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ABSTRACT

Grounded Theory Methodology (GTM) is being used increasingly in the Information Systems (IS) discipline. However, some consumers of IS literature are skeptical of the findings in studies using this method. In this paper, we provide some steps that can be taken by researchers to improve the credibility of their work. This can be accomplished through increased trustworthiness of their research. The quality of quantitative research can be evaluated by examining the internal validity, external validity, reliability; similarly the trustworthiness of GTM studies can be evaluated by examining the credibility, transferability, dependability and confirmability of the study. We provide specific steps that can be taken to accomplish trustworthiness of GTM research and from IS literature; we summarize some of the GTM research that has applied these steps.

Keywords

Grounded Theory Methodology, Trustworthiness, Credibility, Transferability, Dependability, Confirmability

INTRODUCTION

Grounded Theory Methodology and other qualitative research have been discounted by some Information Systems (IS) scholars as nothing other than 'nice stories'(Urquhart 2012). How can readers tell if the emerging theory is not a result of an authors' 'self-delusion', and therefore unreliable and invalid?(Carcary 2009) Many consumers of IS literature such as doctoral students, authors, journal reviewers and editors are more comfortable with the quantitative-positivist research paradigm as credible and scientific research. This is because they are more familiar with the well signposted means for evaluating the reliability, validity and generalizability (Pedhazur and Schmelkin 1991; Straub et al. 2004; Straub 1989) of quantitative-positivist research. However, the use of other research methods such as design science (Hevner et al. 2004; March and Smith 1995), action research (Baskerville and Myers 2004), and grounded theory methodology (Birks et al. 2013) have also found acceptance in the IS discipline.

Use of GTM by IS researchers continues to grow with many research articles using this method getting published in some of the leading journals in our discipline. One of our leading conferences, America's conference on Information Systems (AMCIS) had a special track dedicated to this research methodology in the recent past. The European Journal of Information Systems (EJIS) recently published a special issue on this method (Birks et al. 2013). Furthermore, every leading journal in the IS discipline has published studies using GTM (Orlikowski 1993; Urquhart et al. 2010; Vannoy and Salam 2010)

In this article, we describe some steps that can be taken by scholars using GTM to help ensure their findings are more than 'nice stories'. This can be accomplished through increasing the trustworthiness of their findings. Trustworthiness has been defined as the conceptual soundness from which the value of qualitative research may be evaluated (Bowen 2009). Some four factors have been suggested for establishing trustworthiness of qualitative research, these are credibility, transferability,

dependability and confirmability(Brown et al. 2002; Rolfe 2004). Borrowing a leaf from quantitative-positivist research, we will briefly describe how these factors map on to internal and external validity, reliability and objectivity. The research question is '*how can the trustworthiness of Grounded Theory Methodology research in Information Systems be improved*?' The purpose of the article is provide GTM users in the IS field some possible suggestions for improving the rigor of their research endeavors.

In the following sections, we begin by giving a brief description of grounded theory methodology, followed by ways to improve the trustworthiness of GTM research. We then give examples of use of trustworthiness elements in Information Systems research and end with a conclusion.

GROUNDED THEORY METHODOLOGY

Grounded Theory Methodology was first espoused by two sociologists, Barney Glaser and Anselm Strauss in 1967 in their book '*The Discovery of Grounded Theory: Strategies for Qualitative Research* (Glaser and Strauss 1967). But it has since then been used in a number of other disciplines such as nursing, education, marketing, management, information systems etc. As opposed to testing existing theory, the book espouses a method for generating theory. Some IS research use GTM only for coding their data, however the end product of this methodology should be theory(Urquhart et al. 2010). The GTM researcher does not come to the table with pre-conceived theories to test, but rather they focus on how individuals interact with the phenomenon under study. This data can be gathered from interviews, documents, observation and other sources. Data analysis involves the identification of concepts, sub-categories, categories and how they relate to each other as soon as data begins to be available. It proceeds from open coding, to selective coding to theoretical integration. Concepts are developed through constant comparison with other slices of data. The emerging categories and their relationships are integrated with existing theoretical literature to find how they fit together. This is theory, the end product of GTM. The emerging theory is then presented as propositions or as a narrative framework (Urquhart et al. 2010; Urquhart 2012).

