Grounded Theory: Its Diversification and Application Through two Examples From Research Studies on Knowledge and Value Management

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Abstract: The grounded theory research method has been adopted by researchers across a range of different disciplines. Two different examples that are currently using the method as part of individual research programmes are explained. These two examples form part of two separate PhD programmes that are currently at similar stages of development making for a timely comparison of the different applications of the grounded theory research method. Both examples involve research conducted in the construction related fields of knowledge management (km) and value management (vm). A background is provided for each study and the similarities and differences between each application are outlined as well as the process and stages involved in the research investigations undertaken. The use of computer software packages is explored and a case for and against using such a tool is made to the effect that this will largely depend on the nature of the problem under investigation. The paper concludes with the suggestion that grounded theory is a method that can be adapted to suit the nature of the research problem provided that the fundamental aspect is adhered to which is to ensure that the theory derived is 'grounded' in the data.

Keywords: grounded theory, knowledge management, value management, software packages

1. Introduction

This paper explores grounded theory by reviewing the key characteristics of the research method, the founders of the method as well as how the method has changed over time. The paper responds to the work of Blismas and Dainty (2003) who called for an open debate on the merits and demerits using computers in inductive research. The research work outlines a case for and against the use of computer software packages which involves one example using such a package and the other adopting a manual approach. The two examples are explained which differ in approach and outcome. For the purposes of this paper these approaches will be labelled 'Approach A' and 'Approach B.' Approach A investigates the role of knowledge management in small and medium enterprises (SMEs) and approach B explores the commonality of project issues using value management workshop reports.

The paper is structured as follows; a background on the two PhD research areas; knowledge management and value management followed by a general review of grounded theory and the different approaches it encapsulates. A summary of both approaches which form part of the two individual PhD research programmes distinguishes between the two approaches before an in depth explanation of Approach A; the theoretical model and Approach B; theory generation is offered. Succeeding this, a review of the usage of software packages is given to corroborate with the researchers different approaches to addressing the data. Finally, the paper concludes with challenges and recommendations with the aim of transferring lessons learned for the grounded theory researcher.

2. Background on the research areas

Knowledge management and value management are two construction-related disciplines that have both become more established in the UK in the last ten years. Approach A contributes to knowledge through the exploration of knowledge management in SMEs where there has been little evidence of implementation in knowledge management practices. Approach B's contribution to knowledge is the investigation of value management in an area which is not familiar with value management; that of the public service sector. Therefore, both approaches are exploring new ground for implementation (SME's and the public service sector) for the two management disciplines.

2.1 Knowledge management

Malhotra (1998) suggested that, "Knowledge management caters for the critical issues of organisational adaption, survival and competence in face of increasingly discontinuous environmental change. Essentially, it embodies organisational processes that seek the synergistic combination of data and information processing capacity of information technologies and the creative and innovative capacity of human beings". The economic crisis of the early 1990's led to downsizing in many organisations, as well as mergers and acquisitions. This led to "corporate memory" losses in some organisations as key knowledge workers were forced to leave their employment. The crises of the early 1990's, to some extent helped to focus minds on the need and importance of knowledge management.

The review of literature indicates that some of the large organisations in the construction industry have adopted and reaped the benefits of KM, but there is very little evidence of KM in SMEs in the construction industry. Denzin et al. (1998) suggest that when there is a high degree of unpredictability, a pilot study is a good means to add value to the research. In this PhD study, prior to the main study, a pilot study was undertaken which helped the investigator to refine their data collection plans with respect to both the contents of the data and the procedure to be followed.

The pilot study explored the main challenges in knowledge management process in construction SMEs. Eleven organisations involving twelve professionals in Glasgow, Scotland, were interviewed. The result from the study indicated that knowledge capture seemed to be the main challenge associated in knowledge management process. The main study involves qualitative research methods using a grounded theory analysis in a case study context.

