



Addressing methodological frailties in IT outsourcing surveys

Bülend Terzioglu and Elsie Chan

School of Business, Australian Catholic University, Melbourne, Australia, and

Peter Schmidt

Holmes Institute, Melbourne, Australia

Abstract

Purpose – The aim of this paper is to review 73 survey articles relating to information technology outsourcing (ITO) published by 17 information technology journals over the 20-year period 1991-2010. The review focuses on seven attributes of survey methodology (i.e. information on research questions, pilot testing of the survey instrument, sampling method employed, sample size, response rate, nonresponse bias and internal validity) and ascertains the extent to which those attributes have been addressed. The main purpose of this study is to provide insights for researchers to help improve the data quality, and reliability of survey results.

Design/methodology/approach – Review of literature over the past 20 years (1991-2010).

Findings – There is strong evidence that deficiencies in the administration of survey methods in ITO persist and that such shortcomings compromise rigour, and therefore need to be redressed.

Practical implications – Although this review is performed in an ITO context, findings are of interest and benefit to all survey researchers. The key contribution of this paper is that it provides up-to-date evidence regarding quality of survey research as it applies to ITO by identifying areas needing attention so that the integrity of survey research methodology can be maintained and it can continue to provide reliable findings for the advancement of knowledge.

Originality/value – This study provides an examination of literature dealing exclusively with an IT outsourcing survey. It can, however, serve as a guide for all survey researchers regarding the pitfalls in survey methodology.

Keywords Survey, Methodology, IT outsourcing, Information technology, Outsourcing

Paper type Literature review

Introduction

Information technology outsourcing (ITO) is described as the process of turning over part or all of an organisation's IT functions to external service providers (Loh and Venkatraman, 1992). The survey method is still being commonly used in ITO research. It is a useful tool, especially when a researcher aims to collect data from a large sample, because it provides quality data as long as it is constructed and administered appropriately (Dillman, 1999). Survey is used as a tool to gather information from or about a defined set of people or a population (Easterby-Smith *et al.*, 2002) with a view to producing knowledge and evidence. Empirical evidence points to the ongoing lack of rigour in conducting survey research (Pinsonneault and Kraemer, 1993; Ju *et al.*, 2006/2007).

The authors would like to thank the Editor of this journal and two anonymous reviewers for their valuable comments on earlier versions of this paper. The authors also acknowledge input from Darcy McCormack and participants at a Research Seminar at Australian Catholic University.



The strengths and limitations of survey research

During the 1980s in both Federal and State court cases in the USA, courts and administrative authorities used to accept surveys or opinion polls into evidence (Morgan, 1990). In particular, postal questionnaire surveys are one of the principal tools for gathering information from a large number of respondents at relatively low cost. The intriguing question raised here is what protocols need to be observed so as to maintain the integrity and trustworthiness of survey evidence.

The reliability of survey research outcomes is contingent on how the survey methodology is carried out (Simon, 1980; Pinsonneault and Kraemer, 1993). Despite its many advantages over other study designs, mail surveys rely on user responses, and are subject to a host of problems associated with human judgement processes (Hufnagel and Conca, 1994). In particular, Hufnagel and Conca (1994) pointed out that the wording of questions and response categories provided can influence the response of respondents, and ultimately the reliability of findings.

Kraemer and Dutton (1991) argued that survey research is unable to yield cumulative knowledge, is a theoretical, and is also ill-suited to address the subtleties of IT in complex settings. There is also a lack of control as to whether the targeted respondents actually complete the questionnaires. The method does not allow for probing answers and clarifying questions. In addition, phraseology (Gill and Johnson, 1991) and loss of contextual meaning and significance of the phenomena under study (De Vaus, 1991) are some of the other factors that can adversely affect the validity of responses. Flaws in one or more stages (development of survey instrument, pilot testing, data analysis, etc.) of the survey process are apt to influence trustworthiness, and hence usefulness of the results obtained and reported.

Survey method in IT research

Surveys are relatively less costly than other research designs and are amenable to collection of data from large numbers of respondents, particularly when sample units are geographically dispersed. Besides, they also allow testing of theoretical propositions and provide enhanced external validity. For all these reasons, surveys are one of the most popular methods used in information systems (Newsted *et al.*, 1998). Chen and Hirschheim (2004) reported that 41 per cent of information systems scholars employed survey research. Jiang and Qureshi (2006) found that the mail survey method comprised 25 per cent of the total research on IT carried out from 1990 to 2003.

Challenges in ITO survey methodology

The use of surveys in IT research has been subject of some debate for a long time. Straub and Carlson (1989) examined the validation process of survey instruments as reported in *Management Information Systems Quarterly*, *Communications of the Association for Information Systems*, 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. As a result, Straub and Carlson (1989) concluded that employment of survey instruments in management information systems (MIS) was problematic from a methodological standpoint, and hence pinpointed the need for renewed methodological rigour. Accordingly, MIS journal editors were urged to encourage or even require researchers to include in the methodology section an

“instrument validation” paragraph which should at least include reliability tests and factorial validity tests of the administered instrument.

