The impact of individual and team mental models on strategic thinking in organisations

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Abstract

In an environment characterised by competition, change and uncertainty, strategy making is seen as central to creating and sustaining competitive advantage. Strategic thinking is described as antecedent to conventional strategic planning. Strategic thinking involves creative thinking in terms of setting the direction of the organisation and creating strategic options. It is argued in this paper that this important process can not be limited to decision making established only at the top management level; organisational members on all levels of the organisation should be incorporated in the strategic thinking process. However, individual thinking, as well as team thinking are affected by mental models. The impact of mental models on strategic thinking is considered. To demonstrate the interrelatedness between individual and team mental models, strategic thinking and strategic planning, a model for strategy making is proposed.

Introduction

Traditional strategic planning was the province of one group, usually comprised of CEO and senior managers of an organisation, who set the vision and direction of the organisation and had others, including the line managers and other employees, executing the subsequent strategic plans (Levy, Alvesson & Willmott 2003). In many

organisations, this created confusion and low levels of commitment among employees with possible negative effects on the overall success of the organisation because other employees did not participate in the strategic planning process.

The concept of strategic thinking emerged as a process of strategy making that involves a dynamic, imaginative and responsive approach (Mintzberg 1994), which seeks to include the organisation's best strategic thinkers on all levels of the organisations hierarchy (Bates & Dillard 1993). The expected result of including individuals outside the top management team capable of strategic thinking is to have a strategic management process that can set a more appropriate and inclusive vision and direction for the organisation.

However, an individual's strategic thinking is informed by his or her own, unique mental model, which addresses three crucial purposes; to describe, explain and predict things happening in the environment (Mathieu, Goodwin, Heffner, Salas & Cannon-Bowers 2000). Moreover, other factors impact on the quality of one's mental model (Markides 1997), (Radvansky, Spieler & Zacks 1993) which raises questions on how different mental models may impact on the strategy-making process.

This article will investigate the impact of individual mental models and team mental models on strategic thinking in organisations. It will draw on theory and research regarding issues such as knowledge structures, cognitive complexity, cognitive simplification, strategic thinking through multiple-level teams and cognitive simplification processes to shed light on the influence of individual and team mental models on strategic thinking at all levels in an organisation.

The approach taken in this paper is to provide a clarification on strategic thinking and its relationship to strategic planning. This is followed by a definition of individual mental models and team mental models. Next, the link between mental models and strategic thinking in organisations is made. A model of strategy making is then proposed and finally, some suggestions for further research are detailed.

Strategic planning and strategic thinking

The basic features of conventional strategic planning include setting up a vision/mission for the organisation, an external environment analysis, internal organisational analysis or company profile, a strategy formulation process (long and short term objectives, policies) and a strategy implementation process (Hill, Jones & Galvin 2004; Pearce & Robinson 1994). The focus of formal strategic planning is on expressing and elaborating the existing visions of the organisation; containing existing levels of strategy and rearranging current categories (Mintzberg 1994). While so much time, effort and detail are incorporated in strategic planning, why are some organisations still failing to deliver? According to Mintzberg (1994), strategic planning is set on a destination and calculates what the team must do to get there while members' preferences are ignored. Strategic planning is about analysis, the process of breaking down organisational goals into tasks that can be implemented and evaluated. In doing this, the fallacious assumptions are made that prediction of discontinuities in the environment is possible, the strategists can be detached from the subjects of their strategies and that the strategy making process can be formalised (Mintzberg 1994). Mintzberg explains that his research demonstrates that strategy making is an extensively intricate process that involves more than what a formalised

process can cope with, it requires the sophisticated and sometimes the subconscious elements of human thinking.

