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Practical Considerations in Grounded Theory Research

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Abstract
This paper is a discussion on the practical issues faced by Information Systems professionals when they employ Grounded Theory Method (GTM) in Information Systems research. Various strands of GTM are derived from the grand GTM proposed by Glaser and Strauss in 1967. Starting with the dicta proposed by these two authors in 1967 on the use of GTM, the paper explores several variants of the method that have surfaced and are currently in use. The proponents of GTM had dicta on the use of theory (hypothesis), use of research questions, use of literature in the substantive area of research and data-gathering methods. This paper will explore ways on how these dicta are used when researchers undertake a study in an area of their expertise. This discussion is intended to serve as a guide for novice researchers who intend to use GTM for their Masters or Doctoral research studies as well as for people using the method for the first time. It challenges researchers to reflect always on espoused research methods versus research methods in use. Lastly, some quality aspects of GTM research that will ensure acceptance of the inductively generated theory to a scholarly discipline are proposed.

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PRACTICAL CONSIDERATIONS IN GROUNDED THEORY METHOD RESEARCH

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ABSTRACT:

This paper is a discussion on the practical issues faced by Information Systems professionals when they employ Grounded Theory Method (GTM) in Information Systems research. Various strands of GTM are in us, all of which are derivates of the grand GTM proposed by Barney G. Glaser and Anselm G. Strauss in 1967. Starting with the dicta proposed by these two authors in 1967 on the use of GTM, the paper explores several variants of the method that have surfaced and are currently in use.

The proponents of GTM had dicta on the use of theory (hypothesis), use of research questions, use of literature in the substantive area of research and data-gathering methods. This paper will explore ways on how these dicta are used when researchers undertake a study in an area of their expertise.

This discussion is intended to serve as a guide for novice researchers who intend to use GTM for their Masters or Doctoral research studies as well as for people using the method for the first time. It challenges researchers to reflect always on espoused research methods versus research methods in use.

Lastly, some quality aspects of GTM research that will ensure acceptance of the inductively generated theory to a scholarly discipline are proposed.

KEYWORDS

Grounded Theory Method, Information Systems, Research, Qualitative Research,

INTRODUCTION

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"…adequacy of a theory … cannot be divorced from the process by which it is generated".

Glaser and Strauss (1967)

The purpose of any research endeavour, whether inductive or deductive, is to develop a new theory or to test an already existing theory. In other types of research, both development and testing of theory can be done in a single research endeavour. The most important element in a research project, however, is not the final product, but the way the researcher arrived at the final product. This process puts a great burden on the choice of a sound research design of the project.

The choice of an appropriate research design becomes more critical in qualitative interpretive researches, where generation of theory is the intended goal. As Glaser and Strauss (1967) put it, if theory generation is the goal of the research, the processes undertaken in such an endeavour should be chosen, planned, carefully executed and documented comprehensively. Unlike in quantitative studies, this is the only way in which the quality and rigor of the research process can be measured. In the end, it contributes immensely to the acceptance and use in practice of the theory generated. This paper discusses the practical issues that should be considered when Grounded Theory Method (GTM) is used as a method for research in qualitative studies.

Section 2 of the paper discusses the principles guiding the choice of a research method. Section 3 provides a brief history and discusses the different variants of GTM. Section 4 delves into the discussion of the basic requirements of sound application of GTM to qualitative research and also covers the practical issues to be considered by researchers. It includes also discussions on how GTM can be used in a different form from that proposed by Glaser and Strauss (1967). Each research process should have some quality criteria attached to it. In Section 5, the quality requirements as applied to qualitative research and GTM research in particular are covered and, lastly, Section 6 concludes the discussion and makes some recommendations.

GUIDING PRINCIPLES FOR THE CHOICE OF RESEARCH METHOD

Preamble

This discussion is based on research being carried out as part of a current PhD study in software

development. In part of the study, the researchers investigated the issues that lead to the mechanistic development of software products. The focus was to identify general software development practices in South Africa, covering issues such as methodology, communication, interface and contextual issues. The aim was to find a gap between current software development methods and methods that could lead to the development of romantic, adaptive and evolvable software products. The topic of the PhD research study that was addressed using GTM is "An ontological approach to software development". The study straddled the field of ontology as well as software development philosophies. As mentioned earlier, GTM was the preferred research method and the preferred data-gathering technique consisted of open interviews.

