

## CHAPTER 5: LITERATURE REVIEW

### 5.1 INTRODUCTION

Foxcroft and Roodt (2001:176) define a systematic literature review as ‘a review of the evidence on clearly formulated questions that use systematic and explicit methods to identify, select and critically appraise relevant primary research, and to extract and analyse data from the studies that are included in the review.’ This literature overview is structured in such a fashion that it reflects the research questions of the study, as well as investigates the results of axial codes.

First, complexity theory informed the understanding of the complex South African context or the ‘quantum age’ as it is referred to by participants. Thereafter, the form and function of mental models were investigated and I concluded with an investigation into the existing body of knowledge to inform the process describing the shift and change in the content of the mental model.

The conclusions based on results and the literature is discussed in Chapter 6.

### 5.2 COMPLEXITY THEORY

Whereas it has been established that reality contains any amount of variables, traditional theories in management, leadership and personality do not reflect complexity and multiple truths (Gummesson, 2006:169). Complexity theory, on the other hand, offers unique perspectives of organisational behaviour and the generation of dynamic adaptability in the context of the quantum age. Such a perspective challenges the Newtonian reductionist approach, systems theory and other related notions of predictability, planning and coordination (Marion & Uhl-Bien, 2001:389).

The key message of the theory of complexity is that our world is the result of our interactions with one another and the environment, and is not only subjective. Therefore, there is also an alignment between complexity theory and my postmodernist philosophical orientation and constructivist paradigm.

Dent (1999:5) offers a definition that ‘complexity science is an approach to research, and a perspective that makes the philosophical assumptions of the emerging worldview’. Complexity theory is the study of dynamic behaviours that interact in an interdependent fashion and act as adaptive agents under conditions of internal and external pressure. It is useful to summarise the three dominant characteristics of complex systems: they involve interacting units, they are dynamic and they are adaptive, as explained in Table 17.

**Table 17: Characteristics of a complex system**

Characteristic of a complex system	Explanation
<b>Interactive</b>	Complexity theory examines the patterns of the dynamic mechanism that emerge from the adaptive interaction of many agents (multiple stakeholders)
<b>Dynamic</b>	Things change and emerge over time
<b>Adaptive</b>	Ability to adapt on individual and macro-level

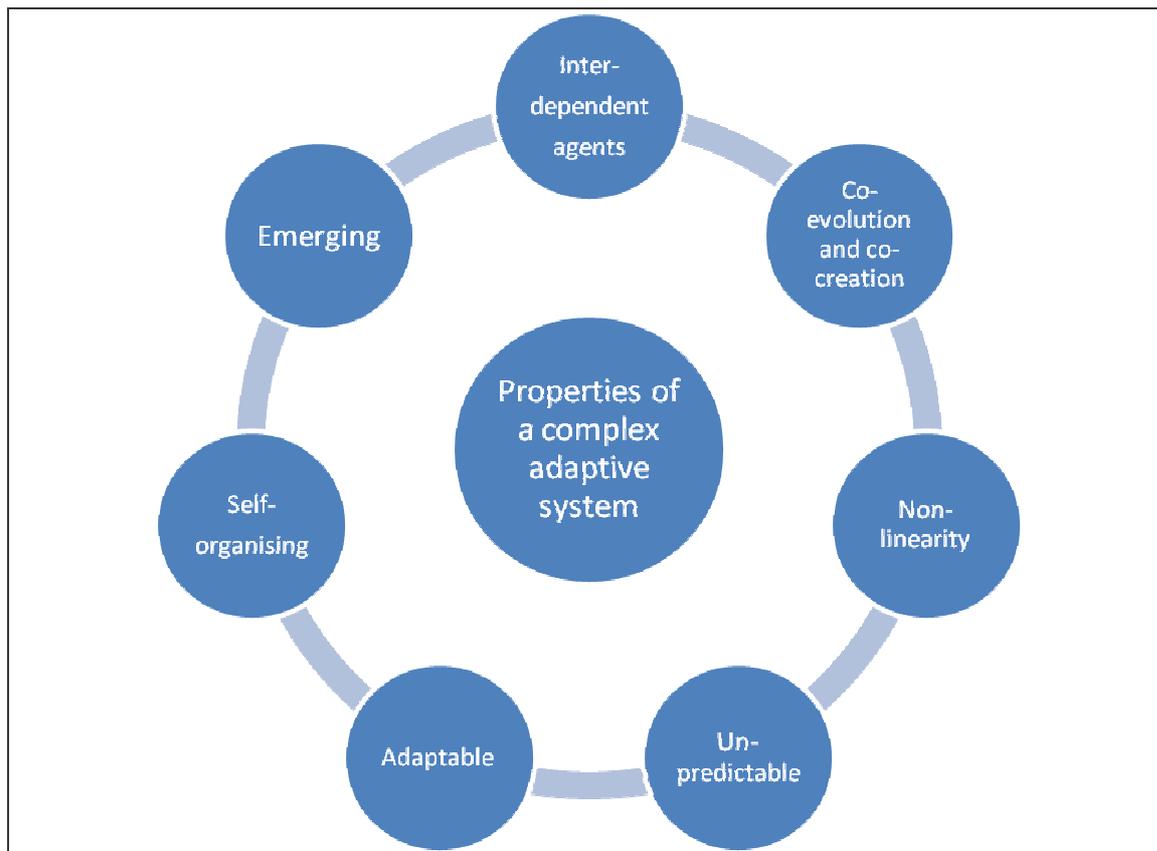
**Source:** Palmberg, 2009:485

### 5.2.1 Assumptions of complexity theory

Complexity theory is based on a set of assumptions as illustrated in Figure 18.

- Complexity theory does not require coordination or input from outside sources (i.e. traditional top-down leader) that creates order in behaviour and structure.
- Order can be created by getting rid of energy, which is called dissipating. When a system becomes overly tense or destabilised, a sudden release of energy will occur and new order will emerge from this dissipative process – almost a mini big bang event! Complexity theory describes this as emergent, non-linear change.
- Complexity theory argues that the future is totally unknowable (link to ‘do not know’) due to the nature of dynamic interactions, interdependencies and relationships (i.e. relationships among stakeholders, workers and leaders) which are influenced, in turn, by random properties. This combination can have a tremendously unpredictable effect on the future of the systems because they are driven by random dynamics and complex interactions in the network.
- Complex systems are based on chaos and self-organised order. In other words, the systems are continuously changing and yet preserve some degree of structure at all times. Because the system is continuously changing, the outcomes are path dependent and may be layered with multiple values or ‘multiple truths’ from stakeholders.

