1. Introduction

In recent years, scenario planning has enjoyed increasing acceptance among practitioners and academics as a tool for supporting strategy formulation in organisations (e.g. Cornelius *et al.*, 2005). A scenario-driven strategy process involves building a set of challenging but plausible futures that the organisation could face, which are used for the development and testing of strategic options, leading in turn to the identification of a feasible strategy that is considered sufficiently robust under a range of different environmental conditions. Although different versions of scenario planning are available to the user (e.g. Bradfield *et al.*, 2005; Huss & Honton, 1987), they are typically deployed within a workshop setting (Hodgkinson *et al.*, 2006), used by a group formed to carry out the task of formulating the strategy, and led by an internal or external facilitator (Schwartz, 1991; van der Heijden, 2004; van der Heijden *et al.*, 2002). Given that a scenario planning workshop comprises a set of group-based activities, it seems obvious that the selection of workshop participants, together with the design of the different facilitated activities, will be crucial determinants of the effectiveness of scenario planning processes and outcomes. Managerial cognition scholars have argued that the cognitive diversity of the group can play a significant influence on the potential success of scenario planning interventions (Hodgkinson & Healey, 2008).

In this paper we examine the notion of cognitive diversity in scenario workshops, drawing upon psychological theory and research on individual differences in preferred ways to acquiring and processing information. We argue that these differences represent a major contributing factor to the processes and outcomes of scenario planning workshops. In line with recent calls for gaining an increased understanding of the cognitive significance of strategy practitioners' behaviours (Hodgkinson, 1997; Hodgkinson & Clarke, 2007), we aim to shed light on the possible ways in which scenario planning users approach the strategy workshop task.

2. Scenario planning and scenario planning workshops

In a recent review, Bradfield et al (2005) discuss the origins of scenario planning, from visionary thinkers such as Plato and Thomas More, to the 20th century work of organisations such as the Rand Corporation and Shell. Building upon the work by Huss and Honton (1987) they identify three main scenario planning schools: intuitive logics (e.g. Wack, 1985), trend impact analysis (e.g. Gordon, 1994) and cross-impact analysis (e.g. Millett, 2003). Many differences can be observed between the various scenario approaches embedded in the intuitive logics tradition (e.g. Ringland, 2006; Schoemaker, 1995; Wack, 1985). Nevertheless, all approaches, when deployed in a workshop format, show some basic structure in the process steps required as noted by O'Brien (2004). These include the generation and reduction of key uncertainty factors; the generating of scenario themes; and the generation and evaluation of strategic options.

A useful way of understanding these generic process steps is to place them within the context of two phases of broad group activity. The first phase can be thought of as involving *task oriented* group activities, such as collecting, sharing and structuring of key uncertainties, facts, values and beliefs, and generating and testing potential strategies. The second phase is essentially *discursive* and involving significant negotiation and debate about different interpretations of cause-and-effect relationships under different plausible scenarios, the perceived impacts of scenarios, and the robustness and political feasibility of proposed strategies. It is worth noting that order of phases and group activities in a typical scenario planning workshop represents only an ideal linear sequence. In practice, it is possible for the different activities to be deployed contingently or in a non-linear fashion, which makes it possible for the participants to cycle between the phases during a single scenario workshop or over several workshops. Nevertheless, the ideal sequence and the distinction of phases will enable to identify the contributory role that the different information processing tendencies of participants, referred to hereafter as their 'cognitive style', play during a scenario planning workshop.

3. Cognitive style

The term 'cognitive style' refers to a dimension representing consistent individual differences in preferred ways to acquiring and processing information and experience (Kozhevnikov, 2007). The research focus in applied fields such as education (e.g. Grigorenko & Stemberg, 1997) and management (e.g. Hodgkinson & Clarke, 2007; Sadler-Smith, 2004) has reflected the practical need to understand individual differences in the performance of complex cognitive tasks, such as problem solving, decision making, and learning (Kozhevnikov 2007). New dimensions of cognitive style have been developed, such as adaption–innovation (Kirton, 1976, 2003, 1989) and analysis–intuition (Allinson & Hayes, 1996). Research has demonstrated that although an individual's cognitive style is relatively stable, it is also malleable, can be adapted to changing environmental and situational demands, and can be modified by life experiences (Allinson & Hayes, 1996; Hayes & Allinson, 1994, 1998). A few attempts at integrating the available cognitive style dimensions into a unifying theoretical framework with a limited number of central dimensions have been published (e.g. Allison & Hayes, 1996; Kozhevnikov, 2007). Two qualitatively different dimensions are evident among many of these efforts: a perceptual dimension related to way individuals process information, and a judgmental dimension indicating preferences for more complex cognitive activities such as problem solving, decision making and learning.

