

Improving business survey data collection instruments: governance and methodologies

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Veröffentlichungsversion / Published Version
Konferenzbeitrag / conference paper

Zur Verfügung gestellt in Kooperation mit / provided in cooperation with:
GESIS - Leibniz-Institut für Sozialwissenschaften

Empfohlene Zitierung / Suggested Citation:

Jones, J. (2004). Improving business survey data collection instruments: governance and methodologies. In P. Prüfer, M. Rexroth, & F. J. J. Fowler (Eds.), *QUEST 2003: proceedings of the 4th Conference on Questionnaire Evaluation Standards, 21-23 October 2003* (pp. 81-91). Mannheim: Zentrum für Umfragen, Methoden und Analysen -ZUMA-. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-49197-0>

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IMPROVING BUSINESS SURVEY DATA COLLECTION INSTRUMENTS: GOVERNANCE AND METHODOLOGIES

JACQUI JONES

Introduction

Over the past two years Data Collection Methodology, Methodology Group, in the UK Office for National Statistics (ONS) has researched, developed and implemented methodologies for improving business survey data collection instruments¹. As part of this, in April 2003 ONS agreed a six year programme for reviewing all ONS statutory business survey paper self-completion data collection instruments (Jones & Scott, 2003). The reviews have an agreed governance structure and are undertaken by conducting the processes in the framework for reviewing data collection instruments in business surveys (Jones, 2003).

The objective of this paper is to provide an overview of this work by outlining:

- the characteristics of business survey data collection instruments in the ONS
- how improvements have been made to the development of business survey data collection instruments
- the framework for reviewing business survey data collection instruments

An overview of business surveys in the Office for National Statistics

The Office for National Statistics has approximately 90 statutory business surveys with 913 different data collection instruments (excluding Telephone Data Entry (TDE) data collection). The primary mode of data collection is paper self-completion. Every year 1.5 million paper instruments are sent to businesses. For some surveys that collect less than

1 For the purpose of the paper the term data collection instrument(s) refers to the questionnaire(s). This includes questions and the guidance notes.

nine data items TDE is also offered as an alternative mode of data collection. There are also a very small number of surveys that use TDE as the only mode of data collection. For example, the Vacancies Survey.

ONS's business survey paper self-completion data collection instruments are typically designed as administrative forms rather than dialogues with respondents. Even the terminology used characterises this. For example the use of the terms forms, inquiries and contributors rather than questionnaires, surveys and respondents. On the positive side a one data collection instrument fits all approach is not implemented for all business surveys. There are many instances of data collection instruments being designed for specific industries or groups of industries.

Prior to 2001 there was no data collection methodology provision for business surveys. No standard method for reviewing and developing business survey data collection instruments. Little interaction with respondents in either a pre-field or field environment. Instead internal results and validation persons were responsible for developing and designing data collection instruments. Development generally occurred in a piecemeal fashion as respondents questioned facets of the data collection instrument and/or data requirements changed.

The design facets of existing business survey paper self-completion data collection instruments

Prior to 2003 business survey paper self-completion data collection instruments were predominately designed from an administrative form and scanning perspective rather than a respondent perspective. Combined with this there were no standards for facets such as question construction, and instrument layout & instructions.

Most of the existing business survey data collection instruments demonstrate the following design facets:

Layout and formatting:

- printed on white paper
- use black and red ink
- data capture boxes in red ink outline
- no standards for formatting of font emphasis. For example the use of bold, italics and underlining
- very little spacing between questions

Instrument instructions:

- no standard instructions for instrument completion
- no routing around not applicable questions
- respondents asked to complete the instrument in black ink
- the use of **X** rather than tick to indicate a chosen response

Several of the data collection instruments also demonstrate one or more of the following design facets:

Questions:

- questions with two questions in one

For example, the New Earnings Survey postcode question:

Supervisor/Manager of staff? No - 2

3. Place of Work /Home Address (see page 3, guidance note 3)

(a) If employee's workplace postcode is different from **XX9 9XX** Please enter 2.2
 (Site/office location postcode, not head office).