**Figure 18: Properties of the quantum organisation**



**Source:** Palmberg, 2009:485

Complexity science provides a starting point for discussing both the environment and nature of the quantum age, as well as the complexity of the internal structure of the leader's mental model. Chaos theory was not used in this particular study because it is in its essence still deterministic in nature (Gummesson, 2006:170).

The transferring of natural science theories and concepts to social sciences is often being regarded as 'unscientific' or lacking rigour, and labelled as guru-like evangelism. In some cases this may be true, but in this study, I am not attempting to master my understanding of the complexity theory. My search led me to complexity sciences to prove that not only metaphorical but also genuine commonalities exist between the physical realm and social phenomena of leaders. As it turned out, complexity theory was particularly helpful in describing and explaining the behaviour of organisations as complex adaptive systems, while they affect and are being affected by their environment (Houchin & MacLean, 2005:152; Murray, 1998:275).

### 5.3 THE QUANTUM ORGANISATION

A literature review of the nature, form and function of the quantum organisation is presented. A simplistic definition of an organisation is a group of humans working together towards reaching a common goal (Conner, 1998:13). The word ‘quantum’ literally means ‘a quantity of something’. The ‘something’ does not, however, refer to material things, but rather to energy with potentiality and possibility (Shelton & Darling, 2001:264). As can be deduced from Table 18, the existing literature on the quantum organisation is mostly descriptive (Chaize, 2000:95; Conner, 1998:10; Denton & Vloeberghs, 2003:84; Guillory, 2007:91; Karp, 2006:3; Kilmann, 2001:76; Quigley, 2001:11; Shelton & Darling, 2001:264; Wheatley, 2006:36; Youngblood, 1997:8; Zohar, 1998:56). For example, Deardorff and Williams (2006:14) refers to a quantum organisation as a certain type of capacity.

**Table 18: Definitions of the quantum organisation**

Source	Description of the quantum organisation
Pellissier (2001:56)	The quantum organisation is ‘an organic web made up of a dynamic and evolving network of relationships, the primary tenets of which are wholeness, balance, and connectivity, co-operation, creativity and open possibilities’.
Deardorff & Williams (2006:14)	The quantum organisation has ‘an organisational capacity to create an empowering atmosphere of trust, safety, and a sense of belonging enabling continuous introspective and organisational learning and the aligning of personal values to behaviour’.
Youngblood (1997:9)	‘Quantum organisations operate on an organic model that closely mirrors the functional or natural systems.’

Furthermore, it seems that meanings attached to terminologies are varied and used interchangeably in an inconsistent manner. For example, Zohar (1998:56), Overman (1996:87), Youngblood (1997:9) and Gilliland (2004:64) refer to the 'quantum organisation', whereas Guillory (2007:91) refers to the Future Perfect organisation, and Putnik and van Eijnatten (2004:418) refer to the 'chaordic enterprise' as a goal state towards which the learning organisation might evolve. Druhl *et al.*, (2001:382) shed some light by discerning between the learning organisation and the quantum organisation. It is postulated that the learning organisation is a 'forerunner' of the quantum organisation. Learning and systems principles are the central themes of the learning organisation, whereas the themes of emerging and changing structures are central to the quantum organisation, although there are overlaps.

In contrast, Shelton and Darling (2003:358) say that quantum organisations are 'learning organizations – places where continuous improvement and constant learning are cultural norms'. This necessitated an extensive literature review of quantum organisations and led to a synthesis of common themes describing the quantum organisation, as illustrated in Table 19.

In the midst of the conversation around quantum organisations, Houchin and MacLean (2005:162) refreshingly step away from labelling and just ask whether organisations are naturally complex adaptive systems, whatever they are being named. As shown in Table 19, themes emerged from synthesis such as common purpose, shared responsibility, learning, interdependence, networked, self-organising, potentiality and energy, and unpredictability. When comparing the themes with properties of a complex system, as illustrated in Figure 18, it appears that the quantum organisation indeed inhabits the dynamics and properties of a complex adaptive system, hence the success of the quantum organisation in a complex environment.

**Table 19: A synthesis of the literature on properties of the quantum organisation**

Clusters of themes	Overman (1996) – Quantum organisation	Youngblood (1997) – Quantum organisation	Conner (1998)	Zohar (1998) – 8 features of the Quantum organisation	Kilmann (2001)	Pellissier (2001)	Deardorff & Williams (2006) – Quantum organisation	Guillory (2007) – Future Perfect organisation
Common purpose is shared and owned by everyone	Common purpose	Promoting ownership	Deep sense of shared purpose	Participative in nature	Everyone is involved in the design of structure and strategy.	It is creative and collaborative	Owned by identifying with values.	x
Learning	X	Learning as key competence and catalyst for innovation	Learn from experiences	Continual self-transformation of the leader takes place through learning.	Continual improvement and self-reflection; focus on learning	Organisational learning and renewal necessary for survival	Learning is important and continuous	Learning is key
Organisational structure	X	Web-like organisational structure	Line operation and flexible interpretation of existing roles; assume new job responsibilities on periodic basis	Networked	Cross-boundary processes as opposed to silo thinking and operations	It is decentralised	x	x
Self-organising characteristic	X	X	The role of self-organisation in the organisation's future.	Self-managing infrastructure; bottom-up flow of ideas; nurture creativity; spaces with no boundaries (self-organising	Management of self, teams, systems and processes	It is self-managed and leadership based on real trust	Relies on self-emergence of unique solutions, ideas and insights through the self	Self-directed performance and creative adaptation in process; constant evolving

Role of Self				and emergent)				
	X	Awareness of self and mental model	X	X	Deep internal commitment to self-discovery	Self-transformation as the key ingredient for effective leadership	Journey inwards to self as key requirement at individual level of leader to create synergy	X
Power and control	X	x	X	Replace control with trust	Empowered relations among active participants	X	x	X
Diversity	X	Ensure the rich flow of information and diversity in opinion	Diversity of ideas	Inclusive and not exclusive (e.g. us vs them)	Eternal self-transformation of flexibly designed organisations	x	x	Diversity in people is valued and comprehensively integrated
Information	Reliance on non-tangibles such as information	x	X	X	X	It is information based	x	Information sharing
Management of paradoxical nature due to ambiguity	X	Ability to hold and manage anxiety that comes with paradox	Leader's and organisational ability to manage chaos and the unexpected as an asset	Flexible and responsive due to ambiguous and complex environmental phenomena	X	It is rapidly adaptable and extremely agile	x	X
The role of the leader	X	Leadership is not a position, but a process and	The shift from an event to a process mentality	X	X	X	Create synergy through self-sharing with	X

		distributed phenomenon.					others	
<b>Vision and drivers</b>	X	Creating compelling goals and vision	It is vision driven.	Vision centred and value driven.	X	X		The vision is customer integrated and driven.
<b>Potentiality and energy</b>	X	x	x	Realise value of taking risks and encourage play and rewards creativity	x	x	x	x
<b>Participatory universe</b>	X	x	x	Concerned with symbiosis of human and non-human dimensions	x	x	x	X

