A framework for understanding intellectual capital in virtual teams

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Abstract

The deployment of team-based structures and information systems feature prominently in organisational responses to pressure for improved performance. The nexus, driven by rapid expansion in capability and accessibility of computer-mediated-communications, is the "virtual team".

Yet whilst widely adopted in practice, research into virtual teams is still embryonic. Current findings regarding their benefits have been equivocal. One reason for this is the use of measurement frameworks that, because they were developed for comparing one traditional team with another, ignore the novel benefits of virtual teams.

To address this issue, the concept of intellectual capital is employed in this paper to examine the intangible assets that teams build. A framework for understanding this in virtual teams is developed, extending the basis for measurement of team performance to account for for their distinct benefits. This provides a platform for further research to explain where and how these benefits are delivered to the organisation.

Keywords: virtual teams; intellectual capital; performance measurement; collaboration; capabilities

Suggested track: O - Knowledge and learning issues in the context of global, virtual teams

1 Introduction

The adoption of virtual teams either as explicit or implicit organisational structures has rapidly followed the build-out of a technology-based communication-rich world. The expectation is of performance benefits to match traditional face-to-face or collocated teams (Andres, 2002; Townsend, DeMarie, & Hendrickson, 1998). Indeed since virtual teams can draw on the best expertise, wherever it is in the world, achieve round-the-

clock working, and better utilize each individual's time, there is the suggestion that the potential is to go beyond the performance levels of traditional teams. However, teamwork is more than just a set of processes. It is a complex mix of social and knowledge interactions forming dynamic capabilities that continuously evolve over time. In the virtual world, communication mediated by technologies is less rich in its ability to transmit social cues (Daft & Lengel, 1986). The effects of this are greatest on those aspects on which teamwork relies the most, so the counter argument asserts that virtual teams will fall short of the performance of collocated teams.

Research to date has been equivocal on the issue of the performance of collocated teams compared with virtual teams (Walther, 1995). However, these findings hinge on the nature of the measures used. Traditional measures have typically focused on task effectiveness and efficiency, learning and growth and the satisfaction of team members (MacBryde & Mendibil, 2003). Thus by limiting the scope of measurement to internal performance on a single task, and ignoring the capabilities developed by a team to deliver tasks over time and integrated into their environment, current performance measures fail to account for potentially the most valuable outcome, an intangible asset of real organisational value. This paper develops a framework for understanding teamworking as such an intangible asset, and so introduces a vital, additional measure of team performance. It does this by employing thinking from the field of intellectual capital, which to date has focused on the measurement of intangible assets at the organisational level (Guthrie, Petty, & Johanson, 2001). In intellectual capital terms teams and their capabilities are a complex, highly complementary and tightly interrelated mix of human, social and structural capital that meet the needs of an increasingly dynamic environment. As such teamwork is part of an organisation's intangible assets, which are believed to be overtaking other tangible assets as the basis of an organisation's true value (Teece, Pisano, & Shuen, 1998).

The aim in creating this framework is to provide a basis for future research into the benefits that this new organisational form delivers. Such an understanding can then inform decisions regarding the investment in deployment, management and performance improvement of virtual teams. The framework will also provide a new perspective and coherent overall structure for re-examining and reviewing research, models and literature on teamworking and its development in different contexts. For example, extensive research on trust in virtual teams (Corbitt, Gardinger, & Wright, 2004; Lesser, 2001) fits within the context of social capital, whilst temporal pattern research (Massey, Montoya-Weiss, & Hung, 2003; Montoya-Weiss, Massey, & Song, 2001) contributes to thinking on the virtual team's structural capital. Finally, by using

the concept of intellectual capital to examine teamworking this work can be integrated with and capitalise on existing and future research into higher level concepts of organisational capabilities and intangible assets, in the process stimulating wider debate and research into proactive management of intellectual capital, expanding on the narrower practice of knowledge management that we see today.

2 Teams, Virtual Teams, Teamwork

The emerging nature of virtual teams as a field of study places a premium on clarity of terminology. It does so for the simple reason that it aids knowledge transfer and the creation of shared understanding, making it easier to generalise and apply research with confidence. For this reason, despite the extent of the literature on teams it is worthwhile revisiting what is meant by the term" team".

