaire, lends itself to the scrolling or one-page design whereas E-Commerce, being a longer questionnaire, lends itself to a paging design. Consequently, the edit checks appear at different stages of completion for each prototype. The use of the two designs means that, whilst the prototypes share the uniform features listed above, there are differences in the way that they function. Therefore, the remainder of this section looks at the MIDSS and E-Commerce prototypes individually.

#### 4.7.2.1 MIDSS Prototype

The MIDSS paper questionnaire, as we have already learned, is very short; comprising of one, double-sided A4 sheet. The guidance notes are printed on a separate A4 sheet and are sent together in the survey mail-out, which also includes a business reply return envelope. The prototype consists of one main page, consisting of five main sections and a total of 14 separate items (see figure 4.3). As indicated above, the notes page can be accessed via a link found near the top of the questionnaire.



Vanilla self-code - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address C:\Documents and Settings\Owner\My Documents\Zoe\web instrument\midss\vanilla self code2.html

**national STATISTICS** Monthly inquiries into the distribution and services sector

Notice is given under section 1 of the Statistics of Trade Act 1947.

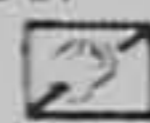
**Your contact for help and queries:**  
 A. Staffmember  
 01633 810000

Informed estimates are acceptable if exact figures are not available.  
 Notes are available [here](#) to help you complete the form or you may telephone your contact named above.

**Important:**

- Failure to make a return can incur penalties under section 4 of the Statistics of Trade Act 1947.
- It is **illegal** for us to reveal your data or identify your business to unauthorised persons.

**For your information:**

- The numbers of businesses and questions are kept to the minimum required to produce reliable results.
- The monthly turnover figures will contribute to early estimates of the Gross Domestic Product.
- Copies of our code "Maintaining the Confidentiality of Data" are available on request.
- If you wish to use our Minicom service for the Deaf please telephone 01633 812399 

Please take note, where values are nil, enter a single zero (0).  
 Thank you for your co-operation.

---

**Period**

1. On what date does the period covered by this return start?  
 DD/MM/YYYY

2. On what date does the period covered by this return end?  
 DD/MM/YYYY

If you cannot supply the exact figures for this period, please give estimates.

---

**Employment**

Include employees at **all sites working** for the business named on the front of the form.  
**Note: part-time means those who normally work 30 hours a week or less.**

3. How many full-time males do you employ?

4. How many part-time males do you employ?

5. How many full-time females do you employ?

6. How many part-time females do you employ?

7. How many employees do you have in total?

---

**Turnover (not including VAT).**

8. What is your total turnover, including fees receivable?  
 Round your answers to the nearest £ or EURO thousand. For example, 1,702,800 = 1703.  
 ,000

---

**Remarks**

9. Please enter your remarks in the box below to:

- give an explanation if your turnover/employment is significantly different from that given in your last return;
- give an explanation if your turnover is zero (0);
- list any businesses covered by this return other than the one named on the front of the form, giving full names and VAT registration numbers.

---

**Contact Details**

10. Please give the name of the person to be contacted if necessary.

11. What is the position does this person hold in the business?

12. What is their telephone number?

13. What is their fax number?

14. What is their email address?

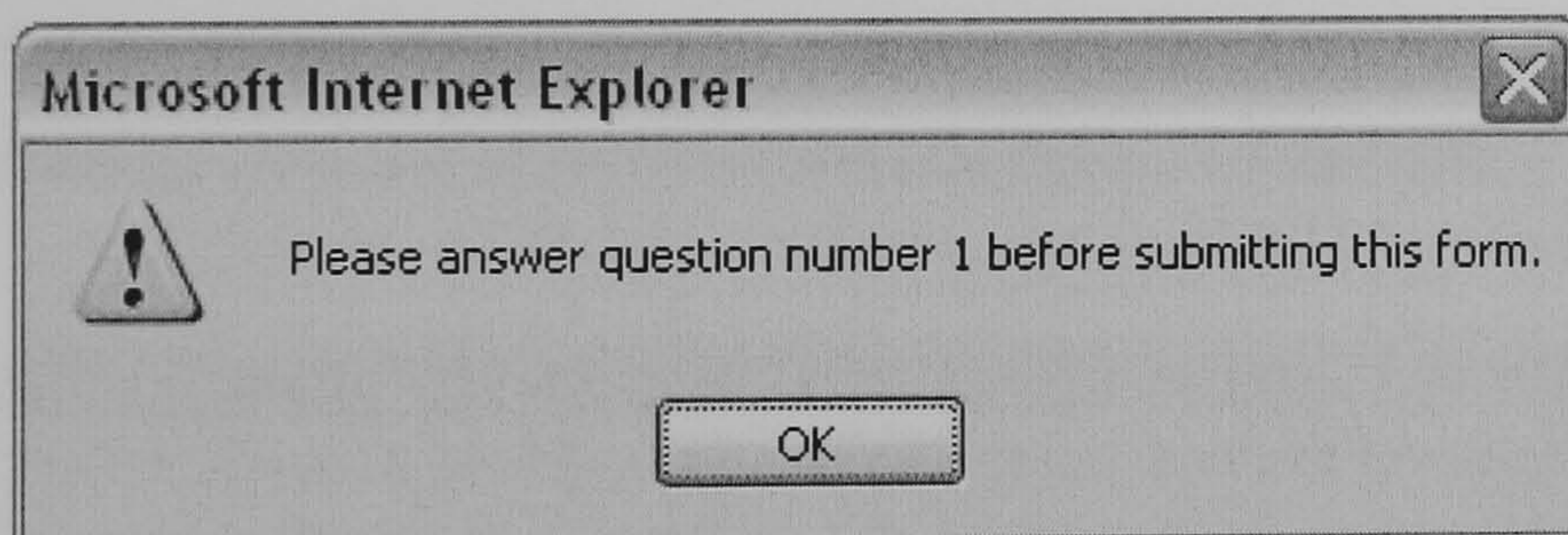
Done My Computer

Figure 4.3 MIDSS Web prototype



Edit checks on the information entered by the respondent take place at the end of the questionnaire upon clicking the 'submit' button. They are designed to perform a number of checks, working chronologically from question 1 to question 14. Problems are identified individually, by the appearance of small 'pop-up' window that provides details of the problem. So, for example, if a respondent has problems with questions 1 and 5, she will first be informed about the problem in question 1 and asked to rectify it. Upon clicking the 'OK' button in the pop-up window she is taken directly to the question 1, with the cursor blinking in the data entry field. After fixing the problem, she then has to scroll down to the bottom of the page and re-click the 'submit' button. The checks are carried out again and the next problem, in this example question 5, is identified with another pop-up window, and so on.

The simplest edit check determines that all compulsory fields have been completed. In this instance, all questions are compulsory apart from question 9 'remarks', (a comment box for respondents to provide details of any significant variance in their turnover from the previous return or any other useful information) and question 13 (requesting a fax number in the final 'contact details' section). If information has not been entered for a compulsory question, a pop-up window appears asking the respondent to complete the specified question before submission can take place (see figure 4.4). If the respondent has not completed other questions, the same message, but with the relevant question number, will appear after resubmission until all compulsory questions have been completed.



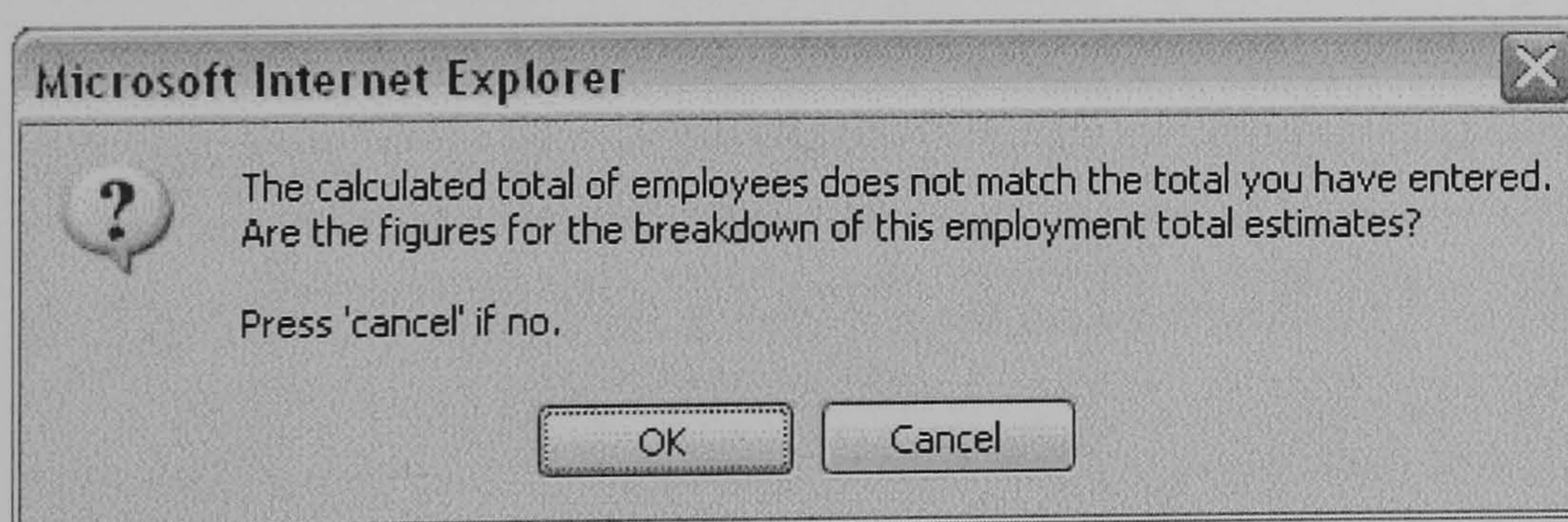
**Figure 4.4: Compulsory question edit check message**

The other edit checks pertain to individual questions. We shall look at these in turn. Questions 1 and 2 ask about start and end dates for the turnover period. The desired date format (DD/MM/YYYY) is illustrated above the data entry box and the fields are designed to allow only numeric characters. However, respondents do have some leeway when entering this information; the date is automatically formatted with the forward slash should the respondent omit it whilst entering the day, month and year.



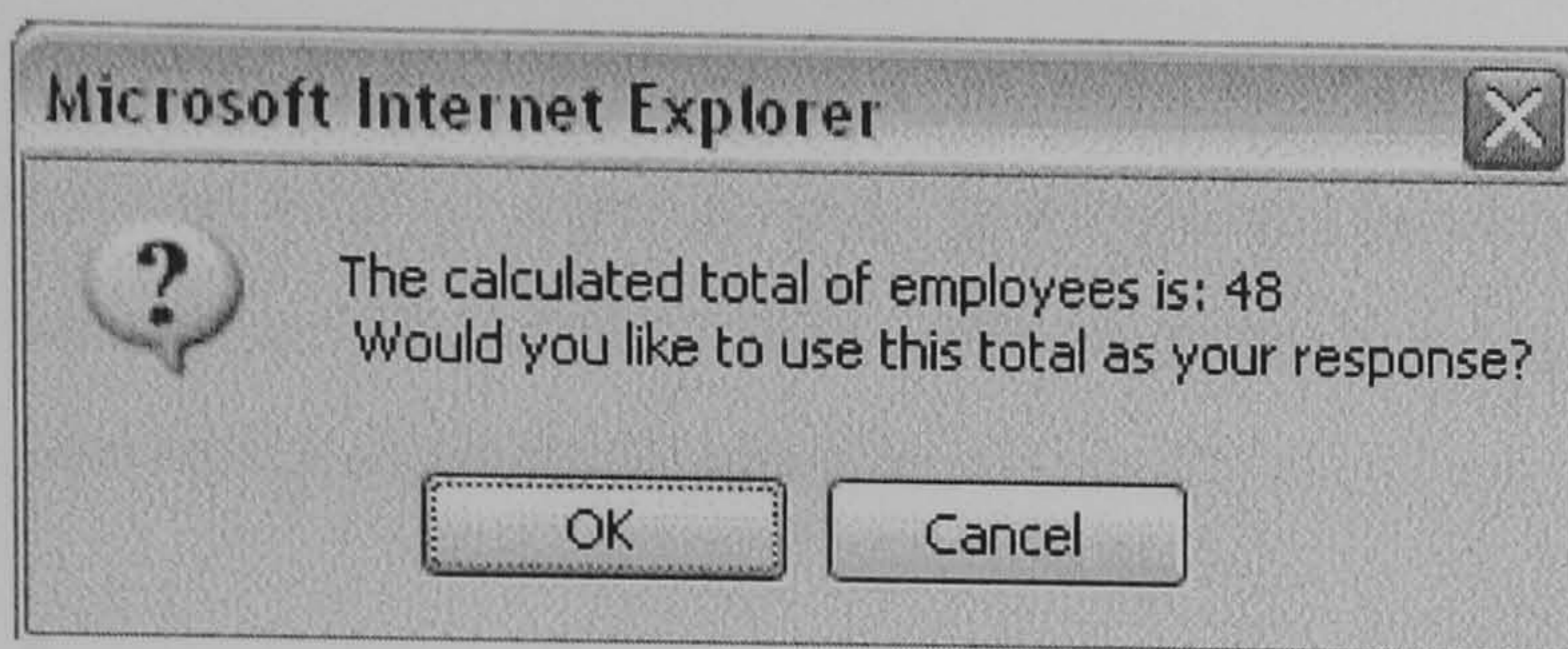
A few other edit checks relating to the turnover period questions are included. An error is flagged should a respondent type in a year before 2004 (“The year you have specified is too far in the past. Please specify a valid year”). Additionally there is a check for the correct number of days in a month. For example if a respondent entered 31/09/2004 the following error appears upon submission: “Only days between 1 and 30 are valid for September. Please specify a valid day for the date in question number 2”. Finally, a check is also incorporated for inconsistencies in the period. For example, if a respondent has said that the period starts on 01/10/2004 and says the period ends on 30/09/2004, an error message will be triggered, stating: “The end of the reference period must be later than the start of the reference period. Please specify valid dates for this question”.

The Web prototype includes the additional employee questions that are asked quarterly and so the next section comprises of questions 3 to 7; full-time males, part-time males, full-time females, part-time females and total number of employees. These figures are to be entered in numeric format, although this is not indicated on the questionnaire and nor are respondents restricted from entering them alphabetically. However, should a respondent type in the word ‘twelve’ instead of the number ‘12’, an edit check will inform them as such but only after they have completed the questionnaire and clicked upon the ‘submit’ button. Finally in this section, an edit check determines whether the answer given for question 7 (total number of employees) corresponds with the sum of the figures provided in the previous 4 questions. Respondents are permitted to provide estimates if they do not have the exact figures. If the figures do not add up, the edit questions whether this is intentional or not. Initially, this edit message consisted of two windows (see figures 4.5 and 4.6).



**Figure 4.5: Edit check message for total number of employees**

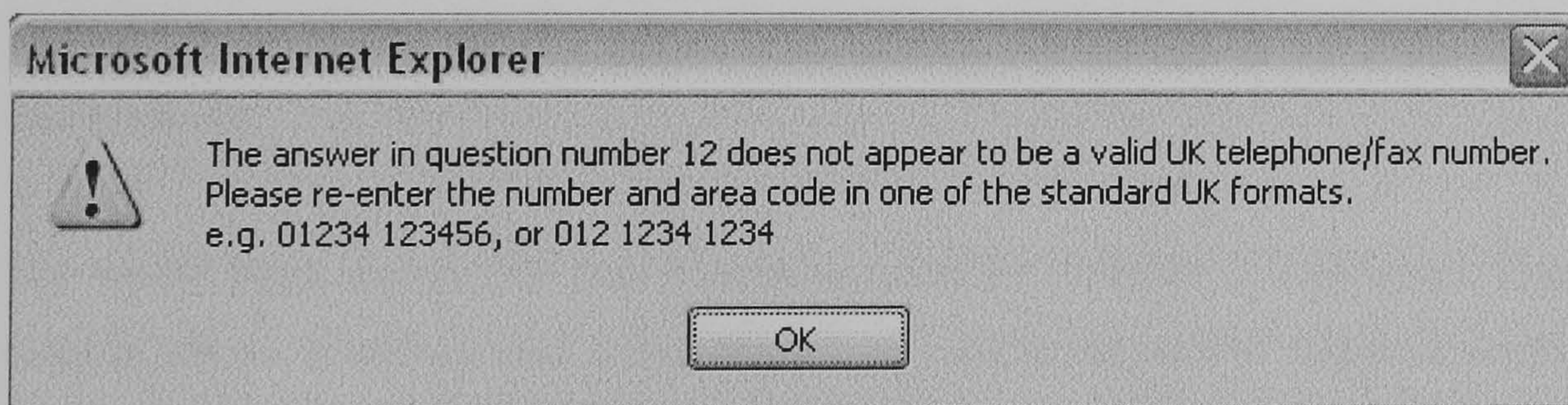




**Figure 4.6: Edit message appearing after respondent clicks 'cancel' in figure 4.5**

However, the programmer of the prototypes participated in the 5<sup>th</sup> MIDSS interview and, seeing the confusion arising from the wording of the above messages, changed the wording of the initial message to read as follows for the remaining MIDSS interviews: “The calculated total of employees does not match the total you have entered. The calculated total of employees is: 48. Would you like to use this total as your response?” The respondent then has the opportunity to click on ‘OK’ or “Cancel”. If they click upon ‘OK’, another message appears noting that the “response has been amended to calculated total”. Alternatively, if they click cancel, they are then asked to amend the number of employees given so that it matches the total number of employees.

The next section consists only of question 8, which asks for the turnover figure for the specific period. Again this figure is to be entered in numeric format and if other characters are detected the respondent will be requested to re-enter their information numerically. As noted earlier, question 9, ‘remarks’, is not a compulsory field and therefore does not have any checks. The final section, ‘contact details’, contains the questions 10 to 14. An edit check for question 12, which requests a telephone number, is programmed to ensure the respondent enters a valid UK telephone number (figure 4.6).



**Figure 4.7: Edit message for invalid UK telephone/fax number**

The same check is performed at question 13, which asks for a fax number. However, this is not a compulsory question and the edit message only appears if a number has been entered and it is not a standard UK number. The final question, asking for an email address, will



produce an error message if a '@' sign does not appear in the address or if the address does not end with a '.com' or '.uk' or similar domain. Once all the checks have been performed and any problems have been rectified, the final message: "Validation complete. Your form is now being submitted" appears.

#### 4.7.2.2 E-Commerce Prototype

The E-Commerce questionnaire, discussed earlier in this chapter, is substantially longer than the MIDSS questionnaire and comprises of multiple sections. Thus the Web prototype of the E-Commerce questionnaire was created as a paging design. The paging design, as reviewed in Chapter Three, means that respondents can only see a certain number of questions per page and are required to click upon the 'next' button in order to proceed with the questionnaire. This design, unlike the one-page MIDSS scrolling design, may make the questionnaire appear less similar to its paper counterpart.

Only the first section of the E-Commerce survey is included in the prototype, a result of the time constraints on the study noted earlier. This section, asking questions about the respondent's business, is 3 paper pages long and has 8 separate questions. This translated into a total of 10 individual Web pages, including the opening page, notes and glossary pages and the closing screen. The opening page (see figure 4.2 in section 4.7.2) provides only some of the information given on the front page of the paper questionnaire; additional details about the survey under the 'for your information' section in the paper front page are not included. However, information about the survey, including the objectives of the survey on the first question page of the paper version, is included on this opening screen. As noted earlier, the opening screen also contains links to the 'notes' and 'glossary' pages. A 'next' button is centred at the bottom of this screen, which takes respondents to the first page of the questionnaire.

The second page, and the first page containing questions, consists of 2 questions. These both require yes/no responses and radio buttons are employed as the response format. The response given for question 2 determines which question that the respondent will see on the following page. In the paper version, if a respondent selects 'no', he is instructed to 'go to question 7'. However, the prototype makes use of automatic routing and if a respondent selects 'no', he will be taken directly to the appropriate question upon clicking the 'next' button. Those respondents that select 'yes' to this question are taken to what is question number 3 on the paper questionnaire. All respondents see questions 1, 2, 7 and 8. Automatic



routing is employed for questions 3, 4, 5 and 6. Respondents will see these questions depending upon their answers to questions 2 and 4.

In this prototype, the majority of questions are grouped according to their routing requirements. Questions 1 and 2 are grouped together, as are questions 3 and 4. Questions 5 and 6 are dependent upon the answer to question 4 and so appear on a single page. Question 7 is not dependent upon any previous question and all respondents are asked it; however it is placed on a single page. This is the result of the following question, question 8, which has a whole page to itself. Question 8 is a multi-item question, asking respondents whether their “business have the following technologies” with 7 items listed below. This question is presented in a matrix format, whereby the name of each item is written in bold with a brief description/explanation placed directly beneath the term. The response options (yes/no) are indicated by radio buttons that are found on the right-hand side directly opposite the item name (see figure 4.8).

**E-commerce Survey 2003 - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Address  Go Links

**Section A - Your Business** (please refer to guidance note 2)

**On the last working day of 2003, did your business have the following technologies?**

For each category, please select either yes or no

	Yes	No
<b>External email</b> electronic message transmission with external businesses	<input type="radio"/>	<input type="radio"/>
<b>Intranet</b> an Intranet uses the same technology as the Internet but over a private or internal network	<input type="radio"/>	<input type="radio"/>
<b>Extranet</b> this is an Intranet set up by a business for its internal use but which also allows other companies that do business with them to have access. It is not available to the general public	<input type="radio"/>	<input type="radio"/>
<b>Automated telephone entry</b> option driven automated system using the telephone keypad, with personal contact as an option only, of the type typically used for ordering cinema tickets	<input type="radio"/>	<input type="radio"/>
<b>Mobile computer technology</b> a mobile Internet connection allowing you to access e-mail or the Internet when you are away from the desk, for example, by using WAP enabled telephones or laptops	<input type="radio"/>	<input type="radio"/>
<b>Wide or Local Area Network (WAN or LAN)</b> a network in which computers are connected to each other over a short distance, usually in the same building (LAN), or over a long distance, often between geographic sites (WAN), using cable, telephone lines and satellite communications	<input type="radio"/>	<input type="radio"/>

Back Next

Done My Computer

**Figure 4.8: Matrix format used in Question 8**



The Web prototypes proved to be an extremely valuable aspect of the interviews. It is worth reiterating that they were used as a visual aid in the interviews in order to facilitate discussion on what, if any, design and functionality features a respondent may desire or indeed expect. Some participants freely had an attempt at completing the questionnaire and, with prompting, discussed design and functionality features. In this instance, this section of the interview could be viewed as moving towards a cognitive interviewing approach. In other interviews, however, participants resisted my request to 'have a go' at completing the questionnaire, even after assurances that no data was collected and they could enter false information. At this point, I would take the initiative and fill out the questionnaire with the participant as the observer. This allowed them to see specific features of the questionnaire and promoted discussion. In this case, the Web prototypes acted clearly as a visual prompt.

It is not clear why some participants were receptive to completing the mock Web questionnaire and others were not. It seems to have been more to do with the perception of the task (too simple/pointless) as opposed to fears about disclosing confidential information. In a few instances, my taking the initiative and entering some fictitious data seemed to prompt the participant to contribute when looking at a later section or revisiting a section of the questionnaire.

#### **4.8 Analysis**

The data gathered in the research was analysed thematically. This approach "seek[s] to unearth the themes salient in a text at different levels" (Attride-Stirling, 2001). Broad themes were developed from the initial reading of the literature, which helped form the interview guide. The themes were developed during the interviews and subsequent analysis. The data was systematically coded using the initial coding framework devised from the themes discussed in the interviews. The code list<sup>8</sup> was revised; codes were renamed, added or removed, as the analysis progressed. This allowed the development of key and sub-themes, or, as Attride-Stirling (2001:389) suggests in the construction of thematic networks, basic themes, organizing themes and global themes. Analysis continued into the writing-up phase, with the continual development of thematic elements in the data.

The interviews were transcribed verbatim and the transcriptions imported into Atlas.Ti, a Computer-Assisted Qualitative Data Analysis Software (CAQDAS) used to assist analysis. It is worth noting that the emergence of such software (a new technology within qualitative

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<sup>8</sup> See Appendix E for the full list of codes.



research) brought considerable debate (Barry, 1998). Some researchers claim that it would impede the analysis process by placing constraints upon the researchers, limit their access to the data and perhaps even direct the course of the analysis. Others researchers claim the contrary, such software packages can only serve to strengthen the analysis process, by increasing the researcher's closeness to the data, allowing better management and opening up the analysis process to more rigorous scrutiny. Atlas.ti was chosen over other available CAQDAS packages as it allows closeness to the data. Coded segments are retrieved with ease and are viewed within their original context. Overall, there was limited use of Atlas.Ti's more advanced capabilities. Rather, the software was used primarily as a data management tool; to organise the data and utilise the code and retrieve functions.

#### **4.9 Additional Research at the US Census Bureau**

In early 2005, I was awarded ESRC funding for a 3-month overseas institutional visit to the Establishment Survey Methods Staff at the US Census Bureau in Suitland, MD (outside of Washington, DC). The majority of this visit, from April to June 2005, was spent working on a usability project for two annual economic (business) surveys that are being migrated to the Census Bureau' 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.

Together with a member of the Establishment Survey Methods Staff, I conducted an expert review of both prototype instruments and made recommendations to the relevant subject matter staff and the Census Taker programmers. Following the expert review, and changes made to the Web questionnaire as a result of the review, we recruited 20 businesses (generally current respondents to the surveys) by telephone to participate in usability interviews. The interviews were conducted by a member of the methods staff (in the majority of instances this was myself) and an observer, either a member from the subject matter team or from the programming team. These interviews were carried out over a four-week period from 16 May until 10 June 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.

It is worth pointing out that the Census Taker questionnaire, although still a prototype, was fully functioning and differed greatly in visual appearance from the UK prototypes (see figure 4.9). For example, the Census Taker questionnaire has a light olive background. Questions are enclosed in a box, which is a few shades lighter than the overall background. The questionnaire also has a navigation box, coloured in pale yellow, placed underneath the questions, towards the bottom of the page.

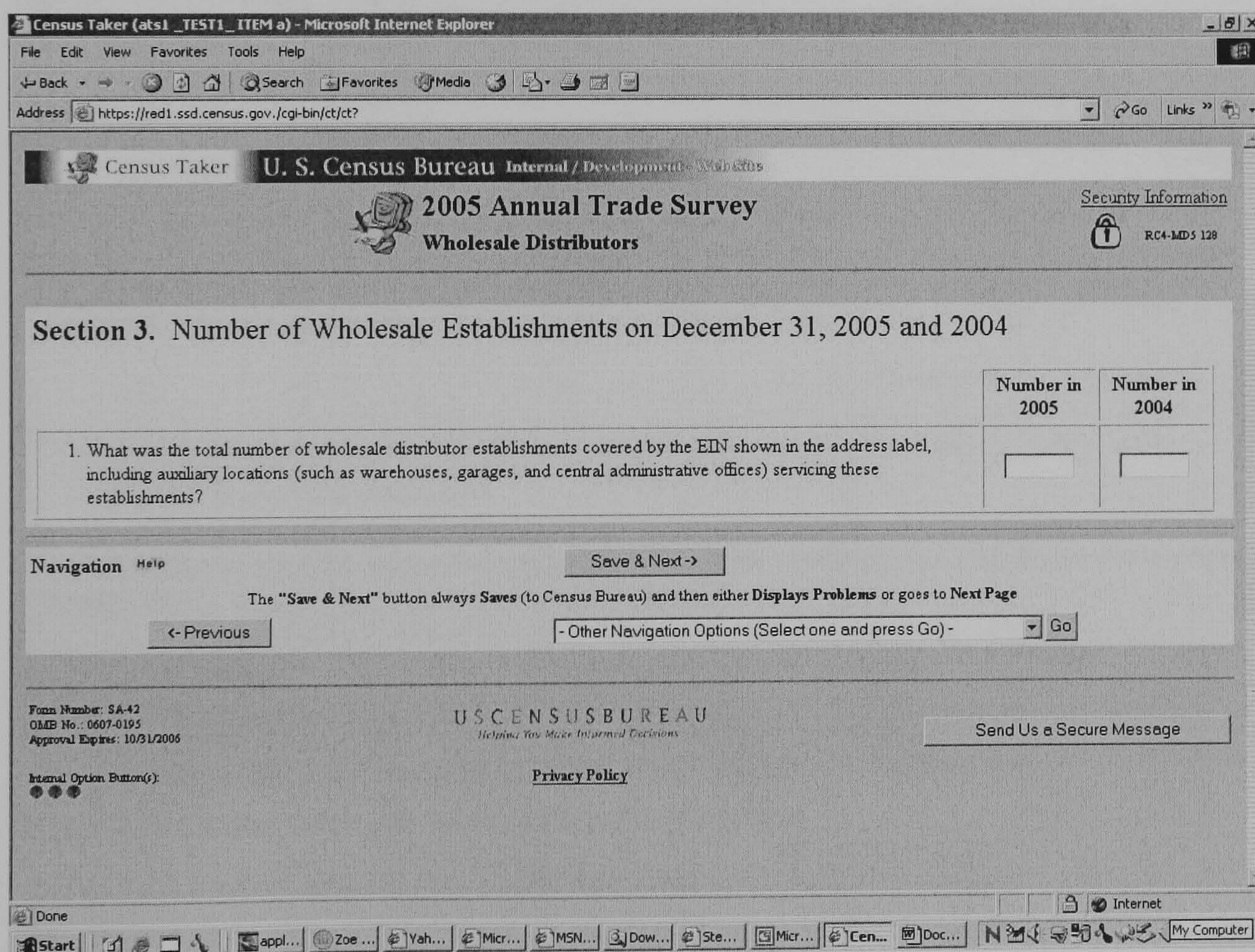


Figure 4.9 Census Taker screenshot



Another example of differences between the prototypes is found in the notification of problems during the edit check (see figure 4.10). In the UK E-Commerce prototype, as we learned earlier, edit checks take place each time the respondent clicks upon the next button. If a problem is identified, the respondent is notified by means of a pop-up window. In Census Taker, page-by-page checks are also in place, although a respondent is able to ignore the problem and move on. Such problems will be re-identified during the final edit check that occurs before submission at the end of the survey. In the final edit check, when problem(s) are found, the respondent has to select an edit that is listed in a drop-down box and then click on the 'Go' button to be taken to that page. Pages with problems have text at the top of the page indicating there is a problem and asking the respondent to move down to locate it. A hazard symbol appears next to the problem with textual messaging, informing the respondent about the nature of the problem.