2.2 Value management

Value management came from the term value analysis which was developed from the work of Lawrence Miles, a purchase engineer for General Electric Company in the 1940's. Miles questioned, 'if I cannot obtain the product I must obtain an alternative which performs the same function,' Kelly and Male (1993). The 'Job Plan' was used to provide a logical sequence of activities to achieve a value that would satisfy the client. Value engineering followed value analysis and is currently in use in the manufacturing industry. It became popular in the UK construction industry in the early to mid 1990's, Kelly and Male (2002), where it became known as value management. Value management is viewed in the UK as the encompassing term for value engineering, value analysis, value planning, value review, value methodology and value management reviews, Male *et al.* (1998). In the US, the term value engineering is used more widely.

Kelly and Male (2002) believe that, 'value management has reached a level of maturity within manufacturing and construction whereby the style and content of the various workshops is reasonably predictable.' This suggests that the application of VM should be further explored to develop new ground for implementation, such as that of the service sector. The grounded theory method is being used to determine if there is commonality of issues at different stages in the project life cycle and if these issues are generic in nature. If the issues are found to be generic this would suggest that the same tools and techniques used in value management could be applied regardless of sector or project type.

3. Grounded theory: Glaserian and Straussian approach

Glaser and Strauss first described the method of grounded theory in 1967 as a means of enabling the 'systematic discovery of theory from the data of social research'. Since then two different approaches have emerged; the Straussian and the Glaserian. It should also be noted that a number of other adaptations have developed identified in Heath and Cowley (2003), however, this particular research focuses on the founders of grounded theory and how their approaches diversified over time. It was not until the publication of Strauss (1987); Strauss and Corbin (1990), and Glaser (1978, 1992) that differences in approach and meaning was recognised. Glaser's approach remained faithful to the original joint description of the grounded theory method whereas Strauss's approach was referred

to by Glaser (1992) cited by Heath and Cowley (2003) as 'full conceptual description.'

Heath and Cowley (2003) describe the difference between the two approaches being methodological which involves a different focus on induction and deduction processes. Glaser's being simply an extension of the original whereas Strauss's incorporates analytical techniques. According to Strauss and Corbin (1990) theory denotes a set of well-developed categories (e.g. themes, concepts) that are systematically interrelated through statements of relationship to form a theoretical framework that explains some relevant social, psychological, educational or other phenomenon.

3.1 Literature review

Strauss and Corbin (1990) suggest that a researcher does not begin a project with a preconceived theory in mind. The researcher begins with an area of study and allows the theory to emerge from the data. Theory derived from data is more likely to resemble the "reality" than is theory derived by putting together a series of concepts based on experience or solely through speculation. However, Smith (1997) suggested that general reading of the literature may be carried out to obtain a feel for the issues at work in the subject area, and identify any gaps to be filled using grounded theory. The researcher is able, therefore to approach the subject with some background knowledge, but it is important that the reading is not too extensive as the theories should evolve from the data itself, producing a grounded theory. In these particular studies both researchers have acquired background knowledge on the areas under investigation, however, the literature for both studies will be used to confirm or challenge the theory after the point at which theoretical saturation is reached.

Glaser (1978) argued that everything is data. Thus, the researcher would perhaps be unwise to carry out reading that provides him/her with anything more than, as Glaser & Strauss (1967) term, a partial framework of local concepts, which designate a few principal or gross features of the situations that he / she will study. If the researcher is concerned with factor relating theory, it could be advantageous

to carry out the literature review in order to stimulate the interactive processes of data collection and analysis. Glaser believes that the literature should be used to gain an overall picture of the research problem and afterwards to confirm the theory. Glaser's approach also involves induction initially followed by deduction once the theory emerges.

Strauss's approach involves using the literature to identify phenomenon. Strauss analyses the data predominantly through deduction. This has been criticised by Glaser (1992) cited in Heath and Cowley (2003) who suggests that the researcher would be making assumptions about what is in the data as opposed to what actually exists. Robrecht (1995) cited by Heath and Cowley (2003) puts forward the view that there is a chance of 'forcing' which involves looking for data rather than at the data set as a whole.

