



Knowledge wisdom and networks: a project management centre of excellence example

Knowledge
wisdom and
networks

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Abstract

Purpose – This conceptual paper aims to explain how “project management centres of excellence (CoEs)”, a particular class of knowledge network, can be viewed as providing great potential for assisting project management (PM) teams to make wise decisions.

Design/methodology/approach – The paper presents a range of knowledge network types and classifies them into a matrix using dimensions of social capital formation and learning levels. Examples were used of each identified type, drawn from the literature, to illustrate and clarify the capability maturity levels, from *ad hoc* isolated communities of interest to integrated and strategic CoEs that serve to propagate and transfer knowledge about an organisation’s advanced project management skills and tools.

Findings – The paper presents a useful framework for understanding this evolution and argues that CoEs can optimise, help coordinate and enhance the effectiveness of a range of knowledge networks operating within an inter-organisational or intra-organisational project team.

Originality/value – The framework: facilitates PM organisational leaders to understand knowledge networks from a social capital formation and learning organisation perspective; highlights limitations of each of the identified knowledge network types from this perspective; and challenges PM leaders to strategically create and maintain a workplace environment that both encourages PM best practice and maximises organic learning development from which knowledge networks spring. PM leaders need to realise that sustaining CoEs is highly corporate resource intensive, however, derived benefits can include reduced wasted effort, poor project outcomes and increase organisational learning that facilitates continual PM process improvement. The framework provided here helps to justify that commitment.

Keywords Centres of excellence, Knowledge management, Project management

Paper type Research paper

Introduction

The “project office” concept has emerged, in which project teams are linked, either electronically or through co-location, with a “space” where tools and skills can be deployed that focus upon delivering the project outcome (Kerzner, 2003). The project office concept, can be seen as a passive tool to the extent that it is a facility that is available for project managers to access and use. However, this has more of a “push” technology rather than a “pull” one where the project office is a facility rather than an organisationally embedded feature. More recently, significantly greater attention has been directed towards focussing on creating an environment that effectively maximises knowledge transfer due to an increasing appreciation that knowledge is a key organisational asset. To this end, the project office concept has evolved into a project



management (PM) centre of excellence (CoE), where an organisation's most advanced PM skills and tools are developed, made available and actively promoted to project teams. This paper provides a useful example of how knowledge networks can contribute to not only competitive advantage and improved service delivery but also developing a solid basis for building organisational memory as a valuable knowledge asset. Organisational memory can thus generate wisdom, in which the most appropriate decision is made on whether or not, or how to apply knowledge to a project situation.

The paper's usefulness lies in its role in helping to focus those involved in PM on developing their project management knowledge assets. We hypothesise that this will contribute to the improvement of project management practices and provide both tangible and intangible outcomes for clients and project management practitioners. We use several examples from our experience to illustrate and justify our position. Further case work is being undertaken to more rigorously test this hypothesis.

Background

The idea that competitive advantage can be gained through organisations collaborating through knowledge networks has been increasingly recognised as a promising business strategy. It also has several advantages over open competition both between and within organisations. Dyer and Singh (1998, p. 674) argue, from a relationship view of the firm, that supernormal profits are generated from interfirm knowledge routines, complementary resource endowments and effective governance. This contrasts with a resource-based view of the firm that stresses managerial talent, process technology advantage, financial resources and intangible resources, such as reputation as being the source of such profits.

Thus, the value of knowledge sharing communities developing across organisations has been seen to have significant merit. Further, the process of knowledge creation and transfer within organisations has been accepted by a wide variety of experts as effectively occurring when groups work together to solve complex problems (Cohen 1998; Burton-Jones, 1999; McDermott, 1999; Wenger, 1999; Davenport and Prusak, 2000; Dixon, 2000; von Krogh *et al.*, 2000; Nonaka *et al.*, 2001; Takeuchi, 2001). Additionally, the development of communities that can effectively transfer knowledge and best practice offers significant value in terms of tapping into existing knowledge that might otherwise be recognised (O'Dell and Grayson, 1998). These communities can be developed and encouraged and can also provide considerable expertise into an organisation through the effective exchange of favours in providing help to solve difficult problems (Storck and Hill, 2000). While informal networks receive and pass on information, and knowledge networks provide links between people and knowledge, they can be *ad hoc*, their links poorly defined and structured, and their ability to be applied to a focused challenge is often limited. Such networks of disparate people and knowledge sources can be effectively marshalled into communities that share common practices and knowledge bases. While such groups apply information to solve particular problems by processing information into knowledge, this knowledge is often not sustained within the network because of the ephemeral nature of that structure – thus potential wisdom (the judicious choice of alternatives) evaporates because it is not sustained within a context that can be easily understood at some future time.