There are different views in the literature on what strategic thinking entails. Strategic thinking is viewed as: "…synthesis. It involves intuition and creativity. The outcome of strategic thinking is an integrated perspective of the enterprise, a not-too-precisely articulated vision of direction." (Mintzberg 1994 p.44). Bonn (2001) supports Mintzberg's view that strategic thinking and strategic planning are different concepts; she views strategic planning as a process which takes place after strategic thinking. Strategic planning follows a rational process, identifying specific steps to take to accomplish the organisational goals, a preconceived intended plan, assuming aspects of the environment than are in reality unsustainable (Graetz 2002). However, the unpredictable environment may interfere with this master plan and emergent strategies appear (Mintzberg 1987). This concept is in line with strategic thinking, acknowledging the influence of environmental change on all levels of the organisation and impacting on the emergent organisational plans. Following Liedtka's (1998) work on strategic thinking, Graetz (2002) concluded that strategic thinking focuses on a holistic view that incorporates the influence that different parts of the organisation and their different environments has on each other. The role of strategic thinking is to "seek innovation and imagine new and very different futures that may lead a company to redefine its core strategies and even its industry" (Graetz 2002 p.462). Creativity, specifically creative strategic thinking, is of importance in making strategic decisions. Human brainpower, using the ultimate nonlinear thinking tool to develop the conventional linear model of strategic planning to an understanding of the different elements of a situation, is essential in strategic thinking (Hussey 2001).

Strategic thinking in individuals include the ability to identify external opportunities and integrate it back into the organisation, the ability to think laterally and intuitively, to deal with complex situations and identify multiple options and individually determine what actions are required (Graetz 2002). It requires a holistic understanding of the organisation and its environment, creativity and a vision for the future (Bonn 2001) as core competencies. Strategic thinkers need to understand the organisation as entity within a wider context (markets, industries and nations) that is influenced by interrelations and interdependency of these systems. Creativeness requires the individual to be open to a wide range of possibilities, to be able to recognise potential and select and develop ideas and ultimately to be able to implement ideas. A vision for the future is also essential on the individual level to create and follow a sense of purpose that can motivate all employees (Bonn, I 2001).

Strategic thinking and operational thinking are not the same thing. In higher level managerial positions, such as CEO's and senior managers, strategic thinking skills are not always evident as many incumbents are appointed for their operational thinking skills only (Bates & Dillard 1993). This results in the traditional strategic planning team with sub-optimal strategic thinking capabilities. The IPM (Inter-functional/multi-level planning) approach provides for continuation of appropriate levels of strategic capability through inclusion of managers with latent strategic thinking abilities on all levels of the organisation (Bates & Dillard 1993). Further to her research on strategic thinking, Bonn (2001) found that strategic thinking is evident at the organisational level (including the organisation and the context) and the individual level (including individuals and groups). Formal planning systems should

include divisional and business unit managers (Bonn & Christodoulou 1996). The important implication of this approach is that it recognises the influence of individual characteristics and actions on the organisational context and also the influence of the organisational context on individual thinking and behaviour. It is also argued that strategic thinking involves more than the traditional strategic planning team to include organisational stakeholders (shareholders, management/employees) and getting strategic thinking going throughout the organisation (Hodgkinson & Johnson 1994). Strategic thinking is required on individual, team and organisational level. Strategic thinking entails knowledge building processes, human cognition, organisational learning, knowledge management and cognitive maps, or mental models (Hodgkinson & Johnson 1994).

It is therefore important to acknowledge the importance of the strategic thinking capabilities of employees on all levels of the organisation to ensure that the influence of environmental changes on the different parts of the organisation is recognised and included in the strategy making process.

From the above discussion, it is clear that human thinking is the key to strategic thinking in organisations. Strategic thinking is about how individuals, work teams and organisations perceive and create the direction of the organisation. Aspects influencing individual and team thinking will now be investigated. The next two sections will address individual mental models and team mental models respectively.