CHOICE OF RESEARCH METHOD

In a study of this nature, it is very important to view the software development process in its actual setting. The researcher realized that software developers needed to be part of culture or community in which the resultant system will be used or at least to immerse themselves temporarily in that society. As an aside, it is important to mention also that software development is more effectively achieved by developers who have a business understanding of the area to be served by the resultant system.

Another aspect is that the research required the researchers to constantly modify the data-gathering process as and when the study progressed (Trochim, n.d.). This allowed the researchers to direct and redirect the interview questions to get relevant data that could answer the research questions. This was in response to the changing environment and the understanding of the researchers. In fact, the researchers came to have better understanding of the research problem as the research progressed.

Ontologically, the research study assumed that a reality outside the observer's perception did not exist (Trochim, n.d.). Instead, it assumed the ontology definition proposed by Hacking (2002) that refers to ontology as "What is there that we can individuate?" against the classical philosophy description of "What there is?"As the researchers collected data from software practitioners, they found that they could not separate themselves from the respondents. In fact, they permanently became part of the researched, especially since they were also information technology professionals and academics. The researchers' reality shaped much of the research process and one has to accept that they were subjective rather than

objective observers.

In conclusion, the research was based on the epistemological and ontological assumptions made and proposed about the research problem and the research process.

QUALITATIVE RESEARCH

Strauss and Corbin (1990) describe qualitative research as any type of research whose results are not a product of any statistical process or some form of quantification. The word "results" does not however imply the absence of numbers in the research process. Qualitative research focuses on how the research findings were arrived at. It has to be based on interpretation of the results and not on the quantification thereof. Qualitative research is usually done when the task of the researcher is to uncover and understand a phenomenon in its natural setting (Strauss and Corbin, 1990). This type of research is able to uncover new knowledge in a field where very little is known.

Unlike Hunter (2003), who limits qualitative research to "an interpretive approach" only, Olivier (2004) acknowledges that it can also be positivist, interpretive or critical research. After a brief description of the background on which this discussion is based, the following section is dedicated to the study of GTM.

GROUNDED THEORY METHOD

The first proponents of GTM were Glaser and Strauss who, in 1967, used the method in their study of dying in-patients. Grounded Theory Method is defined as a research method that seeks to develop theory that is grounded in data. According to Olivier (2004), Grounded Theory Method starts by observing the field of interest, and theory is allowed to emerge (is grounded) from what is observed in the data. The data should be systematically gathered and analyzed as the study progresses (Olivier, 2004; Cornford and Smithson, 1996).

According to Martin and Turner (1986), Grounded Theory Method is viewed as:

'an inductive, theory discovery methodology that allows the researcher to develop a theoretical account of the general features of a topic while simultaneously grounding the account in empirical observations or

data'.

Trochim (n.d.) regards Grounded Theory Method as a generative method in that its purpose is to generate or produce theory. Glaser and Strauss (1967) urge grounded theorists not to start with a problem statement or research questions, because just an interest in the field of study should be sufficient. Researchers' adherence to this requirement influences the way a grounded theory researcher plans and executes the research study as is described below.

There are many varied ways of conducting research using Grounded Theory Method. Some of these ways are very prescriptive (Strauss and Corbin, 1990) but others leave room for the researcher to direct his or her research in a way that suits the research environment. The proponents of Grounded Theory Method, however, urge researchers to use the method flexibly (Glaser and Strauss, 1967) and are strongly supported by Charmaz (2006), who refuses to accept any prescriptive way of using this method. Instead she regards the method as a guiding framework, that is, "a set of principles and practices" which any researcher can fine tune to suit the context of the particular research project (Charmaz, 2006). The basic tenet of GTM is to allow free discovery of theory and, by all means, to limit any preconceptions.

PRACTICAL ISSUES IN GTM RESEARCH

This section discusses the practical issues that were considered during application of GTM in the study described.

REQUIREMENTS FOR SOUND APPLICATION OF GTM

In a grounded theory research project, a researcher having an interest in a specific area of study should lose no time in identifying its substantive area. This is the area in which the theory developed should be applicable and used. In some instances, the area of interest straddles several disciplines, leaving a researcher with the problem of explicitly defining the substantive area of research. For example Goede's (2005) research focused on the use of data warehousing in decision support systems and system thinking methodologies. An untrained researcher could mistakenly identify either system, regarding methodologies or data warehousing such as those used in decision support systems (Goede, 2005) as separate substantive

areas. This could completely change the research strategy of the study. In other circumstances, one may pick both as substantive areas of research, again creating a problem of multiplicity of substantive areas. A critical look at this research, and also as explained by Goede (2008), reveals that she:

"… wanted to study one area from the viewpoint of the other area. I wanted to look at Data Warehousing (DW) from a Soft System Thinking (SST) perspective and not from an objective perspective - I did not want DW answers, I wanted DW from a SST perspective answers".

