

Peer review: Its efficacy as a quality control mechanism

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ABSTRACT

This article aims to foster retrospection and debate regarding the use of peer reviews as the predominant mechanism to manage the quality of business research outputs such as scholarly publications, competitive research grant submissions, theses and research reports. The efficacy of the practice of peer review as a quality control mechanism has not elicited much debate amongst business scholars. However, over the past several decades, there has been vehement debate in the natural, health and medical science domains on the efficacy of peer reviews, including blind peer reviews, as a quality gatekeeping mechanism. Literature that informed this study indicates that several articles in respected natural, health and medical science journals conclude that the peer review practice lacks rigor and is open to biases and ethical malpractices and consequently is not effective in gatekeeping the quality of research outputs. The article presents contemporary discourses on the practice of peer review, then, using a case example, the article analyses reviewer comments to examine the efficacy of the practice of peer review. The article concludes that the practice of peer review has serious limitations. These limitations may be the outcome of the proliferation of publication outlets and thus the difficulty of finding qualified reviewers, time constraints faced by reviewers, the inability of peer reviewers to contextualise discourses and, in some instances, unethical behaviours and academic malpractices on the part of reviewers.

Keywords - peer review, quality control, research ethics, quality gatekeeping, academic malpractice, research evaluation

INTRODUCTION

This article aims to foster retrospection, analyses and debate that would encourage the business research fraternity to re-examine the purpose and practices of peer reviewing research-based conference papers, journal manuscripts, research theses and proposals for research funding. Research is a demanding endeavour in terms of time, effort and cost. The underpinning higher-degree theses are typically the culmination of significant emotional commitment to a topic of intense personal interest, in the expectation of making a significant contribution in a chosen discipline or profession.

Though in practice the quality of research may vary considerably, it is unarguable that any study should be conducted ethically, rigorously and must be subjected to formal checks and balances including formal reviews. However, it seems that there is less clarity, if any at all, surrounding the responsibility of appointed reviewers to play their part in the process purposefully, rigorously and ethically. In fact, it should be equally axiomatic that reviews not only fulfil those criteria intrinsically but also take into account the context and scope of the study itself as part of the process of assessing its rigor and limitations. This will entail critical analyses of all aspects of the study - knowledge base that informs the study, purpose of the study, research methodology, nature of the findings, analytical procedures, quality of conclusions, theoretical and practical implications and extent to which these are properly grounded in the evidence presented.

Inadequate reviewing can be a significant drain on creativity, motivation and innovation in a community of scholars. In order to present the authors' arguments with appropriate evidence, the authors' decided to use a lengthy review of a research publication so as to demonstrate how lack of quality control throughout the peer review process can have significant negative effects on the pursuit of research excellence.

LITERATURE REVIEW

Appraisal and assessment by an anonymous panel of "experts" in the area of inquiry or editorial peer review is the norm for determining "quality" and acceptability of scholarly works and even progression in academic careers (Ware and Monkman, 2008; Bloom, 2006; Smith, 2006, Rennie, 2003; Yi-Luen Do, 2003). In this article, the term scholarly works refers to manuscripts submitted to scholarly journals, research monographs, competitive research grants proposals and research theses. The assessment by an anonymous panel of "experts" is described as blind peer review. One, two or more experts in the area may undertake peer reviews. Peer reviewers are required to advise on matters such as the quality and rigor of the methodology, novelty and contribution of the study in regard to advancing theory, contribution of the study to practice and policy, quality and clarity of the arguments and presentation and whether the study was conducted ethically (Yi-Luen Do, 2003).

There is evidence that peer reviews increase the quality of the scholarly work and that there is widespread recognition that peer reviews are essential to evaluating scholarly works (Sanders *et al.*, 2008; Yi-Luen Do, 2003; Tobin, 2002; Goodman *et al.*, 1994). Based on an international survey of 3,040 authors, Ware (2008) concluded that 93% of academics consider peer reviews, as currently practiced, to be effective in gatekeeping the quality of scholarly works. Sanders *et al.* (2008, p. 67) contends that:

... attaining accuracy in work begins with a healthy skepticism toward our own work, manifested by repeating experiments and observations, working to falsify personal hypotheses, and developing and testing alternative theories. Even this, however, is not enough since the subjectivity of working in

isolation—or even in a small group—can blind researchers to alternative explanations or certain flaws in reasoning. This potential source of error can be remedied by seeking input from knowledgeable colleagues unconnected with the research, thus leading to at least the beginning of peer review ...

However, there are an equally large number of scholars who express serious misgivings about the efficacy and contribution of peer reviews, even blind peer reviews, as practiced in almost all major scholarly reviews (Rennie, 2003a, 2003b; Altman, 2002; Altman, 2002; Callaham *et al.*, 1998). Callaham *et al.* (1998) presented the findings of an experiment in which a manuscript with 23 deliberate errors was sent to 124 reviewers, 10 of these errors comprehensively invalidated the entire study and 13 were less critical. However, on an average the 124 reviewers only identified 3.4 of the major and 3.1 of the minor errors thus raising serious concerns about the efficacy of the practice of peer review.

In another study, Altman (2002) reveal that using two or more peer reviewers do not contribute significantly to improving research quality. Altman revealed significant differences in the evaluations of the same scholarly work by different reviewers. Rothwell and Martyn (2002) came to similar conclusions. They concluded that the probability of two reviewers agreeing about a particular scholarly work is only marginally greater than a chanced outcome. According to Jefferson *et al.* (2002) the practice of peer review is based on faith in its effects, rather than on factual evidence. Also, notwithstanding that a manuscript is blind peer reviewed, because scholars within specialised discipline domains are a small community, reviewers would generally be able to identify the authors and this could result in unfair evaluations (Ware, 2008; Yi-Luen Do, 2003; World Association of Medical Editors, 2002; Rothwell and Martyn, 2000).