Teams are a type of group, differentiated from other groups by their level of performance on a given task. This difference in performance is attributed to the form of working together they develop, which we refer to as teamwork or "team competence" (Thorbjornsen & Mouritsen, 2003). The positive connotation associated with the development of teamwork has resulted in the pejorative use of the term "team" to describe groups in either anticipation or hope that they will work in the type of productive fashion we associate with effective teamwork. At its broadest then, a team is a group of individuals sharing a common purpose (Adair, 1986), particularly in an organisational context, and its members work together in some way to fulfil that purpose.

Accepting this broad but commonly used definition of a team it follows that a virtual team is a team that interacts primarily using communication technology. This is a slightly broader definition than "a group of people interacting through interdependent tasks, guided by a common purpose… with links strengthened by webs of communication technologies" that is the most commonly used version, from Lipnack and Stamps (1997, p7). However, although in many circumstances, teams work on interdependent tasks, even where the task is simply a collection of individual efforts, teamwork in the form of mutual support, shared norms and commitment can impact performance. Thus although interaction through interdependent tasks is an important characteristic of the type of teamwork that is built, to include it in a definition would ignore other forms of teamwork in which socio-emotional processes make the bigger contribution. By choosing a broad definition of "team" and "virtual team" it is recognised

that a continuum exists from those that are working effectively through teamwork to those that are not. Equally, there is a spectrum of virtual teams from those that never meet at one extreme through to those that do meet face-to-face frequently.

3 Teamwork as an Intangible Asset

The difference in outcomes between functional teams and dysfunctional teams is in their performance and we attribute this to their teamwork. Included by many in their definition of a team, a functional or successful team develops a sense of shared responsibility (Cohen & Bailey, 1997) that combines the socio-emotional commitment to the team with commitment to the shared purpose of the task (see figure 1). This often underpins some of the most effective teamwork delivering the most complex tasks. MacBryde and Mendibil (2003) identify four dimensions to team performance, of which efficiency, learning and growth and team member satisfaction are centred in the building of teamwork, whilst the fourth, effectiveness, focuses on the achievement of the task. However, whilst teamwork has a value to the organisation associated with completing the task at hand, it also has an additional value in its future potential to complete other tasks more effectively and efficiently than would be the case starting from scratch with another group of individuals. Using Tollington's (1998) definition of an asset, teamwork is thus an intangible asset whose future benefits flow from the ability to complete tasks at a lower cost.

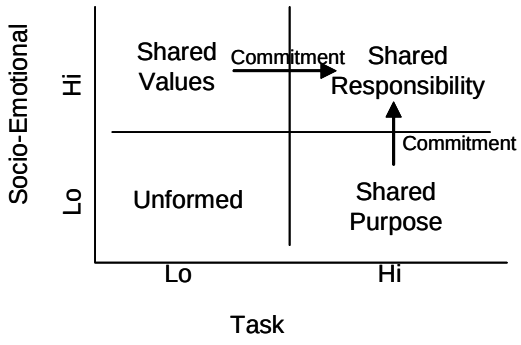

Fig. 1: Development of shared responsibility that underpins teamwork

In common with most intangible assets, the exact value of teamwork is difficult to pin down. The nature of the asset itself is dependent on the tasks undertaken by the team. So whilst some tasks can be simply broken down into individual contributions, which are not dependent on one another, others require specific, sometimes highly complex and interdependent, sequences to be followed for completion. Uncertainty, equivocality

and variability also affect the repeatability of a task, resulting in exceptions in the way a task is performed. Where both complexity and variability are extreme, tasks are unique, complex and highly interdependent (Nunamaker Jr, Romano Jr, & Briggs, 2002; Van de Ven & Delbecq, 1974). These task characteristics drive the nature and intensity of interactions between team members, and externally with other teams, and hence determine the nature of the teamwork the team builds (see figure 2). Complex tasks (Sheard & Kakabadse, 2002), requiring individuals with a range skills and expertise require high levels of interaction but these will be of a distinctly different nature to those coordination interactions needed for tasks featuring highly interdependent activities (Offermann & Spiros, 2001) .