A project team is another form of community that is brought together for a period of time (virtually and/or physically) to address a particular challenge. A project team is

formed to realise a project objective and this team is generally led by a project manager (Turner, 1999). The management of projects (project management) inherently involves a temporary organisation of people to undertake a defined objective in a finite period (Project Management Institute, 2000). Inevitable, the network of people from different contributing teams and organisations form and disband at the end of the project – much of their experience and knowledge dissipates as it is rarely recorded or available after the project is complete (Gulliver, 1987). In the film industry, DeFillipi and Arthur (1998, p. 134) state:

No capital investments convert to fixed asset, no revenues are retained, no structure or positions are permanent, and no returns to learning accrue for future projects.

While some projects produce a physical product (a ship or building) or a tangible service (a benchmarking project or a change management initiative) others produce ephemeral outcomes (a public relations initiative to increase brand awareness) or in the film industry case, a revenue stream (that not only includes a film but also associated merchandising). In each project management type, teams are formed and disband, often as noted by DeFillipi, with no continuity of knowledge to the project “client” and only in an *ad hoc* way to project participants. This represents not only a serious loss of management energy and resources being wasted but it also represents a lost opportunity for people to continue to create and share valuable knowledge through their project community.

To counter this waste and dysfunctional approach to managing knowledge, the concept of knowledge networks has been evolving under the guise of various forms and terms. Powell (1998, p. 131) describes knowledge networks in the biotech industry in terms of “organizations and networks as vehicles for producing, synthesizing, and distributing ideas”. This includes a form described by Wenger as a community of practice (CoP). A CoP is “a group of people, informally bound together by shared expertise and passion for a joint enterprise” (Wenger and Snyder, 2000, p. 139). This notion of cooperation and collaboration to create and share knowledge, particularly in a non-formal structure that was not initiated by organisations following a knowledge management strategy, is an interesting construct that has been internalised by firms and has evolved into forms that include the original informal arrangements but now also more formally structured and organisation-initiated (Storck and Hill, 2000; Wenger *et al.*, 2002).

Three key concepts that we explore and expand upon in this paper are knowledge, wisdom, and knowledge networks. This involves tracing the evolving structural form that networks of project management professions have adopted in sharing knowledge to capitalise on project management wisdom.

We then discuss how knowledge transfer through such networks extends the functionality of the project office to a centre of CoE that actively engages in knowledge development and transfer to improve both project management practice and service delivery. The project office concept has in the past been poorly recognised as a core organisational knowledge asset. Its utility has been generally accepted to centre on a problem-solving and coordination tool rather than offering a knowledge management opportunity. The implication of this for project managers is that by focussing on a CoE as a knowledge network (that is also learning-centric), CoEs can be better recognised as facilitating sustainable wisdom for project management teams.

Knowledge and the evolution of knowledge communities

Davenport and Prusak (2000, p. 5) defines knowledge as:

... a fluid mix of framed experience, values, contextual information, and expert insight that provides a framework for evaluating and incorporating new experiences and information. It originates in and is applied in the minds of knowers. In organisations, it often becomes embedded not only in documents or repositories but also in organisational routines, processes, practices, and norms.

McDermott (1999, p. 105) simplifies this into describing it as “the residue of thinking”. Both definitions assume an hierarchy of data being interpreted into information and that information being further enriched into knowledge through understanding the data’s context. However, when the value of knowledge is further extended through greater insights into upstream and downstream consequences of applying that knowledge, it becomes wisdom. Standards Australia (2001, p. 7) states that:

Wisdom could be described as the best use of knowledge ... to focus on to achieve [organisational] objectives.

As Meacham (1983) in Weick (1995, p. 112) states:

Each new domain of knowledge appears simple from the distance of ignorance. The more we learn about a particular domain, the greater the number of uncertainties, doubts, questions and complexities. Each bit of knowledge serves as the thesis from which additional questions or antithesis arise.

Clearly then, wisdom results from people consciously and skilfully applying appropriate knowledge to a given situation and this is based upon psychological factors governing their reasoning to apply a particular action or behaviour – knowing when and/or how to apply, or refrain from, applying rules. It is interesting to consider how organisations can encourage wisdom, better manage their knowledge environment through tapping into knowledge networks, and use CoEs that develop wisdom in those who are connected with them.