Peer reviewing is also influenced by personal biases including biases arising from nationality, gender and host institution of the author/s or because the reviewer and author could be competitors or may belong to different schools of thought (Ross *et al.*, 2006; Godlee and Dickersin, 2003; Williamson, 2002). Several other studies (Smith, 2006, 1999; Greaves *et al.*, 2006; Kumashiro, 2005; Jefferson *et al.*, 2002; Altman, 2002; Van Rooyen *et al.*, 1999; Goldbeck-Wood, 1999) also conclude that the practice of blind peer review is flawed and needs to be reviewed. These studies conclude that blind peer reviews (a) do not provide a rigorous basis of gatekeeping quality and ethics in research (b) do not improve the quality of scholarly submissions (c) are open to unethical practices and that in some instances reviewers 'steal' ideas from works submitted for review or deliberately procrastinate so that publication of competing work is delayed (Smith, 1999; Goldbeck-Wood, 1999; Kumashiro, 2005; Greaves *et al.*, 2006). Smith (2006) cites an extreme example of non-ethical behaviour by a reviewer of a respected scholarly journal:

... the story of a paper ... sent ... deputy editor of the New England Journal of Medicine ... for review to Vijay Soman. Having produced a critical review of the paper, Soman copied some of the paragraphs and submitted it to another journal, the American Journal of Medicine. This journal, by coincidence, sent it for review to the boss of the author of the plagiarized paper. She realized that she had been plagiarized and objected strongly. She threatened to denounce Soman but was advised against it. Eventually, however, Soman was discovered to have invented data and patients, and left the country. Rennie learnt a lesson that he never subsequently forgot but which medical authorities seem reluctant to accept: those who behave dishonestly in one way are likely to do so in other ways as well ...

There appears to be strong evidence that blind peer reviewing may have outlived its usefulness. This is partly because of the proliferation of scholarly journals, increase in numbers of PhD granting institutions and the concurrent increase in manuscript submissions, and difficulty in finding “qualified” reviewers.

In the medical, health and allied domains there is considerable retrospection and critical analyses of peer review practices. New practices of quality control are being explored so as to improve quality control. Journals such as *Electronic Transactions on Artificial Intelligence* distinguish between reviewing (communicating with the peer community to provide feedback for authors) and refereeing (defining quality threshold before accepting a manuscript for publication) and systematically complete both these processes as distinct but key components of the peer review practice (Sandewall, 2006). Other journals such as *Nature*, *British Medical Journal*, and *Medical Education* have experimented with open peer reviews and pre-publication open reviews (Solomon, 2006). There are several variants of open peer reviews. This includes open post publication reviews and conventional pre-publication peer reviews. Open peer reviews can draw comments from a wider audience and thereby make the review a more real time process.

Notwithstanding evidence that the practice of open peer-review is at least as rigorous as conducting blind peer reviews, there is opposition to greater use of open peer reviews (Ware, 2008; Rothwell and Martyn, 2000). Proponents of open peer review contend that it is ethically superior to blind peer review with little or no impact on the quality of the review but has the advantage of fostering greater civility and transparency in the review process (van Rooyen *et al.*, 2010; Godlee 2002; Morrison 2006). On the other hand, there is concern that negative comments disseminated in the public domain can impact negatively on the confidence and motivation of early career researchers who may be particularly vulnerable to open challenges on the quality, rigour and other aspects of their work (Regehr and Bordage, 2006). However, these debates are almost entirely in highly respected scientific and medical journals and have not been considered to any great extent in business and social science domains. Are not editors, author/s and reviewer/s in the business and social science domains not confronted with these ethical and quality assurance challenges?

Informed by the debates in the medical and physical sciences, the authors of this article decided that it would be beneficial to analyse the peer review and referring practices in scholarly business and social science journals. The authors’ drew on their personal experiences and the experiences of several of their peers in India and abroad. Their discussions with peers led them to believe that there is merit in publishing an article that could foster retrospection on the peer review practice in scholarly business and social science journals.

Because this article specifically reflects on the peer review of a publication (which is used as an example to advance this debate) the authors’ commence the discussion by first considering the question “What is the role of scholarly publications?” and thereafter considering the question “What is the function of the practice of peer review in scholarly publications”?

The role of scholarly journals are to (a) foster growth of collective knowledge through providing an archive of knowledge that researchers can draw on (b) disseminate contemporary knowledge to the scholarly community (c) validate the quality of research through peer review (d) validate the reputation of scholars because publication in peer-reviewed journals is a key source of referent credibility amongst scholars, and (e) establish scholarly communities through knowledge sharing and collaboration between scholars (Schaffner, 1994; Bourne and Korngreen, 2006).

Several scholarly journals provide guidelines on matters to be considered when reviewing publications (Bourne and Korngreen, 2006; Wager *et al.* 2002b; Bordage and

Calleigh, 2001). Reviewers are asked to consider questions such as:

- What is the motivation for the study?
- Does the study motivations justify the need to conduct the study?
- Have relevant extant studies been considered to determine the current state of knowledge and gaps in knowledge?
- Does the study findings contribute to knowledge or challenge extant knowledge?
- Is the research question clearly defined?
- Is the research design appropriate for the inquiry?
- Was the research conducted per research code of conduct and practice?
- Are the conclusions evidence based?
- Is there a clear message in the article?
- Is the article presented coherently?
- Would the article be of interest to the readers of the journal?