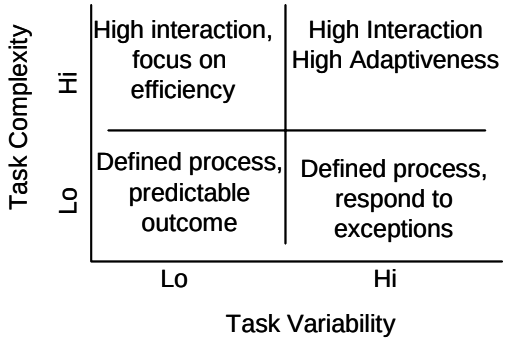

Fig 2 : Impact of the nature of the task on team interactions (derived from Van de Ven, 1974)

Since the value of an asset depends on its nature and the demand for it, the value of a particular form of teamworking depends on its fit with the tasks the organisation must complete and their importance to its success. The extent to which an organisation's interaction with its environment creates complex, interdependent and highly variable tasks therefore affects the forms of teamworking that are most effective and hence valuable. In this context Townsend et. al. (1998) cite just such an increase in the complexity, interdependence and dynamacism of the organisational environment as a driver for the adoption of virtual teams.

4 Intellectual Capital as a Measure of Intangible Assets

As a concept, intellectual capital developed in response to the inadequacy of traditional measures, in the form of financial accounting, to capture the new drivers of performance. It aimed to measure and report intangible assets such as know-how, reputations and innovations that, rather than the tangible assets of land, buildings and

equipment, were increasingly responsible for delivering the future returns that are the basis of an organisation's value (Petty & Guthrie, 2000; Tollington, 1998). With the development of the field, the focus has now shifted toward understanding the nature, characteristics and mechanisms through which these intangibles drive performance and value, thus enabling effective interventions focused on improvement to be undertaken (Bontis, 1998; Bontis & Nikitopoulos, 2001; Petty & Guthrie, 2000).

In his pioneering work Edvinsson (1996), defined intellectual capital at the highest level as a combination of human and structural capital, the latter being "the part of the firm that remains when the human resource goes home" (Edvinsson & Sullivan, 1996, p360). Since then researchers from a number of fields have adopted and developed the concept from their own perspective creating a wide variety of additions and adaptations. Thus while Edvinsson's (1996) original definition of structural capital included reference to "customer-related" assets, others (Bontis, 1998; Petty & Guthrie, 2000) subsequently separated this out as "customer capital" and then broadened it further to "relational" or "relationship capital", referring to the value of inter-organisational relationships with partners and suppliers as well as customer relationships (Bontis & Nikitopoulos, 2001; Peppard & Rylander, 2001). Assertions of a convergence around this terminology (Peppard & Rylander, 2001) were premature as more recently still this has been broadened further to include the internal networks and relationships that bind an organisation together by drawing on the work in the field of social capital (McElroy, 2002). In fact it was as early as just two years after Edvinsson's original work that Nahapiet and Ghoshal (1998, p245), defined intellectual capital in their seminal article as "the knowledge and knowing capability of a social collectivity". Although they did not go so far as to explicitly include social capital in intellectual capital, they did state their belief that "the coevolution of social and intellectual capital is of particular significance in explaining the source of organizational advantage" (Nahapiet & Ghoshal, 1998 p259).

Despite the importance of this inclusion of social capital alongside human and structural capital in the definition of intellectual capital, the simplistic, hierarchical models, such as McElroy's (2002) remain limited in their ability to provide insight into the nature and mechanisms through which intellectual capital is developed and drives performance and value in organisations. Indeed, once again it is valuable to pick up the thread from Nahapiet and Ghoshal (1998) whose emphasis on the highly interrelated nature of human, social and structural capital began the process of elucidating these interactions, paving the way for an understanding of the development of intellectual capital within and across organisations.

5 Intellectual Capital and Virtual Teams

5.1 Extending Team Performance Measurement

Team performance measurement has, by tradition, primarily focused internally and on the effectiveness and efficiency of task delivery. Added to these, team member satisfaction and learning and growth reflect recognition by Adair (1986) that teams need to develop individuals. However, although Adair also identified the need to maintain relationships between members reflecting the importance of social capital in the form of networks, relationships and shared context. Add to this the knowledge and processes that teams build internally, and as teamworking, it not only contributes to the performance of the task in hand, but also represents a potential for delivering other tasks in the future and hence a measure of performance in its own right.