Much of the knowledge management literature stresses the social context of knowledge creation. In their seminal work, Nonaka and Takeuchi describe a knowledge creating cycle of:

- individuals sharing tacit knowledge through socialisation (S);
- articulating this either verbally or textually to make tacit knowledge explicit (E);
- combining the explicit shared knowledge with existing explicit knowledge such as operating procedures, manuals, and information bases (C); and
- then through reflection and embodying that re-framed explicit knowledge, internalising it so that it becomes refined tacit knowledge for many individuals across the organisation (I).

This SECI process spirals in a three dimensional cycle of generation and regeneration of knowledge (Nonaka and Takeuchi, 1995, p. 73).

Technology or organisational structures used for knowledge management can only be an enabler and facilitator of the means of getting people together to create and share knowledge – rather than being a knowledge generator itself. E-tools can only be a means of managing a knowledge environment. E-tools include, but are not limited to:

information repositories; search engines; knowledge portals; and even software such as groupware that links people together. In a project management context, one important tool is the project office, the communication and coordination centre with all its decision making aids and technology that facilitates people to share information and knowledge as well as engage in problem solving using planning and simulation tools. The SECI process requires the socialisation process as a key driver of knowledge creation. As people interact and share insights, they help determine the context and speculate and test assumptions of the implications of applying their shared knowledge and so they gain wisdom as well as redefine existing knowledge into new knowledge. This tacit knowledge can be partially codified but because much of the deep contextual content is difficult and highly time consuming to codify it remains as tacit knowledge. During the mid-1960s the concept of tacit knowledge was explored. Polanyi discusses how we can know more than we can tell. He cites the example of face recognition. We can recognise a particular person's face, even someone from the past or someone who we have never met, from the thousands and indeed millions of faces we could have presented to us yet we cannot explain how we know that particular face (Polanyi, 1997, p. 136). Tacit, according to the dictionary, means silent, not openly expressed but implied, understood or inferred – from the Latin word *taceo*, meaning “I am silent” (The Macquarie Library, 1987, p. 1727). People draw on their own tacit knowledge in the form of the skills and wisdom that have been gained via experience – when making choices.

The notion of a project office (PO) recognises that the SECI process applies to groups as well as individuals. Hedlund (1994) observes that the SECI knowledge process interacts between not only explicit and tacit knowledge between individuals (level 1), but that this is also going on in the group (level 2), organisation (level 3) and inter-organisation (level 4) domains. Moreover, he talks about three distinct things happening during the SECI knowledge process within these four levels: storage, transfer, and transformation. Figure 1 illustrates his conceptualisation of this knowledge process.

Hedlund visualises a knowledge push-pull effect occurring at all four levels. The pull of knowledge occurs when it is assimilated from the various levels and embodied and embedded in these groups using the SECI process. Assimilated knowledge is appropriated for use. Articulated (explicit) knowledge is internalised and through a process of reflection and articulation it is extended, first through dialogue between individuals and groups, then at the organisational level and further at the inter-organisational level. Stored appropriated knowledge is not only recycled across levels through the above knowledge transfer process but it is also expanded and transformed during this process. No existing stored knowledge can ever remain untransformed because during the above process there is a constant re-contextualisation and interpretation occurring. This can only effectively happen in knowledge sharing communities. Hierarchical delivery commands, edicts or formal control policy cannot force knowledge sharing and transformation to organically and effectively happen in the way indicated in Figure 1. This is why Hedlund argues that effective knowledge transfer occurs between networked groups and while there is a measure of quid-pro-quo about transfer of knowledge, there is also a genuine free exchange of knowledge taking place in which these networks are vital. This networked form of organisational response to complex decision making by individuals and groups