TRUSTWORTHINESS IN GROUNDED RESEARCH METHODOLOGY

From the point of view of a quantitative-positivist researcher, we present trustworthiness in GTM under categories equivalent to internal and external validity, reliability and objectivity. Trustworthiness credibility matches internal validity, transferability matches external validity and dependability matches reliability. However, we must point out that these are two different research paradigms and so the matching is not and cannot be a perfect fit.

a. Credibility

Credibility is a trustworthiness concept that roughly corresponds to internal validity (Morrow 2005; Rolfe 2004). In positivist research, internal validity refers to the ruling out of rival hypotheses, that the constructs are likely real and reliable, and the instrument is measuring the right content (Straub et al. 2004). Credibility refers to how much the data collected accurately reflects the multiple realities of the phenomenon. Credibility can be established through prolonged engagement with informants, triangulation of data or getting data from a variety of sources (interviews, documents etc.), sharing with each participant the verbatim transcript of the individual interviews, and the emerging concepts and categories or respondent validation(Carcary 2009) or participant checks(Morrow 2005). The participant guidance of the enquiry through interview questions updates based on initial findings or emerging concepts (Cooney 2010). Negative analysis which is examination of cases that contradict the main findings, and peer debriefs which is allowing other pairs of eyes to confirm the emerging concepts and categories from raw data (Brown et al. 2002; Carcary 2009).

b. Transferability

Transferability is a trustworthiness concept that can be seen as external validity (Morrow 2005; Rolfe 2004). External validity in positivist research is how well an instrument generalizes or is consistent across diverse constituencies (Straub et al. 2004). Transferability refers to the applicability of one set of findings to another setting. Transferability can be enhanced through clear descriptions of the research, the participant's diverse perspectives and experiences, methodology, interpretation of results, and contributions from peer debriefers (Brown et al. 2002). Information about the researcher as an instrument in the process, the relationships between the researcher and participants enhance transferability (Morrow 2005). An audit trail should be provided and be detailed enough to allow other researchers to repeat the same enquiry in a similar setting (Cooney 2010).

c. Dependability

Dependability is a trustworthiness concept that closely matches reliability (Morrow 2005; Rolfe 2004). In positivist research, reliability is the extent to which a variable or a set of variables is consistent with what it is supposed to measure when repeated multiple of times (Straub et al. 2004). Dependability refers to the confirmation that the data represents the changing conditions of the phenomenon under study(Brown et al. 2002) and should be consistent across time, researchers and analysis techniques(Morrow 2005). This is done by another individual who audits and confirms that the GTM procedures are followed and verifying that they are used correctly (Brown et al. 2002). Peer researchers, student advisors or colleagues can examine the detailed chronology of research activities and processes or audit trail to determine the reliability of the findings (Morrow 2005).

d. Confirmability

If another researcher confirms the findings if presented with the same data are what confirmability in GTM refers to. Confirmability tests the 'objectivity' of research. An audit trail provides the necessary materials for confirming research (Brown et al. 2002).

Table 1 below provides a listing of these steps that can be taken to improve the trustworthiness of GTM research in IS.

Trustworthiness dimension	Steps to improve Trustworthiness
Credibility (Internal validity)	• Prolonged engagement with participants(Brown et al. 2002; Jacelon and O'Dell 2005; Morrow 2005) • Triangulation of data (data from interviews, observations, documents etc.)(Bowen 2009; Brown et al. 2002; Jacelon and O'Dell 2005) • Thick descriptions of data and sufficiency of data assessment or saturation(Morrow 2005) • Respondent validation of interview transcripts and emerging concepts and categories (participant checks) (Brown et al. 2002; Jacelon and O'Dell 2005; Morrow 2005) • Participant guidance of inquiry (theoretical sampling)(Cooney 2010) • Use of participant words in the emerging theory(Cooney 2010) • Negative case analysis(Brown et al. 2002; Morrow 2005) • Peer debriefers(Brown et al. 2002; Jacelon and O'Dell 2005; Morrow 2005)
Transferability (External validity)	• "Thick descriptions" of the research, the participants, methodology, interpretation of results and emerging theory.(Bowen 2009; Brown et al. 2002; Cooney 2010; Morrow 2005)
Dependability (Reliability)	• Examination of a detailed audit trail by an observer(Brown et al. 2002; Morrow 2005)
Confirmability	• Examination of a detailed audit trail by an observer(Brown et al. 2002; Morrow 2005)