In other words, the substantive area was an integral collection of data warehousing practices viewed from SST as a lens and not separately.

It requires a very critical mind to successfully identify the focus point for literature study as it is not advisable to study literature in the substantive area (Glaser and Strauss, 1967; Glaser, 1992). Such multiplicity of disciplines, which need to be consulted in the same research area at one point or another, may appear to flout many of the basic dicta of Grounded Theory Method as proposed by Glaser and Strauss (1967).

In this study, there are also two fundamental disciplines that need to be consulted by the researchers. These are the fields of software development and of ontology, as used in the Information Systems discipline. This dialectical debate emanates from the researcher's interest in using ontology to improve the usability of information systems by improving the development process, which alone forces researchers to shift their interest into the way these information systems are developed and the software products that are used to implement these systems. The following section contains a brief description of how this dialectical debate was solved.

THE SUBSTANTIVE AREA DEBATE

In this study the authors recognized that the title of the research project, "An ontological approach to software development" is multifaceted. It is therefore very important that the researchers stress that the substantive area is neither software development nor the study of ontology in information systems but is an integration of both. Put more simply, it is the study and use of ontology in the development of software

products.

As such, the study did not need to separate software development from the ontology discipline or later to choose one of them as a substantive area. It therefore treated the two fields as substantive areas and any dictum applying to the sound use of Grounded Theory Method principles was applied with respect to this resolution.

PROBLEM STATEMENT AND USE OF RESEARCH QUESTIONS

As part of the research design, Glaser and Strauss (1967), as well as Glaser (1992), call on GT researchers not to consider a research question as a statement that focuses and identifies the unit under study. Many research methodologies call for a research question into the problem area that guides the method of data collection and identifies the unit of analysis. By contrast, through the use of GTM, the research focus becomes clear during open coding, collection of data by theoretical sampling and analysis of the data through the constant comparison method. Since one does not start with a problem statement but an interest in the field, one cannot derive these research questions (Glaser and Strauss, 1967; Glaser, 1992).

Contrary to Glaser and Strauss (1967) and Glaser's (1992) suggestion, Strauss and Corbin (1990) advise researchers to start with a preliminary theory or hypothesis. This theory is intended to guide the researcher and define the scope of the study. They argue that, without such a research hypothesis, the researcher would be faced with too many aspects to consider in a single research project. In choosing such a research hypothesis, the researcher should structure it in such a way that it leaves flexibility and freedom for an in-depth exploration. It should not restrict the investigator but should function solely as a guide (Strauss and Corbin, 1990). As the research progresses, the scope of the research question is narrowed and focused, altering concepts and relationships to concepts that are inductively arrived at after analysis the initial data samples.

Strauss and Corbin's (1990) suggestion did not go down well with Glaser, who accused them of encouraging researchers to limit the free generation of theory by introducing preconceived ideas. However, in her book, Constructing Grounded Theory, Charmaz (2006) agrees with Strauss and Corbin, as she also

advocates the use of a preliminary theory.

Despite this academic debate, in practice researchers have to negotiate a way through all these requirements and come up with a practical research design. The researchers herein disagreed with Glaser's (1992) inflexible and strict adherence to the non-use of preliminary theory. Glaser strongly opposes the use of theory and is supported in this by some of his arguments reflected in publications such as those of Glaser (1992), Glaser (1994) and, lastly, Glaser (2002), who, in the last-named publication expressed his discomfort with Charmaz' (2000) monograph, which suggested that the Grounded Theory Method should be viewed as a constructivist method.

In this study, the researchers advise GTM users to propose a preliminary theory, especially when researching phenomena in their areas of expertise. The theory should, however, strictly be preliminary as advocated by Strauss and Corbin (1990), Gasson (2003) and Charmaz (2006). With all the abundant preliminary knowledge available in their expert fields and in the literature, failure to propose a preliminary theory may result in a lack of research focus.

USE OF LITERATURE

"There is a need not to review any of the literature in the substantive area under study"

Barney Glaser (1992)

During quantitative studies, literature can be used to find relevant previous research in the area, to discover gaps in the knowledge and to find theoretical or conceptual frameworks that can be used to guide the research process. In qualitative studies, in particular when the Grounded Theory Method is used, researchers are strongly advised to defer the literature study until they have collected and analyzed the first batch of the research data (Glaser and Strauss, 1967; Glaser 1992; 1994).