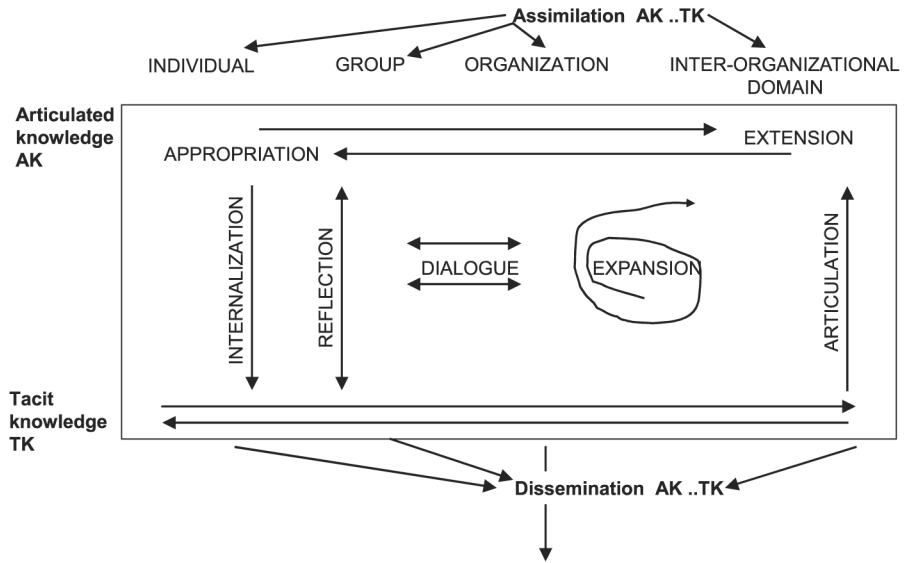


Figure 1.
Knowledge transfer
process

Source: Hedlund (1998, p. 78)

is in stark contrast to a divisionalised approach in which separate expert groups in isolation take parts of the problem being resolved being coordinated. In the latter divisionalised matrix form, the hierarchy encourages an inevitable move towards silos of knowledge that cannot be effectively disseminated. The above also accords with (Maqsood *et al.*, 2003) at the organisation level where a model of knowledge transfer leading to innovation was mapped on a maturity trajectory. Their model shows how organisations move from being impervious to assimilation of knowledge from outside and their people, processes, and technology are equally kept in silos to one in which the organisational boundaries are pervious to allow both assimilation and dissemination of knowledge.

People are social animals and so they naturally develop social networks to share information, knowledge, and insights and help each other to solve problems of mutual interest. One of the most referenced example of a CoP is the study undertaken on the way that photocopying machine technicians formed an informal (but highly focussed) technical support group to help them solve complex and often perplexing problems relating to breakdowns and malfunctions of these machines (Orr, 1996). The account of this research has been interpreted by numerous writers on knowledge management and more specifically the workings of CoP, for example (Brown and Duguid, 1991; Davenport and Prusak, 2000). In Orr's example of a CoP, a number of individuals share a common enterprise and objective (in this case the repair and maintenance of photocopying machines), and through their support group share both knowledge and perceptions through narratives (war stories) where they discuss details of problems, their contexts, the messiness and quiriness of the situation in all its rich detail of tacit details and sub-text. These are within-organisation and informal CoPs. Subsequent to the high levels of citation of Orr's PhD thesis and other publications such as Brown and Duguid (1991, 2000), Werbach (2000), and Brown and Duguid (2001), great interest has

followed in company sponsored, initiated and supported CoPs (Wenger *et al.*, 2002). This notion of the strategic CoP has emerged and has been cited as useful and successful in cases at Xerox (Storck and Hill, 2000) and BP (Prokesch, 1997) and in a variety of other industries most notable the automotive industry (Wenger *et al.*, 2002).

From knowledge networks to project management centres of excellence

Tiwana and Bush (2001) identify four defining elements of communities that share knowledge in a social knowledge network as practice, community, meaning and identity. Practice is learning as doing and this reflection as an active tool for learning that has been long recognised in the management literature (Schön, 1983). This has been linked to meaning (making sense of shared experience through reflection and dialogue between colleagues) by decades of work by Weick (1995). Reflective learning from experience can lead to double-loop learning (Argyris and Schön, 1978) where systemic problems are solved rather than quick fixes to symptomatic problems being made through better understanding of cause and effect chains. This reduces the extent to which people fail to make the connection between cause and effect (causal ambiguity) that is a major factor that contributes to what is termed knowledge stickiness or inability to readily transfer tacit knowledge (Von Hippel, 1990; King, 1999; Szulanski and Winter, 2002; Szulanski, 2003). Double-loop learning is best achieved through reflection by groups of people who can share experiences from a number of diverse perspectives (Hames, 1994; Hames and Callanan, 1997). This leads to the importance of community, sharing these diverse perspectives in a non-threatening way in an environment where the individual has a sense of belonging. This in turn deepens the organisational culture – its sense of belonging. Deep organisational culture builds deeper levels of cultural adherence beyond shared identity manifested by symbols and artefacts such as group badging to impinge upon core beliefs and values underpinned by shared assumptions that make up the “soul” of the community (Schein, 1985). A close and tightly bound force binds people engaged in common enterprise through shared experience, shared sense of belonging and commitment to the community by identifying with its shared assumptions. The degree of engagement and supporting mechanisms largely determines a knowledge network’s effectiveness in knowledge exchange and sharing to building wisdom. These can be scaled in terms of density of cultural adhesion and a description of many of these common knowledge networks follows.

