The contribution of information processing and decision-styles to corporate environmental management and sustainable enterprise

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Abstract

Research in the area of sustainable enterprise suggests that environmental and sustainability issues place demands on managers for skills to think systemically, to integrate many different facets of environment and business problems, and to support collaborative action between disparate partners. To learn more about how different people interact with this situation, we explored patterns of differences among some managers involved in sustainable issues everyday using a theory and assessment method for understanding patterns of individual differences, the Driver decision-styles model (Driver *et al* 1993). This model is relevant to our interest in understanding how people with certain decision-making styles 'interact and perform' under a given situation. The model explicitly addresses how people manage complexity in problem solving situations and characterises people in to five different styles. In our exploration, we adopted a situation-based or contingency approach. We presented a sample of people with a given situation (a complex stimulus, i.e., the management of issues associated with 'greening of a specific industry' in a one day game simulation), and explored how different groups representing similar patterns in decision-making styles 'perform'. Our results show a variation between groups who have patterned differences in decision-making styles.

Introduction

The natural-resource-based view of the firm (Hart, 1995) argues that firm capabilities provide the basis for ecologically sustainable enterprise. This notion is also supported by the view that capabilities in [total] quality management (Stead & Stead, 1992) and organisational learning (Dobers & Wolff, 1995) are antecedents for performance in organisational greening and that these capabilities serve as bridges between conventional

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business processes and emerging environmental management processes (Win & Roome, 1993).

At the level of individual managers in a firm it is argued that environmental issues arise through the interaction of complex human and environmental systems. Capturing knowledge about environmental issues requires capabilities in integrating information, or systemic thinking together with an ability to relate this information to both its environmental and business context (Roome, 1994). Practical examples of the capture of systemic environmental knowledge are found in the development of tools such as life cycle analysis.

At the level of organisational teams it has been reported that firms involved in developing organisational responses to environmental issues encounter problems arising from the inability of environmental managers to communicate their concerns and approaches to others within the organisation (Shelton & Shopley, 1996). It is argued that this implies a need for environmental managers to develop a better business language or business case to support their ambitions and proposals (Shelton & Shopley, 1996). This would logically drive a company to provide environmental managers with training in analytical techniques, which support environmental management through the development of a coherent 'business case' accessible to firm decision-makers.

An alternative hypothesis is that mainstream business managers are familiar with the development of a business case for choice yet are not adept at appreciating the significance of the arguments presented by environment managers about how they view their concerns and responses. This would lead logically to the development of training for mainstream business managers (such as business strategists) that enables them to develop an appreciation of the more systemic and contextually dependent issues that characterise business/environment choice.

A third hypothesis is that the reported problems of communication between business and environmental managers simply arise at the interface between organisational groups, which draw on fundamentally different information processing and decision styles. These different styles arise through a process of experience and selection. Through the process of experience and selection the 'systems complexity and context dependency' of environmental issues attracts and reinforces managers with individual capabilities in processing this type of information, while the decisiveness and focus of many business choices attracts and reinforces individuals with capability in this information and decision style. In these circumstances training one group (environmental managers or mainstream business mangers) only serves to ignore the more fundamental problems of teams: integration of environmental issues in business is a complex and difficult team process requiring mutual recognition by team members of the importance of functional as opposed to dysfunctional teams. Here functional teams are defined as teams, which are self-reflective and capable of appreciating that the information processing and decisions style of individual team members and the pattern of communication that stems from those approaches, reveals and obscures different aspects of a shared problem. Among other things functioning teams are aware of how differences of information process and

decision style impose problems on the choices that have to be made by a team or group as a whole. The acceptance of such an hypothesis would imply a commitment to training in which mixed groups of business managers and environmental managers explore their information processing and decisions styles and understand how these styles affect the way they communicate and ultimately make choices together.

Using this last perspective the paper reports on the relationship between individual 'decision-making styles' in problem-framing and action strategies taken with regard to managing sustainability. Our paper is based on our participant observation in an intensive one-day simulation involving a group of senior environmental managers (varying in decision-making style) and their approaches to 'greening' of a fictitious firm.

Point of departure
The point of departure of the paper is that a firm's capabilities (for learning, quality management, and ultimately for 'greening') are greatly dependent on the information seeking and information processing styles of its managers and the ability of teams that contribute different styles to work together in a functional way. That is, a firm's capabilities to manage complex issues around sustainability depend greatly on the capabilities and approaches to managing complexity of individual decision-makers comprising the firm, especially as managing complexity places high demands on the information seeking and processing capabilities and styles of people.

This places a premium on systemic thinking. This is supported by research and literature on the 'bridging capability' of organisational learning (e.g., Senge 1996), which suggests that 'learning organisations' enact leadership that is able to: build shared vision; surface and test mental models (bring forward and test the underlying assumptions used to interpret observations); and, think systemically (i.e., identify interrelationships, processes and the overall patterns of systems and their failures). It is supported by literature on environmental education in the management curriculum (Roome, 1994), which suggests that environmental issues require managers with the skills to think systemically, integrate many different facets of environment and business problems and support collaborative analysis *and* action between disparate partners.

'Styles' and the management of sustainable issues
However, this view of the importance of systemic thinking raises questions about what is 'systemic thinking'? And what does it mean as a 'style' of information seeking and information processing? We consider systems thinking to be a 'style' of reflection, learning, and approach to problem solving. Systems thinking approaches imply the use of certain behaviours and skills in information seeking and information processing, where interrelationships among social and technical dynamics *and its* details (i.e., the forest's ecosystem and its trees) are sought and integrated into a rather complex perspective on problems and problem solving, which is then translated into the management of organisations and issues.