Notwithstanding the fact that scholarly journals provide guidelines to reviewers, in practice reviews are influenced by the experience, backgrounds, personal biases and personal agenda of reviewers (Moher and Jadad, 1999; Van Rooyen, Black and Godlee, 1999). Authors should be cognizant of these possibilities and should, if necessary, challenge reviewer comments. However, in practice research and its dissemination is often motivated by the well-known career imperative to publish original work (Winck *et al.*, 2011; Yi-Luen Do, 2003; Wager *et al.*, 2002a). This may influence authors to accept as 'instructions' the observations by reviewers that may in fact be ill founded and acting upon which could result in reporting potentially misleading information and conclusions to the readership. Yet it ought to be recognised that the real objective of publishing the results of a study is to disseminate useful learning to a target audience, which may sometimes require dialogue, negotiation and reiteration with reviewers and editors.

The proliferation of research studies and publication outlets has made it more difficult for editors to identify and recruit appropriately qualified reviewers, and to screen out those who may accept the responsibility even if they do not have sufficient expertise in the topic of the study or its methodology (Colquhoun, 2011). If poor-quality feedback from less thoughtful or conscientious reviewers is not detected and dealt with appropriately by experienced editors or publishers, there will be cumulative effects on the design and conduct of research studies, dissemination of findings and conclusions, and the training of researchers.

CASE EXAMPLE

Introduction

The case example discussed in this article is a single formal review of a publication on the adoption of information communication and internet technologies by small-to-medium enterprises in the food sector, a study funded by a national research and development agency. Substantial public funds had been dispensed to the study by a funding organisation that deemed the research worthy of support on the basis of a two-stage competitive tendering process: a preliminary proposal followed by a full proposal. The project had also attracted significant cash and in-kind contributions from industry partners, who endorsed the practitioner benefits to be derived from the study. There is thus no question that the findings of the study demanded conscientious reviewing, and that its conclusions needed to be disseminated both promptly and accurately.

The Review

In this and the next section, figures in parentheses identify relevant items in Appendix 1. Appendix 1 presents reviewer comments under headers and in the order in which these were conveyed to the authors and the authors' response to each of these comments. There were nine 'General Comments' and 56 'Specific Comments'. The 65 items do not include comments pertaining to grammar and vocabulary, which are, in the authors' judgment, a matter of opinion. Though the comments on grammar and vocabulary are important, discussion of these items could distract attention from the key issues and therefore are not considered in this analysis.

The reviewers commended the quality of the manuscript and recommended publication provided that their concerns were adequately addressed (8, 9). This article was motivated by the authors' assessment of the quality of the review and the consequences of complying with the concerns expressed by the reviewers. The paraphrased responses to the reviewers' comments are to place them in context, and to serve as indications of the extent to which they needed to be contested and discussed. It may in practice be a much longer process to clarify the contents of an article or contest the comments of reviewers. However, it is important that authors engage in this dialogue rather than simply changing aspects of the contents without debate so as to hasten its acceptance for publication. The central proposition in this discussion is that it is only through engagement with peer reviewers that the quality and integrity of research can be preserved.

Though the most superficially obvious feature of Appendix 1 is that the authors' contested almost all the points raised by the reviewers, the greatest cause for concern was a stark misalignment between what a formal literature review is conventionally expected to contribute to a study and the reviewers' comments regarding this. The general understanding of the role of literature reviews is that it is a formal and thorough appraisal of existing conceptual and empirical papers and that it is a necessary and crucial input to the design of a research study by:

- Identifying gaps in knowledge and thereby justifying the study
- Building the conceptual underpinnings of the study
- Identifying various factors that may impinge on the research questions
- Evaluating strengths and weaknesses of research methodologies and analytical techniques in past studies and thereby informing choices for a new study, and
- Formulating research models for replication and theory testing.

The potential benefits implicit in the above five contributions to the development and execution of a research plan are an evident rationale for making an exhaustive literature review an essential precursor to any rigorous process of inquiry. However, some of the common generic comments made by reviewers regarding literature reviews are that:

- Cited and referenced publications are out-of-date
- Some publications have been not considered
- Scholars known to the reviewers are pursuing research on the same topic and that the author/s should establish contact with them

It is important for authors to understand and appreciate why any such comments and suggestions could materially strengthen and develop the manuscript under scrutiny. Yet there is seldom any explicit justification for ruling a 'dated' study as being inappropriate for inclusion in the review. It would help the author to know if the findings in the study that has been cited have been superseded by the findings in more recent studies and, if so, how the more recent findings influence the arguments in the manuscript.

Allegations of out-datedness are useful only if they include signposts to more recently published studies that are critical to the research being discussed. The year of publication should not be the overriding criterion for inclusion of a citation, especially if more recent studies only confirm the findings of an earlier one. Even if the findings contradict an earlier study, it is important to determine whether this is the outcome of differences in the context, the methodology, or both. Of course, if the contention is that a more recent work reinforces earlier studies, authors' have the duty to show that the former replicated the latter.

A literature review is a purposeful exercise in using the knowledge from past research to inform the development of a new study. It is thus critically important to give due value to past knowledge as a key input to a new inquiry, provided that it is contextually relevant and the rigor of the study can be objectively established.