In addition, teams within organisations rarely deliver tasks in isolation. (MacBryde & Mendibil, 2003; Sheard & Kakabadse, 2002). Their interaction in an organisational and often inter-organisational context with other teams depends upon the nature of the wider goals or tasks to which they are contributing and their own access to required resources. Where such wider goals are complex, highly variable and equivocal there is a need for a high degree of interaction and, as a result, the external networks, relationships, shared contexts, knowledge and processes that also constitute inter-team working make a significant contribution to the performance of the task in hand as well as an ongoing capability to deliver such tasks. Thus measuring the performance of a team purely against a single task ignores the value from both its effective integration into the broader environment of the organisational goal as well as the ongoing value of this intangible asset. Isolating team performance measures from their context where complexity and interdependencies are characteristic features renders them ineffective in the same way that traditional accounting measures have increasingly failed to capture the growing importance of intangible assets in determining the value of an organisation.

To understand this wider perspective of team performance requires consideration of the determinants of performance of the organisation that provides the context for the team. An appropriate approach here appears to be the use of the resource-based view of an organisation which suggests that organisational performance is achieved through competitive advantage in the marketplace as a result of an ability to control scarce resources (Teece et al., 1998). However, Grant (1991) whilst recognising the importance of tangible and intangible resources, goes on to emphasise that resources on their own are rarely productive and that it is teams of resources learning complex

patterns of co-ordination that create “capabilities” from which benefits flow (Grant, 1991, p119). The breadth and scale of organisations and their goals means that a capability often requires a “web of teams” and the extent to which there is effective inter-team working determines the capability’s impact on organisational performance and hence its value. The more complex the capability the more likely that it will be unique, durable and difficult to replicate or transfer from or to other environments. The complex integration of the variety of resources required emphasises the importance of the social relationships and structural processes in determining not just effectiveness and efficiency but also the uniqueness and therefore the competitive advantage and value of the capability.

The identification of these linkages from the organisation through capabilities to the team level and the use of intellectual capital as a lens through which to view them has led to the development of a multi-level model of intellectual capital (Dixon, 2005). This locates team level intellectual capital and its contribution to the organisation’s intangible assets and suggests a high level model to describe how it develops. Employing the resource-based perspective of an organisation, capabilities represent a level of analysis between the organisational and the team levels. Teams of resources make up a capability by providing the building-blocks in which tangible assets are combined with intangible human, social and structural capital to deliver tasks.

Teams, therefore, deliver value to the organisation in addition to delivering the immediate task. To fully understand the performance of a team, this needs to be taken into account. They develop an intangible asset we refer to as teamworking that constitutes an ongoing ability to deliver such tasks more effectively and efficiently in the future. Within their environment they develop this further in an asset we refer to as inter-team working that can play a vital role in the effectiveness of the capabilities that determine an organisation’s competitive advantage. Finally, in an environment characterised by constant change the ability of teamwork and inter-team working to rapidly change and adapt for continued effectiveness and efficiency is yet a further, important element of its overall value. Intellectual capital provides a concept with which to understand these extensions of team performance measurement to account for such value.

5.2 Team Intellectual Capital

Developed as it was for measuring intangibles at the organisational level, the intellectual capital concept is currently characterised by simplistic, hierarchical models limited in their ability to provide insight into how human, social and structural capital

interact and develop to drive performance and value in organisations. That they do, and are not simply additative is most apparent at the micro or human interaction level, for example in a team environment. Here, when considering their nature it is evident they are interrelated dimensions along which intellectual capital develops as a result of their interactions. Two as opposed to three dimensions are justified on the basis that the competence and commitment aspects of human capital (Ulrich, 1998) develop in parallel with structural and social capital respectively; competence aligning with the knowledge and understanding nature of structural capital and commitment aligning with relationships and social networks.

Firstly, taking structural capital, it is apparent at the team level that in addition to the explicit or formalised knowledge in the form of specifications, process descriptions, rules and regulations etc there is also shared understanding or shared tacit knowledge that makes the coordinated, cooperative and collaborative action of teams possible. It is important to note that since explicit knowledge is submissable to the economics of technology that this often reduces its importance and value in comparison with that of tacit knowledge which is not. Further, where tacit knowledge is shared as collective knowing or shared understanding it has a value in excess of that associated with other tacit knowledge that an individual might possess because of its potential for concerted action. Even explicit and formalised knowledge must be internalised ie. converted to tacit knowledge first in order to be put into effect. Nonaka and Takeuchi (1995, p71) describe this process in their “spiral of organisational knowledge creation” (figure 4).