Table 1. Trustworthiness in GTM Research

In summary, trustworthiness of GTM can be enhanced through the use of audit trails, peer debriefers, negative case analysis, triangulation of data sources, prolonged engagement with informants, sharing with participants individual interview transcripts and emerging concepts and categories, and having peer review the process.

TRUSTWORTHINESS IN INFORMATION SYSTEMS LITERATURE

In this section we summarize steps taken to enhance trustworthiness in three IS studies using GTM. We limit the number to three articles because of space and word limitations. We selected a paper from three leading IS journals, MIS Quarterly (MISQ), Information Systems Research (ISR) and Journal of Management Information Systems (JMIS).

The trustworthiness of Orlikowski paper in MISQ on "*CASE Tools as Organizational Change: Investigating Incremental and Radical Changes in Systems Development*"(Orlikowski 1993) was enhanced through a number of ways. The author provides a 'thick description' of the research process, including the choice of research sites. Triangulation of data sources: unstructured and semi-structured interviewing, documentation review, and observation. They spent four weeks on average on each of the projects observing and interviewing the workers as they performed their daily jobs which speaks to the prolonged engagement with the participants. One hundred and nineteen interviews were conducted at the first site; forty interviews were conducted at the second site, with each interview lasting between 60 – 90 minutes. They also describe the analysis methodology in rich detail which enhances the dependability and confirmability of their findings. They also carried out participant checks on findings and the framework which enhances the credibility of the study(Orlikowski 1993).

From JMIS, we selected the article "*Exploring the Application and acceptance of Group Support Systems in Africa*" by De Vreede et.al(Vreede et al. 1999). The authors of this article describe the setting of their work in great detail by giving information on the countries they visited, a detailed account on the types of meetings they had with the participants, and also a description of practical issues they encountered. It is obvious that these researchers interacted closely with the participants which add to the credibility of their study. Even though other trustworthy measures are not mentioned in this article, the detailed description of participants, countries visited, and the findings convince the reader that the findings are credible and dependable(Vreede et al. 1999).

The last article we consider is from ISR. The article by Vannon and Salam is on "*Managerial Interpretations of the Role of Information Systems in Competitive Actions and Firm Performance: A Grounded Theory Investigation*"(Vannoy and Salam 2010). This article has a sub-section titled 'validation' which elaborates on trustworthiness measures undertaken by these researchers. First, they had a peer debriefer; second, the emerging theory was compared to the existing literature which enhances transferability; and third, participant checks were applied by having the interviewees review the findings(Vannoy and Salam 2010).

These three articles discussed above used differing approaches for improving the trustworthiness of their findings. Furthermore, the authors may not have reported every little detail of the work they did. But the publication of these articles in leading IS journals is a testament to the idea that the trustworthiness of GTM research in IS can be articulated in a variety of ways.

CONCLUSION

The quality of GTM can be enhanced by increasing the trustworthiness of the research. Increased trustworthiness can be realized through the use of audit trails, peer debriefers, negative case analysis, triangulation of data sources, prolonged engagement with informants, sharing with participants individual interview transcripts and emerging concepts and categories, and having peer review the process. In this article, we map these trustworthiness practices to positivist validity and reliability conceptions.

These are not new ideas, rather our contribution is presentation of ideas on GTM trustworthiness from many disciplines (nursing, education etc.) under one IS umbrella. However, it must be pointed out that Qualitative GTM and Quantitative-positivist research methods have different philosophical underpinnings(Myers 1997) and therefore the comparison is inappropriate(Brown et al. 2002). It is not possible to have a universal set of quality criteria for both qualitative and quantitative research. Consumers of GTM research in IS would be better placed to evaluate the quality these studies by familiarizing themselves with qualitative research.

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