Communities of interest (CoI)

These are loosely grouped and often *ad hoc* groups that come together from time to time to informally share information. They seldom have a life span beyond one or two meetings and meet with such infrequency that they remain as originally formed with an evolving *ad hoc* membership that varies greatly between meetings depending on who is interested and needs to exchange knowledge. These have no formal structure or defined membership. This does not in any way limit the value of such knowledge networks because considerable information and knowledge is shared and learned and even created in such informal settings. The capture of such knowledge at these networks, however, is often a great deal more illusive, given the lack of structure and methodologies to capture it (Wenger *et al.*, 2002, p. 42) – such meetings often have no

record of proceedings. Lack of knowledge capturing strategies is understandable given that these CoIs are more about “relationships” than conscious learning.

Project teams

These are formed for a common purpose to achieve a set of objectives, tasks and to generate a product or deliverable. The notion of project teams is quite broad as they are often numerous teams grouped and assigned to a project each fulfilling various functions (initiation, design, delivery etc.) and are generally answerable in part to the project manager representing the lead team who in turn is accountable to the project's client for coordinating these diverse teams delivering the project outcome (Walker and Hampson, 2003b, p. 21). Project teams are loosely linked in a matrix arrangement, principally accountable to their “home” organisation but they are also accountable to the coordinating project management team. Alternatively, project teams may reside within the sponsoring business unit, or in some cases be part of a centralised strategy within a project office. In this latter case they are tightly linked and their sense of community is generally stronger because they share common workspaces, they usually have a common identity associated with the project and their project involvement gives them a sense of common meaning and community. It is not uncommon for such teams to be more committed to their project community than their host organisation. However, as teams move through a project's different phases of initiation, design and planning, implementation, and closeout (Project Management Institute, 2000), there is an ebb and flow of personnel with special knowledge drawn upon at different times. This discontinuity, and the fact that the project team will be disbanded at the end of a project, inhibits a sense of continuing community beyond the project.

The project office (PO)

Kerzner (2003) claims that concept of the project office (PO) has existed since the 1950s and that its character has changed over the years. He maintains that up until about 1990, POs tended to be stand alone, single project offices with a project specific team supporting a single project. With large scale projects that justified dedicated personnel these were centred on the project and the project team inhabited that office. There was little if any formal exchange of transfer of knowledge from one project to another except via the senior project sponsors – these people had little knowledge of day-to-day activities and relied mainly upon monthly reports from the project manager's team and any site visits that were undertaken so naturally knowledge exchange across projects was limited. With no internet connections at that time, information exchange tended to be centred on project cost and time information and would not be sufficiently context-rich to be considered as deep knowledge. During the decade 1990-2000, there was a general move in many industries in western economies towards projectisation, organisational de-layering, outsourcing and introduction in the later part of that decade with advanced information and communication technologies to link and connect parts of the business both together and to the corporate core headquarters (Pettigrew and Fenton, 2000). According to Kerzner (2003), this had the effect of starting to change the role of the PO from governance agent managing and controlling the project on site towards a more distributed entity with POs for major projects. POs for groups of smaller projects centred in regional or headquarters and

POs centred at the headquarters that interacted with the project-based POs. Emerging corporate POs now served to service the projects with strategic activities. Since the start of the twenty-first century, corporate POs have accelerated their role in PO support activities including mentoring, benchmarking for performance improvement and transferring best practice within the organisation, training and development, and knowledge management to improve business case development and harvesting knowledge across the organisation.

A PO is characterised by one of three entities. One entity is a stand-alone project management office (PMO) that manages a single project. A second is a project support office (PSO) that traditionally supports the organisation and its business units to achieve successful outcomes but does not direct or have a line of authority over the business. And the third is the corporate project management office (CPO) that services the entire company and focuses on strategic and corporate activities to coordinate and improve project management within the entire organisation. This latter form of PO moves towards the concept of a centre of excellence in project management and as Kerzner (1998) argues, it creates an environment to deliver a continuous stream of successfully managed projects – success is measured by having achieved performance that is in the best interest of the whole company as well as the specific project. He provides a simplified model of a CPO with four direct components:

- (1) Project managers (engaged in the PO for their projects).
- (2) Support staff for the corporate activities described above.
- (3) Tools such as information and communication technologies facilitating project monitoring and control, knowledge management and decision support tools that can be visualised as the classic incident room used by police forces around the world to solve crimes or the “war room” that can provide highly sophisticated coordination in crisis management and has been reportedly used to great effect in the Hewlett-Packard Compaq merger (Ingebretsen, 2003).
- (4) A centre of excellence to continually improve project management activities and bring best practice to as many areas of the organisation as possible.