Based on a review of 122 survey articles published in *Management Information Systems Journal* in the ten-year period between 1980 and 1990, Pinsonneault and Kraemer (1993) concluded that survey methodology had often been misapplied and was plagued by the following weaknesses:

- use of 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
- overreliance on cross-sectional surveys where longitudinal surveys are needed.

Pinsonneault and Kraemer (1993) stressed that exploratory surveys are of poor quality overall. There appears to be agreement among researchers (Pinsonneault and Kraemer, 1993; Ju *et al.*, 2006/2007; Abareshi and Martin, 2008) that surveys in information technology suffer from a range of 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.

Problems with survey research are not restricted to information technology; such problems are also a pervasive issue in many other disciplines. Some of the literature dealing with issues in survey methods in other academic areas includes marketing research (Hunt *et al.*, 1982), supply chain management operations (Zhang *et al.*, 2011), sociology (Marsh, 1979; Groves, 1987), cross-cultural research (Watkins, 2010) and management accounting (Wim *et al.*, 2005). Therefore, findings of this study should have a wider target audience. To the best knowledge of the authors, no study has examined methodological aspects of survey research solely in the context of information technology outsourcing. There is evidence of an ongoing lack of methodological rigour in information technology/systems research (Pinsonneault and Kraemer, 1993; Yu, 2003; Ju *et al.*, 2006/2007). Following Pinsonneault and Kraemer (1993) who argued that survey research is a tool on the quality of survey data in ITO research spanning a 20-year period, and to highlight issues that need addressing.

This study differs from similar earlier studies in the following ways:

- The period covered in this review spans over 20 years which is longer than most surveys except Alavi and Carlson (1992) and Chen and Hirschheim (2004).
- In contrast to other similar evaluative studies, which examined survey methodology within the broader MIS discipline, this paper is the first study that specifically focuses on survey methodology in a narrower ITO context.
- Most of the evaluative studies are outdated; this paper therefore aims to provide current knowledge about the issues surrounding survey research.
- Most of the earlier studies (Pinsonneault and Kraemer, 1993) examined different aspects such as research design, sampling procedures and data collection. By contrast, this paper adopts a different focus by evaluating survey research using seven selected attributes.

The present study contributes not only to the existing ITO literature, but also to the literature of other disciplines which employ survey research, by highlighting the problems that have potential to threaten the credibility of conclusions reached.

The paper is structured thus: in the following section a review of previous literature is undertaken, followed by an analysis of methodology approaches. Subsequently, research findings pertaining to different methodological parameters are discussed. Finally, the paper concludes with a discussion of recommendations and implications of the study.

The objective of the current study is to review and report whether in survey-based articles on ITO:

- (1) research questions were specified;
- (2) survey instrument was pilot-tested;
- (3) sampling was employed, and where it was, the sampling method used was reported;
- (4) response rate was reported;
- (5) non-response bias was reported; and
- (6) internal validity was reported.

The research questions are predominantly derived from the works of Pinsonneault and Kraemer (1993), Grover *et al.* (1996) and Malhotra and Grover (1998).

Critical discussion of previous literature

Ju *et al.* (2006/2007) examined editions from three journals: *Management Information Systems Quarterly*, *Journal of Management Information Systems*, and *Information Systems Research* since their inauguration until 2004, and reported that survey articles as a proportion of total articles comprised 15.4, 15.9, and 14.3 per cent, respectively. While findings to date indicate that the use of survey methodology ranges between 20-40 per cent of total research in IT, no clear pattern as to whether survey research is on the rise or decline can be inferred from Table I.

Addressing methodological problems and achieving desirable rigour in research are central to the reliability of results, and are of significant interest to the readers of those survey articles. Previous studies dealing with methodological issues associated with ITO research are summarised in Table I. Generally, the 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). Yu (2003) examined 75 survey articles on MIS published at three MIS journals (*Management Information Systems Quarterly*, *Journal of Management Information Systems*, and *International Journal of Information Management*) 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. Ju *et al.* (2006/2007) examined how each journal reported survey methodological attributes (i.e. 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.* (2006/2007) acknowledged some improvements in the quality of survey

Table I.
Selected prior studies
dealing with the quality
of information
systems research