(b) If employee's home postcode is different from **XX9 9XX** here 2.3

4. Start date for employee (see page 4, guidance note 4)

- no question just a heading with response boxes

For example, the Long-Term Insurance questionnaires:

6. UK Corporate Securities

6.1 Other than shares

6.1.1 UK corporate sterling bonds

6.1.1.1 Issued by banks.....

6.1.1.2 Issued by building societies.....

6.1.1.3 Other UK corporates.....

- questions where respondents are asked to select a response category, then the response code and then enter the response code

For example, the Annual Register Inquiry:

1. Information about the business
 If any of the following apply, please select a single code from (1-5) below and enter it in the box provided.

<p>1 - The business has closed down. 2 - The business is dormant. 3 - The business has not started trading. 4 - All business activity is carried on outside the UK. (i.e. the business is only registered in the UK for VAT). 5 - The business has been taken over or merged with another. If none of the above (including operating holding companies) please leave blank.</p>	<input type="text" value="5"/> 10	<p>WHAT TO DO NEXT</p> <p>If you have left the Box blank please complete questions 2-5 and all appropriate parts of the form before returning it to us.</p> <p>If you have entered 1, 2, 3 or 4, please complete question 5 overleaf and return the form</p> <p>If you have entered 5 please give details in the comments box at question 2c overleaf and complete the rest of the form before returning it to us.</p>
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Possible impact from the design facets of existing business survey paper self-completion data collection instruments

Much has been written about the importance of data collection instrument design and the detrimental effects that poor design can have on the final survey results (Dillman, 2000; Biemer & Fecso, 1995). Data collection instrument design and impact are both multi-faceted. For example, instrument design consists of facets such as question construction, appropriate response categories, position of guidance notes, layout of questionnaire and survey introduction. Design impact can affect facets such as measurement error, non-response error, processing error and respondent burden. It is important to address each facet of instrument design and impact separately. Each facet needs to be researched and evaluated to ensure that instrument design minimises the negative aspects of the facets of impact. Lohr (1999) highlights this point by stating that:

"The quality of survey data is largely determined at the design stage. Fisher's (1938) words about experiments apply equally well to the design of sample surveys: "To call in the statistician after the experiment is done may be no more than asking him to perform a postmortem examination: he may be able to say what the experiment died of". Any survey budget needs to allocate sufficient resources for survey design and for nonresponse follow-up. Do not scrimp on the survey design; every hour spent on design may save weeks of remorse later" (page 262).

As described in the previous section, the characteristics of existing ONS business survey paper self-completion data collection instruments often demonstrate facets of instrument design that could have a negative result to one or more of the facets of impact. Understanding these facets is part of the on-going research to improve business survey data collection instruments.

Improving business survey data collection instruments

In 2001 a data collection methodology branch for business surveys was established in the Methodology Group of ONS. Since 2002 this branch has been working with business survey areas to improve the process of designing and developing business survey data collection instruments for all modes. A major part of this work has been:

- agreeing and establishing governance for business survey data collection instruments
- researching and developing standards for the design of business survey data collection instruments. For example, standard instructions, layout and formatting
- researching, developing and implementing a standard framework of methodological processes for reviewing business survey data collection instruments

The governance of business survey data collection instruments is now the responsibility of the Business Questionnaire Steering Group that is supported by survey specific project boards and working groups as each survey is reviewed. Membership of the Steering Group, project boards and working groups generally consists of persons from the data validation unit; results, analysis and publication; information management; the forms processing centre; communication division; and methodology group.

Research and development of standards for the design of business survey data collection instruments are now at the stage of implementation for instruments currently being reviewed. The standards are now being drafted for use within the office.

The framework for reviewing data collection instruments in business surveys was first used in 2002. In March 2003 it was reviewed and slight adjustments made to it. To date the framework has been used for reviewing the E-Commerce Survey, New Earnings Survey, Annual Register Inquiry and Long-term Insurance questionnaires & General Insurance questionnaires. The E-Commerce Survey is the furthest progressed having completed all stages of the framework. The evidence from this work shows that the stages and processes carried out provide a valuable evidence based approach to the design of data collection instruments. The results of the E-Commerce Survey stage 5 post implementation evaluation shows that reductions have been made to the measurement error, non-response error, processing error and respondent burden.