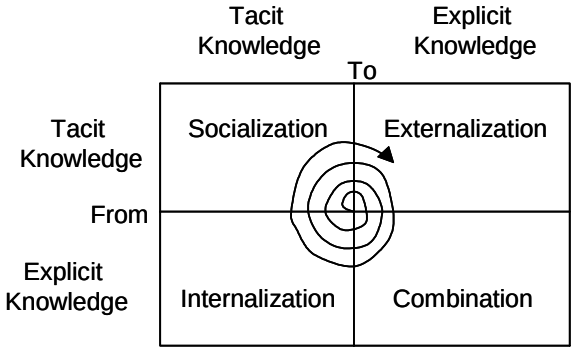

Fig 4: Knowledge Spiral derived from Nonaka and Takeuchi (1995, p71,72)

These transformations occur in “fields of interaction” that “facilitate the sharing of members’ experiences and mental models… through… meaningful dialogue and collective reflection… using appropriate metaphor and analogy” (Nonaka & Takeuchi, 1995, p85). This is supported by Nahapiet and Ghoshal (1998, p260) who went on to describe the roots of intellectual capital as being “deeply embedded in social relations

and in the structure of these relations" (Nahapiet & Ghoshal, 1998, p260) and identified the components of social capital as; the structure of a network of relationships between individuals - the ties, network configuration and appropriable organisation; the content of the relationships - identification, trust, norms and obligations; and the cognitive dimension or context of the relationships - shared language, codes and narratives. The social capital dimension of intellectual capital therefore centres on the ability of groups to have effective interactions (Chua, 2002) either internally or externally to a team by underpinning "fields of interaction". The resulting shared understanding or collective knowing of the "same" tacit knowledge makes possible further meaningful exchange and combination of knowledge as well as providing the basis for action.

The characteristics of tasks heavily influence the nature of a team's interactions and so determine the mode of operation and associated configuration of social and structural capital (see Figure 5). Tasks requiring little interaction can be carried out with low levels of both social and structural capital, by the collection of individual contributions. Tasks separated into self contained serial and parallel sub-tasks as part of a formalised work process or project plan with a high level of structural capital require little social capital in what would take the form of coordinated, transactional interactions. Conversely, high levels of social interaction found in groups which tend to be self organising, for example Communities of Practice, are characterised by cooperation and little formalised structure. Finally, where tasks are complex, ambiguous and governed by organisational and time constraints, a collaborative approach requires both the structural and social dimensions of intellectual capital.

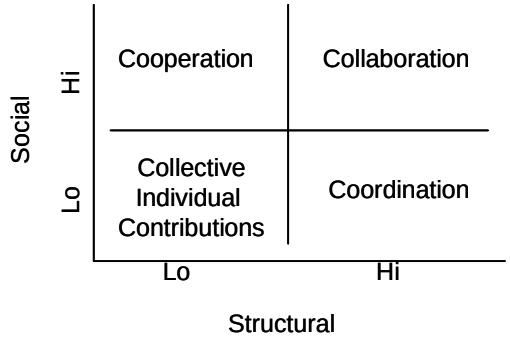

Fig 5 : Mapping of the nature of team interactions to the social and structural dimensions of intellectual capital

A collaborative environment has been described as featuring mutual influence, open and direct communication, conflict resolution and support for innovation and experimentation (Aram & Morgan, 1976). While this description stresses the high social

capital aspects of collaboration, the interactions between social and structural capital within collaboration can perhaps best be characterised in terms of reaching a “win-win” in situations where there are competing interests (Jassawalla & Sashittal, 1999). This extends beyond interdependent parties making decisions, to joint ownership of those decisions and collective responsibility for the outcomes (Liedtka, 1996) a form of teamwork most often associated with effective teams, and hence sometimes used to define “real teamwork”.

Collaboration then balances the trade-offs between structural capital and social capital which in many ways is akin to trading fixed for variable costs. The cost of structural capital lies in the formalisation process and the benefit is in its efficiency under stable conditions. Adler et al (2002) distinguish between social, hierarchical and market relations and most environments mix all three types. Substituting social relations with structural capital in the form of hierarchical relations and their associated processes inside the organisation and market relations and contractual agreements outside the organisation may prove beneficial under stable conditions, but the greater inflexibility can be both costly and risky to create and maintain the more dynamic the environment.