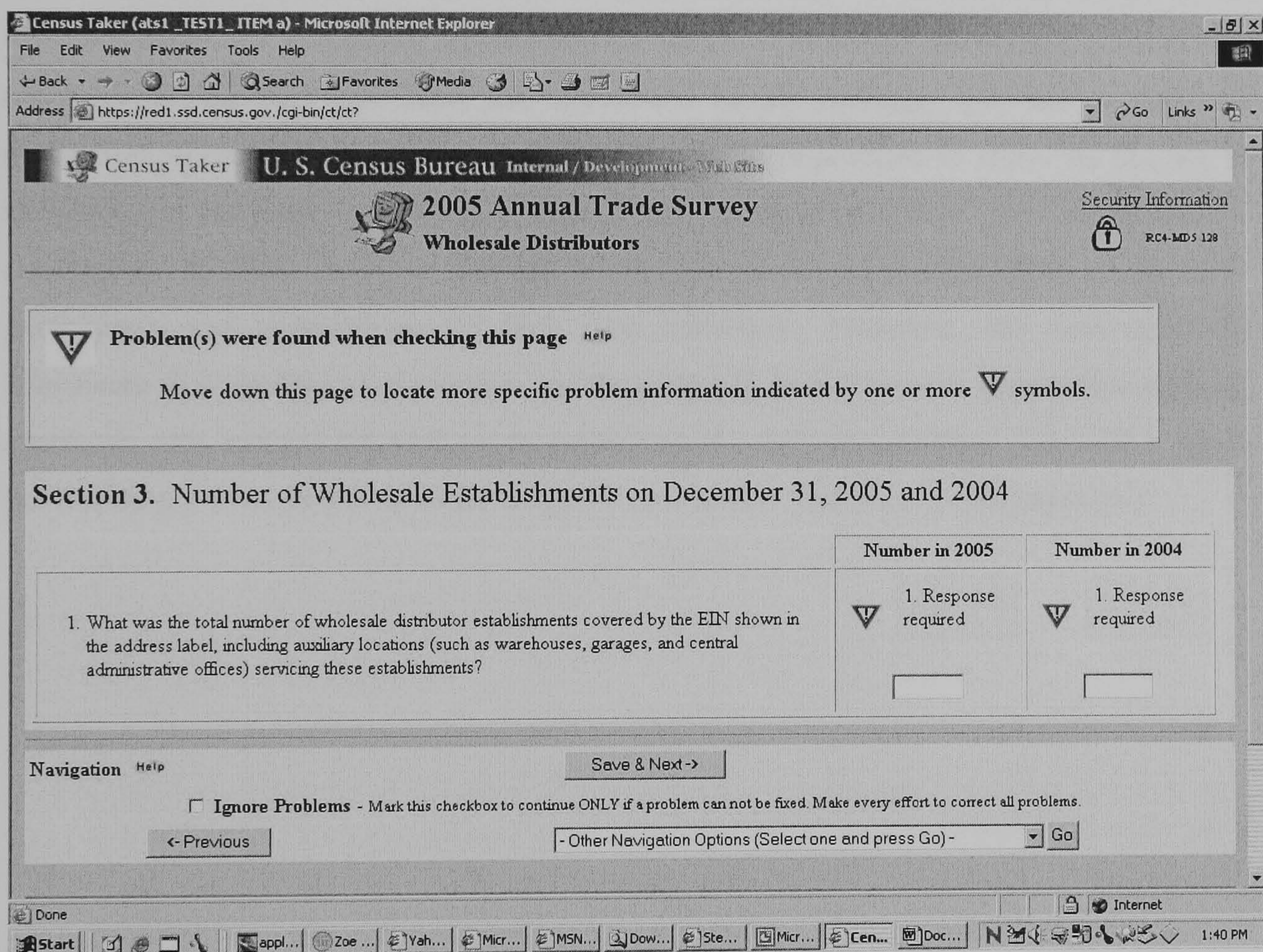


Figure 4.10 Census Taker edit check notification of problem

The three month visit to the Census Bureau contributed to this thesis in a number of ways. The empirical work with the respondents is similar to the UK research and provides some international comparative data with regards to design and functionality aspects of Web questionnaires. These findings largely corroborate the UK findings and are discussed with



the relevant findings in the analysis chapters.<sup>9</sup> Secondly, working at the Census Bureau for a three month period provided fuller integration in an NSI than the weekly visits to the ONS allowed. I learned a great deal about official business surveys and was able to experience, in part, the implementation of a new mode of data collection. All of these elements provided insights into the UK data and the thesis as a whole.

#### **4.10 Conclusion**

Overall, the methods employed are successful in achieving the aims of the research. However, they do have certain limitations. The interview data are limited to a certain extent by the purposive sampling technique employed. There was no opportunity to speak to respondents that would not be open to, or even strongly against, the use of Web data collection. Likewise, the use of snowballing for contacting NSIs limited the scope of the institutes contacted. It could be considered that the use of prototype Web questionnaires with restricted functioning may limit the application of the findings; this was a simulated experience of responding via the Web. In this way, it is possible to argue for the use of ethnographic methods that observe respondents completing a live questionnaire to be returned to the ONS. However, the aim of the interviews was to explore the respondents' perceptions and expectations of Web data collection. Therefore, the semi-structured interviews that facilitated discussion on these topics was the most appropriate method. Moreover, this method allowed me to experience the different environments within which the mandatory surveys arrive, which helped contextualise Web data collection further.

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<sup>9</sup> The main data and findings discussed in this thesis arise from the UK interviews. Accordingly, any findings that are discussed from US research are clearly identified as such.



## CHAPTER FIVE

### ELECTRONIC DATA COLLECTION WITHIN NATIONAL STATISTICAL INSTITUTES: A SNAPSHOT

#### 5.1 Introduction

Many new technologies implemented within NSIs have helped to improve various aspects of the survey process. This includes statistical methods, processing and, the focus of this thesis, data collection. Electronic data collection (EDC) is far from a new tool for NSIs. We saw in Chapter Two that CAI was widely adopted for household surveys in the early 1990s, made possible by the emergence of laptop computers and is now a primary mode of data collection for these surveys. More recently in social surveys, many NSIs have either used or are exploring the use of the Web for their general population census. For example, the US Census Bureau and Statistics Norway offered a Web option for their respective 2001 general population census. The Australian Bureau of Statistics (ABS), Statistics New Zealand (SNZ) and Statistics Canada all offered a Web option for their respective 2006 general population census.

de Leeuw *et al.* (2000:1) observe that the adoption of new technology for data collection has been slower in business surveys. In a review of data collection methods by 13 statistical agencies, undertaken in 1998, they found that postal questionnaires are used in 85% of all business surveys. However, change is taking place. A similar study undertaken in 1992 (reported by de Leeuw *et al.*) found that 48% of business surveys used mail only methods. This had decreased to 32% in 1998 (de Leeuw *et al.*, 2000:2). By the millennium however, NSIs were adopting TDE, IVR and to a lesser extent other electronic methods; including diskette by mail, email returns and electronic data interchange (EDI<sup>10</sup>). It is important to note that EDC options are almost uniformly developed and implemented within a mixed mode environment; with paper questionnaires still the primary mode.

The implementation of such new technologies has far-reaching impact. As we saw in Chapter One, Parent & Jamieson (2000:383) of Statistics Canada, claim that “the emergence of technology in all aspects of data collection, has radically changed the way we plan, design, and execute such activities”. This sentiment is echoed by Keller & Willeboordese

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<sup>10</sup> EDI is the transfer of data between companies using a network, such as the internet.



(2000:403) of Statistics Netherlands. The implementation and use of these new technologies both shape and are shaped by these organisations and so it is important to view the technologies in the institutional context.

This chapter focuses upon the use of three types of EDC for NSI business surveys (dedicated software on respondent's computer, email and email attachments and Web questionnaires) with a view to positioning the emerging use of the internet (and Web in particular) for receiving and returning questionnaires. This is a very current area and much research is on-going; therefore the documentation is somewhat limited, particularly so in terms of external dissemination. In this way, the chapter does not aim, nor claim, to be a comprehensive account of all developments occurring within all of the NSIs discussed. Rather, the developments help raise a number of issues around the implementation of new technologies for data collection and place the current research into a global context.

The chapter presents a snapshot of the use and development of these EDC methods at eight NSIs, namely Australian Bureau of Statistics (ABS), Statistics Canada, Statistics Netherlands, Statistics New Zealand (SNZ), Statistics Norway, UK Office for National Statistics (ONS), US Bureau of Labor Statistics (BLS) and the US Census Bureau. As noted in section 4.3 of the previous chapter, the data in this chapter was gathered by email communication with the participating NSI employees, who provided both informal comments via email as well as documents from their NSI on EDC. This was done in 2004, the same year that the study participants were interviewed. The employees were identified by a snowball sampling method and were often approached after an email introduction by another NSI employee. They were asked about their NSI's past and current work in EDC for business surveys and asked to provide documentation (internal reports, conference papers, published articles) where possible. In addition, each employee was asked for their own thoughts on their NSI's move towards EDC; the benefits and pitfalls of the new modes, the drivers, and any cultural variability that they may recognize within their own country.

The email exchanges generally took place over the period of several months. The documents and email communication data were analysed and subsequently broken down into the three main types of EDC named above. The drivers towards EDC (discussed in the second part of this chapter) mostly emerged from the email communication. Where relevant, the documentary sources are cited. The remaining data arises from the email communication. Finally, it is worth noting that each NSI employee had the opportunity to review a draft of this chapter and at this point often provided updated information.



The chapter is organised into two main sections. The first section is a discussion of three types of EDC available for business surveys; dedicated software, email/email attachments and finally Web questionnaires, which provides the organisational context within which the technologies are implemented. The second section explores the drivers acting as an impetus for NSIs to research and implement EDC. The chapter concludes by drawing together what we have learned about the implementation of these new modes; the expectations that NSIs have and how these expectations were formed.

## **5.2 Electronic Data Collection**

In its broadest sense, electronic data collection (EDC) encompasses all types of Computer-Assisted Interviewing (CAI), such as Computer-Assisted Self Interviewing (CASI), Computer-Assisted Telephone Interviewing (CATI) and Touch-Tone Data-Entry (TDE). As noted in the introduction, this chapter explores three types of EDC within business surveys; namely 'dedicated software provided to respondent', 'email or email attachment' and 'the Web'. It should be noted, however, that whilst useful for the purposes of this chapter this typology is not without contest, both in the terminology used and the boundaries between these modes, which can overlap. Dedicated software and Web questionnaires are both data collection instruments. Email, however, can be both a data collection instrument and a data transmission technology. For example, dedicated software can use (encrypted) email as a method to return the data. Further, this typology does not distinguish between the different levels of structure and design that can vary between and within each of these classifications.

### *5.2.1 'Dedicated software provided to respondent'*

'Dedicated software provided to respondent' requires the respondent to install software, provided by the NSI, onto a desktop. The software, which is often, but not always, in-house software that is created and developed within the NSI, contains the questionnaire and any other documentation that the respondent may require. This type of EDC emerged before access to the internet was widespread, thus initially respondents both received the software and returned their data on floppy disk, although there was some use of FTP for data return. More recently, data returns are likely to be done automatically via FTP, email or the Web. The software may simply be an electronic version of the paper questionnaire or it may make use of extensive functionality allowed by the electronic medium.



Statistics Canada has used this mode since the early to mid 1990s and, in 2001, they began a project to develop the potential offered by both dedicated software and Web EDC (Best, 2003). The software option, PRES (Personalised Reporting and Exchange Services), was developed primarily for very large businesses, with the software encrypting data provided by the respondent allowing secure transmission back to Statistics Canada via either email or FTP. The questionnaire is an Excel based form, consisting of a covering sheet (containing survey information and instructions) and the questionnaire itself. An electronic version of the Quarterly Survey of Financial Statements (QSFS) was created in this manner.

Statistics Netherlands has also made use of this type of EDC since the early 1990s. Roos (2003) reports that respondents for the International Trade Statistics survey have had the option to send data electronically, via their CBS-IRIS<sup>11</sup> software tool, since 1<sup>st</sup> January 1993. This software must be fully installed on the respondent's computer and can be either sent to respondents via a CD-Rom or emailed (as the compressed application is only 2MB). The CBS-IRIS software makes use of Blaise technology for the data entry form, menu options and code lists. Blaise is a system for data entry and survey design developed and used by Statistics Netherlands for more than 15 years. The program is also used by many other NSIs for CAPI and CATI interviews (Lina, 2003). The current version of the CBS-IRIS software was developed using Blaise 4.5 and has a semi-fixed import facility, which allows a certain amount of data to be imported into the relevant fields. Completed surveys are returned via floppy disk or email. As of 2003, over 8000 (or 25%) of the 32000 respondents of the survey use this mode of response.

More recently, in Spring 2002, Statistics Netherlands developed an electronic version of their Traffic and Transport Survey (Kerssemakers, 2003:3). A lengthy and detailed form, it was decided that a number of forms (in a hierarchical design) using a data entry program would be the most appropriate tool, resulting in a similar response procedure to the International Trade Statistics. The electronic version of the Traffic and Transport survey proved to be reasonably successful in terms of take-up, with around half of the businesses receiving the software actually making use of it to return their data. However, a few issues arose. A number of respondents filling out the form in a multi-site situation reported some difficulties in the completion of the survey, for example an important person could be at a different (distant) geographical location. Respondents also requested the inclusion of a print facility. Finally, data security remains problematic and thus Kerssemakers (2003:11) suggests this could hinder Statistics Netherlands' use of the internet for business surveys.

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<sup>11</sup> IRIS stands for Interactive Registration of International Trade Statistics.



In addition, Kerssemakers (2003) reports that the development of the Traffic and Transport survey, which was both challenging and rewarding, highlighted the need for standards or guidelines for electronic forms; although the complexity of this survey made it too difficult to develop such guidelines. A year later, in March 2003, an electronic version of the Vacancies and Absentee Rates survey was deemed necessary. This survey had demanding, but not too intricate, design features and was therefore considered appropriate for the development of standards for both dedicated software and Web questionnaires. This development is discussed in the subsequent section on Web questionnaires.

The Australian Bureau of Statistics (ABS), as part of a research and development learning exercise, developed electronic versions of two business surveys and by 2001 had conducted initial testing and evaluation of these forms (Burnside & Farrell, 2001). The surveys chosen were the Internet Activity Survey (IAS), which is a quarterly census of Internet Service Providers and the Business Expectations Survey (BES), which collects mostly qualitative data on projected levels of key economic activity. The EDC version of the IAS involves software on the respondent's computer and will be discussed below, whilst a Web questionnaire was created for the BES. Again, the development of this Web version is discussed later in this section.

The electronic version of the IAS was created as an application installed on the respondent's computer, using 'off the shelf' software, Jetform FormFlow99. This was the more complex form out of the two surveys chosen, containing a number of edits, extensive help features, and combined navigation and a progress indicator. It also employed a range of response formats. Perhaps unsurprisingly considering the survey content and the target audience of ISPs, testing showed respondents expected a Web-style form (as opposed to an application). Other findings from testing include the desire for extended help features, 'tooltips'<sup>12</sup> for buttons, the ability to complete in more than one session, the inclusion of 'flags' for skipped questions and the ability to print the form upon completion.

In Norway, a system for Municipality and State Reporting (KOSTRA) was established in 1994 with the same kind of software as the Australian IAS. The project was developed with the goal of improving data reporting between municipalities (and counties) and the State. In particular it aimed to enhance data quality and reduce financial and human resources (Sæbø

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<sup>12</sup> A tooltip is where the mouse cursor hovers over an item, without clicking it, and a small box appears with additional, often explanatory, information about the item.



*et al.*, 2002:3). The KOSTRA pilot ended in 2002 after electronic reporting was made obligatory in 2001 for all 435 municipalities and 19 counties.

In 2001, the Norwegian Tax Authorities launched an electronic declaring system for the Tax Form that businesses could install on their computers. Statistics Norway also included the questionnaire for Structural Statistics in the system. The software was not a success and was taken down in 2003, after just one year in normal operation. However, the collaboration that was established between the Tax Authorities, Statistics Norway and The Brønnøysund Register<sup>13</sup> during this project led to the development of a common internet portal for all compulsory business forms, called AltInn.<sup>14</sup> As we will see later, Statistics Norway also developed their own internet portal, which has been their main systems for Web questionnaires to this day. However, it is anticipated that their portal will be integrated with AltInn in the future.

The US Census Bureau has also created a survey application that is installed on the respondent's computer, called Surveyor (Hak *et al.*, 2003a). The application is accessible as an internet download or can be provided on a diskette or CD Rom. In 2002, all respondents to that year's Economic Census were offered the option to provide their information electronically. The Economic Census takes place every five years and is a key source for many economic indicators, including the US Gross Domestic Product. The questionnaire is tailored by industry, which results in more than 550 versions of the questionnaire.

Upon opening Surveyor, respondents are presented with a window that provides them with general information about the electronic form. After viewing this, respondents proceed to the 'survey inbox'. The inbox is the main information area of the application, holding a list of all questionnaires that the respondent is required to complete, one for each establishment. Respondents use the inbox to move between questionnaires as well as print and submit questionnaires. The inbox also displays information about the questionnaires, including whether or not the questionnaire contains any errors or warnings. Respondents complete the questionnaire by keying in data or they have the option to import data through a preformatted spreadsheet. This option, however, requires respondents to map relevant items to the spreadsheet columns for each questionnaire that their business is required to complete.

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<sup>13</sup> An institution that runs all business registers in Norway

<sup>14</sup> AltInn = *Alternativ Innrapporteringskanal* = Alternative Data Submission Channel



The Census Bureau has conducted on-going research to enhance Surveyor for the next Economic Census in 2007 as well as the development of general recommendations for other electronic business surveys in their organisation (Hak *et al.*, 2003a:58). Research on Surveyor took place both during and after the 2002 Economic Census, comprising of 9 'on-site real-time visits' with very large businesses and 15 'retrospective on-site debriefing visits' with smaller companies. This research provided valuable insights about the application and the electronic questionnaires. For example, the need to map relevant items to the spreadsheet columns in order to use the import function was considered too burdensome. Also, the 2002 version of the software did not allow businesses to install the software on more than one computer, which prohibited the software being shared with other people in the company. This was particularly difficult for respondents with a decentralised reporting system. These examples help illustrate both NSI usage of this type of EDC and a few of the issues that arise in the development of such software, in terms of usability and respondent requests.

Another issue that is becoming more problematic is the ability of respondents to download software onto their computers. Some businesses are preventing employees from doing so and as a result, this option is becoming more and more limited. These examples also show that this type (and any of the subsequent types) of EDC is not developed in isolation. Already we can see that different types of questionnaires are considered to suit different modes of EDC.

### *5.2.2 Email and email attachments*

The dedicated software, as we saw above, can make use of email/email attachments to return the respondent data. However, this is not the only possible use of email. With the introduction of email addresses in their contact details, some NSIs have found that the inclusion of this address has led to a number of businesses making use of email to return their information. The Census Bureau, over concerns about data security, has not made any efforts in this area. However, they do accept data that has been emailed from respondents, although this practice is not encouraged. The ONS also has experienced an increasing number of data returns sent to their generic email address but again this method of return is not encouraged.

Statistics New Zealand (SNZ) has reported a similar experience. They have included a generic email address on many of their business surveys since 1997 and subsequently, SNZ found that more and more respondents were returning their data in this manner. This led



them to develop a standard response format and in early 1999, they actively encouraged respondents of the Retail Trade Survey<sup>15</sup> (RTS) to send their data via email (McBeth *et al.*, 2001). Email returns were again actively encouraged later in the year in the hope of improving timeliness.

McBeth *et al.* (2001), conducting an analysis of the RTS email returns using 4 sets of data gathered over 8 months from December 2000, found that an average of 70 businesses (equating to 2% of sample) responded via email. These email responders were more likely to be businesses with large numbers of geographical units and accounted for 9% of the total sales figure published from the survey (McBeth *et al.*, 2001:5). Email return times prove to be slightly faster than mail, with 50% of email returns received on day 9 and 50% of the total sample received by day 12. However, the gain in timeliness of response is countered by issues within the data received, such as unclear data, item non-response and the absence of identifiers. Another issue, which also applies to EDC in general, is the integration of electronic returns into the existing data processing systems.

The ABS, in addition to the dedicated software discussed earlier, also uses email attachments for despatch purposes for some surveys, including a limited number of Excel spreadsheet 'eforms' for several collections. Respondents return their data by uploading the completed 'eform' in the ABS 'Secure Deposit Box', which is a secure website. Like the other NSIs, the ABS does not use email attachments for data return owing to security concerns.

Another example of the use of email attachment is seen in the early years of Statistics Norway's KOSTRA project. In 2002, most respondents were sending their data by email attachment, using 128-bit encryption. In this year Statistics Norway moved away from email attachments and conducted a test for reporting using XML<sup>16</sup> in 2002. Again, timeliness of the data is reported to have improved, which has had a notable impact on the timeliness of the statistics' publication. Statistics Norway expects that this will further improve as this EDC matures. They also anticipate that the XML format will be developed further and become the standard means of responding in the future. This example leads us to the final type of EDC considered in this chapter, Web questionnaires.

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<sup>15</sup> The RTS is a monthly survey that gathers single sales figures for each geographical unit of the businesses surveyed. 4000 businesses are surveyed, resulting in data from around 7900 geographical units (McBeth *et al.*, 2001:3)

<sup>16</sup> Extensible Markup Language, or XML, is a simplified version of SGML (Standard Generalized Markup Language). It is more flexible than HTML, the original language, and provides more freedom when designing a Web page.



### 5.2.3 Web questionnaires

The rapid growth of the Web as a feature within workplaces allows NSIs to consider the Web as part of their data collection toolkit and as such, various NSIs are creating Web options in conjunction with other EDC options or are looking to replace existing EDC options with Web data collection. SNZ, for example, is developing a Web based data collection system to replace their email system, discussed in the previous section (McBeth *et al.*, 2001:9). Web, it is thought, provides more control over the data and thus will resolve some of the problems that they experience with the email system.

In the early 2000s, Statistics Canada developed a data collection system hosted on a Secure Internet Response Site (SIRS). The system is primarily aimed at small and medium businesses and more suitable for short surveys completed in a single sitting (Best, 2003). Businesses are sent a solicitation email, directing them to a dedicated page on the Statistics Canada website where they can complete the survey. The solicitation email includes their ID and password. Upon accessing the survey URL, respondents are presented with an opening page asking them to select either English or French, thus allowing them to complete the survey in the language of their choice. Respondents then proceed to a welcome/information screen, which in turn leads to a login screen, providing access to the one page questionnaire. Finally, respondents view a confirmation page, letting them know they have successfully submitted their data.

An electronic version of the Business Conditions Survey was created in this manner and implemented in December 2002, followed by a number of other surveys. Statistics Canada has experienced varying levels of take-up for this type of EDC (Best, 2003:14). The electronic option for the Business Conditions Survey has received take-up rates ranging between 9% to 36%. In contrast to this, the electronic version of the Quarterly Survey of Financial Statements, implemented in March 2003, has enjoyed a substantial take-up rate of 75%. The option to respond electronically has been extended to a number of other surveys, with varying degrees of take-up, ranging from 15% for an agricultural survey (Stocks of Frozen Meats) to 45% for the Computer Service Providers survey.

When designing these questionnaires, Statistics Canada aimed to balance usability and data quality, opting for minimalist editing and applying basic formatting to the questionnaires. This approach appears to have been successful as findings from the returned electronic forms displayed improved timeliness and cleaner data, which exhibit some immediate benefits from EDC. However, Best (2003) notes that there needs to be an analysis undertaken on



mode effects between the electronic and paper returns. Security issues are also an on-going concern at Statistics Canada but Kovar & Labillois (2003) comment that the gap between good data security and usability is no longer immense, which greatly assists the movement towards online data collection. However, the apparent conflict between NSI security requirements and ease of use for respondents is an ongoing challenge.

The ABS (Burnside & Farrell, 2001), at the same time as developing a dedicated software option for IAS, used the Business Expectations Survey (BES) to create a server-based Web-form. This was a one page questionnaire, using a scrolling design (but with permanently visible toolbar), to be completed in one sitting. Help was presented in a separate window that popped up after clicking on a help button, definitions of questions were similarly accessible. Two versions of the Web-form were developed in order to test various design features. These included response formats (radio buttons vs. drop-down box), question and response layout (side-by-side vs. directly underneath) and immediate edits (a version with and a version without). The testing found that respondents tended to prefer radio buttons and did not seem to mind if immediate edit checks were present or omitted. However, the BES was abolished shortly after testing and so the HTML form was not deployed in practice.

From both their testing and evaluations of Web questionnaires, as well as software on respondent computers (discussed earlier) the ABS gained various insights into EDC. Overall, it was found that respondents expect EDC forms to work in a similar manner to the normal functioning of the application that they were using – for example Excel spreadsheet or HTML Web page. Respondents wanted “access to help or definitions to be convenient and immediate” (Burnside & Farrell, 2001:4). Finally, the testing also demonstrated respondents’ desire for a print function and the ability to complete the forms in multiple sessions.

The ONS has undertaken two pilot studies on internet data collection. A number of businesses from the Quarterly Products of the European Community (PRODCOM) inquiry were recruited to submit their responses via the internet. A Web version of the PRODCOM questionnaire was created and eventually piloted with 65 respondents. Web responders initially received a letter providing details about the survey, a URL and password. Any further communication, including reminders, was undertaken via email. The other pilot (Survey of Business Enterprise Research and Development) differed from the PRODCOM pilot in that businesses were asked to register online before they were able to complete the Web questionnaire. The Research and Development pilot received 83 Web returns, which was 22% of the total response received. The main aim for both pilot studies was to



investigate the potential for Web data collection and the costs/savings involved in order to move further towards development and implementation.

The pilots provided the ONS with useful feedback from the respondents that highlighted difficulties respondents faced when re-visiting the questionnaire to amend data. The edit checks in place were seen to be overly burdensome and some respondents reported trouble in accessing the questionnaire website. In addition, requests for printing facilities were received. In the R&D pilot, the registration process resulted in delays. However, positive feedback was also received with many respondents finding the Web to be quick and user-friendly. In this research, the ONS piloted a 'reward system', which allowed respondents to view data comparing their business with trends across the industry as a whole. Unfortunately, little feedback was received regarding this feature.

In the US, both the Bureau of Labour Statistics (BLS) and Census Bureau are very interested in Web data collection and offer the option to respond via the Web for a number of their business surveys. As we saw in the previous chapter in section 4.9, the Census Bureau has a Web data collection option, Census Taker, that is used for both social and business surveys. In 1996, the BLS created and implemented a Web version of the Current Employment Survey for a small number of respondents. Since then, BLS has undertaken detailed research into usability aspects of Web data collection. From this research, the importance of a 'user centred design' has emerged and a number of guidelines have been formed (see Fox *et al.*, 2003). All BLS Web surveys are standardised. That is, they are accessed through a common portal and they all have the same look and feel. Levi & Fecher (2002:2) note "a common infrastructure and set of standards facilitates access for respondents who supply data to multiple surveys and establishes a recognizable (branded) organisational presence". In terms of data collection mode, their usability research suggests that there should be consistency across modes whilst taking advantage of the strengths of the particular medium (e.g. paper or Web). Security and confidentiality remain an on-going concern. Finally, they also suggest further research on the use of edits (employing hard or soft edits) is necessary in order to optimise their use, without being a burden/irritation to respondents.

The BLS has found that respondents will often make use of their prior knowledge of the Web when responding via this mode. This has implications for the design of the questionnaire, in particular upon navigation. In their discussion on usability and Web questionnaire design, Fox *et al.* (2003:2.6) highlight a Federal law, Section 508, which "requires electronic and information technology (including websites) that are developed,



procured, maintained or used by the federal government to be accessible to people with disabilities. This law also applies to self-administered, Web-based surveys, where a major concern is the accessibility by visually challenged respondents". This requirement has a bearing upon colour and other visual design elements within the Web questionnaire. It is worth noting that Section 508 applies to all federal statistical agencies, not just the BLS.

Following on from their work with dedicated software on the Traffic and Transport survey (discussed in section 5.2.1), Statistics Netherlands developed a Web version of the Vacancies and Absentee Rate survey in 2003. A number of features were incorporated in the initial design of the Web form (Kerssemakers, 2003:7-9). A multi-pane design was created as the designers felt that help should be readily accessible but without over-burdening the respondent with text. The body of the questionnaire was positioned in-between a menu on the left, containing navigation buttons, and a help pane, containing explanatory notes, on the right. The Statistics Netherlands website colours and logo were used in the design as well as a visual progress indicator. Screen resolution caused a problem in that the lower resolution of 800 by 600, in which the form was initially designed, distorted the alignment of the panes. As a result, the form was designed with a screen resolution of 1024 by 786. Kerssemakers (2003) does not comment on how this will affect respondents whose computers do not support this screen resolution. Statistics Netherlands is committed to using Blaise IS for their Web forms and Roos (2002:2) notes that Blaise IS 2.0 is currently being developed and will be entirely XML- and SXL based, which will provide improved functionality for both scrolling and paging questionnaires.

The above account of these three types of EDC use is, as noted at the beginning of this chapter, merely a snapshot and does not provide a comprehensive account of all EDC developments within all the NSIs discussed. However, it does provide some insight in the ways that NSIs are making use of these types of EDC; selecting what they deem to be the most appropriate method for particular surveys. Some of the NSIs use all three modes. Statistics Norway, for example, employs dedicated software to collect structural data for industries and trade, and email for the monthly Retail Trade and Consumer Price Indices. From 2002, the first Web versions of the Monthly Retail Trade Survey were available through the IDUN<sup>17</sup> portal, followed by other business surveys (Sæbø *et al.*, 2002:4/5). In 2004, Web versions of all new business questionnaires were available in this IDUN portal or in the previously mentioned AltInn portal. A first version of design and functionality

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<sup>17</sup> IDUN = *Informasjon og Datautveksling med Næringslivet* = Information and Data Exchange with Businesses



principles for Statistics Norway's Web questionnaires was published in 2004 (Haraldsen & Notnes, 2004). Other NSIs, however, have been slower to adopt any of these methods for their business surveys. The ONS, for example, does not encourage email returns and has only piloted Web questionnaires.

Expectations of these EDC by NSIs appear to include increased timeliness in response and in some cases quicker publication of the findings. In addition, some NSIs report cleaner data from the EDC systems and therefore improved data quality. The snapshot also highlights numerous issues with EDC. NSIs need to make the design useful for respondents. This includes incorporating a print function, extended help features and the ability to complete the questionnaire in multiple sessions. Important issues surrounding data security and integration into NSIs' existing data processing systems were raised. Another issue surrounding the implementation of Web data collection (or indeed any new mode of data collection) is that of take-up of the new mode.

This brief snapshot only hints at a few of the difficulties that NSIs face when investigating and implementing a new mode of data collection. In addition to those outlined above, they face broader internal, external, monetary and political constraints. Given these challenges, it is worth asking what factors lead the research and development of EDC for NSIs and so the second part of this chapter, to which we now turn, investigates the drivers leading these EDC attempts.

### **5.3 Drivers leading Electronic Data Collection**

The drivers leading the development and implementation of EDC can be divided broadly into three categories. First, and most often cited, is that EDC offers improvements to current systems. Secondly, many governments have e-government policies, of which NSIs are required to adhere. Finally, NSIs are responding to the arrival of new technologies in society. These three drivers are considered in turn below.