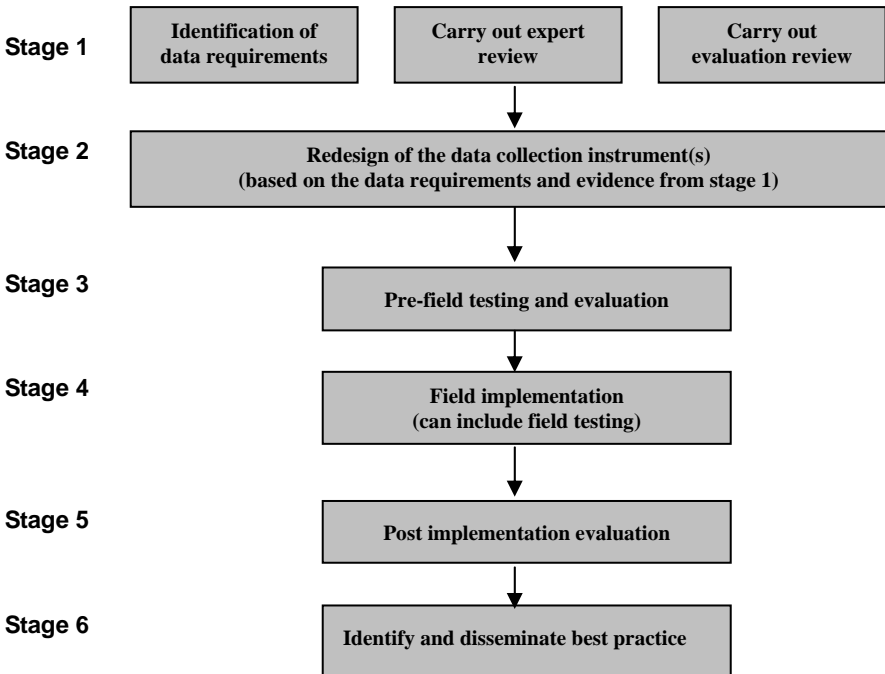
It is envisaged that the framework will continue to be reviewed on an annual basis to ensure that the best approach is maintained.

The framework for reviewing data collection instruments in business surveys

The objectives of the framework (figure 1) are to use a system of stages and processes, which:

- provides evidence to inform decision making in the design of data collection instrument(s)
- provides a consistent, comprehensive, timely and reliable approach to reviews
- pre-field tests the data collection instrument(s)

Figure 1: A framework for reviewing data collection instruments in business surveys



The stages of the framework

Stage 1: identifying data requirements, expert review and evaluation review

This stage of the framework involves three simultaneous processes. In process 1 (the identification of data requirements) the relevant survey output manager is responsible for carrying out a consultation exercise to identify and agree the objectives and data requirements of the survey. For the New Earnings Survey this involved contacting users and asking them to respond to the following questions:

- (1) What data do you require?
- (2) Why are the data required?
- (3) How often are the data required?
- (4) What alternative sources of data are available?
- (5) Do alternative sources of data meet your data requirements (if not, why not)?

The output manager then assesses the collected information and further user consultations maybe undertaken to agree the objectives and data requirements for the survey. These requirements need to be signed off before stage 2 of the framework can commence. If this is not done then it is impossible to redesign the data collection instrument(s) in stage 2 of the framework.

In process 2 (carry out expert review) at least one expert review is carried out. At a minimum a data collection expert in Methodology Group will carry this out. Where possible an independent data collection expert and a subject-matter specialist will also be asked to carry out an expert review. An expert review is a desktop review of the design of the existing data collection instrument(s). The review focuses on all the design facets of the instrument(s)².

Process 3 (carry out evaluation review), is a formative evaluation. It triangulates data from a variety of qualitative and quantitative sources. For example, unit non-response, item non-response and respondent feedback.

Stage 2: redesign of the data collection instrument(s)

Stage 2 of the framework looks at the agreed objectives and data requirements of the survey and based on the evidence produced from analysis of the expert review and evaluation review identifies facets of the data collection instrument design that require further development. During this stage the data collection instrument(s) are redesigned.

2 For example, the wording of questions, response categories, instructions, definitions and the layout and formatting of the instrument.

The redesigned data collection instrument(s) are then presented to the relevant output manager to clarify that the data requirements for the survey are being met. Where appropriate other experts are consulted. For example, the ONS accountancy advisor and National Accounts. Prior to moving into stage 3 of the framework the data collection instrument(s) must be signed off by the survey output manager and Methodology Group.