Authors	Number of articles reviewed	Period covered	Database	Percent of articles that are survey methodology	Key findings as they relate to methodology
Vogel and Wetherbe (1984)	389	1977-1983	ACMCS, AMJ, AR, CACM, DB, DM, DS, HBA, I&M, JDE, MS, MISQ, SMR, SOS, TDBS	36.3 per cent (leading institutions) 27.9 per cent (other institutions) n/a	The article does not focus on methodological problems. Rather examines publications record top US universities in leading MIS journals
Straub and Carlson (1989)	117	1985-1988	CACM, I&M, MISQ	n/a	Methodological problems exist
Orlikowski and Baroudi (1991)	155	1983-1988	CACM, MISQ, MS Proceedings of ICIS	49.1	Instrument validation is necessary Lack of diversity in IS research
Alavi and Carlson (1992)	908	1968-1988	MIS	7.3	A positivistic research orientation Paucity of theoretical papers Balance between MIS research rigour and relevance emphasized
Lending and Wetherbe (1992)	744	1984-1990	ACM, ACMCS, ACMTDBS, AR, CACM, DB, DS, HBR, I&M, ISR, MS, MISQ, SMR	27.4	Decline in MIS research of top 20 US universities
Pinsonneault and Kraemer (1993)	141	1980-1990	16 MIS journals	n/a	Exploratory studies' overall quality is poor Inappropriate and careless implementation of surveys
Farhoomand and Drury (1999)	2,098	1985-1996	CACM, EJIS, ISR, I&M, JSIS, MIS, MISQ, MS, Proceedings of ICIS	32	Overall quality of exploratory and descriptive studies is poor-moderate. Decline in non-empirical studies Surveys are the most dominant strategy
Palvia <i>et al.</i> (2003)	843	1993-1997	MISQ, CACM, DS, I&M, ISR, JMIS, MS	24	Increase in experiments Survey is the most widely used strategy

(continued)

Authors	Number of articles reviewed	Period covered	Database	Percent of articles that are survey	Key findings as they relate to methodology
Yu (2003)	75	1996-1999	MISQ, JMIS, JIJM	100	Use of nonprobabilistic sampling methods is common Improvement in stating research hypotheses Improvement in pretesting Survey is the most widely used strategy
Palvia <i>et al.</i> (2004)	1,226	1993-2003	MISQ, CACM, DS, I&M, ISR, JMIS, MS	22	Increase in empirical studies Increase in case studies Not applicable. The paper predominantly focuses on gaps in the literature
Chen and Hirschheim (2004)	1,893	1991-2001	AMIT, EJIS, ISJ, ISR, JIT, JMIS, MISQ, Proceedings ICIS	41	Overall improvement in the quality of IS research
Jiang and Qureshi (2006)	168	1990-2003	BSP, DJI, EI, PQ, SD	24.9	Lack of non-response error tests Failure to use a combination of collection methods Survey is still dominant, but shows a decline
Ju <i>et al.</i> (2006/2007)	1,653	1997-2004	ISR, JMIS, MISQ	15.4	Most research is published by US-based researchers Unit of analysis is the individual Unsystematic sampling methods are still common
Palvia <i>et al.</i> (2007)	435	1998-2005	I&M	41.5	Most of the survey research is conducted in the USA European journals (58 per cent) have twice as much research on outsourcing compared to US journals (29 per cent) Scant longitudinal and action research
Abareshi and Martin (2008)	1,784	1992-2006	I&M, JMIS, MISQ	36.5	
Yadav and Gupta (2008)	70	1995-2005	DS, EJIS, EMJ, ISR, JIT, JMIS, MISQ, MS	21	

Table I.

research, they stressed that the most problematic areas of survey research include the failure to employ multiple data collection methods and failure to address the non-response error.

Based on a meta-analysis of 651 survey-based studies on MIS, 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 also conducted, that most studies failed to employ multiple data collection methods, and that most researchers employed unsystematic methods of sampling. Although 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.

Methodology

Online databases of seventeen journals listed in Table II were searched for survey articles on IT outsourcing over the 20-year period 1991-2010. Other studies from dissertations, conference proceedings and books relevant to IT/IS outsourcing were excluded. Seventeen journals were chosen based on the findings of survey articles in the works of Ju *et al.* (2006/2007) and Alsudairi and Dwivedi (2010). In identifying articles to include in this study, Webster and Watson's (2002) three-phased structured approach was adopted. First, the table of contents of each journal listed in Table II were scanned to identify survey articles on ITO. Second, the initial screening was supplemented by a review of citations for the articles identified. Finally, a ProQuest database search was performed to identify articles citing the key articles identified earlier in step one. Articles that used the questionnaire within a case study are included. Consequently, a total of 73 mail survey articles that specifically focus on ITO were identified.