Individual mental models

Authors such as Gentner & Stevens (1983), Johnson-Laird (1983), Norman (1983) and Wickens (1984) (as cited in Rouse & Morris 1986) from the fields of cognitive, applied, experimental and other areas of psychology and also from the management and business fields (Barker (1992), Spender (1990), Walsh (1995), Hamel & Prahalad (1989), (as cited in Markides 1997); identify mental models as important in explaining many aspects of human behaviour. Mental models are our beliefs about an issue (Markides 1997). It has been described as our rules and regulations, habits, managerial frames, assumptions, mindsets, paradigms, conventional wisdom, industry recipes, customs and institutionalised memory (Markides 1997, p.14). It is believed by Markides (1997) and others (Radvansky, Spieler & Zacks 1993) that mental models develop over time and through education and experience. In organisations, it is manifested in culture routines and unwritten rules of behaviour. It serves as a filter to process information and make decisions quickly. Mental model is defined (Senge et al. 1994) as the images, assumptions and stories that we carry in our mind of ourselves, other people and every aspect of the world around us. They influence what we see and how we react to issues, two different people will act differently to and describe the same events differently because they look at different details and we observe selectively (Senge 2001). The purpose of mental models (Mathieu et al. 2000) is to allow people to predict and explain the behaviour of the world happening around them, to note relationships among components and to predict what may occur next.

In the study of cognition in organisations, information processing theory suggests that the individuals create knowledge structures to help them process information and

make decisions (Walsh 1995). Knowledge structures are mental templates that individuals apply in an information environment to give structure and meaning.

An individual's interrelated belief systems, values, and assumptions, the way that an individual relates to the world, is also referred to as a cognitive structure (Langfield-Smith 1989). Cognitive structures are mapped to present the individual's conscious perception of reality, the idiosyncratic world view, while filtering out details that relate to specific experiences. Another term to describe the abstract models that represent the knowledge structure and the processes incorporated in these structures, is schemas (Langfield-Smith 1989). The cognitive structure of an individual is also influenced by other related cognitive structures, behaviour of significant persons in the individual's life and his or her own experiences and the outcomes of these experiences. It is the conglomeration of experiences that builds the individual's cognitive structure to be more abstract, more complex and more organised over time (Langfield-Smith 1989). Steinbruner (see Langfield-Smith 1989) summarised the cognitive principles by indicating that the mind is constrained by reality and develop a structure of core beliefs to order uncertain situations. The core beliefs are preserved by the mind to be consistent and unchallenged, when confronted with external reality, cognitive inference mechanisms are activated to keep the structure of core beliefs in place.

The term 'cognitive simplification processes' has been used to describe a concept similar to cognitive structure. Individuals use cognitive simplification processes to understand complex new situations by viewing it in a simplified and more manageable form. In short, simplification tools apply a simple structure to a complex

situation (Pellegrino & Carbo 2001) by using analogy and identifying a single alternative when confronted with unstructured issues.

The problem of mental models, according to Adamides, Stamboulis & Kanellopoulos (2003) is that it is difficult to change and individuals tend to analyse a situation by selecting from the changes in the environment only those that can fit into their personal existing paradigm to understand and cope with it. This frequently results in inappropriate action because significant issues may have been overlooked.

Team mental models

The team mental model concept, as described by Klimoski and Mohammed (1994), is different from the concept of group mental model. They portray groups as collections of individuals whose responsibilities and shared purpose may vary considerably whereas a team consists of interdependent and differentiated individuals. All teams are groups but not all groups are teams. Teams are relevant in organisations and represent team dynamics and team functioning, and therefore the term 'team mental model' will be applied in this paper to describe the shared cognition in work teams. The term 'shared mental models' pertaining to organised knowledge shared by team members, is also used by other authors (Mathieu et al. 2000) in referring to team mental models. Other terms connected to team-level knowledge structures include collective cognition maps, team mental models, collective cognition, hypermaps, dominant logics and negotiated belief structures (Walsh 1995 p.291).

Although mental models are, to some agree, unique to an individual, mental models can be shared, individuals can share a set of concepts and language which makes

communication easier (Mathieu et al. 2000). While the individual mental model is based on a person's own thoughts, perceptions, beliefs and expectations; a team mental model is more than the sum of the individual properties; synergy is created when mental models are shared (Klimoski & Mohammed 1994). Team mental models represent multiple sets of shared knowledge and allow individuals to share in their learning experiences. Team members use the team mental model in attempting to conceptualise and assess stimuli in the environment, they develop categories in the team's interpretation of the stimuli to structure events (Klimoski & Mohammed 1994).

Team members with widely different mental models will work towards different objectives and will anticipate different outcomes, this will be problematic in coordinated efforts and will result in process loss and ineffective team processes (Mathieu et al. 2000). Denzau (1994) argues that individuals with common cultural backgrounds and experiences, linked to their learning experiences, will have convergent mental models.