#### *5.3.1 Offers improvements*

For most, if not all NSIs, the movement towards EDC, and Web data collection in particular, is at least partly driven by a desire to capitalise on the benefits that the mode appears to promise. In short, Web data collection is perceived to offer improvement to their current data collection systems.



The wish to improve on current systems is not new to NSIs. Over the past ten years, as noted in Chapter Two, the ONS has invested a substantial amount of time and resources into improving its business data collection, with the over-arching aim of reducing response burden by improving efficiency within the Office. In the mid-1990s, the DCI team was created with the aim: “to reduce the cost and increase the efficiency of data collection for business surveys; to reduce the burden on the contributor; and to improve the quality and timeliness of data” (Baird *et al.*, 2002:5). Since their creation, the DCI team has implemented various electronic systems, such as optical scanning of returned paper questionnaires (using Intelligent Character Recognition (ICR) to capture most data electronically) and TDE for a number of surveys. TDE is now offered as a mode to respond in 40% of short-term inquiries and accounts for 20% of all returned business forms (Baird *et al.*, 2002; Thomas & Baird, 2001). As with other NSIs Web data collection may be the next electronically sophisticated step in achieving the goals of reduced costs and response burden with increased efficiency, quality and timeliness. These interlinking drivers are considered in turn below.

Cost efficiency and savings are an important consideration for all NSIs and one that should not be underestimated. Likewise, the impact of the perceived potential for reducing survey costs via EDC should not be underestimated. With EDC, there is the prospect of cost-savings on printing, mailing and data entry. One NSI employee stated, “the main driver behind the introduction of Web data collection will come from the research institutes in their pursuit of cutting costs of data collection” and many NSIs explicitly cite cost savings as a driver for EDC. However, whilst there is much discussion on the potential of EDC (and the Web in particular) to reduce survey costs, this is yet to be borne out in practice. There is a lot of invisible work that goes into the development and subsequent maintenance of these systems. Nardi (1999:2) comments: “Because of the extreme division of labor [sic] in postindustrial society, work is, in a sense, always invisible to everyone but its own practitioners”. As a result of the invisible work surrounding the development and maintenance of these systems, as well as the continuation of existing data collection modes, NSIs may initially underestimate the costs associated with Web data collection.

Consideration of respondents is another oft-cited driver. NSIs wish to provide respondent choice, diminish response burden upon businesses and respond to user demand. Labillois (2002:2) reports that a recent survey found 56% of Canadians and 85% of businesses have a desire to respond to surveys via the internet. Therefore, the implementation of EDC responds



to user demand and in doing so, Statistics Canada also hopes to reduce respondent burden, improve data quality and timeliness. This is true for other NSIs, such as the BLS, the Census Bureau, Statistics Netherlands, SNZ and Statistics Norway.

Whilst users may be voicing a desire for EDC, take-up rates of these new modes remains problematic in practice. In May 2002, Statistics Netherlands commenced their 'E-Quest' (Electronic Questionnaires) project (Roos, 2002:9-11), which aimed to add EDC as a response option for a number of their short-term panel business surveys. Businesses in this panel were sent short questionnaires, generally seeking turnover data, either monthly or quarterly depending upon the information required. Statistics Netherlands hoped to convert around a third (9,000 of the 27,000 businesses participating in these panels) into electronic respondents.

These respondents were recruited by a number of methods over a period of several months. Initially, all panel members were sent a personalised letter, detailing the advantages of responding electronically, whilst requesting an email address. A month later, all respondents received a brochure, which covered ten topics about electronic response including security issues, advantages and limitations. This appears to have been the least successful method of recruiting respondents. Finally, panel members were contacted by telephone, where businesses, which were not registered and met certain criteria in terms of number of employees and trade, were asked if they were able to provide an email address and if so, whether they willing to respond electronically. A combination of these methods led to approximately 7000 businesses (or just over a quarter) signing up for electronic data collection. Roos (2002:11) notes "whether respondents are going to participate depends on their (technical) ability and their willingness". He goes on to say that respondent willingness can be increased by a multi-contact campaign that outlines the advantages of EDC. These findings are corroborated by research at the Census Bureau, which also undertook research that attempted to convert respondents to electronic reporting for their monthly, Manufacturers' Shipments, Inventories, and Orders survey (M3) (Hak *et al.*, 2003a; Hak *et al.*, 2003b). The study employed different methods in the conversion process, informational letter, calling and visits. The authors conclude that "an active conversion strategy help in moving respondents from a non-electronic mode fax/mail) to an electronic mode" (Hak *et al.*, 2003a:57)

The reduction of response burden is another respondent-centred driver for EDC. It is thought that providing respondent choice may positively impact upon response burden. The ability of



EDC to reduce response burden may rest upon a reduction of perceived burden. Aplin (2000:2) from the ABS, notes that EDC itself may not reduce burden but rather “the provider’s perception of the load will diminish if they can choose their preferred method of interaction with the ABS” (this is also linked to user-demand discussed above). Accordingly, provider choice is a main motivator at the ABS, and many other NSIs, but again they also hope that EDC may have a positive impact upon data quality and timeliness. Whether respondents perceive an option to respond via the Web as a reduction in their response burden remains unclear. Only Statistics Norway and the Census Bureau have undertaken any research into respondents perception of response burden but their findings are not always conclusive, as we shall see below.

In 2002, Statistics Norway instigated their IDUN (Information and Data Exchange with Businesses) project, which aims to improve data quality and speed, resulting in decreased burden for businesses. An additional feature in this project is that businesses are provided with feed-back on their own information, simple statistical analysis of their data, links to relevant statistics or market information. Businesses are also able to see basic information about their business held on the Business Register, with the ability for them to update that information (Sæbø *et al.*, 2002:4).

Haraldsen (2004) conducted a series of qualitative interviews in order to test the Web questionnaires for the Monthly Retail Trade Index Survey and Quarterly Investment Statistics, implemented as part of the IDUN project. As part of these interviews, Haraldsen investigated the concept of response burden, work that we have already addressed in Chapter Two. Surprisingly, even though the Web version took longer to complete, all participants reported the Web questionnaire as being less burdensome than the paper version. Haraldsen (2004:8) notes, however, that it is possible the participants thought this was the expected response and thus he appears doubtful about the permanence of this positive view of the Web questionnaire, believing it is somewhat of a novelty. Rather, in order to reduce response burden in the long term, the administration of the questionnaire (often troublesome in business surveys owing to different responsibilities in different departments within a business) as well as the design, wording and flow of the questionnaire need to be carefully considered, making use of features that will assist in ease of completion. These features, Haraldsen (2004:10) notes, include the use of automatic routing and tailoring question wording in order that it fits the respondent’s situation.



Research at the Census Bureau provided some important findings in this area. These findings largely corroborate the above research, burden being a subjective experience for the respondent. In research for the M3 survey, discussed earlier, Hak *et al.* (2003b:1725) found that burden in business surveys predominately arises from the number of survey requests and the work or effort required to comply with these requests. Respondents in this research who moved to Web data collection found they preferred this method even though it took more time, generally citing the following reasons (Hak *et al.*, 2003b:1727):

- Respondents do not need to move from their desk to file the report.
- Web reporting fits with how they see their work developing in the future from paper-based to paper-less.
- Some feel more confident that data have actually and safely been submitted.

In this way, the Census Bureau research appears to substantiate NSI expectations that Web data collection may reduce perceived burden. However, Hak *et al.* (2003b:1730) end with a note of caution by commenting that “this was a self-selected group who reported electronically precisely because they had decided beforehand that they were going to like electronic reporting, despite all ‘objective’ advantages of reporting through fax”.

The final areas to consider within the ‘offers improvements’ drivers, are those of quality and timeliness. Quality, we saw in Chapter Two, is a growing and key concern for NSIs. In 1997, Morganstein & Marker (p475) suggested that “a systematic approach to improving quality throughout an agency has been missing”. Over the past decade quality has received a notable increase in attention and as a result more active steps are being taken to ensure quality. Quality does not just refer to the accuracy of the data produced but to a wider range of elements. Colledge & March (1997:501) of the ABS and Statistics Canada respectively, discuss quality as referring to ‘relevance, accessibility, accuracy, timeliness and costs’ (costs occurring both from the NSIs’ perspective and from the respondents’ perspective). These are similar to the concepts discussed by Elvers (2000) of Statistics Sweden, who also highlights the difficulties of measuring quality, particularly that of accuracy and non-sampling errors. Nevertheless, improving quality is an oft-cited driver for the implementation of EDC.

In terms of data quality, electronic modes offer NSIs the ability to add edit checks for problems such as missing items, consistency and formatting checks. These features may improve the quality of data that the NSI receives and in turn, the use of edit checks may lower data editing time at the NSI and reduce the number of call-backs to respondents to verify data, all which could improve timeliness. Timeliness, as we have seen in the previous



section, can be improved by EDC as data submission is instantaneous; omitting the postal and data entry time that is required by paper returns.

### 5.3.2 E-Government

Many governments are keen to have a Web presence and to offer services via this medium. The US, for example, has an e-government policy that aims to “make it easy for citizens to obtain service and interact with the federal government; improve government efficiency and effectiveness; and improve government’s responsiveness to citizens” (Executive Office of the President, 2002). E-government directives often have a direct impact upon NSIs. Members of various statistical agencies in the US acknowledge that this policy is one factor driving the movement towards Web data collection. The extent to which such policies impact upon other NSIs is considered below.

The movement towards EDC in the ONS is also, at least in part, related to e-government developments. The ONS’ Service Delivery Agreement includes the E-Government target for 100% of business surveys to be offered electronically by 2005, with a 50% take-up rate (Baird *et al.*, 2002).<sup>18</sup> A similar goal by the Canadian government is leading the expansion of EDC within Statistics Canada, whose Government Online initiative aims to offer all key government services online by the year 2005. SNZ and Statistics Norway also have to respond to e-government initiatives.

The introduction of the Electronic Transactions Act (ETA) in 2001, by the Australian government has had an immediate affect upon the ABS. The Act stipulates, “if a person or business is required or permitted to give information in writing to a Commonwealth entity, the requirement is taken to have been met if the person gives the information by means of an electronic communication” (Burnside & Farrell, 2001:5). With the implementation of the ETA, the ABS is legally bound to provide EDC if requested by respondents. In order to meet these requirements, the ABS developed the ‘Business ETA Instrument’. According to Burnside & Farrell (2001:5) the “expectation is that an uncertain but limited number of respondents across the entire range of ABS business surveys and form types will elect to report electronically”. Thus, instead of developing EDC questionnaires for all of their 150+ business surveys, which would be costly, time consuming and unlikely to receive large take-up levels, the ABS developed the aforementioned Business ETA instrument. This consists of

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<sup>18</sup> It is important to note that electronic data collection is not limited to the internet but includes touch-tone data entry (TDE) and other forms of computer assisted data collection.



a number of Microsoft Excel templates that can be adapted to fit particular surveys when required. These templates are based on the paper questionnaires with changes for on-screen completion where found to be appropriate or technically necessary. They do not make use of the additional features available with EDC – for example, edits/validation of information provided and colour. The Business ETA instrument was implemented as an interim solution, allowing the ABS to meet the government requirements whilst providing more time for further research and development for more permanent solutions that adequately address many of the issues surrounding EDC. Despite being seen as short-term, the Business ETA instrument has proven to be durable and has been progressively extended and the templates refined, though still with minimal added functionality.

It can be argued that these e-government policies decree a need for EDC without the NSIs actually conducting any research and development in the area. Such policies appear to make EDC an inevitability rather than an option. The e-government policies also place time pressures upon the NSIs, which can impact upon the amount of development and testing time of a new EDC mode has before it is made available to respondents. Quick implementation potentially creates problems with factors such as usability and raises issues such as mode-effects as most, if not all, of the EDC options are implemented within a multi-mode environment.

Finally, these e-government policies, considered within the Computerization Movements perspective outlined in Chapter Three, represent the first level staging of the Computerization Movement, technological action frame. The governments, with the development of these initiatives and policies, are creating the technological action frames by determining how this technology is to be used.

### *5.3.3 Technology*

Finally, and related to the above, the move towards EDC also appears to be driven by individual NSIs' desire to mirror technological change within society. Statistics Norway's strategic plan states that they will "change the content of statistics and production methods in line with the development of the society" (Sæbø *et al.*, 2002:1). This involves the dissemination of data as well as the collection of data. The notion of keeping abreast of technological change and advancements is more apparent in this quote from an NSI employee, who states, "another argument (and I think this holds more water than the others) is that people expect a modern government agency to have an internet presence. If we did not



have a Web option, it would seem to some that we were still living in the 19<sup>th</sup> century, let alone the 20<sup>th</sup>.” This way of thinking and talking is to some extent deterministic, in that the NSIs feel they need to develop their processes in line with developments (and therefore progress) in society. This fits with MacKenzie’s (1996) assertion, discussed in Chapter Three, that many people in society think and talk about technology in a deterministic manner.

Changes and advancements in technology can be seen, albeit crudely, by viewing the three types of EDC considered in this chapter within a chronological timeframe. In doing so, we see that their uses correspond with technological advancements. Broadly speaking, software on respondent computers, although still in use today, peaked in the mid to late 1990s,<sup>19</sup> email and email attachments in the late 1990s to early 2000, the current focal point for research is Web data collection. The implementation of EDC is not just responding to user demand, government initiatives or even simply capitalising upon the improvements that the technology may bring to the survey process. EDC, dissemination of survey findings, as well as the delivery of other information and services via this medium allows the NSI to be, and importantly seen to be, technologically current. A technologically current, or even advanced NSI, may positively affect their image in society as a whole and respondents in particular. In this way, we see NSIs responding to the public discourse (the second level of Computerization Movements) surrounding the internet, which has strong expectations for the future role of the technology in society.

#### **5.4 Conclusion**

This chapter has provided a brief snapshot, taken in 2004, of research into and the application of three types of CASI EDC within eight NSIs. All of these methods are in use by various NSIs, with the type of EDC depending both upon the features of the survey in question and upon the characteristics of the respondents (for example business size). It is worth pointing out that in the two years since the snapshot many of the NSIs have developed and expanded their internet data collection and some report a large growth in businesses responding in this manner. However, the snapshot remains valuable in illustrating how the implementation of EDC modes has brought improvements, such as increased timeliness in response and publication of survey results. At the same time, the importance of design and

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<sup>19</sup> This said, interest in installed software could return for use in the collection of administrative data. In Norway, for example, there is a growing interest for using data collection modules in administrative programs that the establishment installs in their computers. Salary and sick leave information are already collected in this way.

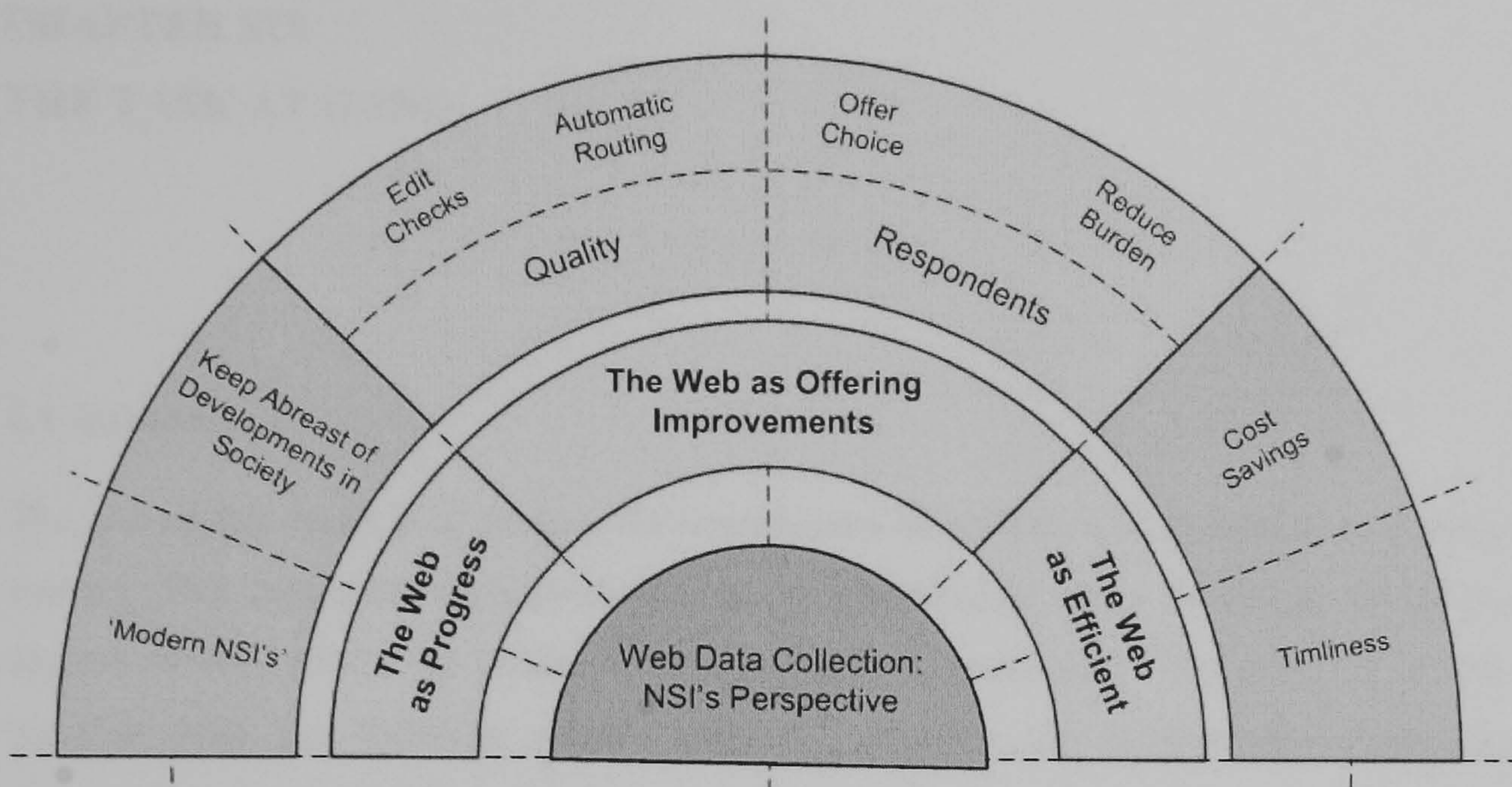


functionality testing has been highlighted together with problems surrounding respondent take-up of a new mode of data collection.

Most NSIs cite similar drivers leading towards the implementation, and increased use, of EDC with the desire to capitalise upon the perceived improvements to the survey data and process offered by EDC. Additionally, the role of e-government policies and the desire to keep abreast of technological developments cannot be ignored. Another driver, not considered in the body of this chapter, arises from the need to improve on the current state of business survey methodology, as discussed in Chapter Two. If we return to the comments made by Parent & Jamieson (2000) of Statistics Canada, and Keller & Willeboordese (2000) of Statistics Netherlands, cited in the introduction to this thesis, the implementation of new modes of data collection often requires NSIs to rethink and refine their existing data collection and processing procedures. Yet despite frequent comment that EDC offers improvements to existing processes and procedures, research illustrates a number of pitfalls. These include security and confidentiality concerns, limited take-up of a new mode, integration into data-management systems as well as administration and, importantly in the context of this thesis, questionnaire design issues. Questionnaire design presents both familiar and new challenges, which, if not carefully considered, may compromise quality, timeliness, burden and ultimately costs. All of the factors that NSIs hope will be improved by implementing EDC.

The potential to reduce response burden, provide respondent choice and to respond to demands for EDC are also substantive motivators in developing this area. However, there is little research focusing upon the respondent's perspective to EDC. There is little research with respondents on the topic of response burden and the findings within this research are inconclusive. Another area that a few NSIs mention is the ability to provide feedback about the survey and their information to respondents. This was piloted by the ONS and is offered by Statistics Norway in some surveys but there is no documentation on how this information is received by respondents.





**Figure 5.1 NSI Expectations for Web Data Collection**

Pulling together the findings from this chapter, we can see that NSIs' expectations for Web data collection fall into three broad categories: the Web as Progress, the Web as Offering Improvements and the Web as Efficient (represented visually in Figure 5.1). These expectations are formed by a combination of their experience and knowledge of electronic data collection mixed together with the public discourse (cyberbole) surrounding the new technology. In this way, the NSIs are participating in the internet's Computerization Movement, implementing the technology within their local level.

This chapter offers a view of EDC from the survey researcher's perspective, in this case NSIs. The following chapters turn to the other side of the coin and consider EDC (Web data collection specifically) from the respondent's perspective.



## **CHAPTER SIX**

### **THE TASK AT HAND**

#### **6.1 Introduction**

The aim of this thesis is to explore the implementation of Web data collection in a holistic manner. This entails the consideration of the methodological issues as well as the cultural context within which the mode is implemented and employed. The previous chapter, together with the literature review chapters, considers the institutional context and perspectives for Web data collection. We now turn to the respondent's perspective. This chapter opens the discussion by exploring respondents and their current approaches to completing mandatory business surveys. This is not simply a factual account providing details of company size, industry, geographic location and so on, as these are already known but rather takes a closer look at individual cases that will contribute to the development of a holistic account of government business surveys. This discussion provides a contextual backdrop for the following two chapters investigating the respondents' perspective on Web data collection.

Respondents to ONS business surveys come from wide-ranging backgrounds, business types, sizes and positions within companies. As we saw in Chapter Four, the 30 participants and their businesses involved in this research illustrate this point. The business size, industry and ethos of their respective companies vary greatly. Whilst the majority of the interview participants are accountants, they have different degrees of seniority. In addition to this, the individuals completing the survey come from different walks of life with a range of personality traits and characteristics. All of these factors contribute to the response process and have a direct impact upon the data received by the statistical agency.

The chapter begins with a snapshot of the different businesses and individuals who respond to the surveys. This is followed by the participants' account of completing the MIDSS and E-Commerce survey; the task at hand. The chapter concludes with 'the respondents' perspective', which discusses the response process and response burden by drawing on the literature reviewed in Chapter Two. Before turning to the body of the chapter, it is first useful to outline other ONS surveys that participants discussed in the interviews.



## 6.2 Additional ONS Surveys

In Chapter Four a description of the two surveys focused upon during the interviews is given. However, during the interviews many participants noted that they receive a number of other ONS questionnaires. Whilst the interviews focused on either the MIDSS or E-Commerce surveys, participants often discussed their experiences with regards to other questionnaires. A few surveys in particular are mentioned by participants. These include the Annual Business Inquiry (ABI), Capital Expenditure Inquiry (CAPEX), and Quarterly Stocks Inquiry (QSI). There are also a few instances of respondents receiving both the MIDSS and E-Commerce surveys. Where possible these two questionnaires were discussed with respect to Web data collection but time-constraints (the participant had been informed that the interview would take around an hour) limited such discussion.

The Annual Business Inquiry (ABI) is the most commonly cited survey in the interviews conducted with approximately two-thirds of the participants having some experience with completing one of these questionnaires. When discussing this survey, participants often made reference to the length and difficulty of completion:

And the Annual Return is a real beast. That is horrible. (NW-MIDSS-441)<sup>20</sup>

Oh it could take a whole afternoon to do that. Easily, easily. I mean that is just a monster of a form. (IR-MIDSS-1500)

The ABI is a large-scale, mandatory, postal survey comprising of two parts, the first gathering employment information and the second financial information. A sample of around 78,000 businesses is created from the IDBR. Like MIDSS and E-Commerce, a stratified sample is used. All English companies with 250+ employees are included. Companies below this threshold are divided into additional strata based upon employee numbers and random sampling undertaken within each strata. There is a lower automatic inclusion threshold for companies in Scotland and Wales. In addition to this, there are some differences in questionnaire length for businesses of varying sizes. A long questionnaire is sent to all businesses with 250+ employees and to a selection of other sampled businesses. These questionnaires ask for in-depth details of purchases, employment costs, taxes, duties and levies. A shorter version of the questionnaire is sent to the remaining businesses and only asks for totals on these topics (National Statistics, 2004a). This survey is one of the ONS' Employment Earnings and Productivity Surveys, discussed in Chapter Two.

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<sup>20</sup> Throughout the thesis the participants will be identified in the following manner: participant initials (NW)-survey considered in the interview (MIDSS)-number of employees in their business (441).



Another frequently mentioned survey was the Quarterly Capital Expenditure Inquiry (CAPEX), which gathers data on businesses' capital expenditure by asset for the majority of industries within the UK. Around a third of the participants were familiar with this survey. This survey sample includes 32,000 businesses per quarter, with those businesses employing more than 300 included permanently and the remainder divided into three strata, again based upon employee numbers (20-49, 50-99 and 100 to 299) with random selection taking place within each stratum. CAPEX is a mandatory survey, which offers postal, fax and telephone returns (Brown & Dowsett, 2005:38; National Statistics, 2005c).

Just under a third of the participants discussed the Quarterly Stocks Inquiry (QSI), which collects information on businesses' stocks at the beginning and end of the defined period for the production, construction and distribution industries. The QSI is another mandatory survey and the sample includes 21,000 businesses, also using a stratified sample based upon employee numbers. All businesses with 300 or more employees are permanently included (with the exception of some industry types, where the inclusion threshold is 100 and higher). Random samples are taken from 4 strata, created for the remainder of businesses (0-19, 20-49, 50-99 and 100-299). QSI offers both postal and TDE returns.

A number of other surveys were cited, including the Monthly Production Inquiry, Quarterly Dividends Inquiry, Foreign Direct Investment (both quarterly and annual), Annual Research and Development Inquiry, and the New Earnings Survey. The latter is now known as the Annual Survey of Hours and Earnings (ASHE) and was discussed in Chapter Two.

The above descriptions of the various surveys help to illustrate the number and range received by the participants. Few of the businesses visited contributed in only one ONS survey. Two companies that received the MIDSS survey were small businesses with less than 15 employees. Three of the E-Commerce respondents did not complete any other ONS surveys. These participants were IT managers and therefore only responsible for IT-related information. However, they were certain their company receives other questionnaires from the ONS. In contrast, a common response from many of the other participants when asked about what other ONS surveys they receive is "we get quite a few actually".

We can see from the descriptions of the surveys outlined above and from the MIDSS and E-Commerce descriptions in Chapter Four, the importance of business size. The importance of 'key responders', large companies that individually have an impact upon the country's economy, has been considered earlier in Chapter Two. Small businesses are also important



but the burden of response for these companies is high. A link between the size of the participant's business, the number of questionnaires that they receive and their perception of burden can be seen in the following quote:

We do about five or six but since we are just a small company...that is why I had a moan. (BA-MIDSS-46)

Response is not simply about the survey in question but includes every survey that they receive from the ONS. In addition, some participants group the ONS surveys together with all other surveys and information requests that they receive from government departments.

The ONS (and other NSIs) attempt to monitor and reduce the burden upon smaller businesses by limiting the number of survey requests that small businesses receive. This is done by keeping a record of business size and employing sampling methods that take business size into account. In addition to this, the ONS has a policy of giving businesses with less than 10 employees a three-year 'holiday' from potential inclusion in any of their samples. However, as we saw in Chapter Two, burden is by no means limited to the number of surveys that a respondent is obliged to complete. Several other factors contribute to a respondent's perception of the task and the burden associated with the task. This is explored further in the final section of this chapter.

### **6.3 The Participants**

In business survey research often the reality that the questionnaire is completed by an individual (albeit on behalf of their business) can be neglected. This is another area where business survey methodology could learn from its social survey counterpart. When we consider the respondent in business surveys, it is easy to think about the business in question; for example the large supermarket chain, ShopFresh,<sup>21</sup> or the corner bakery, Henrys. However, these surveys are actually completed by a Mary McDonald, from the accounts department or a Henry Smith, the sole proprietor. In order to understand a little more about the Mary McDonalds or Henry Smiths, the following section provides a description of selected participants with the aim of illustrating what kind of desk the questionnaire lands upon and a few of the characteristics of the individual completing it.

In Chapter Four some general information about the participants and their businesses was presented. There is a fair mix in terms of business size, something we have already seen to

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<sup>21</sup> Any reference to business or respondent names are fabricated and used for illustrative purposes only.



be important. To summarise, 16 of the businesses interviewed had more than 250 employees (6 of which had more than 1000 employees), 5 businesses were in the 50-249 category, and 9 had less than 50 employees (4 of which had less than 20 employees). However, the picture is not as clean-cut as this categorisation makes it seem. Participants at 2 of the small businesses were group accountants, meaning that they deal with all the accounts for a number of very small companies; often sole proprietors with few employees, co-existing under one umbrella. Thus the accountant receives survey requests from the ONS for each of the individual companies, something that can become overwhelming for the respondent.

IA is a group accountant for 10 companies that are all builders' merchants. She freely admitted that the reason she agreed to the interview was to display the number of surveys to which she has to respond, demonstrating this with two large folders filled with ONS questionnaires dating from 1999. It was clear from early in the interview that IA felt the task to be a burden, both based upon the number that she receives as well as the feeling that it is over and above her normal workload:

Well you don't mind when you get one, do you? And then another one comes and then another one comes...

Later in the interview she commented:

And it is not my job is it? You [the ONS] are sending the forms and they have to be done, it is just on top of your job. And the boss certainly doesn't see it as part of the job...forms to be filled I guess but other things are a priority in his book.

It is unlikely that IA's predicament is unusual. Whilst the ONS has policies and practices in place to reduce the burden upon small businesses, there are going to be instances where the burden of the task, in terms of numbers, is increased for the actual respondents (the person completing the questionnaire) as they receive independent data requests for several businesses. Further, this interview illustrated that although IA indicated she may try out Web data collection, it is not going to offer any immediate benefits or help with reducing burden. This may be the case for respondents in a similar position.

To continue with the theme of less typical respondents, another of the participants proved to be an interesting, and perhaps unique, case. This interview took place at a management company, which provides professional services to small, single shareholder companies. These services include management of their payroll, tax returns and other administrative tasks. The company currently manages around 30,000 small businesses. The director agreed to an interview in order to discuss the completion of ONS questionnaires by the management company on behalf of their clients (including MIDSS and E-Commerce) and to consider the



potential of Web data collection for their purposes. The interview turned into a focus group with 3 members of the company present; the managing director, an accounts team member (who is responsible for completing the questionnaires) and an IT manager.

To a certain extent, the director (CH) used the interview as a means to update himself on the status of the ONS questionnaires. He was somewhat surprised to learn that they receive 'a couple of hundred' MIDSS questionnaires a month (to which he inquired about the ONS sampling process) but pleased they have managed to automate some of the process. One of their IT staff is able to run a report that produces all the required information and the woman in charge of completing the questionnaires (EZ) fills in each one accordingly, with the period and the turnover figure. However, she only completes one 'contact details' section as it would be too onerous to do this for each questionnaire. The questionnaires are then placed in a large envelope, with an ONS business return envelope attached to the front (thus saving the management company from having to pay for the mailing costs) and posted back to the ONS.

ONS surveys that they receive regularly are the ABI, E-Commerce and monthly surveys, such as MIDSS and RSI. EZ reported that they receive a few E-Commerce questionnaires per year and around 60 to 70 ABI questionnaires per year, noting that they are much longer and more difficult to complete. She also remarked that the appearance of a 'new' survey, one not previously seen, is more difficult to complete. In this event, she consults her direct boss for advice over any questions that are not easily answered.