Journal	Number of articles
<i>Decision Sciences</i>	3
<i>European Journal of Information Systems</i>	4
<i>Industrial Management and Data Systems</i>	5
<i>Information and Management</i>	12
<i>Information Management and Computer Security</i>	4
<i>Information Systems Management</i>	1
<i>Information Systems Management Journal</i>	2
<i>Information Systems Frontiers</i>	6
<i>Information Systems Research</i>	4
<i>International Journal of Information Management</i>	2
<i>Journal of Computer Information Systems</i>	3
<i>Journal of Global Information Management</i>	2
<i>Journal of Information Technology</i>	3
<i>Journal of Management Information Systems</i>	8
<i>Journal of Strategic Information Systems</i>	2
<i>Logistics Information Management</i> (Published as <i>Journal of Enterprise Information Management</i> since 1994)	9
<i>Management Information Systems Quarterly</i>	3
Total	73

Table II.
Classification of
survey-based papers on
ITO reviewed by journal
of publication

Results

An examination of the survey articles focused on selected methodological aspects (i.e. whether the selected methodological attributes (i.e. research questions, pretesting of the questionnaire, the sampling method, the sample size, the response rate was indicated, the non-response bias, and the internal validity) has been reported in Table III which displays overall findings relating to selected methodological attributes.

Research questions

A survey is instigated to address a research question, which in turn, determines the appropriate methodology to be employed. As Barthelémy and Geyer (2005) reported, 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 analysis reveals that the research question was not specified in 21.9 per cent of the articles reviewed (Table III). Diamond (2000) argued that the legal framework requires that any survey should include a statement describing the purpose of the survey.

Pilot testing of the survey instrument

In order to improve the robustness of an instrument, Lewis *et al.* (2005) suggested 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 be tested on colleagues, target respondents and users of data. Careful selection of respondents based on their expertise, professional integrity and pilot testing of questionnaire can iron out poorly framed questions (Innes and Mitchell, 1997). While Ju *et al.* (2006/2007) found that in survey articles published in *MISQ*, *JMIS*, and *ISR*, questionnaires were not pretested/pilot tested in 47.7, 43.9, and 36.6 per cent of the articles, respectively. One of the major purposes 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 important step before actual data gathering begins. 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) and so build more rigorous scientific standards of data collection (Mitchell, 1985). However, the authors’ analysis indicates that 63 per cent of the survey articles reported

Methodological attributes	Reported		Not reported	
	Count	%	Count	%
Research questions specified	57	78.1	16	21.9
Instrument pretested	46	63.0	27	37.0
Sampling method cited	45	61.6	28	38.4
Sample size specified	60	82.2	13	17.8
Response rate specified	59	80.8	14	19.2
Non-response bias reported	20	27.4	53	72.6
Internal validity reported	28	38.4	45	61.6

Table III.
Summary of the results
of this study in terms
of reporting
of methodological
attributes

that the survey instrument was pretested while 37 per cent did not report whether pretesting was performed (Table III). This finding appears to be consistent with Ju *et al.*'s (2006/2007) result.

Sampling method employed

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/sampling frame 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. Although a popular method for gathering data, among other things, the disadvantages of questionnaires include low response rates, respondent attentiveness.

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. The current review demonstrates that 38.4 per cent of the articles reviewed did not report the sampling method employed (Table III).

Sample size

Sample size is defined as a subset of population (Collis and Hussey, 2003). The purpose of the survey and precision aimed by the researcher are the key determinants of sample size. Especially for a random sample, the reader may want to know the magnitude of standard error and confidence interval. From a reader's perspective, sample size informs as to what extent the survey findings are representative of the population. Pinsonneault and Kraemer (1993) view providing sample size information as a quality criterion for survey research, and Draugalis *et al.* (2008) suggest that authors should describe the process they used to estimate the required sample size. In our analysis, sample size was indicated in 82.2 per cent of the articles reviewed while the remaining 17.8 per cent made no mention of the sample size (Table III).

Response rate

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 the following uniform definition and method of calculation for the response rate adapted for questionnaires (Wiseman and Billington, 1984). Their suggested method of response rate calculation divides number of completed questionnaires with

responding units by number of eligible responding units in the sample. Drury and El-Shishini's (2005) formula which recommends that response rate be found by dividing number of completed and returned questionnaires by the number in the sample minus ineligible plus unreachable. Some papers (Fink and Shoeib, 2003) used number of received questionnaires as denominator. Even these two examples illustrate the disagreement in response rate computation.

The response rate is the proportion of usable responses of the sample size. Response rate is also 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. This review found that 17.8 per cent of articles provided no clue as to the response rate (Table III). 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.* (2006/2007) 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.* (2006/2007). 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 pertains.

Non-response bias

Non-response bias is concerned with the possible effect of non responses on survey estimates (Fowler, 2002), that is to say, respondents who answer differently from non-respondents and give a biased version of reality (Mentzer and Kahn, 1995). Since little is known about non-respondents (Brownell, 1995), non-response bias is always an issue in mail surveys, and can be examined by analysing response waves (Armstrong and Overton, 1977).