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It is known that information seeking and information processing 'styles' used in decision-making are not uniform across any given cohort of managers (or other groups of people for that matter). There is well over 50 years of research and reporting in scientific and popular organisational development literature, literature and research on group dynamics, leadership, learning styles, team building, cultural studies, etc. on patterns of individual differences/similarities in temperament, style, communication, values, etc. of relevance to management. Literature and research in these areas present alternative models, methods of assessment, frameworks and theories of patterns of individual differences/similarities which have been introduced, developed, refined, challenged in 'pure' research settings, action/applied research settings, and in practice. Our purpose is not to review nor argue for or against theories, frameworks, methods or otherwise.

However, we must clarify our position regarding 'the nature of these types of theories' and their relevance for management since we have chosen to use one framework in particular.   Three general statements can be made (which are not only supported by research but hold 'face/experiential validity' of practical concern to most of us) about this literature and claims about people (us) made in it.[i]

1) Patterns of individual differences (alternatively similarities) among us can be assessed/measured; even if these patterns are along dimensions 'constructed' by the researchers/theorists themselves. That is, given consistent (constructed) stimuli, the range of our reactions to such stimuli tend to cluster in ways not explained by random variation but rather by 'dimensions' of our temperament, style, personality, value systems, etc. The specific patterns one chooses to emphasise are derived from both stimuli and measurements the constructs (practitioner uses), and they do not necessarily represent 'ultimate truths' about our personality, temperament, style, values, etc. Such constructs and the dimensions they comprise are human constructs (about all of us), which are relevant and useful for creating understanding and enhancing communication about people with one another (if not necessarily for insights into the 'true' aspects of our human personality).

2) Understanding patterned *differences* identified between people often contributes to overcoming difficulties in communication and co-operation/co-ordination needed to jointly solve problems, make joint decisions and implement them.

3) Patterns of individual differences influence our individual/group/organisational behaviour 'performance/effectiveness.' The effect on performance/effectiveness is not only a function of our individual/group/organisational constitution *per se*. Nor is it only a function of how synergistic we are as people in a given group/organisation. Our effectiveness/performance is best evaluated with respect to our *interactions* with the tasks and situations at hand. Effectiveness/performance then is situation based. If not, all people would be equally effective/ineffective in all situations. Conversely, situations would not differ with respect to demands placed on participants, and thus all situations would be viewed equally. As situations vary so does our own effectiveness and the effectiveness of different constitutions of teams/groups/organisations of which we are part.

We present these three points above as our baseline position in approaching the relationship between individual styles and approaches to issues of environmental management and the development of sustainable enterprise. We do not argue for any one superior assessment, theory or model of arriving at or then explaining patterns of individual (style) differences and their interactions in given situations. Our purpose is rather to report on one exploration into how we witnessed the way that individual styles influence problem-framing and action strategies with respect enacting environmental and/or sustainable enterprise.

Exploring sustainability and peoples' interactions in managing it
We hope that the three points above make clear that our position is based on the practical understanding that (we) individuals act both as individuals and as groups/organisations, as a fulcrum for eventual success or failure in attempts to conduct and develop sustainable enterprise. But the 'success or failure' of attempts to conduct and develop sustainable enterprise represent boundary conditions that are interpreted by people. These interpretations are based in part on our own patterns of information seeking and processing styles, and achieving and managing efforts toward sustainable enterprise place specific, describable demands on individuals/groups/organisations. Understanding these 'situational demands' and how they impact different styles of information seeking and processing will enhance our ability to act.

As noted in the introduction, research suggests that environmental and sustainability issues place demands on managers for skills to think systemically, to integrate many different facets of environment and business problems, and to support collaborative action between disparate partners. We consider this the 'situation' we are concerned with. To learn more about how different people interact with this situation, we explored patterns of differences among some managers involved in sustainable issues everyday.

Next we report on our use of one particularly suitable and robust theory and assessment method for understanding patterns of individual differences, the Driver decision-styles model (Driver *et al* 1993). This assessment method and theory is relevant to our interest in understanding how people with certain decision-making styles 'interact and perform' under a given situation. This framework is relevant because it explicitly addresses how people manage complexity in problem solving situations and goes so far as to characterise systemic thinking in relation to other styles. We present the framework in more detail later in the paper.

In our exploration, we adopted a situation-based or contingency approach. We presented a sample of people with a given situation (a complex stimulus, i.e., the management of issues associated with 'greening of a specific industry' in a one day game simulation), and explored how different groups representing similar patterns in decision-making styles 'perform' (interact to the stimuli). Interesting variation is indeed found between groups who have patterned differences in decision-making styles.

The participants

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The sample of people selected for our exploration of is one of *relevant* convenience. They are managers responsible for managing environmental and sustainability issues in their enterprises who participated in a one-year executive development program at the Stockholm School of Economics on Strategies for Sustainability. For reasons of integrity we do not provide names of the participants nor the firms they represent. However these firms ranged from global concerns (headquartered in Europe with 1000s of employees) to European firms (headquartered in Sweden) to firms based and operating in just Scandinavia (with a few hundred employees). Industries represented included energy, pharmaceuticals, finance, telecommunications, construction, transportation/logistics, manufacturing, and housing. Organisations included private and publicly traded, as well as governmentally owned enterprises. All the enterprises sold products and/or services commercially (even governmentally owned enterprises). The ages of individuals ranged from early 30s to mid 50s. There were 50% men/women.