**Sources:** Conner (1998); Deardorff & Williams (2006:1); Guillory (2007); Kilmann (2001); Overman (1996:87); Pellissier (2001); Zohar (1998)

## 5.4 THE LEADER IN A COMPLEX ENVIRONMENT

Literature is in agreement that the concept of transformational leadership is inadequate (Denton & Vloeberghs, 2003:84; Conner, 1998:10; Kilmann, 2001:76; Pellissier, 2001:16; Wheatley, 2006:36). In this, several authors have attempted to reframe and label a new type of leadership appropriate for the complex environment. Deardorff and Williams (2006:1) label the leader in a complex environment as the 'synergy leader', Plowman, Solansky, Beck, Baker, Kulkami & Travis (2007:341) refer to 'emergent leadership' and Zohar (1998:146) refers to the 'servant leader'. However, one commonality is that they all focus on the behaviour and thinking that determines a leader, rather than the role assigned through positional power.

Complexity theory raises provocative questions about the conventional approach of the leader and follower. Building an argument upon the assumptions of complexity theory and the properties of the quantum organisation, one should ask who is a leader and what does it mean to be a leader in the quantum organisation? If self-organisation is an inherent characteristic of the quantum organisation, then what is the role of the leader? Table 20 compares principles of complexity theory, relates it to enabling behaviours required from a leader and juxtaposes it against certain mythical assumptions about a leader.

**Table 20: The role of the leader in a complex environment**

Complexity theory principles	Myths	Enabling behaviours of leader in a quantum organisation in context of a complex environment
Emergent self-organisation – system level order emerges as agents interact; information gets exchanged	Leaders specify desired futures as they know the future and their role is that of a future crafter	Leader provides linkages to emergent structures; enhances a connection amongst members of system (stakeholders)
Sensitivity to initial conditions such as small fractal changes can have huge, unpredictable consequences	Leaders drive change because they know the one truth and reality	Leader makes sense of patterns in small changes
Far-from-equilibrium is where change occurs, because system will dissipate energy and information, which will create disorder and lead to new order	Leaders have power that comes with role and position. Must eliminate disorder and gap between current reality and future vision	Leaders encourage disequilibrium
Non-linear interactions occur, because diverse and multiple stakeholders are interconnected	Leaders influence, manage and control others because they are all knowing	Leaders encourage processes that enable emergent order between multiple stakeholders with multiple perspectives. Distributed phenomena; results are achieved by creating environment of quality thinking, co-creativity and learning a leadership competency

**Sources;** Plowman *et al.* (2007:349); Youngblood (2000:6)

Literature on the quantum organisation often describes the behaviour of individuals operating within the quantum organisation (Chaize, 2000:95; Conner, 1998:10; Denton & Vloeberghs, 2003:84; Gilliland, 2004: 64; Guillory, 2007:91; Karp, 2006:3; Kilmann, 2001:76; Quigley, 2001:11; Shelton & Darling, 2001:264; Wheatley, 2006:36; Youngblood, 1997:8; Zohar, 1998:56).

**When conducting a comparative analysis, it appears that leaders in a complex environment do not fit in the framework sketched by the transformational, transactional, charismatic, serving, authentic theories. They do, however, embody certain elements and demonstrate certain contact points with the theories.** For example, a leader in a complex environment has an orientation towards serving others and being authentic, although he/she does not comply with the 'criteria' of the theories. An interesting alignment appears between African leadership and leading in a complex environment. For example, leading in a complex environment requires co-creation of new meaning between stakeholders, which is also implied by the African leadership of 'ubuntu'. The phenomenon of 'ubuntu' underpins a philosophy of interconnectedness and power in the networked community of being and thinking.

In the quantum organisation, the system's ability to self-organise needs to be optimised and therefore the leader needs to shift his/her behaviour and thinking to promote and cultivate the richest possible environment for this self-organisation to occur, instead of attempting to block and/or control it. The result is the phenomenon of synergy (Deardorff & Williams, 2006:1; Mason, 2007:10; Youngblood, 1997:10).

This can be done by:

- Developing alignment and promoting understanding of events in the context of the organisation's shared vision. As people can be inundated with data that are often ambiguous and contradictory, the role of the leader is to interpret, make sense of and translate the 'noise' in a meaningful way (Gilliland, 2004:374).
- Cultivating and positioning learning at the heart of the organisation (Karp 2006:16).
- Being an 'internal networker' as someone who inhabits many roles and is mobile within the informal operating networks. The leader fulfils the function of connecting, because it has been found that internal networking infuses change (Senge, 2006:51).
- Focusing on the emergence of relationships (Karp and Helgø, 2008:30).

- identifying and directing attention to patterns of behaviour and thinking (Palmberg, 2009:485).

In conclusion, leaders in the quantum organisation are distinguished by their quantum thinking as opposed to only their position.

#### **5.4.1 African leadership: An alternative paradigm**

The African management philosophy offers an alternative route to the existing body of literature on complexity theory relating to leadership which is worth investigating.

African leadership is seen as a catalyst for social transformation, but only when deeply rooted in African concepts of identity and community. It is therefore a group phenomenon where a leader is a servant to the clan, tribe, community or group and co-creates with the village towards the desired objective. Power and decision making becomes a phenomenon to be shared by all villagers or community members, rather than be invested in one person (Mbigi, 2000; Prinsloo, 2000:280; Reddy, 2004:4).

African leadership can be defined in terms of various perspectives and variables.

- **Attribution:** African leadership is located in personal behaviours, competencies and characteristics such as empathy, understanding, participation, sharing, reciprocating, hospitality, loyalty, sociality, health, sympathy (Prinsloo, 2000:276).<sup>9</sup>
- **Relational:** Khoza (2007:25) postulates that 'African leadership influences others to allow others to lead themselves'. African leadership is therefore located in the relationship between the leader and the follower.
- **Gender dimensions of African leadership:** Despite the dominance of men in political power structures, the societies have been centred on women - the principle of matriarchy. Research cannot afford to neglect an understanding of the status and experiences of African women in African organisations. Gender relations is of critical importance in the African Renaissance, as gender is

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<sup>9</sup> Correlation with axial code 'behavioural orientation'

socially constructed from historical and cultural perspectives (Mboup, 2008:106; Nkomo & Ngambi, 2009:50; Phendla, 2004:161).