The other issue regarding literature reviewing in grounded theory is determining when the second review of the literature should occur. Strauss & Corbin (1994) argue that selective sampling of the second body of literature should be woven into the emerging theory during the third stage on grounded theory induction, the stage they term concept development. However, in contrast to these arguments, Glaser (1978) asserts that the researcher should refrain from accessing this second body of literature until the theory has emerged from the data.

3.2 Analysis

The aim of using grounded theory is the identification of core categories achieved by the grouping and integration of coded concepts under a single cover term. Grounded theory is a repetitive process; the analyst is required to return constantly to data sources, to check aspects of the emerging interpretation and to gather new data, as and where appropriate. Smith (1997) refers to grounded theory as a process of constant comparative analysis. The main features of the area of interest are mapped through repeated comparison of the data.

In terms of obtaining a suitable sample size in grounded theory, the grounded theorist does not decide on the size of the sample population before the study

begins. Sample size is deemed to be satisfactory only when the key concepts that have been identified from the collected data have reached saturation point, in other words, when no new data emerges.

3.3 Validation

An important aspect of grounded theory often misinterpreted to suggest that qualitative research never "validates" theory. This is not entirely the case, some qualitative studies do and some do not, but even those that do validate theory do not do so in the sense of testing as in quantitative research. Rather, it is a process of comparing concepts and their

relationships against data during the research process to determine how well they stand up to such scrutiny.

4. The two approaches to grounded theory

The literature review has highlighted the diversification of the research method from its initial introduction over thirty years ago. The following sections focus on the two individual PhD research programmes to illustrate the similarities and differences between the two approaches applying grounded theory. Table 1 encapsulates the differences prior to an explanation of each offered in the subsequent sections.

Table 1: The two approaches

Characteristics	Approach A KM in SMEs	Approach B VM and Project Issues
Research Strategy	Case Study	Case Study
Research Technique	Interview	Archival records
Use of Software Package	Yes	No
Outcome of Approach	Theoretical Model	Theory Generation
Inductive / Deductive	Inductive	Inductive
Assumptions Made	No	Yes
Prior Knowledge	literature and pilot study	literature and experience
Approach Chosen	Strauss and Corbin	Combination of Glaser and, Strauss and Corbin

The two grounded theory focused PhD programmes reported have been chosen for their distinct approaches in using the grounded theory method as evident in the characteristics breakdown in Table 1. The two approaches are different in the outcome expected and the techniques employed to reach this. The combination of the two approaches provides a comprehensive overview of the implementation of the grounded theory method in practice.

5. The theoretical model and theory generation

Two outcomes will be derived from the individual PhD investigations. Approach A will involve the development of a theoretical model which will facilitate knowledge management initiatives in small and medium enterprises in the construction industry. Approach B will involve the generation of a theory to be applied by value management practitioners to support the facilitator in VM workshop preparation and ultimately to benefit the project team.

5.1 Approach A: Theoretical model

The discovered grounded theory is generally called a theory (Chen, 1996) or a model (Backman & Hentinen, 1997). Work done by Turner (1976), Locke and Golden-Biddle (1997), have led to the development of a theoretical model in management research using grounded theory which have focused on process within an organisation. Approach A investigates the process of knowledge capture along with the main challenges associated with implementing knowledge capture initiatives / programmes in SME's, efficacy of different technologies and techniques and the nature of training provisions that will be of benefit to SME's with their knowledge capture initiatives. The model developed will provide insight or a perspective on phenomena and will also focus an individual on one perspective or set of ideas for facilitating KM initiatives.

The objectives of the study are:
▪ To investigate the main challenges associated with implementing Knowledge capture initiatives/ programmes in SMEs.

- To investigate the efficacy of different technologies and techniques.
- To examine and document the nature of training provisions that will be of benefit to SMEs with knowledge capture initiatives.

To develop, implement and validate an Information Technology (IT)-based framework for raising awareness for knowledge capture.

To achieve the above objectives it is intended to use the case study approach as a research strategy and semi-structured interviews as the research technique. The method of analysis for the interviews would follow the grounded theory approach of Strauss and Corbin. The outcome of this will be the theoretical model.