The simulation

The simulation is a management game called "Transformation" and was originally designed by Susan Svoboda in co-operation with Stuart Hart & Richard Duke[1] at University of Michigan. The purposes of the game is to:
- Introduce and familiarize participants to the concepts of sustainable development and stimulate a discussion on what it is and what it means for them and their corporations
- Create awareness of the "network" of actors, or stakeholders, influenced by and influencing the corporation and its' decisions and activities
- Create awareness of the new types of skills and capabilities necessary for companies to develop sustainable strategies and practices
- Introduce concepts and strategies aimed at improving environmental performance
  1. in the firm
  2. in partnership with suppliers
  3. in partnership with customers
  4. in partnership with other stakeholders, for example local communities, environmental organisations, other NGOs, policymakers etc
- Introduce tools related to environmental process and product design
- Introduce tools for "networking" with stakeholders
- Introduce tools for analyzing environmental opportunities
- Encourage integration of (long-term) sustainable, design, activities and practices across functions, throughout the company and in co-operation with stakeholders.
- And finally to help evaluate different environmental strategies against other business goals and against sustainable development.

The transformation game develops both analytic and collaborative skills while helping participants learn how their organisation can turn environmental challenges into a competitive advantage. Thus it shows how sustainability serves as a catalyst for improved

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[1] The original work was done at University of Michigan by the MBA-student Susan Svoboda, Associate Professor Stuart Hart and Professor Richard Duke. Susan Svoboda has developed the game further and is now situated in Washington DC where she teaches at Georgetown University and has her own consulting firm, Realia Group (www.realiagroup.com).

performance. Rather than depicting sustainability as a static outcome, the exercise shows how it's possible to identify and achieve continuously progressive goals without retrograde effects on the environment.

The exercise forms participants into self-managing teams that operate simulated companies and compete among themselves and with computer-simulated competitors, in a hypothetical industry. Each team consists of different functions including finance, strategic planning, manufacturing, environment and marketing. The approach is to involve them in a demanding, hands-on exercise in which they enact full-blown operational scenarios that develop and enlarge their perspective and skills. Each team designs, manufactures and markets products and/or services in the context of life-like conditions such as time, budgetary restrictions, unpredictable stakeholder interventions, changing market conditions and limited information.

Reflecting the real world, participants often find they are working with incomplete, changing or conflicting information. They are encouraged to identify and evaluate their data to identify information deficiencies. In some cases teammates will have the information needed, in others, they may gather information from external sources via the facilitator (or as in our case with multiple people participating in the game role-playing), who plays the role of the selected sources, and provides the requested information in character. The Transformation Game enables the facilitator to customize and re-shape some aspects of the exercise on the spur of the moment, and compel participants to react to uncertain circumstances. This format enhances the learning environment by encouraging "out of the box" thinking and decision-making.

Participants receive feedback on their financial, market and environmental performance, while the computer-simulated competitors demonstrate the effectiveness of alternative strategies. The computer simulated companies represents four different environmental strategies based on Hart's classification, pollution prevention, product stewardship, clean technology, and sustainability (Hart, 1997). The debrief discussion relates the exercise lessons back to actual business activities and decisions. A proven outcome of the exercise is that participants will resume their management roles with a new understanding of the business logic behind sustainability and the critical considerations that will significantly affect performance.

A Driver Decision-styles model
One author (P.Sweet) has used a specific framework and tool (in both research and practice) for understanding and managing teams, individual development, executive assessment, communication, and even information systems design. This framework explicitly addresses styles of thinking (or cognitive decision-styles), which help specifically to understand our habits regarding: a) how we gather information, b) how we processes it, c) how these behaviours influence our framing of problems and the character of our decisions, and d) how our styles influence our communication and interaction with others.

The framework used is the Driver Decision-styles model (Driver *et al* 1993).
The dimensions of the Driver decision styles model are easily understood. People are posited to vary with respect to a) how much information we gather/use before feeling ready to make a decision, and b) the manners in which we process the information we gather to solve problems and make choices.[ii]