The majority of this interview ran like a brain-storming exercise where they discussed how they could minimise the burden of the task. They looked at the E-Commerce prototype of Web questionnaire and discussed how it could function. However, it soon became apparent that Web data collection in the format proposed in this research would not assist this company. Rather the director, and the individual who completes the questionnaires, seek an automated, EDI process with which they could meet the ONS requests for data and minimise the workload for their company. How this automated process works would not matter, just having the facility to do so would be enough. As the director states:

Whatever they like. I mean there are many different ways we could and would do it. We would accommodate whatever way they wanted it, to be honest.

It is certainly possible that similar businesses as well as very large businesses also seek a more automated approach to providing the required information. Part of CH's frustration is that he perceives that the technology exists and it is possible to provide data in a more



efficient manner so he wants to know why it is necessary to continue with the paper returns. EDI is a relatively old idea that did not achieve success because of the need for extensive metadata management. The respondent (the business) would need to keep all their records in statistical terms used by the ONS and international standards. This would likely require extensive changes on behalf of the respondent and it is doubtful that they would be prepared to undertake such a large task.

The above situations deviate somewhat from the norm. Before exploring some of the response issues already raised, as well as hearing of others, it is useful to consider a few participants that are more typical ONS respondents. The remainder of this section provides descriptions of 4 participants; one from each of the business size categories (ranging from 0-49, 50-249, 250-999 and 1000+ employees) and evenly split between survey type (2 MIDSS and 2 E-Commerce) as well as a range of industries. These accounts also help introduce a number of the issues raised by the participants as respondents to ONS surveys in general.

The smallest business visited is a marquee hire business, which is owned and run by a sole trader, RH. The business is seasonal and so employee numbers depend upon the time of year, as does their turnover with most of their annual income earned during the months of May to August. The business has around 13 full-time employees (including the sole trader), five of whom are office based. These include RH's sister and daughter. The business is located in a rural area in Cambridgeshire (the nearest town is approximately fifteen miles away) and the office is a small, one-story building located steps from RH's house. Unfortunately, there was not an opportunity to see inside the office as RH greeted me outside and suggested we conduct the interview in his kitchen, out of the way from the office, which he said was busy with people at that time.

RH is a very friendly and open man in his mid-fifties. He gives the impression of being very hands-on (both within the office and the 'yard') and thus very busy. When describing how he goes about completing the MIDSS questionnaire, he outlined his average working day, which starts around 6:30am (this is often when he gets time to complete the questionnaire) and ends around 9pm. RH admitted to being not particularly computer literate and cannot actually go into their electronic accounting system to retrieve the required data. He keeps his own paper records of the accounts but he explained they are inclusive of VAT, which would mean more work in order to calculate the figure required by the ONS. Thus, when completing the questionnaire, he asks one of the 'girls' to obtain the figure from the computer system. Once he has this, he fills in the amount and other required details and then faxes the questionnaire



to the ONS. RH uses fax as the mode of response in order to receive a receipt to say that the ONS has received the questionnaire, something that appeared to be important to RH. He does not keep copies of the questionnaires; once he has obtained the fax receipt, the questionnaire is thrown away.

MIDSS is the only ONS survey that RH and his business receive. He is a relatively new respondent with the first questionnaire arriving five months prior to the interview. RH seems to be unaware of the duration of his inclusion in the survey or indeed its purpose:

I think there is a name on there somewhere and it is just this person who is on the end of a phone somewhere sitting in his ivory tower somewhere, and hasn't got anything else better to do than send this out. This is the feeling that me as a small businessman gets. I think it would be very nice if somebody from National Statistics actually phoned up, said what they were doing, said how long it is likely to last for, said the reasons why they are doing it and the benefits that may accrue because of it and what might you achieve through what I am doing and then when the period that they have said it will last for ends, phones up and says thank you very much Mr Smith for helping us out. That is why I have no objections to you coming here today. I will do as much as I can to help anybody to do their job but it would be nice had they have explained a bit better.

The desire for more feedback, including why he was providing the data and how it would be used as well as some sort of thank you from the ONS was repeatedly raised throughout the interview. RH was not alone in this desire, as we investigate in more detail later in this chapter.

The next example of a more typical ONS respondent takes us to a medium size business, within the 50-249 category, and one that is a direct contrast to the participant (RH) and business portrayed above. This business is a steel stockholders, housed on an industrial park in a town within Greater London. The office is situated on the steel yard and neighbouring businesses include auto repairs and a builder's merchant. The business has 86 employees, most of whom work in the yard or at one of their four depots.

The participant, YS, is both the accounts and IT manager for the company. She is likely to be in her early 50s and has worked for the company for seven years, during which time she has created and developed an IT infrastructure for the business. This started with the introduction of the internet, followed by the creation of a website. They are currently in the process of putting in their own email server, which will allow them to develop their website further with a view to taking orders online. The interview took place at YS's desk, located in the company administration office and shared by two others.



This interview focused on the E-Commerce questionnaire but YS completes other ONS surveys on behalf of the business, including the Quarterly Stocks Inquiry and the New Earnings Survey. It emerged that she also used to complete MIDSS but this stopped a year previously:

I didn't even really miss it until when the Stock one arrived the other day I thought that's funny I haven't actually seen that one for a long time. I think it must be about a year since we last had it.

This again illustrates that respondents are not always aware of the sampling process and how long they can expect to receive these questionnaires.

As both accounts and IT manager, YS is able to complete the E-Commerce questionnaire with relative ease. However, the task requires some searching for the requested information and takes roughly an hour to complete. YS's view of the task is very stoical. To her there are many forms and questionnaires to be completed in business and "this is only another form", a stance echoed by a number of other participants.

Turning our attention to another participant, this time in a large business with more than 250 employees, we travel to a town in Kent and meet JW, who is an assistant accountant at a paper mill company. The company owns two mills, with the one in Kent also being the head-office. Each mill has around 300 employees. It emerged that JW completes ONS questionnaires for both mills. JW is in her mid to late 20s and at the time, she was relatively new to her position having started at the beginning of the year, some nine months before the interview. Initially she found the task of responding to the surveys "scary"; however she explained that she gets assistance and advice from her manager, who also looks over each questionnaire before it is returned to the ONS.

This interview was supposed to focus upon the E-Commerce survey but although the company had responded to the survey, JW had not been involved in the process. This is most likely because she was too new at the time that it arrived. She is a little vague about what surveys she regularly fills in, saying only:

...Production surveys, and sales, I think, employees and stuff like that. I get so many that I've...we get quite a few, really. Because we've got the both mills as well, so we have to do two of each of them.

However, now that she is more familiar with the requests and knows where to find the information, the task is not problematic for her. In many ways, it is just something that forms part of her monthly routine. In addition it seems that she has gained the role of the 'forms



person' within her section, commenting that people do not even open the letters now; if they see National Statistics on the envelope it is placed straight on her desk. This notion of a 'forms person' is something that arose within other companies, particularly in the larger ones. When a new person starts (or is promoted/transferred) and they are directed to take over completion of a particular questionnaire, it often transpires that they end up completing all the others that comes into their department. Perhaps unsurprisingly, it is a task from which people are keen to be relieved and thus is transferred to newer, often more junior, members of staff. However, this is not always the case as a few of the participants are senior managers in some of the larger companies.

Several very large businesses with global interests agreed to participate in the study. Most of these companies have over 1000 employees in their UK office(s) and so the final example is taken from this group. AP is an accountant at a global company<sup>22</sup> with large, plush offices located in the centre of London. He is in his mid 30s and employed in the company for more than five years. This interview focused on MIDSS but like others mentioned above, the participant was responsible for completing a number of other surveys, including the Quarterly Capital Expenditure and the Annual Business Inquiry. The company has numerous entities operating under one umbrella. AP currently works in the administrative (back office) company providing support and services for other companies in the group. The complexity of the company structure and the issues that this raises in connection with ONS survey requests was raised early in our interview:

Sometimes the definitions of the companies aren't very clear, particularly in an organisation of this size where we do have so many different entities. What I did, I contacted [the ONS contact person] and we determined exactly what the return was supposed to be for and whether we were talking about Matrix International Energy Limited or whether we were talking about both entities or whether we were talking about Matrix International Limited<sup>23</sup> so it was a matter of determining what was actually required. And it does help because it has to be completed for Matrix International Energy activity, so that's Matrix International Energy Company but its title here shouldn't say including Matrix International Limited because it doesn't actually include it. It is not part of the return. So that is the other thing, sometimes it can be difficult to determine exactly what companies we are talking about.

AP used the interview to raise a few issues surrounding ONS data requests. This was not a complaint about workload (like, for example, the group accountant IA described earlier) but rather with a view to obtaining clarification in order to provide accurately the data that the ONS requires, thus raising the idea of the 'responsible respondent'. A number of the

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<sup>22</sup> In order to ensure anonymity, references to the actual industry within which this business operates have been omitted and generic terms used in their place. All business names are pseudonyms.

<sup>23</sup> Matrix International Energy Limited and Matrix International Limited are separate entities.



participants raised questions about questionnaires and individual questions within these. In many instances these questions highlighted their desire not just to provide the information and therefore comply with the mandatory requirement but to do so to the best of their ability. In some cases, as with this participant, Web data collection offered a way to assist in resolving their concerns. For example, AP voiced another concern over ONS surveys not reaching the correct person and so either being filled out incorrectly or not at all. Web data collection could allow the development of a 'corporate ID' where, upon logon, it would be possible to see all the surveys (with deadlines) that the ONS requires the company to complete. This idea is discussed further in the next chapter on the respondent's view of Web data collection.

The above description of these participants provides some insight into the assortment of individuals and businesses that receive ONS surveys. Businesses are in different stages of development, have different employee numbers and turnover rates, have varying levels of local and global impact, and so on. In the same vein, the individuals who complete the questionnaire on behalf of their company also hold a mixture of characteristics. They have varying levels of seniority, from company owners and senior managers/directors to junior assistants, often with various levels of experience and education. Some respondents work within large departments whilst others form a department on their own. In addition, these individuals have varying degrees of experience in terms of responding to the surveys. Some are frequent respondents to multiple surveys whilst others are frequent respondents to only one survey (for example, the monthly surveys). There are also occasional respondents (for example those that receive a survey only once a year) and those who are one-time respondents.

The interviews show a link between the business size and the number of surveys that a respondent completes. In addition, the area within which an individual works is likely to affect the number of survey requests received. The majority of the participants are accountants, which corresponds with existing knowledge of respondents as professionals, as detailed in Chapter Two. These were also the individuals who are likely to respond to multiple survey requests, again depending upon company size. One exception to this is E-Commerce respondents, who in the larger companies were IT managers and this was often the only ONS survey that they complete.

In addition to illustrating the assortment of business and individual characteristics, the descriptions also help introduce a number of important topics for discussion. For example, it



can be seen that respondents approach the task in different ways. Some are stoical in that it is just another element to their job whilst others feel that it is over and above their job and therefore a real burden. This leads us to the next section of this chapter that takes a closer look at how the participants approach the task of response.

## **6.4 The Task at Hand**

### *6.4.1 MIDSS*

It appears that the MIDSS questionnaire is completed almost universally by accountants. In the interviews those responsible for completing the questionnaire have a range of seniority spanning from junior assistant to company finance director. The exception is the sole proprietor, RH, introduced in the previous section (6.3). For many of the respondents regardless of business size, completing the monthly questionnaire is not problematic, as it only asks for start and end dates and the turnover figure for this period. All that is required of participants is to generate a report from their company accounts, something described as ‘simple’ and ‘straightforward’. As one participant observed:

I just run a report with all our turnover for the particular month and just phone them up and give them the number. (OT-MIDSS-14)

OT is referring to the ONS freephone number that is provided on all questionnaires and enables respondents to provide their answers over the telephone. This is a straightforward method for respondents to supply their data and as a result, it is likely to remain with the introduction of Web data collection.

Only one participant (BA-MIDSS-46) complained that the task was onerous and takes him more than an hour to complete. It subsequently emerged that the actual completion time is between five and ten minutes. His initial estimate of the completion time indicates his perception of burden rather than actual burden, an issue that we will return to before the end of this chapter. Not all companies have actual turnover figures at the time that the data is required. Some participants commented that they always receive the reminder notice and generally by that time they are able to complete the questionnaire. Others return an estimated amount and provide the actual amount either the next month or quarterly, depending upon its availability.

The quarterly questionnaire, which requests a breakdown of employee figures, proves to be more troublesome for the participants. In the larger companies (those with more than 100



employees) this often requires liaison with their human resources department. This is generally done via telephone or email with participants keeping the questionnaire themselves, although there are a few exceptions where the questionnaire is sent to the HR department for them to enter the figures. A couple of participants noted that they have to count the numbers of male and females manually, each for part-time and full-time staff because their systems do not break down these figures by sex. This is particularly time-consuming for large companies:

I mean that takes about an hour to do because I have to go down, well at least an hour, maybe an hour and a half, because I have to go down every employee and check whether they are male or female and then we have some contractors that we need to pull in still, well they are Davies Research employees still but they are more on a contract basis but we add those on manually. (UE-MIDSS-738)

For such participants, the additional element of providing employee figures introduces a more negative perception of MIDSS as a whole.

In general, most of the participants post the questionnaire back to the ONS using the supplied freepost envelope. However, this method can change depending upon the time they have to meet the deadline, where, if very close, they may fax or even simply phone their ONS contact person. A few participants have made use of the, then newly introduced, TDE option but there was no indication that TDE will become a usual method of return by those interviewed. Some participants said they like to have a proof of return (and therefore use fax), a few said they had not heard of it, whilst others said they have used it but it did not work. A common sentiment for TDE is:

Oh no, I think that would just irritate me. I think it is easier to just fill in a few numbers and post it. I go for ease. Ease of use. (HS-MIDSS-300)

The majority of the participants keep copies of their completed questionnaires, something I often saw first-hand with the various folders participants showed me during the interviews. When asked why they kept copies, a typical reply was so they could refer back to them in the event the ONS calls with a query. In addition, participants often keep copies in order to refer to them should they receive the questionnaire again. However, this is something that is more prevalent in the annual surveys.

Overall, it emerged that MIDSS is generally an uncomplicated questionnaire that the majority of participants do not see as arduous. Rather, it is the annual surveys that are more difficult and time-consuming, as we can see from the following quote, and it is to these that we now turn our attention:



This form, this form in particular I am absolutely fine with and it is not a concern. Often I'll actually give this form to a colleague and they will complete it. Not a problem. Other ONS forms, ohh, when they on the desk you are just thinking oh my goodness, nightmare. (IR-MIDSS-1500)

#### *6.4.2 E-Commerce*

The E-Commerce questionnaire obtained a more diverse reception from participants. For the majority of them it was the first time seeing this questionnaire, which is not surprising owing to both the newness of the survey and also the wider range of businesses included in the sample and the lower sample size. Those participants that were familiar with the questionnaire are from large companies, who are likely to be permanently selected in the sample. Again, the majority of participants, 9 out of the 14, are accountants with varying levels of seniority from a junior assistant to an executive director in a large global company. One of these participants, YS (introduced in section 6.3), is both the accountant and IT manager, 3 of the remaining 4 participants are IT directors, with the 4<sup>th</sup> the manager of “E-Business Systems”.

This questionnaire appears to be more complicated and for many, in contrast to MIDSS, requires more extensive information gathering from records and IT systems as well as consultation with others in the company. Many of the participants said that they could complete some questions from memory, most likely the first two sections that are more general in nature. A few participants completed the questionnaire with ease as they do not undertake any online transactions and so many of their answers would be a simple ‘zero’. However, for companies that do, the questions relating to orders and payments that are made and received using ICTs, require information gathering and calculations in order to obtain the desired total. QX (ECOM-3082), an IT manager of an international confectionary and foods company, summed up the process of completing the questionnaire:

I would say 70% of the form I can just fill out off the top of my head. Probably 20% I probably have to just work out some numbers and look things up and 10% I have to refer to other people.

Generally those participants that need to consult others in order to complete the questionnaire said that they would keep hold of the questionnaire and email or telephone their requirements to the relevant person. Much of this seems to be down to the fact that they are responsible for completing the questionnaire and therefore would rather keep hold of it and enter in the information themselves. FF (ECOM-29) echoed this view and continued that it is faster for him to obtain the information and enter it himself. Furthermore:



...if you give this to someone else partially completed, the tone of what you are putting in there might change.

Participants did not just consult others to complete the questionnaire. Some of the participants who had received the questionnaire in the past, generally those in very large companies who are likely to be sampled every year, referred to the previous year's answers before inputting their answers for the current year. It was not unusual to be shown copies of completed questionnaires with calculations and notes in the margins. These, participants noted, are documented in order to assist completion in subsequent years. Taking notes of calculations performed, where to retrieve the data as well as keeping a copy of the actual information returned is useful not just to aid completion but ensures that the information returned is consistent from one year to the next. This said, the most commonly cited reason for keeping copies of the completed questionnaire is in order to consult should the ONS phone with a query. This is true of both E-Commerce and MIDSS participants. It appears that respondents who do not keep copies are in the minority.

Participants reported a range of completion times for the E-Commerce questionnaire, which is much longer in comparison to MIDSS. At the lower end, a participant (AA-ECOM-109) reported that it had taken him around 10/15 minutes but it was difficult to say for sure as he was completing it in-between other tasks. At the higher end, another participant (LD-ECOM-398) reported it took around an hour and 20 minutes. On average, as far as the participants could recall, most seem to have spent roughly 45 minutes completing the questionnaire. Surprisingly, length of time spent on the questionnaire did not seem to affect the participant's perception of the task in terms of burden. LD, who said he spent an hour 20 minutes on the questionnaire, noted that "it wasn't an excessive amount of time". At the time of the interview, LD had received only one ONS survey request and did not see the task as problematic, particularly as he knew where to find the information required. In contrast, some of the participants who had spent a shorter amount of time completing the questionnaire, around 45 minutes, were less happy with the task:

Well it is painful really. Because it doesn't benefit our business. So it is a painful thing to be done. It is another piece of government regulation. (SD-ECOM-19)

I could do without it to be honest because, I mean this year, I can't remember when it came, but I was very busy with a project which has now been implemented that was taking all of my time so to get this as well is a bit of an administrative nuisance really. Fair enough it is a mandatory requirement so I do it. (QX-ECOM-3082)



These quotes also illustrate two points that repeatedly appeared within the interviews, namely, the mandatory nature of the task and the perceived lack of benefit for the participant and their company.

This section has provided a description of how the participants approach the task of responding to MIDSS and E-Commerce surveys. The final section in this chapter examines these accounts with reference to the literature on business surveys discussed in Chapter Two. This discussion leads us to the following chapter, which investigates the potential of Web data collection for these surveys.

### **6.5 The Response Process**

The interview questions probe how participants approach the task of completing the ONS questionnaire in order to provide a description of their current response process. This was done with a view to understanding how Web data collection could fit into their established routines. These questions produced both expected and unexpected results when comparing them to the Sudman/Willimack (2000) response process model, discussed in Chapter Two. The various accounts of how participants complete the questionnaire are, on the whole, expected. It is possible to see evidence of participants following the steps of Sudman/Willimack's model. Evidence of certain steps are more explicit than others. For example, step iii 'assessment of priority', participants often began by saying "well I first look at when it is due" or as DN (ECOM-100) said:

...the problem with them is not volume and not time it takes to do them because that information we have, obviously, it is just when you have 100 things to do and that is number 99. You know what I mean? You do from 1 to 90 and then you start again at no 1 and get to 90 but 99 never gets done.

An example of step iv, 'comprehension of the data request', is seen in participants' discussions and comments about inclusions and exclusions of turnover in the MIDSS questionnaire. Almost all participants clearly described step v, how they retrieve the necessary information from their existing company records. Step vii, 'communication of the response' and step viii, 'release of the data', are somewhat more overtly stated in the MIDSS interviews with many participants outlining how they retrieve the data (step v) and then saying 'and so I just fill it in and send it off'.

Unexpected results from the interviews are some of the questions and issues that the participants raised. A number of participants mentioned the need to use estimations instead



of actual figures, which is an example of step vi, 'judgement of the adequacy of the response'. SD (ECOM-19) gave the example of orders received via email, saying that they simply do not keep that information and it would be impossible for him to obtain actual figures, therefore he provides an estimate. For SD, this is an acceptable and adequate response. However, other participants find this more problematic. JL (ECOM-19) highlighted the predicament she feels when providing estimates, a concern with which she is not alone:

I think usually it is just a slight dilemma as to how much is an acceptable estimate. Looking at it, it was asking what percentage of your orders comes via the Web and things like that so it is not overly onerous but it can be a bit of a dilemma when they are asking you for information that we would not normally gather. You are sort of thinking what is an acceptable estimate and I am loathe to put something down that I think is wildly inaccurate but on the other hand I do not want to spend a day ploughing through the figures. So it is just trying to get a reasonable compromise as to what is a good estimate without wanting to be misleading.

In this, we can see JL's desire to be a 'responsible respondent' and provide accurate information whilst also trying to minimise the length of time to complete the task. Here it is possible to see a combination of step vi (judging the accuracy of response) from the Sudman/Willimack response model and elements from Social Exchange Theory (outlined in Chapter Two), whereby the participant is attempting to minimise the perceived costs of response.

A few participants took the issue of accuracy of response further when discussing estimates and questioned the validity of the survey findings, saying that the results:

...would only be as useful as the quality of the information that is being submitted. If people like me are finding the filling in of the forms are a pain in the backside and therefore are not being hugely accurate with what they put in, what comes out is not really going to be a huge benefit to anybody. They are just doing it to keep NSO [National Statistical Office] quiet. (GX-ECOM-1300)

Such questions around the validity of the survey results were not limited to discussions around estimates. Participants in both the MIDSS and E-Commerce interviews raised the issue. Again the notion of the 'responsible respondent' is apparent. DK (ECOM-3173) wondered how accurate the data can be when the questions asked are so generic. He commented that they (his team) find themselves answering as best as they can but at the same time he was concerned the information was not really what the ONS was trying to gather. Another participant (AP-MIDSS-1046) felt that it was necessary to interpret exactly what was being requested. In this case it was around what to include and exclude with



regards to turnover, even after consulting the notes provided by the ONS. These participants are concerned that the data being collected may not be the data that the ONS seeks. From a Social Exchange perspective these concerns can be seen as costs, which in turn negatively affect response. For these, and the other participants that raised this concern, further clarification within the instructions may be useful. It is worth noting that the need for respondents to interpret what the ONS seeks may not be a design problem *per se* but rather the concept itself may be confused or ill-defined. We saw this in Chapter Two when Jones (2005) commented that ‘unclear data requirements’ is a known problem for many business surveys.

## 6.6 Response Burden

In Chapter Two we saw that respondent burden is not just attributed to the length of the questionnaire and time it takes to provide the information but that perceived burden is also important. We noted that Bradburn (1978:36) suggests four factors are important in determining perceived burden. To recap these are: i) the length of the interview/questionnaire, ii) the amount of effort required of the respondent, iii) the amount of stress on the respondent, and iv) the frequency with which the respondent is interviewed. Bradburn also suggests that the respondent’s perception of the importance of the research is a key factor in determining perceived burden but does not attribute equal weight to this factor.

Evidence of these four factors emerge from the earlier description of the participants and subsequent accounts of responding to the questionnaires. To illustrate this point, many of the MIDSS participants clearly state that it is a short questionnaire, it does not take much time to complete and therefore they do not see it as problematic. For these participants, the combination of minimal questionnaire length (factor i), minimal effort (factor ii) and lack of stress (factor iii) minimises the more negative impact of the monthly frequency of survey requests (factor iv). Thereby, for the majority of the participants, this results in the monthly MIDSS questionnaire being perceived as a low burden task.

However, the quarterly MIDSS questionnaire requires more effort and places additional stress on a few of the participants. Thus the task is perceived as more burdensome:

I hate that one...because it is so fiddly. It is difficult for me to get the information.  
(LB-MIDSS-55)



A number of participants, from both sets of interviews, raise the issue of gathering the required information. Some participants feel that the task of retrieving the data is the difficult part, not the actual completion of the questionnaire:

The hard work is finding the information first. Filling in the form, I think, is the easier part. (GI-ECOM-2000)

At this point it is also worth remembering IA (the group accountant first introduced in section 6.3) who also mentions that the gathering of the information is the difficult part (amount of effort, factor ii). In addition, IA is very clear that completing the questionnaire is over and above her job. These elements taken together with the frequency of the survey requests that she receives, result in her associating high levels of burden with ONS surveys.

Other ONS surveys, generally the annual ones and in particular the ABI, create considerably higher levels of perceived burden. The ABI is a lengthy questionnaire requiring a substantial degree of effort from respondents and is generally associated with elements of stress created by the amount of time it takes to complete the questionnaire, fitting this in with their everyday job and meeting the return deadline. Many of the participants note that this questionnaire often comes at a very busy period for them, which makes it more difficult to comply with the return deadline.

The E-Commerce survey, as we saw above, is longer and requires more information gathering and consultation than the MIDSS survey and according to Bradburn's (1978) factors this is likely to increase perceived burden. However, the results are less conclusive as we see more variation between participants in their perception of this survey. Those participants who did not see the task as problematic were more likely to have fewer, if any, other ONS surveys. This suggests that the frequency of survey request (factor iv), or in this case the low number of survey requests, reduces perceived burden. However, perceived burden for some occasional respondents is increased as a result of other factors.

Stress (factor iii) can arise from a number of different areas. The external demands, which are not related to the survey, can place additional stress on the task of response. For example, QX was in the midst of a challenging project when he received the 2003 E-Commerce questionnaire, which compounded the amount of stress and effort (factor ii) required to complete the questionnaire.

The mandatory nature of the surveys is another area that increases stress of response. At least a third of the participants overtly refer to the mandatory nature of the surveys, with some



participants enquiring what happens should they not comply – something they have no wish to find out first hand. Some are very clear about the mandatory nature. For example SD (ECOM-19) who, it seems, completes the questionnaire solely under this premise:

But as I said at the end of the day, it is a legal requirement so you have to fill it in. That is the bottom line.

Stress (factor iii) can arise from factors that directly relate to the task of response as well as factors that are unrelated to the task but increase the burden associated with response. In this way, we can modify factor iii by including amount of stress resulting from ‘internal and external demands’.

Other participants take a different perspective and do not dwell on the mandatory nature of response but rather allude to their company’s willingness to participate in research and/or help out others where possible:

We always ask ourselves what do we glean from doing this and a lot of these things it is not much but it is, I guess, for the greater good...It makes us feel good I guess that is the only reason we don’t feel obliged to do it, why not if it can help. (FF-ECOM-29)

Bradburn (1978) comments that understanding the importance of the research can serve to reduce burden. FF’s comment implies that he (and his company) considers the research to be valuable in some way and this appears to reduce their level of perceived burden.

FF is not alone in considering what benefits arise from their efforts in completing the survey(s). The majority of participants, in some form or another, noted that there are no benefits to completing the ONS surveys, some more overtly than others:

Hopefully the information is being used productively and somebody is using it and somebody is getting some benefit out of it because we obviously don’t, as a company, get any benefit out of it. (DN-ECOM-100)

This is the respondent’s view and one that no doubt would be disputed by the ONS and the government. In this quote, DN also demonstrates a lack of knowledge about where his company’s data is being used and for what purpose. This is true for many of the participants. When asked if they know what happens to the information that they provide, most made an educated guess:

I see them [the ONS] as being part of the Civil Service and that a large amount of what they do is supply information to the government for when they are setting taxes or deciding on government policy. I suppose I also imagine that you can use this information in businesses but I can’t say I ever have. I don’t know whether much of what they gather is available to the general public. (JL-ECOM-19)



More than two-thirds of the participants are not aware of what happens to the data that they provide. As noted above most were able to take an educated guess, with a number citing the news: “I guess you hear bits on the news but that would be it” (UE-MIDSS-738).

The ONS provides some details about the use of the data, positioned on the front pages of both the MIDSS and E-Commerce questionnaires. For example, under the ‘for your information’ section at the bottom of the MIDSS front page, it says:

The monthly turnover figures will contribute to early estimates of Gross Domestic Product.

More detail is provided on the E-Commerce front page:

The results of the survey are used to monitor the UK’s progress in its development and use of e-commerce. The data will also be invaluable for businesses to benchmark themselves against their industry’s trends. Comparisons with other European Member States are also available by visiting the website of the European Statistical Office (EUROSTAT) <http://europa.eu.int/comm/eurostat>

However, when this information was pointed out, participants claimed to be unaware of its presence on the front page. This is perhaps not surprising as it is well known that survey respondents often ignore instructions and proceed directly to the questions. Indeed, some participants admitted that they do not read the front page (often because they have seen the survey so many times), turning their attention to the questions immediately. Respondents ignoring or not seeing instructions and information has implications for design, which are not easily addressed. In the following chapters, we will investigate whether the Web can offer any solutions to this problem.

In the same vein, many of the participants are unaware how they (their business) are selected to respond to the survey: ‘I wonder how they pick who they’re going to use then’ (PC-ECOM-432). We saw earlier that a few participants asked, without any prompting, about the sampling process quite early on in their interview (for example, the director of the management company, CH, introduced in section 6.3). In addition many of the participants are not aware when (if) their inclusion in the survey will cease, for example RH and YS, also introduced in section 6.3.

Overall the interview data strongly suggests that participants are interested in having more information about the survey(s) that they complete, with the word “useful” most commonly mentioned when discussing this idea. However, this presents a paradox given that respondents most often do not read extra information. Again, Web data collection may offer



some solution to this problem. This is addressed in the following chapter. The point being made at this juncture is as follows: participants are aware of their obligation (both legal and as part of their job) to complete the survey and for this reason they do so, generally to the best of their ability. However, they are less likely to be aware of the impact of the survey findings.

Returning once again to Bradburn's (1978) paper and his assertion that respondent understanding of the importance of the research can affect perceived burden, the data gathered suggests that the participants are unclear about the relevance and uses of the survey. It is possible that a clearer understanding of the survey as a whole, from how respondents are selected to the use of the results, may reduce perceived burden. It is also possible that an increased understanding of the survey may lead to better data quality. For example, when AP (MIDSS-1046) discussed issues around interpretation of the survey questions, he noted:

I would be interested to know how they determine what they want to look at.

AP continued that knowing this would help him provide the information that the ONS seeks. In a similar vein, FF (ECOM-29) indicated that understanding more about the data request would act as a motivator:

...if you know what the end goal is or what is going to come of it then, yes, it does inspire to you to fill these things in. (FF-ECOM-29)

In each of these instances, it seems fair to speculate that increased understanding would lead to both a reduction of perceived burden and increased data quality (through increased effort in response). In this way, we can add another factor to Bradburn's model, v) understanding the value of the research, attributing equal value to this factor rather than Bradburn's original suggestion that it is merely of importance.