CoE

CoEs have emerged to promote growth within disciplines, associations or groups that share common practices. The highly evolved project office form of CoE is more than a passive vehicle for improving project management practices by transferring best practice. Through the transfer of best practice and learning derived from benchmarking, it can actively encourage knowledge management and development of wisdom. In order to create an effective CoE, Bolles (2002) identifies four key elements:

- (1) *Authorisation*: assists organisations to align its resources with its strategic objectives. It identifies, categorises and prioritises projects. It also provides a means to manage projects and assist an organisation to advance in its levels of project management maturity.
- (2) *Standards*: establishes standard tools, templates and methodologies to be applied to all projects within an organisation.

- (3) *Education*: provides training and educations to all concerned with respect to project management within an organisation. This key component of the cultural change is often required to implement the authority and standards structures.
- (4) *Readiness*: establishes a projects readiness to proceed through the required methodologies and may include an evaluative aspect or pr-project assessment as to the likelihood of success for a project. This could also include an assessment of critical success factors or a preliminary risk analysis.

The importance of social capital to networking knowledge and wisdom

If we choose to view CoEs in the light of being a facilitating agent within a CPO that potentially creates and transfers knowledge of best practice then it is worth using the framework that Nahapiet and Ghoshal (1998) developed to describe how social networks function. This is because the issue remains whether wisdom can be best engendered through predominantly mandated or voluntary means. Wisdom and deeper knowledge work activities require personal insights and collaboration. Therefore, a voluntary system (or one that is predominately voluntary with corporate non-threatening encouragement) probably provides the best facilitating environment for CoE to develop. The key input is social capital, created by networks of people developing a way of trusting each other to commit to certain mutually advantageous enterprises and activities. They develop a currency of trust that has been given the short cut definition of social capital but this could also be described as “good will”. By depositing good-will credits through social actions that provides others with benefit, people build a social capital bank account, which entitles them to withdraw social capital benefits. Often the beneficiary and recipient are not directly linked but are indirectly linked by virtue of being an active participant. This concept contradicts the traditional transactional approach of a two-way exchange of favours as espoused in transaction cost economics (Williamson, 1975). In a lengthy and erudite paper, Ghoshal and Moran (1996) use a particularly useful way of visualising how social capital is developed to collaborate and cooperate for mutual gain and contrasts this with a transactional view of human nature.

Social capital is categorised into three dimensions. Structurally, social capital comprises network ties, network configurations and appropriate organisation for these networks. It is worth reiterating the part of the definition of Nahapiet and Ghoshal (1998) that relates to potential as well as realised benefits of social networks. When considering financial assets, we accept that cash and cheque account bank deposits represent assets even though they are inactive in generating immediate wealth.

Similarly, we should recognise the intrinsic value of “contacts” through clients, employees, professional associations and more informal communities of practice such as “mates” and colleagues that have built up a trusting long-term relationship from past/present employment encounters and continued mentoring. This latent asset is as potentially useful and potent as cash in the bank. The structural dimension of social capital infers that to develop and fully leverage social capital we need to understand, perhaps through mapping, network ties including their nature, characteristics and configuration. If this is effectively done then there is an opportunity to adapt the

business organisation to best avail itself of the benefits to be derived from social capital with respect to knowledge and intellectual capital.

A second dimension of social capital identified by Nahapiet and Ghoshal (1998) is cognitive. This comprises firstly, shared codes and language and secondly, shared narratives. Shared codes and language is an easy concept to grasp. We all have felt at some time excluded by, jargon, forms of expression, or arcane language that seem to include some but not others. This is a natural part of forming cultures and sub-cultures. Such language contains subtle forms of communication, fine distinctions that mean something special to those using the words or terms. Often this subtlety is valuable as it embeds elements of tacit knowledge and/or powerful concepts. Networks also share codes. Many COPs have a code that requires anyone with specific knowledge about a particular problem that they share it when asked. For example Teigland (2000) draws to our attention that often in hi-tech organisations, such as internet developers, their programmers may be working on the organisation's competitors' problems part of the time. This is apparently commonplace as software developers on "bleeding-edge" projects run into a technical problem they often call on their COPs to help and that finding an elegant solution is part of the credibility and kudos gained within the COP. In a more macro sense all organisations gain because when they hire someone from a COP they also gain access to the entire COP's intellectual capital. Shared narrative have been also termed "war-stories", however, shared narratives are more than empty boasting or bragging – they are shared examples of a particular problem under discussion so that the context as well as the story is explored often with alternative end-games, solutions or outcomes offered to provide a deeper perspective for those concerned. This is an example in action of that described as the socialisation process described by (Nonaka and Takeuchi, 1995) in their model of tacit to explicit knowledge transformation.

