Individual and collective congruence in the knowledge management process

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Abstract

This paper is concerned with the cognitive infrastructure underpinning the socially situated process of knowledge management in dynamic contexts. It describes the cognitive congruence framework (Fourth International Conference on Competence Based Management (1998); Knowledge Management and Organizational Competence, Oxford University Press (2001)) and shows how it can be used as a sensemaking device to reconcile some of contentious issues in knowledge management literature. Three case study vignettes are employed to illustrate the importance of individual and collective cognitive congruence and the utility of the framework as a diagnostic tool for highlighting flaws in the cognitive infrastructure. The implications of the framework for theory and practice are discussed. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

Knowledge management is a focal point for trans-disciplinary management research. Literature on the subject focuses extensively on the classification of knowledge under the tacit/explicit and personal/collective dimensions and with issues of converting one type of knowledge to another (Nonaka and Takeuchi, 1995; Spender, 1998).

Recent literature on competence-based competition (Sanchez and Heene, 1997; Sanchez et al., 1996; Hamel and Prahalad, 1994; Hamel and Heene, 1994) and dynamic capabilities (Lei et al., 1996; Teece et al., 1997) highlights knowledge management and organisational learning in strategic competition. In terms of the resource-based view of the firm (Wernerfelt, 1984; Peteraf, 1993), the capability to create and utilise knowledge has
been suggested as the key inimitable resource contributing to the creation of sustainable
rents (Schendel, 1996):

It is the process of learning rather than what is learned, meaning that the capacity to
develop organisational capability may be more important than the specific knowledge gained. Rates of learning can give rise to first mover advantages and from the
speed of learning can come sustainability conditions that have more to do with
movement than with static position.

This paper aligns itself with the concerns of these writers in strategic management, and
its focus is on the process of knowledge management in dynamic contexts. In the wider
literature there is a debate surrounding the nature of knowledge itself and the notion of
collective knowing, and some issues remain contentious. In the next sections we explore
some of these issues and show how the cognitive congruence framework (Merali, 1998,
2000) described in Section 3, can be used as a sensemaking device to reconcile competing
views. The framework (describing a cyclical relationship between action and perception)
serves as a ‘sensemaking’ device in Weick’s (Weick, 1995) tradition of sensemaking as “a
developing set of ideas with explanatory possibilities, rather than as a body of knowledge”.

The paper shows how the cognitive congruence framework can be used to elucidate the
relationship between cognitive, action and social aspects of the knowledge management
process in the organisational context. Section 2 describes the context and issues that
surround this application of the cognitive congruence framework which is described in
Section 3. Section 4 outlines its relationship to organisational factors, and the utility of the
framework as a management tool is demonstrated using three case vignettes in Section 5.
The discussion that follows reflects on the implications of the cognitive congruence frame-
work for the theory and practice of knowledge management.

2. Issues in knowledge management

As a topic for inquiry, knowledge management straddles strategic, social and cognitive
domains. The classification of knowledge, the interaction between social and intellectual
capital, the existence of a collective intelligence, and the casting of knowledge and
knowing as sources of competitive advantage have all been debated in the various
domains. This section provides a brief overview of these issues, shows how they are
related, and positions the cognitive congruence framework in relation to these debates.

2.1. Classification of knowledge and the importance of knowing

Attempts to classify knowledge generally focus on two distinctive dimensions
(Spender, 1996): the communicability of knowledge (in terms of Polanyi’s (Polanyi,
1958) tacit/explicit dimension), and the knowing entity (in terms of individual and collec-
tive knowledge, based on notions of the ‘conscious collective’ (Durkheim, 1964) and
socialisation (Nelson and Winter, 1982).

Polanyi defines tacit knowledge in terms of its incommunicability, with the implication
that some knowledge will always remain tacit. Spender introduces the term “implicit”
to refer to knowledge which does not necessarily have a codified (and therefore
communicable) existence but which is possible to codify and communicate. The distinction between tacit and explicit knowledge aligns with Ryle’s (Ryle, 1949) distinction between “know how” (procedural knowledge based on experience and often embedded in practice) and “know what” (theoretical, declarative knowledge which can be codified and transmitted without loss of meaning). Von Hippel’s (Von Hippel, 1988) definition of “know how” (“accumulated practical skill or expertise that allows one to do something smoothly and efficiently”) highlights the practical and time-dependent nature of this type of knowledge. Kogut and Zander (1992) use an organisational chart as an example of “know what” and say

know how is the understanding of how to organise a firm along these formal (and informal) lines. It is in the regularity of the structuring of work and of the interactions of employees conforming to explicit or implicit recipes that one finds the content of the firm’s know how.

This illustrates the interplay between the tacit and explicit dimensions of a firm’s knowledge, and the importance of social and practical interactions and enactment in realising the tacit dimension.

Much attention has been paid to codifying and classifying different types of knowledge as “stock” for reuse within the organisational context. This approach to knowledge management is challenged on the basis that some knowledge will always remain tacit (Polanyi, 1967) and therefore elude codification, that tacit knowledge is valuable, and that the value of what is known is realised in the realm of action. Concurrently there is the view that management engagement with the concept of knowing is necessary for interacting with the social and physical world in a way that exploits and enriches the knowledge stock of an organisation. Cook and Brown (1999) argue that the focus on “knowledge as object” is grounded in the “epistemology of possession” which cannot account for the knowing found in individual and organisational group practice, and they call for an “epistemology of practice” to deal with knowing as action. Nahapiet and Ghoshal (1998) point out that Polanyi’s emphasis on knowing as well as knowledge suggests “both a view of knowledge as object and of knowing as action or enactment in which progress is made through active engagement with the world on the basis of a systemic approach of knowing”.

