CHAPTER 3: THE QUALITATIVE RESEARCH JOURNEY AND METHODOLOGY

3.1 INTRODUCTION

In Chapter 2, I provided a theoretical account of my research philosophy and design and the role of reflexivity in qualitative research. In Chapter 3, I proceed with a theoretical account of my research methodology, but take a more integrated stance by incorporating my own personal account of the qualitative research journey. However, it must be realised that it is impossible to give a full account of every step and decision taken in this chapter. I offer a big picture by chronologically presenting key phases and methodological decisions taken with the intention to establish credibility and demonstrate rigour at the outset.

This research process is illustrated in Figure 8, which I use to structure the format and discussions in this chapter.
Figure 8: The research journey
3.2 PHASE 1: GAINING ACCESS TO THE FIELD

Phase 1 describes the preparation prior to entering the field, such as establishing and deciding on criteria for the best suitable research participants and the sampling approach. This phase also describes contacting the participants and getting their consent from an ethical perspective.

3.2.1 Phase 1a: Research participant criteria and sampling

After I have gained clarity on what to study (research topic, problem and questions), how to study it (research philosophy, paradigm and design), it was time to consider who will be studied (participants).

Plummer (2001:18) suggests that a good participant should be ‘thoroughly enculturized’, ‘currently involved’ and ‘non analytic’, which implies that they should be able to talk about their experiences in raw detail. In addition, my promoter and I have jointly agreed that the participants needed to be information-rich, fairly articulate and have a high level of self-awareness, courage and honesty. Senge (1992:31) also states that part of being a leader is becoming mature as a human being and gaining life experience. Therefore we decided that participants had to have a minimum of 15 years’ experience in any given industry in the capacity of a leader. Participants consisted of two groups: leaders who are in the organisational position of implementing and/or formulating strategy, and academics exposed to the constructs researched.

I purposefully selected seven research participants consisting of practitioners and academics who met these requirements.
3.2.2 Phase 1b: Contacting the participants

During my discussions with Professor Yvonne du Plessis\(^2\) access to the research participants was considered, especially as the proposed research participants were executives in South African organisations and published academics. The nature of the research participants posed two potential problems:

- Gaining initial access to the individuals could be problematic, due to their positions and various gatekeepers. This proved to be a challenge initially only, as I got hold of their details to contact them directly or spoke directly to their personal executive assistants.
- Their diaries are typically full and to get a timeslot may be difficult. Once again, this challenge dissolved as I got an appointment with each of them within a two-week period through the help of one of our resident professors, Professor Stella Nkomo. This meant, however, that I had to meet them at their preferred place of meeting, which resulted in having to drive 456 kilometres to one participant!

Some participants also asked for an abstract or shortened version of my research proposal in order to prepare and be informed prior to the interview. Figure 9 shows an example of communication sent to a participant to gain preliminary approval (the participant’s name has been hidden to protect the identity).

\(^2\) I will hereafter refer to Professor Yvonne du Plessis as Prof Yvonne
The seven research participants consisted of practitioners and academics. As indicated in Table 7, I reiterated their position in the researchscape and paradigm of enquiry, adopted mostly through the interview which of course indicated their preferred type of reasoning. I have made clear distinctions between practitioner and academic as I have explained in the location of participants in the researchscape (Section 2.2.7). Testing true to the nature of the quantum organisation, we represented a microcosm of a complex environment ourselves, which I view as a strength of this study as highlighted in Table 7. All participants had at least 20 years’ experience, with the eldest participant being 73 years old.
Table 7: Participant information

<table>
<thead>
<tr>
<th>Participant number</th>
<th>Participant background</th>
<th>Industry</th>
<th>Paradigm of enquiry in researchscape</th>
<th>Gender</th>
<th>Race</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1</td>
<td>CEO/Board member of top South African company</td>
<td>Practitioner in Retail industry</td>
<td>Enquiry inside out</td>
<td>Male</td>
<td>White</td>
</tr>
<tr>
<td>#2</td>
<td>Academic, author and consultant in organisational behaviour</td>
<td>Academic</td>
<td>Enquiry outside in</td>
<td>Male</td>
<td>White</td>
</tr>
<tr>
<td>#3</td>
<td>Academic, author in organisational behaviour</td>
<td>Academic</td>
<td>Enquiry outside in</td>
<td>Female</td>
<td>Black</td>
</tr>
<tr>
<td>#4</td>
<td>CEO of South African company</td>
<td>Practitioner in Education industry</td>
<td>Enquiry inside out</td>
<td>Male</td>
<td>Coloured</td>
</tr>
<tr>
<td>#5</td>
<td>Systems engineer and business consultant</td>
<td>Practitioner in Manufacturing and Mining, amongst other industries</td>
<td>Enquiry inside out</td>
<td>Male</td>
<td>White</td>
</tr>
<tr>
<td>#6</td>
<td>Academic, author in engineering, mathematics and quantum physics</td>
<td>Academic</td>
<td>Enquiry outside in</td>
<td>Female</td>
<td>White</td>
</tr>
<tr>
<td>#7</td>
<td>Rector of South African university</td>
<td>Practitioner in Education industry</td>
<td>Enquiry inside out</td>
<td>Male</td>
<td>Coloured</td>
</tr>
</tbody>
</table>

The next step in gaining access to the field was to gain the participants’ consent.

3.2.3 Phase 1c: Getting consent

Ethics refers to the appropriateness of the researcher’s behaviour in relation to the participants’ rights, as well as a moral and responsible way of gaining access, collecting and analysing data and reporting findings, as indicated in Table 8.