The perceptual dimension is set out as a bipolar continuum between two contrasting approaches to information processing: analysis and intuition (e.g. Allinson & Hayes, 1996). According to Allinson and Hayes (1996, p.122), analysis relates to "judgment based on mental reasoning and a focus on detail", whereas intuition refers to "immediate judgement based on feeling and the adoption of a global perspective". Analysis is typically connected to terms such as deduction,

convergence, differentiation, linear, and reflective. Intuition, on the other hand, is commonly described by terms such as induction, divergence, integration, non-linear, and creativity

The judgmental dimension has been typically associated with problem solving, decision making, or learning. Scholars have treated judgement with both uni-dimensional and multi-dimensional constructs. An example of the former is Kirton's (1976, 2003, 1989) adaptation-innovation model. In his model, the judgmental dimension is linked to "a preferred model of tackling problems at all stages" (Kirton, 1989, p.3). Drawing on the notion that people characteristically produce qualitatively different solutions to seemingly similar problems, Kirton defines adaptors as those preferring to accept generally recognised policies or problems, while generating ways of 'doing things better'. Innovators, on the other hand, tend to redefine generally agreed policies or problems, and propose ways to 'doing things differently'.

Scenario workshops are atypical events that require from participants the 'suspension of disbelief' and the conduct of novel and loosely-structured tasks that are at odds with the familiarity of everyday work routines. Hodgkinson and Healy (2008) liken scenario workshops to 'weak situations', namely, situations that provide few dispositional cues to participants regarding appropriate behaviours, and in which behaviours are strongly influence by personality styles (Beaty *et al.*, 2001). Although several writers have acknowledged the important that role cognitive style plays in strategic decision making (e.g. Hodgkinson & Clarke, 2007; Mitroff *et al.*, 1977; Sadler-Smith, 2004; van der Heijden *et al.*, 2002), neither researchers nor practitioners have specifically addressed the contributory role of the perceptual and judgmental dimensions in the conduct of scenario planning workshops. To address this gap, we articulate a framework that highlights the role of these cognitive style dimensions within a generic scenario planning workshop model.

4. Exploring cognitive style in scenario planning workshops

Scenario planning workshops are essentially a strategic decision making tool, used to help a senior management team explore multiple plausible futures for the organisation, and identify and choose feasible robust strategy. Therefore, our examination of cognitive style must take into account a conceptualisation of style that considers modes of information gathering (i.e. perceptual) *and* evaluation (i.e. judgmental). The Jungian model, as operationalised by the Myers-Briggs Indicator (MBTI) (Myers *et al.*, 1998), has been widely researched in studies of strategic decision making (e.g. Gallen, 2006; Hough & Ogilvie, 2005; Nutt, 1993), and seems to be well understood and accepted by managers (Gardner & Martinko, 1996).

Four styles can be derived form combining the perception and judging dimensions of the Jungian model: sensing-thinking (STs) types, sensing-feeling

(SFs) types, intuition-thinking (NTs) types, and intuition-feeling (NFs) types. Jung viewed these styles as dominant, not absolute modes of expression.