This is by no means an extensive list of all the variables that come into play during the African leadership discussion. The Generational theory may also have an impact on the perceptions and experiences of Generation Y or African leadership.

#### **5.4.2 Ubuntu**

A body of knowledge has emerged in response to the Western approach and global considerations of leadership, as well as practice. This field of study is known as African management philosophy and defined as ‘the practical way of thinking about how to effectively run organisations – be they in the public or private sectors – on the basis of African ideas and in terms of how social and economic life is actually experienced in the region. Such thinking must be necessarily interwoven with the daily existence and experience in Africa and its contextual reality’ (Prinsloo, 2000).

Does ubuntu provide Africans with a distinctive social value that can be called ‘African leadership’? To answer this, the ontology of ubuntu must be critically investigated to determine whether it is implied as a romanticised notion or truly a social practice across the African continent. How then is this communitarian value system conceived and what are the implications for leadership in such a value system? (Bolden & Kirk, 2005:13) Central to Afrocentric management is the concept of ubuntu – the community concept of management. Ubuntu is not a management style or business technique, but an epistemological and humanistic philosophy that focuses on people and provides some guidelines for leadership styles and management practices. Ubuntu, literally translated, means ‘I am because we are.’ The social value of ubuntu is that the human being finds identity and ways of being in a community without losing personal identity or being swallowed up by the community (Booyesen, 2001:30).

Khoza (2007:24) argues that the following constellation of values characterises the ubuntu African leadership paradigm:

- Valuing humanity - *Umuntu ngumuntu ngabantu* – a human being finds genuine human expression in human relationships with other humans – ‘I am because you are, you are because we are.’
- Consultation as a value orientation
- Interdependence as a superior value to independence<sup>10</sup> - *Rintiho rin we a ri nusi hove Xitsonga* (one finger cannot pick up a grain – you can achieve more through co-operation)

It also begs the question whether a quantum organisation can be without a leader or can a leader be without a quantum organisation? In a South African study on quantum leadership, Hall (2008:5) found that the leader is first necessary to cultivate an enabling environment. Thereafter, the quantum organisation will self-organise as such and instil leadership behaviour at all levels.

The next section of the literature review addresses the type of mental model of such a leader.

## 5.5 MENTAL MODELS

First, the form and thereafter the function of a mental model are discussed. Definitions of mental models from an organisational behaviour perspective are cited in Table 21.

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<sup>10</sup> Correlation with axial codes ‘it is a connected world’, ‘we are equal thinkers’ and ‘co-creation’

**Table 21: Definitions of mental models**

Source	Definition of mental models
Marquard (1996:45)	A mental model is 'our image or perspective of an event, situation, activity or concept. It is a deeply ingrained assumption that influences how we understand the world and how we take action.'
Rowe & Cooke (1995:243)	Mental models are 'internal representations of a system that is formed by one's knowledge of a system'.
Theron & Roodt (2000:15)	Mental models are defined as 'unitary, spatial models where distance has functional consequence, and which are used to give meaning and understanding to complex systems or phenomena'.
Gilliland (2004:374)	A definition of mental models 'is assumptions leaders hold'.
Karp (2006:5)	A mental model is 'an internal scorecard that helps to structure thinking and behaviour in situations'.
Senge (2006:164)	The mental model is 'deeply ingrained assumptions, generalizations, or even pictures or images that influence how we understand the world and how we take action.'
Morecroft (1994:7)	'It is useful to think of mental models as a dynamic pattern of connections comprising of a core network of "familiar" facts and concepts, and a vast matrix of potential connections that are stimulated by thinking and by the flow of conversation.'
Deardorff & Williams (2006:5)	'The mental model reflects the interconnected characteristics of the leader, team members and organisation within which collective thinking is of value.'

Literature does not agree on the form and function of a mental model. For example, are mental models deeply ingrained and relatively stable or unstable? Are they 'extremely simple' (Meadows, Behrens, Meadows, Nail & Zahn, 1974:128) or ranging to complex and sophisticated? (Senge, 1992:5)

Are they images, facts, beliefs or assumptions, paradigms, cognitive maps or recipes? Should a single belief be considered as a mental model or should the term 'mental model' refer to a 'set of interacting beliefs or network?' (Doyle & Ford, 1998:20). Does an individual have a mental model referring to one particular type of cognitive structure? Are they images or mirrors or are they declarative knowledge or intuitive knowledge? Are they unstable and ever-changing in the sense that they are being discarded as needed to solve problems?

Constructs such as archetype, gestalt, worldview, template, schema, mind-set, conceptual framework, paradigm and **mental model** are used interchangeably, which causes confusion about the exact nature of a mental model (Kilman, 2001:13; Marquard, 1996:45; Rowe & Cooke, 1995:243, Senge, 2006:164; Shelton & Darling, 2003:353). Definitions of the mental model are therefore ambiguous, multidimensional and contingent. Partly because of the inconsistency, the concept of mental models is being used by researchers in different contexts for different purposes. For example, Johnson-Laird (1980:100) applied the concept in the context of reasoning, whilst other studies used it in the context of human computer interaction. Different meanings could therefore be attached because of different contexts.

This necessitated me to conduct a further investigation into the existing descriptions of the form and functions of mental models in a complex context (Table 22), with specific reference to the work of Karl Weick (1995:15). Form implies the contents and structure of the mental model, whereas function refers to the role it plays.

Table 22: A synthesis of descriptions of the form and function of mental models

	Description of mental model	Sources
<b>Form (structure, elements it consists of)</b>	A mental model includes biases, deeply-seated and ingrained assumptions, beliefs, experiences, values, and generalisations, and is therefore a representation of how one sees reality <sup>11</sup>	Day & Nedungadi, 1994:31; Meadows <i>et al.</i> , 1974:4-5; Senge, 2006:164
	Contains both declarative and procedural knowledge	Barker, van Schaik & Hudson, 1998:312
	Mental models are multifaceted and made up of distinguishable sub-models	Richardson, Anderson, Maxwell & Stewart, 1994:3
	May evolve and change over time, leading to a different way of understanding, acting and being in the world. Develop through context of social and cultural practices and through discursive interaction. The 'richness' in evolution is usually linked to growing maturity, exposure to new experiences	Barker <i>et al.</i> , 1998:310; Jacobs & Heracleous, 2005:340
	<b>Not</b> consciously aware of contents of mental model <sup>12</sup>	Senge, 2006:170; Karp, 2005:89
<b>Function (role)</b>	Constant interacting with patterns of perception through thinking and action	Senge, 2006:164
	Mental models are the 'driving force' for understanding, sense-making, reasoning and prediction, problem solving activities, decision making, selecting and organising newly acquired knowledge	Adamides, Stamboulis & Kanellopoulos, 2003:72; Barker <i>et al.</i> , 1998:310; Doyle and Ford, 1998:3; Michael, 2004:228; Senge, 2006:164; Johnson, 1995:258

<sup>11</sup> Correlation with axial code 'map to navigate'

<sup>12</sup> Correlation with axial code 'unconscious'

The declarative knowledge of the mental model, as explained by Bucciarelli (2007:67), refers to what people believe themselves to know about any given entity in the world and its principles in a conscious manner, and which they are able to express verbally and reflect upon. Procedural knowledge, on the other hand, refers to knowledge about how to act even when such information is not represented in an explicit fashion. In practice, a clear-cut distinction between the two definitions is difficult. However, it appears that procedural knowledge, knowing how to, has far more currency in the change arena than declarative knowledge, which seems to confirm that mental models are made up of deeply-ingrained assumptions. Leaders are often not consciously aware of what is known as procedural knowledge,<sup>13</sup> as found during the axial coding and interviews.