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According to South African demographics, there are four major racial groupings: Black, White, Indian and Coloured. The majority of South Africans prefer to be viewed as ‘African’ or ‘South African’ as opposed to be categorised according to racial groupings, especially in the post-apartheid era. However, for the purpose of this study, racial groupings are being made to demonstrate the diversity in the participant selection and in an attempt to demonstrate an equal representation of the South African population.
The University of Pretoria’s Code of Ethics specifically states that no harm shall be done to a participant and I could enter the field only after the university’s Committee for Research Ethics gave clearance based on my research proposal.

Table 8: Ethical issues

<table>
<thead>
<tr>
<th>General ethical issues</th>
<th>Stage of research</th>
<th>Stage-specific ethical issues in this research</th>
</tr>
</thead>
</table>
| Privacy, voluntary nature, consent, deception, confidentiality, anonymity, embarrassment, stress, harm, discomfort, pain, objectivity, quality of research | Formulating and clarifying research topic | Participants’ right to useful research
|                                                            |                                    | Participants’ right to quality research                                                                      |
|                                                            | Designing research and gaining access to participants | Obtain written permission from participants to conduct the study
|                                                            |                                    | Participants’ right to be fully informed
|                                                            |                                    | Participants’ right to privacy                                                                               |
|                                                            | Data collection through interviews (inductively) | Participants’ right to informed consent
|                                                            |                                    | Participants’ right to withdraw
|                                                            |                                    | Participants’ right to anonymity and confidentiality                                                        |
|                                                            | Processing and storing of data | Participants’ right as an individual to the processing and storing of their data |
|                                                            | Data analysis and reporting of findings | Rights of participants to confidentiality and anonymity                                                      |

Sources: DiCicco-Bloom & Crabtree (2006:319); Saunders et al. (2007:180)

Informed consent can be defined as ‘the voluntary and revocable agreement of a competent individual to participate in a research procedure, based on an adequate understanding of its nature, purpose and implications’ (Leedy & Ormrod, 2005:101; Conneeley, 2002:186).

The participants agreed to sign a letter of consent detailing their participation and rights (Appendix A). One individual asked me not to take a picture as some of the information was sensitive in nature and might compromise confidential information, whereas the rest of the participants were quite comfortable with releasing their names and pictures. The right to privacy was of particular importance to this study and I made sure that the nature and quality of participants’ identities were kept strictly confidential. Because of the close personal discussions, no pictures, names or credentials are offered to avoid any problems of confidentiality and anonymity. Each participant was coded with a number, for example Participant #1 and Participant #2.
3.3 PHASE 2: DATA COLLECTION

The next step was to start the qualitative research journey that would, although unbeknownst to me, bring many insights and a setback, namely the loss of data. The data were collected from 18 November 2009 until 9 February 2010. Although the data collection and analysis are discussed under separated headings, in reality these two phases were overlapping as the one activity is part of the other activity. During data collection, data analysis was already underway.

3.3.1 Phase 2: Conducting interviews

Data collection proceeded through interviews. The interviews were individual and semi-structured, guided by the initial set of research questions and newly evolving research questions that emerged during the interviews. Constructivists believe that it is ‘impossible to separate the inquirer from the inquired into. It is precisely their interaction that creates the data that will emerge from the inquiry’, as opposed to a ‘smash-and-grab’ approach (Mills et al., 2006:9).

The venue for the interviews was chosen by the participants and most preferred their workspace. One of the participants even arranged for the interview to take place at one of his favourite spots in Cape Town, without the possibility of interruption from the public (Figure 10). This allowed for privacy. No interviews were conducted in coffee shops where external sounds could influence the tape-recording process. The field experience also enabled me to gain an understanding of the participants in relation to their environments, as they have chosen their workspaces as location for the interview.
Interviews were conducted in English, except for interview #6 which was conducted in Afrikaans. A translator was not used as both researcher and participant were fluent in English and Afrikaans. Table 9 is a summary of the interview schedule, indicating the duration and date of the interviews.

Table 9: A summary of the interview schedule

<table>
<thead>
<tr>
<th>Interview #</th>
<th>Date of Interview</th>
<th>Duration of interview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview #1</td>
<td>18 November 2009</td>
<td>02:24:34</td>
</tr>
<tr>
<td>Interview #2</td>
<td>28 January 2010</td>
<td>01:39:11</td>
</tr>
<tr>
<td>Interview #3</td>
<td>21 January 2010</td>
<td>00:34:40</td>
</tr>
<tr>
<td>Interview #4</td>
<td>4 February 2010</td>
<td>01:08:04</td>
</tr>
<tr>
<td>Interview #5</td>
<td>5 February 2010</td>
<td>00:54:39</td>
</tr>
<tr>
<td>Interview #6</td>
<td>8 December 2009</td>
<td>00:49:55</td>
</tr>
<tr>
<td>Interview #7</td>
<td>9 February 2010</td>
<td>01:22:21</td>
</tr>
</tbody>
</table>
Each participant was only interviewed once, with no follow-up interviews, except for follow-up telephonic calls to clarify meaning or to gather more information on particular metaphors and stories used.

3.3.1.1 Starting the conversation

I introduced myself, gave my background and explained my interests in qualitative research and in researching mental models of leaders in the South African quantum organisation. I also explained to the participants why they had been chosen and invited them to share raw stories. I then explained the individual informed consent form that I had included in the initial contact email. I re-emphasised that:

- Their identities, names and names of respective organisations would be treated as confidential, nor would any responses be disclosed in the research report that might disclose their identity
- No confidential industry-related information that might emerge would be disclosed in the research report
- Interviews would be recorded.