2.2. The social dimension of knowledge management

The debate around knowledge and knowing emphasises the importance of understanding social interactions and contexts for knowledge management. Social capital (the resource that resides in networks of social relationships) is an important part of an organisation’s intellectual capital. Nahapiet and Ghoshal (1998) established the relationship between intellectual capital and social capital, defining social capital in three dimensions:

*The structural dimension* comprises the impersonal configuration of linkages between people or units defining the overall pattern of connections between actors in terms of who you reach and how (Burt, 1992).

*The relational dimension* comprises the personal relationships developed through the
history of interactions (Granovetter, 1992). These influence behaviour and fulfil social motives (approval, prestige, etc.). Nahapiet and Ghoshal use the relational dimension of social capital to refer to assets created and leveraged through relationships. Key factors emanating from relationships are: trust and trustworthiness (Fukuyama, 1995; Putnam, 1993); norms and sanctions (Coleman, 1990; Putnam, 1995), obligations and expectations (Burt, 1992; Coleman, 1990; Granovetter, 1985) and identity and identification (Hakansson and Snehota, 1995; Merton, 1968).

The cognitive dimension comprises the resources providing shared representations, interpretations and systems of meaning among parties (Cicourel, 1973). These include shared languages and codes (Arrow, 1974; Cicourel, 1973) and shared narratives (Orr, 1990).

Social networks are of particular importance in dynamic competitive environments: they aid adaptive efficiency together with creativity and implied learning, and they increase cooperative behaviour, encouraging new forms of organisation. Nahapiet and Ghoshal provide a framework (based on the view that all new knowledge is created by either combination or exchange of existing knowledge) showing that the four dimensions of social capital are related to the creation of new intellectual capital. These provide access to parties for combination/exchange of intellectual capital, motivate various parties to participate in combination/exchange processes, create the anticipation of value from combination/exchange of intellectual capital and generate a combinative capability.

2.3. Knowledge management and the notion of collective knowledge and knowing

Notions of “organisational learning” and “collective intelligence” remain controversial. Some (e.g. Simon, 1991) argue that only individuals learn: an organisation is an aggregate of individuals who learn and an organisation’s knowledge is an aggregate of the knowledge of the individuals that belong to it. This view is consistent with the application of the transaction cost model of economics to knowledge management, in which organisations can acquire new knowledge by recruiting individuals who possess it.

A second, increasingly popular view in knowledge management holds that the socially situated activity of learning and doing in an organisation creates a body of knowledge and capabilities which are collective properties, differing from and in addition to those contained or owned by any individual member. This perspective is compatible with the resource-based view of competition popular in the strategy literature, maintaining that firm-specific knowledge and knowing capabilities are of fundamental importance in the generation of superior rents. Kogut and Zander (1993) suggest that the potential advantage of internal organisation over market organisation may arise from superior abilities to create and exploit intellectual capital.


2.4. Practitioner issues

In the practitioner domain, the challenge of leveraging knowledge for organisational gain is central in the knowledge management agenda (Quinn et al., 1996). One issue in knowledge management is concerned with making tacit/implicit knowledge explicit and codifying it effectively in knowledge repositories, (Hansen et al., 1999). A second issue is concerned with transforming personal, individual knowledge into collective knowledge through learning and socialisation processes (e.g. Nonaka and Takeuchi, 1995; Weick and Roberts, 1993; Nelson and Winter, 1982). The third issue is about creating and maintaining an environment in which collective knowing and knowledge-based processes emerge and evolve (e.g. Brown and Duguid, 1991). Lastly there is an issue about retaining rents from new knowledge by incorporating it into firm-specific attributes (such as the recipes and routine of Nelson and Winter, 1982).

All of these issues require diffusion and absorption of knowledge between actors in the organisational context. Individuals’ actions are shaped by their perceptions of what is appropriate at a given time and place in relation to perceived contextual parameters. For the collective to function as a coherent community of practice, there must be significant congruence between the actions and perceptions of a significant proportion of the actors in the community. Models of organisational learning attempt to provide a processual view of the transformation of knowledge in the tacit/explicit and individual/collective dimensions (e.g. Nonaka and Takeuchi, 1995; Boisot, 1987), but do not explicitly provide a generalised framework to link the cognitive and social elements with action. The cognitive congruence framework presented in the next section addresses this: it is a sense-making device for the human interactions in which actors realise the knowledge transformations by acting in the organisational context, dynamically redefining that which is ‘known’ by the collective.

3. The Cognitive Congruence Framework

Whilst the socially situated nature of knowledge processes is not contested by the writers above, there is considerable tension with regard to the nature of knowledge, the relative importance of “knowledge as object” versus “knowing as action”, and the existence of individual versus collective knowledge attributes. The cognitive congruence framework enables us to address the socially situated process of knowledge management by linking the cognitive, social and action dimensions.

The cyclical representation of the cognitive infrastructure in Fig. 1 illustrates the mutual dependence of its components. These are defined below and their relationships are discussed with reference to some of the relevant work in organisational cognition. An account of the origins, development and justification of the framework can be found in Merali, 1998; 2001.
3.1. The schema

Generically in information environments, the term “schema” refers to a knowledge structure representing organised knowledge about an information domain (Walsh, 1995). Both the knowledge components (content) and structure (in terms of linkages among the components) of the schema are important determinants of how knowledge is retrieved and utilised (i.e. to deal with situations and problems that are encountered: Gioia, 1986). The structure and content of the schema also determine what new knowledge is incorporated into the extant schema. The schema is thus a dynamic structure, selectively open to modification by the external environment, and it has the capacity to prompt action and facilitate learning (but see below).