## **6.7 Conclusion**

Mandatory business surveys gather data on all spectrums of a country's economy. Consequently, as this chapter began by noting, respondents to these surveys are employed in a variety of business types and sizes with varying job descriptions and levels of seniority. Furthermore, these respondents come from a range of socio-demographic backgrounds with an assortment of personality traits and characteristics. All of these elements have an effect upon response.



Business size is important as all very large businesses, the key respondents, are included permanently in the surveys. Therefore in these businesses, individuals completing the questionnaires are more likely to receive multiple survey requests per year. Whilst smaller businesses may not receive many survey requests, these are more likely to be burdensome in terms of time and resources, particularly if they receive them in close succession. An individual's position and role within a business impacts upon response. Some respondents feel that the task of completion is part of their job description, illustrated by individuals becoming known as their department's 'forms person'. These respondents are more likely to work in larger companies. On the other hand, some respondents perceive the surveys to be over and above their job and consequently the task appears more burdensome. Moving down another level, an individual's character also affects how the task is perceived, for example whether the task is approached stoically and with acceptance or unhappily and with protest.

MIDSS is generally considered unproblematic. On the whole, the necessary data is retrieved from respondents' information systems with ease. The quarterly MIDSS questionnaire, which asks for employee numbers, can be more difficult but few respondents are likely to find it a real problem. In contrast, the E-Commerce questionnaire is substantially longer and as such has longer completion times and requires more effort from the respondent. Despite this, the task does not appear to be overly onerous for the majority of respondents.

This chapter considered the application of two models surrounding response for these surveys (Sudman/Willimack (2000) response process and Bradburn (1978) response burden). On the whole the data gathered concurs with these models. However, a couple of additional elements emerged from the data. Firstly we have the re-occurring concept of the 'responsible respondent', whereby respondents do not simply complete the questionnaire but endeavour to do so to the best of their ability in order to provide accurate and useful data. In addition, such respondents may experience a certain degree of anxiety when they feel they are not providing the information that the survey requestor seeks. Drawing from a social exchange perspective, anxiety increases the costs of response, which in turn may increase burden associated with the task.

Another element emerging from the data, in terms of perceived burden, is that of external factors affecting the respondent's ability to complete the questionnaire. This can be, for example, the time that the respondent has available to undertake the task or their access to information. In this way, it is useful to modify factor iii of Bradburn's model and include both internal and external demands. These relate to the internal demands of response (the



stress associated with obtaining and providing the required information) and the external demands (factors that are unrelated to response but that contribute to the stress associated with the task of response).

Finally, Bradburn's model consists of four variables affecting perceived burden. He alludes to the importance of respondents understanding the significance of the research but does not attribute equal weight to this factor. Many respondents appear to be unaware of the purpose of the survey. Furthermore, they feel that there are no direct benefits to them or their company in completing the questionnaire. The data gathered in this research suggests that understanding the value and uses of the information being provided could positively influence respondent motivation and perceived burden. Hence it is added as an additional, fifth, factor. The model of response burden now reads as follows:

- i. Length of the interview/questionnaire
- ii. Amount of effort required of the respondent
- iii. Amount of stress on the respondent (arising from internal and external demands)
- iv. Frequency of being interviewed
- v. Understanding the value of the research.

This chapter provides a contextual backdrop for the remainder of this thesis by conveying a picture of respondents' current approaches to the task at hand. Related to this, it illustrates the numerous, and at times, complex issues surrounding response to mandatory business surveys. Response to these surveys is not simply about one person sitting behind one instrument; this is too simplistic as response is more fluid than this model suggests. In this way, the chapter expands the literature in what is known about the response process and response burden. These elements all contribute to the formation of respondent perceptions and expectations of Web data collection considered in the following chapters.



## **CHAPTER SEVEN**

### **THE PROTOTYPE WEB QUESTIONNAIRES**

#### **7.1 Introduction**

In Chapter Five we saw that the use of electronic data collection has been explored by many NSIs since the early to mid 1990s. 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. We also saw that 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. NSIs also perceive these electronic options as a means to reduce respondent burden, an issue discussed in Chapters Two and Six, by providing choice to respondents in their method of return.

NSI research into, and implementation of, CASI electronic options have verified some of these expectations, such as increased timeliness of response and publication of results. However, the introduction of these options also brings difficulties, such as data security concerns and problems with integration into their existing data processing systems. 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.

Two Web prototypes, described in Chapter Four, of the MIDSS and E-Commerce questionnaires provided a visual illustration of what these paper surveys could look like on the Web. Keeping in mind the user-level issues noted above, this chapter explores the participants' reactions and comments to the prototypes with a view to understanding what design and functionality features, if any, respondents desire from Web questionnaires. Before investigating these comments, we will first consider the internet within the participants' workplace and their use of it.

#### **7.2 The Internet in the Workplace**

The previous chapter explored the participants' current approaches to and perceptions of completing the surveys in order to provide a contextual backdrop for Web data collection.



The final contextual element to consider before looking at the Web prototypes is that of the internet; firstly within the businesses and secondly the participants' use of it, both professionally and personally.

### *7.2.1 The internet within the businesses*

All of the participating businesses are connected to the internet and have been for at least three years, with the majority having a connection for over six years. Perhaps unsurprisingly the larger the business, the longer the time that they have had an internet connection. All except the smallest business with only 13 employees, 5 of whom are office staff, have a broadband connection. This level of internet connection is consistent with the 2004 E-Commerce survey results, which found that 64% of UK businesses have internet access (National Statistics, 2005a:18). This figure increases to 85% when excluding businesses with less than 10 employees. This survey also reports that 42% of these businesses access the internet via a broadband connection; an increase of 63% from the previous year. The percentage of businesses with a broadband connection increases to 60%, when omitting those with fewer than 10 employees.

For the businesses participating in this study, the level and extent of internet usage within the businesses appears to be dependent upon a number of factors; most notably the size of the business and the industry within which it operates. The large UK and global companies are often reliant upon the internet for a variety of functions including internal and external communications and electronic transactions, such as placing and receiving orders. The following quote (UO-MIDSS-120) illustrates how this UK branch of a Korean-based shipping company makes use of the internet to provide customer information as well as internally in the form of a company-wide intranet:

We are using it much more now for our own daily business as in all of our sailing schedules are on the system so anyone can view our ships coming and going, they can view their own Bill of Lading so they can actually see their own cargo moving on our system. We are as a business using the internet a lot more than we have done over the past couple of years. We have just gone self-sufficient on a new HR package which is on the intranet, which is employee self-service so we are sort of doing that and we are also looking and progressing on at the moment with a new transport where we are doing invoices over the internet and not getting physical pieces of paper.

This illustrates, within the Computerization Movements perspective, local level appropriation and development of the technology. The company is beginning to place



applications on their intranet, which will ultimately increase the intranet's importance in the company.

The importance of an intranet is already established in many of the very large companies. It was not unusual for participants from these companies to cite their intranet as being integral to their internal operations.

The intranet site is so valuable for communication. It is used by everybody, I would say, at some point during every single day, for every person, even if it is just to look at what is on the menu in the restaurant or looking at the train times to London or whatever. It is a valuable tool. (DK-ECOM-3173)

In the larger companies often their intranet has been established for several years with many more applications available on this network. This means that in order to access such an application (for example HR facilities) an employee has to use the intranet. In this way, the employees become familiar with the intranet and learn to use it for other purposes as well, thus creating an intranet culture within the company. The increased use of intranets (and Web applications) can lead some to consider paper-based tasks (like the ONS surveys) a nuisance. We will return to this point and the desire to reduce paper and paper-based work in the following chapter.

Several participants in the large companies describe how their company's use of the Web has increased in recent years. The implementation and integration of Intranets occurred relatively early on but the use of the Web has been more gradual. AP (MIDSS-1046) noted that his company traditionally has been sceptical of the Web owing to security concerns.

The internet [referring to the Web] is still seen pretty much as a wild area I think and we have to be very careful what we do in the internet in terms, particularly in terms of looking at sites where they may be trying to copy files to our PC and stuff like that. So security issues I think on the internet still. But I think that does seem like it is changing slightly. I have to say that over the last year or so it does seem to be changing.

AP went on to say that his company is more open to the use of knowledge-sharing tools and allowing other businesses to interact with them on their website. In large companies such as this, the use of the Web is more sophisticated and as a result poses a greater security risk. This in turn increases the costs associated with using the Web.

Business size is not the only determinant of extensive internet use. A business within a particular industry, such as travel and tourism, can be reliant on the internet regardless of its size. This is clearly demonstrated by OT (MIDSS-14) who works in a very small tourism



company in the centre of London and is a strong champion of the technology. She explained that over the past few years the internet has changed the way the travel and tourism industry operates, with up to 80% of their work being conducted over the internet.

The Web is very, very important because of all the information that we have to find. Sometimes we will have obscure places for example that they know about and we may not know about, so the internet provides up-to-date, up-to-the-minute information on all these places so we rely a lot on them. And also for bookings, it is very, very fast and efficient. It is not like the old days where we had to sit on the phone, you just do it all [online]. (OT-MIDSS-14)

Information is fundamental to the tourism industry. As a result it is not surprising that the Web has become a key tool for the industry. In contrast, many of the participants in construction and manufacturing industries commented that their industry has been slow to adopt the internet. This is largely because there has been no call from their customers to provide either information or purchasing over the internet.

I mean the business we are in is roofing and the main customers that we have coming through the door are roofing contractors, generally speaking sole man bands, you know sole trader, occasionally they will be slightly bigger and have 10 employees but really you don't have much bigger than that. And our customer base hasn't headed down the internet revolution and one or two of them have websites but by and large we don't, that is why we don't have a lot of trade through the internet. Similarly with the suppliers. (DN-ECOM-100)

Despite the current environment not requiring a Web presence or e-commerce availability, DN seemed to feel that they need to develop their Web presence and discussed future plans to do so.

Other participants in the small to medium size companies discussed how their company's adoption of the internet is developing. Several of these participants, given the company size, were often senior, decision-making members of the company and as a result provide input into the expansion of their company's IT systems. In this instance, it was common for them to discuss their company's future plans for increased use of the internet and how this is likely to help their business. These advancements were most likely to be the development of a new or existing company website allowing greater interaction with their customers.

We are working on a new website at the moment, which is going to be more interactive so the internet will become much more important for us. Because on the website in the long run, people will be able to send in forms, like credit application forms for customers, so in the long run that will take away papers and you just do it online... It is becoming more important now. (SP-ECOM-109)

A number of participants from the small/medium sized businesses discussed the development of their website to allow interaction from customers, ranging from the



submission of credit applications, discussed above, to the placement of orders. This is moving from a marketing model of websites that only facilitates one way communication to a company portal allowing two way communication and e-commerce. YS (ECOM-86), who is the accountant and IT manager in a steel stockholders and has a similar customer base to DN's company discussed above, talked about her vision of allowing their customers to check prices, stock availability and place orders on their website at any time of day. This is something that she feels is important in maintaining their customer base. These examples indicate that internet adoption may be slow in certain industries and small and medium-sized enterprises (SMEs) but that it is likely to gather pace as the internet develops and grows within commerce and society as a whole.

Internet access is becoming more important in the very small businesses. According to the 2004 E-Commerce results (2005a:21), 30% of businesses with fewer than 10 employees have a website. In comparison, this number rises to 68% for businesses with 10 or more employees. In Chapter Six RH (MIDSS-6) the sole proprietor of a marquee business located in rural Cambridge was introduced. We saw that in comparison with the other participants, he has lower levels of computer literacy and relies on his office staff to retrieve certain accounting information from their computer systems in order to complete the MIDSS questionnaire. Despite RH's limited computer use, he has had an email address for about a year (indeed the date and time for the interview was arranged via email as it proved too difficult to get hold of him by the telephone). It also emerged he uses the Web for personal use, for example booking holidays. The company has its own website for marketing purposes that provides information on services offered and contact details. RH is adamant that whilst the internet is more difficult for his generation, he thinks it is an exceptionally important tool for small businesses. This is demonstrated by the increased number of enquiries that have been received since the development of their website around two years previously. RH also commented that many of their website-originating enquiries come from younger people.

The use of the internet, within the four years that we have had it, we have probably 10 times/12 times more now than we were... well I would say two years ago. When we first started it was zilch. The first year it was probably 10% and 20% and now it probably equates to 50% of our work or certainly the enquiries. 50% of the enquiries. I can't say we convert all those enquiries into work but certainly 50% of the enquiries would come through the internet. And the other thing that it does, for local companies like us, what I have found with the internet is that it doesn't distinguish too much with areas...Where it is just Yellow Pages for the Cambridge area, it would be there but now the whole of East Anglia wouldn't be out of the question.



This company's website has opened up the geographical area within which they can do business. This has been a welcome but unintended benefit of the website.

### *7.2.2 Participants' use of the internet*

All of the participants described use the internet on a personal level. Most see the Web primarily as an information tool, from obtaining train-times, cooking recipes to reading daily political and financial news; although, as we have already seen, a few discussed using it to book holidays or ecommerce. Most participants were of the persuasion that the internet is 'good' or 'very useful'. A few commented that it was easy to 'get lost in' and lose time.

Several participants discussed making use of their work internet access for personal purposes, whilst a few referred to their internet access and usage at home.

Yes but it tends to be more for personal use than for business use. So it would be keeping in touch with friends, on the internet you know I might sort of go onto the BBC website and find out what the latest news is. I might be keeping track of my share portfolio or whatever. (AP-MIDSS-1046)

I use it extensively at home. We do things on the internet that we would not have been able to do 10 years ago like banking, booking holidays, find it very good for looking at images of places particularly if you are going on vacation you can see what hotels are like and so on. (QX-ECOM-3082)

A few participants commented that they do not use the internet very much and are not very good with the technology. However, when hearing about their actual use and later seeing their relative ease with the prototype, their comments seem somewhat contradictory.

I'm not very good on there, I must admit. I sort of do struggle. I mean I sort of tend to use things like Ask Jeeves or something like that. I mean I am not ...I am not technically minded, I wouldn't want to have a computer at home because I don't, I just don't have the time. I have a lot of other interests as a person but I know I can use the one at work so if I am looking for something specific, then I might have a go around. And I might sort of find myself in things that I don't need to be in or I think oh that is interesting but I am not an avid Web-user. Completely not. I am not a good person on there, I am not very confident and I will have a go and just see where I can get and if I can find some sort of information. Now and then I have sort of purchased bits and I am a bit hesitant about that when you hear about all these people who have got fraud and this, that and the other but I have ordered a couple of things off there and it has been alright. I have not had a problem with it. (UO-MIDSS-120)

The quote above illustrates that UO feels that she struggles with the Web and is not a competent user. At the same time, she reports using it as an information tool and for occasional personal online purchases. Nor did UO have any trouble completing the MIDSS



prototype and, in fact, responded favourably to it. Her feelings towards the Web appear to come from a lack of confidence rather than an inability to navigate the Web successfully. This concurs with recent research by Hargittai & Shafer (2006), which found that women are more likely to underrate their ability to navigate the Web. Further, the authors (Hargittai & Shafer, 2006:444) comment that “women’s lower self-assessment vis-à-vis Web-use ability may affect significantly the extent of their online behaviour and the types of uses to which they put the medium”. It is possible that take-up of Web data collection could be affected in this way. Age is another factor that can increase apprehension and fear of technology, which can act as a barrier to using the technology. RH (MIDSS-6) alluded to this in his reference to ‘old gits like me’ as opposed to ‘the girls in the office’, whom he discussed as being computer and Web proficient.

Overall few participants reported using the Web frequently for work-related activities. Rather email emerged as the most important internet application, both at a company level and within participants’ jobs. Participants in the larger companies discussed using email much more extensively than the smaller ones, reporting frequent use on a daily basis for both internal and external communication. Nevertheless, regardless of company size it is an important tool.

I mean obviously we are very reliant on it for emails. It is the first thing that you do in the morning. (YS-ECOM-86)

It is quite a vital communication aid I would say. Probably I would, personally I would probably use email more than the telephone now. (EI-MIDSS-300)

Email has long been referred to as the ‘killer application’ of the internet. Winston (1998:335) writes “from the very beginning it has been clear that the most unambiguously valuable facility provided by the net is email”. The value of email in their working, and to some extent personal, lives was emphasised by many participants.

In line with the prevalence of email as a communication method, a few participants discussed the use of email for obtaining information from people in other departments in order to complete an ONS questionnaire:

I would just email them and ask them. Because sometimes I do, sometimes I will just email and say oh can I have the numbers for this form and just fill them in myself. (TH-MIDSS-300)

However, face-to-face or telephone communication remained the most commonly cited methods of gathering the necessary information:



...Very little of the information is actually available to me. So I have to refer to our IT department who provide most of the information... Most of it [information gathering] is done on the phone... (GX-ECOM-1300)

In contrast to the frequent use of email in their working day, Web use is much more limited. Several participants commented that they only use the Web occasionally as part of their job.

Oh, I use email all the time, I use the internet [Web] as and when I need to. Not very much. (HS-MIDSS-300)

It is likely that the nature of the majority of participants' jobs, as accountants, means that the Web is not pivotal to their job. In contrast and perhaps unsurprisingly, the IT managers were more likely to report frequent, daily Web use but this was not always the case.

I am on the internet most hours of the working day. I always have a browser open. I use it for everything. I use it quite a lot. (FF-ECOM-29)

Regardless of job role or position, the Web is used across the board as an information tool, even if not regularly. For example, participants reported obtaining information about other companies, obtaining exchange rates or getting market information but would often reiterate that their use is infrequent.

Getting information about other companies sometimes, but not really, I don't use it all that much. (JW-ECOM-309)

Those participants that report work-related Web use do so most often for practical purposes, such as online banking, and small-scale purchases, such as ordering office supplies and making travel arrangements.

I know another thing I didn't mention, I forgot, you said what do I use the internet for... Everyday and I completely forgot about it. I have a software package from the Co-op Bank is our bank, and I am dialling them up all the time and sending electronic payments. We make BACS [Banks Automated Clearing System] payments electronically to people so I do use the internet for that. (JL-ECOM-19)

The participants that use the Web in this manner are in small and medium sized companies and have a senior role within the company, for example a financial director or group accountant.

### *7.2.3 Government websites*

There is one key exception to the limited work-related Web usage. A good number of participants discussed accessing government websites for both information and services,



such as Inland Revenue, Customs and Excise, National Insurance, London Congestion Charging and DVLA vehicle registration and taxation.

I do increasingly use government websites. Things like [Inland Revenue] and [Customs and Excise] websites are pretty comprehensive and I did actually this year fill in some of the year-end returns about PAYE [Pay As You Earn] and previously I sent printed forms. (JL-ECOM-19)

Of the government websites mentioned, the Inland Revenue was discussed most frequently, with many participants using it for information purposes. A number have also used it for online submission of their company tax return. Their opinions of the Inland Revenue's offerings were mixed, with some very comfortable with the online submission and others a little more wary.

I like doing forms online quite frankly because I find that so much easier...I did all of the tax returns this year, I did those online and I just, well I suppose because I work with technology all the time, I would just prefer to do it that way. (YS-ECOM-86)

I was scared of doing it, I must admit, because it was a lot of work that you have got to send again if it doesn't work in the first place and obviously you know that if it doesn't get there you are going to get a fine for not, for sending them in late. So I was very hesitant to do it...So I felt a lot easier once I've actually checked on the system and I phoned them to say have you got it and when they said yes, we can see it, then I was relieved but until that time it was something that you know you have got to do but you don't want to do it. (UO-MIDSS-120)

UO's comments concur with her discomfort of the technology, which we saw earlier in section 7.2.2. Her comments indicate she feels a sense of inevitability about the future role of the technology, using the technology is 'something that you know you have got to do'. We shall return to these ideas in the following chapter.

This section has illustrated the extent of internet use by the participants and their businesses, allowing an understanding of the various situations within which Web questionnaires would be completed. We also have an understanding of participants' use and proficiency in using the internet. This helps contextualise their comments about the prototypes and their expectations of Web questionnaires.

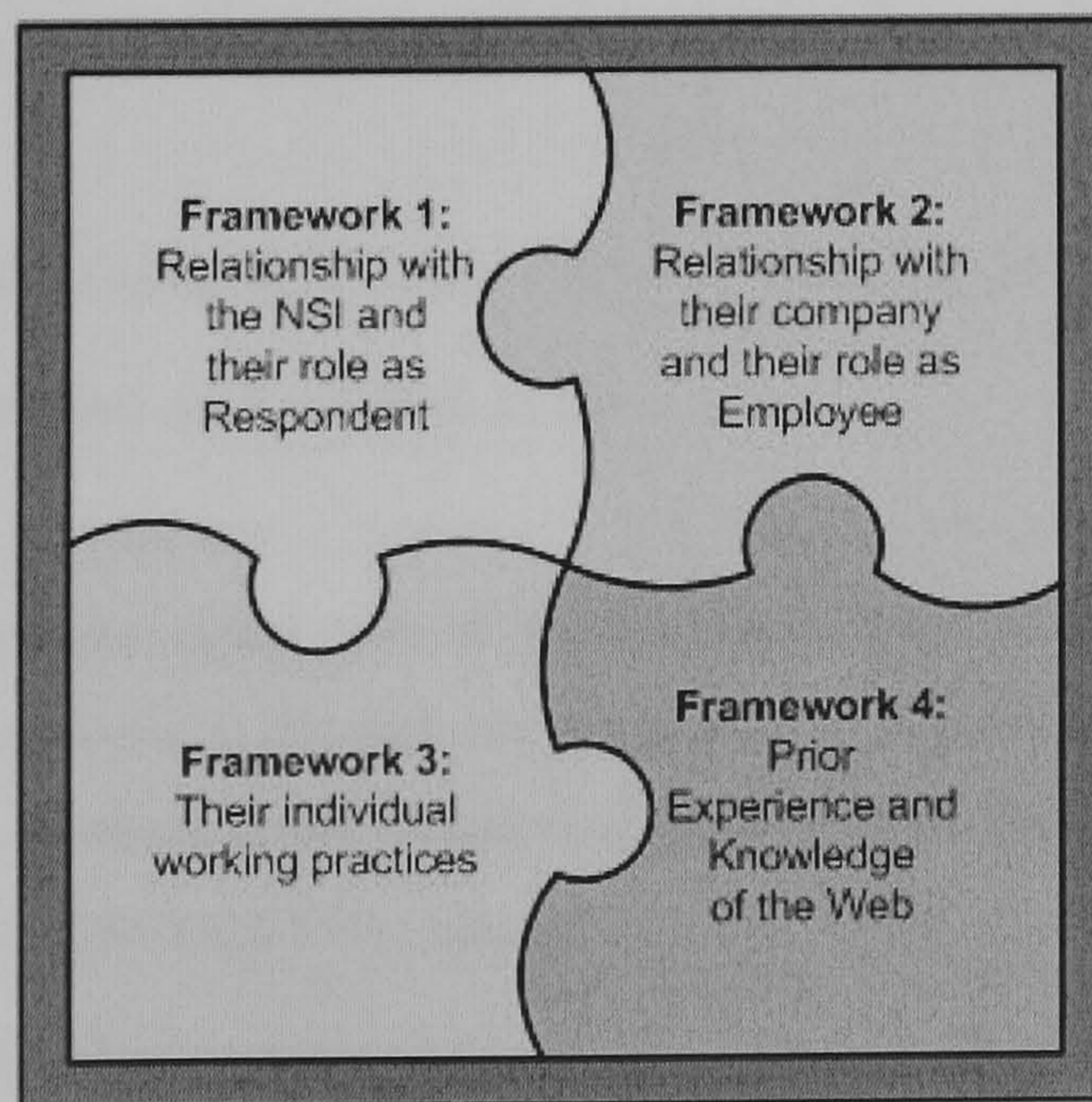
### **7.3 Prototypes Visual Design**

The second part of this chapter considers the reactions and comments that the participants made both during and after a trial run through the relevant Web prototype. The majority of this discussion comes from the UK research with ONS respondents; however it also includes



some reference to findings from the US Census Bureau research, discussed in section 4.9 of Chapter Four. These findings are clearly identified in the chapter as those from the US research. The participants' comments from both studies provide a good and necessary insight into how these participants in particular, and respondents in general, evaluate the usefulness, usability and desirability of Web data collection. The section explores comments on the design and functionality elements, including desired features, then considers logistical aspects and supplemental features of Web data collection. In conjunction with this, the section also considers the application of the Web survey methodology literature, discussed in Chapter Three, as well as the research undertaken by the NSIs, discussed in Chapter Five.

During analysis of the 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 7.1 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 NSI, 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 7.1 Participant Frameworks for Evaluating Prototypes**



All participants were asked to look at the relevant prototype and have a trial run of completing the questionnaire by entering (fictitious) 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 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'. As we saw in section 3.2 of Chapter Three, there is some support in the literature for keeping Web questionnaires similar to paper designs, with Dillman (2000a:379/95) suggesting that this is more intuitive for respondents in that it mirrors the majority of Web pages and caters for respondents with lower bandwidth and computing power.

Few participants had any strong feelings or substantive comments on the visual appearance of the Web questionnaires. Some felt that it was 'boring' or 'dull' and indicated that they would like to see something more colourful.

To be honest it is always nice to have colours to make it look pretty and things but I know all you are trying to do is collect some simple details and I don't think it is really essential. (AP-MIDSS-1046)

AP draws upon his prior experience of Web use (framework 4) and indicates that he prefers visually colourful and attractive websites. At the same time, however, turning to his role as a respondent to government surveys (framework 1) he feels that the design is appropriate and fit for purpose. Most participants echoed the view that the appearance was fit for purpose as a government form:

It looks typical government colours. Grey and blue. (LB-MIDSS-55)

It looks professional. (DK-ECOM-3173)

Participants' reactions to the appearance of the prototypes were also influenced by their own working practices, framework 3. Several commented on the font size, saying that they could read the text without having to strain. In addition, most felt that the prototype is well laid out and not cramped. As MP (ECOM-350) sums up:

I can even read it without my glasses. Yes, it looks fine. It looks nice and clear and uncluttered.

In this vein, some participants considered the appearance of the Web version to be preferable to the paper questionnaire:



Because on here [the paper questionnaire] the actual headings are, for my eyes, disappearing and it's the italic bold stuff that stands out more. But on here [the Web version] it's much clearer. (PC-ECOM-432)

This said, participants recognised both of the Web questionnaires as being very similar to the paper versions. This is not a negative feature, as SD (ECOM-19) observes:

It is just a reproduction of the form on there isn't it? I mean from that point of view then people are used to the format.

A similar format ties in with respondents' working practices (framework 3) and the consultation of previous questionnaires before completing the current questionnaire. Finally, a couple of participants, generally with reference to security, noted the presence of the ONS logo on each page. DN (ECOM-100) remarked:

The logo I recognise obviously as National Statistics so that makes me feel comfortable looking at it.

Here DN notes the importance of verifying the authenticity of the questionnaire as an ONS request for data, alluding to the need to protect his company's interests when giving out information (framework 2).

### *7.3.1 Response Options*

In Chapter Three (section 3.3) we saw there has been much research into types of response options that are available in this mode, the most common being radio buttons, check boxes, drop-down boxes and text-entry fields. Dillman (2000a:392) advocates the use of radio buttons as they are most similar to tick boxes in a paper questionnaire. This is particularly important when using multiple modes, which will be the case for the foreseeable future in government business surveys. In radio buttons, once an answer has been selected the respondent is committed to providing an answer (but not necessarily the answer initially selected). Another drawback to radio buttons is illustrated in research by Heerwegh & Loosveldt (2002:471) who found that the download time for drop-down boxes is substantially quicker than radio buttons. However, as we saw in section 3.3 of Chapter Three, drop-down boxes have their own problems, including the need for additional clicks to reveal the answer options.

Very few participants had any comments on the format of the response options. All participants were comfortable selecting radio buttons and entering numeric or textual data where necessary. A few MIDSS participants remarked that they would prefer a drop-down



option for date selection. VE (MIDSS-619) felt that this format is more common in Web applications and is less likely to incur data entry errors:

I think a lot of dates that you would have, would on any Web-based system have a date as a drop down, a month as a drop down, and a year as a drop-down...as opposed to, yeah it is easy to key in but I think it is what people are used too. And by doing the drop downs the benefit of that is that you are not really going to make a mistake. You know, if I have keyed in 72 I would go all the way through but you wouldn't pick that up.

VE is clearly drawing upon previous Web experience (framework 4) with drop-down boxes and, in her view, their effectiveness in preventing mistakes. This view does not necessarily stand as data entry errors are still possible as a respondent may inadvertently select the incorrect day, month or year. Nevertheless, it is worth noting that some respondents may prefer drop-down response format in the case of dates.

Generally, however, participants were happy to enter the numbers themselves using the required format (DD/MM/YYYY). Those participants who did not insert a forward slash when entering this information (e.g. 01102005 versus 01/10/2005) were pleased to see that the field was automatically formatted.

That's good the way that it fills in... (EI-MIDSS-300)

A small feature like this can contribute towards respondents reporting a positive experience. With this in mind, the inclusion of any aids, no matter how small, should not be overlooked.

Another type of response format are questions grouped together in a matrix, where the questions are on the left of the screen and the answer options are on the right of the screen. In section 3.3 of Chapter Three we saw Graf (2002:56) argue that this format places too much cognitive burden on respondents and should be avoided. This is a view echoed by Comley (2000) and Schonlau *et al.* (2002). A few E-Commerce participants felt that the last set of questions in the prototype, which were grouped into a matrix, was not clear. Instead, they would prefer to see the yes/no answer options located directly under the question (as opposed to the right-hand side). YS (ECOM-86) notes:

I think the 'no' is probably too far over to the right so that if you are reading the question and you are looking and it is saying 'what did you' and 'did you' and you are saying 'yes' but you are not necessarily noticing that there is a potential to say 'no' as well.

This view corroborates the view that questions grouped in a matrix format are at risk of increasing cognitive burden. Not all participants concurred with this stance and in contrast GI (ECOM-2000) comments:



It is clearly marked that each part is something different. It is not all jumbled up and it is quite clear what it is asking and how each point is separate. Yes, it is very good.

Both of the quotes from the participants illustrate their personal preferences combined with their working practices (framework 3) and draw from their experience with such Web views (framework 4).

### 7.3.2 Progress Indicators

In the E-Commerce questionnaires, a number of participants observed that there is no indication of the questionnaire length; how many questions they have completed and how many they have still to answer:

I think that might be useful if...the user knows up-front how many... not necessarily how many questions they're going to have to answer but roughly how many pages they're going to have to go through, and you can give a little scale somewhere to say how far through that you are. Because if you're sat there doing it, you're going to want to know how much longer you have to sit there doing it. (PC-ECOM-432)

Participants also commented that they needed to have an idea of the length of the questionnaire and their rate of completion so that, if necessary, they could tell their manager (or in some cases company director) of their progress. These comments show how participants evaluate the prototypes in terms of their working practices (framework 3) and negotiating these working practices within the company (framework 2).