They signed the individual informed consent forms before the interview commenced. We also did a thorough clarification of our respective roles: both participant and researcher would co-construct in the conversation, although I would have some initial questions to provide a framework to the conversation.

I had initial anxieties for doing it ‘the right way’, but was frustrated because I could not find a ‘right way’, except for embodying equality, demonstrating impeccable listening skills and conversing as a participant researcher. Ironically, the need for ‘getting it right’ was shared by notably one participant, who gave me all the politically correct answers, neatly packaged and not willing, or perhaps not able, to go to the uncomfortable places with me.
The following entry from my research diary speaks about this experience (dated 5 February 2010).

The need for ‘getting it right’ was certainly not mine alone, which explains the phenomena of counter transference\(^4\) during one interview. Perhaps this insight helped me gain empathy for the participants who were not willing or able because of the need to get it right - Perhaps it is because dipping into your own mental models is messy and an unpredictable journey. The irony? I had to deal not only with the messy reality of the thesis, but also with my own and participants’ internal complexity which emerged during the process.

I enjoyed the interviewing process and was left inspired by not only the collective body of knowledge which was revealed by the participants, but also the courage of the participants to disclose in a very authentic manner necessary information about their own mental models and leadership experience in a complex environment. They shared not only the good, but also the bad and the ugly and therefore I am forever humbled by my participants. Knowing that I might not get an opportunity to do follow-up interviews and that it might be my only chance to gather rich information created anxiety, though most of the participants thought spontaneously of offering me more time if needed.

3.3.1.2 The research questions: an evolutionary matter

The initial formulated research questions (Section 1.6) were used as a framework for the discussion, as opposed to getting through as many research questions as possible. The basic research questions served as the first interview questions to delve more deeply into different aspects of the research issue. As more information was gathered during the interviews, I was enabled as ‘co-participant’ to ask more specific questions.

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\(^4\) Counter transference is a term used by therapists which implies the displacement or redirection of emotion onto the other party.
The iterative nature of preliminary data analysis coincided with data collection, which resulted in changing or adjusting the research questions for future interviews as the process unfolded. This enabled me to give account of my own and the participants’ lived experience in this co-constructed conversation. I also trust that this allowed for rich data rather than data resulting from superficial opinion-seeking questions.

To demonstrate the evolving nature of research questions, I have selected research questions which organically emerged in a co-constructed manner during interviews.

**Researcher asks during Interview #1:**
My question however is: What enables someone to ask those questions? What enables people to make that shift towards asking the right questions?

**Researcher asks during Interview #4**
But how do I get to that place of asking questions and what other picture is there? How can we bring in a picture of possibility?

**Researcher asks during Interview #5**
While I am listening to you...uhm (3 seconds’ silence)....a new question came up. Do the leaders in the quantum organisation think of themselves as leaders in the traditional and conventional sense of the word? Do they even think of themselves as leaders? If not, how do they think of themselves in a complex environment?

Interesting to note that most of the research questions were answered spontaneously as the conversation evolved. The central research question was: What does the learning and sense-making process constitute of?

**3.3.1.3 Listening and reflective skills**

The focus on the interviewer as an instrument and co-construct partner in interview makes strong demands on the interviewer’s level of competency. It requires impeccable listening skills to content (what is being said) and process (how it is being said), empathy and reflective listening skills (Dicicco-Bloom & Crabtree, 2006:314).
I listened on two levels:

- Content – I listened to what the participant was saying (e.g. emerging themes, discrepancies, multiple meanings, ambiguities, for words that hold multiple meanings while I had participants to clarify). During the interview I would feedback and reflect or reiterate issues to ensure that I had understood correctly. Any misunderstanding or misinterpretation was then clarified by the participant. This contributed to the trustworthiness of the data.
- Process – silence, sudden movements, non-verbal cues, energy levels that change suddenly.

I include my own voice in the text to demonstrate equality in voice and bring alive the lived experience of co-construction and to demonstrate the application of listening and reflective skills as such (Charmaz, 2000:520).

**Participant #3 responds after I (researcher) have reflected back to her what I have heard with an interpretive tone:**

*I haven’t really thought about it that way. That is a good summary. I haven’t thought about it that way (participant stares in front of her with 5 seconds’ pause).*

**Researcher and Participant#2 co-constructed conversation:**

*Researcher:* You said something interesting whilst I listened to you. You didn’t use the description of leader in a complex environment; you switched to the words ‘quantum thinker’

*Participant #2:* I don’t think it is insignificant that you have picked it up. I wasn’t even aware of, or realised that I have made that distinction. But I think there is a lot of value in what you have just picked up.

I spent a great deal of time paying attention to tone of voice, body language and other non-verbal behaviour during discussions as this is another means of collecting data. I also looked for ‘off-the-cuff’ and ‘informal conversations’ before and after the ‘interview’ and viewed these conversations as an integral part of the whole interview experience. These remarks were coded under themes. Sometimes interesting behaviour such as a sarcastic laugh, sudden pause and silence, sudden movement of the head and hands, and blushing emerged.
These behaviours were explored during the interview and the participant was then given the opportunity to discuss the meaning thereof. As participants described their understanding of the constructs, meaningful cues such as non-verbal expressions, quotations and sidetracks were also carefully documented in order to collect thick data.