In using the Grounded Theory Method, the intention is to discover and not to test or duplicate concepts and hypotheses. At the beginning of the study, the researcher is advised not to study any literature in the chosen field of study. This, Glaser warns, could introduce researcher bias by giving rise to a set of preconceived

concepts, categories and properties from other researchers' work. Starting with a literature study will constrain the free discovery of theory and, hence, will defeat the main dictum of grounded theory approach (Glaser and Strauss, 1967; Strauss and Corbin, 1990; Glaser, 1992; Charmaz, 2006; Gasson, 2003). This notion is supported by Hunter (2000), who argues that approaching a research problem without preconceptions will lead to the emergence of a theoretical framework from the data. It is important to note that Strauss and Corbin (1990) do not completely dissuade people from reading literature in the substantive area before they start data gathering. They, however, believe that some understanding of the research area through literature study will increase the theoretical sensitivity of the researcher when he or she is generating theory from the first data samples.

Glaser, however, argues that, only after the collection and coding of the first set of data and after generation of a preliminary theory in the substantive area, then, can data from a substantive literature study be used to support the emerging theory (Glaser, 1992). In Strauss and Corbin (1990) talk of preliminary theory being generated from initial data samples, which seems to agree with Glaser's idea. They ask researchers to use a theoretical framework that is generated from the initial data gathered as a starting point in their theory-building process. However, this framework should not be derived from the literature study.

Strauss and Corbin (1990) also encourage the study of non-technical literature. They define non-technical literature as comprising of letters, reports, diaries, biographies, videotapes and various other materials. Non-technical literature, they argue, can be used as sources of primary data, supplementing the data collected through interviews and observation. However Glaser (1992) says that non-related literature can be used to sensitize the researcher theoretically and to improve writing style and presentation techniques but he strictly forbids any literature study in the substantive area of study, whether technical or non-technical. This debate is possibly based on their interpretations of what constitutes technical, non-technical, related literature and unrelated literature. Glaser (1992) summarizes the argument by noting that reading unrelated literature:-

"…maximizes the avoidance of pre-empting, preconceived concepts which may easily detract from the full freedom to generate concepts that fit and are relevant when initially coding and analyzing the data as it is collected".

The next section puts forward a suggestion on how researchers can use this debate on the use of literature in their studies. This is how the present researchers used it in their study.

PROPOSED USE OF LITERATURE IN GTM RESEARCH

Sociological researchers, such as Glaser and Strauss (1967) often have the task of carrying out investigations in areas whose disciplines could be very new to them. An example is when they investigated and reported their study involving dying of patients (Glaser and Strauss, 1965).

It is quite possible that they may not have prior knowledge of the literature in that area. This is not the case with many researchers who happen to investigate issues in their fields of expertise. In such cases it becomes hard to adhere to the dictum of never reading literature in the substantive area. This is the situation in which the present researchers found themselves in, in their study. These researchers are lecturers in information systems and are familiar with literature on software development and ontology. It is thus apparent that the biggest challenge is to observe, obey and adhere to the requirements of this dictum as prescribed by Glaser and Strauss (1967).

In this study the researchers allowed their prior knowledge to encroach on the research. If Glaser's argument on what constitutes data is used (Glaser, 2002), this should not have an effect on the answers that the respondents gave during their interviews. The data should, however, come from the field and, therefore, the researchers avoided as far as possible any discussion on software development and ontology with the respondents before the interviews. In some cases, where the interviewees needed to know about the study, these aspects were discussed only after the completion of the interview.

The literature was also consulted in a bid to establish the preliminary problem statement and research questions. The researchers felt themselves at liberty to doing this, on the grounds that the Grounded Theory Method as proposed by Glaser and Strauss (1967) is not a prescriptive method but should be viewed as guiding principles. In short, literature study can be encouraged as long as its effects do not encroach on or manifest themselves in the interviewees' responses. It should be borne in mind that data are considered as coming from the interviewees' responses.

PREREQUISITES FOR GROUNDED THEORY DATA GATHERING

"How you collect data affects which phenomena you will see, how, where, and when you will view them, and what sense you will make of them."