➢   When gathering information to make a decision we tend either top satisfice or maximise. Satisficing occurs if we stop searching and use new information as soon as a sufficient solution (or set of solutions) is identified. Maximising behaviour is described as continuing to collect information until no additional value (is felt to be) obtained from that new information. Figure 1 presents two people (A & B) who 'satisfice' or maximise.
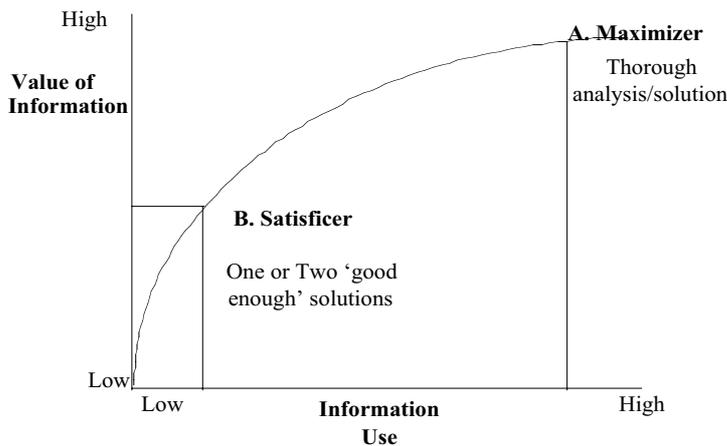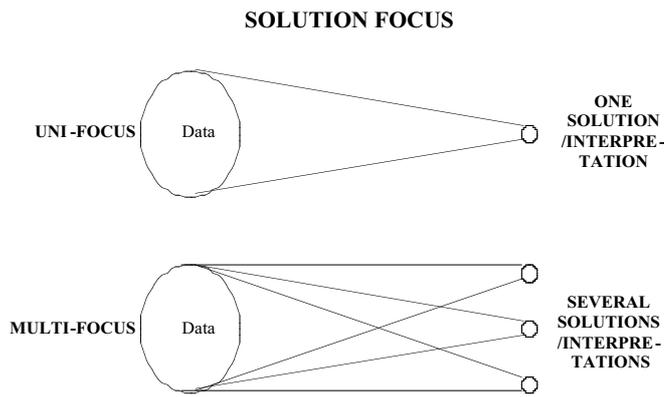

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Figure 1 Information seeking/use and information value.

The second dimension of the model is *solution focus*.
➢   When making a decision (processing information), we differ in our tendency to develop either a single solution (tendency toward closure) or a set of possible solutions (tendency toward open interpretation). Either we tend to push to find one solution or we tend to push to find multiple solutions. That is we tend either to be uni-focused or multi-focused (See figure 2).

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Figure 2 Solution focus of decisions.

Combining these two dimensions (information use and solution focus) creates five basic decision styles -- Decisive, Flexible, Hierarchic, Integrative and Systemic.   The five basic styles are displayed below in Figure 3.

You will notice the fifth decision style in Figure 1 as the systemic style. The systemic style emerges as a unique decision-making style combining aspects of the *integrative* and *hierarchic* maximising styles. The systemic style has emerged from empirical research (over the past 20 years) which reflects the grounded nature of the model and its development.

Figure 3 Decision Styles Matrix (from Driver, et al 1993).

Rather than focus on the unique styles in individual cells, we suggest you first contemplate the dimensions of the model: Information Use (horizontal) and Solution Focus (vertical).

These dimensions are characterised by different styles. *Satisficing* styles (decisive/flexible) are action oriented while *maximising* styles (hierarchic/integrative/systemic) are analytic. Or looked at another way, *uni-focus* styles (decisive/hierarchic) tend toward closure and control of issues and interpretations of information/events, intended to 'arriving at a single best' solution and holding to it. *Multi*-focus styles (flexible/integrative/systemic) tend towards open-solutions and interpretations of data/perspectives/information/events. Multi-focus styles more easily reconsider previous decisions than uni-focus styles. So, each style represents a combination of *focus/information use*.

Styles in action
These five styles exhibit different communication tendencies, which can be humorously characterised in the following ways.[iii]

Asking the simple question, 'what colour is the sky' yields the following 'characteristic responses' from each style. *Decisive* style says 'The sky is blue' (very direct and not much elaboration). A *flexible* style answer is (looking outside): 'right now, the sky is grey, which is typical especially if you…..(often complemented by a humorous comment).' The *hierarchic* style of answer would be characterised by an explanation of '<u>why</u> the sky is blue' (referring to light/water/atmosphere interactions and offering a rather lengthy answer to a simple question). The *integrative* style is to say: 'It is blue for the most part, depending upon where you view it from, what time of day, etc. In the morning it can be red or pink, at night black, grey at times, and sunset can be orange, but for the most part it is blue' (coming full circle). Here the integrative style offer a similar elaboration on the answer to that of a hierarchic style, but the elaboration takes on the character of *variation of perspective* rather than *detailed explanation* as to why the sky is blue, for example. The *systemic* style is characterised by a pause, a scratch on the chin, and then in true maximising style, probably seeking more information by asking: 'what do you mean by the question? What are you interested in knowing? Does it have something to do with your health, your plans, or what? Why do you ask?' This is a systemic attempt at placing the answer in the right systemic context for his/herself, more than for the one asking the question. If your answer to the 'why do you ask' question is, 'oh, I just wondered', then a systemic style answer would be 'oh, well, blue in general, I guess'.

This reveals the 'general' perspective of the systemic style, which seeks an overview, the big picture, and larger perspectives. So to compare: An integrative style seeks detailed multiple perspectives while the systemic style seeks a *larger* perspective[s] on most issues. The tendency of the systemic style to answer directly, or to answer with a question, can be viewed suspiciously by other styles; while short, quip-like answers (of satisficers) can be viewed as 'shooting from the hip' by maximisers. And just to be complete, the long answers of all maximising styles can drive satisficing styles to 'name-calling!'

Interestingly, uni-focused styles tend to get along greatly or fight like crazy. Uni-focused styles tend to prioritise information sources and outcomes seeking focused results or

explanations. They seek to 'cut-away' alternatives in favour of finding 'the best' solution. They also tend to stick with such a solution once it is derived. The hierarchic style will go to great lengths logically to sort-out, focus, and hold a vision. The decisive style is equally focused but pragmatic and tends to act as soon as 'the best pragmatic solution' is in view, and then stick to it.

Multi-focused styles tend to be more open (tolerant) to others and to differences of opinion. In fact they seek them often.