3.3.1.4 Field notes

Strauss and Corbin (1990:184) advocate the use of a journal by the researcher to record thoughts and how they might influence his or her analysis of the data. I kept a journal not with the intention to keep researcher ‘bias’ at bay, but with the intention to keep an audit trail of my influence and experience during the co-constructed narrative (Mills et al., 2006:10). My field notes were an invaluable element of data collection and analysis. I spent roughly 30 minutes to an hour per interview making both descriptive and reflective field notes. Descriptive notes were on emerging themes, discrepancies and ambiguities in participants’ responses, whereas reflective notes were about my own reflections on the interview.

The saying that ‘ideas don’t keep office hours’ tested true as an inner dialogue or ‘conversation’ continued whether I was driving, bathing, making a cup of tea or, especially, running. Running means different things to different people (Figure 11). For me it means an opportunity to empty my mind, let go and let new insights and ideas emerge. While I engaged in these activities, I became mindful and expectant of new insights. The field notes were also a way of keeping track of my own mental model of the study.
3.3.1.5 Data recording and storing

A high-quality digital recorder was used to download my interview recordings. Recorded data were carefully guarded and destroyed when transcription and analysis were completed. I had an incident where the recorder had insufficient space left for the particular recording. This alerted me to the importance of preparedness on the technical front: sufficient space, extra battery, and checking the recording immediately after the interview in the participant’s presence to ensure that the interview was recorded.
3.4 PHASE 3: DATA ANALYSIS

At this point, my qualitative research journey took a turn into the unknown: ‘how’ do I analyse the data and will I do it right? For the next 10 months I sifted through piles of data looking for patterns, trends, similarities and dissimilarities.

It is important to acknowledge that the text is a sample of what is known by an individual and hence a sample of the content, form and function of the participant’s mental model. Carley and Palmquist (1992:604) suggest specific guidelines regarding textual analysis on mental models:

- Identify ‘codes’, which is equivalent to open coding
- Define the types of relationship that exist between codes and create categories, which is equivalent to axial coding
- Use computer-assisted approach.

The underlying objective of qualitative data analysis is the categorisation of the data into meaningful parts or categories. The categorisation typically involves also recognising and identifying relationships between categories and developing a theory or conceptual framework to reach conclusions (Charmaz, 2000:509). This allowed the exploration of data in a systematic and rigorous manner:

- To comprehend and manage the information gathered in complex constructs;
- To integrate related data from different interviews;
- To develop a framework based on relationships, patterns and categories; and
- To draw and verify conclusions (Saunders et al., 2007:479).

Data analysis occurred concurrently with data collection, which in turn influenced the formulation of research questions and coding. This iterative process is called the constant comparative method (Leedy & Ormrod, 2005:141). The process of analysis continues until no new themes emerge and a level of saturation is reached (Dicicco-Bloom & Crabtree, 2006:318).
3.4.1 Phase 3a: Transcribing

The first step in data analysis was the transcription of the interviews. I transcribed the interviews myself, which increased my awareness of and familiarity with the data exponentially. It also helped with the re-formulation and preparation of subsequent data for the next interview.

Transcribing the tape-recorded interviews was an intensive and time-consuming process. Therefore, I can confirm first-hand the following observation by Plummer (2001:149-501): ‘[A] first major task after interviewing for most researchers is transcription (and possibly editing too). This is a hugely time-consuming – and often boring – process. For every hour of tape, it can take up to ten hours to transcribe – especially if you are to engage in analysis at the same time.’

However, this ‘painful’ experience brought insight: I became aware of capturing the spoken word in text form through sentence structure, quotations and subtle nuances.

3.4.2 Phase 3b: A close reading of the raw data and voice

This step, before coding, involved a close reading of the transcript by me and was drawn from a practice advocated by Miles and Huberman (1984:59) in arguing for systematic procedures in data analysis. This close reading gave me an initial sense of some of the issues arising from the data. It afforded me the opportunity to read the transcript as a whole, to listen to the rhythm and beat of the script and the participants’ voices as well as my own during the interviews without imposing a mind of coding on the script. It further alerted me to process commentary, which assisted me to read ‘for regularly occurring phrases and with an eye to surprising or counterintuitive material’ (Miles & Huberman, 1984:22). I read the transcripts twice before I began coding.

For example, what the interviewees regarded as a leader in the quantum organisation surprisingly elicited interesting responses.
Most participants suggested and made the assumption that a leader in a quantum organisation is someone who already maintains a position of power and holds a strategic position, such as an exclusive executive position. However, one participant clearly outlined that a leader in a complex environment is often not in an executive position, but from anywhere in the organisation from supervisory level. This account enabled me to draw more nuanced conclusions about the role and function of a leader in a complex environment, rather than focusing solely on who the leader is in a complex environment. A subtle yet significant reframing and refocus pointed me in the right direction and lead to confirmations during the literature review. This example illustrates the importance of reading transcripts closely and repeatedly and guarding against the mechanistic application of procedures and assumptions made by the researcher. It also demonstrates ‘investigator responsiveness’, which Morse, Barrett, Olsen & Spiers, (2002:11) explain as follows: ‘The investigator remains open, uses sensitivity, creativity and insight, and is willing to relinquish any ideas that are poorly supported regardless of the excitement and the potential that they first appear to provide’ as opposed to ‘responding reactively to the loudest bangs and brightest lights’ in the text.