The same applies to the intellectual capital in teams. The cost of trading off social for structural capital is highlighted in organisations that develop intellectual capital in the form of tightly bonded, efficient teams with well-defined processes appropriate to well-understood, repeatable coordination tasks. Lacking the relationships and shared understanding for tasks that are complex and highly variable the teams have no means of accessing diverse skills, knowledge and networks if the organisation’s environment changes and becomes more dynamic. In such an environment organisations with capabilities that can address a wide range of tasks or that can rapidly build teams and capabilities to address them will have greater value. The speed with which an organisation senses the need for change and responds by developing and renewing intellectual capital is thus in itself an intangible asset at the organisational level (Dixon, 2005).

5.3 Team Intellectual Capital and Virtual Teams

In Powell, Piccoli and Ives’ (2004) review of the current literature on virtual teams a simple process model with which to locate the current research in the field is employed. Using this model, and the associated literature that informs it, together with the concepts of team intellectual capital enables a framework to be developed for understanding virtual teams and those characteristics that underpin the differences in their intellectual capital from that of collocated teams. Importantly, from the perspective

of understanding the contribution such teams make to organisational success, the same model can be applied at the capability level to also account for the intellectual capital that virtual teams develop as a result of inter-team working, a vital aspect of virtual teams currently ignored in the literature. This thereby provides the means of extending team performance measurement as it relates to real benefits to organisations.

Powell et al's model has been developed in the following ways (figure 6): "inputs" are extended to include the broader form of the organisational context; "communication" is developed into a broader more fundamental concept focused on interactions, as the raw material for building teamwork and inter-team working; "task" and "socio-emotional" processes are broken down to reflect their stages of potential development; "outputs" are extended into the organisational context with impression management but more fundamentally performance is broadened to account for the intellectual capital the team builds and its fit with the needs of the organisation over multiple, as opposed to a single task. The result is a framework reflecting the development of the social and structural capital that make up intellectual capital in teams, underpinned by the factors that impact on that development in virtual teams.

At the most fundamental level, the mediation of communications that make up interactions between individuals and teams by the use of communication technology results in adaptations of the communications processes (Majchrzak, Rice, Malhotra, King, & Ba, 2000). These adaptations impact the processing of information (Cramton, 1997) and as a result the building of trust, relationships and cohesion (Daft & Lengel, 1986) as well as the knowledge transfer (Cramton, 2001) that is the basis for shared understanding within and between teams (Sarker, Nicholson, & Joshi, 2003). The effect is seen in the evolution of the task and socio-emotional processes and ultimately in the structural and social capital that form the basis of the team's intellectual capital. Task specific performance and team satisfaction in the short term, and its impact on the wider capability of inter-team working and the team's value to the organisation in the long term, are all affected. Finally, it is important to recognise, not least in terms of research, that these outputs are also subject to the team's ability to manage the external impression of them.