In the cognitive congruence framework, the schema is the total cognitive construct which contains the organised collection of interconnected beliefs and perceptions about self and the universe together with their spatial, temporal and semantic relationships. The schema embraces self-concept, scripts and environmental sensemaking together with mechanisms for their linguistic and semiotic articulation.

An individual’s schema is unique and is developed through the individual’s experience and interactions with his social environment. Similarly, the collective schema underpins the collective consciousness and is established through the collective being and sensemaking process which is socially situated. The cognitive congruence framework is founded on the importance of the social dimension of knowledge creation and leveraging, and on the notion of the collective consciousness (Durkheim, 1964). Thus an individual is an effective part of the collective only to the extent to which there is a congruence between the individual and collective schemata. Relationship scripts and enactment (described below) provide the mechanisms for developing and maintaining a degree of congruence between the individual and collective schemata.

3.2. The self-concept

Self-concept operates at a primordial level and is a perception of that which we call our identity (identification is the process whereby individuals see themselves as one with another or group: Nahapiet and Ghoshal, 1998). Weick (1995, p. 160) makes identification a focus for sensemaking and a basis for congruent action of the collective:

Each... organisation chooses who it will be by first choosing what actions, if any it needs to explain, and second by choosing which explanations for these actions it will
defend. An inability or unwillingness to choose, act and justify these leaves people with too many alternatives and too few certainties. Binding decisions affect the tasks we are attracted to, the reasons that move us, the values we try to realise, the plans we admire, and the people we seek out. Avoidance of such decisions slows down the development of attractions, reasons, values, plans and associates.

For an organisation that is operating in a dynamic environment and for whom knowledge acquisition and evaluation are significant activities, the establishment and understanding of its own identity is particularly important.

In the sense of this paper, self-concept arises from being and gives rise to doing. Whilst Weick asserts the primacy of perception over action, it is clear that in dynamic contexts there is a ‘cyclical’ relationship between action and perception. The cognitive congruence framework is an action–perception cycle (Merali, 1998; 2001): self-concept and identity shape action which in turn informs perception. In Weick’s terms the utility of the schema lies in its capacity to prompt action and facilitate learning.

3.3. Relationship scripts

Relationships between individuals determine the content and structure of intra- and inter-organisational knowledge networks. At the individual level, the relationship is a filter for relevance: the value attached to a piece of information by the recipient is affected by the credibility with which he perceives the informant. The recipient’s investment of credibility in the informant may be rooted in a number of factors derived from and affecting the recipient’s perception of the informant (e.g. trust and emotion characterise the relationship). Extended to the social level, the relationship network is a mechanism for sharing and diffusing ideas and for intersubjective realisation of the organisational self-concept.

Considering the enactment of relationships with regard to mutual perceptions and shared learning, it is useful to characterise the roles played by the participants in the relationship. Each distinctive relationship is mediated through, and evidenced by, its transactions. Transactions are influenced by the perception of each participant about him or herself in relation to the other participants. These perceptions are analogous (see Merali and McGee, 1998a) to the so-called scripts referred to by adherents of transaction analysis (Berne, 1961).

An individual’s script is an internal conceptual structure containing a set of rules and norms and a highly cross-linked set of data about self, the world and interactions between the two. The script acts as a filtering mechanism for fresh data: nothing is accepted into a script unless it can be made to fit with what already exists. The script evolves over time as new information is incorporated, and socialisation modifications occur as a result of its involvement in meaningful relationships. The nature of this evolution (e.g. in terms of what can or cannot be incorporated into the script) is itself determined by, and is characteristic of, the existing script.

The concept of relationship scripts is useful at all levels of analysis. At the macro level it
is useful for understanding how an organisation perceives itself within its environment. At a micro level it helps to make sense of the social learning processes.

In their exposition of social capital Nahapiet and Ghoshal (referred to in Section 2.2 above) do not explore in any detail the mechanisms by which the various components of social capital interact. The cognitive congruence framework deals with this aspect by introducing the mechanism of relationship scripts to explicate the role of relationships in the development and realisation of knowledge assets.

### 3.4. Relationship enactment

The cognitive congruence framework links the individual with the social dimension (see above and Section 2.3) through the mechanism of relationship scripts and its application is scaleable from the individual to the collective.

The *collective enactment* of relationship scripts is the mechanism by which the self-concept is realised, capabilities are leveraged, experiences are formed and learning takes place (in other words, the collective enactment of relationship scripts is the manifestation of the organisational being).

The collective schema and self-concept are the *perception* ‘shapers’ for the action–perception cycle of Fig. 1. The relationship script is rooted in the organisational self-concept, and is the framework within which relationships are enacted. It is instrumental in selecting (i.e. recognising as ‘relevant’) data and cues for incorporation into the organisation’s perception of its environment.

The enactment of the relationships is the mechanism through which environmental sensemaking takes place. Environmental sensemaking is the dynamic incorporation of environmental data and cues to develop a perception of the ‘here-and-now’ competitive terrain and its likely development over time. It generates ‘new information’ which may modify and refresh the schema which in turn will inform the self-concept, relationship scripts and relationship enactment mechanisms.

The association between the organisational self-concept and the schema of environmental sensemaking is an integral one. Uniqueness of identity derives from occupying a specific space at a given point in time. The self-concept is a perception of identity and must of necessity incorporate a locus of being relative to the space and time that surrounds it (i.e. its environment). ‘Space’ in this case is the competitive landscape within which firms compete over competencies and intellectual capital (Rumelt, 1994; Schendel, 1996). In other words, the self-concept exists relative to a perception of the environment, and the perception of the environment is in turn shaped by the self-concept.