Multi-focus styles (flexible/integrative/systemic) all tend to seek multiple sources of information while integrative styles are characterised by trying to find links among bits and sources of information for purposes of 'networking' (knowledge and people) and integrating/synthesising. Systemic (multi-focus) styles not only seek links, but they also seek to organise these links into causal and influential relations, often complex in nature, often stretching to find underlying systems of relations, causes, effects, and trends (which go beyond the networking/synthesis of the integrative style.) The systemic style is the most complex style. However, it should be noted that there is no correct style. For example systemic styles may seek complexity when it is not there.

So-called toxic styles are styles that do not share any commonality on neither the *focus* nor the *information use* dimension (the diagonal cells in figure 3). Toxic styles sometimes have a difficult time finding 'common perspectives' since their approaches (amount of information gathered and how they analyse it) are so different.

Where do styles come from?
Whether we develop a uni- or multi-focus style or a satisficing or maximising style is a matter of learned habit (experience and practice) *not intelligence*. Our learned habits or styles come from culture, education, and professional experience etc. In general they come from our social milieu. Our styles can also change or be changed consciously.

These dimensions (information use and solution focus) are independent of one another, and various habits are encouraged/discouraged by different institutions. For example, fast-adaptable satisficing styles are not normally encouraged in academic institutions while they might be in occupations such as advertising. Satisficing decisive-bottom line focused styles are not likely to be encouraged by urban planning professions, while detailed analysis and rigorous presentation of the pros and cons of various approaches to social problems (as traditional urban planning is supposed to entail) is not often encouraged by those involved in the operational work of corporations.

Driver also posits that the cognitive styles we use are 'situation awareness' sensitive (as well as a matter of learned habit). Again, styles are not innate. For example, in some situations we engage our public or role style habits, while in others we engage an operating or private style. It is not unusual for a person to exhibit say a 'decisive' role style in public situations while employing an 'integrative' operating style in more relaxed situations.

There is also posited dynamism in relation to the style or habit we engage and situational stress and pressure. Under high stress we almost always tend to engage a satisficing style (flexible or decisive) while under moderate stress we *may* engage a more maximising style (hierarchic, integrative, or systemic) although this need not necessarily hold true. Again, it is an interplay of learned habit whether or not we develop or engage a maximising or satisficing style, as well as when we employ it (the situational demands), and whether it is uni- or multi-focused.

Style summary
Person and situation are posited to interact in unique ways. However one can describe or understand these interactions in terms of: multi-focus versus uni-focus tendencies or learned habits and maximising versus satisficing behaviours. These tendencies/habits and behaviours are sensitive to (among other things) how self conscious we are to our normative surroundings (which implies the invocation of a 'role or public' style) versus how 'unconcerned' we are with respect to norms, which invokes our 'operating or private' style. We exhibit consistency and inconsistency. We are influenced by situations but react using *repertoires* of learned (patterned) responses. We can innovate and refine.

Each style exhibits certain behaviours. These can be characterised according to: action or analysis, seeking closure versus seeking options, tenacity to hold to previous decisions or continuous re-adjusting/adapting to new input, etc. The five styles are distinct. They cluster to form the basis for constructive and destructive differences and shared/unshared perspectives and orientations toward action within groups or teams.

Environmental managers in action
As described above a group of managers responsible for environment and sustainability issues for their companies participated in *The Transformation Game* as part of an executive education program. This explored patterned differences between groups of managers and the influence of these differences on framing issues and taking action. The mangers were first divided into three groups according to their decision-styles. These styles had been assessed through a series of two instruments[iv].

Three groups were chosen (and not 5 to represent each of the styles) for a simple reason. There was a higher degree of homogeneity among these (environment and sustainability) managers than would be expected in an average group of managers. We say 'average' based on data and experience. An 'average' group of managers of a similar size would usually comprise a broader/near complete spectrum of decision-styles. An average group is usually comprised of managers from different functions and areas of responsibility. In contrast 2/3rds of the group in the study were multi-focus!

A similar degree of homogeneity has been seen among sales executives, insurance executives, students enrolled in a given professional development program. This emphasises an important point. The interaction between person and situation can lead to a 'natural self-selection' among styles. That is, certain styles seek-out certain jobs and conversely, certain job/situations demand certain styles, which can lead to individuals

'changing style' to meet demands of certain jobs. In a database of several hundred thousand individual decision style profiles (used for understanding marketing segmentation) there is a patterned variation and clustering associated with industrial sector and type of responsibility relative to decision-styles (Sweet & Kramer 2000).

The Driver assessment tool assesses 'primary' and 'secondary' styles used by individuals. The majority of this group of environmental and sustainability managers consisted of 'primary' maximising and multi-focused styles. We know from our database of several hundred thousand profiles that line managers tend to be trained into 'action' styles or 'leader' styles that value 'bottom-line' focus and results. Sustainability issues, however, are more complex and imply multiple evaluative criteria. Typical management-development programs tend to 'train' organisations to *focus on core competence* and '*lead to goals'* and *reward narrow results* (like increased sales, profit, market share and the like). Here we begin to see some of the basic difficulty in broadening an organisational agenda to include multiple evaluative criteria, since individuals who lead organisations tend to exhibit uni-focus/satisficing action-oriented styles (i.e., decisive styles). In this group, there was an above average representation of both maximising and multi-focus styles.