The next step was to sanitise the interview transcripts (taking out all names and references) and prepare the format of the documents for input purposes into the Atlas.ti 6.0, according to guidelines supplied by Liz Archer from the Centre for Evaluation and Assessment at the University of Pretoria. Liz Archer is regarded as an expert in qualitative research and computer-assisted data analysis.

3.4.3 Step 3c: Coding

Coding means the naming of data segments with a label that simultaneously categorises, summarises and accounts for the piece of data (Charmaz, 2000:43). Graneheim and Lundman (2004:106) elaborate on the notion of a code and refer to a code as a constellation of words and/or statements that relate to the same central meaning, in other words ‘codes are tools’ to think with. This process entails data fragmentation and contributes to what Miles and Huberman (1984:11) refer to as ‘data reduction’.
The next level in data analysis is creating sub-categories of commonalities. They consist of multiple codes which are internally homogenous and externally heterogeneous and answer the question of ‘what?’ (Graneheim & Lundman (2004:107). Coding assisted me in managing information, and describing and interpreting segments of data. It also assisted with the building of a conceptual framework from the onset. However, coding, to my surprise, is not a simple, linear or mechanical task.

The next level of data analysis involves the concept of a core category which has multiple meanings, and creating themes is a way to link underlying meanings together in categories. Themes, therefore, operate as threads of meaning that recur and answer the question ‘how?’ (Charmaz, 2006:11; Graneheim & Lundman; 2004:106), as illustrated in Figure 10 below.

![Data analysis process](source: Charmaz (2006:11))

Each transcript was coded in its entirety before I moved onto the next transcript to prevent getting confused. However, I found that once I was finished with one script, new insights and connections emerged which was evident but not coded as such in the previous texts – an iterative process again.
I did however start to code during the interview process. This assisted me in recognising new possibilities or opportunities for questioning and deepening the interview process, and I then used that insight and learning in the next interview.

Under the next few headings, I discuss from a theoretical perspective, how I approached the data analysis and what the identification of codes and categories entailed. I also give an account of how I approached this, with my own personal reflections on the experience of coding.

3.4.4 Computer-aided data analysis

I met Liz Archer on 27 May 2010, before I bought an Atlas.ti student license on 12 July 2010. Atlas.ti was used in this study as it has its origin in grounded theory.

Using computer-aided data analysis has the following advantages:

- It allowed me to be in control during the actual coding and interpretive process, as the interview text on screen was linked to codes. The purpose of such software was not to provide me with a methodological or analytic framework, nor to think on my behalf.
- It allowed for a systematic and multilevel coding of data.
- The ‘source tags’ enabled me to go back and see where the original text has come from (original interview, who, when, contextual factors). For example, I used the functionalities offered by the software to search for codes within a document in order to verify whether all participants were reporting and saying the same things. For instance, most of the participants repeatedly mentioned that ‘knowing’ what to do in an uncharted area or situation, paradoxically came from acknowledging and being comfortable first by ‘not knowing’. Using the first-level code ‘not know’, a code that emerged from the data, I conducted an electronic search to see how many of the participants, across data sets, reported this particular thought pattern. From this, I compared and reflected and could weigh the significance of this particular finding in relation to the form and function of the mental model of a leader in a complex environment – by constantly checking and rechecking the data.
Strauss and Corbin (1990:212) stress the importance of memos to assist with the conceptualisation during data analysis. Memos can be viewed as electronic field notes (see Section 3.3.1.4 on field notes). There were also memo areas, which allowed the capturing of immediate insights and more questions on aspects that arose from the text. In the figure below, I questioned whether the quantum age originated from the quantum leaps in technology, or has it always been in existence, although our mental models did not allow us to label or interpret it as such? This question and insight came during a flight mid-air between Cape Town and Johannesburg, South Africa. The memo functionality of the Atlas.ti allowed me to capture emerging themes anytime and anywhere.

**Figure 13: Atlas.ti memo during data analysis**

MEMO: ME - 24/02/10 [1] (0 Quotations) (Super, 24/02/10 20:33:20)
No codes
No memos
Type: Memo

Is it the Quantum age or has it always been there just mental mode did not acknowledge it? See if old cultures live, however current technological facilitated and acted as a catalyst to see existence of ‘Quantumness’ (sic) of our environment.

### 3.4.4.1 Methods of reasoning

Inductive, deductive and abstraction as methods of reasoning are used in this study. The use of both the inductive and deductive perspectives has enabled me to consider the multiple realities of the mental model in the quantum organisation (Saunders et al., 2007:116).
There are three approaches in generating new knowledge:

- Deductive reasoning begins with a theory, hypothesis or research question and then attempts to operationalise and test the assumptions of the theory, hypothesis or research question in practice.
- Inductive reasoning begins with the observation of phenomena in order to reach wider and general statements based on the phenomena witnessed.
- Grounded theory typically requires the fracturing of data through coding and then puts the data back together through abstraction, which is another mode of reasoning.

3.4.4.2 Open Coding

Miles and Huberman (1984:69) refer to the naming, labelling and classifying of text in a working set of codes as ‘first-level coding’, while Charmaz (1995:30) uses the term ‘initial coding’. It is suggested that first-level coding is mostly descriptive. Coding entails the assigning of unique labels to text passages that contain references to particular categories of information, as well as the disaggregation of data into units, and does not apply pre-existing categories to the data (Miles & Huberman, 1984:56).