Generally, the participants did not have any preference on how progress through the questionnaire is indicated. A few, like PC above, discussed the use of a progress bar whilst others mentioned the use of textual indicators. Textual indicators could provide information on how many sections there are in the questionnaire, what section they are in and so on. A textual indicator may be preferable to respondents as it can provide more information about the questionnaire and also eliminates the accuracy problem that arises with progress bars when using automatic routing for questions. We saw in section 3.2.2 of Chapter Three that research identifies various issues that arise both with the inclusion of progress indicators and exclusion, leading to the conclusion that their use or omission needs to be an active design choice (Conrad *et al.*, 2005).

The above discussion shows how participants viewed the overall appearance, the 'look and feel' of the prototype Web questionnaires and some of the basic elements. It is clear to see that the participants draw upon the four frameworks introduced at the beginning of this section and that these frameworks influence their assessments of the prototypes. At times,



the frameworks complement each other; seen for example in comments made about the use of the ONS logo, which correspond to frameworks 1 and 2. In other instances, the frameworks conflict with one another; illustrated by comments made about the colour and visual appearance of the prototypes, where frameworks 1 and 4 come into play. Overall, the participants were comfortable with what they saw and had few comments or suggestions. This was not always the case with regards to functionality elements incorporated into the prototypes. It is to this that we now turn.

#### **7.4 Prototype Functionality**

One of the key differences between paper and Web questionnaires is the ability to incorporate functionality elements such as edit checks and automatic routing. As we have noted in earlier chapters, the ability to employ such elements is seen as one of the main benefits of Web data collection for NSIs and are 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.

##### *7.4.1 Moving through the Questionnaire*

Within both 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. (BA-MIDSS-46)

Once again, 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 again clear that even seemingly minor functionality features can have a big impact upon the positive and negative perception of the Web questionnaire by respondents. As noted when referring to progress indicators, 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 prototype 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. AA (ECOM-109) 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.

The provision of a 'don't know' option is a long-standing and major methodological issue, the use of which needs to be a calculated and informed decision by the researcher. If respondents are to be forced to provide an answer, which is discussed below, then a 'don't know' option may be necessary.

Another drawback of edit checks being used in this manner is that respondents are unable to move through the questionnaire providing answers where known and documenting what other information they need to gather in order to answer the remaining questions. This impedes the respondent's working practices (framework 3) and the relationships that they need to negotiate within their workplace (framework 2). As QX (ECOM-3038) said:

What you want to do is go through and answer where you could, leave some blanks and then come back later. Let's say I got to one I couldn't answer then I don't want it to prevent me going forward because I might want to see all of the questions I can't answer and then go to other people.

As with the case of 'don't know' options, forcing respondents to provide answers before moving onto the next question/set of questions is a major methodological issue (Oppenheim, 1992). In section 3.3 of Chapter Three we saw research by de Rouvray & Couper (2002a)



that investigated methods for dealing with these options for Web surveys and found that a 'decline to answer' prompt following an unanswered question was the most successful method.

Furthermore, 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.

A related issue is the ability for respondents to move around the questionnaire without losing the data that they have already provided. Participant working practices (framework 3) show that respondents may return to a particular question or section in order to revise an answer.

But if you can go back through the form, then you can always change a previous answer if it is necessary. You might get later on in the form and it asks a set question and you put an answer down and you think oh but hold on, that doesn't tie up with an answer I gave earlier on. So you might want to go back but you have to have the facility to go back and change answers. (SD-ECOM-19)

In the prototype, if a participant returned to a previous page in the prototype, his answers were lost. Undoubtedly, it would be very frustrating for the respondent if inputted data is lost like this during the course of completing a questionnaire. It is very unlikely that a NSI Web questionnaire would be designed in such a way. One way to prevent lost data is to include session cookies in the design so that all information is stored on their computer. This solution is problematic as many individuals and companies prevent the use of cookies as a security measure. Alternatively, the information can be sent back to the NSI's server and stored there. This transfer of data could be done every time the respondent clicks on the 'next' button to continue onto the following page. In this event, the NSI needs a watertight way of ensuring that the most recent version of data submitted by the respondent is stored. This must include the removal of answers. Further, respondents must not be bothered with version control.

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).

#### *7.4.2 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'. (JL-ECOM-19)

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.

#### *7.4.3 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. (LB-MIDSS-55)



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 revisiting the same survey twice. As HS (MIDSS-300) 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, the research discussed in Chapter Five and the findings from the interviews discussed below, show that 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. As described in section 4.7.2.1 of Chapter Four, the first 5 MIDSS participants experienced this check as 3 separate pop-up windows with somewhat confusing text. Those participants that encountered this text seemed to feel it was testing their ability rather than assisting them:

It was testing me. (IA-MIDSS-16)

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 (VE-MIDSS-619)

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. (JL-ECOM-19)

Drawing upon prior experience with Web-applications (framework 4), participants deduce that immediate consistency checks are possible and in their mind desirable. This type of



check could reduce response burden by ensuring that they get it right immediately, rather than having to revisit such questions.

The E-Commerce edit checks occur at the end of each page when the respondent clicks upon the 'next' button in order to proceed with the questionnaire. Conversely, the MIDSS edit checks are designed to run once the submit button has been clicked at the end of the questionnaire. A paging design, such as used in the E-Commerce prototype, would allow each question (or groups of questions) to be validated before the respondent proceeds. However, the use of a paging design for a short questionnaire (such as MIDSS) may not be the best approach simply to accommodate question-by-question checks. A possible solution is programmed checks running in the browser environment, such as Java Script. In Chapter Three (section 3.6) we saw the warnings and advice given by researchers such as Couper (2001) and Schonlau *et al.* (2002) surrounding issues associated with respondents' computer equipment, internet connections, browsers, etc. These factors present problems for the solution of programmed checks running in the browser environment. Once again, every design option has advantages and drawbacks, which the designer needs to weigh-up before making her choice. In this study, the participants clearly want to see the advanced features of the Web employed. In this context, designing the Web questionnaire to the lowest common denominator may be detrimental. Excluding advanced features could alienate many of the proficient and advanced users of the Web, who see this as a key benefit for completing the questionnaire in this manner.

The interview data show that checks for consistency and valid ranges at the end of the questionnaire, as in the MIDSS prototype, appears to be a burdensome method for the respondent, particularly if she has multiple errors. As described in Chapter Four (section 4.7.2.1), each error appears in a pop-up window and has to be treated one at a time, with the user having to re-submit the questionnaire after each correction. This requires a great deal of effort on behalf of the respondent and may cause frustration. Another point to consider is that more and more companies and individuals have pop-up blockers enabled in their browsers, which might prevent the respondent from seeing the edit results. An alternative approach would be to present all errors clearly marked at the relevant question in order to enable a single review and submission. However, this again can come with its own set of confusion and frustration.

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 (see Figure 4.10 in Chapter Four). 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, 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 NSI expectations of improving data quality through Web data collection.

## **7.5 Desired Functionality**

All the participants, with the notable exception of the sole proprietor RH, 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.

### *7.5.1 Automatic Computation of Totals*

The ability for the MIDSS questionnaire to sum totals automatically was by far the most often requested functionality element in these interviews. This feature was also 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, something that the Census Bureau does not feel comfortable using in order to ensure compliance with Section 508, outlined in section 5.2.3 of Chapter Five.



In the MIDSS interviews some participants, reaching the question asking for 'total number of employees', were surprised that the totals were not automatically entered for them:

Oh doesn't it add it up for me? (HS-MIDSS-300)

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. (NW-MIDSS-441)

Other participants deliberately entered an incorrect total in order to see what would happen. In this event, they were surprised that they could continue completing the questionnaire despite having an incorrect answer:

How many full-time males do you employ? 10 part-time 20, 10, 20 makes 60 and I put 70 in total and it has not queried it. (IA-MIDSS-16)

How many...oh I can't add that up, can I make it up? Will it tell me that...Oh it doesn't do the enter at the end at all then... I would have thought here as well that it would verify your figure so that it would come up with an error that says if these aren't adding up to what you expected then that would verify it. (UE-MIDSS-738)

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.

This returns to the earlier issue of immediate edit checks that some participants expected. Prior to reaching the total number of employees, UE had typed in employee figures for each group and pressed the enter key after each figure. She voiced her expectation of receiving some sort of confirmation that her answer had been accepted. She explained that as an accountant she is used to working in Excel and using the enter key to confirm the number she had inputted and to move forward. Excel cells can be formatted in various ways and immediate edit is possible. An Excel user can easily see what cell she is working in as it is marked with darker borders and the row/column number and letter is highlighted. It is not clear to which feature this participant is referring, however it remains noteworthy that she expected the questionnaire to function in the same manner. It also illustrates once more that immediate edit checks for such items are highly preferable and should be considered if possible.

Not all participants felt that automated totalling was necessary for such a short questionnaire; 'I mean they are so basic anyway, aren't they' (NW-MIDSS-300) However, it would be a different case in longer surveys, such as the ABI. Once again, participants returned to their previous experience with Excel and other frequently used programs that sum totals as they work (framework 3):



The biggest one that I would talk about is the sum function. And that also comes into function with something like this [ABI] where you know you start at high level, you put in some numbers and as you get further into it, so it then tries to break these things down. In many ways this particular report, I think, tends to work the opposite way around. I used a model when I used to work for [large telecommunication company] for submitting their month end and you build it up from the bottom up so you would be plugging in all these numbers and it would be steadily up-dating this front sheet. Whereas this one tends to work that you put the numbers in here and then you break the detail down, and then the box total here should equal the box total there. So yeah, the model they used is the opposite way around, you would have all this stuff done, all the analysis and it would have populated the front bit. So I don't know maybe a re-think of how the forms work possibly. Especially in the electronic version where it could do that for you. It could sum your numbers for you. And then all you would have to do is check your front bit for sensibility, look back at your own internal account, internal reporting, stat accounts or whatever and have some degree of comfort that it has all come in. (EI-MIDSS-300)

This rather lengthy quote illustrates not just the desire for automatic totalling but also returns to the point that, for the accountants completing the survey, having the Web questionnaire function in a way that is intuitive to them, based upon the software and applications that they frequently employ, would increase usability and ease. At the same time, this needs to be balanced with the user-friendly requirements of non-accountants, especially those with limited computer literacy. 'User-friendly' was a term brandished by many of the participants from various businesses and positions and is a key point to keep in mind when considering design. These elements relate both to framework 3, their working practices, and framework 4, their previous experience of the Web.

#### *7.5.2 Inclusion of Previously Provided Information*

The other commonly requested functionality for MIDSS, and also seen 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 NSI 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. With only the first section of the E-Commerce questionnaire being included in the prototype, these participants did not see a similar set of questions and therefore were not required to enter contact details. Consequently, a discussion on the inclusion of this information did not occur in these interviews.



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 NSI 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. (NW-MIDSS-441)

Well if you did it by password or whatever, it would be great if you could have that [completed] so you wouldn't have to fill that bit in again. (LB-MIDSS-55)

On the other hand, others felt it ought to be included:

And then the contact details would just be annoying because it is taking you two-thirds longer to do that part. (IR-MIDSS-1500)

So you wouldn't need to give, you know, if there have been any changes please amend but the default would come up because it is a real pain. (VE-MIDSS-619)

A few participants wanted to see default data included in the first questions asking for the turnover period (start date and end date). The rationale behind this being that, as the ONS sends the questionnaire out for a particular month, this month should be the default value entered into these fields. Discussing their role as a respondent and their relationship with the ONS (framework 1), these participants felt that as long-term respondents to these surveys, the ONS should make it as simple as possible.

You go to fill in the January one, they know what it is, you know. Why put January in there again? So there is a bit of duplication there again... The simpler, because it is long term so I have been told, the simpler the better. (BA-MIDSS-46)

The front page of each MIDSS questionnaire contains the date by which the survey is to be returned. BA, as seen from his quote, feels that this is unnecessary duplication. He did concede that not all companies open their books on the first day of the month and close on the last. However, he felt that the Web allows default month values to be entered and it is up to the respondent to change the month if it does not fit with their company's record.

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. (HS-MIDSS-300)

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 NSI (framework 1). Participants are again looking to the NSI 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 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 could influence the overall survey results.

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 in order to assess their overall impact.

### *7.5.3 Ability to Print*

The ability to print at various stages in the response process surfaced as another important feature, an issue that emerged in Chapter Five from research by NSIs. 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. (GI-ECOM-2000)

A point alluded to earlier is that a printed copy of the entire 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. It remains to be seen whether this would be problematic for respondents. In addition, the NSI would need to decide how it would offer this printed version. Most logically it would be a PDF<sup>24</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 below.

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 the questionnaire and their data before submitting it to the Census Bureau.

The MIDSS participants did not think it necessary to print a paper copy of this questionnaire, generally because it is so short but also because most understood that they could make use of the browser print function. However, a number of them highlighted the importance of a print option whilst discussing other longer surveys. In all of these cases, participants are clearly referring to their working practices (framework 3) and considering how Web data collection would fit into these practices. MR (MIDSS-300) illustrates this when discussing the possibility of completing the ABI online:

I would imagine though, the one we do annually, that is a booklet isn't it? I would imagine that would be quite difficult online... I think that we'd have to do it on a hard copy. Fill out the hard copy, then once we have got all the information on the

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<sup>24</sup> PDF = Portable Document Format created by Adobe Acrobat



hard copy then go and do it online. If we just had an online version we'd have to print it.

Those respondents that print and complete a draft copy of the questionnaire before returning to the Web version and entering the data in order to submit their answers to the ONS, add an additional step to their response process. It also seems that this increases the burden of the task. As noted earlier, some participants acknowledged (rather bashfully) that they photocopy the paper questionnaire that they currently receive, complete the draft version and then write the answers in neatly on the original questionnaire. The response models that we considered in Chapter Two do not take into account this extra step.

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 ONS. 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.

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. (OT-MIDSS-14)

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

## **7.6 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.

### *7.6.1 Email vs. Postal Survey Requests*

Many participants, particularly those that are MIDSS respondents, were concerned that the implementation of Web questionnaires would mean that they would not receive notification informing them when their monthly return is due.



When the new statistic report will be due, will they automatically then send me an email to remind me that it is due?...Because sometimes when you are busy with other things you can so easily forget, especially when, I know it is important for it and I know what they use it for but nevertheless, it is not top of my list, not a priority thing and so therefore I do rely on the Statistics Office to send me this every month. (OT-MIDSS-140)

The relationship with the ONS (framework 1) and the participant's working practices (framework 3) are evident here. Participants want to know that the ONS will keep them informed about their requirements and they do not want a transition to Web returns to affect their current working practices. 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. (IR-MIDSS-1500)

Definitely. I would ban all communications in any other way except in email if I had my way. (YS-ECOM-86)

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. (LB-MIDSS-55)

Again, this illustrates how participants evaluated the prototypes with reference to their working practices and how Web data collection would work for them, or in LB'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).

### *7.6.2 Login/Corporate ID*

During the interviews, participants were also quick to ask about the logistics of accessing the questionnaire; whether they would require a login and how this would work. The manner in



which they asked about reminders, the logon process and the concern that they displayed highlights once again the notion, discussed in Chapter Six, of the 'responsible respondent' who wants to complete the task to the best of their ability.

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 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. (AP-MIDSS-1046)

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. LD (ECOM-100) 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 ONS 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 the deadline 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 NSI and respondent expectations of Web data collection reducing response burden.



### *7.6.3 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. (NW-MIDSS-441)

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. (DN-ECOM-100)

DN 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 position, most participants felt this would be a useful feature for these surveys. Multiple sessions in very long surveys, such as the ABI, were collectively considered to be an essential feature as it is known to be arduous and time-consuming:

There is another form, the annual one [ABI], which is quite complicated and potentially I could go in there several times to do it. (AP-MIDSS-1046)

Overall, it appears that the facility for multiples sessions should be integrated into the original Web questionnaire design, regardless of the questionnaire length.

### *7.6.4 Confirmation of Submission*

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. (IR-MIDSS-1500)

[I would expect to see] something like automatic e-mail or something that says that it has been sent successfully. (GI-ECOM-2000)



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. The wording on the page following submission did not reassure participants that their data has 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.

#### *7.6.5 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. 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. (US participant)

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. Participant preference on the communication method with the Census Bureau reflects framework 3, 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 missed this, saying that they were looking for something saying ‘Contact us’, wording that is commonly used on websites (framework 4).

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.



## 7.7 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.

### 7.7.1 Rewards/Feedback

During the discussion on submission and what would follow after clicking the submit button, PC (ECOM-432) 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 participant. It is noteworthy that PC 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. (RH-MIDSS-6)

In this way, feedback could act as an incentive to completing the survey and add a positive element on how respondents perceive the ONS (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. (FF-EOM-29)

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. (AP-MIDSS-1046)

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

This is not to say that these participants were not in favour of such feedback. To the contrary, they felt that this could be the "value-add" of completing the ONS questionnaires and they would be getting something back in return for their efforts, thus framework 1 is also applicable in how they evaluated the idea.

That would be extremely useful. Well, interesting. Yes. I am not sure how we would use that information but you never know. Yes, it is nice to know, anything that you do, it is nice to know that it is being used somewhere along the line. Yes, that would be beneficial. (DK-ECOM-3173)

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. (EI-MIDSS-300)



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, as government organisations, are unable to offer any kind of financial incentive to respondents. 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.

A feedback page could also be helpful in imparting additional information about the survey. As we saw in Chapter Six (section 6.6), a large number of participants claimed to have very little knowledge about the survey and its purpose, with many saying this would be useful. We also saw that participants, predominantly those who are repeat responders to ONS surveys, admitted to overlooking text on the front page and instructions, instead moving straight to the questions. The provision of a feedback page could help respondents understand not just what they have completed but assist in generating interest and understanding for future questionnaires that they may be required to complete. If so, this may have a positive impact on data quality.

Before turning to the conclusion, it is worth addressing two important elements of Web data collection that have not been considered in this chapter; help features within the questionnaire and security. Overall, security was not an area of concern for the ONS participants or the Census Bureau participants. This is not to say that they are uninterested in security. Rather, the overwhelming feeling is that security is the ONS' concern and if the ONS offers Web data collection, it is assumed that they have proper and sufficient security features in place. These participants, as we saw in section 7.2.2 of this chapter, are reasonably proficient and long-term internet users. Security may be a stronger concern for other groups of respondents, for example less proficient or newer users.

The lack of discussion on help features also does not reflect a lack of interest or diminish its importance. The prototypes included minimal help, simply reproducing the guidance notes in the paper questionnaire and placing them in a separate Web page with a link at the top or first page of the prototype. Only one participant clicked upon this link without prompting and many only noted the link after it was pointed out to them. It is clear that this provision of help on a working version of the Web questionnaire would not be productive. At the very least, guidance notes, glossary of terms and other such help features need to be visibly placed and accessible in all areas of the questionnaire. Given that these participants frequently draw upon their experience of the Web (framework 4), it is feasible that a more sophisticated

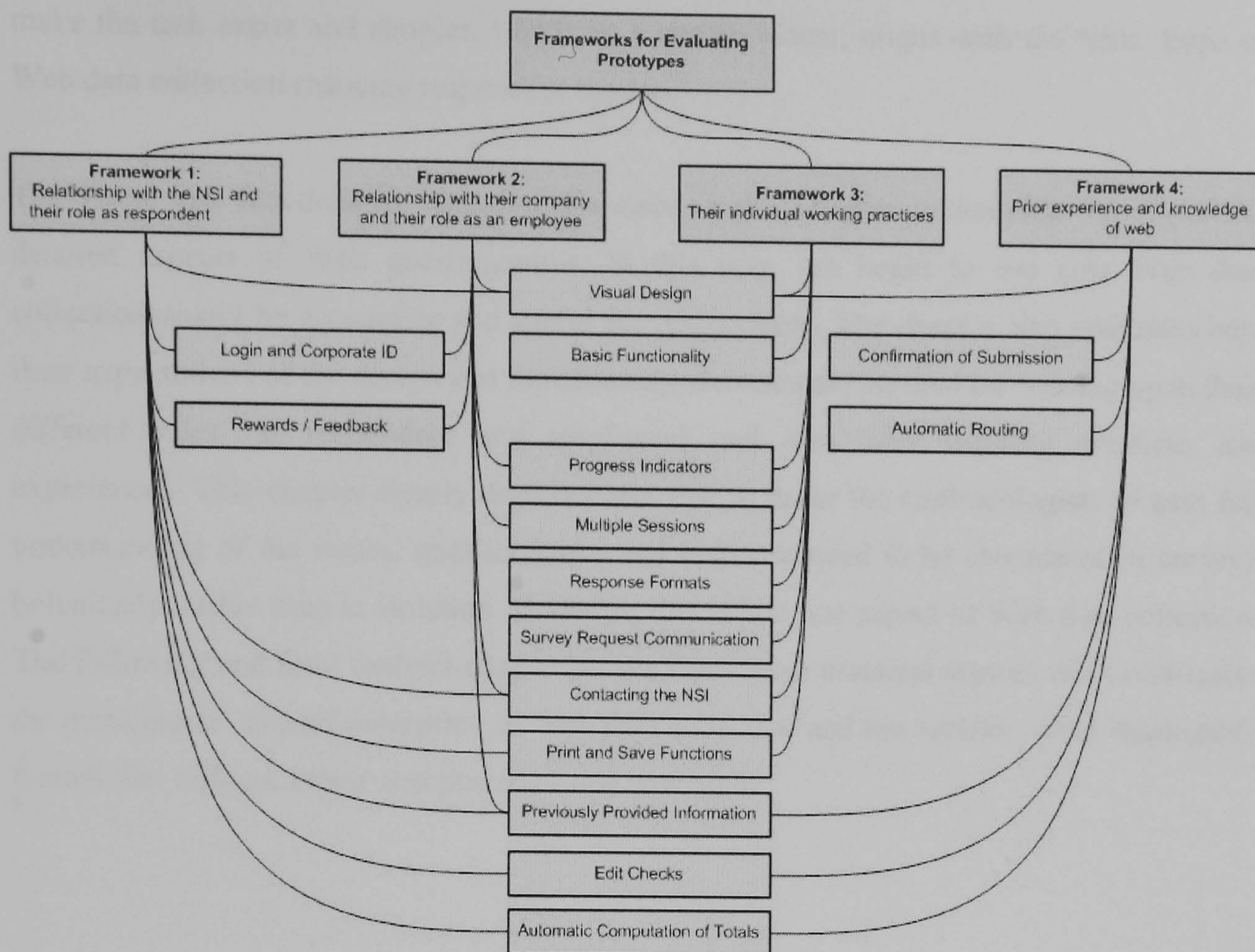


manner of offering help would be welcome, if not expected. The Census Bureau participants also wanted to see more use of help features, such as clickable links and help icons near where they need it, rather than clicking to a link on the instruction sheet. Again the participants reference to framework 4 clearly informs their expectations of the questionnaires.

## **7.8 Conclusion**

Response 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. In Chapter Six, it was emphasised that respondents to government business surveys are individuals with different positions, varying degrees of seniority and experience. On a personal basis, these respondents have varying social-demographic backgrounds, different personality traits and characteristics. All of these elements influence how they approach and respond to these surveys, as do factors 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, illustrates this point well (see Figure 7.2 below).





**Figure 7.2 Interlinking nature of Respondent Frameworks illustrated their evaluation of Web data collection**

The reactions and opinions of participants to the prototype questionnaires corroborate existing research as well as introduce new findings. Research from NSIs, discussed in Chapter Five, 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 NSI to



make the task easier and simpler, which, to a certain extent, aligns with the NSIs' hope of Web data collection reducing respondent burden.

The visual and functionality elements discussed in this chapter contemplate very specific, detailed aspects of Web questionnaires. In this way, we begin to see how Web data collection would be acceptable and useful for respondents. The chapter also addresses 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 chapter 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. However, this is just one aspect of Web data collection. The following and final analysis chapter moves from these practical aspects and investigates the participants' overall perception of Web data collection and the broader, often ideological, factors that influence their acceptance of this new mode.



## **CHAPTER EIGHT**

### **WEB DATA COLLECTION: THE RESPONDENTS' PERSPECTIVE**

#### **8.1 Introduction**

The preceding analysis chapters provided, firstly, an understanding of respondents and their current response procedures and secondly, an insight into their thoughts on desirable, and indeed expected, design and functionality features within a Web questionnaire. In Chapter Six (section 6.6), we saw that the greater part of burden, and perceived burden, lies not in the actual completion of the questionnaire but in gathering the required data from their information systems or from other people within their company. In this respect, participants did not feel that Web data collection would change the task of responding to an ONS survey. We also saw that many participants felt that, with the exception of the Annual Business Inquiry, completing the questionnaire(s) is a 'simple task' and so unproblematic. However, for some the real burden lies in the number of survey requests that they receive. Again, Web data collection is not going to alter this issue.

In Chapter Seven we saw that respondents' expectations in terms of design and functionality are based upon a negotiation between their different roles as respondent and employee as well as their working practices and their previous experience with the Web. Despite the comments that the difficulty of completion lies in obtaining the necessary information, participants appear to feel that Web data collection may be beneficial. Perceived benefits arise from the inclusion of certain design and functionality features. This chapter takes a step back from the detailed elements of Web data collection and explores the broader, often ideological factors that influence respondent expectations of the new mode.

#### **8.2 It's Easier and Quicker**

The same participants who said Web data collection would not change the task of responding expressed a preference for completing the questionnaire over the Web, as do many others. Several claim that online completion would be easier, although many were not able to articulate why this would be the case, simply saying:

For some reason it feels easier and quicker. (NW-MIDSS-441)



Some participants commented that typing is faster than writing and therefore it would be quicker to complete the task online.

...Just the fact of typing it in, I can type in quicker than I can write. (LB-MIDSS-55)

For other participants, the notion of easier and quicker related to the online submission and omitting the necessity to fold up the questionnaire, put it in the envelope and take it to the post box:

‘You click submit and Bob's your uncle’. (DK-ECOM-3173)

A few participants noted that the task of responding would seem less arduous if it is online as opposed to sitting with a piece of paper, which can feel ‘exam like’ (FF-ECOM-29). One participant, SD (ECOM-19) directly commented on perceived burden, remarking that whilst there is still the burden of completing the questionnaire, it is more enjoyable to do so online rather than on the paper version.

The perceived burden would be less I think, yes. But it would still be a case of the email comes in and you have got a form to fill in, 'oh I've got a form to fill in' but it would be probably a more enjoyable experience [laughs] and more convenient, yeah. (SD-ECOM-19)

The idea that the Web questionnaire may be more enjoyable could be attributed to the novelty of completing it online as opposed to the known experience of completing the paper version. A point we saw made by Haraldsen *et al.* (2002) in section 5.3.1 of Chapter Five.

SD is not the only participant to feel that it is more convenient to respond online. GX (ECOM-1300) expands upon this noting that:

It is just more convenient to do it [online], simply because the whole day is geared to working on a PC.

Several other participants also discussed how their workday is increasingly spent on a computer and hence find it is easier to complete tasks, whatever they may be, electronically. This includes their individual preference of typing as opposed to writing:

I just prefer to use it, using a computer than writing stuff down. That's all. (NW-MIDSS-441)

The desire for Web data collection based on convenience fits with framework 3, the respondent's working practices. It also appears to align with NSI expectations of reducing burden by providing respondent choice.



The notion of 'easier and quicker' goes beyond Web data collection and carries through to all interaction with government. All the participants were asked their opinion about the government's recent endeavours to put information and services on the Web, including but certainly not limited to the purpose of the interview, online ONS questionnaires. Not all participants have direct, professional experience with such websites. In this event they referred to either personal experience, such as submitting personal tax forms or looking for information about schools, or to items that they have heard on the news.

I think they are excellent. I fill in my [personal] tax form on the internet and I think it is a superb service and I recently had to apply for a new passport and I got the forms from the post office and I then realised you could of applied on the internet, which is great. (QX-ECOM-3082)

Those that have professional experience discussed both the information available and the ability to submit data to the government online. Without exception, all participants were very positive about these efforts, with comments ranging from 'it is good' to 'it makes life easier'.

It makes life a lot easier. Much easier to have the information to hand, to be able to submit forms and things directly to them rather than... you always work to a deadline if you are going to get it into the post and you think is it going to get there on time? Or courier it to Belfast or whatever. You know it is just a lack of aggravation if you can do it directly online. And you get a response if they have received it straightaway that sort of thing. It is much better. (HS-MIDSS-300)

HS is referring to online submission for Customs and Excise and the Inland Revenue. The benefits of instant submission with no postal delivery time considerations and immediate confirmation is another feature that many participants consider to be strong benefits of ONS (and US Census Bureau) Web data collection. Along these lines, a few participants from both the UK and US research talk about the 'black hole of the postal office' and their preference to avoid using the postal service as far as possible.

Despite the very positive responses to government websites, participants were quick to point out that these sites need to be kept up-to-date and most importantly, be available. UO (MIDSS-120) discussed problems that she encountered with the Inland Revenue website when submitting her company's tax returns. Despite the problems, the experience does not seem to deter her from using this service in the future as she feels it was simply teething problems. However, not all participants are so forgiving, as MP (MIDSS-350) comments:

I access it for the VAT [Customs and Excise] but that's not widely successful they are always updating their site and says 'Please come back later' so it makes you cross, doesn't it?



MP has an expectation that the sites are available and fully functional when he visits them. If it is not, then this is a source of frustration but owing to the compulsory nature of the task, he will come back and use it at a later date. Several participants commented that they would expect the questionnaire website to 'work' properly when they went to complete their return. A slow or unavailable website would be annoying. It is possible that an early negative experience, such as those discussed above but certainly not limited to these problems, with an ONS Web questionnaire could damage the 'easier and quicker' perception and cause them to abandon Web returns altogether.

### **8.3 Saving Resources**

Many participants cited the importance of efficiency; the need to save on resources. Many observed that Web data collection would be beneficial for the ONS. Linked to this, the importance of cost efficiency for the government was referred to several times.

At the moment if you receive something through the post and it says please complete me and then you don't complete it and then you get loads of... [reminders] you know to receive two pieces of paper for you know it is the postage, it is expensive to send out all of that stuff. (VE-MIDSS-619)

The need to save taxpayers money is important but in addition to this, time efficiency is also recognised as being important.

And also I mean if they, I don't know what they do in the NSA [National Statistical Agency] once they get the stuff back but presumably, if it is all PC based in the first place, then ideally all they are doing is downloading it through a model and it is straight on to the system whereas if they get back a piece of paper they have got to sit down and key it all in...I suppose if you have got that amount of information, it has got to make some effort to cut down the pure manual side of it. (GX-ECOM-1300)

These ideas directly align with the NSIs expectations of Web data collection providing financial benefits as well as reducing the length of time from receiving the data and publishing the findings.

The importance of efficiency is not simply the need for the government to be efficient, it is important to the businesses themselves and many participants feel that Web data collection would save their business resources. This would be worthwhile, even if the savings were on a small scale, such as the cost of a fax call.

Well, I haven't got to pay for the fax call. (RH-MIDSS-6)



A number of businesses have an active policy of doing as much as possible electronically in order to save resources.

We would very much like to switch to an electronic submission as well. It is things that are going to save us postage, time and paper. (EI-MIDSS-300)

Even if it is not an overt company policy, participants are conscious of saving resources for their business. JL (ECOM-19) for example, feels she ought to be doing more online in order to save on financial and storage resources.