One third of the group exhibited uni-focus styles. About one third of the group had some secondary uni-focus styles. The participants were, therefore, divided into three sub-groups one with primary uni-focus styles, one group of primary multi-focus styles, and a mixed group (uni- and multi-focused styles).

**Reflections on styles in action in the Transformation Game**
A brief reflection on the 'outcomes' of the three groups in playing the Transformation Game is used to highlight how styles affect the approach to the problems and challenges of sustainability that the game simulated.

Example one: 'Branding and Imaging'
Each group chose a company name and was given a chance to develop a presentation of their 'firm'. Recall that the Driver decision-style theory posits that:

➤ Uni-focused styles tend to focus, pay attention to control, quality and clarity, emphasising thoroughness and longer-term approaches (if they are maximising).
➤ Multi-focus styles will emphasise openness, broad appeal, integration, flexibility and adaptability, etc.
➤ A mixed group should emphasise some kind of dual message or a compromise.

The pure multi-focus group used a logo consisting of a circle (very cyclic/integrative). Its name was SecureDelivery. Note the 'circular integrative nature' of the logo.
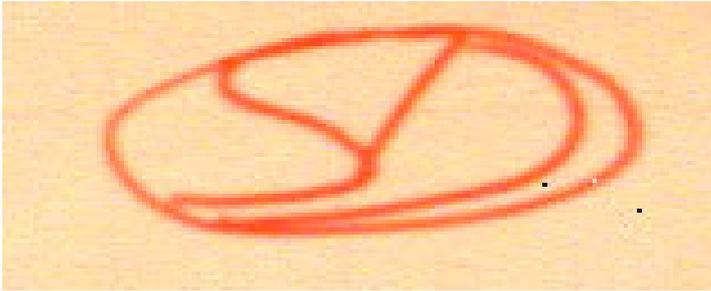
The uni-focus group used a logo with block letters encased in a single-line rectangular box. Its name was decided to be Safe Kinestic International.
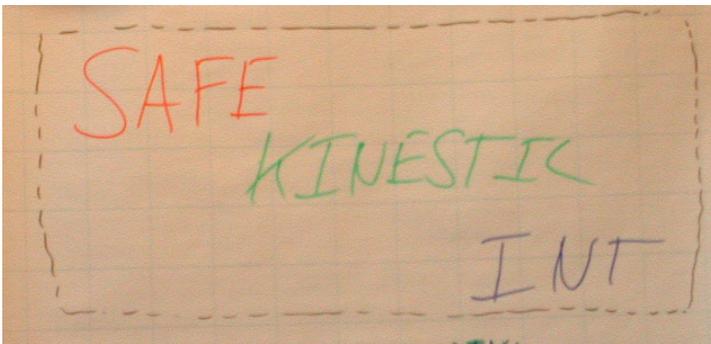
The mixed-focus group called itself Volvo Mobility (interestingly enough, Volvo was NOT represented by any of the participants). This choice had something to do with the company in the game simulation being a transportation company, and Volvo represents an established (safe) image that appealed to the groups members while the 'mobility' tag freed-up the 'safe, Swedish, image' for the multi-focused members of this group.
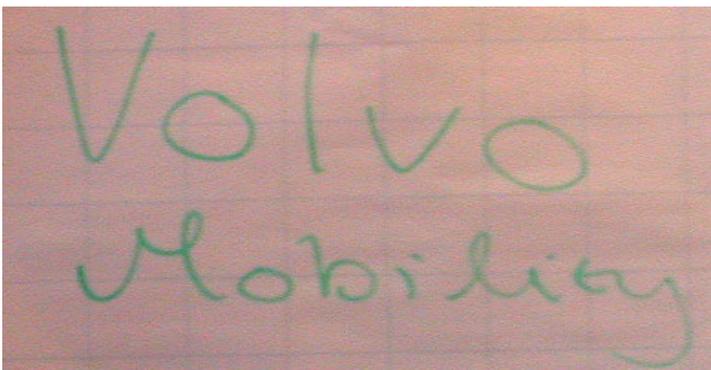
Example two: Vision, strategy and action

Each team was instructed to establish a vision, strategy and action statement for their firm. The following matrix shows what each group came up with.

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	Secure D (Multi-focus)	Safe K (Uni-Focus)	Volvo M (Mixed-focus)
Vision	**The leading supplier of a renewable transport concept**	**World leader in clean and safe transportation**	**Most efficient products for a sustainable future**
Strategy	**Offer a full and flexible transport concept for our customers**	**Number 1 in M2 market with medium price strategy**	**Focus on functionality & future technologies in developing markets**
Action	**Outsource basics, add customers' requirements, add value (insurance, recycling, lifecycle care, etc..)**	**Stake holder dialogue**	**Mkt Survey, good relations with stkholders, develop products, plan production, transparency & trust**

The matrix should be viewed row-wise and then column-wise. Rows provide a comparison of differences in 'framing' a vision, action, and strategy as between multi-, uni-, and mixed focused groups. The columns are less insightful. Comparing columns brings-out differences in focus of 'vision' (no pun intended) and framing of action.

Compare the adaptability and breadth of the multi-focus group's vision of a 'renewable transportation concept' with the precision and clarity of the 'clean and safe' vision articulated by the uni-focus group! The mixed-focus group offers a combination of 'efficiency' (a uni-focus concept) with 'sustainable future', an adaptable multi-focused vision.