Backman and Kyngas (1999) suggest that the researcher should follow one particular author i.e. Glaser or Strauss and then develop their own method using one of these as a foundation. If the researcher was to apply a combination of applications of grounded theory from different texts this would undoubtedly result in confusion and the resulting findings would be lacking in substance. Hence Approach A chooses the Strauss and Corbin methodology for analysis of data obtained through semi structured interview. The research strategy adopted will be case studies in construction SMEs where the number of employees in an organisation is less than 250. The analysis is through constant comparisons of codes, concepts and categories till the saturation point in reached.

Approach A has chosen the Strauss and Corbin method which follows:
- The development of analytic techniques with the provision of guidance to novice researchers.
- Research questions that take the form of identifying the phenomenon to be studied and what is known about the subject.
- A micro analysis (word-to-word) adopted for the data obtained through interviews.
- A constant comparison method of data analysis (deductive and inductive) involves:
  - Open coding: The researcher forms initial categories of information about

the phenomenon being studied from the initial data gathered.
  - Axial coding: This involves assembling the data in new ways after coding. A coding paradigm is developed which incorporates:
    - identifying a central phenomenon
    - exploring causal conditions
    - specifying strategies
  - identifying the context and intervening conditions
    - Selective coding: This involves the integration of the categories in the axial coding model. In this phase, conditional proposition/research questions are typically presented. The essential idea is to develop a single storyline around which categories are formed.

The result of this process of data collection and analysis is substantive level theory relevant to a specific problem, issue or group under study.

5.2 Approach B: Theory generation

Grounded theory has been used as the methodology in this study for the analysis of data through the constant comparative method. This research approach principally adopts the Strauss and Corbin version as Glaser's approach predicates that there should not be a pre-conceived theory in mind which is not the case in this research. This research forming the basis for this paper was inspired by the research question which is 'do similar issues appear at similar project stages and are these generic in nature?' Strauss and Corbin (1998) highlight the requirement for a theoretical statement to enable an explanation or prediction of theory. The theoretical statement for this research is that similar issues occur at similar project stages irrespective of project type. The grounded theory as used in this research enables theory to be drawn from the data and not from speculation or preconceived ideas. A theory is built as opposed to being tested and offers an explanation of phenomena rather than just a set of findings (Strauss and Corbin, 1998).

The project objectives for this particular strand of the research focusing on project issues are:

- To determine the scope for being able to predict issues prior to a workshop and analyse what advantages this would have to the value management practitioner, the construction industry and the client.
- To establish whether different projects e.g. construction and service related, at comparable intervention points have similar issues and thus establish if these issues can be predicted prior to a VM workshop.

Table 1 indicates that a combination of approaches is used. This is in terms of adopting Glaser's original approach to grounded theory which refers to substantive and formal theory. This study forms a substantive theory which borders on formal theory. Although the majority of the case studies are construction industry focused there is theory that may be applied to other areas such as the manufacturing and service sectors. The analysis has been done using comparative analysis which has been described as, 'a strategic method for generating theory,' Glaser and Strauss (1967). And finally, the constant comparative method is used. Glaser and Strauss (1967) state that the rule is to maximise the comparison groups which has been done by ensuring that as many case studies as possible have been used to generate the theory.

6. The use of a software package

Software packages may be used by the researcher to support the research study. In the two PhD research studies, the research work on knowledge management in SMEs (Approach A) has used a software package due to the nature of the research problem, whereas the research work on value management and project issues (Approach B) identified that the use of a software package would only serve to hinder the progress of the research. The case for use of such a package has been presented by the researcher using it to investigate interview data relating to knowledge management in SMEs and the case against the adoption of software has been constructed by the researcher investigating commonality of issues in value management studies.

Blismas and Dainty (2003) made a number of significant points with regards to the use of software which are acknowledged:

- The restriction of the study imposed by a software package
- Importance of understanding how the package operates and what the weaknesses are so these can be addressed
- To remember that the computer is only to aid the process
- Advantage of a software package is that all the data is contained 'within a single analytical environment.'
- A lot of work is required on the part of the researcher despite use of a software package
- Difficulty in analysing qualitative data, particularly huge amounts in a PhD timescale
- Importance of making any prejudices of the researcher apparent in the research explanation

One of the benefits outlined by Blismas and Dainty (2003) is that 'they help the researcher to investigate more lines of thought in a shorter period than would normally be possible manually." However, it is also stated that 'the intuitive steps required within the manual process can never be replaced.'