The responses to items 1 and 2 in Appendix 1 reveal gaps in knowledge, justify the need for the study, and identify the potential contributions of the study. These issues are intimately interlinked in that what the reviewer observed to be a weakness in the literature review could actually be the strength of the study. If a thorough literature search finds no studies that can inform the research that is in itself an important justification for the study and a predictor of the contributions of the proposed study.

The exponential increase in publication outlets presents significant concerns on the quality of sources of information. Researchers and reviewers both need to consider carefully how learning from past studies can and could be used to inform a research plan. The source of information should be a critically important consideration in decisions regarding the usefulness of information from various sources.

Observations on Reviewers' Comments

Appendix 1 reveals that the authors' contested most observations made by the reviewers. In particular, there were significant exchanges turning on the scope of the study, the use of allegations versus evidence, objective inaccuracies, internal inconsistencies, and simple carelessness.

The study under consideration investigated the reasons for the laggardness in the adoption of information communication and Internet technologies by small-to-medium scale food enterprises. The reviewer's criticism was that other studies had come to different conclusions, but the examples were drawn from large-scale and high technology businesses. There was no explanation of how those findings might be relevant to the very different context of the study (18, 21, 23, 32, 34, 47, 49 and 63), the importance of which is evident in the significant inter-group differences based on the size of the small-to-medium enterprises (in terms of turnover and number of employees) and the position of these enterprises in the supply chain (processor, distributor, packer or wholesaler).

The comments in Appendix 1 indicate that, in the opinion of the authors', the reviewers tended to deal in negative allegations rather than evidence-based observations (2, 3, 12, 13, 14, 18, 19, 26, 33, 35, 38 and 58). For example, the assertion that citations were 'dated' was seldom accompanied by any proof that more recent studies were available or that those studies could usefully inform the study (2, 16, 21, 35 and 44). Other works cited by the reviewers' were no more up-to-date and had no evident direct relevance to the matter at hand (11, 21 and 31). Many comments seemed to be based on personal opinions and beliefs (5, 6, 10, 14, 17, 25, 30, 32, 41, 57, 64 and 65) which were sometimes self-contradictory (11, 14, 19, 20, 22, 23, 27, 28, 30, 31, 32, 35, 36, 37, 41, 42, 43 and 56) or dealt with issues beyond the scope of the study and that were unlikely to advance the discourse (18, 19, 21, 31, 34, 63). Reviewers' comments should logically be limited to those that are both relevant and evidence based.

The review furthermore contained several statements that appeared to be objectively inaccurate or to contain evidence of the selective use of information in support of a personal view of what is important or unimportant (7, 10, 11, 12, 21, 23, 26, 33, 34, 38, 40, 41, 48 and 58). Almost all such assessments reflected the findings of past studies, which were used as reference points for commentary on the development of the research study under review. Those judgments were thus of dubious validity and detracted from core issues discussed. It seems reasonable to assert that a valid and useful review should be objective and should deal in facts rather than opinions, unless those are identified as such.

Lastly, the review itself contained grammatical and spelling errors (4, 11, 18, 45, 58, 64, 65), which cast doubt on the validity of comments on the same shortcomings in the manuscript under review.

CONCLUSIONS

It can be contended that the case example used in this article is an isolated instance of a counter productive peer review and does not prove any urgent need to consider the issues that the article canvasses. Discussions with colleagues reveal that the authors' experiences are not unique and that there is widespread concern regarding the practice of peer review in business and social science inquiries. Some active researchers attest that they avoid certain funding agencies or scholarly journals because they believe that there is inherent bias in the review processes. Clearly, closer and deeper examination of the issue is needed before anything more than tentative conclusions can be drawn. Nevertheless, an isolated example can be as indicative of a real phenomenon as several, and evidence of weak quality control in peer review practices deserves to be taken seriously by those who experience such reviews, and those who perform the reviews.

The consequences of 'poor' peer review can be misallocation of research funding or significant disincentives to the dissemination of research findings. It is surely undeniable that trust and confidence in the practice of peer review can exist only if it is managed and conducted rigorously, ethically and at arm's length by competent individuals. Otherwise, it is likely that active participation in the research community will decline, quality will suffer, and important contributions to the discipline will remain largely unknown.

Whether the case example is typical or atypical and whether the conclusions are valid or invalid, the overarching objective of the discussions in this article is to foster retrospection and dialogue on a vital topic and the authors' hope that they succeed in this endeavour.

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Appendix 1

Reviewer's Comments and Author's Observations

Item	Reviewer's comments	Observations on reviewer's comments
Reviewer's endorsements		
1.	This report makes a worthwhile contribution to increasing the knowledge and understanding of the use of e-business and Management Information Systems in food SMEs in Australia	Endorsement noted. The quality and contribution to knowledge of the findings of this study was also acknowledged by the reviewers of four conference papers published from the findings of the study.
8.	Recommendations are good and are supported by the findings	Endorsement noted; no further comment required.
9.	I recommend this for publication once these issues have been adequately addressed.	Endorsement noted; no further comment required.
20.	Very important points [relational bonding and value chain partnerships contributing to new business initiatives] that any e-business system must support and enhance	The Report did set out to highlight the important points from past studies.
22.	Important point [that extant studies have not addressed relationship management and marketing issues in the e-business space]	Endorsement noted, but the Reviewer here seems to contradict his earlier comment (Item 14).
27.	Salient point [importance of customer, supplier and other stakeholder relationship management in the e-business environment]	Endorsement noted; no further comment required.
28.	Important point [successful e-business websites integrate offerings through a 'one-stop-shop' protocol]	Endorsement noted; no further comment required.
29.	Important issue [the influence of coercive power of channel intermediaries in e-business adoption decisions]	Endorsement noted; no further comment required.
30.	Also important [not having internet capabilities present barriers to business development and growth], and likely to be used in rural Australia given relative inaccessibility to high-speed reliable broadband.	This section reviewed the literature, before it was known if this was likely to be an important issue for food SMEs in rural Australia. However, the literature review was the core input to the design of the research questionnaire.
31.	I agree ...[need to investigate whether and how coercive power influences distribution of benefits (amongst exchange partners) from adopting ICIT]	Endorsement noted; no further comment required.
36.	Good point [e-business can support collaborative initiatives between SMEs thus enabling them to penetrate new	This endorsement is noted, though contradicted by comments at Items 37 [e-business is a threat to relationships