Charmaz, 2006

Data-gathering is a very delicate process that needs to be managed. In reality, the quality of research results is directly dependent on the data-gathering process used. There are several data collection techniques for qualitative research but, for GTM purposes, it is important to give more weight to field notes, interviews, document- and report-sampling. The Grounded Theory Method requires that all interviews and field notes that are collected at the beginning of the research be transcribed for coding and analysis.

Charmaz advocates a data-gathering method that would allow researchers to view the researched phenomena in the same way as participants in the research area see it (Charmaz, 2006). These data-gathering techniques can be changed during the research process to suit events occurring in the field. In fact, data-collection methods should be chosen in such a way that the appropriate data that effectively answer the research questions can be obtained. The researcher may, at a later stage, choose to transcribe, code and analyze specific portions of the data, a process called theoretical sampling. Theoretical sampling is done in an attempt to reach theoretical saturation and density in the generated theory (Glaser, 1992).

PRIMARY DATA ACQUISITION AND SAMPLING

In this study, the primary goal was to find empirical evidence to support the claim that ontology artefacts increase the usability of software products in information systems. The survey method of interviewing was used to gather data from system development practitioners.

There was a vast range of people who could have been used as respondents. End users, system analysts, programmers and IT academics all met the criteria. The researchers did not look for a specific class of respondents but decided to start the data gathering process with three IT academics.

The reason for doing this was based on the need to fine-tune the interviewing process as well as the

interview questions. Naturally, the researchers expected academics to have a general knowledge of software development, including the concepts and practices that are used in the development process.

These three IT academics have different backgrounds ranging from system development methodologies, the philosophy of information technology, soft systems development methodologies, systems thinking, traditional and agile methodologies, programming and system and business analyses.

After the initial interviews, the door was opened for other practitioners. The people interviewed included project managers, systems and software developers, system and business analysts and end users. A recommended approach to data-gathering is to start with respondents with a general, all-round understanding of the area under study. This technique can help researchers to have a larger base of categories of concepts that can be focused on at later stages. As the basic framework of the theory is generated, specialists in different sections of the research area can now be interviewed in a bid to increase the theoretical saturation of the generated theory.

INTERVIEWING TECHNIQUES

With or without a specific research question, Glaser (1992) advises researchers not to ask direct questions during interviews. This dictum is used in a bid to guard against the preconception of emergence of data. Glaser also proposes two fundamental formal ways of approaching the interviewing process. Of note in all this is that the questions should not be preconceived. The first requirement is for the researcher to question people working in the substantive area in an attempt to establish their concerns. As they work in the substantive area, people have different ways of arriving at a solution. The researcher then has the task of finding reasons for the differences in their approaches to the same problem.

The second requirement is to find categories of incidents as they show themselves in the substantive area. The fundamental rule for GT is:

"Theory must be based on emergent relevance of categories".

In one of his critiques of the work of researchers such as Strauss and Corbin (1990), Glaser (1992) accuses them of advocating theory generation from "forced conceptual description" of data. For sound GTM

practice, Gasson (2003) identifies two elements that support of Glaser's accusation. Firstly, Gasson (2003) recommends that patterns inherent in the observed empirical data form the basis of theory. Unlike hypothesis testing, he adds that *"no inferences, prejudices or the association of ideas"* are entertained when grounded theory research is being conducted.

Secondly, he notes that use of the Constant Comparison Method allows for the emergence of theory. According to this theory, the codes and constructs (or categories and their properties) are constantly weighed against new data. Such constant comparisons confirm that theoretical constraints are a by-product of - and are embedded in - the data.

It is very difficult to adhere to the requirements on interviewing techniques as proposed here. Most of the problems emanate from the fact that the researchers are carrying out a study in their particular field of expertise and also that, unlike social science investigations which are fluid, the IT field is naturally directed and solid. Many questions tend to force respondents to focus on specific aspects, thus, in a way introducing some preconceptions into the responses.

DATA ANALYSIS IN GROUNDED THEORY METHOD

The generation of theory is a process of converting raw data into information. In this GTM study, interview transcripts were coded, interpreted and subjected to several cycles of analysis to come up with the substantive theory. It is very important to note that, in the study carried out by the researchers, many of the respondents were not familiar with the discipline of ontology as applied to software development. However, they were quite familiar with the Information Systems discipline, which includes the software development process.

The respondents gave descriptions of the software development problem, using their domain language. To match the categories of incidents to the ontology concepts, a double transformation was done, as reflected in Figure 1.

