

Investigate Failings in Survey Method for Improving Business Research

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Abstract:

The purposive nature of business research is the underpinning of the decision making process of managers. In order to make the right decision, the business manager seeks to reduce uncertainty. To that end the decision maker may be informed by descriptive research which identifies the nature of the decision context and may even identify and analyse decision options.

Both qualitative and quantitative research can be helpful in informing the decision maker. The Case Study Method is an example of the former while the Survey Method is common in the latter typically administered via mail-out or the internet.

It is the veritable ubiquity of the Survey Method in business research that is addressed here. We are a group of researchers currently researching in the field of IT Outsourcing. In our review of the literature in this field we were struck with failings either in the reporting or in the analysis of surveys and even by both failings occurring in the one article.

This paper, in documenting these failings, seeks to improve the use of the Survey Method – one of the most common research methods in business research – so as to improve the overall quality of business research.

Field of Research: Business Research, Survey Method

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1. Introduction

Business research is the application of the scientific method in the search for the truth about business phenomena. These activities include defining business opportunities and problems, generating and evaluating ideas, monitoring performance, and understanding the business process (Zikmund *et al* 2010, p.5).

Both qualitative and quantitative approaches are common and the Survey Method is a technique frequently deployed in the latter. Postal questionnaires, and more recently internet-administered surveys, are one of the principal tools for gathering information from a large number of respondents at relatively low cost. In addition, survey method's other major advantage in the amenability of the data collected to quantitative analysis.

In contrast, the reliance of survey methods on the judgements of respondents has been identified by Hufnagel and Conca (1994) as a grave shortcoming of survey research, as it can lead to some inconsistent results. According to Simon (1980), outcomes are subject to the techniques employed, and in the same vein, Pinsonneault and Kraemer (1993) concur that the problem, in fact, does not lie in the survey methodology, but in the way in which the method is deployed.

The authors encountered these issues in connection with their need to interpret survey findings reported in the literature on IT Outsourcing (ITO) which was an essential first step in their broader research project centered on investigating both vendor performance and customer satisfaction in the ITO domain. The intriguing question facing the authors was the extent to which the reported findings were derived with the necessary rigour and that raised the attendant issue of what needs to be done so as to maintain the integrity and reliability of survey evidence, in general. The authors have addressed this question through a literature review of respected journals which have reported survey-based findings admittedly from a specific field – in our case ITO. Throughout this endeavour, the authors were struck with the realization that the issues uncovered have broad relevance beyond the ITO field of literature. Indeed, a similar 'historical analysis' has been undertaken of published survey research in the field of Operations Management (Rungthusanatham *et al.*, 2003). Also, an earlier study (Malhotra and Grover, 1998) reviewed the literature in the field of Production and Operations Management to assess the quality of published survey research in that field. Echoing our findings, both studies (Rungthusanatham *et al.*, 2003) and (Malhotra & Grover, 1998) identified weaknesses in the reported research in key attributes of rigour: sampling strategies, reliability and validity.

Our intention in reviewing the rigour of survey research in our field is to encourage authors to pay special attention to generally accepted survey practices, so that the credibility and trustworthiness of their conclusions be enhanced. It appears our work may have wide applicability to survey-based research in business generally.

2. Literature review

IT literature dating back more than twenty years is replete with concerns about the rigour of survey research and we shall see, from our review of the literature, that little has improved. Previous studies dealing with methodological issues associated with ITO research are listed below.

- Straub and Carlson (1989) reviewed 117 articles from 1985 to 1988. They found that methodological problems exist and that instrument validation is necessary;
- Pinsonneault and Kraemer (1993) reviewed 141 articles from 1980 to 1990. Their findings were that the overall quality of exploratory studies was poor, and that the implementation of surveys was careless and inappropriate;
- Yu (2003) reviewed 75 articles from 1996-1999 finding that the use of non-probabilistic sampling methods was common but that the statement of the research hypotheses and the pretesting of the survey had improved;
- Ju et al. (2006/7) reviewed 1653 articles from 1997 to 2004. They noted an improvement in the quality of research over the period but they criticised a frequent failure to use a combination of data collection methods; and
- Abareshi and Martin (2008) reviewed 1784 articles from 1992 to 2006. They found that unsystematic sampling methods were still common.

There is agreement Pinsonneault and Kraemer (1993); Ju et al. (2006/7); Abareshi and Martin, (2008) that the survey literature they studied suffered from several methodological flaws which cast doubt on the reliability of the survey findings. The ultimate credibility of survey results lies in an appropriately formulated research question, an appropriate data collection instrument and methods, and finally an appropriate data analysis.