The cognitive congruence framework thus enables us to address and reconcile the issues raised by the literature in Section 2. By cyclically linking the schema with action (through relationship enactment) it reconciles notions of “knowledge as object” (stored in the schema) and “knowing as action” described in Section 2.1. The set of relationship scripts and their enactment are embodiments of the social capital: their linkage with the schema (individual and collective) provides the mechanism for linking intellectual and social capital that was missing from the work described in Section 2.2 above. The refreshment of the schema through the socially situated process of relationship enactment links individual and collective knowledge and knowing, thus enabling us to reconcile some
of the tensions highlighted in Section 2.3. The following section examines how organisational factors affect the realisation of the cyclical process in practice.

4. Cognitive congruence and implications of structure, process and communications design

Social values and processes, and the manner in which individuals interact and communicate are important for knowledge creation, codification and leveraging. The structural, process and communications design of an organisation is integral to the development and maintenance of schema, self-concept, relationship scripts and their realisation through relationship enactment.

The collective organisational schema generates formal structures, systems, job and role specifications that reinforce the schema and its associated self-concept. Relationship scripts and relationship enactment may be circumscribed by limitations on resources or opportunity imposed by the formal devices. Formal structures that defend the status quo may favour adaptive (rather than generative) learning. Open structures and mechanisms which enable dynamic incorporation of environmental information into the schema, and the process of intersubjective inquiry (challenging the status quo) are important in developing the congruent cognitive infrastructure.

Issues of individual versus collective perceptions and actions introduce an additional layer of complexity to the analysis. The processes of organisational inquiry and the collective network of relationship enactment provide mechanisms for engaging individuals or groups in revising personal and collective schemata. Cognitive dissonance occurs when individual (or group) schemata and/or scripts are incompatible with their organisational counterparts. The diversity of individual perceptions can be harnessed to augment the collective schema. This is analogous to the concept of double-loop (or generative) learning defined in the organisational learning literature (Argyris and Schon, 1978; Senge, 1990).

The organisational legitimisation of new knowledge claims is predicated on shared (or accepted) perceptions of the utility or value proposition attached to the ‘new knowledge’. For its realisation, the articulation and development of the value proposition needs to be congruent with the language of the successive constituencies that will be involved in the diffusion and absorption of the ‘new’ knowledge. The requisite communication process is a complex and evolving one: as knowledge is contextualised and recontextualised in its transition across the firm, it acquires specific significance for enactment of the ‘here and now’ in different places at different times. It is proposed here that the mechanism for this entire process dealing with the interplay of tacit/explicit dimensions and transfer of knowledge is based on the enactment of relationships between individuals, in which the language of codification evolves across time.

Organisational structures for communication and co-ordination can be viewed as defining the ‘conduits’ in terms of their connectivity and content. Formal (e.g. reporting lines, role specifications and responsibility demarcations) and informal structures (e.g. spheres of power and influence) and physical location can be used to constrain or facilitate the flow of information. Processual constructs shape the topography of the communication network.
The establishment of knowledge management as significant on corporate agendas has been accompanied by investment in IT-based knowledge management tools and environments. In addition to their role in storing and disseminating codified information, these tools have the potential to support knowledge networks by providing connectivity and organisational networking information (e.g. directories of expertise) and creating virtual spaces for discourse and coalescing communities of practice.

The case vignettes in the following section show how the cognitive congruence framework enables us to make sense of the cognitive infrastructure underpinning individual and collective knowledge processes.

5. The case vignettes

Three case vignettes are employed to illustrate the utility of the cognitive congruence framework as a sensemaking device. Detailed descriptions of the cases from which the vignettes are derived can be found in Merali and McGee, 1995, 1998b; Merali and Meadows, 2000. The cases are all concerned with business and organisational transformation, and thus provide an opportunity to deal with dynamic aspects of learning and knowledge management. There is a wealth of literature on IT-enabled change (some of it normative with respect to ‘how it should be done’). Even organisations that do it by the book (often using experienced consultancy firms) can fail to develop and leverage capabilities to the aspired level. This suggests that whilst the “know what” of this type of transformation exists in the literature (and in accounts of successful transformation case studies), the “know how” remains problematic (Merali, 1998; 2001). The cognitive congruence framework is used to explore this aspect in terms of congruence between individual and collective actions and perceptions. The three vignettes have distinctive transformation contexts and illustrate different issues of congruence between individual and collective perceptions and actions.

5.1. Case 1: a quango

5.1.1. Context

‘ITED’ was a quango (quasi non-governmental organisation) established to investigate enabling technologies and to guide institutions in a sector (Sector X) to use appropriate technologies in meeting their professional obligations. As part of its brief ‘ITED’ produced publications and educational packages for promoting the use of IT in the institutions.

‘ITED’ operated as a constellation of focused experts whose outputs were channelled by short-term directives from the executive level. There was no articulated strategy and it was difficult to identify a super-ordinate goal for the organisation.

Non-managerial staff comprising skilled professionals focused on their area of expertise. Most staff had a public sector background; few managers had any commercial experience. The organisation had a matrix structure, with concomitant implications for confused lines of reporting. Politically, power resided with a small number of individuals in key senior management positions: the decision-making profile of the organisation was indicative of a centrally dominated hierarchic structure.
Internal business systems (accounting, sales, marketing, production) had developed piecemeal, representing uncoordinated islands of automation. Functional managers were protective of their own systems and reluctant to share data. Individual workstations were connected over a local area network and had e-mail facilities.