#### **8.4 It's the Way of the Future**

We saw earlier that many participants express a preference to complete the questionnaire online. The preference to work electronically should not be understated and is influenced by a variety of sources. One of which is personal preference, discussed in section 8.1, another arises from their role as an employee (framework 2) in their particular company:

We work, the way our company works, we work very much on that basis anyway. 'Hey fill this information into the Web', we do it and then that is the end of it. If we don't do it, we get email reminders. We are into that kind of culture. (IR-MIDSS-1500)

Throughout the interview it is very clear that IR, personally and professionally, is very pro computer and internet technologies. The use of the internet is highly integrated into their company's internal operations and she recognises this is not always the case in other companies by her reference to their working 'culture'. It is perhaps unsurprising that IR works for a global telecommunications company. In the interview, she is a champion of the internet technology just as her company is within society, on a global scale.

Another source influencing their openness to the internet is their perception of the technology and its position in society as a whole.

I suppose it is just changing with the times, isn't it? You've got to keep up-to-date; you can't keep using pen-and-paper the whole time. (HS-MIDSS-300)

HS seems to be implying that the implementation and use of the Web is part of progress in society; the necessity of keeping abreast of technological developments, and that pen-and-paper is out-moded and needs to be replaced.

Similarly, SD (ECOM-19) feels that they need to 'change with the times', something he feels is 'inevitable':



Well I think they have to go down the route. I think it is largely inevitable. I don't think the government should be seen to be left behind in the IT revolution. And so the further ahead it is the better, I think.

A few participants went further still and suggested that paper questionnaires are outdated:

I think we are in an electronic age and whenever I see a paper form to fill out I think these days it should be online. So yes it would, I would more positively perceive a request for information that I could file electronically than I would for information on paper. (QX-ECOM-3082)

QX's comments echoes, and goes beyond, the view that the government cannot be left behind in the 'IT revolution'. QX appears to feel that we have moved past the revolution stage and are living in the 'electronic age' where technology use is the norm. This is an opinion that corresponds with the director of the management company (CH), discussed in Chapter Six, who feels that the technology is here therefore why is it not being utilised? These comments show an alignment with the notion of a 'Modern NSI' discussed in Chapter Five.

Not all participants were direct champions of technology but rather seem to have listened to public discourse and feel that the technology is upon us and here to stay.

Personally, I like the paper version but that is me being old-fashioned I think... But yeah, I think it is definitely the way forward. (UO-MIDSS-120)

Throughout the interview, UO expressed a degree of wariness of the internet and struggled with feelings of incompetence and fear in using the technology, as discussed in Chapter Seven, section 7.2.2. In the above quotation, she expresses a preference for the paper questionnaire but agreed to the interview and indicates that she will try Web data collection because she believes it represents progress. It is 'the way of the future'. This language used to describe the technology, its position in society and the future is deterministic and illustrates MacKenzie's (1996:5) comment, discussed in section 3.7 of Chapter Three, that technological determinism remains pervasive within the way that society thinks and talks about technology.

Some participants felt that, as with the above quotes, the technology is here and moreover businesses will be compelled to make use of it in the future thereby further reducing paper-based interactions.

I'm sure it will go that way at some stage, whether we like it or not. I think it will be imposed on most companies, starting from the very important forms. I think things will go that way eventually. (AA-ECOM-109)



AA's prediction that Web interactions will be 'imposed' presents a somewhat negative and sceptical view, indicating he may hold reservations about widespread, enforced use of the technology. This is not to say that he is opposed to the technology in the different roles within which he makes use of it. He uses it regularly as part of his work, has an internet connection at home and feels that it is 'an amazing tool'.

In the interviews a few participants, on their own accord, questioned their use and apparent approval of the technology. Again, the notion of being 'up-to-date' was cited.

Is it an improvement? I don't know. Yes, I don't know why it feels like it. It feels more professional for some reason so yeah... and more up-to-date. (UE-MIDSS-738)

In the early 1980s, as the availability of desktop computer became widespread, many professionals and semi-professionals were enthusiastic to have access to computers and relevant software, such as spreadsheets. The use of computers was championed by the various professional societies, who called for their use as part of "professionalization of their members" Icono and Kling (2001). This notion of 'professionalism' can be seen as further computerizing their job and eliminating pen-and-paper interactions as far as possible. Regardless, many participants are keen to reduce the amount of paper that crosses their desks.

### **8.5 The Paperless Office**

The notion of a 'paperless society' has been with us for over 30 years. The vision of a paperless office was first discussed in a Business Week article, published in 1975 (Business Week, 1975). The following year, F. W. Lancaster discussed the idea with reference to the position of libraries and librarians in society (Lancaster, 1999). The idea of a 'paperless society' gained momentum, becoming widely anticipated as technology, and computers in particular, developed at a rapid pace. To date it has not transpired, although with each new decade the vision prevails. In the 1990s, its arrival was believed to be 'imminent' (Muter & Maurutto, 1991). A decade later, Eldredge (2002:72) claims 'its advent seems more likely now than anytime previously'. Here Eldredge is referring specifically to the librarian profession but the hope of a paperless office is not limited to librarians.

Several participants discussed Web data collection as a means to reduce the volume of paper in their office and a few are actively pursuing the goal of a paperless office.



We are trying to be paperless here. I have got a scanning system in now, which scans in all of our delivery notes and all of our purchases invoices and everything so that you can just access them on the screen. And personnel records and things. My big dream is that in a year's time we won't have any paper at all. (YS-ECOM-86)

Others do not necessarily feel that this is an attainable goal. Nevertheless, they feel that they should make an attempt to do as much online as possible in order to help with the practical problem of storage as well as saving (financial) resources.

Yes, I do have a feeling that I ought to be doing it (online). It is partly just this feeling that we constantly have storage issues. There are aspects of my core job (accounts) that I do think to myself sometimes or, have done lately, should I be moving to the point where I send statements to customers to pay electronically because I am wasting money and creating piles of unwanted paper by printing off 40 of these things and sticking them in the post. Not to mention I have to stick them in the envelopes. So there is this kind of feeling for a paperless office. I don't think we will ever quite get there and especially with accounts when the whole system for many, many years is grown of people passing invoices around. (JL-ECOM-19)

The idea and desire to have a paperless office, or at the very least work with less paper, conflicts with the current practices of many participants, who report activities such as printing emails and photocopying questionnaires. We have also seen that participants requested various print options to be available in the Web questionnaire. Thus while participants cite the desire to reduce paper it seems many would shy away from Web data collection if their ability to print is limited.

The idea (or ideal) of a paperless office is one that links with the ideas discussed above about the Web as 'the way of the future', symbolizing progress. Sellen & Harper (2003:5) comment "...paper has always been a symbol of old-fashioned practices and old-fashioned technology." In this way, Sellen & Harper (2003:26) argue that the actual drive for a paperless office in reality may not be to remove all paper but rather "symbolise a concern with how to move from an inefficient present to a gloriously efficient future." Despite the contradictory need for printing abilities, Web data collection appears to be part of that efficient future for both respondents and NSIs.

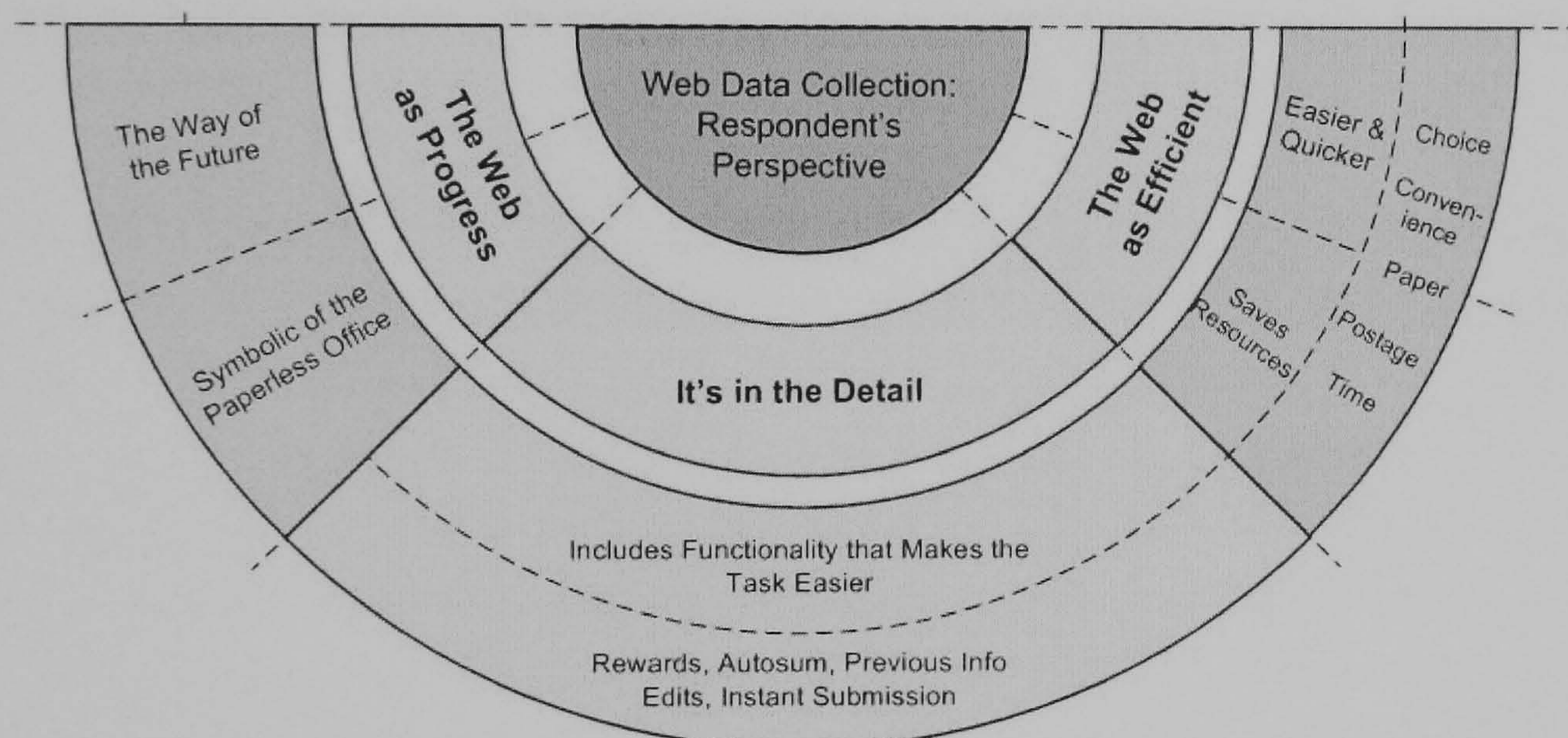
## **8.6 Conclusion**

This chapter has identified four factors that are influential in directing respondents towards Web data collection. The first factor involves the perception that online completion and submission of the ONS questionnaire would be 'easier and quicker'. The second factor stems from the desire to save resources, both from a government and a business perspective. The third factor shows how respondents' perception and understanding of computer and internet



technology can lead them to consider Web data collection as an inevitable part of the future. The fourth and final factor is the desire to reduce the volume of paper in their office and, for some, it is encompassed by their aspirations for a paperless office.

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. We can see that these participants are part of a Computerization Movement, which is propelled forward by the public discourse emerging from the technological action frame surrounding computers and the internet.



**Figure 8.1 Web Data Collection: the Respondent's Perspective**

These factors can be placed into two broad themes. Firstly, the participants 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 the 'Web as Efficient'. The second broad theme links the perceptions, and discourse used, when talking about the introduction of Web data collection and the position that it will hold in the future. The participants clearly consider the 'Web as Progress', which again relates with NSI perceptions of the technology and its future role in data collection. Web data collection then, from the respondent's perspective, is a combination of the detailed elements discussed in Chapter Seven and the broader factors discussed in this chapter. The concluding chapter to this thesis, to which we



now turn, considers what we have learned about the NSI's perspective and the respondent's perspective, the formation of expectations around Web data collection and how far NSI and respondent expectations align.



## CHAPTER NINE

### WEB DATA COLLECTION: NEW TECHNOLOGY AND EXPECTATIONS

#### 9.1 Introduction

The implementation of any new mode of data collection is surrounded by interlinking and often complex factors. A new mode offers the promise of improvements to existing methods but at the same time it is constrained by unknown methodological implications of mode effects and design choices. Survey researchers view the possibilities in different ways; eloquently expressed in the quote that opened this thesis: “For some, each new wave of technological innovation brings new opportunity, offering new ways to enhance and extend survey capabilities. For others, each such innovation is viewed as a portend of the end of surveys as we know them” (Couper, 2005:486).

This thesis has investigated the implementation of a new technology for data collection at government NSIs, which are following other research groups and adding the Web to their data collection toolkit. Chapter One began by asking how NSIs and their respondents form their expectations of this new mode and how far their expectations align. This concluding chapter draws together what we have learned about mandatory business surveys, NSIs, their respondents and Web data collection in order to address these questions. The chapter closes by considering the implications of this research for mandatory business surveys and beyond.

Before doing so, it is worth considering the limitations of the research findings arising from sampling bias. As we saw in Chapter 4, the UK sample was compiled on the basis of their business’ prior response to ONS surveys and in many cases their 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, which in turn may overstate the alignment between NSIs and respondents expectations regarding the new mode. A different method of sampling, perhaps one that is independent of the NSI, may lead to more varied perspectives. Alternatively / in addition, a sampling and recruitment strategy that aims to interview respondents that are *not* interested Web return may also achieve alternative perspectives. 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.

## **9.2 Web Data Collection: NSI and Respondent Expectations**

In the analysis chapters, Chapters Five to Eight, we found that NSI and respondent expectations for Web data collection fall into three broad, but interlinking, categories; namely, the Web as offering improvements, the Web as efficient, and the Web as progress. We address these three categories in turn.

### *9.2.1 The Web as Offering Improvements*

NSIs, as we saw in Chapter Five, have been working on the development and implementation of various electronic data collection methods for business surveys for more than a decade. These new modes are employed in the hope that they will provide improvements to current data collection methods. These improvements are found in four key areas: costs savings, increased quality, increased timeliness and a reduction in response burden. NSIs seek to make savings in financial resources, which Web data collection appears to offer by reducing data input costs by automating this process. At the same time, this automation potentially increases timeliness of publishing the findings by reducing the time taken for the entire survey process. Quality is also purported to be achieved by the use of the new technology, both by increased timeliness of the findings but also in the quality of findings, which are enhanced by the use of features such as automatic routing and edit checks (for missing items, consistency and so on).

NSIs also consider that Web data collection offers improvements by the reduction of response burden, an issue that appeared throughout this thesis. In Chapter Five we learned that NSIs cite response burden as one of the drivers for Web data collection. In the following chapter, Chapter Six, we saw response burden from the respondent's perspective. Here we found that the existing model of burden (Bradburn, 1978) can be modified to include understanding the value of the research as an equal weight factor. In addition, factor iii, the amount of stress on the respondent, was expanded to clarify that 'stress' arises from both internal (directly relating to the task of response) and external (unrelated to the task of response but increases the stress associated with the task) demands on the respondent. Thus the response burden model now reads as follows:

- i. Length of the interview/questionnaire



- ii. Amount of effort required of the respondent
- iii. Amount of stress on the respondent (arising from internal and external demands)
- iv. Frequency of being interviewed
- v. Understanding the value of the research.

We saw that NSIs hope that Web data collection may reduce response burden by providing respondent choice in the mode that the survey is completed and also by meeting requests from respondents who wish to provide their information in this manner. A reduction in response burden may be perceived rather than actual. Regardless, if a reduction in burden occurs, this also may have a positive effect on data quality. In addition, Web data collection allows the NSI to provide extra information about the survey and offer feedback to respondents about their information. In this way, burden may be reduced by respondents gaining a better understanding of the value of the research. Furthermore, the provision of feedback may act as an incentive/reward for response and reduce the costs associated with the task.

Respondents also typically believe that Web data collection can offer improvements to the task of response, both functionally and ideologically. In Chapter Seven we learned how the interview participants evaluated the Web prototypes according to four frameworks. These frameworks reflect different elements that the respondents need to manage and negotiate during the task of response. They encompass respondents' interactions with the NSI (which mostly occurs through the questionnaire), their position as an individual completing the questionnaire on behalf of their company and how this role and relationship are negotiated, how the task of response is carried out and managed within their workflow, and finally their experience and knowledge as a Web user. The evaluation model, developed in Chapter Seven, reads as follows:

- i. The respondent's relationship with the NSI and their role as a respondent
- ii. The respondent's relationship with their company and their role as an employee
- iii. The respondent's individual working practices
- iv. The respondent's prior experience and knowledge as a Web user.

Drawing upon these frameworks, participants recognised detailed elements of Web data collection as offering improvements to the task of response. These detailed elements consist of the visual design and basic functionality as well as the provision of new features, which are made feasible with the use of the new technology. The new features include automatic routing, automatic computation of totals, corporate ID, edit checks, provision of previously



provided information, instant submission combined with confirmation of submission and rewards/feedback.

### *9.2.2 The Web as Efficient*

The improvements of cost savings and timeliness, discussed above, also fall under the umbrella of efficiency. Efficiency is clearly important to both NSIs and their respondents. Both sides consider that financial and time savings are highly desirable and possible with the new mode. The savings are important for the respondent, their business and the government. However, neither side appears to consider the invisible work that surrounds the implementation of Web data collection (Nardi, 1999). For NSIs in particular, this involves the development of the technical infrastructure for Web data collection, integration into their existing processes and development of the instrument, the questionnaire. Efficiency, for the respondents, as we saw in Chapter Eight, is related also to the personal preference of working on a computer and thereby fitting into their everyday working practices. Thus, the ability (choice) to provide their data to the NSI in this manner may reduce perceived burden. Efficiency is very much part of the rhetoric (cyberbole) surrounding the new technology. The desire for increased efficiency, and the expectation that the Web offers this, emerges from the public discourse surrounding the internet, which is the second level within a Computerization Movement (the STS perspective, introduced in Chapter Three, devised by Iacono & Kling, 1996, 2001). Another example of public discourse surrounding the internet, which we noted in Chapters Five and Eight, is the notion of 'the Web as progress'.

### *9.2.3 The Web as Progress*

NSIs and respondents clearly ascribe to the future role of the internet within society, with both having expectations that the technology will become further integrated and pivotal within society. A number of themes emerged from both sides.

In Chapter Five NSIs cited the need to have a 'modern NSI'. They need to keep 'abreast of developments in society', which in this context means having an internet presence and offering respondents the option to return their data online. This, it is hoped, will positively affect their image within society as a whole and respondents in particular. Respondents appeared to agree with the idea that NSIs must be technologically current. In Chapter Eight, we saw that the Web is seen as 'the way of the future' and Web data collection represents 'changing with the times'. Similarly, respondents discussed the reduction of paper with the



notion of a 'paperless office', which is often used as a symbol of progress and increased efficiency (Sellen & Harper, 2003).

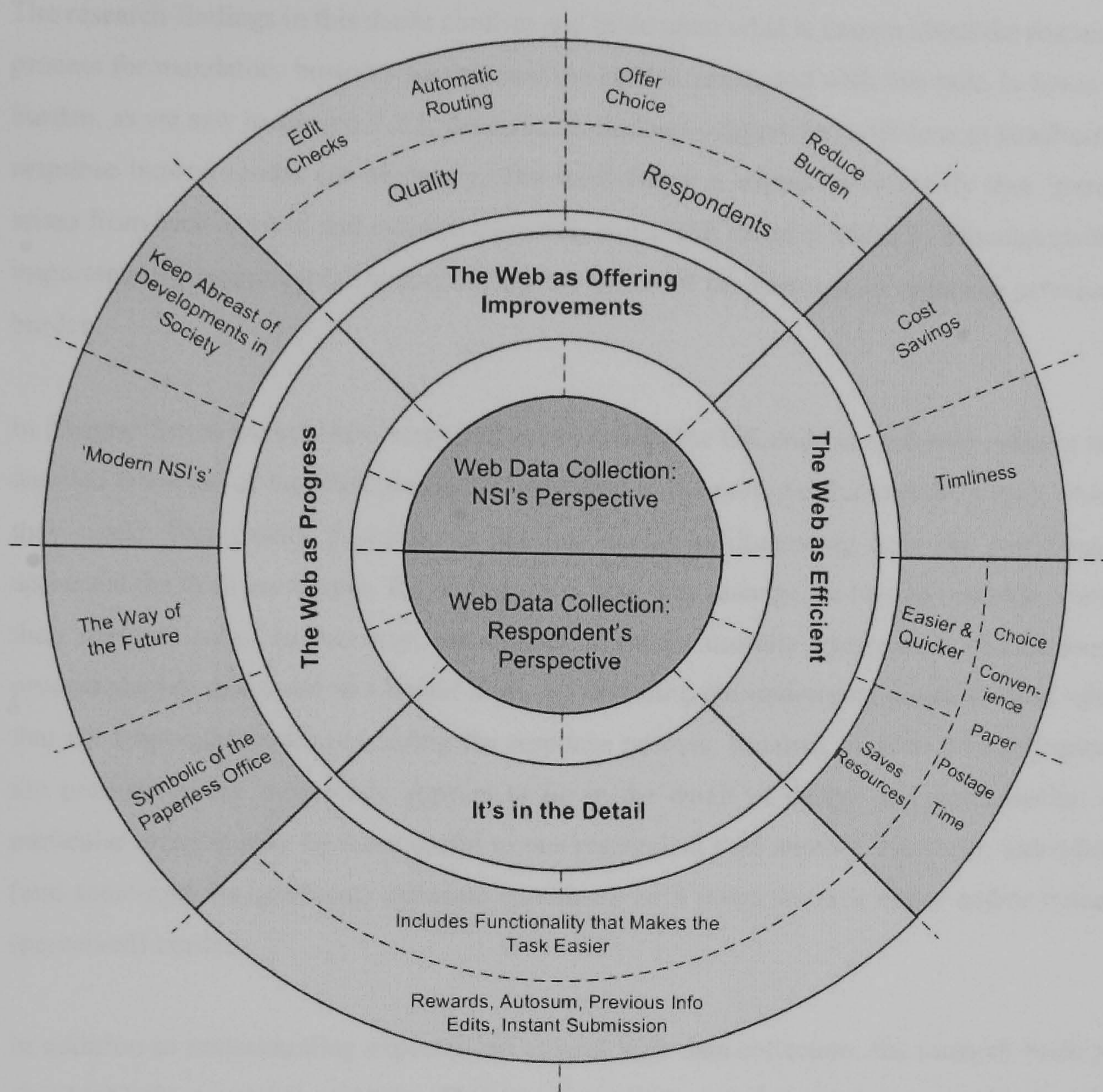
The language in which NSIs and respondents describe the technology, as we saw in Chapter Three, is deterministic; for them the internet represents progress; the technology's future role in society is largely inevitable and expectations are high (Brown & Michael, 2003; Guice, 1999; MacKenzie, 1996). This manner of thinking about the internet also reflects the public discourse surrounding the technology, which in turn adds drive and energy to its future. The local level adoption of the technology by the NSIs and their respondents demonstrates that they are participating within the internet's Computerization Movement.

#### *9.2.4 Expectations Formed and Expectations Aligned*

NSIs and respondents generally have very similar expectations for Web data collection (illustrated visually in Figure 9.1). Both NSIs and respondents desire increased efficiency (in financial and time resources), which the Web appears to offer. Both parties also consider the Web as representing progress and believe its future role in society is assured. Here we see that NSI and respondent expectations align. Furthermore, we can see that these expectations are largely formed by the public discourse surrounding the new technology, emerging from its technological action frame.

For NSIs, the Web appears to offer improvements to their data collection processes by the promise of increased timeliness and quality. In addition, Web data collection provides respondent choice, which may reduce burden and in turn improve quality of data provided. Respondents appear to want that choice and again we see that NSI and respondent expectations align. However, response is complex and multi-faceted. Respondents simultaneously evaluate the instrument in front of them by a number of interlinking, but sometimes contradictory, frameworks. Therefore, whilst Web data collection is desired and certain features are expected by respondents, if the instrument does not meet their needs they may abandon Web returns altogether and return to paper-and-pencil questionnaires.





**Figure 9.1 Web Data Collection: NSI and Respondent Perspectives**

### 9.3 Implications for Mandatory Business Surveys and Beyond

In Chapter Two, we saw that the response process model for mandatory business surveys (devised and developed by a number of researchers over an extended period; Edwards & Cantor, 1991; Eisenhower *et al.*, 1991; Sudman *et al.*, 2000; Tourangeau, 1984; Willimack & Nichols, 2001) demonstrates the additional, more complex tasks that business respondents are required to negotiate in order to respond to these surveys, as opposed to social surveys. The key characteristics of business surveys contribute to this complexity; respondents are completing the questionnaire on behalf of their company and are often required to obtain information from records or another individual/department within the business. The mandatory nature of these surveys inserts an additional element to the task.



The research findings in this thesis confirm and build upon what is known about the response process for mandatory business surveys and the burden associated with this task. In terms of burden, as we saw in section 9.2.1, the research findings suggest that additions to Bradburn's response burden model are necessary. The third factor is expanded to clarify that 'stress' arises from both internal and external demands, and a fifth factor is added to demonstrate the importance of respondents' understanding the value of the research in reducing perceived burden.

In Chapter Seven we saw how respondents (from both the UK and US research) evaluate the detailed elements of the Web prototypes according to the multiple frameworks within which they work. This model, however, is not just useful in illustrating how the participants appraised the Web prototypes. It also illustrates how they manage the task of response within their multiple roles. In this way, the evaluation model usefully supplements the response process model, discussed in Chapter Two, by revealing the underlying negotiation of roles that the respondent manages during the response process. In terms of Web data collection, the promise of the new mode appears to lie in the detail of design and functionality. A particular element may be more useful to one respondent than another. However, individual (and seemingly insignificant) elements combined, help make the task easier and/or reduce (perceived) burden.

In addition to understanding expectations around Web data collection, the research findings also highlight a number of issues. Despite respondents and their businesses embracing the internet and the notion of the 'paperless office', inescapable links with paper remain. It appears that the majority of respondents want the ability to print the questionnaire at various stages of completion. The current ties with paper will not disappear with the implementation of Web data collection. Indeed, in Chapter Seven we saw participant comments' indicating that they like the fact that the Web version appeared no different from the paper version. However, at the same time (and somewhat contradictory) we have increasingly sophisticated respondents. As respondents engage in more and more activities on computers and the Web, and as the Web develops, they also expect more in terms of functionality. In this way, the research findings illustrate the complexities surrounding Web data collection.

Response to a survey is not simply about an individual sitting in front of one instrument. The social setting within which they are completing the survey and the social dimensions surrounding the survey instrument, all influence response. In this way, it is important to consider not just the detailed methodological aspects within a questionnaire but also the



contextual elements. The use of a Science and Technology Studies perspective rather than the traditional social and cognitive approaches most often used in methodological research, allowed the topic to be examined in a holistic manner. This approach provided insights into the underlying views and assumptions that NSIs and respondents hold about the Web, which in turn affect the many methodological issues surrounding Web data collection. This research has demonstrated that respondents evaluate a survey instrument (in this case a Web questionnaire) from multiple frameworks. Thus we see that response is multi-faceted with respondents drawing upon their own sets of background knowledge and experiences, as well as the context within which they are providing the information. Such findings could be applied usefully beyond Web data collection for mandatory business surveys to business surveys in general and to social surveys.



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**APPENDIX A**

**SOLICITATION LETTER**





**Office for National  
Statistics**

Office for National Statistics · Government Buildings · Cardiff Road · Newport  
Gwent NP10 8XG · Tel: 01633 815696 · Fax: 01633 652747  
E-mail: [info@ons.gov.uk](mailto:info@ons.gov.uk) · [www.statistics.gov.uk](http://www.statistics.gov.uk)

Dear Sir/Madam  
**Web Data Collection Research**

I am grateful for your recent return of the Monthly Inquiry into the Distribution and Services Sector (MIDSS) questionnaire. My reason for writing is to ask if you would be willing to co-operate in some research work that the Office for National Statistics (ONS) is sponsoring.

As you are probably aware the ONS carries out a range of business surveys that feed through into economic statistics used by the Government in its monitoring of the economy. These surveys are carried out through paper questionnaires although for some of the smaller surveys there is an option for return of the data through telephone data entry.

The ONS is, however, keen to increase the options by which businesses can return their data and as part of this we are investigating web-based collection.

As part of our investigations Zoe Dowling, who is a doctoral researcher at the University of Surrey, is currently employed by ONS to carry out research into web-based collection for business surveys. As part of her research she is undertaking a study whereby she would like to interview a small number of businesses who have recently completed an ONS business survey to seek information on:

- The processes businesses go through in completing the current paper questionnaires
- Current use of the internet within businesses
- Issues concerning returning business survey data via the web

I would be grateful if you could let me know if you are willing to contribute to this research, by completing and returning the attached sheet in the envelope provided by 15 March 2004. It is voluntary but I do hope that you will feel able to take part. The results of this work will provide important information to ONS as it formulates its policies and collection instruments for web collection.



Following your agreement to cooperate ONS will provide Zoe with your contact details and she will then take the lead in setting up a meeting. This would be at a location of your choice and the meeting is not expected to last more than an hour. While we provide Zoe with blank copies of the MIDSS questionnaires we will not be disclosing the data you have included on it. It is possible that on some visits Zoe will be accompanied by one other member of staff from ONS.

Thank you in anticipation of your co-operation.

Yours faithfully,



Peter Thomas RD.

I would be willing to take part in the ONS Web Data Collection Research for business surveys.

Contact name:.....
Position in business:.....
Signature:..... ...
Date:.....Telephone number:.....



## APPENDIX B

### INTERVIEW GUIDE

INTRODUCE the purpose of the interview and outline three sections: current experience of filling in form; the Internet within your workplace and finally, I will show you an illustration of how the MIDSS survey could look like on the Web and ask for your impressions.

#### Section A – prior experience of ONS mandatory survey

- I'm interested to hear about your recent experience in completing the survey. Can you tell me about the process – from initially receiving the form to the final point of returning it to the ONS?
- How do you return the questionnaire (post/fax/TDE completion? Why that option?) How do you feel about having a choice in the way you respond?
- How did you find this task/process? (Burden?)
- Employer view it as part of job?
- Perception of National Statistics?
- Do you know what happens to the information you provide?