#### **5.5.1 Mental models and change leadership in a complex environment**

It has been established that mental models and change leadership effectiveness are interdependent (Bovey & Hede, 2001:372; Harrison & Boyle, 2006:31, Karp, 2005:89; Osborne, Stubbart & Ramaprasad, 2001:435). The direct relationship between the leader's mental models and successful organisational change has also been established (Strange & Mumford, 2002:343; Osborne *et al.*, 2001:435). Barr, Stimpert and Huff (1992:16), amongst others, state that the crucial component of leadership behaviour in an ever-changing environment is undeniably the cognitive process of noticing, absorbing and making meaning of environmental change (Karp, 2006:3; Lyons, Adjali, Collings & Jensen, 2003:11).

Karp (2006:4) highlights the dynamic relationship between mental models and change effectiveness and performance when he says: 'Each person has an internal mental model of his/her world; a dynamic model that guides his/her thinking and behaviour and that changes as a result of the consequences of that person's actions and of the information exchanges.'

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<sup>13</sup> Correlation with axial code 'unconscious' element of mental model

### 5.5.2 The challenge

Leaders often fail to consider alternative models in reasoning and thereby perpetuate the same deductive inferences about a complex situation, because mental models are held in a limited-capacity working memory. Therefore, a leader will reduce the cognitive load in an attempt to deal with complexity by integrating new information into already constructed and simplified mental models.

The challenge is the following:

- The sense-making functionality of a mental model necessitates that it ‘manages’ complexity by reducing it into chunks, which is no longer sufficient to make sense of and navigate in a complex environment
- The leader’s perception of reality is simply a function of the categorisation and interpretation processes and, as a consequence, he/she focuses on things which have already happened in the past and enacts the environment. What is seen, therefore, is the construction of the environment, not the environment itself, as informed by the theory of sense-making by Weick in 1995.
- The leader holds an incorrect mental model and draws incorrect conclusions, as informed by the work of Johnson-Laird in 1983.
- The mental model of the leader determines what information will be received and attended to, whilst other potentially important fractal and strange attractors may not be recognised.
- Current data may be interpreted in relation to the individual’s current mental models rather than be seen as a signal for needed change (Barr *et al.*, 1992:17; Day & Nedungadi, 1994:31; Grosset & Barrouillet, 2003:289-290; Doyle and Ford, 1998:10).

Studies show that organisational decline is a result of significant changes in the environment that either go unnoticed, or are improperly interpreted by the leader’s mental model and, as a consequence, are addressed through inappropriate actions (Barr *et al.*, 1992:17).

## 5.6 LINEAR AND QUANTUM THINKING

Now that the form and function of mental models have been investigated, it is important to investigate two types of thinking that can drive mental models: linear thinking or quantum thinking. Table 23 illustrates a comparative analysis between linear and quantum thinking.

**Table 23: A comparative analysis between linear and quantum thinking**

Linear thinking	Quantum thinking
Continue to apply previously established criteria for success	Develop new criteria for success and realise that this is a continuous process of revising, <b>reformulating</b> and updating success criteria
Continue to pay attention to issues and ask questions that were relevant in previous circumstances	Learn what to pay attention to and what type of questions to ask in the <b>complex</b> environment
Apply previously established priorities, policies and practices and/or sequencing of interventions to new circumstances	Identify new priorities and/or new sequencing of activities to match <b>emerging demands</b> in <b>complex</b> environment
Continue to apply outdated approaches to solving problems	Identify new ways to solve problems and/or take advantage of opportunities posed by environment
Feel resentful that previously successful behaviours are no longer relevant or rewarded in new circumstances	Feel accountable to develop and learn new behaviour that will address new circumstances
<b>Thinking in</b> either/or paradigms and 'categories' (us/them) <b>through the use of deductive logic</b> and adversarial confrontation	Cooperative <b>dialogue</b> in order to explore and understand together. Talk and listen in order to <b>change mind model and as a consequence, thinking. Build</b> a deeper understanding of investigated phenomena through collective or parallel thinking

**Sources:** Adapted from Conner (1998:321); Deardorff & Williams (2006:12)

## 5.7 THE CHANGE WITHIN

Chaize (2000:86) and Kilmann (2001:70) provide clarity and conclude that continual change and reformulation of the leader's own mental model is a pre-requisite for leading organisational change successfully. Barr *et al.* (1992:17) and Adamides *et al.* (2003:73) agree that organisational renewal and agility require of the leaders to constantly change their mental models in response to the complex environment first. If they do not, they respond to change from an outdated mental model and contribute to deteriorating performance.

Conner (1998:vi) poses a leadership challenge for the complex environment: 'How do we get ready for the changes we can't even see yet.' Organisational success in the complex environment will be achieved by 'those who realise where changes are heading and are therefore able to use changes to their own advantage' (Pellissier, 2001:67). According to Scharmer (2009), to lead is to continuously shift focus and structure of attention within the mental model. This implies deepening the process of becoming aware and increasing the number of options for responding to a given situation. The Mental Model Theory (MMT) refers to the 'un-focussing' of the mental model, which is the process of automatic inferencing and making alternatives explicit and aware. Holland in Lyons *et al.* (2003: 12) distinguishes between a 'tacit internal model', which describes current action under the current assumptions of the future state, and an 'overt internal model', which provides a basis for the internal processes of exploring alternatives. He advocates the successful approach which involves taking tacit internal models (held by the leader) and turning them into overt internal models.

Next I discuss three models and one theory which describe the process of shift within the mental model in the context of complexity. I use principles of quantum physics, called the quantum thinking mental model and the quantum skills model, Scharmer's generative dialogue model and the essence of the U-theory. I also pay a brief visit to the field of Mindfulness to inform the change process in a mental model.