The third dimension of social capital is relational. This represents four elements:

- (1) Trust as discussed in Walker and Hampson (2003a) is vital for alliances and partnership whether this be a CoP or more formal arrangement. Trust means an expectancy that promises will be delivered as well as a measure of knowing what any person within the social group may be expected to be delivered.
- (2) Norms are the rules and degree of consensus about some important matters that concerns the social group. For example, the norms that when a group member sends out a general call for help on a specific matter that anyone in a position to help will volunteer to assist (rather than being dragooned into doing so).
- (3) Obligations operate as a credit transfer system. Having been helped or been in a position to expect help one puts CoP members in position of being obliged to offer help to other CoP members. Obligation thus binds members into mutual dependency which a very powerful force for maintaining and developing social networks because it is the whole point of their existence.
- (4) Identification is a process whereby members of a group feel and believe that they truly belong to that group.

Having described what social capital is comprised of and is characterised by; we need to know how it can be leveraged to generate new intellectual capital. Four conditions for exchange and combination of knowledge are describe by Nahapiet and Ghoshal (1998) that draw upon earlier work on value creation developed by one of these authors

(Moran and Ghoshal, 1996). They state that first there must be an opportunity existing for combination or exchange of knowledge through access to a social network with that knowledge and/or access in terms of appropriate information and communication technology to do so. Second, there must be an anticipation of the value to be derived from the exchange or combining of knowledge. When you go to a meeting, seminar or conference you are much more likely to gain benefit from that experience if you started out with the goal of achieving something (even if that “something” is vague or undefined) from the encounter. There must also be a motivation to share knowledge or to combine knowledge in creating new knowledge. This is where many organisations encounter difficulties in setting the scene for extrinsic or intrinsic motivators for knowledge transfer and combination.

The fourth condition identified by Nahapiet and Ghoshal (1998), combination capability, is an interesting condition. In a very insightful paper by Cohen and Levinthal (1990), they discuss the term “absorptive capacity”. This is the capacity of an organisation (or individual) to learn and absorb new knowledge. They discuss in their paper some of the precursors to innovation take-up and identify many of the (cultural) organisational factors that indicate the capacity of organisations to absorb new ideas. These include openness, tolerance of mistakes (if recognised and analysed why the failure occurred and what may be remedied next time), having boundary-spanners (people that bridge several disciplines or areas of expertise so that they can “see” the potential of one idea transferred to another context or use of cross-disciplinary teams that truly interact), diversity of participants in terms of their world-view, and also interestingly, past experience in having experimented and toyed with new ideas (again a measure of openness and preparedness to take risks).

Analysis and discussion

Thus far we have highlighted the CoI, CoP, PO (PMO, PSO and CPO), and CoE as classes of knowledge network structures that can be used to create, transfer and use knowledge and develop wisdom in people using this knowledge. We also introduced the notion of social capital’s role in creating intellectual capital that includes knowledge and wisdom. We identified social capital in terms of three dimensions. We also identified in Figure 1 learning as being predominantly being conducted at the individual, group and organisational level. Further, the main problem identified by almost all writers on knowledge management and organisational learning is that when people leave an organisation they take with them one of the most valuable resources (knowledge) that organisations need for competitive advantage. To better summarise and visualise the characteristics of each of these knowledge networks we have constructed Table I. Knowledge networks provide an important vehicle for individual and group learning.

CoIs are valuable for individual learning but wisdom generation may be limited because the CoI participants are more likely to be involved in single rather than double loop learning and a CoI requires little if any resources and organisational support. These are organic bottom-up type networks with little organisational learning being developed but with little or negligible costs to organisations for support.

CoPs are better value if they can generate double loop learning and hence wisdom. Both individuals and groups benefit from learning. Retention of organisational knowledge is low to medium depending on the scale of organisation support for CoPs.