#### Section B – the Internet in the workplace

- First if we look at the business as a whole –
  - Do you know how long you have had Internet access? Internet connection, browser info etc.
  - Can you tell me what proportion of the staff has Internet access?
  - Do you know if your company employs its own technical support staff?
  - Roughly, what proportion (if any) of the day-to-day business happens online?
- Now can you tell me a bit about how you make use of the Internet (if at all) as part of your job? *If necessary prompt:*
  - How often have you used the Internet in the past 7 days?
  - Familiarity with: browsers, email, web booking, buying tickets, buying goods, downloading information/pictures, discussion groups, own website/services.
- Are there any restrictions (that you know of) surrounding your Internet use?
- In general, what do you think about the Internet?
- What about the government's attempts to put information/services on the Internet?
- Have you ever used to Web to complete a survey? (For work or in personal/home place)

#### Section C – responding via the Web: acceptability, design and functionality issues

- Discuss design (instructions, clarity of task, response options, colour, layout etc.)
- Discuss functionality (print/save, multiple sessions etc.)
- What expectations (if any) would you have of a Web survey?
- Are there any particular issues (good or bad) arise in your mind? (perceived burden – more/less?) (Security)
- Would responding via the Web change the task? (Make the task easier/more difficult?)
- Rewards – feedback on own information, simple statistical analysis of data, links to relevant statistics or market information etc.
- Do you think you/your business would consider responding via the Web if it were an option?



APPENDIX C

MIDSS PAPER QUESTIONNAIRE



Monthly inquiries into the distribution and services sector

Notice is given under section 1 of the Statistics of Trade Act 1947

PLEASE USE BLACK INK TO COMPLETE THIS FORM  
Write any changes to your name/address in this box only.

1

TO BE COMPLETED FOR:

FROM:

Office for National Statistics  
A Government Executive Agency  
NEWPORT  
NP10 8XG

YOUR CONTACT FOR HELP AND QUERIES:


Please return your data via telephone data entry, post or fax by

Informed estimates are acceptable if exact figures are not available.  
If you have any queries, you may telephone your contact named above.

IMPORTANT:

- Failure to make a return can incur penalties under section 4 of the Statistics of Trade Act 1947.
- It is *illegal* for us to reveal your data or identify your business to unauthorised persons.

FOR YOUR INFORMATION:

- The numbers of businesses and questions are kept to the minimum required to produce reliable results.
- The monthly turnover figures will contribute to early estimates of Gross Domestic Product.
- Copies of our code "Maintaining the Confidentiality of Data" are available on request.
- If you wish to use our Minicom service for the Deal please telephone 01633 812399. 

THANK YOU FOR YOUR CO-OPERATION











## NOTES TO HELP YOU COMPLETE THE FORM

### What Your Monthly Inquiry Form Should Cover

All activities carried out in Great Britain (that is, England, Scotland and Wales). Figures for subsidiaries should, wherever possible be excluded. Only include Northern Ireland subsidiaries and branches if you cannot provide separate data.

Where the business addressed is a holding company, figures are required only in respect of the holding company and not for the group as a whole.

Work done in connection with overseas contracts or activities should be included in your turnover only if the invoices are issued by the business covered by your return.

#### 1. Employees

Please note the number of employees should be those in post on the specific date indicated at this question.

##### Include:

- employees at all sites working for the business named on the front of the form;
- temporary and casual employees;
- those off sick, on holiday, on short-time or on maternity leave;
- those on Government-Supported Training who have a contract of employment;
- employees who work away from the workplace such as sales reps and lorry drivers.

##### Exclude:

- those employed by outside contractors or agencies;
- working proprietors, partners and self-employed, directors not on contracts;
- those on Government-Supported Training who do not have a contract of employment;
- home workers on piecework rates;
- former employees still on the payroll as pensioners;
- those who normally work at another business such as temporary transfers and secondments.

#### 2. Period

Your return should cover the month shown on the front of the form. If you do not have figures for that period, the return may be made for the nearest period of a similar length as long as it relates mainly to the one specified. It is important that there are no gaps or overlaps with this period and the period covered by any previous returns that you have made to this inquiry.

#### 3. Total Turnover (Excluding VAT)

Turnover consists of total takings or invoiced sales and receipts of the business in connection with the sale of goods and services. Interest and similar income, other operating income and extra-ordinary income should be excluded from the total turnover figure as should net proceeds on sales of capital items.

Figures should be given gross of indirect taxes, duties and levies (except VAT) invoiced to the customer. It is important that the figure is given on a consistent basis from month to month.

##### Include:

- all sales of goods and services (except fixed capital assets) including exports and goods purchased and resold without processing;
- provision of goods or services to other parts of your company or organisation, which are not covered by this return. These should be valued as if sold to an independent customer. If you are unable to supply figures on this basis, please value them at transfer cost;

*Continued overleaf*

09T64C  
1/04



## MIDSS – quarterly notes page (2 of 2)

- work done on customers' materials (**including** value of any additional materials added);
- income from construction activity (even if sub-contracted);
- income from all industrial and non-industrial services rendered;
- progress payments received for work in progress on long-term contracts, which have not been identified as stocks on the balance sheet;
- income derived from the renting of property;
- amounts received for the right to use patents, trade marks, copyrights etc.;
- receipts from government for goods and services supplied free (or at a subsidised rate) under the National Health Service and similar public services;
- transport, insurance and packaging charges (less amounts for returnable containers) invoiced by your business (even if invoiced separately);
- income from sub-contracted activities;
- for commission work (i.e. where you do not hold title to goods sold), the commission/fee is to be **included**, but not the full transaction price. Also to be **included** here are costs incurred and passed on to the customer;
- the value of second-hand goods taken in part exchange;
- service charges for credit provided (but not interest charges);
- the value of vouchers, tokens and coupons used by customers as a means of payment (but not the sale of such vouchers etc. to customers);
- royalty payments received.

### **Exclude:**

- income recorded as extra-ordinary income in your accounts;
- amounts received from the sale of fixed capital assets;
- amounts received from the sale of patents, trade marks, copyrights etc.;
- grants from any source;
- subsidies from UK public authorities and the European Union (EU);
- value of insurance claims received;
- income derived from the renting of land;
- income recorded as "other operating income" in your accounts;
- all trade, cash or other discounts and rebates (i.e. record turnover net of these);
- interest payments received and other similar income.

## **4. Cost of sales**

This is the element of sales passed on to other businesses by advertisers and agents acting on a commission basis after deducting commission and fees.

### **Include:**

- all amounts paid to other organisations for the provision of accommodation;
- amounts payable to other organisations for the carriage of passengers or goods by all forms of transport;
- amounts paid for the purchase of media space;
- all production purchases, associated with sales on own account, of advertisements created for television, radio, newspapers, magazines etc. These include payments for work directly associated with production and carried out by sub-contracted, self-employed or freelance staff;
- all other payments for cost of sales.

### **Exclude:**

- amounts payable for VAT or customs duties;
- any internal costs such as staff salaries and administrative expenses.

You may find it useful to take a copy of the form for future reference or to answer any queries that may arise.

09T64D  
1/04



## APPENDIX D

### E-COMMERCE PAPER QUESTIONNAIRE



### E-COMMERCE SURVEY - 2003

Notice is given under section 1 of the Statistics of Trade Act 1947

**PLEASE USE BLACK INK TO COMPLETE THIS FORM**  
Write any changes to your name/address *in this box only*.

1

TO BE COMPLETED FOR:

FROM:

*Office for National Statistics*  
A Government Executive Agency  
NEWPORT  
NP10 8XG

YOUR CONTACT FOR HELP AND QUERIES:

PLEASE COMPLETE AND RETURN THIS FORM VIA POST OR FAX BY


Informed estimates are acceptable if exact figures are not available.

Notes are enclosed to help you complete the form or you may telephone your contact named above.

**IMPORTANT:**

- Your response to this survey is very important whether you carry out e-commerce or not.
- Failure to make a return can incur penalties under section 4 of the Statistics of Trade Act 1947.
- It is *illegal* for us to reveal your data or identify your business to unauthorised persons.

**FOR YOUR INFORMATION:**

- The results of the survey are used to monitor the UK's progress in its development and use of e-commerce. The data will also be invaluable for businesses to benchmark themselves against their industry's trends. Comparisons with other European Member States are also available by visiting the website of the European Statistical Office (Eurostat) <http://europa.eu.int/comm/eurostat>
- The 2002 results were published during the Autumn of 2003 on the National Statistics website: [www.statistics.gov.uk/about/methodology\\_by\\_theme/e-commerce\\_related\\_activities/default.asp](http://www.statistics.gov.uk/about/methodology_by_theme/e-commerce_related_activities/default.asp).
- The numbers of businesses and questions are kept to the minimum required to produce reliable results.
- Copies of our code "Maintaining the Confidentiality of Data" are available on request.
- If you wish to use our Minicom service for the deaf please telephone 01633 812399. 

THANK YOU FOR YOUR CO-OPERATION



## E-Commerce (1 of 15)

### Guidance Notes:

1. This survey covers the United Kingdom activity of businesses (including foreign owned businesses) except where the coverage is specified as Great Britain or Northern Ireland underneath your address on the front page. The United Kingdom consists of England, Wales, Scotland and Northern Ireland, and excludes the Channel Islands and the Isle of Man. Great Britain consists of England, Wales and Scotland only.

If you do not have exact percentages, please give the best estimate you can.

If your business did not have Information and Communication Technology or carry out e-commerce during 2003, please note that your response is still very important to the survey and results.

2. The business unit for the survey is the company, partnership, sole proprietorship, etc. to which the questionnaire has been addressed unless specified otherwise on the front page of the questionnaire. Figures for subsidiaries of the business addressed should be excluded, unless specified otherwise on the front page.

If your sister company carries out e-commerce on your behalf, this should be excluded as we only want the transactions of the business named on the front of the questionnaire.

3. Your employees are defined as those who receive a salary/wage to carry out permanent/temporary/full-time/part-time jobs (or to be on training schemes with contracts of employment); they must be aged over 16 and their jobs/training schemes must be based in the UK and be on your payroll on the survey date.

Temporary absence on the survey date (e.g. holidays, sickness and maternity leave) does not affect an individual's status as an employee for the purpose of this survey. Similarly, staff (e.g. sales reps) who are mobile should be counted.

If your business is an agency that provides temporary staff for other businesses, those staff should be counted as employees on the payroll of the business-site from which they are paid. (i.e. in most cases this will probably be the site of your agency rather than the place they happen to be working on the survey date).

4. Public authorities should be regarded as central and local government organisations, at national, regional and local level, offering, as an example, the following public services for businesses:

- social contributions for employees
- corporation tax: declaration and notification
- VAT: declaration and notification
- registration of a new company
- submission of data to statistical offices
- customs declarations
- environment related permits (incl. reporting)
- public procurement.



## E-Commerce (2 of 15)

### Glossary:

<i>Automated telephone entry</i>	Option driven automated system using the telephone keypad, with personal contact as an option only, for example, of the type typically used for ordering cinema tickets.
<i>BACS</i>	Banks Automated Clearing System. An automated, electronic debit and credit system.
<i>Broadband</i>	High speed, always on Internet access running with a speed of greater than 128Kbps. It is able to carry much larger amounts of information than narrowband.
<i>xDSL</i>	Digital Subscriber Line, including Integrated DSL, HDSL, SDSL, Asymmetrical DSL, RADSL, VDSL, DSL-Lite. DSL technologies are designed to increase bandwidth available over standard copper telephone wires.
<i>Electronic Data Interchange (EDI)</i>	Electronic exchange of forms, such as for orders, between geographically dispersed locations.
<i>Electronic commerce (e-commerce)</i>	Transactions over the Internet or over other computer-mediated networks (for example: EDI). The goods and services are ordered over those networks, but the payment and the delivery of the goods or services may be conducted on or off line.
<i>EPOS</i>	Electronic Point Of Sale. Electronic tills linked to other electronic business systems, such as stock re-ordering systems.
<i>E-mail</i>	Electronic message transmission.
<i>Full electronic case handling</i>	Where all aspects of a case are processed online including any necessary payments.
<i>Information and Communication Technology (ICT)</i>	Activities which contribute to the display, processing, storing and transmission of information through electronic means. ICT can also be described as a convergence between computing and communications, forming information and communication technologies.
<i>Information Technology (IT)</i>	All aspects of managing and processing information with computers within companies.
<i>Internet</i>	Relates to all the Internet Protocol based networks: world wide web (www), Extranet over the Internet, EDI over the Internet, Internet-enabled cellular phones.
<i>Kbps</i>	Kilobits per second. This refers to the speed that data can be transmitted.
<i>LAN</i>	Local Area Network. This relates to your company's computer network, usually within an office, building or closed geographical area.



## E-Commerce (3 of 15)

<i>Laptop</i>	A small, portable computer which can be battery operated as well as run from the mains. This means it may be used anywhere and the information on it is easily transferred to a PC via a disk or docking station.
<i>Leased Line</i>	A dedicated telecommunications, always on, link between two points, e.g. between two offices of a large corporation.
<i>Megabyte</i>	A megabyte is a measure of the memory in a computer. It is equal to approximately one million bytes.
<i>Modem</i>	MOdulator DEModulator. The modem dials via a telephone line to connect you to the Internet or to other computers around the world. Its transmission speed or baud rate is measured in kilobits per second (Kbps).
<i>Narrowband</i>	Narrowband is the term used to describe all non-broadband Internet connections running with a speed of 128Kbps or less such as ISDN or analogue modem.
<i>PC based fax</i>	A facility within a personal computer that allows the paperless transmission of faxes i.e. electronically without the use of separate fax machine.
<i>Public authorities</i>	Central and local government organisations, at National, regional and local level.
<i>Satellite broadband</i>	Offers connection to the Internet via satellite utilising a dish like the ones used for accessing satellite television. However, it only works in one direction i.e. while you get lightning download speeds of up to 6Mbps, you have to send or upload information via a land-based connection.
<i>WAN</i>	Wide Area Network. A network in which computers are connected to each other over a long distance, using telephone lines and satellite communications.
<i>WAP phone</i>	Wireless Application Protocol. The technology that allows you to access information from your mobile phone. This includes your e-mail and information from the Internet, such as share prices and news bulletins.
<i>Website</i>	A collection of webpages arranged together to provide information or advice. It can consist of text, graphics, sound, video or a combination of these.
<i>Wireless broadband</i>	Broadband connection to the Internet via wireless technology.



2003 E-commerce Survey

This is the fourth National Statistics E-commerce survey of businesses.  
The objectives of this survey are to collect information on:

- Which technologies UK businesses have used
- How these technologies have been used and the level of that use.

A response to this survey is sought from users and non-users of Information and Communication Technologies (ICTs) (please refer to guidance note 1).

Information and Communication Technology (ICT) comprises of activities which contribute to the display, processing, storing and transmission of information through electronic means. ICT can also be described as a convergence between computing and communications forming information and communication technologies. Examples of ICTs include the Internet, EDI, e-mail, PC based fax or automated telephone entry, that support E-commerce.

*This questionnaire will be scanned, therefore please:*

- complete in *black ink*
- ensure letters and numbers are printed and centred within each box
- *do not* use commas  or dashes
- *do not* cross sevens  or zeros  for example 7%  %

**Section A - Your Business** (please refer to guidance note 2)

On the last working day of 2003,

1. *did your business have personal computers, workstations or terminals?*  
*Include: laptops.*  
*Exclude: the use of electronic tills which are only used for monetary transactions (EPOS) and computer controlled machinery.*

Please  one box only

Yes

No  010

2. *did your business have Internet access?*  
*Include: access from mobile technology such as WAP enabled telephones, laptops and digital TV.*

Please  one box only

Yes

No  → Go to question 7 038



E-Commerce (5 of 15)

On the last working day of 2003,

3. for how long had your business had Internet access?  
Please round 6 months up. For example 1 year 7 months should be recorded as 02 years.

Years   051

4. how did your business primarily connect to the Internet?  
By broadband we mean a permanent connection that provides high speed Internet access, delivering multiple channels of data over a single communication medium. It is able to carry much larger amounts of information than lower capacity technologies i.e. narrowband.

Please  one box only

- Broadband.....  → Go to question 5 041  
Narrowband.....  → Go to question 6 042  
Don't know.....  → Go to question 7 043

5. what type of broadband connection was your business primarily using?

Please  one box only

- Cable or xDSL (types of high speed digital telephone connections for example, ADSL or SDSL).....  053  
Other fixed broadband connection.....  } Go to question 7 054  
Wireless or satellite broadband.....  055

6. what was the single most important reason for your business not using a broadband connection?

Please  one box only

- High installation costs/high running costs.....  077  
Not available in geographical area.....  073  
Have not previously considered.....  075  
Not needed.....  078  
Other.....  076



E-Commerce (6 of 15)

On the last working day of 2003,

7. did your business have a web site, whether own or third party?  
Exclude: a listing on an online directory.

Please  one box only

Yes

No  080

8. did your business have the following technologies?

For each category, please  either yes or no

	Yes	No	
External e-mail <i>electronic message transmission with external businesses</i>	<input type="checkbox"/>	<input type="checkbox"/>	031
Intranet <i>an Intranet uses the same technology as the Internet but over a private or internal network</i>	<input type="checkbox"/>	<input type="checkbox"/>	032
Extranet <i>this is an Intranet set up by a business for its internal use but which also allows other companies that do business with them to have access. It is not available to the general public</i>	<input type="checkbox"/>	<input type="checkbox"/>	033
Electronic Data Interchange (EDI) <i>electronic exchange of forms, such as for orders, between geographically dispersed locations</i>	<input type="checkbox"/>	<input type="checkbox"/>	034
Automated telephone entry <i>option driven automated system using the telephone keypad, with personal contact as an option only, for example, of the type typically used for ordering cinema tickets</i>	<input type="checkbox"/>	<input type="checkbox"/>	035
Mobile computer technology <i>a mobile Internet connection allowing you to access e-mail or the Internet when you are away from the desk, for example, by using WAP enabled telephones or laptops</i>	<input type="checkbox"/>	<input type="checkbox"/>	036
Wide or Local Area Network (WAN or LAN) <i>a network in which computers are connected to each other over a short distance, usually in the same building (LAN), or over a long distance, often between geographic sites (WAN), using cable, telephone lines and satellite communications</i>	<input type="checkbox"/>	<input type="checkbox"/>	039



E-Commerce (7 of 15)

**Section B - Your Employees** (please refer to guidance note 3)

This section asks about all your employees' (including sole traders, directors and proprietors) use of Information and Communication Technologies (ICTs) for their work.

On the last working day of 2003,

9. what percentage of your employees had personal computers, workstations or terminals for their work?

Include: laptops.

Exclude: the use of electronic tills which are only used for monetary transactions (EPOS) and computer controlled machinery.

Please round part percentage points to the nearest whole number. For example 8.3% should be recorded as 8.

% → If 0%, go to question 11 023

10. of the percentage of your employees with personal computers, workstations or terminals: (10a and 10b should add up to the percentage given in question 9)

10a. what percentage had Internet access  % 022

10b. what percentage did not have Internet access  % 021

**Section C - Orders Placed by your Business**

During the year 1 January to 31 December 2003,

11. did your business place any orders over the Internet, irrespective of the payment and delivery method?

Exclude: orders placed over other ICTs such as EDI, e-mail, PC based fax, automated telephone entry, over the telephone (person to person) and over conventional fax

Please  one box only

Yes

No  → Go to question 14 090



E-Commerce (8 of 15)

During the year 1 January to 31 December 2003,

12. of the total monetary value of orders placed by your business, what percentage was placed over the Internet?

*Include: the total value of orders placed for goods, materials and services over the Internet, irrespective of the payment or delivery method.*

Note: 5% should be entered as 5.00

.  % 101

13. of the total monetary value of orders placed by your business over the Internet, please give a percentage breakdown into:

*(13a, 13b and 13c should add up to the percentage recorded in question 12)*

13a. Internet orders for physical products

.  % 104

13b. Internet orders for digitised products  
*Physical products which are converted into a digital format in order to deliver them electronically eg: books, music, film, weather forecasts, news, consulting services etc*

.  % 106

13c. Internet orders for services

.  % 105

During the year 1 January to 31 December 2003,

14. did your business place any orders over ICTs other than the Internet, irrespective of the payment or delivery method?

*Include: orders placed over other ICTs such as EDI, e-mail, PC based fax and over automated telephone entry. Exclude: orders placed over the Internet, telephone (person to person) and over conventional fax.*

Please  one box only

Yes

No  150



E-Commerce (9 of 15)

Section D - Orders Received by Your Business

During the year 1 January to 31 December 2003,

15. did your business receive any orders over the Internet, irrespective of the payment or delivery method?

Exclude: orders received over other ICTs such as EDI, e-mail, PC based fax, automated telephone entry, over the telephone (person to person) and over conventional fax.

Please  one box only

Yes

No  → Go to question 19 110

16. of the total monetary value of orders received by your business, what percentage was received over the Internet?

Include: the total value of orders for goods, materials and services received over the Internet, irrespective of the payment and delivery method.

Note: 5% should be entered as 5.00

.  % 121

17. of the total monetary value of orders received by your business over the Internet, please give a percentage breakdown into:

(17a, 17b and 17c should add up to the percentage recorded in question 16)

17a. Internet orders for physical products

.  % 125

17b. Internet orders for digitised products  
Physical products which are converted into a digital format in order to deliver them electronically  
e.g. books, music, film, weather forecasts, news, consulting services etc.

.  % 127

17c. Internet orders for services

.  % 126

18. of the total monetary value of orders received by your business over the Internet, please give a percentage breakdown into:

(18a and 18b should add up to the percentage recorded in question 16)

18a. Internet orders from households

.  % 128

18b. Internet orders from businesses

.  % 129



E-Commerce (10 of 15)

During the year 1 January to 31 December 2003,

19. did your business receive any orders over ICTs other than the Internet, irrespective of the payment or delivery method?

Include: orders received over other ICTs such as EDI, e-mail, PC based fax and over automated telephone entry.  
Exclude: orders received over the Internet, telephone (person to person) and over conventional fax.

Please  one box only

Yes

No  → Go to question 22 130

20. of the total monetary value of orders received by your business, what percentage was received over ICTs other than the Internet?

Note: 5% should be entered as 5.00

.  % 141

21. of the total monetary value of orders received by your business over ICTs other than the Internet, please give a percentage breakdown into:

(21a and 21b should add up to the percentage recorded in question 20)

21a. other ICT orders from households  .  % 142

21b. other ICT orders from businesses  .  % 143



Section E - Payments Made or Received using Information and Communication Technologies (ICTs)

During the year 1 January to 31 December 2003,

22. did your business make payments over any ICTs including the Internet?

*Include: payments via the Internet, EDI, PC based fax and automated telephone entry.*

*For BACS and similar systems include if initiated electronically by your business.*

*Exclude: payments via the telephone (person to person), via conventional fax and payment of salaries. For BACS and similar systems exclude if not initiated electronically by your business.*

Please  one box only

Yes

No  170

23. did your business receive payments over any ICTs including the Internet?

*Include: payments via the Internet, EDI, PC based fax and via automated telephone entry.*

*Exclude: payments via the telephone (person to person), via conventional fax and payment of salaries.*

Please  one box only

Yes

No  160



■ **Section F - Electronic Links** ■

**Electronic Links Within Your Business**

On the last working day of 2003,

24a. within your business did you have electronic systems for placing or receiving orders that automatically linked to other electronic systems?

Please  one box only

Yes

No  → Go to question 25a 240

24b. within your business did your electronic systems for placing or receiving orders automatically link to:

For each category, please  either yes or no

	Yes	No	
your production or service operating systems	<input type="checkbox"/>	<input type="checkbox"/>	185
your logistics or delivery systems	<input type="checkbox"/>	<input type="checkbox"/>	186
your invoicing or payment systems	<input type="checkbox"/>	<input type="checkbox"/>	184
your marketing or customer relationship management systems	<input type="checkbox"/>	<input type="checkbox"/>	187
your other internal operating systems	<input type="checkbox"/>	<input type="checkbox"/>	188



**E-Commerce (13 of 15)**

■ **Electronic Links With Other Businesses** ■

*On the last working day of 2003,*

**25a. did your business have electronic systems for placing or receiving orders that automatically linked to other businesses' electronic systems?**

Please  one box only

Yes

No  → Go to question 26 250

**25b. did your business's electronic systems for placing or receiving orders automatically link to:**

For each category, please  either yes or no

	Yes	No
your suppliers' ordering or business systems	<input type="checkbox"/>	<input type="checkbox"/> 181
your customers' ordering or business systems	<input type="checkbox"/>	<input type="checkbox"/> 183
other links to external businesses' systems	<input type="checkbox"/>	<input type="checkbox"/> 189



■ ■  
**Section G - Interaction with Public Authorities** (please refer to guidance note 4)

During the year 1 January to 31 December 2003,

26. did your business use the Internet for interaction with public authorities?

Please  one box only

Yes

No  → Go to 'your comments and feedback' 290  
that follow this section.

27. why did your business use the Internet to interact with public authorities?

For each category, please  either yes or no

	Yes	No	
to obtain information	<input type="checkbox"/>	<input type="checkbox"/>	301
to obtain forms	<input type="checkbox"/>	<input type="checkbox"/>	302
to return completed forms	<input type="checkbox"/>	<input type="checkbox"/>	303
for full electronic case handling <i>see glossary for definition</i>	<input type="checkbox"/>	<input type="checkbox"/>	304
other	<input type="checkbox"/>	<input type="checkbox"/>	305

■ **Your comments and feedback on this questionnaire and survey.**

500 ■



**E-Commerce (15 of 15)**

*How long has it taken you to complete this questionnaire?  
Include: any time spent extracting information from your accounting systems and collating data over and above normal accounting operations.*

Hrs   Mins          600

PLEASE USE BLOCK CAPITALS

Compiler of questionnaire

Position in business

Telephone no.  Ext.

Fax no.

E-mail address

Signature .....

Date .....



## **APPENDIX E**

### **LIST OF CODES**

MIDSS interview  
E-COM interview  
Business - Industry  
Business Size - Small  
Business Size - Medium  
Business Size - Large Global  
Business Size - Large UK  
Participant Job - Accountant  
Participant Job - Proprietor/director  
Participant Job - IT

Evaluation - Automatic Computation Totals  
Evaluation - Automatic Routing  
Evaluation - Basic Functionality  
Evaluation - Confirmation of Submission  
Evaluation - Edit Checks  
Evaluation - Framework 1  
Evaluation - Framework 2  
Evaluation - Framework 3  
Evaluation - Framework 4  
Evaluation - Frameworks for Prototype  
Evaluation - Known Information  
Evaluation - Login & Corporate ID  
Evaluation - Multiple Sessions  
Evaluation - Print & Save Functions  
Evaluation - Progress Indicators  
Evaluation - Response Formats  
Evaluation - Rewards/Feedback  
Evaluation - Survey Request Communication  
Evaluation - Visual Design

Familiar with MIDSS?  
Familiar with ECOM?

Finding the info is the hard work

Gen Info - company description  
Gen Info - company size  
Gen Info - completing surveys  
Gen Info - Complexity company structure  
Gen Info - Employer view part of job?



Gen info - no ONS questionnaires?  
Gen Info - participant view part of job  
Gen Info - who does what questionnaire?

Internet - in workplace  
Internet - company intranet  
Internet - connection  
Internet - cookies  
Internet - current/future plans for use  
Internet - ebusiness  
Internet - form filling  
Internet - government's use  
Internet - java  
Internet - length of time in company  
Internet - participant competency on Web  
Internet - participant use of at work  
Internet - participant use of personally  
Internet - perception of  
Internet - restrictions  
Internet - security issues  
Internet - IT support in company

Interpretation - of questions  
Interpretation - which company in group?

Method of return - choice  
Method of Return - FAX  
Method of return - general  
Method of Return - TDE  
Method of returning ECOM  
Method of returning MIDSS - current  
Method of returning MIDSS - FAX  
Method of returning MIDSS - TDE

ONS - how can reduce burden?  
ONS - perception of  
ONS - use of website/statistics/functions  
ONS staff - 'very helpful'

Org culture of assisting in research

Other government questionnaires  
Other Web data collection

Paper - orientated  
Paper - waste  
Paper - paperless office

Participant - change of questions in questionnaires



Participant - Consistency in questionnaires  
Participant - Consulting others to complete questionnaire  
Participant - copy of info provided  
Participant - Ever completed Web survey?  
Participant - gathering the data  
Participant - Help requirements  
Participant - Ignoring notes/instructions?  
Participant - knows what happens to data?  
Participant - manager checks before submission  
Participant - Mandatory requirement  
Participant - new questionnaire/new to questionnaires  
Participant - questioning validity  
Participant - reading through questionnaires  
Participant - Reference to previous questionnaire  
Participant - sense of responsibility  
Participant - understand why questionnaires stop?  
Participant - understand why selected?  
Participant - understand why: makes sense/reduce burden?

Participant Questions - about questionnaires  
Participant Questions - how business selected  
Participant Questions - ONS workings

Perception - burden  
Perception - of task: ABI  
Perception - of task: ECom  
Perception - of task: MIDSS  
Perception - of task: Other questionnaires  
Perception - statistics

Process - completing ABI  
Process - completing ECom  
Process - completing MIDSS  
Process - completing general  
Process - completing Others  
Process - notes pages

Questionnaires - Annual Business Inquiry  
Questionnaires - Annual R&D  
Questionnaires - Capital Expenditure  
Questionnaires - Direct Investments  
Questionnaires - Fixed Assets  
Questionnaires - New Earnings  
Questionnaires - Production  
Questionnaires - Quarterly Dividends  
Questionnaires - Quarterly Stocks

Rewards - get something back  
Rewards - understand what doing



Technology - all that is good  
Technology - changing with the times  
Technology - commenting on  
Technology - computers and paper  
Technology - in workplace (over time)  
Technology - saving resources  
Technology - Web is best  
Technology - working with daily

The Web as Efficient - Cost Savings  
The Web as Efficient - Timeliness

The Web as Offering Improvements - Quality  
The Web as Offering Improvements - Reduce Burden  
The Web as Offering Improvements - Proof of return  
The Web as offering Improvements - Offer Choice  
The Web as Offering Improvements - Just a preference (the web)

The Web as Progress - Modern NSI  
The Web as Progress - Keep Abreast of Developments in Society

Web data collection - additional features  
Web data collection - any easier/different?  
Web data collection - benefits ONS  
Web data collection - benefits/positive aspects  
Web data collection - concerns/negative aspects  
Web data collection - expectations  
Web data collection - expectations confirmation  
Web data collection - expectations general appearance  
Web data collection - interested?  
Web data collection - login  
Web data collection - move on without answering q  
Web data collection - multiple sessions? - ECom  
Web data collection - multiple sessions? - MIDSS  
Web data collection - multiple sessions? - other questionnaires  
Web Data Collection - NSI Perspective  
Web data collection - print before submit  
Web data collection - print questionnaire/notes  
Web data collection - print/save option  
Web data collection - proof of return  
Web data collection - reminders  
Web data collection - security  
Web data collection - seeing 'totality' of Q  
Web data collection - still person to complete questionnaire?  
Web data collection - validation  
Web data collection - viruses  
Web data collection - progress indicator  
Web data collection - scrolling vs. paging



Web data collection - using tab function

Web illustration - first impressions

Web illustration - adding up totals

Web illustration - colours, appearance, font

Web illustration - completing questionnaire

Web illustration - context specific help

Web illustration - default values

Web illustration - help/instructions

Web illustration - layout

Web illustration - overall impressions

Web illustration - routing

Web illustration - similar to paper questionnaire?

Web illustration - validation

Web survey vs. paper survey

Workflow - questionnaire moves about?

Workflow - right questionnaire, right person

Workflow - Web data collection