6.1 Approach A: The case for a software package

Qualitative research usually means the collection and analysis of unstructured textual material in order to develop concepts, categories, hypotheses and theories. Most of the time during 'qualitative data analysis' is spent on reading, re-reading, interpreting, comparing and thinking on texts. Thereby the analysis of thousands of text segments in hundreds of interviews seems an insurmountable task with or without a computer. There are a large number of computer programs available as an enabler for qualitative analysis, such as NUD*IST, ATLAS/ti, Decision explorer and Code-A-Text, to mention a few. Dainty *et al.* (2000) reflected on the use of computer-aided qualitative data analysis software (CAQDAS) tools within an industry-led research project. The CAQDAS aids data management, allowing text or discourse to be edited, visually coded, contextually annotated, hyperlinked to other texts or multimedia data, and

searched according to parameters specified by the user. Software programs which are based on these principles have been called 'code-and-retrieve' programs (Kelle, 1995).

The data-handling and manipulation capability of CAQDAS proves a great benefit to the research by significantly increasing the rate at which data could be accessed, retrieved, and viewed. Additional features such as colour coding of documents in managing the coding and analysis status of documents are available. It is difficult to foresee an occasion where analysis of textual data or interview transcripts would not benefit from such data-handling and manipulation capabilities. The CAQDAS represents a strong metaphor for systematic, objectivity and rigour, but also optimistic forecasts that computer software would make the qualitative research process more transparent and rigorous (Richards and Richards, 1991). The program NUD*IST contains extensive features which support the construction of hierarchies of codes and categories. But linkages between codes may not only take the form of hierarchical relations but can form whole networks of categories, containing chains or loops. Since a theory can be regarded as a network of categories the idea itself suggests that tools for connecting codes to each other could be helpful for displaying the structure of the emerging theory and that software which facilitates the connection of categories can make a major contribution towards theory building.

Lee and Fielding (1996) have found that the median sample size, even in qualitative studies that use software for data management, is about 40 which seems feasible if one bears in mind that 'representativeness' in the statistical sense is usually not regarded as the crucial purpose of qualitative sampling. In this research, for main study, 41 professionals were interviewed in the construction industry SMEs. Researchers are primarily guided by their research objectives and analysis strategies, and not by the software they use.