STs stress systematic problem solving and decision-making with hard data. They put considerable emphasis and concentration on specifics and factual details of problems or choices. STs place high importance on tasks and structured information, and use logical, step-by-step processes to reason from causes to effects. NTs, like STs, stress systematic problem solving and decision making, but they tend to ignore specific, detailed information of problems or choices. Instead, they put significant emphasis on broad, global information and issues. They enjoy structuring complex problems and reducing them to simpler ones by studying patterns in data. NFs stress judgement and experience in problem solving and decision making, often portraying their personal views as facts. They rely on gestalt, intuitive perceptions and maintain few decision-making rules. Like NTs, NFs spend little effort getting to know specifics (sometimes they show an extreme disdain towards getting down to specifics). Also like NTs, NFs pay attention to long-term planning and enjoy working in ill-structured problems and choices that require innovative concepts and theories. Unlike NTs, however, their structuring of these problems and choices typically involves global human and social issues. SFs stress people's opinions in decision-making. Like STs, they rely on specifics and focus on short term problems. However, STs are more interested in details and facts about people than about things. SFs are concerned with individuals in particular rather than people in general. They are concerned with making people get along in more harmonious manners.

Because of their attention to specifics, we hypothesise that the contribution of STs and SFs to procedural scenario workshop activities (e.g. setting the scene, surfacing strategic options) is likely to help generate high levels of detailed information, as well as add precision to contributions made by NTs and NFs. For discursive scenario workshop activities (e.g. choosing uncertainty factors or scenario themes), we contend that STs are likely to press for realistic and well-articulated themes or options, whereas SFs are likely to press for themes of options they perceive would be endorsed by the consensual majority. Consequently, their contributions may slow up the scenario workshop proceedings considerably. On the other hand, because of their concern for the short-term, we hypothesise that STs and SFs will find the more divergent scenario workshop activities (e.g. generating uncertainty factors, building scenarios) particularly challenging, for they require thinking in significantly longer time frames than is preferred. Conversely, due to their concern for new possibilities and long-term plans, we hypothesise that NTs and NFs are likely to enjoy this type of workshop activities. Furthermore, both are likely to help provide a comprehensive set of information inputs to the process, as well as identify themes within which the contributions made by STs and SFs can be located. As to the more discursive scenario workshop activities, NTs are likely to press for comprehensive but well articulated scenarios or options, whereas NFs are likely to press for scenarios or options that stress global human and social dimensions.

Appendix 1 summarises our theoretical framework of the role of different Jungian cognitive styles within scenario planning workshops.

5. Conclusions and implications for research and practice

Our framework suggests that scenario planning workshops will be favoured by different types of individual. This leads to the following two propositions:
Proposition 1: Homogeneous intuitive groups (NTs and NFs), rather than homogeneous sensing groups (STs and SFs) will be more effective in scenario workshop interventions.
Proposition 2: Homogeneous intuitive groups (NTs and NFs), rather than homogeneous sensing groups (STs and SFs) will experience a higher satisfaction with scenario workshop interventions.

Although not implied by our framework, it is worth noting that there is other work suggesting that individuals might be able to override their stylistic preferences by 'switching cognitive gears' (Louis & Sutton, 1999) in order to address the problem at hand (e.g. Robertson, 1985). Therefore,
Proposition 3: Individuals trained in switching cognitive gears, rather than those who are non-trained, will be more effective in scenario workshop interventions.

In order to be able to relate the data generated by coding individuals' contributions within strategy workshops to their cognitive styles, researchers will require a clear operationalisation of scenario workshop processes and outcomes, as well as a robust instrument to measure cognitive style. For example, individual contributions could be classified by their task or relational orientations, allowing group processes to be compared against normative models of decision making or conflict management, respectively (Folger *et al.*, 1996). Similarly, resulting scenarios could be rated against standard quality criteria such as 'coherence', 'plausibility', 'internal consistency', and 'logical underpinnings' (Bradfield *et al.*, 2005). As to measuring cognitive style, the primary psychometric instrument to measure the Jungian cognitive styles is the Myers-Briggs Type Indicator (MBTI) (Myers *et al.*, 1998).

Knowledge and understanding of cognitive style and its impact will help the workshop facilitator to manage the underlying cognitive, behavioural and emotional processes observed at work during scenario activities. For example, when dealing with a scenario workshop group comprising a majority of STs or SFs, facilitators should introduce techniques directed toward fostering innovative thinking in order to generate challenging and plausible scenarios and creative strategies for dealing with the contingencies so envisioned. On the other hand, despite their apparent fit with scenario planning workshops suggested by the propositions articulated earlier, a scenario workshop group comprised by a majority of NTs and NFs would require the facilitator to stimulate group members to challenge one another's contributions.

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