2.1 Five Weaknesses in Survey Research Studied

Based on a review of 122 survey articles published in Management Information Systems Journal in the 10-year period 1980 to 1990, Pinsonneault and Kraemer (1993) expounded their finding that the implementation of the survey method was often carelessly misapplied and plagued by the following five important weaknesses:

- Single-method designs where multiple methods are needed;
- Unsystematic and often inadequate sampling procedures;
- Low response rates;
- Weak linkages between units of analysis and respondents; and
- Over-reliance on cross-sectional surveys where longitudinal surveys are needed.

2.2 Lack of Validation Processes

Straub and Carlson (1989) examined the validation process of survey instruments as reported in MIS Quarterly, Communications of the ACM and Information & Management between January 1985 and August 1988, and contended that 62 per cent of the studies they reviewed lacked even a single form of instrument validation.

They concluded that employment of survey instruments in MIS was problematic from a methodological standpoint, and called for renewed methodological rigour and urged MIS journal editors to encourage or require researchers to prepare an 'instrument validation' subsection of the methodology section which should at least include reliability tests and factorial validity tests of the administered instrument.

Lewis et al. (2005) developed a methodology for construct development in three stages of domain definition, instrument construction and evaluation of measurement properties with respect to six key measurement properties (content validity, factorial validity, reliability, convergent validity, discriminant validity and nomological validity), and offered suggestions to improve the rigour of the construct development process.

2.3 Drawing Imperfect Inferences

Hufnagel and Conca (1994) focused on cognitive issues involved in responding to survey questions and shortcomings in users' inferential reasoning which, as a consequence, give rise to imperfect inferences drawn from the data. Their recommendations comprise inclusion of a 'don't know' category, and suggestions on how to improve the precision of survey questions and the identification of potential sources of bias.

2.4 Sampling Procedures

Yu (2003) examined 75 survey articles on management information systems (MIS) published in three MIS journals (MISQ, JMIS and IJIM) during 1996-1999, and found weaknesses in using survey methodology. Problem areas that Yu (2003) identified included research design and repeated use of non-probabilistic sampling procedures.

2.5 Non-response Error and Single Data Collection Methods

Ju et al. (2006/7) examined all editions of three journals (Management Information Systems Quarterly, Journal of Management Information Systems and Information Systems Research) since their inauguration until 2004 investigating how they reported nine survey methodological attributes (randomization /selection procedure, reporting of the sampling frame, reporting a profile of respondents, use of a combination of collection methods, whether whole or a part of the questionnaire has been appended, reporting of validity or reliability analysis of items, whether pre-test / pilot test of the instrument has been performed, reporting of response rate, and justification of non-response error). While Ju et al. (2006/7) acknowledged some improvements in the quality of survey research, they pointed out that the most problematic areas of survey research was the failure to employ multiple data collection methods and the failure to address the non-response error.

2.6 Literature Review: In Summary

While the purpose and scope of those studies differ, it appears that some key deficiencies (i.e. lack of non-response test, use of unsystematic sampling) reported in early 1990s are still prevalent. Based on a meta analysis of 651 survey-based studies on management information systems, published in Information & Management, Management Information Systems Quarterly and Journal of Management Information Systems during the period 1992-2006, Abareshi and Martin (2008) found that the highest response rate was attained where interview survey was conducted, that most studies failed to employ multiple data collection methods, and that most researchers employed unsystematic methods of sampling. Alsudairi and Dwivedi's (2010) review reveals that the proportion of research using field study methodology in the years 2006-2008 topped 31 per cent.

Credibility and veracity of the work relies on attention to the rigorous, complete and impartial analysis of the available data (Lillis, 1999), and few researchers attend to the criteria of trustworthiness (Chua, 1996).

3. Data and methodology

The research question we address is the extent to which the reported findings of survey research in our field is presented with the necessary rigour. We used the research method of a literature review of all articles published in selected respected journals in the field over a twenty year period. We identified 97 articles from these journals for analysis (see Table 1).