Approach A has adopted the software – QSR N6, for analysis of the data obtained through semi-structured interview (Figure 1). N6 is selected for the research as it exhibits advanced data-handling and manipulation features being the sixth version of NUD*IST (Non-numerical Unstructured data Indexing Searching and Theorizing). The software aids data management, allowing text or discourse to be edited, contextually annotated, hyperlinked to other text, import and export to statistics packages and search text according to parameters specified by the user. N6 also contains matrix "cross tabulation" of coding to show and discover patterns in data, which can be exported as text report or table. As suggested by Blismas and Dainty (2003) coding and subsequent analysis require intensive input by the researcher, regardless of the mode to achieve them. However the use of software allows limitless manipulation on the data without altering the original data set, data- handling capabilities significantly increase the rate at which data could be accessed, retrieved and viewed. This provides a great advantage over the manual method. One of the limitations of using computer software packages for coding text documents is that only a small section of the data is visible at any instant, making data scanning very difficult.
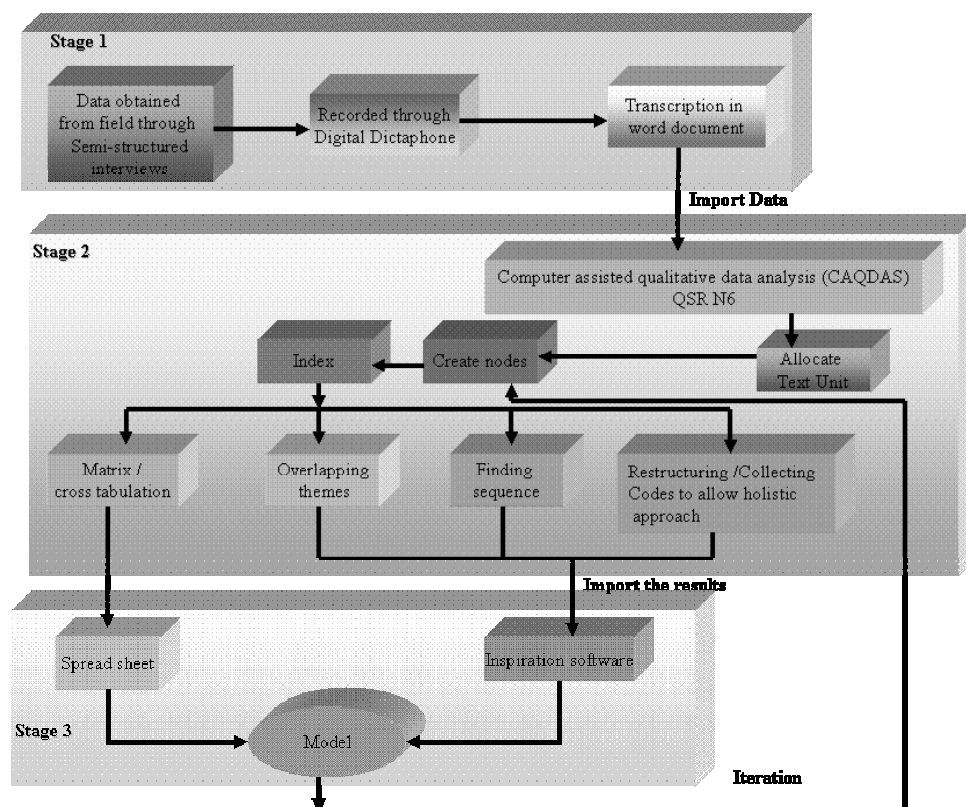
Figure 1: Process diagram for analysis

6.2 Approach B: The case against a software package

Nissan and Schmidt (1995) highlight the fact that words can mean so many things and have different meanings when used in conjunction with other words. This was evident in the case study data where some project issues were one-worded, some a phrase and some a sentence therefore making it difficult to attach meaning by using other words for a software package to pick up on. Coffey and Atkinson (1996) highlight that there are no computer software packages that are capable of doing an analysis on their own and that there is '… no great conceptual advance over manual data sorting.' The process of using such a package involves coding the text, however, the coding process does not differ a great deal from the manual method. In addition to this, coding is not the same as analysing and therefore the data has still to be analysed manually. Scott *et. al*. (2002) recognised that data could be programmed although it was felt that this approach would act as a 'filter between the researcher and the data,' as it was feared that the richness would be lost

from the data. This is supported in Cronholm (2002), who suggests that only a general analysis can be conducted using computer software. It is also suggested that manual coding permits the researcher to become more familiar with the data, Scott *et al*. (2002). This is an important feature in this study as the researcher has been able to identify and understand the project issues expressed in different forms by reading each one individually through the constant comparative method.

In this approach a significant factor also making it difficult to use a computer package is the manner in which the issues are expressed in words as various forms have been used to communicate the issues. These include clichés, adages, colloquialisms, figures of speech, questions, words or phrases, various terminology such as technical phrases or institutional terms and acronyms. Tables 2 and 3 give an example of some of the comparable issues that have been highlighted to differentiate the similar issues.