Non-response bias together with low response rates is an ongoing concern in conducting mail surveys (Greer *et al.*, 2000). According to Sudman and Blair (1999), there is a disturbing trend in the past quarter century of a slow but steady decline in sample cooperation. Moreover, not knowing how non-respondents would have responded leads to non-response bias. This situation occurs when all the questionnaires have not been returned. Dillman (2000) view non-response bias as a significant source of error in self-administered surveys and rank non-response bias as one of the primary sources of survey error. Madow *et al.* (1983) identify three sources of non-response error. First, some sampled units may not be contacted (i.e. wrong address); second, a sampled unit is contacted but fails to respond, and third, the unit may respond to the questionnaire incompletely. Armstrong and Overton (1977) recommend testing differences between the first and second mail-outs. It is essential that the researcher ensures that no significant differences exist between responses received and response from non-respondents. Non-response bias forms one of the major disadvantages of written questionnaires. In order to reduce the non-response bias, Gall *et al.* (1996) recommend that where the response rate is less than 80 per cent, a random sample of 20 non-respondents should be contacted.

There is evidence that non-sampling error (i.e. error caused by non-response and measurement problems not associated with the sampling process) is the major

contributor to total survey error (Assael and Keon, 1982). As illustrated in Table III, our analysis shows that about three quarters (72.6 per cent) of survey articles made no mention about how the non-response bias issue was addressed. In the earlier study of Ju *et al.* (2006/2007), it was found that 80.4 per cent of articles did not perform non-response tests to justify the loss of data due to non-response. Most of these 31 articles did not address non-response bias. Obviously the higher the response rate, the lower the non-response bias will be. Given the generally lower response rates achieved in surveys, it becomes important to determine and report the non-response bias. In consideration of declining response rates obtained in mail surveys, it becomes important for researchers to handle non-response bias by reporting it accordingly. However, it should be acknowledged that little or nothing is known about non-respondents (Brownell, 1995). Non-response error results from a failure to collect complete information on all units in the selected sample. According to Sudman (1976) there is non-response error in all surveys even where every possible effort has been made to contact non-respondents. Especially given that there is a gradual decline in response rates, the potential for survey errors attributable to non-response is serious. Assael and Keon (1982) argue that response rate is a poor surrogate for non-response error, and improving response rate does not necessarily reduce non-response error. Instead, they also propose that validated response bias is a better surrogate measure for non-response error.

Internal validity

One of the major concerns of researchers is to employ a research instrument that is appropriate and capable of measuring what is intended to be measured, which is referred to as "internal validity". Flawed measures, which lack internal validity, can lead to several problems including erroneous conclusions (O'Leary-Kelly and Vokurka, 1998). Three types of validity are typically addressed. First, the face validity test evaluates whether on the face of it the measure seems to measure what it is supposed to. Because it is appearance-based, it is a subjective and relatively weaker validity. Although theoretically the face validity may appear simple an appropriate approach to establish is to form a panel of judges who are experts in the area to render an opinion as to what a particular instrument is measuring (Brownell, 1995). Second, construct validity, which relates to the consistency between the measures employed and the theory. Discriminant validity and convergent validity are employed to assess construct validity. Discriminant validity assesses the extent to which the measures of different latent variables are unique. Convergent validity examines the degree to which multiple methods used to measure the same variable yield the same results.

Churchill and Peter (1980) suggest that reliability and/or validity information will not be published, but they should be included with submission and discussed/interpreted in the abstract. Mentzer and Kahn (1995) argue that although mail surveys are strong in external validity, they are weak on internal validity due to lack of control. A clear, concise, well-designed questionnaire will help assure internal validity (Larson, 2005). Assael and Keon (1982) consider internal validity (in the form of non-sampling error), to be the most severe contributor to total survey error. Internal validity encompasses face validity, content validity and construct validity. Our analysis shows that internal validity was reported in 38.4 per cent of articles, most articles (61.6 per cent) making no mention of how internal validity was addressed (Table III).

Conclusions

The purpose of this paper was to identify methodological deficiencies in IT/IS survey research. From a methodological perspective, it is important that there is sufficient detail in a research article to demonstrate the rigour and reliability of the published study. Burgstahler (1987) comments that research cannot be deemed trustworthy unless readers have confidence in the tools employed and the results reported. The analysis presented in this article reveals that non-response bias and internal validity tests get most commonly ignored or are not reported by researchers. Our analysis indicates the proportion of researchers who did not address those tests range from 72.6 to 61.6 per cent of the total number of survey articles reviewed. Furthermore, it is alarming that 37 per cent did not indicate whether their questionnaires were pretested, 38.4 per cent did not indicate the sampling method used, and 19.2 per cent did not report the response rate, which can cast doubt on survey results.