Levine et al (1993 p. 599) proposed that cognition is almost always collaborative, when a group of individuals are brought together, each with their own knowledge structure about a specific information environment, a collective knowledge structure will emerge. This collective knowledge structure will operate in the same way as personal knowledge structures do.

The extension of individual knowledge structures to team level, has important implications. Not only is it the overlap of knowledge among team members, but the

synergy of knowledge structures that comes to play. Shared mental models are beyond simple shared task knowledge (Mathieu et al. 2000).

A shared mental model, according to Klimoski & Mohammed (1994 p406) can refer: 'to a cognitive representation that is *identical* among team members (e.g., common knowledge), a *distributed* configuration of representations (no overlap), or to a configuration of *overlapping* representations among group members'. Cannon-Bowers (as cited in Klimoski & Mohammed 1994) argued that shared mental models do not suggest identical models but a compatibility that provides members the notion of common expectations. Team members sharing a mental model will think about and perceive a situation in a similar manner.

It is clear from the above discussion that mental models (on individual and team level) are used to understand current events, predict future events and choosing appropriate courses of action. How does this influence strategic thinking? How do different mental models of individuals affect collective strategic thinking in teams? What are the linkages between mental models and strategic thinking? These aspects will now be further explored.

Individual mental models and strategic thinking

Research has shown that mental models have an influence on how managers attempt strategic planning and their decision making process (Hofstede, 1984, 1991; Bartlett & Ghoshal, 1989; Bettis & Prahalad, 1995; Brown & Duguid, 1991 (as cited in Lane & Sirmon 2003). It influences how the individuals and teams respond to the strategic planning process and ultimately it may also be that the same collective mental model

of an organisation may have an impact on the strategic thinking processes of the individuals and teams. Moreover, Lane & Sirmon (2003) suggested that mental models are focused on the macro level (addressing strategic planning) and on the micro level (addressing operational issues).

Two levels of mental models are identified in research on how mental models influence the organisation's strategy makers' perceptions on competitive strategy (Porac, Thomas & Baden-Fuller 1989). These researchers found a 'material' or technical level of decision making but also a cognitive level; where the competitive environment influence the decision-makers' perceptions (Porac, Thomas & Baden-Fuller 1989, p.398).

A study on the individual differences in managers' perceptions and how managerial cognition contributes to the processes of strategic thinking, was executed by Hodgkinson and Johnson (1994). This study has shown that role responsibilities, experience, interests and goals of individuals influence their individual taxonomies (mental models). It is concluded that there is considerable variation in the contents and structural complexity of the cognitive taxonomies of individual managers. The necessity to address the issue of how organisations reconcile the diverse interests of individuals in order to formulate and implement coherent strategies, was identified.

Managers are confronted with complex and ambiguous information and it is their responsibility to make strategic decisions from this. They use knowledge structures to facilitate information processing and decision making. Walsh (1995) noted that although the application of managers' knowledge structures may assist them in

structuring the information, it may also restrict their vision of the changes in the business environment by reducing the complexities and compromise their strategic thinking capabilities. Although it seems that this approach may reduce stress when faced with multiple alternatives, Mintzberg et al (1976) argues that this approach may be detrimental to strategic issues as it may impede the process of thinking strategically, where the context is unstructured and the challenge is to identify multiple alternatives. If individuals use simplification processes such as reasoning by analogy and single outcome calculation (Pellegrino & Carbo 2001), is it then possible for humans and the human mind to think strategic in complex situations?