Look next at strategy in the table. Compare how the multi- group articulated a strategy to 'offer a full and flexible transport concept for our customers' whereas the uni-focus strategy was to be 'number 1 in M2 market with medium price strategy'. The uni-group would not sacrifice quality for price, and their goal of course was focused on being #1. The multi-focus group immediately brings *fullness, flexibility and customers* into their strategy (they are the only group to mention customers in their strategy!). The mixed group articulated a 'focus on functionality & future technologies in developing markets' which evidences *focus* and *developing markets*. We view this again as a dual statement or a statement of compromise. 'We must have focus and we must have options, so why not *focus on developing markets*.'

Lastly consider action in the table. What is obvious when looking at the last row is that the uni-focus group articulates *one action*! One clear focus on dialogue with shareholders. Yes, this can be interpreted as 'openness to shareholders' but it is striking to

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compare that single action to the multiple actions of the multi- and the mixed-focused groups. Looking at the content of the multi-focused action statement we find *diversification* into recycling, insurance, lifecycle care services, etc.

Example 3: Readiness to change/adapt business models
There are additional evidences as the game ran. For example, at the outset of the game the 'business model' each group was given for their company was identical. This model was specified as follows: the company built and sold transport systems (like trucks) for the transport of fragile products. The multi-focus group actually expanded and changed this business model in the very first round (to include leasing, insurance, full delivery, for example) while the uni-focused group 'considered this, but could not quantify its effect in time'. They invested early and heavily in pursuing *the same business* but in another market and unfortunately, miss-assessed its growth and timing, and thus nearly went bankrupt. *This is not to say that a uni-focused strategy is wrong or that a multi-focused strategy is right!* The effectiveness of choice depends on the situation, and the game had several random events (by design), which in this case gave the multi-focus strategy an edge. However, in the debrief, even the uni-focus group admitted that they saw signals early 'but discounted them intentionally to stick to plan!' Under the circumstances of the game this happened to be a poor choice.

Example 4: Measures of success
Each group was asked to determine their own measures of success in the game. The multi- group identified 'customer satisfaction, employee satisfaction, and market share' as measures of success. Notice the emphasis on satisfaction and on customers. The uni-group identified 'market share, revenue, long-term profit.' These are definitely internal measures of pure economic performance. The mixed group identified 'market share and customer satisfaction' as having medium importance as measures of success, and identified 'net income' and 'sustainable impact divided by profit' as being highly important. Note again that the mixed-focus group compromised, which led to a formula that 'quantified' yet divided 'profit' into some 'sustainability impact' index.

Summary and implications

The introduction to this paper pointed out that research in the area of sustainable enterprise suggests that environmental and sustainability issues place high demands on managers for skills to think systemically, to integrate many different facets of environment and business problems, and to support collaborative action between disparate partners. This implies two important reflections: 1) Certain cognitive styles (systemic/integrative/open styles) are required to cope with and manage sustainability issues facing the firm. 2) Since cognitive styles impact communication and group functioning it is crucial to understand the relationship between cognitive/information processing demands on managers and how individual cognitive styles influence individual and group functioning in complex situations. Increased understanding will help us better manage and develop our interpersonal and organisational skills and competencies in managing sustainable issues facing firms.

This paper presented reflections on an innovative management development program intended to assist in understanding the relationship between complex demands facing environmental managers, cognitive styles and subsequent group behaviour and performance in a controlled setting. We reported on theory behind demands for 'systems thinking', we introduced a means of measuring cognitive styles (one of which is a systemic thinking-style), and reported on how a group of 14 managers were divided into three 'style homogeneous' groups and who then participated in a realistic game/simulation on sustainability and the firm. We conclude with our reflections on their (group level) performance in the game/simulation and implications for management development.

The sample of environmental and sustainability managers (that participated in our program) displayed a narrower range of information processing and decision styles than would be expected in an average group of managers of a similar size. The group as a whole displayed a strong tendency toward multi-focus styles.

We also see evidence that information processing and decision styles influence the framing, vision and actions taken by these groups in the Transformation Game. This occurred despite the reasonable assumption that environmental managers have a broader and more maximising focus than other functional or line managers, and this (we assume) influences their framing, vision, and action in the real world.

We also note that complex/maximising styles, especially systemic styles that combine the openness of the integrative style with the prioritising and thoroughness of the hierarchic style, may have difficulty in reacting to immediate opportunities yet they contribute to seeing the larger and longer-term consequences of actions of others and interactions with context. Our 'focused' group tended to react much more cautiously to changes presented to them in the simulation. Integrative styles developed more complex responses to the Transformation Game that even included the reformulation of the rules of the game as seen in the redefinition of the business model.

The more focused styles provide clear and relatively unambiguous and long-term commitment to previous decisions and thus, expected outcomes. These are communicated with clarity and simplicity. While these maybe more readily measurable they may not capture the richness of the options, information and choices that were available in the game (and perhaps in the real world). However, they do serve to focus and ground the potentially unending loops of reciprocating causalities seen by strongly integrative styles.

The group with the mixed-focused styles was often involved in the development of compromise that connected the measurable with the more open. While the group appeared to manage this process of compromise they were not sensitised as to the 'style' of their group before the game (nor the styles' advantages and limitations that each style brings to group decisions). A pre-game briefing would likely have improved the capacity of the mixed group to understand why compromise was needed and why such divergent

approaches emerged as a consequence of information processing and decision styles, which have to confront exactly the same information.