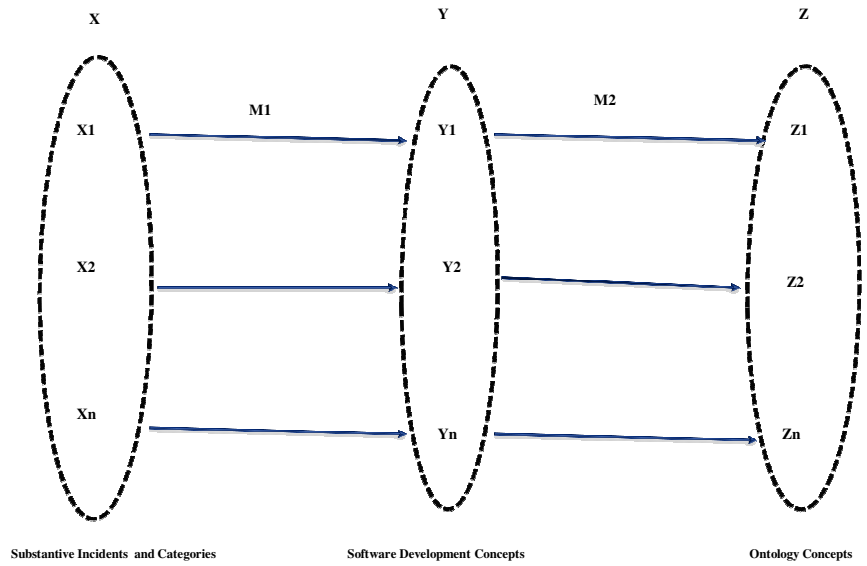

Figure 1: Three Tier Incident and Concept Mappings

The categories of incidents thus discovered had to be assigned codes, which are themselves concepts in the software-development field. This is the first mapping M(X) to M(Y). In a study consisting of a single substantive area, the relationship between categories in M(Y) could singly be used to generate the theory.

However, in the study described in this paper, a second mapping, M2, was required to map the software development categories to the ontological concepts that they relate to, that is the transformation M(Y) to M(Z). This second mapping became necessary because of the existence of the second substantive area and the research requirements of finding a framework of ontology aspects that could be used to improve the software development process. The ontology concepts do not directly have the same meanings as the concepts in use in current software development practices.

The implication of this double mapping is that the relationships between categories generated through mapping M(1) could be distorted by the second mapping M(2). This could have a serious implication on the final generated theory as reflected at M (Z). To have a sound data analysis in a case like the one described here, researchers are urged to have a thorough knowledge of literature in the two areas under study. The knowledge of literature, in addition to increasing theoretical sensitivity, will also ensure a more appropriate mapping of concepts and their categories through mapping M (1) and M(2). In short,

researchers are urged to conduct a thorough and continuous study of literature.

In conclusion, the respondents revealed the requirements for romantic systems development but indicated that these needed to be mapped onto the ontological concepts that formed the framework.

GROUNDED THEORY METHOD CODING

Grounded theory recognizes two types of codes: namely substantive and theoretical codes. The conceptual meanings that are given by the generation of categories and their properties comprise their substantive codes. These substantive codes are made up of the data patterns that are revealed in the substantive incidents during field data gathering. On the other hand, theoretical codes comprise conceptual models of relationships that theoretically relate substantive codes to each other.

The ability to generate these codes is of the utmost importance during generation of grounded theory. To achieve this, three basic coding types are used: open coding, axial coding and selective coding (Glaser and Strauss, 1967; Glaser, 1992; Strauss and Corbin, 1990; Charmaz, 2006). In the next section these three types of coding are briefly described. These types of coding can be done manually or can be assisted by the use of qualitative analysis software such as Atlas.Ti. In their study the researchers used Atlas.Ti 5.2.

OPEN CODING

Open coding is a process tasked with discovery of categories and their properties, which groups or classifies them into themes or categories, while, at the same time, looking for trends in the data (Gasson, 2003; Glaser, 1992; Glaser and Strauss, 1967). During this process, Gasson (2003) advises researchers to look for commonalities, associations and implied causality in the elicited categories. The basic premise for open coding is that the research starts without any concepts. Thus, open coding has to establish core concepts and their categories.

Open coding breaks data into incidents, which are further examined and analyzed to check for similarities or differences in the incidents thus generated. Glaser (1992) urges researchers to constantly check the "category or property of a category" that the incident indicates. The process of eliciting categories or their

properties must be based on sound, unbiased judgments and a neutral view to the data.