Knowledge network type	Structural dimension	Relational dimension	Cognitive dimension	Dominant learning level	Degree of hierarchy	Organisational knowledge retention	Level of potential wisdom generation	Corporate support resources required
Community of interest (CoI)	No	Yes	Maybe	IL ^a	Very low	Very low	Low-medium	Nil
Community of practice (CoP)	Yes/maybe	Yes	Yes	IL ^a /GL	Low	Low/medium	Medium-high	Nil-moderate
Project team	Yes	Yes	Yes	IL/GL ^a	High	Low/medium	Low	Moderate
Project management office (PMO)	Yes	Yes	Yes	IL/GL ^a	High	Low/medium	Low	Moderate
Project support office (PSO)	Yes	Yes	Yes	IL/GL ^a	High	High	Medium	High
Corporate project management office (CPO)	Yes	Yes	Yes	IL/GL ^a /OL	Very high	Very high	Medium-high	Very high
Centre of excellence (CoE)	Yes	Yes	Yes	IL/GL/OL ^a	Very high	Very high	High	Very high

Note: IL=individual learning; GL=group learning; OL=organisational learning; ^aDominant level

Table I.
Knowledge communities
in relation to the
dimensions of social
capital and learning

Organisational support (and thus knowledge retention) can be quite low as CoPs are most likely bottom-up networks, though as discussed earlier, corporate sponsored CoPs require resources such as ICT infrastructure and the kind of purpose built software tools described by Davenport and Prusak (2000) as used by British Petroleum. That particular software product was further developed and then used by the construction company Carrillion Plc. as a CoP management tool (Jewell and Walker, 2005).

Project teams using the PMO to promote both individual and group learning are organisationally sponsored and so more top-down developed and hierarchical in nature. They have greater levels of resource commitment intensity but they do return some limited organisational learning and memory, both individual and group learning and are moderate in their organisational resource demands.

As the PO characteristic moves towards a more interventionist approach higher group learning and wisdom potential is likely but at the cost of committing greater organisational resources. The project support office is still not organisation wide (focussing on groups of projects within a defined customer base or business unit/division) and therefore demands less corporate resourcing with lower learning being achieved at the total organisation level compared to the corporate project office, which is highly focussed on developing and transforming standards as well as best practice transfer across the entire organisation.

CoEs, often as part of a CPO, are highly corporate-resource intensive, though this leverages greater learning across the organisation and is more likely to deliver double loop learning in the form of wisdom. It can also be argued that CoEs justify matching committed resource costs with savings in waste (management and direct costs) as well as the delivery of more consistent and better service quality. This is why they may be able to justify themselves, however, this argument has not been proved conclusively to any significant degree. Measuring the effectiveness of CoEs will no doubt be the subject of a significant focus of future research effort.

Conclusions and recommendations

CoEs facilitate and enable organisations to better utilise CoPs to flourish and enhance knowledge transfer and, through people sharing rich insights, allow their staff to gain wisdom. The CoE also has a coordination, knowledge capture and transmission role and so it is better placed to turn personal knowledge into corporate and organisational knowledge as indicated in Figure 1. The CoE's benchmarking and best practice diffusion initiatives are particularly relevant to this end. The tools and technologies that the CoE can introduce and develop for corporate wide application provides the wider group problem solving activities that helps to build social capital as well as generate knowledge. This is a people-centred activity but communication technologies have their role to play. Jewell and Walker (2005) for example, describe a case study of the use of a CoP software tool that helps CoPs to better manage their activities and bring people with common interests together in a leading UK construction company.

We linked knowledge with wisdom in this paper by showing how knowledge may be exposed and tested and how this in turn creates the conditions for project management wisdom to be developed. We argue that knowledge communities might span a maturity development continuum that engage knowledge networks moving from Cols through CoPs, and in parallel and complimenting these, forms of Pos that culminate in the CoE.

We argue that CoEs may be situated at the highest level of knowledge network in terms of potentially delivering organisational as well as individual learning, greater levels of wisdom and double-loop learning that has been delivered in a strategic manner. We show that this may inhibit organically formed CoPs but that still may be achieved if the organisational style is sensitive to grass-roots movements that can be harnessed to organisational advantage. If corporations are willing to commit sufficient resources to CoEs, then the benefits may extend well beyond cost savings through minimising waste, and also deliver greater creativity and double-loop learning leading to greater wisdom. This then becomes apparent throughout the organisation, and learning occurs at the individual, group and organisational level. We speculate that this may attract more creative and wise employees who could provide even greater returns than have been indicated above. This assertion remains untested but is valid for us to flag as it should be the subject of further research.

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