Cognitive complexity can be seen as an individual trait or characteristic in how a person deals with complex information loads. It depends on the quantity of memory information and represents the degree to which an individual uses this information to apply to multiple perspectives when perceiving and evaluating stimuli within a domain (Goodwin & Ziegler 1998). When describing issues, cognitive complex individuals can view the situation from many different perspectives, in contrast to cognitive simple individuals who are restricted to fewer viewpoints or dimensions. Cognitive complexity represents the ability to use information contained in memory (Goodwin & Ziegler 1998). Boal (2000) described behavioural complexity as the large behavioural repertoire that a leader may have and the ability to select the right roles for the situation. Good leaders need both cognitive and behavioural complexity and flexibility to adjust personal approaches to team action successfully. Cognitive complex employees are better at understanding what is going on in the organisation, are better decision makers because more alternatives (based on their ability to consider different perspectives) are identified and evaluated. Lundberg & Richards

(1972) demonstrated that individuals with higher levels of specific cognitive abilities (cognitive complexity) both process more information about a complex problem and reach higher quality decisions than those with more simple cognitive complexity. Hodgkinson and Johnson (1994) noted that managers who have more complex mental models hold jobs and roles that require greater insight into their business environments. These authors suggested that cognitive models vary because job holders draw on different frames of reference when interpreting their surroundings. Frames of references are founded in job experiences, the responsibilities, interests and goals that the managers have.

Another variable that seems to have importance in strategic thinking is the individual's need for structure. Pellegrino et al (2001) argues that the capability of an individual to think strategically depends also on his or her need for structure. 'Personal need for structure will determine the level of comfort that arises in each individual as he/she is confronted with a simplified version of reality. This comfort level, in turn, affects how much an individual relies on simplification tools" (Pellegrino & Carbo 2001 p.4). Therefore, if an individual has a high need for structure, he or she will rely heavily upon the simplification tools to make sense out of the complex situation and in terms of strategic thinking, this can be detrimental to the process of identifying and evaluating different options.

Other aspects that may influence the individual's ability to think strategically can be found in contextual issues but also individual characteristics. If an individual is in a work environment that does not support and hinders employee creativity, where ideas

and inputs into thinking are not encouraged, the systems and processes in the organisation will probably not provide opportunities for thinking (Graetz 2002).

Emotional intelligence also plays an important role in the capacity of individuals to think strategically. Goleman (1998) identified key characteristics of emotionally intelligent leaders that include, among others, characteristics such as strong interpersonal skills, an ease with ambiguity, openness to change and the ability to take decisive action and draw others to the vision of the organisation. Not only emotional intelligence but also individual personalities and cognitive styles may impact on strategic thinking. Gallen (1997) proposed a link between MBIT (Myers Briggs Type Indicator – Jung's psychological types) and organisational typology [Myles and Snow model, (see Gallen 1997) – identifying organisational types of defender, prospector and analyser). She found observable characteristics such as age, education and socio-economic roots not sufficient to explain the different strategic choices that managers make, based on identical information. Gallen (1997) argues that the cognitive style and/or the psychological characteristics influence strategic decisions. Haley and Stumpf (1989) also proposed personality as a link to strategic decisions and cognitive processes. Their pilot study illustrated some connections between personality types and biases; how different personality types develop dominant decision styles and preferred modes of data gathering, formulation of different options and evaluation of alternatives.

From the above discussion it is clear that our mental models affect the way that we perceive the world and also how individuals 'think' in organisations. This may have an impact on the individual level but also on the team level where mental models may

be shared among team members. Ultimately, it may also be applicable on the organisational level where it may impact on and be influenced by the culture and strategic thinking processes of organisations.

Team mental models and strategic thinking

Individual mental models, knowledge structures, individual need for structure and cognitive styles form the basis for team mental models . Strategic thought originates within the mind of the individual (Pellegrino & Carbo 2001) but the combination of different individual's ideas brings synergy to strategic options and can be seen as a form of group creativity. If the relationship between cognitive styles and strategic types can be confirmed on the individual level, it can be extended to team decisions too (Gallen 1997). De Geus (1988) found that the real purpose of strategic planning is not to make plans but to change the microcosm, the mental models that decision makers have. Institutional learning should be filtered through the organisation by involving team members in the development of a new common model (mental model) and by leaving their individual models implicit.

A study on shared mental models in work teams (Mathieu et al. 2000) showed that team effectiveness is influenced by shared mental models; greater sharedness in mental models of team members contributed to greater team effectiveness. The greatest impact is on decision making and communication (both important in strategic thinking). Team members with widely different mental models were found to work towards different goals and objectives whereas team members with similar mental models were aiming at common objectives and a shared vision on how the team should operate (Mathieu et al. 2000).