The initial coding in this study included broad and fine codes, as introduced by Wengraf (2001:227). For example, a broad code was ‘mental models’ and fine codes would be ‘mental models: cognitive’, ‘mental models: metaphysical’ and ‘mental models: emotional’. These finer codes are nestled in the broad code ‘mental models’, but are not categories because they do not focus on patterns and relationships in the data; they are merely a description on a detailed level of a construct (Charmaz, 2006:50). I did line-by-line or rather, word-by-word coding through the computer-assisted programme called Atlas.ti. Figure 14 is a screenshot to illustrate the Atlas.ti-assisted coding process.
This approach has elicited critique from a constructivist that the voice and individuality of participants might get lost in the coding and conceptualisation. Cognisant of this, I have attempted to seek meaning in the data that goes beyond the surface, searching for tacit meanings and beliefs and assumptions. In capturing these during coding, I have made use of what Charmaz (2006:550) refers to as ‘in vivo’ coding. In vivo codes are used to capture participants’ special terms and assist to preserve their meanings or their view in the coding itself. These codes kept the coding closer to the participants’ experiences (Mills et al., 2006:12). I looked for their implicit meanings and in doing so, was able to link them to a category.
I was often unsure of whether I was doing it ‘right’ and felt overwhelmed by the number of codes. On 12 August 2010, I met Prof Yvonne at her office to give feedback on progress and discuss fears and anxiety regarding coding.

Figure 15: Top: Prof Yvonne and myself discussing codes and categories. Bottom: I am giving feedback on progress and discuss insights gained.
Unfortunately, ‘sleeping over it’ and taking a procrastination stance towards coding did not cure this anxiety, and I decided to deep dive back into the literature and phone a PhD graduate. The indication from Strauss and Corbin (1990:58) that open coding is indeed a very careful and minute interpretation of data, as well as words of encouragement from my colleague, created a normalising experience - anxiety is normal.

It sparked a flame of confidence in my own ability to continue confidently with the coding process, as reflected in the following entry in my research diary (dated 14 August 2010):

> I was often tempted to simply take away the ‘difficult’ data and settle for the ‘easy’ ones. However, sitting through the difficulties showed me complexity theory in action – essential patterns and meaning initially emerged. Complexity theory is not just a theory after all. I am experiencing it first-hand!

I ended up with 144 codes. Certain codes, such as ‘letting go’, ‘seeing’ and ‘understanding the context’, were central to the nature of the mental model. Other codes suggested the context of complexity and the quantum organisation functioning within a complex context.

### 3.4.4.3 Axial coding

The second level coding involved two steps: firstly, identifying clusters and hierarchies of information and, secondly, a deeper level of analysis identifying patterns and relationships between codes. The categorisation of codes is also known as axial coding. Strauss and Corbin (1990) define axial coding as a ‘set of procedures whereby data are put back together in new ways after open coding, by making connections between categories’, which implies identifying and recognising relationships between categories of data. This process is also referred to as ‘focused coding’ in which the most significant and/or frequent earlier codes are used to sift through larger amounts of data and synthesise larger segments of data.
By arranging a number of sub-categories, I began interpreting the relationship between codes and between sub-categories. For example, 'pause stop and thinking from the outside' would be a sub-category as it introduces an interpretive element of the quantum thinking process. This second step helped me to begin producing the findings.

Atlas.ti refers to 'families' when codes are meaningfully coded together. A family must be created manually and are not generated automatically. Two panes appear in the middle of the window – the one on the left for codes which have been grouped in the family and the one on the right (in red) for non-members. Codes I wished to group together in the family were then transferred manually to the left pane. The numbers in the upper column after the code family name indicate how many codes have been allocated to this specific code family (Figure 16).
I also experienced, as suggested by Miles and Huberman (1984:57), that this part of the coding process was both descriptive and interpretive, as codes are partly analytical and they link segments of text to a particular construct.

Atlas.ti enabled me to generate electronic reports on the codes attached to a category. These summaries included evidence in the form of quotations from the data and a weighting of evidence based on how many times the single code came across and was mentioned by participants. Patterns of repetition of occurrences when talking, unusual disclosures and consistent silences were part of the findings (Miles & Huberman, 1984:51-54). The result was 20 sub-categories, with quantum thinking (consisting of 46 codes), quantum leader (consisting of 42 codes) and quantum organisation (consisting of 45 codes) as the themes with the most codes attached to them. For an illustration of the axial coding, refer to Section 4.2.

### 3.4.4.4 Selective coding

Strauss and Corbin (1990:92) point out that selective coding is a process where the researcher selects a core or central category and then systematically relates it to the sub-categories to validate those relationships in the process. The result is core categories.

I selected the sub-categories and grouped (clustered) sub-categories with underlying similarities into core categories and defined these new core categories in terms of the conceptual framework from which they emerged. For an illustration of the selective coding, refer to Section 4.3.

### 3.4.4.5 Data loss

The content of this heading is ironic, seeing that it flows from a previous discussion on data recording and storing (see Section 3.3.1.5). In September 2010, I lost data on my hard drive and external hard drive due to unforeseen events. Luckily, I kept a hard copy of every article and coded interview, since a PhD graduate who also experienced data loss shared this misfortune with me early on in my study.
This meant that I had to type up and code all interviews again, but it gave me a second opportunity to conduct open coding and re-assess my categories. New insights and confirmations of my previous coding emerged through this painful, yet valuable experience. It did, however, slow me down significantly.