Table 1: The 97 Articles Reviewed in this Study

Journal Name	No. of survey articles
Asia Pacific Business Review	1
Australasian Journal of Information Systems	2
Communications of the ACM	1
Decision Sciences	3
Decision Support Systems	1
Engineering Management Journal	1
European Journal of Information Systems	4
European Management Journal	1
Healthcare Financial Management	1
Industrial Management and Data Systems	5
Information and Management	12
Information Management & Computer Security	4
Information Resources Management Journal	2
Information Systems Frontiers	6
Information Systems Management	1
Information Systems Research	4
Information Technology & People	1
International Journal of Accounting Information Systems	1
International Journal of Human and Social Sciences	1
International Journal of Information Management	2
International Journal of Management and Enterprise Development	1
International Journal of Production Research	2
International Journal of Social Sciences	1
IT Pro	1
Journal of Computer Information Systems	3
Journal of Global Information Management	2
Journal of Global Information Technology Management	1
Journal of Information Technology	3
Journal of Management	1
Journal of Management Information Systems	8
Journal of Organizational Computing and Electronic Commerce	1
Journal of Strategic Information Systems	2
Journal of Supply Chain Management	1
Logistics Information Management (published as Journal of Enterprise Information Management since 1994)	9
Management Information Systems Quarterly	3
Organization Science	1
Sloan Management Review	1
Strategic Management Journal	1
Thunderbird International Business Review	1

Our analysis was not able to distinguish whether weaknesses identified were in the conduct of the survey research itself or in the way in which it was reported. In any case, from the point of view of the academic reader, it makes no difference where rigour has been compromised only that it has been compromised. Where a weakness was detected by one member of our team, another team member verified the weakness.

Though the measure of rigour in survey research is many faceted, as evidenced in the foregoing literature review, we focused on the following four fundamental attributes of survey rigour:

- 1 Whether the Research Questions have been specified
- 2 Whether the Sampling Method has been cited
- 3 Whether the Survey Instrument has been pre-tested
- 4 Whether the Response Rate has been specified

4. Findings and Discussion

In our examination of survey articles we checked on several methodological aspects (i.e. whether the research questions were specified, the questionnaire was pretested, the population was defined, the sampling method employed and the sample size were indicated, the response rate was indicated, the response error was addressed, the non-response bias was addressed, the missing data analysis was performed and finally whether the internal validity was tested).

Our overall findings from the analysis of 97 papers from 17 journals focused on the four fundamental attributes of rigour mentioned above and our results are summarized in Table 2.

Table 2: Findings from the 97 Articles Reviewed in this Study

Methodological attributes	Reported	
	Count	%
Research questions specified	71	73%
Sampling method cited	61	63%
Instrument pretested	59	61%
Response rate specified	83	86%

4.1 *Whether the Research Questions have been specified*

This is clearly the most fundamental of the attributes expected in survey research as it sets the scope and defines what constitutes a legitimate question. Survey research is instigated to address a research question, which in turn, determines the appropriate methodology to be employed.

Diamond (2000) argues that the legal framework requires that any survey should include a statement describing the purpose of the survey. As Barthelemy and Geyer (2005) report, a specific research objective helps avoid inappropriate selection of samples and the use of irrelevant questions. The research question also determines the boundaries of the investigation by way of narrowing the problem (Strauss and Corbin, 1998).

Our study reveals that the research question was not specified in 27 per cent of the articles reviewed (Table 2).

4.2 Whether the Sampling Method has been cited

The most critical element of the sampling procedure is the choice of the sampling frame that constitutes a representative subset of the population from which the sample is drawn (Pinsonneault and Kraemer, 1993). As Birnberg *et al* (1990) highlight, the ability to collect data from a representative sample constitutes one of the major strengths of the survey method. A sample representative of the population also allows generalisation of the results. Unrepresentative samples have potential to affect the external validity of conclusions. Therefore an appropriate sampling method is essential. In addition, inclusion / exclusion criteria need to be specified.

Furthermore, information related to the number of respondents, the type of sample and the respondent selection method should be included in the each abstract (Churchill and Peter, 1980). Pinsonneault and Kraemer (1993) found that 70 per cent of studies they reviewed used either a convenience sample, or did not report the sampling procedure. In addition, more than 50 per cent of the descriptive studies either did not describe or did not have a sampling procedure. Yu (2003) and Abareshi and Martin (2008) established that one of the key shortcomings in MIS research was the use of non-probabilistic sampling methods.

Our review found that 37 per cent of the articles reviewed did not report the sampling method employed. (Table 2).

4.3 Whether the Survey Instrument has been pre-tested

In order to purify an instrument, Lewis *et al.* (2005) suggest a pilot test to be undertaken following revisions from the pre-test. They describe pilot testing as a 'dress-rehearsal' of the instrument with a small sample. Pre-testing of survey questions and the questionnaire is important because target respondents have nobody to ask for help in clarifying questions if necessary (Dillman, 2000). Therefore, Dillman (2000) recommends that the questionnaire and questions are tested on colleagues, target respondents and users of data. Pilot testing by a careful selection of respondents based on their expertise and professional integrity can iron out poorly framed questions (Innes and Mitchell, 1997). Ju *et al* (2006/7) found that in survey articles published in MISQ, JMIS and ISR, questionnaires were not pretested/ pilot tested in 47.7 per cent, 43.9 per cent and 36.6 per cent of the articles, respectively.