Johnson & Scholes (2005) researched the development of strategies in organisations and proposes that managers operate within the limits of their circumstances, knowledge and experience; their cognitive models. Three lenses are described through which strategy development is incorporated in organisations. One of the lenses is "strategy as experience", the lens that managers and others in the organisation use to create future strategies by adapting past strategies – the future strategies are based on their basic assumptions and culture. This implies that strategy develop in an incremental and adaptive way and is based on individual and collective experience of people in the organisation and their basic assumptions (Johnson, Scholes & Whittington 2005). The shared and collective experience of members of the organisation and their basic assumptions and believes are seen as the organisational culture.

Factors important in linking shared mental models with team performance are communication processes, strategy and coordinated use of resources, and interpersonal relations or cooperation (Klimoski & Mohammed 1994). To improve strategic thinking in organisations, Bonn (2001) proposes that structures, systems and processes be created to foster ongoing strategic dialogue among the top team by establishing regular opportunities to engage in dialogue about strategic issues, insights and ideas. Structures, systems and processes should also be created to exploit the creativity and talents of every employee by encouraging employees to explore new ideas, come up with improvements and participate in the development of innovations and strategies.

Proposed model for the strategy making process

It is clear from the above discussions that individual mental models and team mental models may have an impact on strategic thinking in organisations. Moreover, the relevance of strategic thinking as antecedent in the process of strategy making, has also been explored. A model for the strategy making process, based on these assumptions, is proposed (see figure 1).

This model recognises the role of individual mental models and team mental models in strategic thinking, it allows for a communication medium to enhance sharedness in team mental models and includes a forum where strategic thinkers from different organisational levels can contribute and share in strategic thinking. This model also implicates that strategic thinking should take place before the strategic planning process is commenced. It is hoped that this approach will improve strategy making by increasing the sharedness among team members in strategic thinking and incorporating the contributions of strategic thinkers from the different organisational levels. This should result in recognising a broader range of strategic options, closely linked to the environmental changes that impact on different organisational levels. Strategic choices reflecting the changed and developing needs of customers and stakeholders can then be made to assist in the organisation becoming market leaders in their specific product or service and sustaining competitive advantage.

Suggestions for future research

Future research should focus on developing a process to measure the constructs of individual and team mental models. Then the relationship between mental models

and strategic thinking can be tested. Also the mental model of the strategic thinker can be explored. The proposed model for strategy making should further be empirically tested.

Conclusion

The purpose of this article was to theoretically develop the idea of a connection between individual mental models, team mental models and strategic thinking. Based on previous studies, the concepts of individual mental models and team mental models were discussed in relation to strategic thinking.

Strategic thinking involves creative thinking in terms of the direction of the organisation that can not be limited to the top management level. Environmental changes impact on all levels of the organisation and the role of individual strategic thinkers on different organisational levels is significant. Multiple strategic options can be developed if the input from all strategic thinkers in the organisation is incorporated.