	markets and compete efficiently in a global environment], particularly in fragmented industries where Australia does not have a clear competitive advantage.	with established customers] and 41 [importance attributed to personal relationships precludes SMEs from adopting novel e-business systems].
39.	This [weak information and management control systems] is a very significant issue, and one that I believe requires substantially more treatment ...	The context is again the literature review. Reasons for Australian food SMEs being slow or unwilling to adopt ICIT were dealt with in great detail in the Report. The Reviewer acknowledged this in his comments on the findings and conclusions section (Items 8 and 56).
40.	While this [high cost of new e-business infrastructure] is a good point, it is contradictory to what was claimed in the first sentence	The context is once more the literature review. Different studies have drawn conflicting conclusions, which may be because of differences in contexts, methodologies etc. The Report in fact argued that these inconsistencies make a strong case for the research study it presented.
41.	Important point [relationship bonding as a competitive strength], and a legitimate disincentive for SME owner/managers to adopt novel information systems	This endorsement is noted. The comment that relationship bonding is a disincentive to SMEs adopting e-business is contradicted by those recorded at Items 35 [E-business enabled collaborative networks is commonly accepted] and endorsements recorded at items 36 [E-business supports collaborative networks], 42 [E-business creates differentiated competitive advantages through enabling better management of customer relationships] and 43 [E-business enables sharing of information and relationship bonding].
42.	Important point [differentiated competitive advantage because of relational strengths]	This endorsement is noted. The comment is contradicted by endorsements recorded at Items 37 [e-business is a threat to relationships with established customers] and 41 [importance attributed to personal relationships precludes SMEs from adopting novel e-business systems].
43.	Important point [sharing information engenders trust, co-operation, commitment, satisfaction and greater relational bonding]	This endorsement is noted. The comment is contradicted by endorsements recorded at Items 37 [e-business is a threat to relationships with established customers]. While some "points" are undoubtedly more "important" than others, the aim of the literature review was to provide a background to the current study and

		inform its development.
56.	This [SMEs laddering up from one combination of technology (cluster 1) to the next combination of technologies represented by clusters 2 and 3] is supported by the data	The findings show that food SMEs in Australia do 'ladder-up' from one capability to higher level alternatives. Some SMEs only use the telephone and fax for interaction with customers and use these facilities differently and for different purposes. Some SMEs also use the email. Others have adopted e-enabled customer relationship management systems of differing levels of sophistication. The findings indicate that it was appropriate to select the fax as one of the variables (Reviewer's question in item 55).
59.	This discussion [positive correlation between importance attributed to e-business and greater use of e-mail communication] is interesting	Endorsement noted.
60.	Important findings [in face-to-face interviews respondents indicating that personal touch was critical in their dealings with customers]	Endorsement noted.
Reviewer's implicit and explicit recommendations		
2.	While significant effort appears to have been invested in the literature review, much of the literature appears dated – and this is reflected in the language used, and issues raised. It is suggested that the literature review be reworked with updated more current references.	A detailed literature search did not identify any published studies in the specific context of this study or dealing with topics that are relevant to the issues being investigated. Extensive search in Current Contents, EBSCOhost, Emerald and Web of Science, and of the 'Table of Contents' and 'Abstracts' in such top-tier peer-reviewed academic journals as <i>Journal of Management Information Systems</i> , <i>Organization Studies</i> , <i>Organization Science</i> , <i>Journal of Small Business Management</i> did not find any recent publications that could inform the research agenda of this study. Many of the articles published more recently are replications of past studies in new contexts, different countries, different industries or different industry sub-sectors. The fact that a detailed literature review did not identify any published studies reveals the substantive gap in knowledge and the significant contribution of this study to the issues

		being investigated.
5.	The presentation and organization of the quantitative data needs to be improved. Several graphs are poorly designed.	<p>The comments regarding the design of the graph are unclear other than that later (Items 57, 64 and 65) he recommends the use of colours rather than hashing or dots to distinguish the bars in the chart. The funding agency does not publish its reports in colour. Therefore, although the use of colours could potentially make the presentation clearer in the draft report in electronic form, the graphs could have become less clear when the final report was printed in black and white. In response to this criticism, the graphs were printed out and presented to 10 researchers for comment on readability, all of whom responded positively. The design of graphs and other figures in a report is surely a subjective matter? The issue is whether or not the audience targeted by the report would think the presentation and organization of the quantitative data were in need of improvement. The second opinions solicited suggest not.</p>
6.	While this research makes some important findings, much of the best stuff is buried and difficult to access readily. I would suggest that a pithy summary of findings appear at the beginning of the 'Results and Discussion Section'. This should be a couple of pages in length, and perhaps appear as bullet pointed paragraphs.	<p>The 'Results and Discussion' chapter comprises 12 pages of written text for 13 sub-headed topics under discussion: that is, less than one page each. The rest of the chapter contains tables and graphs to support and illustrate the discussions and results. That surely constitutes a succinct discussion and summary of the findings, without the need for a summary at the beginning of the chapter?</p> <p>The findings are also presented even more succinctly in the two-page Executive Summary, one page of which is devoted entirely to summarising the results and key findings of the study. None of the other chapters in this Report begins with a summary, so adding one at the beginning of the 'Results and Discussion' chapter would introduce inconsistency in the structure and style of the Report. The findings are also summarised in the concluding chapter.</p>
10.	Change "digitized" to "electronic"	The term "digitized" is used in several