This analysis is based on the information contained in the published articles, where such tests were not reported. Inclusion of such information, if undertaken, would enhance information quality and the trustworthiness of survey evidence. We concur with Pinsonneault and Kraemer (1993) that the quality of survey research remains poor and that the methodological problems in MIS research still prevail. As suggested by Hunter *et al.* (1983), there is the need to carry out research in a systematic and programmatic manner. For example, with a view to improve the quality of measurements, in 1980, *Journal of Marketing Research* required authors to submit a measurement abstract along with manuscript (Churchill and Peter, 1980). The measurement abstract includes information on description of constructs, description of measurement procedure, nature of the sample, when, where and how data were collected, descriptive statistics, reliability and validity information. The current study also contents that critical methodological issues are too often ignored in ITO research.

The discussions presented here are intended to contribute to scholars a guide to building quality of data collection and reporting processes with the intention of developing renewed awareness of the significance of attaining high level of methodological rigour. Paying greater attention to established guidelines would not only provide such key details to the readers associated with the administration of the survey but also enhance the credibility of the study. The findings of the present study highlight that although similar problems were identified in studies dating back to early 1980s, some of the issues relevant to survey methodology remain unresolved. The continued departure from best practice in survey methodology over many years is striking; it is hoped therefore that survey researchers will be mindful of such problems, and make strides to improve rigour in their research.

Directions for future research

Both the current study and most of the other evaluative studies focus on some selected aspects of implementation of survey research. Therefore, an extension of this paper could adopt a more comprehensive approach and examine not only some aspects but rather the full spectrum of attributes of survey research. Malhotra and Grover (1998) provide an excellent framework for this purpose, which allows the researcher to obtain ratings with respect to adherence to best practice survey research protocols.

Limitations

One of the limitations of this study is that the results drawn in this paper are restricted to survey articles from the selected 17 information technology journals. The study is also limited to survey articles on information technology outsourcing. Finally, another important limitation centres around the conclusions drawn, which are based solely on the seven chosen parameters of survey research.

References

- Abareshi, A. and Martin, B. (2008), "A meta-analysis of survey-based research in MIS field from 1992-2006", *Proceedings of the 19th Australasian Conference on Information Systems in Christchurch, New Zealand, December*, Paper No. 75.
- Alavi, M. and Carlson, P. (1992), "A review of MIS research and disciplinary development", *Journal of Management Information Systems*, Vol. 8 No. 4, pp. 45-63.
- Alsudairi, M. and Dwivedi, Y.K. (2010), "A multi-disciplinary profile of IS/IT outsourcing research", *Journal of Enterprise Information Management*, Vol. 23 No. 2, pp. 215-58.
- Armstrong, J.C. and Overton, T.S. (1977), "Estimating non-response bias in mail surveys", *Journal of Marketing Research*, Vol. 14 No. 3, pp. 396-402.
- Assael, H. and Keon, J. (1982), "Non-sampling vs. sampling error in survey research", *Journal of Marketing*, Vol. 46, Spring, pp. 114-23.
- Barthelémy, J. and Geyer, D. (2005), "An empirical examination of IT outsourcing versus quasi-outsourcing in France and Germany", *Information & Management*, Vol. 42 No. 4, pp. 533-42.
- Birnberg, J., Shields, M. and Young, S.M. (1990), "The case for multiple methods in empirical management accounting research", *Journal of Management Accounting Research*, Fall, pp. 33-66.
- Brownell, P. (1995), "Research methods in management accounting", Coopers & Lybrand Accounting Research Methodology Monograph No. 2, Coopers & Lybrand and Accounting Association of Australia and New Zealand, Melbourne.
- Burgstahler, D. (1987), "Inference from empirical research", *Accounting Review*, Vol. 62, pp. 203-14.
- Chen, W.S. and Hirschheim, R. (2004), "A paradigmatic and methodological examination of information systems research from 1991 to 2001", *Information Systems Journal*, Vol. 14 No. 3, pp. 197-235.
- Chua, W.F. (1996), "Issues in substantive areas of research: field research in accounting", in Richardson, A.J. (Ed.), *Research Methods in Accounting: Issues and Debates*, Research Monograph Number 25, CGA Canada Research Foundation, Vancouver.
- Churchill, G.A. and Peter, J.P. Jr (1980), "Measurement abstracts: purpose, policy and procedures", *Journal of Marketing Research*, Vol. XVII, November, pp. 537-8.
- Collis, J. and Hussey, R. (2003), *Business Research*, 2nd ed., Palgrave Macmillan, Basingstoke.
- Creswell, J.W. (2003), *Research Design*, 2nd ed., Sage, London.
- De Vaus, D.A. (1991), *Surveys in Social Research*, 3rd ed., UCL Press, St Leonards.
- Diamond, S.S. (2000), "Reference guide on survey research", *Reference Manual on Scientific Evidence*, 2nd ed., Federal Judicial Court, Washington, DC, pp. 225-71.
- Dillman, D.A. (1999), *Mail and Telephone Surveys: The Tailored Design Method*, Wiley, New York, NY.