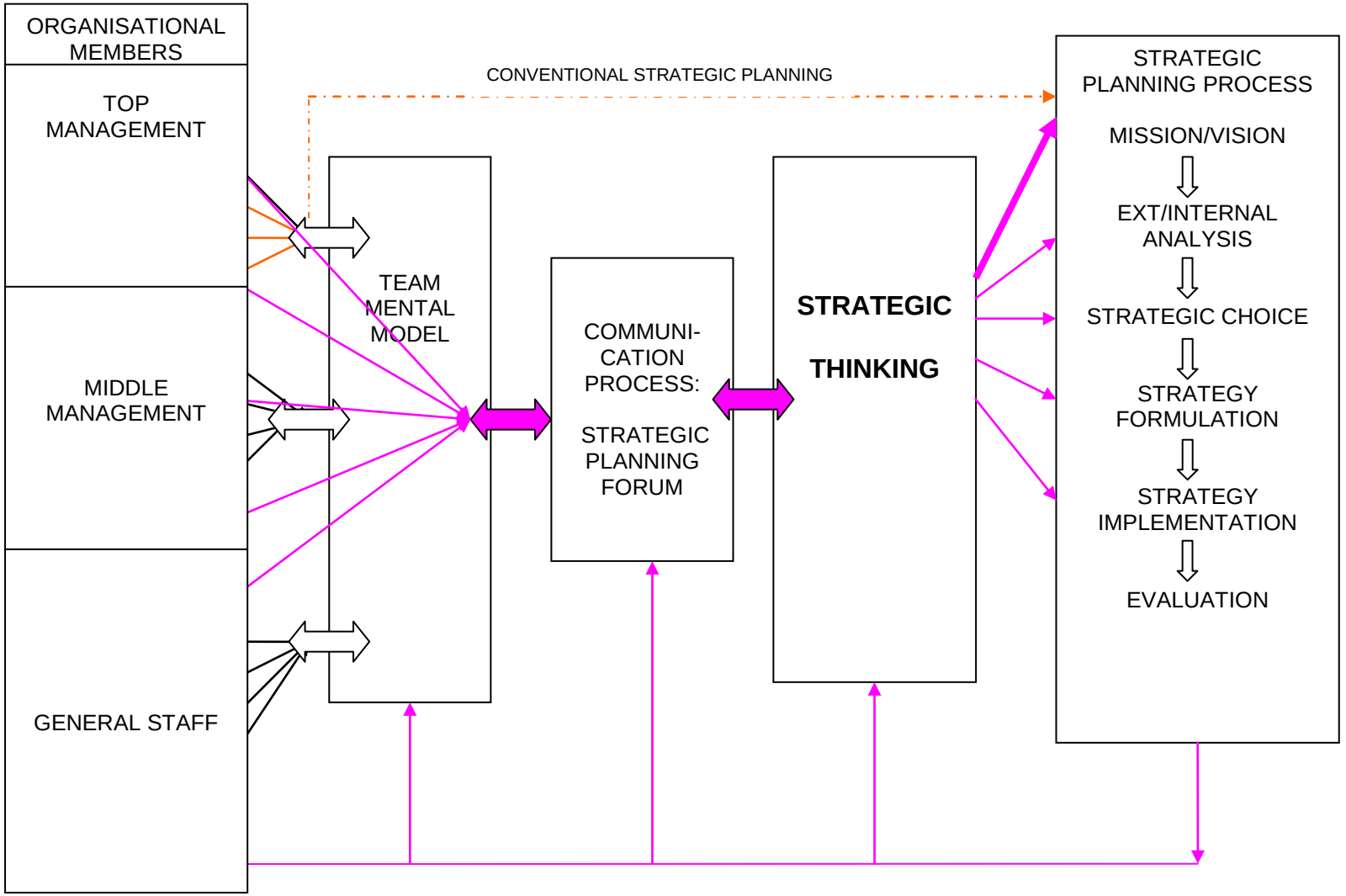
Individual mental models and team mental models influence individuals and teams in how they undertake strategic thinking. The purpose of individual mental models is to understand and order complex information to enable the individual to predict things in the environment. Team mental models are based upon individual models and are shared concepts between individuals in a team. The more sharedness or collectiveness in a team mental model, the more team members will be able to perceive the environment similarly and this will improve communication in deliberating the strategic options that the organisation may have. This will also have

a positive effect in implementing strategies when individual's mental models are shaped in the same direction. The downside of similarity in team mental models is that it may limit the variety of strategic options that can emerge from individuals with divergent mental models.

It was found that many factors impinge upon the establishment of individual and team mental models. Cognitive models (individuals' circumstances, knowledge and experience), communication processes, social memory, knowledge structures, cognitive simplification processes, contextual issues and individual issues (personality, need for structure, cognitive complexity and emotional intelligence) were found to influence individual and team mental models. These issues were acknowledge but not dealt with in detail in this paper as the focus was specifically on mental models.

Finally, to demonstrate the interrelatedness between individual and team mental models, strategic thinking and strategic planning, a model for strategy making was proposed. This model incorporates the influence of mental models in strategic thinking as an antecedent in the process of strategy making.

FIGURE 1: PROPOSED MODEL FOR STRATEGY MAKING



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