Tables 2 and 3: Comparable issues

HOTEL	HOUSING ASSOCIATION	TOWERS REFURBISHMENT	SECURE PROJECT WEB SITES
Budget	**Cost**	**Finance**	**Funding**
Contingencies (1B)	Aggregate tax	Cost reflecting design	£200 per month for a site
Cost (1B)	Availability of funding (7B 3R)	Inflation	Currently on shoestring
Cost in design terms	Cost in use to X (4B)	Life cycle of materials (0, 1)	Funding of web sites
Cost plan (1B)	Cost in use to tenant (1B)	No nasty surprises - open and honest (2, 4)	Outside funding to cover operating costs (1, 0)
Final account procedure	Cost limits (1B)	Openness	
Preliminaries (3B)	Costs in use (1B)	Process to manage out turn cost	
Provisional sums – what's included?	Inflation due to X programme	Quality promise	
Recovery of costs		Require cost certainty (0, 3)	
		Right price for job	
		Sufficiency of tender (5, 3)	
		Understanding project	
		Value for money	

HOSPITAL	TOWN HALL	INTEGRATED GROUP PEOPLE SYSTEM
Risk	**Risk**	**Risks**
£20m Budget Dictates Size in m2 (1B)	Changes in scheme (0, 1)	Be forward looking - not an inhibitor (1, 0)
Affordability of Specialist Equipment (1B)	Communications (1, 4)	Business will keep changing - selling off / merger / acquisition
Capacity Management by Strategic Health Authority	Condition of existing building	Compensation agreement with service providers
Consumerism	Conflict between conservatism and business plan	Do not create further level of bureaucracy
Content	Conflicting specialist advice	Driver to integrate stops
Current Budget £20m	Fear of risk taking	Integration driver support removed
NHS Estates Involvement	Impact of lack of funding on scheme (0, 3)	Internal politics (1, 1)
Procure 21 this is the First	Interpretation of information	Not co-locating HR until 2003
Section 106 Planning (1B)	Managing expectation (1, 3)	Overselling the product
Status of FBC	The organ	Risk - integrity of data / compromising data
Trust Commissioning		Risk of losing corporate support by lack of resource at implementation
Validation of Information Requirements (1B)		Risk of not resourcing procedure at the start
		Risks - possible to implement with number of IT departments
		Risks - system being too rigid
		Service provider robustness
		Support from the top of the organisation (4, 4)

It is evident from the way some of these issues have been expressed where confusion may result from the use of a computer software package.

6.3 Synopsis on the use of software packages

Computer packages can never replace the intuition of the researcher or the need to make judgments, which are a key characteristic of qualitative research. There are no ways of avoiding these time-consuming but essential aspects. Simister (1995) pointed out that one of the problems inherent within the richness of interview data is that analysis is impractical without a reduction in the form of data. Yet, this reduction must be balanced with general intelligibility and must also convey the deep meanings that have emerged from the analysis (Miles and Huberman, 1994). Coding and subsequent analysis require intensive input by the researcher, regardless of the mode used to achieve them.

7. Challenges of the grounded theory method

In both studies, the researches have had to overcome a number of challenges of using the grounded theory method. Any research method has specific characteristics associated with it that have to be addressed. The following is a condensed list of the challenges faced using this particular method to inform the researcher employing a grounded theory approach.

- The general management of the data i.e. sorting and coding.

- Dealing with a huge amount of data and prevention of getting 'lost' in the data.

- Ensuring the theory is grounded by standing back from the data to prevent prior assumptions; knowledge and experience influence the process. Therefore there is a requirement to have an open-mind: An open-minded approach to the data is something that can operate at a variety of levels. It is not possible to start a research study without some pre-existing theoretical ideas. Approach A is based on a literature review and pilot study, while approach B is based on literature review and experience.

- The unknown factor of when data saturation is going to occur. With other methods i.e. questionnaire the researcher normally has a pre-defined period of time in which to obtain the data from respondents and has an idea how long it will take to analyse the results from the nature and length of the questionnaire. This is not feasible with grounded theory as it is not possible to predict in advance the size of the sample that will be used.

- For analysing data there are various methods suggested by Glaser, Strauss

and Corbin, Glaser and Strauss, and other authors, which can cause a considerable amount of confusion amongst researchers. It is the researcher's decision to choose the path that suits them for analysis of their data.

In terms of challenges specific to the typical construction-industry researcher, the following was found:

- With regards to data gathering; it is a challenge to collect data across units in the SMEs and to have unrestrained, long term access to their organisations (Approach A).