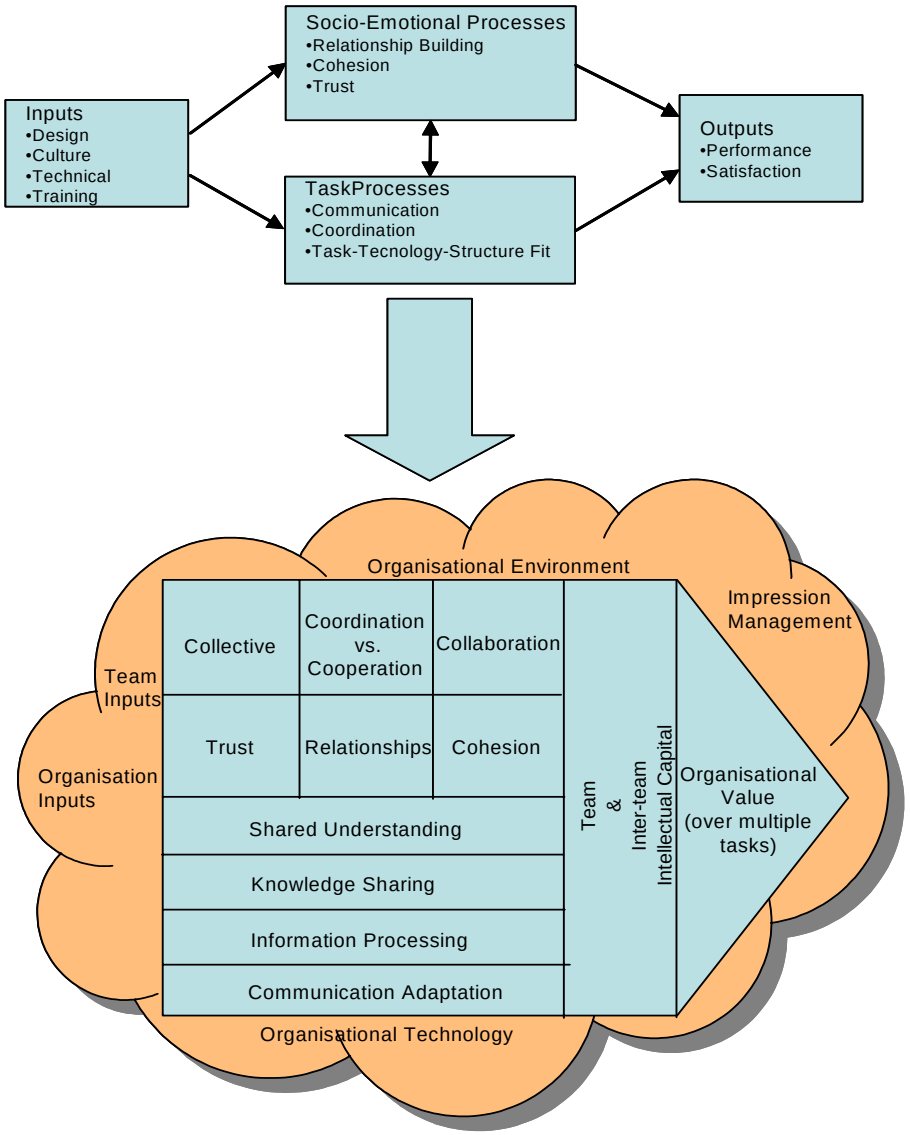

Fig 6: Evolution from Powell et al (2004) process model of virtual teams to a framework based on intellectual capital.

Re-examining the virtual team literature using both this framework and the intellectual capital concept as a lens presents a number of insights into the implications for performance of teamwork and inter-team working of virtual teams.

Firstly, the ability of virtual teams to draw on diverse memberships suggests that access to human capital in the form of competence or expertise is likely to be high. However, at the outset, where such diversity is also accompanied by a lack of social capital, it is likely to take time for such expertise to be trusted and therefore exploited. Additionally where diversity also extends to cognitive contexts, the lack of a common platform of understanding on which to build could raise the risk of misattribution,

misunderstandings and conflict (Jehn, Northcraft, & Neale, 1999). Whilst task-based conflict can be beneficial in generating creative input and ensuring alternatives are recognised and adequately debated (Qureshi, Bogenrieder, & Kumar, 2000; Reagans & Zuckerman, 2001; Samarah, Paul, & Mykytyn, 2002) a team needs to have developed effective means of conflict management if this is not to become detrimental to performance, or worse evolve into harmful relation-based conflict (Joshi, Labianca, & Caligiuri, 2002). Thus, the benefits of high human capital in the form of competence and diverse perspectives in virtual teams may be tempered where social capital is not also present. A common response to this comes in the form initial bonding or kick-off meetings and get-togethers thereafter, to enable and maintain the trust, relations and shared contexts. Whilst this appears entirely logical, there are those that suggest that the temporal rhythm (structural capital) that this creates prevents the development of a completely different virtual team work pattern (Malhortra, Majchrzak, Carman, & Lott, 2001) and that such social relations can be formed virtually, they just require more interaction and hence perhaps take a longer elapsed time to develop (Walther, 1995).