Gasson (2003) and Strauss and Corbin (1990) argue that good open coding is informed by literature. Open coding uses the constant comparative method of analysis described below.

THE CONSTANT COMPARATIVE METHOD

This is an analysis process during which the researcher constantly compares incident with incident and then incident with concept. The properties of categories are generated during this process. The next step is to find the categories or properties of categories to which the incident belongs.

In the generation of categories, the grounded theory (GT) analyst looks for patterns and for a conceptual name that is given to a pattern of many similar incidents. The incidents compared can be used as indicators of the same concept. Saturation point is reached when many interchangeable incidents are found and coded. Categories are generated from similar occurrences of a pattern and not from isolated single occurrences that cannot be generalized.

When looking at the generation, discovery or development of categories, the researcher should desist from bringing into the fray preconceived ideas that could force the data (Glaser, 1992). Theories should be allowed to emerge freely from the data. Patterns of data should be allowed to show themselves at a grand level of incidents and sift down through to the properties of incidents.

Lastly, in open coding, analysis, line by line, of sentences, paragraphs or entire documents could be considered. The most important thing is to allow the piece of data under analysis to describe a comprehensible pattern or incident that could be used at the conceptualization stage to generate, discover or develop a category.

UNIT OF ANALYSIS

Coding is a process of analyzing data. The researcher is thus faced with the problem of choosing the correct unit of analysis. In open coding, this may be "a sentence, a line from a transcript, a physical action … or a combination of" such elements. In data analysis, it is important to differentiate between terms used by the

respondents and the technical terms that the researcher associates with the phenomena. This, Gasson (2003) claims, will reduce the bias that could be introduced into the analysis by the researcher's preconceptions.

AXIAL CODING

Gasson (2003) describes axial coding as a constant search for relationships that exist among coded elements. Categories, sub-categories and their properties, as elicited during open coding should be scrutinized to check for similarities and dissimilarities in their associations. This is an attempt to relate structure to the process.

THEORETICAL SENSITIVITY

Glaser (1992) refers to theoretical sensitivity as the "researcher's knowledge, understanding, and skill" that enables the generation of categories and their properties. Strauss and Corbin (1990) regard this theoretical sensitivity as more of a personal trait. These qualities enhance the researcher's ability to relate the categories and properties to hypotheses and later to integrate them into hypotheses according to the emergent theoretical codes (Glaser, 1992). The main tasks of theoretical sensitivity are to generate concepts from the data and to establish their relationships using normal models of theory. It is a case of finding meaning, relationships and the concepts in the collected data.

The ability to undertake theoretical sensitivity highlights the difference between an informed and knowledgeable researcher and a theoretically competent grounded researcher. Unlike the former, the latter has the ability to generate hypotheses and convert them into theory. Strauss and Corbin (1990) attribute this ability to the researcher's intelligence, research, academic and professional background, as well as to the researcher's understanding of the area under study.

In addition to attending sociology classes on theoretical coding and conceptualization, Glaser urges a grounded theory researcher to constantly study "substantive and formal theory" in disciplines other than the discipline under study. He urges researchers to "*Study theory constantly*", (Glaser, 1992). By knitting down

the theoretical codes, the researcher is able to see the research, the research data and the concepts that emerge from the data in a novel way. These can then be used for generating theory.

The current researchers agree that theoretical sensitivity can only be improved through the study of literature. However, they encourage GTM researchers to focus the literature study in the substantive area under study from the time they start analyzing the first batch of data. They noted that, as one is generating codes, one needs to know the concepts in the field of study so that one can be able to establish relationships among categories. The researchers truly agree with Glaser when he said, "Study theory constantly" (Glaser, 1992), but argue that it should mainly be in the field of study, the substantive area.

THEORETICAL MEMOS

When doing coding, the researcher is occasionally struck by emergent theories, theoretical formulations and ideas about data. These revelations should be documented and are referred to as theoretical memos. Documentation of these emergences would provide an insight into the type of questions and data that still require exploration.

A more practical way for GTM researchers is to keep a notebook in which they enter all the emergent theories and their relationships. Even if one is using qualitative data analysis software which has the facility to add a memo, the researchers discovered that it was faster and more coherent to manually write the theoretical emergences in a note pad.

SELECTIVE CODING

The purpose of selective coding is to factor in data that implicitly and explicitly supports the already identified categories and their properties. The researcher should step back and look at the research questions to find what the research data needs to generate. At this juncture, the researcher chooses data that supports the intended theory and should realize that not all data is worth analyzing (Gasson, 2003; Glaser, 1992).