- Dillman, D.A. (2000), *Mail and Internet Surveys: The Tailored Design Method*, Wiley, New York, NY.
- Draugalis, J.R., Coons, S.J. and Plaza, C.M. (2008), "Best practices for survey research reports: a synopsis for authors and reviewers", *American Journal of Pharmaceutical Education*, Vol. 72 No. 1, pp. 11-13.
- Drury, C. and El-Shishini, H. (2005), *Research Report: Divisional Performance Measurement: An Examination of Potential Explanatory Factors*, The Chartered Institute of Management Accountants (CIMA), London.
- Easterby-Smith, M., Thorpe, R. and Lowe, A. (2002), *Management Research: An Introduction*, Sage, London.
- Farhoomand, A. and Drury, D.H. (1999), "A historical examination of information systems", *Information Systems Journal*, Vol. 1 No. 19, pp. 1-27.
- Fink, D. and Shoeb, A. (2003), "Action: the most critical phase in outsourcing information technology", *Logistics Information Management*, Vol. 16 No. 5, pp. 302-11.
- Fowler, F.J. (2002), *Survey Research Methods*, 3rd ed., Sage, Thousand Oaks, CA.
- Gall, M.D., Borg, W.R. and Gall, J.P. (1996), *Educational Research: An Introduction*, Longman, White Plains, NY.
- Gill, J. and Johnson, P. (1991), *Research Methods for Managers*, Paul Chapman, London.
- Greer, T.V., Chuchinprakarn, N. and Sephardim, S. (2000), "Likelihood of participating in mail survey research", *Industrial Marketing Management*, Vol. 29 No. 2, pp. 97-109.
- Grover, V., Cheon, M.J. and Teng, J.T.C. (1996), "The effect of service quality and partnership on the outsourcing of information systems functions", *Journal of Management Information Systems*, Vol. 12 No. 4, pp. 89-116.
- Groves, R.M. (1987), "Research on survey quality", *The Public Opinion Quarterly*, Vol. 55, pp. 156-72.
- Groves, R.M. and Peytcheva, E. (2008), "The impact of nonresponse rates on nonresponse bias: a meta-analysis", *Public Opinion Quarterly*, Vol. 72 No. 2, pp. 167-89.
- Hufnagel, E.M. and Conca, C. (1994), "User response data: the potential for errors and biases", *Information Systems Research*, Vol. 5 No. 1, pp. 48-73.
- Hunt, S.D., Sparkman, R.D. Jr and Wilcox, J.B. (1982), "The pretest in survey research: issues and preliminary findings", *Journal of Marketing Research*, Vol. 19 No. 2, pp. 269-73.
- Hunter, J.E., Schmidt, F.L. and Jackson, G.B. (1983), *Meta-Analysis: Cumulating Research Findings Across Studies*, Sage, Newbury Park, CA.
- Innes, J. and Mitchell, F. (1997), "Survey research on activity-based costing: a reply to Dugdale and Jones", *Management Accounting Research*, Vol. 8, pp. 241-9.
- Jiang, B. and Qureshi, A. (2006), "Research on outsourcing results: current literature and future opportunities", *Management Decision*, Vol. 44 No. 1, pp. 44-55.
- Ju, T.L., Chen, Y.Y., Sun, S.Y. and Wu, C.Y. (2006/2007), "Rigor in MIS survey methodology: in search of ideal survey methodological attributes", *Journal of Computer Information Systems*, Vol. 47 No. 2, pp. 112-23.
- Kraemer, K. and Dutton, W. (1991), "Survey research in the study of management information systems", in Kraemer, K. (Ed.), *The Information Systems Research Challenge: Survey Research Methods*, Harvard Business School Press, Boston, MA, pp. 3-57.
- Larson, P.D. (2005), "A note on mail surveys and response rates in logistics research", *Journal of Business Logistics*, Vol. 26 No. 2, pp. 211-22.