3.5 PHASE 4: LINKING THE DATA WITH THE LITERATURE

The place of a literature review in grounded theory has been debated in order to reach clarity about when and why to conduct the literature review. Some researchers (McGhee et al., 2007:334) are of the opinion that an initial high-level literature overview enables researchers to justify before starting to develop the theory. Furthermore, an initial high-level literature overview facilitates theoretical sensitivity and awareness of the complexity and depth of constructs to be researched, provides a secondary source of data for triangulation purposes (McGhee et al., 2007:336). After data had been collected inductively, a second and more in-depth review of the literature was conducted with the aim to link existing research and theory with concepts (derived deductively), constructs and properties of the new theory that emerged inductively. Up to this point I have avoided a more thorough literature review to ensure that the themes would emerge from the data itself.

The literature review that followed was structured around significant sub-categories and core categories that had emerged. Literature on the categories was then synthesised with the aim of an integrated theoretical understanding that would

- articulate attributes and the complexities of leaders’ mental models in the quantum organisation;
- discover the scope of existing knowledge on mental models of leaders in the quantum organisation, after which findings could be validated and a theory could be developed; and
- increase awareness and pro-actively avoid conceptual and methodological pitfalls (McGhee et al., 2007:336).
Linking the categories with existing literature was very time-consuming, chaotic, messy, like falling into a labyrinth of information, but very rewarding. This process occupied me from September 2010 until January 2011.

3.6 PHASE 5: CONCEPTUAL FRAMEWORK

A theory can be defined as ‘a set of interrelated concepts, definitions and propositions that represent a systematic view of phenomena by specifying relations among variables, with the purpose of explaining and predicting phenomena’ (Kerlinger & Lee, 2000:11). The primary goal of a theory is therefore to answer the questions how, when and why. Miles and Huberman (in Veal, 2006:54) describe a conceptual framework as follows: ‘A conceptual framework explains, either graphically or in narrative form, the main things to be studied – the key factors, constructs or variables and the presumed relationships among them.’ This description suggests that a conceptual framework is simply a graphic or written description of a set of relationships which still needs to be tested empirically.

Building the conceptual framework based on my data analysis enabled me to consolidate core categories. However, the challenge proved to be how to visually convey my conceptual framework to demonstrate to the reader the complexity of the nature and structure of the mental model of a leader. I had numerous meetings with Prof Yvonne where we brainstormed on the most effective format to visually display the conceptual framework.

3.7 RESEARCH RIGOUR

Rigour is defined and demonstrated when the epistemological and ontological philosophy of a research study is displayed congruently with the methodology of data collection, analysis and interpretation. Historically, Lincoln & Guba (1985:300) and Strauss and Corbin (1990:222) put forward a strong argument that, because interpretive research is based on a different set of ontological and epistemological assumptions, it cannot be measured against the traditional criteria of validity and reliability (Morse et al., 2002:2). Strauss and Corbin (1990:250) advocate a redefinition in order to align to the qualitative research orientation.
Baxter and Eyles (1997:505) suggest a set of evaluation questions derived from a review of qualitative work to demonstrate rigour, as suggested by Lincoln and Guba. The criteria are credibility, dependability, confirmability and transferability as juxtaposed against traditional quantitative criteria in Table 10.

### Table 10: Conventional and alternative criteria for qualitative research

<table>
<thead>
<tr>
<th>Traditional criteria to assess rigour</th>
<th>Criteria to assess trustworthiness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal validity</td>
<td>Credibility</td>
</tr>
<tr>
<td>External validity</td>
<td>Transferability</td>
</tr>
<tr>
<td>Reliability</td>
<td>Dependability</td>
</tr>
<tr>
<td>Objectivity</td>
<td>Confirmability</td>
</tr>
</tbody>
</table>

**Sources:** Conneeley (2002:186); De Wet & Erasmus (2005:28); Lincoln & Guba (1985:300)

It is interesting to note that authors distinguish between conventional and alternative criteria, whereas the ‘alternative’ is not really an alternative; it is the criteria.

Doyle and Ford (1998:27) postulate that accurate, unbiased measures of mental models can only be done through rigorous experimental research. Nine rules are suggested in order to ensure rigour and quality in researching mental models. However, having a closer look at the epistemological orientation, it appears that there is a strong positivist and quantitative orientation present by using the traditional set of criteria to assess rigour, which is not aligned to the epistemological and ontological orientation of this study (De Wet & Erasmus, 2005:27; Lowes & Prowse, 2001:472).

#### 3.7.1 Credibility

Table 11 outlines a demonstration of evidence for meeting trustworthiness criteria with specific reference to credibility.
Table 11: Credibility criteria

<table>
<thead>
<tr>
<th>Methods for meeting credibility criteria</th>
<th>Reference to sections for evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adoption of appropriate, well-recognised research method</td>
<td>Chapter 0</td>
</tr>
<tr>
<td>Purposeful sampling</td>
<td>Section 3.2.1</td>
</tr>
<tr>
<td>Prolonged engagement with some of the participants and familiarity of participants' culture</td>
<td>Section 2.2.6</td>
</tr>
<tr>
<td>Interview tactics to ensure honesty and rapport</td>
<td>Sections 3.3.1.1 and 3.3.1.2</td>
</tr>
<tr>
<td>Iterative questioning in data collection dialogues</td>
<td>Section 3.3.1.2</td>
</tr>
<tr>
<td>Use of reflective commentary</td>
<td>Section 3.3.1.3</td>
</tr>
<tr>
<td>Thick description of phenomena</td>
<td>Chapter 4</td>
</tr>
</tbody>
</table>


3.7.2 Dependability

Table 12 outlines a demonstration of evidence for meeting trustworthiness criteria with specific reference to dependability.