Stage 3: pre-field testing and evaluation

Stage 3 involves pre-field testing and evaluation. To date cognitive interviews using either concurrent or retrospective probing have been the pre-field testing methods used. However, in November 2003 the first focus group with business respondents was successfully conducted. Both cognitive interviewing and focus groups are new methodologies for ONS business surveys. When conducting cognitive interviewing people in the business survey areas are also involved in carry out the cognitive interviews. Methodology Group is responsible for providing training, conducting at least one cognitive interview per iteration, quality assuring the cognitive interviews and analysing the qualitative data.

The cognitive interviewing training is divided into two sessions each lasting approximately two and a half-hours. The first training session outlines:

- what cognitive interviews are
- why we conduct cognitive interviews
- when to conduct cognitive interviews
- how to conduct cognitive interviews

The session also gives participants the opportunity to practice cognitive interviews using a variety of probes³ and receive feedback on their cognitive interviewing skills.

The second training session takes place two days after the first training session. This time interval has been found to be the most effective in allowing participants time to consider and practice their probing techniques. It gives participants further opportunities to practice cognitive interviewing and receive feedback. It is also used to standardise the cognitive interviewing by developing standard probes. This ensures that all interviewers systematically probe specific design facets of the data collection instrument(s).

In the agreed timetable the pre-field cognitive interviews are carried out in at least four iterations. Each iteration incorporates at least four face-to-face cognitive interviews, an interviewer debriefing session, analysis of the data and further development of the data

3 Probes such as comprehension, paraphrasing, confidence judgement and recall.

collection instrument(s). Interviewing is carried out by two interviews and recorded using a mini disc player. Methodology Group quality assure this process by carrying out at least one interview per iteration, leading the debriefing sessions, analysing the qualitative data and redeveloping the data collection instrument(s) based on analysis of the data. If there are still design issues at the end of the fourth iteration further face-to-face cognitive interviewing or telephone interviews are carried out. At the end of stage 3 the data collection instrument(s) is signed-off for implementation. The survey specific working group & project board and the Business Questionnaire Steering Group undertake sign-off.

Stage 4: field implementation

Stage 4 implements the data collection instrument(s) into the field. This stage involves the printing and despatch of the instrument(s), the capture and validation of the returned data, dealing with respondent queries, response chasing and the analysis of the data. Throughout this stage pre-defined data is collected for use in stage 5 (post implementation evaluation). For example, respondent queries on a question by question basis, problems in data capture and problems in data validation.

To date implementation has not included any field-testing. However, in 2004 ONS will be piloting field testing in stage 4 (field implementation) of the reviewed data collection instruments for the Business Register Survey (previously named the Annual Register Inquiry) and the Annual Survey of Hours and Earnings (previously named the New Earnings Survey).

Stage 5: post implementation evaluation

Summative evaluation is carried out in this stage. The data collected during stage 4 field implementation plus data such as unit and item non-response are collated and analysed to identify any aspects of the design of the data collection instrument(s) that show:

- measurement error
- non-response error
- processing error
- unnecessary respondent burden

Follow-up telephone interviews with respondents to the survey are also carried out. If the analysis provides evidence of any type of error or respondent burden with the data collection instrument design then the procedure is to move back to stage 2 of the framework and work through the processes again.

Stage 6: identify and disseminate best practice

This stage involves both the identification of best practice for the processes involved in the framework and the design of data collection instruments in business surveys. Best practice is disseminated through ONS standards and guidance. For the processes involved in the framework this will provide evidence to inform the annual review of the framework. For facets of the design of data collection instruments this should ensure that stage 1 expert reviews and stage 2 redesign of the data collection instruments are based on best practice evidence.

Next Steps

The governance structure and framework for reviewing data collection instruments in business surveys will continue to be used. In 2004 to 2005 the reviewed and redesigned data collection instruments for the Business Register Survey and Annual Survey of Hours and Earnings will be field tested. Post-implementation evaluation will proceed the field tests. The next round of reviews are commencing. The Business Questionnaire Steering Group has agreed the following reviews for 2004:

- Quarterly Profits Inquiry
- Research & Development
- International Trade in Services
- Monthly Production Inquiry
- Retail Sales Index
- Monthly Inquiry into Distribution and Services Sector
- The 12 monthly review of the framework will also take place.

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