### 5.7.1 Quantum thinking mental model

Deardorff and Williams (2006:12) describe a shift in the leader's mental model in the quantum organisational context, called the **quantum thinking mental model** (Figure 20), which involves 4 steps:

- Step 1: Paradigm tear - when the existing mental model is exposed to new environmental challenges and the existing understanding of the complex environmental phenomena **causes discomfort and chaos**.
- Step 2: Paradigm recognition - when the existing mental model and new mental model are juxtaposed, intuitively creating the need to establish the new mental model or readjust the existing mental model.
- Step 3: Paradigm reorganization - the mental process of re-thinking and accepting the newly reframed mental model.
- Step 4: Self-transformation - a radical change in the mental model of the leader that leads to self-transformation. The change reflects the change capability and adaptability of the leader, which in turn reflects successful change leadership in the complex environment.

**Figure 19: The quantum thinking mental model**

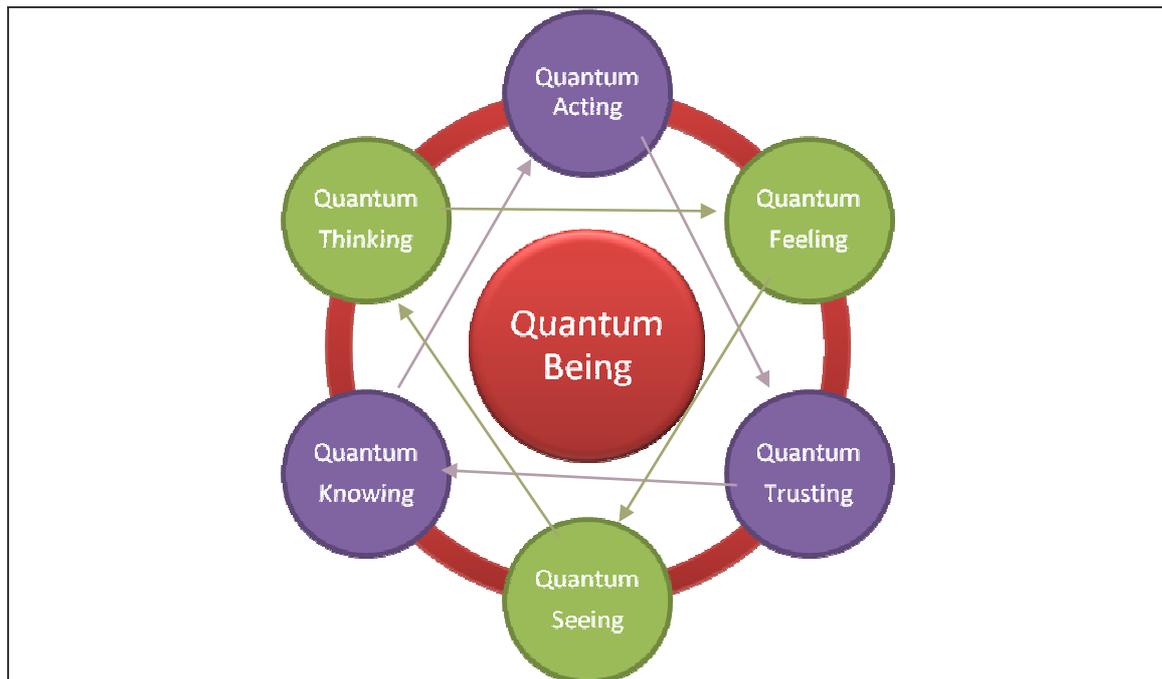


**Source:** Deardorff & Williams (2006:12)

### 5.7.2 Quantum skills model

The purpose of the quantum skills model is to demonstrate the interaction between skills and thinking, premised on the assumption that quantum reality of energy is the essence. The first three skills are clustered as primarily psychological in nature, whereas the other three are spiritual in nature (Figure 20). Notice the correlation between axial coding results and the quantum skills model.

**Figure 20: The quantum skills model**



**Source:** Shelton & Darling, 2001:265

- ‘Quantum seeing’ refers to the ability to see intentionally, as human perception is highly subjective. It is based on the premise that reality is inherently subjective and manifests according to the assumptions and beliefs of the observer.
- ‘Quantum thinking’ refers to the ability to think paradoxically. Creative thinking requires the development of the right hemisphere of the brain. Quantum thinking is based on the premise that the universe often functions in an illogical and paradoxical manner.<sup>14</sup>

<sup>14</sup> Correlation with axial code ‘quantum thinking’

- ‘Quantum feelings’ refers to the ability to feel vitally alive. Human feelings are not the result of external events, but of internal assumptions and inferences driven by mental models.
- ‘Quantum knowing’ refers to the ability to know intuitively because we live in an intelligence universe. It is not meant to bypass the diligence process, but to reduce the frequency with which an organisation needs to deploy it.<sup>15</sup>
- ‘Quantum acting’ refers to the ability to act responsibly because everything in the universe is interrelated. It is based on the concept of interconnectivity and its by-product, non-local causation.
- ‘Quantum trusting’ refers to the ability to trust life’s processes and that the principles as applicable to chaos and the emerging nature of complexity can be trusted.<sup>16</sup>
- ‘Quantum being’ is inextricably linked to other quantum skills and reflects on the role of connectivity. The ability to be in a relationship that recognises the relational nature of the complex context.

### 5.7.3 Scharmer’s U-theory

The U-theory postulates that awareness will emerge from three different movements (indicated by circular movements in Figure 21) by:

- Co-sensing<sup>17</sup>: opening up to the world outside and seeing that you as the observer are not a separate entity from the external world, but that all is connected and part of a complex adaptive system
- Co-presencing<sup>18</sup>: opening up to that which wants to emerge and being still. However, a pre-requisite is to first ‘let go’
- Co-creating<sup>19</sup>: bring the new emerging realities into reality and activate a capacity by ‘being’ the new reality

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<sup>15</sup> Correlation with axial code ‘trust the knowing’