Data used for selective coding should be gathered from specialists in the field under study. In choosing the

respondents, as discussed earlier above, the researchers grouped the respondents into two categories, namely generalists, whose data are used during open coding and specialists, whose data are used during selective coding.

QUALITY CONSIDERATIONS IN GTM RESEARCH

As in all qualitative research tasks, process documentation is a very critical requirement of the study. The researchers are of the opinion that the documentation and annotation of each process undertaken in the research process is the ultimate guide to ensuring quality and rigour in the study.

The study on the quality of GTM research is based mainly on the work of Gasson (2003) and Klein and Myers (1999), which gave separate but related sets of criteria for judging and ensuring quality in qualitative researches. This section presents a brief overview of the most important issues that need to be addressed in an attempt to ensure basic quality tenets in the research process. The discussion is an integration and synthesis of the criteria from both Gasson (2003) and Klein and Myers (1999).

In accepting the reflexive nature of a GTM research process, the researcher should ground the research process on the principle of the hermeneutic circle. The resultant finding of every GTM process should be based on a process of cyclic interpretation of data and repetitive execution of several mandatory steps. It should also be noted that qualitative research is not about sample size but rigour in the analysis of the qualitative data that are gathered. The same data should be analyzed separately at least twice, in order to check and ensure consistencies in the categories generated. At the same time, all these processes should be documented to ensure the validity and reproducibility of the research results, as suggested by Gasson (2003).

GTM reflexivity of the data analysis process, as enshrined in the constant comparison method, is a good measure of the internal consistency of the research findings. This process ensures that the biases and distortions that are always inherent in the data and the analysis process are identified and minimized. Internal consistency can be read in conjunction with Klein and Myers' (1999) principle of suspicion. They are both tasked with identification of errors in the research process.

Every research task and problem has its uniqueness, situation and context. The quality of a GTM study can be enhanced if the context of the study is fully described. The nature of the study, the research process, the methods of data collection and analysis and the findings from this, should be described comprehensively in the context of the research environment. This part should be done to satisfy the principle of contextualization (Klein and Myers, 1999) in conjunction with confirmability and dependability requirements, as proposed by Gasson (2003).

Lastly, the GTM findings should be transferable between contexts. The task here is for the researcher to move from substantive theory to formal theory (Glaser and Strauss, 1967; Strauss and Corbin, 1990). Through research in different contexts or the involvement of different researchers in the same substantive theory, generated theory can be generalized and adapted to apply to different scenarios.

This task would also ensure that, in addition to the existence of multiple interpretations, the formalized theory would take into consideration the varied assumptions, interpretations and work settings that were used by the different researchers. This process would increase the transferability of the research results.

CONCLUSION AND RECOMMENDATIONS

GTM is a research method that deals with theory generation and not theory testing. As concluded by Glaser and Strauss (1967), the way GTM is used in practical research tasks is purely a mutation of the original dicta as proposed by its proponents. Researchers are urged always to consult the dicta proposed by Glaser and Strauss and to compare these with the GTM variants as proposed by Strauss and Corbin (1990), Charmaz (2000), Gasson (2003) and by many other researchers before they embark on a practical research project.

Researchers should accept that the GTM dicta proposed by Glaser and Strauss (1967) are guideline principles or represent a framework of good practices. In different research contexts, researchers are encouraged to tune and apply the dicta flexibly. Based on the present researchers' experiences, novice users of GTM are encouraged to consult the works of Glaser and Strauss (1967), Strauss and Corbin (1990), Glaser (1992; 1994; 2000) and Charmaz (2000) before deciding on their research design.

The first two authors will give the prospective researcher an insight as to what was conceived in GTM at its inception and how one of the proponents modified the initial method. Glaser (1992) will show the researcher how the storm brewed between the first proponents of GTM. In Glaser's critique, the basic tenets of the initial proposal and the emergence of possible variants of the method are highlighted.

Glaser (1992, 1994), Charmaz (2000) and Gasson (2003) will help the researcher to chart a research design that is soundly grounded in the principles of GTM but is methodologically different. This supports the notion that knowledge is a creation of the human mind and accepted theory, whereas research based on sound theoretical assumptions is not always applicable in practical settings. As such, users tend to transform the accepted theory to theory in practice, i.e. to a theory that is used in practical situations. Although each has its merits and drawbacks, the research fraternity is generally able to come up with practical solutions.

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