		past studies and reports, such as that by Kasarda, J.D. (2002): 'New Logistics and Infrastructure for the Digitized Economy'
17.	Change from "technology networks" to "the internet"	This term is used widely in published studies
24.	Typically this [ICIT] is referred to as ICT (Information and Communication Technology), and would encompass Internet technologies. ICIT is not a widely used or accepted descriptor.	The change has been made, but it was clearly indicated that ICIT stands for 'information communication and internet technologies'.
25.	These [e-mail, internet, intranet, extranet, electronic data interchange, product barcodes, radio frequency identity tags, internet telephony and various other peer-to-peer networking enablers] need to be defined earlier in the document. While these technologies / terms are readily understood by domain practitioners, one would not expect a general audience to know what these are	They are descriptions of various capabilities as used in the literature, and this is the first paragraph of the literature review. How much earlier would be appropriate?
47.	These [knowledge regarding how to integrate e-business with overall business operations; financial constraints; time constraints; shortage of skilled staff; and lack of opportunities for training] individual factors need more thoughtful analysis	Noted but the recommendation is outside the scope of the present study. The literature review sought to identify the findings and limitations of past studies in the context of food SMEs. The constructs derived from the literature review were incorporated in the research questionnaire and the data was analysed and is discussed in the report.
49.	An important experience [training opportunities has not increased ICIT adoption by SMEs in UK] that needs to be investigated and explored throughout this report	This study focused on Australian SMEs, whereas that by Martin in 2004 investigated SME experiences in the UK, and is therefore peripheral to the objectives of this Report.
50.	Further explanation is required in the appendix as to how this [chi-square test] was undertaken.	Chi-squared is an elementary statistical test. The sub section 'Data Analysis' explains all the statistics used and the methodological rationale, so there seems no need to do so again in the Appendix.
51.	There needs to be a summary of the results presented as a discrete section before the discussion. Important learnings are currently obscured by the thorough discussion.	This more or less repeats the general comment in Item 6, and the response is the same.
52 and 53.	Change title from 'Findings and Discussions' to 'Results and Discussion'	The requested change has been made, though 'results' hardly offers a different clue to the content of the section. 'Discussion' is now in the singular.
57.	The use of stripes is not effective, and is	In fact, the middle bar is coloured grey

64 and 65	<p>particularly confusing given the subtle difference in direction.</p> <p>This graph needs to be reformatted as per comments from the previous – the stripped [sic] fill used for bars should be replaced with solid colours or shades of grey.</p> <p>Poor choice of fill for bars. This graph needs to be reformatted using solid colours or shades of grey.</p>	<p>and the two adjoining bars are striped. Because the Report will not be printed in colour, the use of different shades or colours would have made the data less clear, not more so. The format was tested on colleagues. (See also Item 5).</p>
63.	<p>This case [reference to Martin, 2004] appears to be important, and needs to be analysed more thoroughly</p>	<p>See my observation in response to Item 49.</p>
Reviewer's criticisms and contradictions		
3.	<p>While the author appears to have good grasp of business related concepts, naivety in terms of Information and communications technology is demonstrated on occasion.</p>	<p>Because the reviewer does not provide evidence of naivety in regard to information and communications technology, it is not possible to specifically address this comment.</p>
7.	<p>Very little use is made of the qualitative data in this report. While the author claims that triangulation is used, it is done so in a limited manner. The qualitative data should be summarised more fully and I believe its inclusion could prove a substantial and positive enhancement to the report.</p>	<p>Face-to-face interviews were only conducted in 10 SMEs and were primarily designed to check non-response bias and to triangulate the findings. The report acknowledges that the triangulation process used in this study has limitations and explains them. Information obtained in the small number of face-to-face interviews supported the findings of the confidential postal survey.</p>
11.	<p>This [attributing non adoption of more advanced ICT capabilities by Australian food SMEs to gaps in knowledge regarding these capabilities and the benefits and costs of adopting them] is naïve and overly simplistic. There is substantial available literature relating to 'adoption' and 'implementation' that could more fully explain this. Eg Kautz, E & Pres-Heje, J. 1995. Diffusion and Adoption of Information Technology. IFIP. Oslo, Norway. I can supply other [sic] on request.</p>	<p>Given that the Report presents the findings of a study of food-sector SMEs in Australia in 2007, there seems to be no benefit or relevance in including in the Executive Summary commentary on an 11-year-old study of the high technology sector in Norway. The statement also contradicts the comments made in Items 8 [Recommendations are good and supported by findings], 36 [E-business supports collaborative networks], 42 [E-business creates differentiated competitive advantages through enabling better management of customer relationships] and 43[E-business enables sharing of information and relationship bonding].</p>