5.1.2. The transformation concept: from paper to electronic publishing

The notion of business transformation in ‘ITED’ was incipient. The R&D group had demonstrated (in a pilot project) that electronic publishing and dissemination of information to Sector X institutions via the internet was technologically viable. A study to investigate the feasibility of leveraging this capability identified a number of potential benefits.

Electronic publishing had the potential to transform the production process, dramatically reducing the cost and time for updating publications in a fast-moving domain, and to provide and enable easier access to a wider market. Use of Web technologies for two-way dialogue would enable the development of a ‘customer’ orientation and a better understanding of customer needs (using Web technologies for two-way dialogues). The establishment of web-enabled user forums would enable ‘ITED’’s clients to create a self-help network and supply ‘ITED’ with ideas for product development and enhancement.

The development of the requisite internal integrated IT infrastructure would provide a platform for sharing information resources between teams and functions. More importantly it would enable ‘ITED’ to co-specialise the Web capabilities with the domain knowledge and multimedia and design expertise that already existed in the organisation’s ‘expert ghettos’. Commercial organisations were beginning to show interest in entering the arena and ‘ITED’ was in a position to consolidate a ‘first mover advantage’.

The feasibility study report was circulated, considered at the executive level and shelved. Most of the ‘fast-track’ R&D staff have since left to join more progressive organisations.

Six years after the feasibility study, with the change in government, ‘ITED’ is required to perform against specified targets defined in terms of technology uptake and leverage in the institutions that ‘ITED’ was originally set up to help. It has recruited a new team to work on the exploitation of Web technologies to disseminate its materials. Other providers have entered the arena of electronic publishing in Sector X.

5.1.3. The cognitive congruence framework applied to ‘ITED’

‘ITED’ had good knowledge creation capability (the R&D group’s web technology capability and the ‘state of the art’ status of the prototype), yet it failed to leverage this capability.

‘ITED’ possessed the ‘knowledge’ required to change from publishing on paper to publishing electronically. Its R&D group had the vision and “know-how” (both technological and pedagogic) to develop client facing web-enabled products and services. Besides the technological “know how” to develop the requisite delivery infrastructures, ‘ITED’ had access to the conceptual frameworks on change management: the language of management teams resonated with concepts articulated by the ‘gurus’ in the literature, ‘ITED’ staff advised clients on managing IT-related change.
Application of the cognitive congruence framework (Fig. 2) provided an insight into why ‘ITED’ could not leverage its capabilities: it had an incomplete schema. The schema lacked those elements of the external environment that would enable it to make sense of its raison d’être; the boundary for intersubjective sensemaking and leveraging capabilities was drawn in a way that excluded external stakeholders. In the schema the government mandate was the raison d’être, leading to a self-concept in which ‘ITED’ was a centre of expertise. ‘ITED’ staff conformed to this schema: they existed within ‘ITED’ to do work that required their expertise. The relationship scripts and the enactment of the relationship scripts were congruent with this self-concept: experts did ‘expert types of things’ and managers ensured that experts worked within clear project boundaries and did not dissipate their energies by engaging in non-project activities. The schema was therefore reinforced. No process of organisational inquiry inside ‘ITED’ challenged the schema, and (until the change of government) there was little outside pressure requiring ‘ITED’ to extend its schema.

The importance of social capital in schema development is highlighted by the disjunction between individual and collective knowing. An R&D project officer produced a feasibility study pointing out the potential of the web-enabled system for increasing the effectiveness of ‘ITED’ and the potential benefits for its clientele. However, the extant relational and structural components of the social network partitioned R&D knowledge from the rest of the organisation, and so the solipsistic collective schema persisted. The R&D officer took a redundancy package and left the organisation shortly after the report was shelved.

In knowledge management terms, ‘ITED’ was successful in its process of knowledge creation and codification within the R&D group. The de-coupling of this knowledge from the external context for its exploitation prevented ‘ITED’ from developing the requisite internal structural, relational and cognitive infrastructures necessary for pulling the R&D knowledge through to product and service development for its customers.

5.2. Case 2: a financial service company

5.2.1. Context

‘Finsoc’ was a financial services organisation (see Merali and Meadows, 2000 for a full description). It engaged in a program of rapid growth through acquisition in the “boom time” (early 1980s). Acquisitions included businesses outside ‘Finsoc’s, traditional portfolio. To survive the recession (late 1980s) ‘Finsoc’ divested itself of less profitable
businesses. The organisation was hierarchical. The strategic imperative for rationalisation and the related urgency reinforced a strong command-and-control culture: staff who survived the cuts were compliant and management directives were not challenged. Work organisation was task-based and the skills base was narrowly focused on specific product lines. IT systems were accounts-based (rather than customer-based) implementations on outdated technologies and provided little in the way of support for customer-oriented cross-selling of products. The slimming down exercise (a bloody period in organisational memory) coincided with the appointment of a new CEO who launched a major business transformation programme.

5.2.2. Transformation concept: from account-based transactions to customer relationship development

The transformation programme was designed to turn ‘Finsoc’ into a customer-focused organisation. Issues of strategy, structure, technology, people and roles were defined and planned for. Resources were allocated for change management experts to run workshops with ‘Finsoc’ staff to enable them to adjust to new roles.