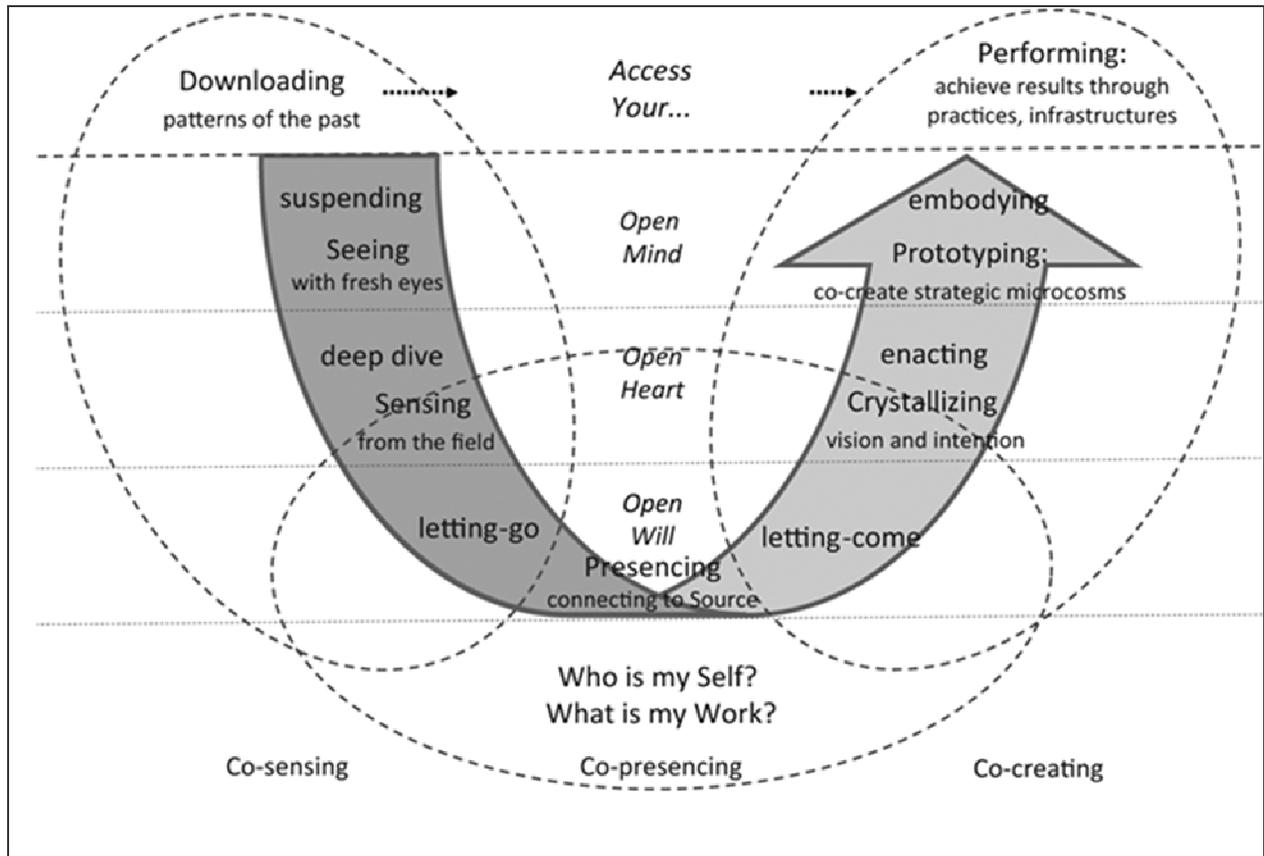
<sup>16</sup> Correlation with axial code ‘trust the knowing’

<sup>17</sup> Correlation with axial code ‘it is a connected world’

<sup>18</sup> Correlation with axial code ‘letting go’

<sup>19</sup> Correlation with axial code ‘co-creation’

Figure 21: The U-process of presencing: Seven field structures of attention



**Source:** Scharmer (2009:246)

Within these three movements, there are seven different actions, which are:

- Paying attention: beginning to open up and letting to
- Seeing the view from outside
- Sensing the view from within
- Presencing the view from a surrounding presence
- Crystallising vision and intent
- Prototyping living microcosms
- Performing, embodying and 'being' the new reality

#### 5.7.4 Generative dialogue

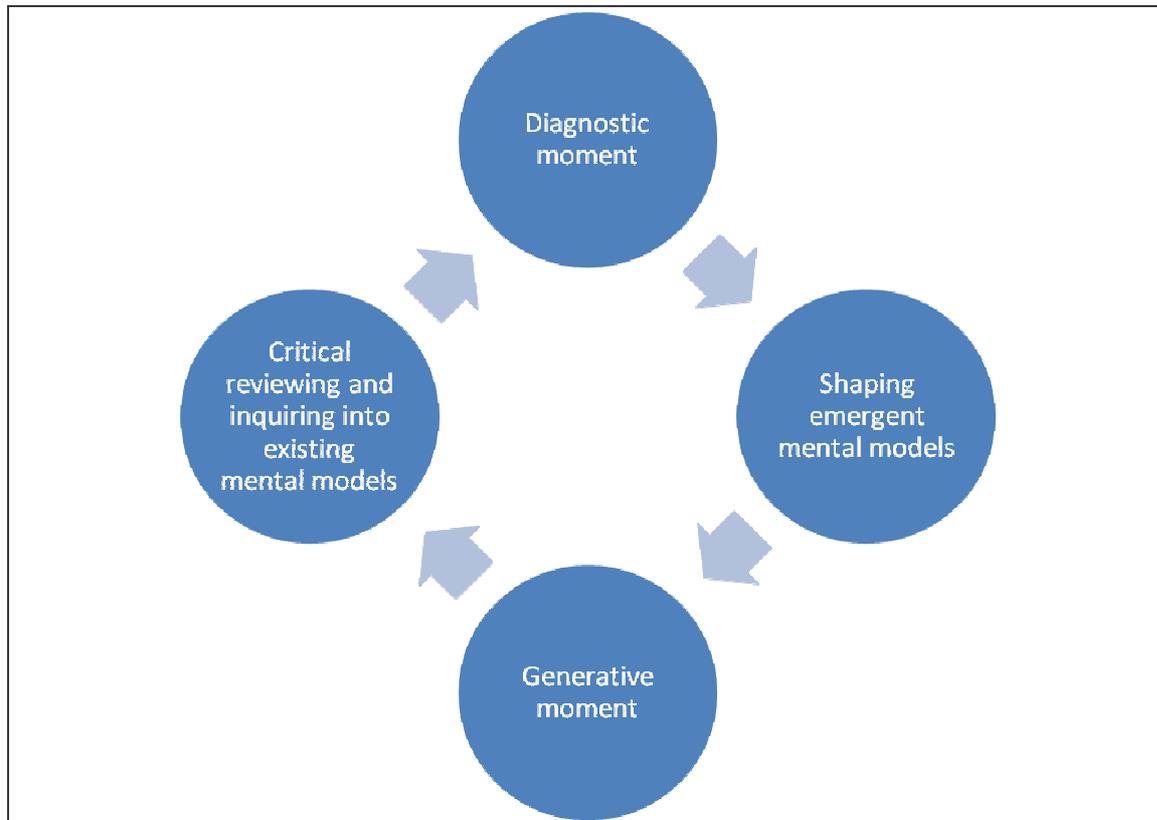
‘The mental model is fuzzy. It is incomplete. It is imprecisely stated. Furthermore, within one individual, a mental model changes with time and even during the flow of a single conversation.’ (Forrester, 1971 in Doyle & Ford, 1998:6).