12.	Informational websites can hardly be referred to as 'e-business'	<p>This seems to be a case of misinterpretation. The Report simply contends that SMEs in Australia have concentrated on developing informational websites rather than developing their e-business capabilities.</p> <p>Furthermore, several studies (Bart et al., 2005; Martin, 2004; Belanger et al., 2002) have described informational websites as the first stage in the e-business adoption ladder, a concept that is discussed at page 60 of the Report. There is also a report by the UK Department of Trade and Industry on ICT adoption laddering by SMEs in the United Kingdom which positions informational websites as the first phase of the ICT adoption ladder.</p>
13.	While these [quality of information, transparency of information, privacy and confidentiality] are all important, this neglects to mention 'usability' issues relating to website and Information Systems development and use. I would suggest that security and usability of any given Information System are the most significant barriers to further use	<p>These recommendations for the addition of new material do not explain the basis of what seem to be personal assertions. Specifically, they do not define "security". That issue is captured in the report by the comments that managers of SMEs expressed "... concerns pertaining to issues of privacy and confidentiality" in adopting ICIT.</p> <p>The context of the study has to be considered. If "security" and "usability" did not feature highly, it could be because SMEs in Australia's food sector are less concerned about those issues than are those in the IT sector in Norway, the context of the study cited by the Reviewer.</p>
14.	I strongly suspect that many of these activities [using information communication technology to collate, analyse and share information such as transactional behaviour of customers, activities of competition and market trends] currently happen – via the experience, judgement and expertise of competent managers. Further formalisation or systemisation of this, whilst may afford some benefit, could add significantly to the administrative overhead of already busy small business owners.	<p>The Report presents the findings of the study, which show that the activities in question are not currently pursued by food-sector SMEs in Australia. The Reviewer's suspicions are therefore unfounded. They may be based, on the strength of comments elsewhere in the review, on knowledge drawn from studies conducted in contexts different to that of this study.</p> <p>With regard to the suggestion that administrative overheads may be an obstacle to ICIT adoption, the findings of the Report show that only a minority of SMEs identified them as</p>

		constraints. Issues pertaining to costs and technical capabilities are discussed elsewhere in the Report. It is noteworthy that the owners and managers of food SMEs in Australia do not normally have the skills needed to assess the costs and capabilities associated with the adoption of an appropriate suite of ICIT capabilities. The study concluded that most are not in a position to make informed decisions on their own with respect to the ICIT requirements for achievement of the strategic aims of their business.
16.	Dated reference	Though the reference in question dates from 2002, it includes forecasts for 2004: the most recent data available from a reliable source. Those from elsewhere were judged to be unreliable, and were often contradictory.
18.	Overly simplistic. While this is true for certain types of enterprise, How does this explain the re-emergence of locally based commerce such as “farmers [sic] markets”??	This is what Kotler said in 2003. The example cited is curious because, in the Australian context, stalls in farmers’ markets are micro-businesses rather than SMEs according to the definition adopted in this study. Additionally, the literature search did not identify any published studies with this focus.
19.	A significant reason for this [correlation between financial performance and level of bonding with customers, suppliers and employees] is the face-to face relationships SMEs develop with value chain intermediaries and customers. These are notoriously difficult to build online or through large businesses with high staff turnover.	The Report is repeating what has been suggested in prior studies, which are cited. Furthermore, the importance of face-to-face relationships is a major underpinning of this study. However, it is not true that customer relationships cannot be developed online. What about the ubiquitous customer relationship management systems? Not all large businesses have high staff turnover.
21.	There are a number of dated references here 1991, 1994, 1997. Google as a company is only 10 years old, and many popular ideas in ICT a decade ago are now redundant. Google, Microsoft and Yahoo are all examples of large companies that don’t conform to the theory posited here.	Findings of more recent studies are discussed in the follow-up paragraph. As technology companies, Google, Microsoft and Yahoo do not seem appropriate to this study. In any case, as the studies cited in the paragraph that follows demonstrate, the position has not changed.
23.	‘Personal contacts’ may not be an entirely accurate or helpful way of discussing this [that there is a significant gap in knowledge on how relationships	The actual statement was that adoption of e-business could lead to fewer one-on-one personal contacts, and relationship management capabilities

	will be managed in an e-business market environment]. ICT may actually enhance the ability of SME's to maintain relationships with customers and value chain partners. Merchants on eBay for example are provided with tools to enhance their ability to interact directly with customers – via customer “blogs” and email	via e-business systems therefore have to be increased. The Reviewer again seems to contradict the comment recorded in Items 19 [customer relationships are difficult to build online] and 37 [e-business is a threat to relationships with established customers].
26.	This [P-Commerce] is not a commonly used or accepted term	It matches the terminology used in the studies cited in the literature review.
32.	Several websites including eBay.com employ customer rating systems-whereby previous customers leave a rating and comment on their buying experience. These comments are made readily available to new customers, who can then use these to evaluate the potential performance of a given seller. Online tools can provide a means for buyers to establish more transparent relationships with sellers, in ways that are not necessarily practical without online tools.	The context here is a discussion of the literature, within which this comment seems extraneous. This comment is inconsistent with comments recorded in Items 19 [customer relationships are difficult to build online], 37 [e-business is a threat to relationships with established customers] and 41[importance attributed to personal relationships precludes SMEs from adopting novel e-business systems].
33.	This [standing and profile of the business and endorsements by customers can foster trust] is overly simplistic and needs critical thought. In such situations buyers are making assessments about the risk of the transaction ie ‘what is the probability I will not receive goods I have purchased’. I would contend that there is little relationship between the likelihood of buyers ‘trusting’ information on a website and the price of the goods	Here again, the context is a discussion of the literature. The statement was that according to the studies cited positive information about the business and customer endorsements can foster trust. The Reviewer seems to be questioning the conclusions of the published studies reviewed, without identifying sources of supporting evidence.
34.	This statement [characterising food businesses as early adopters of new technologies] is relative – but the author does not indicate what it is relative to. Finance and banking are heavily reliant upon ICT and e-commerce for instance.	This comment relates to discussion of Montealegre et al. (2004), the context of which was firms in the agricultural and food sectors. It is not clear in what sense it is relevant that finance and banking are heavily reliant upon ICT and e-commerce.
35.	In 2007 this [e-business enabled collaborative networks and partnerships] is now commonly accepted. This reflects that the references are now substantially out-of-date	The thorough literature review did not reveal any studies (in the food SME context) that would contribute new knowledge on this issue. The study concludes that Australian SMEs have not addressed these issues, and the Reviewer agrees. Furthermore, this criticism is somewhat contradicted by those recorded at Items 22 [extant studies have not addressed relationship management and marketing issues in the e-business space], 37 [e-business is