The organisation was restructured: business focused teams were created with a view to developing multi-skilled personnel to cross-sell products. A new IT and information systems infrastructure was installed to enable teams to work effectively. Software design included support for personalised transactions and customer relationship management. Scenario-based training was used to enable customer-facing staff to articulate and record changing customer circumstances and requirements, and, where appropriate, to respond with offers of additional or alternative services. Traditionally, staff had a “back room” role dealing with postal queries and transactions; the new mode of operation required individuals to be proactive and to act on their own initiative during customer encounters.

The restructuring, implementation of the technological infrastructure, and staff training in the new technology went according to plan. ‘Finsoc’ acquired the IT-related capabilities smoothly and rapidly. Despite the textbook-like implementation of the transformation process, performance figures showed that ‘Finsoc’ had not succeeded in leveraging the new capabilities that it had invested in.

A study to review the early experience revealed that the teams were not effective and, despite the workshops that they had attended, staff felt unable to work in the new mode. Middle management and teams reported feeling isolated. Whilst teams were given responsibility for organising their activities to deliver to targets, they had no input into the processes for resource allocation or target setting. As new contingencies arose, team managers had no power base from which to negotiate targets or marshal supplementary resources to overcome emergent problems. Team members interpreted this as abandonment and abdication of responsibility by management in the name of empowerment.

5.2.3. The cognitive congruence framework applied to ‘Finsoc’

Application of the cognitive congruence framework (Fig. 3) provides an insight into why ‘Finsoc’ did not leverage its capabilities.

Despite the team-based restructuring, the power base remained with the small number of individuals who had been responsible for the directive rationalisation in the recession. Change management workshops established a strong rhetoric about the self-concept
summarised as ‘We used to be a command and control organisation...now we are a team-based organisation’.

The rhetoric served superficially as an affirmation, and the self-concept was never challenged. The relationship scripts for relationship enactment did not fundamentally change: managers and team participants behaved as if the command and control culture had survived. People were reluctant to make decisions and were afraid to experiment or act on their own initiative. There was a feeling that the organisation was less effective in its new form than it had been before (when people knew what was expected of them and understood how the reward and punishment mechanisms worked).

‘Finsoc’ had a well-developed schema for the external environment. The internal schema was consistent with the self-concept of a ‘team-based organisation’, but the self-concept was incongruent with the actual relationship scripts (which still conformed to the command-and-control behaviours). Relationship enactment thus failed to leverage the capabilities that would have been leveraged in a more empowering context. The schema was not confronted with the incongruence between the rhetoric and reality of the relationship scripts until business performance indicators signalled the problem.

Initially ‘Finsoc’ had an inadequate (almost absent) process of intersubjective inquiry for developing an organisational understanding of the actions that would underpin the realisation of the transformation rhetoric. Codification was flawed because it resulted in rhetoric rather than in a meaningful, communicable representation of the actionable knowledge relating to the transformation exercise. This highlights the importance of the language of codification in the diffusion and absorption of innovative practice in organisations. Intellectually, the “political correctness” of the rhetoric shielded it from scrutiny by peers in the relationship networks. Nobody had to explain what being team-based meant, and so there was no clear concept of what it meant to “walk the talk”.

‘Finsoc’ illustrates the importance of tacit and emotional dimensions of relationship enactment engendered by the relationship script. Although the formal structural and relational infrastructures were designed to facilitate a flat organisation, the networks collectively elevated traditional power holders to a dominant plane. Whilst the customer-facing staff possessed requisite knowledge elicitation capabilities for developing customer relationships, deference to the traditional power holders impeded progress by preventing effective team-based decision making in response to the contingencies of customer-facing operations. This inertia also inhibited ‘Finsoc’ from channelling individual “know how” into learning at the organisational level: whilst individuals could update the database with their observations and newly acquired customer
information (i.e. the “know what”), the relationship scripts did not enable their “know how” to be incorporated into organisational decision making and action traits. Consequently organisational learning and responses were retarded.

5.3. Case 3: a natural resources company

5.3.1. Context

‘Groupe Tulip’ is an international group of natural resource companies which recently completed a major restructuring exercise accompanied by a fundamental change in the headquarters self-concept and resulted in significant changes in the headquarters-business relationships. The case (see Merali and McGee, 1998b for more detail) focuses on the corporate headquarters and its relationships with the corporate portfolio of multinational business.

Historically ‘Groupe Tulip’ was vertically integrated with extensive formal planning procedures. Gains from integrating activities along the supply chain were important. Recent vertical disintegration resulted in upstream and downstream companies acquiring more distinct identities and benefiting from economies directly attainable within the scope of the business (as opposed to corporate) operations. The role of headquarters in this new structure was revisited and gave rise to the transformation programme.

5.3.2. The transformation concept: from imposing to facilitating

Restructuring the corporation coincided with the arrival of a new CEO who was a key actor in the process by which the headquarters redefined its role and raison d’être. In facilitated workshops headquarters, managers re-evaluated their behaviours, attitudes and fundamental beliefs relating to the headquarters and its role in the group. This enabled senior management to develop a coherent vision for the future of the headquarters and its relationships with the businesses. From this came a revised concept of what the headquarters should do, and how it should influence the businesses. A corporate-wide ‘Transformation’ programme was launched to realise this concept.

The desired headquarters’ style was articulated as change from being ‘directive’ to ‘influencing’ and ‘interactive’, from ‘telling’ to ‘listening’. The desired headquarters’ role was articulated as change from ‘overseeing’ to ‘strategic leadership’. The ‘strategic leadership’ role was associated with the realisation that the internally focused, programmatic schema was inadequate for enabling ‘Groupe Tulip’ to position itself favourably in the uncertain industry context that it faced. Corporate leadership needed to facilitate development of appropriate capabilities to deliver sustainable performance in the dynamic environment, pursuing a more emergent strategy. The desired processes to enact the new role were articulated as ‘coaching and learning’, ‘advisory’ and ‘engagement’.