- Some of the issues uncovered used specific construction terms and acronyms that would not easily transfer to the development of a formal theory outside the scope of the construction industry (Approach B).

- A level confidentiality had to be retained when reviewing the project issues which resulted in wording referring to projects and companies being removed from the data (Approach B).

Finally, it is important to consider some of the advantages of choosing to use the grounded theory method. First of all, it captures complexity, in the sense that if the data is very detailed and difficult to make sense of, the process of categorisation in grounded theory will start to organise the data into a sensible order so that the properties can be examined and coding can commence. Grounded theory also links very well to practice as the derived theory can be tested outside the research paradigm to investigate the applicability of the new theory. In addition to this, it supports the theorizing of 'new' substantive areas which can then be further explored to develop a more formal theory.

8. Recommendations to the grounded theorist

Having engaged in the aforementioned grounded theory studies the researchers are able to make some recommendations for others to consider prior to starting their individual studies:

- It is important to have a good background and understanding of the differences between approaches to prevent confusion and bias to specific methods.

- Development of a method to best suit the nature of the data being explored is important as well as a method which suits the researchers preferred style of investigation. However, it is important to adhere to the grounded theory principles to ensure that any theory derived is 'grounded.'

- A software package should only be used if it will support the study and not influence the researchers approach in anyway, for instance, by changing the direction of the research to suit the package chosen or the package available.

It is important to remember that provided the rules of grounded theory are adhered to, the researcher may adapt the method to suit their own research project as no research studies can be compared like for like. The literature on grounded theory provides the background, principles and rules, however it does not provide the researcher with a step-by-step guide to structure a study as there are too many variables involved. Therefore, the researcher has to be original when configuring their own approach.

9. Synthesis

This paper has highlighted two examples of the application of grounded theory in the construction industry in the areas of knowledge management and value management. A background on each research area has been given as well as valuable points with reference to grounded theory which have been picked up through the course of a comprehensive literature review. In addition to this, the research work has highlighted the case for and against use of a software package which has left use of such a medium open for debate that follows through from the work of Blismas and Dainty (2003).

Although, the grounded theory method has been used in both research studies, the two approaches are different in the techniques employed and the outcome expected, making for an interesting comparison on how the grounded theory method can be adapted to suit the nature of the study. The researchers have outlined the challenges faced which are mainly general with regards to the use of grounded theory but differ in terms of the techniques and sources of data obtained which pose specific challenges in

themselves. A series of recommendations have been made to the wider research audience and not specifically to the construction industry researchers which have been developed from the researchers experience from engaging in grounded theory studies that will be of use to those researchers who may be considering using grounded theory in their area of work.

10. Conclusions and further work

This study has illustrated the benefits and pitfalls of the use of software packages and has highlighted that use of these must suit the type of problem under research and not make the mistake of adapting the research problem to suit the capabilities of the software packages available.

Blismas and Dainty (2003) opened a debate on whether software aids qualitative data analysis or if it inhibits a multiplicity of approaches for qualitative data analysis. Since Approach A uses software and Approach B does not, this paper has succeeded in exploring the pros and cons of each and a more thorough review can be made in the later stages of investigation through subsequent comparative studies. It is anticipated that more research work on the use of software packages in research will be reported as a response to the work of Blismas and Dainty.

It is clear that grounded theory is very diverse in its application and can be modified and applied to suit the nature of the research problem and the particular research style of the investigator. This opens up the approach to wide audience of researchers who will use the method in different ways to analyse their sources of data which will also differ depending on the particular research techniques employed.

The two research studies have shown that the use of grounded theory can vary considerably, however, the fundamental aspect which must be adhered to is to ensure that the theory derived is 'grounded' in the data. It would be interesting to read more on these kinds of studies that use the grounded theory method to make cross comparisons and to

highlight the scope for the grounded theory approach.

Further work in the two ongoing PhD research programmes will be reported both individually with the possibility of another joint paper to identify the approaches taken for coding and categorising the data as well as generating the framework and theory.

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