		a threat to relationships with established customers], 41[importance attributed to personal relationships precludes SMEs from adopting novel e-business systems], 42 [E-business creates differentiated competitive advantages through enabling better management of customer relationships] and 43 [E-business enables sharing of information and relationship bonding].
37.	Conversely, the potential risk of damaging relationships with well established customers is a clear disincentive for many SMEs, particularly where good face-to-face relationships exist with a few significant customers.	Point taken. However, the underlying thesis of the study was that SMEs are concerned about losing the person-to-person relationship with major customers, so this comment is not in fact particularly negative. This chapter in the Report was in fact discussing the literature. If there were published counter-arguments that could inform the research, they would have been presented. This criticism is somewhat contradicted by Items 35 [E-business enabled collaborative networks is commonly accepted], 36 [E-business supports collaborative networks], 42 [E-business creates differentiated competitive advantages through enabling better management of customer relationships] and 43 [E-business enables sharing of information and relationship bonding].
38.	These findings [e-business adoption experience of SMEs in different countries] are so broad that they are almost not useful. Further information needs to be provided on context for this to be helpful eg. What type of e-business systems, how long were they using these systems etc	The context is the literature review, which can report only what was found in a given article. It is the knowledge gaps and the conflicting conclusions in different studies that informed the development and conduct of the study.
44.	Based on dated reference [that many SMEs limit their e-business application to e-mail and web brochures	No more recent published studies on this particular issue in comparable countries were found.
45.	Electronic mail [commenting on the use of the word e-mail] is the more commonly used term. However, the term e-mail is now so commonly used and understood that it is more imappropriate [sic].	The Reviewer presumably meant to say “appropriate”. At the first mention of electronic mail, the full description was used; thereafter, it was “e-mail”.
46.	What is an e-group?? This term is simply too generic to be meaningful	The term e-group is used in the literature. It was defined as a virtual (electronic) community with common interests and needs. In the pre-tests, SME owner/managers had no

		difficulty in understanding the term.
48.	This [relationship between training opportunities and ICIT adoption] is not supported by available evidence	The Report says only that the findings of the studies cited show that adequate training of owners and managers is critical to more intense use of ICIT.
54.	What is the working definition of 'Internet'? How can respondents report that they use e-mail when the Internet is a pre-requisite for e-mail use?	Pre-tests and discussions with the industry partner showed that SMEs did indeed differentiate between the Internet (as a source of knowledge, via visits to useful websites) and e-mail (as a means of communication). One of the reasons for pre-testing questionnaires is of course to address issues such as this.
55.	Why is fax selected as the variable here? Surely telephone and e-mail would have similarly high correlations.	The design and refinement of the questionnaire were informed by the literature review, pre-tests conducted by face-to-face interviews, and discussions with the industry partner, as explained in the methodology section. Several SME owner-managers viewed the fax and the telephone as being different modes of communication. Therefore, the telephone and the fax were chosen as variables. This usefully helped to investigate 'laddering-up' from telephone to e-mail via fax.
58.	This is an overly simplistic treatment of 'trust'. There are additional factors that effect trust including an enterprises 'brand', 'word-of-mouth reputation', sellers [sic] responses to pre-purchase enquiries etc	'Trust' is discussed in detail in the sentences after the one to which the comment relates, acknowledging the fact that the quality of the website alone does not influence relationship trust. In any case, the task of this section was simply to report findings
61.	How is 'information source' defined here? This would appear to conflict with the findings above.	The sentence has been re-written, but the need to define information source is debatable. I do not agree that there is conflict with the first statement, which reports on respondents' use of the capability (widespread) and the extent of their usage (moderate).
Reviewer's miscellaneous comments		
4.	This research makes use of both qualitative and quantitative research approaches. As I do not have a background in statistics I cannot confidently comment on the rigor or soundness of the quantitative analysis, beyond the application of good logic. I have highlighted issues from a ley [sic]	The data analysis and interpretation were evaluated by colleagues. Additionally, the eight reviewers of the four papers that resulted from this study all commended the data analysis and interpretation.

	readers [sic] perspective	
15.	If they are judged to [comment in reference to a recommendation in the Report that food SMEs should be encouraged to adopt better quality and a wider suite of e-business capabilities]	It will surely be understood that this is meant to apply only to SMEs that are judged not to have done so? The findings of the study show that the great majority of food SMEs in Australia have not, and this recommendation is therefore generally applicable.
62.	This [40 per cent (n=34)] is a significant proportion of respondents	“Significant” seems to be a subjective judgment, here. The fact is simply that the majority of respondents did not say that sales had increased.