The emphasis of the new organisation was on achieving high performance and establishing a socially responsible image consistent with ‘Groupe Tulip’s’ global corporate image. The focus of the headquarters-business relationship was to establish a coordinated, outward-looking performance culture through the ‘Transformation’ programme.

The headquarters developed a corporate balanced scorecard (Kaplan and Norton, 1992) method for performance target setting and evaluation which was adopted by all the
businesses (with adaptations to reflect local context). Businesses were encouraged to make performance data visible across the corporation. The process was empowering and businesses were ‘mentored’ to develop self-evaluation and target-setting capabilities.

It was recognised that whilst knowledge management can be facilitated by the use of IT (important for disseminating ‘best practice’ documentation with intranet technology provided coordination and communication infrastructure across the global businesses for knowledge creation and for the corporate level leveraging of existing knowledge), the development of the social knowledge network was a pre-requisite for the success of organisational learning. The headquarters was committed to investment in social processes for transferring expertise. It invested in enhancing networking amongst individuals and in leveraging this for the transfer of expertise. Cross-business conversations were engineered and international projects set up to establish global networking capabilities.

5.3.3. The cognitive congruence framework applied to ‘Groupe Tulip’

Application of the cognitive congruence framework (Fig. 4) provided an insight into why redefinition of ‘Groupe Tulip’s’ corporate self-concept resulted in a radically different enactment of the headquarters-business relationship.

It was generally accepted that the headquarters was considered to be responsible for

- delivery of value to the shareholders and the internal integration;
- the presentation of the corporate image to the global public;
- husbandry of resources to deliver to the external expectations that it had shaped.

The process catalysed by the new CEO demanded self-evaluation at a fundamental level, both of individual beliefs and behaviours and those of the headquarters as a collective. This resulted in articulation of a revised self-concept. Self-evaluation also required an examination of individual and corporate relationships and mechanisms for their enactment. This gave rise to the development of relationship scripts and established action parameters for the enactment of those scripts.

The headquarters self-concept shaped the relationship scripts and a congruent dynamic corporate schema was maintained through the relationship enactment: communications channels developed to enable the incorporation of business knowledge into the corporate mental map, whilst allowing the businesses to share and shape the corporate mental map.

This transformation is distinctive because it shows the evolution of successive congruent action–perception cycles at successive levels.
Individual self-examination at the headquarters was connected with revaluation of the headquarters as a collective entity, so that the two were congruent. Those who acted in the name of the headquarters articulated in their own terms the purpose and role of the collective. The articulated headquarters self-concept was translated into specific action traits, communication characteristics and programmes, so that actions were congruent with the headquarters’ rhetoric. The balanced scorecard served as a device for articulation of specific business “world views” and targets within the generic blueprint, maintaining congruence between global and local dimensions of change. The mentoring process and the social infrastructures enabled the development of local action plans, networks and targets congruent with the global self-concept.

The transformation process developed capabilities (e.g. self-evaluation and empowerment, congruent corporate identity, networking capabilities, collaboration and intersubjective development of organisational identity) that coordinated ‘Groupe Tulip’s’ reactions to external changes.

The ‘desired profile’ for ‘Groupe Tulip’s’ transformation was articulated in terms that related more to the cognitive infrastructure than to the transformation of business processes and operations. In implementing the change, the corporate centre created an environment for nurturing and maintaining a dynamic, congruent cognitive infrastructure.

6. Discussion

The cognitive congruence framework represents congruent organisational cognitive infrastructure: the four components are in harmony, and congruence is maintained between an (externally and internally) informed dynamic schema, self-concept, scripts and relationship enactment.

This congruence and harmony produces “wisdom of action”, i.e. knowing what the appropriate thing to do is in the “here and now” (Merali, 1998; 2001). Congruence between action and context is maintained and a virtuous action–perception cycle is sustained for leveraging organisational capabilities. Individual wisdom of action is observable in retrospect, as “wise” moves lead to a position of sustainable viability of the actor and his intact self-concept. Whilst action in organisations is directed towards strategic business outcomes, the definition of “appropriate” encapsulates holistic notions of viability, sustainability and persistence of the organisational identity.

In the case studies where cognitive infrastructure became incongruent, the four components were no longer in harmony with each other and the (internal and external) environment: the action–perception cycle became dysfunctional, capabilities were leveraged ineffectively and resources were wasted. Incongruence commonly arises from de-coupling of cognitive components within the organisation (as in the ‘Finsoc’ case) or de-coupling of the organisation from the external context (as in the ‘ITED’ case). The assertion in this paper is that internal and external congruence of the cognitive infrastructure is necessary for effective leveraging of organisational capabilities (as illustrated by the ‘Groupe Tulip’ case).

Whilst the literature on knowledge management and communities of practice highlights the importance of shared individual and organisational values and beliefs (Davenport and
the collective schema may also be dangerous (as illustrated by the ‘ITED’ case), blinkering the organisation to important environmental contingencies. This aspect is highlighted in the strategy and cognition literature. Prahalad and Bettis (1986, 1995) refer to it as an organisation’s “dominant logic” and show how it can blinker strategists to critical changes and discontinuities in competitive and industry context. Similarly, Walsh (1995) cites case studies (Wilensky, 1967; Starbuck and Hedberg, 1977; Narayanan and Fahey, 1990; Zahra and Couples, 1993) that attribute critical organisational blunders to shortcomings of collective schema of the key decision making group. In a longitudinal study comparing management team cognition in two competing companies, Barr et al. (1992) found that the successful organisation demonstrated continued experimentation, change and learning in its mental maps, whilst the defunct one changed once and “froze”. Other studies demonstrate the importance of social interaction and reflection in schema development and modification (Weber and Crocker, 1983; Walsh and Charlandbides, 1990; Millar and Tesser, 1986). Exposure to diverse external schemata, and reflection on alternative representation, were found to effect changes in existing schemata.