- Lending, D. and Wetherbe, J.C. (1992), "Update on MIS research: a profile of leading journals and U.S. universities", *Database*, Vol. 23 No. 3, pp. 5-11.
- Lewis, B.R., Templeton, G.F. and Byrd, T.A. (2005), "A methodology for construct development in MIS research", *European Journal of Information Systems*, Vol. 14 No. 4, pp. 388-400.
- Lillis, A. (1999), "A framework for the analysis of interview data from multiple field research sites", *Accounting and Finance*, Vol. 39 No. 1, pp. 79-105.
- Loh, L. and Venkatraman, N. (1992), "Determinants of information technology outsourcing: a cross sectional analysis", *Journal of Management Information Systems*, Vol. 9 No. 1, pp. 7-23.
- Madow, W.G., Olkin, I., Nisselsson, H. and Rubin, D.B. (1983), *Incomplete Data in Sample Surveys*, Academic Press, New York, NY.
- Malhotra, M.K. and Grover, V. (1998), "An assessment of survey research in POM: from constructs to theory", *Journal of Operations Management*, Vol. 16 No. 4, pp. 407-25.
- Marsh, C. (1979), "Problems with surveys: method or epistemology", *Sociology*, Vol. 13, pp. 293-305.
- Mentzer, J.T. and Kahn, K.B. (1995), "A framework for logistics research", *Journal of Business Logistics*, Vol. 16 No. 1, pp. 231-50.
- Mitchell, T.R. (1985), "An evaluation of the validity of correlational research conducted in organizations", *Academy of Management Review*, Vol. 10 No. 2, pp. 192-205.
- Morgan, F.W. (1990), "Judicial standards for survey research: an update and guidelines", *Journal of Marketing*, Vol. 54 No. 1, pp. 59-70.
- Newsted, P.R., Huff, S.L. and Munro, M.C. (1998), "Survey instruments in information systems", *MIS Quarterly*, December, pp. 553-4.
- O'Leary-Kelly, S.W. and Vokurka, R.J. (1998), "The empirical assessment of construct validity", *Journal of Operations Management*, Vol. 16, pp. 387-405.
- Orlikowski, W.J. and Baroudi, J.J. (1991), "Studying information technology organizations: research approaches and assumptions", *Information Systems Research*, Vol. 2 No. 1, pp. 1-28.
- Palvia, P., Pinjani, P. and Sibley, E.H. (2007), "Editorial profile of information systems research published in *Information & Management*", *Information & Management*, Vol. 44 No. 1, pp. 1-11.
- Palvia, P., Mao, E., Salam, A.F. and Soliman, K.S. (2003), "Management information systems research: what's there in a methodology?", *Communications of the Association for Information Systems*, Vol. 11, pp. 289-309.
- Palvia, P., Leary, D., Mao, E., Midha, V., Pinjani, P. and Salam, A.F. (2004), "Research methodologies in MIS: an update", *Communications of the AIS*, Vol. 14, pp. 526-42.
- Pinsonneault, A. and Kraemer, K.L. (1993), "Survey research methodology in management information systems", *Journal of Management Information Systems*, Vol. 10 No. 2, pp. 75-105.
- Shosteck, H. and Fairweather, W.R. (1979), "Physician response rates to mail and personal interview surveys", *Public Opinion Quarterly*, Vol. 42, Winter, pp. 547-50.
- Simon, H. (1980), "The behavioral and social sciences", *Science*, July 4, pp. 72-8.
- Straub, D.W. and Carlson, C.L. (1989), "Validating instruments in MIS research", *MIS Quarterly*, June, pp. 147-69.
- Strauss, A. and Corbin, J. (1998), *Basics of Qualitative Research*, 2nd ed., Sage, Thousand Oaks, CA.
- Sudman, S. (1976), *Applied Sampling*, Academic Press, New York, NY.

-
- Sudman, S. and Blair, E. (1999), "Sampling in the twenty-first century", *Journal of the Academy of Marketing Science*, Vol. 27 No. 2, pp. 269-77.
- Vogel, D.R. and Wetherbe, J.C. (1984), "MIS research: a profile of leading journals and universities", *Database*, Vol. 16 No. 1, pp. 3-14.
- Watkins, L. (2010), "The cross-cultural appropriateness of survey research value(s) research", *International Marketing Review*, Vol. 27 No. 6, pp. 694-716.
- Webster, J. and Watson, R.T. (2002), "Analyzing the past to prepare for the future: writing a literature review", *MIS Quarterly*, Vol. 26 No. 2, pp. 13-22.
- Wim, V.d.S., Young, S.M. and Chen, C.X. (2005), "Assessing the quality of evidence in empirical management accounting research: the case of survey studies", *Accounting, Organizations and Society*, Vol. 30, pp. 655-84.
- Wiseman, F. and Billington, M. (1984), "Comment on a standard definition of response rates", *Journal of Marketing Research*, Vol. 21, August, pp. 336-8.
- Yadav, V. and Gupta, R.K. (2008), "A paradigmatic and methodological review of research in outsourcing", *Information Resources Management Journal*, Vol. 21 No. 4, pp. 27-43.
- Yu, C. (2003), "Toward an understanding of MIS survey research methodology: current practices, trends, and implications for future research", *Academy of Information and Management Sciences Journal*, Vol. 6 No. 1, pp. 39-56.
- Zhang, X., Donk, D.P.V. and Vaart, T.V.D. (2011), "Does ICT influence supply chain management and performance: a review of survey-based research", *International Journal of Operations & Production Management*, Vol. 31 No. 11, pp. 1215-47.

Corresponding author

Bülend Terzioğlu can be contacted at: bulend.terzioglu@acu.edu.au

To purchase reprints of this article please e-mail: reprints@emeraldinsight.com
Or visit our web site for further details: www.emeraldinsight.com/reprints

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.