This quote led me down the avenue of the body of knowledge in dialogic sense-making. Dialogue is being defined as a sustained collective inquiry into the processes, assumptions and certainties that compose every day experiences. Knowledge is created through a continuous dialogue between tacit (elements of mental model and deep beliefs which are difficult to communicate) and explicit (can be formally communicated) knowledge.

In addition, constructivist perspectives have shown that verbal communication is not simply about the transfer of information; it is integral to the construction and reconstruction of meaning. A significant body of literature suggests that dialogue as a reflective conversation mode can enable sense-making and, as a consequence, alter deep-seated assumptions within the mental models and transform, in turn, social interactions and new ‘realities’ due to its generative potential (Jacobs & Herecleous, 2005:338).

The opportunity for a leader to see things differently, as well as think differently, will be afforded through this practice of inquiry into privately held assumptions, mostly unconscious, and a recursive process of inquiring into existing mental models (the diagnostic moment) and thereby allow for emergent mental models to take shape, which will lead to the generative moment (Figure 22).

Figure 22: Reflective dialogue as an enabler for sense-making



**Source:** Jacobs & Herecleous, 2005:344

The essence of the generative moment is when time slows down, self-imposed boundaries collapse and limiting assumptions dissolve. This, however, requires being acutely aware and being in the present (notice correlation with axial code ‘awareness of present moment’ in Section 4.9.1).

### 5.7.5 Mindfulness

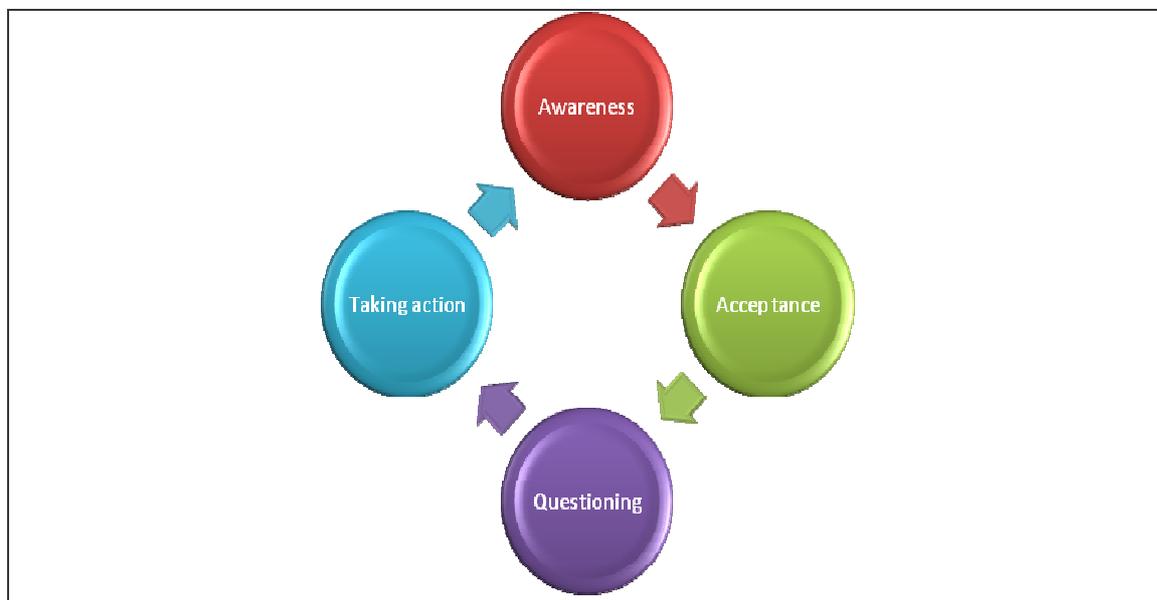
This was perhaps the most surprising part of my journey of searching to understand the internal change process, which led me to the body of work on Mindfulness. Mindfulness can be defined as a state of being, based on deep awareness of the present moment and what is going on within and around one, and is characterised by openness, curiosity and acceptance (Nhat Hanh, 1976 in Hawkins, 2010:2; Hopper, 2010:15). It is also important to note that in all Asian languages, the word for ‘mind’ and ‘heard’ is the same.

Jagannathan and Rodhain (2009:4) further elaborate that a mindful leader is characterised by surrendering the need to know and control,<sup>20</sup> by empathy<sup>21</sup> and compassion, tolerance, tranquillity, joy, happiness and purpose. Furthermore, mindfulness is not only a cognitive way of being, but it also flows towards the attitudinal dimensions of compassion. Which drives the message: It is not only about doing but also about being, as the doing will flow from the sense of being. Hawkins (2010:2) proposes a four-phase description, through dialogic sense-making, for the mindful leadership of change in a complex environment (Figure 23):

- An awareness of early signals in the external environment<sup>22</sup>
- Acceptance of the current reality<sup>23</sup>
- Questioning<sup>24</sup>
- Taking action

Although this model describes the process for mindful engagement with others during change, it can also be applied as the mindful internal change of the mental model during change leadership.

**Figure 23: Mindful leadership of change**



**Source:** Hawkins, 2010:69

<sup>20</sup> Correlation with axial code 'awareness of not knowing'

<sup>21</sup> Correlation with axial code 'attitudinal orientation'

<sup>22</sup> Correlation with axial code 'awareness of present moment'

<sup>23</sup> Correlation with axial code 'acceptance of current reality'

<sup>24</sup> Correlation with axial code 'questioning'

## 5.8 CONCLUSION

The quicker leaders learn and mindfully reconstruct their mental model, the more armed they are to lead in the complex environment. Zohar (1998:25) eloquently summarises the key message: 'If we want to transform the structure and leadership of our organisations, we have to address change at the fundamental paradigmatic level. We have to change the thinking behind our thinking. Leaders who want to initiate real change processes must become aware that they have been acting out of a paradigm. They must see the origin and nature of this existing paradigm and the effect on their management. And they must get to a point where they can feel the reality of an alternative paradigm - or the creative excitement of standing at the edge between paradigms.'

## SECTION C: THE CONCEPTUAL FRAMEWORK

This section refers to Chapters 6 and 7 in which I cover the following:

In **Chapter 6** I discuss and draw conclusions on mental models of leaders in the South African quantum organisation. The conceptual framework describes the dynamic change leaders undergo in their mental models. **Chapter 7** addresses the contributions of the study, its limitations and recommendations for future research.