These studies highlight the importance of relationship networks and relationship enactment in reviewing and refreshing the collective schema of the cognitive congruence framework. Connectedness with the “external” world is essential for access to its changes and discontinuities. Access to internal diversity (e.g. through intersubjective inquiry) is important in challenging the existing schema.

The power dimension is important in selecting between competing cognitive constructs and it impacts on the values and frames of reference adopted in an organisation. Gray et al. (1985) find that the struggle for power in an organisation is often a struggle to impose and legitimise a self-serving construction of meaning for others. Bartunek and Ringuest (1989) found that individuals who held schema that differed from their superiors during periods of organisational transformation subsequently received less recognition for their talents and were more likely to leave than peers who did not hold challenging cognitive structures. The power dimension is clear in the ‘Finsoc’ case, where the collective memory of powerful individuals was retained in relationship scripts. In the ‘ITED’ case, the R&D officer with the non-conforming schema was not recognised for her achievement and left the organisation.

When used in a diagnostic capacity, the cognitive congruence framework exposes flaws in congruence between the four cognitive components and the environment. The incongruence highlighted by the framework generally finds its origins in the social, organisational, political or strategic domains. It is thus from these domains that appropriate action to deal with the lack of congruence is required.

7. Implications of the cognitive congruence framework for theory and practice

7.1. Implications for theory: articulation of perspectives on knowledge management

The tendency to categorise knowledge and knowledge processes along various pairs of dimensions as described in Section 2 implies that the categories are orthogonal. This leads to a polarisation of discourse (as evidenced by competing $2 \times 2$ matrices in the literature).
The cognitive congruence framework provides a means of reconciling these dimensions. As a dynamic knowledge structure, the schema is effectively a knowledge store (consistent with the “knowledge as stock” view). By acting as a filter for the incorporation of new knowledge the schema defines knowledge (consistent with the “knowledge as object view”).

As a basis for the definition of self-concept (positioning “self” with respect to the environment) and relationship scripts, the schema allows the articulation of the concept of knowledge with that of knowing. The relationship script specifically connects the cognitive and relational dimensions of collective cognitive and social capital, and relationship enactment is the realisation of knowledge and knowing, and also of the collective being. Action in the social world is a means of validating beliefs (thus legitimising knowledge claims as “justified true belief”) and experience is a source of material for inclusion in the schema.

Updating of the schema based on the experiences of relationship enactment is key to knowledge management. At this juncture the cognitive congruence framework creates an important bridge between the literatures of knowledge management and organisational learning (which are often perceived as distinctive). The literature highlights the importance of action and reflection in learning (Kolb and Rubin, 1991), and defines social interdependence as integral for codification and diffusion of new knowledge in organisational learning (Boisot, 1987). The framework accommodates these dimensions and facilitates the confluent utilisation of concepts from both literatures (see Merali, 1998; 2001 for an extended discussion).

The question of individual and collective knowledge is contentious in the literature. In the cognitive congruence framework, relationship scripts and relationship enactment connect the individual to the collective. The relationship and the relationship enactment are social phenomena. Viewing the organisational network of relationships and its enactment as a social entity, the collective emerges when there is a consistently high degree of observable congruence between the behaviour of individuals in the social entity over time.

7.2. Implications for practice: utility of the cognitive congruence framework

The case vignettes illustrate the descriptive and explanatory aspects of the cognitive congruence framework. At the fundamental level, the framework offers the practitioner a sensemaking device: it enables the articulation of, and discourse about, observations and management of competence leveraging processes. It can be utilised in a ‘diagnostic’ fashion in the management of the action–perception cycle to highlight ‘flaws’ in the underlying cognitive infrastructure.

The cognitive congruence framework can also be used to develop insights for the design of better organisational processes for the leveraging of knowledge assets. By requiring explicit definition of schema, self-concept, relationship scripts and enactment, and the examination of congruence between the elements the framework is a useful device for evaluating the connectedness of work with world, action with perception (and so rhetoric with belief/commitment/understanding) and social relationship networks with individual and collective cognitive positions. This constitutes an input for the design of interventions.
to sustain, enhance or change extant action and perception characteristics at the individual and organisational level.

The cyclical relationship between action and perception underpins much of the existing theory on learning by doing. From a pragmatic viewpoint, the cognitive congruence framework focuses on the process that underlies the legitimisation and realisation of the choice of the particular action–perception cycles enacted in leveraging capabilities in different organisational settings.

8. Conclusions

The cognitive congruence framework is a sensemaking device for studying organisations in dynamic contexts. It relates cognitions and actions to social and organisational contingencies, and offers the mechanism of relationship scripts and relationship enactment for co-ordinating and updating individual and collective actions and perceptions in response to changes in the environment. The case vignettes illustrate the diagnostic utility of the framework and the discussion places the framework in the context of existing work on cognition and social capital.

This paper extends existing debate in knowledge management by reconciling tensions between competing theories of the nature of knowledge, knowing, “know-how” and “know what”. It further links individual with organisational knowledge and sensemaking in a socially aware framework.

References