This study also shows that despite the fact that all three groups were presented with the same information and events during the Transformation Game they arrived at radically different approaches, strategies and tactics. The authors and readers of this paper might find powerful arguments that help to explain that these different responses to the game arise from the information processing and decision style characteristics at the disposal of each group. Again it is worth repeating that the style-make-up of the groups was unknown to the groups themselves.

In practical terms it seems evident that the information processing and decision style make-up of each group influenced their choice. Knowing the make-up of the individuals in a team or group contributes then to an understanding of the possible outcomes of choice as well as the process of communication and compromise the group members have to engage in. It also suggests that it might be difficult to reconcile the outcomes of the approaches of the uni-focus group and the multi-focus group if they were developing responses for one parent organisation. Once the products of the Transformation Game are developed it would seem particularly hard for one group to understand how the other group could come up with their perspectives without a great deal of understanding of the underlying cognitive processes. It is likely that these outcomes would become the basis for competitive and contested approaches. Both approaches would potentially draw advocates from like-minded individuals within the organisation who could 'read' the meaning of each approach.

Mediating between these contested approaches might be reconciled in a number of ways. It could fall to a 'power game' between advocates of particular approaches or to the ability of a key decision-maker to understand and interpret one approach over the other. In a general sense, the more complex style of environment and sustainability managers as against the more common focus among business managers would dispose decision makers to understand and chose for the less systemic solution. Richness and flexibility of sophisticated responses would be lost to simplicity and determinability. It might be focused but could well have the wrong focus. On the other hand to introduce the more complex choice could well lose the attention of the mangers within the organisation that are disposed to a more uni-focus style.

Our argument is that an assessment of individual information processing and decisions styles together with a knowledge of the possible problems of communication and collective choice based on those styles is a key element in the move to a better integrated approach to corporate environmental management. Moreover the ability to appreciate the implications of your own decision style and that of others may indeed be a hallmark of sustainable enterprise.

In our view the study has significant implications for the design and content of management training and education in companies committed to the integration

environmental management practice or those with a commitment sustainable enterprise and corporate social responsibility as well as notions of the learning organisation.

For example, if senior managers select (or introduced to) an environmental manager for her specific expertise, it may be difficult for her to gain legitimacy in areas 'outside' of her expertise, in the eyes of others. Broadening the 'integrative' understanding of the group's overall cognitive style make-up is doable, and likely required to manage broad, systemic environmental issues. The approached used in this management program is one effective means.

A corollary to potential 'managerial myopia' is that environmental managers might well be equally myopic to valuing integrative styles over other more focused styles. 'Integrative myopia' will likely lead to difficulty in communicating and group functioning.

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Appendix

The Decisive Style

   The Decisive style is a fast-moving, action-oriented, and focused style. The style places great emphasis on efficiency and practicality. People who use this style frequently are generally viewed as quick-thinking, productive, and reliable. When in Decisive mode, people generally want to make decisions, put them into action and then move on to other issues. Once decisions are made they are not changed easily.

The Flexible Style

   The Flexible style is another fast-moving, action-oriented style. But, unlike the Decisive style, the Flexible style is geared to adapting rapidly to change. The flexible style is equally as adept at making decisions as the Decisive style. People who use this style frequently are generally viewed as fast, agreeable, and highly responsive to changing circumstances. When in Flexible mode, people generally make fast decisions that they will quickly modify or change if situations change. They are seldom at a loss for ideas, and tend to be intuitive and innovative.

The Hierarchic Style

   The Hierarchic style is a methodical and analytic style that puts energy into thinking things through carefully. People who frequently use the Hierarchic style usually place a great deal of importance on quality and on doing things in the best way possible. Thoroughness and logic are very important. Once high quality decisions are made, they are seldom abandoned unless obviously superior alternatives present themselves. The Hierarchic style values competence and expertise. Knowing what one is talking about, and having "done one's homework" weigh heavily in determining confidence in other people.

The Integrative Style

   The Integrative style is another highly analytic style. However, compared to the Hierarchic style, the Integrative style is much more exploratory and attracted to new and unusual ideas and possibilities. People who often use the Integrative style tend to be drawn to groups and teams because of the diversity of information and ideas that are available. When using the Integrative style, people seldom do things the same way twice, preferring instead to try out new methods and ideas. When decisions are made they often involve doing several things simultaneously. Moreover, decisions are modified or adapted to meet changing conditions.

The Systemic Style

   The Systemic style is a highly analytic, very thorough, and global-thinking style. People who make use of this style seldom make decisions until they fully grasp the "big picture" surrounding any situation. Once they turn their attention to action, they search for strategies that deal not only with the immediate issue before them, but also the larger context surrounding the issue. Usually, their decisions are intended to satisfy many criteria. When using the Systemic style, people often work to satisfy multiple priorities.

They tend to make decisions slowly, but their decisions often are highly original and very comprehensive.

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[i] Literature and research in the area is too vast to cite without appearing to argue for a particular 'approach' as superior over another, without comment on strengths and weaknesses in theory, measurement, etc., which is not our purpose here. We assume our readers are familiar enough with management in experience and/or higher education to 'find their own way' to through this literature.

[ii] The Driver decision-style model has been used with over one million people in a variety of contexts ranging from education, recruitment, organisational developmental, information systems design, and the like.

[iii] A short description of each style is included in an appendix to this paper..

[iv] Please contact Patrick Sweet for more information on the assessment instruments, the model, and its usage.

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