Table 12: Dependability criteria

<table>
<thead>
<tr>
<th>Methods for meeting dependability criteria</th>
<th>Reference to sections for evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recorded data</td>
<td>Section 3.3.1.5</td>
</tr>
<tr>
<td>Purposive and theoretical sampling</td>
<td>Section 3.2.1</td>
</tr>
<tr>
<td>Participants’ confidentiality protected</td>
<td>Section 3.2.3</td>
</tr>
</tbody>
</table>

However, the usual qualitative reliability measures, such as member checking or peer checking (asking panel of experts to re-analyse the data), are questioned from an epistemological approach. Rolfe (2006:305) postulates that if reality is assumed to be co-constructed and consisting of multiple truths, then repeatability is not essential and one should not expect fellow researchers to arrive at the same themes and categories. Therefore, any attempt to increase reliability through checking is coined as ‘artificial consensuses at the expense of the validity of the data. Consequently, I did not include reliability measures such as member checking.

3.7.3 Confirmability

The table below outlines a demonstration of evidence for meeting trustworthiness criteria with specific reference to confirmability.

<table>
<thead>
<tr>
<th>Methods for meeting confirmability criteria</th>
<th>Reference to sections for evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulation to reduce effect of researcher bias</td>
<td>Not applicable. Already put forward the argument of the non-existence of researcher ‘biases due to constructivism approach.</td>
</tr>
<tr>
<td>Explication of researcher’s beliefs and assumptions</td>
<td>Section 1.7.1</td>
</tr>
<tr>
<td>Recognition of shortcoming in methodology</td>
<td>Section 7.6</td>
</tr>
</tbody>
</table>
| Audit trail products  
Thick description of audit trial | Chapters 0 and 0 |
| Meticulous data management and recording  
Verbatim transcription of interviews (careful notes of observations, clear notes on theoretical and methodological decisions, accurate records of contacts and interviews) | Chapter 0 |

**Sources:** Baxter & Eyles (1997:512); Lincoln & Guba (1985:289-331); Shah & Corley, (2006:1830); Shenton (2004:73)
Triangulation is mentioned as a method to meet confirmability criteria in order to ‘reduce bias’, whereas triangulation was applied in this study for different purposes. The combination of different sources of data, the methodology, methods of reasoning, and theory offers the following triangulation options for this study (Baxter & Eyles, 1997:514; Conger, 1998: 111):

- Data triangulation, which is the use of various sources in the study such as a combination between leaders in practice and academics
- Theory triangulation, which is the use of multiple perspectives and theories (cognitive sciences, complexity sciences, quantum physics)
- Triangulation in methods of reasoning such as induction, deduction and abduction.

Furthermore, triangulation

- May lead to thicker, richer data
- Leads to integration or synthesis of theories
- May uncover contradiction
- Confirms and corroborates findings in order to provide richer data and mitigate paradoxes in data
- Provides a fuller picture and deeper understanding and enhances description, understanding and definition of constructs, which leads to an integrated approach.

Conger (1998:111) warns against over-reliance on interviewing as principal methodology and suggests method triangulation in gathering data. Conger (1998:11) asserts that qualitative researchers will fall in the same trap as quantitative researchers who use surveying as their principal method. It is therefore imperative to use other qualitative strategies in addition to the interviews to ensure:

- Method triangulation – I used the principles of grounded theory and qualitative and pragmatist approaches.
- Multiple perspectives on phenomena being studied – I employed multiple theories on conducted interviews with several participants to gather multiple perspectives on constructs investigated.
3.7.4 Transferability

Table 14 outlines a demonstration of evidence for meeting trustworthiness criteria with specific reference to transferability.

Table 14: Transferability criteria

<table>
<thead>
<tr>
<th>Methods for meeting transferability criteria</th>
<th>Reference to sections for evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purposeful sampling</td>
<td>Section 3.2.1</td>
</tr>
<tr>
<td>Detailed and thick description of concepts, categories documented and analysed after interviews, and literature review</td>
<td>Chapters 2, 3 and 4</td>
</tr>
</tbody>
</table>


3.8 CONCLUSION

It is suggested that a researcher should construct a decision trail explaining the choices on research methodology and decisions taken during the journey (Bowen, 2008:7-8; Jootun et al., 2009:45; McGhee et al., 2007:44). In this chapter I have attempted to construct a decision trail in a systematic manner by referring to appropriate research methodology literature and personal insights, as well as describing the process since entering the field up to the submission of the thesis.

According to my epistemological orientation I do not ask if my biases were relevant, but rather how they were relevant. As a researcher I have found that my emotions and values were always prevalent; however non-judgemental I tried to be. It is also clear that my behaviour as a researcher affected participants’ responses and thus influenced the direction of the findings.
Another researcher with a different repertoire of knowledge and experience, a different set of assumptions, would probably have unfolded a different story. This first-hand experience is echoed by Hammersley and Atkinson as cited in Finlay (1998:455): ‘We must work with what knowledge we have, whilst recognising that it may be erroneous and subjecting it to systematic inquiry, instead of treating reflexivity merely as a source of bias, we can exploit it’.
SECTION B: OUR STORY

I call this section ‘our story’ because the data derived represent the construction of how we (participant researcher and participant interviewees) moved towards a co-constructed narrative. This section refers to Chapters 4 and 5 and cover the following:

In Chapter 4 I present the sub-categories and core categories which emerged during axial coding, citing direct examples of responses from interviews.

In Chapter 5 I conduct a literature review.