The major purpose of pretesting the questionnaire is to detect weaknesses (i.e. clarity of questions, question sequence, how to address reactions of respondents, and the time it takes to complete, etc.). Pretesting is an essential step before actual data gathering begins. Rigorous scientific standards of data collection procedures and instruments are essential (Mitchell, 1985). Pilot testing of the survey instrument is important to establish the content validity of the questionnaire and to improve questions, format and scales (Creswell, 2003).

Self-administered questionnaires should ideally be administered on potential respondents, colleagues and users of the data (Dillmann, 1999).

Our finding is that 61 per cent of the survey articles reported that the survey instrument was pretested while 39 per cent did not report whether pretesting was performed (Table 2). Our finding appears to be consistent with Ju *et al*'s (2006/7) result.

4.4 Whether the Response Rate has been specified

Although a popular method for gathering data, the disadvantages of questionnaires include low response rates and low respondent attentiveness.

Shosteck and Fairweather (1979) pointed to the lack of a precisely defined and broadly accepted definition of survey outcomes, which results in severely limited discussions of survey methodology. They stressed that reported response rates are often misleading and frequently overstated. In order to address the lack of a standardized definition of response rates, the Board of Directors of the Council of American Survey Research Organizations (CASRO) developed a uniform definition and method of calculation for the response rate adapted for questionnaires (Wiseman and Billington, 1984) namely, divide the number of eligible responding units in the sample by the number of completed questionnaires with responding units. Wiseman and Billington (1984) determine response rate by dividing the total number of completed and returned responses by the sample size minus ineligible and unreachable.

The response rate is the proportion of usable responses of the sample size. Response rate is an indicator of the success of data collection effort. It is important to know the details of the way response rates are calculated. Differences in the way they are calculated can make comparisons difficult. For instance, some papers (i.e. Fink and Shoeib, 2003) used the number of received questionnaires as the denominator. Pinsonneault and Kraemer (1993) found that in more than 70 per cent of the studies they reviewed had reported a response rate of 51 per cent or below, or did not report it at all. Ju et al. (2006/7) found that more than 61 per cent of the articles they reviewed either reported a response rate below 50 per cent or failed to report it. The proportion of articles that did not report, however, was not indicated in Ju et al. (2006/7). As Groves and Peytcheva (2008) argue, survey research typically assumes 100 per cent response rate on a probability sample. That is to say, all sample elements must be measured and, when only a subset is measured as a result of low response rate, none of the properties of the probability sampling inference pertain.

This review found that 86 per cent of survey articles gave the number of usable responses received but the remaining 14 per cent of articles provided no clue as to the response rate (Table 2).

Based on the foregoing analysis, one could argue that there is still room for improvement in the implementation and reporting of surveys. Enhanced attention to rigour would add more credibility to survey results.

5. Conclusion and Limitations

The purpose of this paper was to identify methodological issues in IT/IS survey research. Some notable findings are summarized in the following paragraphs. From the critical readers' point of view, it is important that there is sufficient detail in the published articles to assure those readers of the rigour and reliability of the published study. Burgstahler (1987) comments that research cannot be considered a success unless readers have confidence in the tools employed and the results reported.

Our major findings that 39 per cent did not indicate whether their questionnaires were pretested, that 37 per cent used sampling but did not indicate the sampling method used, that 14 per cent did not report the response rate, and that 27 per cent

did not even report the research question(s) being addressed in their survey, is alarming and can potentially cast doubt on survey results.

Nonetheless, it should be added here that this review is based only on the information contained in the published articles. There is, of course, a possibility that respective researchers might have performed such tests, but for some reason, did not report. However, inclusion of such crucial information would enhance both the information quality and the reliability of surveys.

In lending support to Pinsonneault and Kramer (1993) who argued that the quality of survey research was poor, we concur that the methodological problems which have long plagued MIS research still abound. The current study supports the contention that critical methodological issues are generally ignored in ITO research. Beyond our reporting of the weaknesses is our intention to serve researchers a basic guide to the fundamental issues in ensuring the quality of data collected and improving the subsequent reporting effort. This paper pinpoints the need for renewed awareness of the significance of validity and reliability in survey-based research.

Underlying the weaknesses in the conduct and/or reporting of business-related survey research identified here, are the vetting processes of journal editors and reviewers who accepted articles for publication in the first place. This opens out another dimension in our work, namely an initiative to identify those attributes viewed by journal editors and/or reviewers as essential to the academic rigour of any article they would publish.

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