Secondly, whilst virtual teams have access to expertise irrespective of location, it is increasingly likely that much of that expertise will be employed as and when the task requires, and in this sense will be part-time on a number of virtual teams. Whilst the potential productivity benefits of maximising the use and development of human capital competences across parallel tasks are considerable, it does raise questions regarding the second aspect of human capital, the individual's commitment to particular tasks and teams. Commitment to one particular virtual team may impact performance to the detriment of other virtual teams where there is less commitment. The extent of such commitment will be subject to a number of factors, not least of which will be the organisational context and the perceived priorities and real rewards associated with individuals and each virtual team. In addition, however, with individuals working across a number of virtual teams, there is at a minimum the opportunity to share knowledge and practices and at best to afford a basis for effective bridging between virtual teams thereby achieving greater, inter-team working in the form of cooperation, coordination or collaboration as part of organisational capabilities or the strategic process of developing them. In this way the boundaries between virtual teams can be seen to be blurred and fluid portraying the flexible characteristics of social networks as opposed to the rigidity of formalised structures. However, whilst such issues as team boundaries have received attention in studies of traditional teams (Ancona & Caldwell, 1992) there has been little effort to highlight what may prove to be significant benefits of virtual teams in this area (Mortensen & Hinds, 2002).

Thirdly, although it is widely recognised that working in virtual teams results in the adaptation of communication patterns there have been few studies into the adaptation of work patterns. For example, it is suggested that greater use of formalised structures and processes in the organisation of team interactions and associated work than would otherwise be the case in collocated teams could be used to compensate for the inability of virtual teams to develop the social dimension of intellectual capital (Kiesler & Cummings, 2002). Greater partitioning and decoupling of activities and tasks both within and between teams reduces the need for social interaction, reducing virtual communications to a transactional nature, in essence shifting work patterns into a coordination mode (figure 5). However, by failing to build social capital early, if the environment drives greater complexity and dynamacism the lead time available for building it at a later stage may prove costly. This can be most apparent where the relationships also span organisations. Building social capital into inter-team working with customers, suppliers and other partners can be costly but when there is rapid change in a market, organisations without such links can suffer significantly. The adoption of strategies to “outsource” of various elements of an organisation’s capabilities places this firmly in the spotlight. Thus, whilst virtual teams appear to offer some advantages in such inter-team working and the nature of the task or tasks (complexity, interdependence, variability) should suggest some appropriate balance between the social and structural capital, there is evidence of varying views as to the appropriate path to achieving it. The framework therefore identifies some of the important mechanisms that make up the interplay between the development of social and structural dimensions of intellectual capital as a result of the nature of the task and the organisational context.

6 Conclusion

Whilst research to date has linked virtual teams to a number of fields of study the fundamental question regarding their performance and hence benefits to organisations has been blinkered by incomplete comparisons with collocated teams. Arriving at the subject from a variety of perspectives has quickly led to a rich if somewhat disparate set of research studies, methodologies and findings. So whilst practitioners have forged ahead in adopting virtual teams, largely as a matter of course and presumably on the premise of superior performance, researchers have continued to compare productivity and performance with the same framework they use to compare one traditional team with another. Perhaps unsurprisingly since some of their differences are fundamental in nature, benefits and other influential factors fall outside of the scope of these studies and they have failed to gather unequivocal evidence to justify the trend.

The important limitations of this performance measurement of traditional teams lie in the focus internally within the team and on a single task. It ignores the value to the organisation of a team's interaction with its context, particularly where its task forms part of a wider set of tasks aimed at achieving some larger goal. The more effective this integration is into the wider context the greater the value to the organisation. Similarly, by ignoring the value a team has to deliver further tasks in the future, this ignores the investment made in developing teamwork. Whilst the cost of building a new team may have been less in traditional teams than the costs of physically moving a whole team to address a similar task elsewhere, the nature of virtual teams is such that they inherently have the flexibility to address tasks without these associated costs.

By employing the relatively new concept of intellectual capital this paper has developed a framework at the team level to examine the intangible assets of teamwork and inter-team working. By doing so team performance measurement has been extended to address these important factors from an organisational perspective presenting the means by which previously unmeasured benefits delivered to the organisation can be revealed. Whilst some of the mechanisms driving these benefits have been examined in existing research, a framework has been lacking with which to see their relevance to team and organisational performance. Using intellectual capital to provide a consistent, framework from team to capability to organisational level, allows for integrated thinking and understanding across these levels. Without this decision making, executing and tracking of investments in such intangible assets would continue to be at best based on instinct (Mayo, 2000) and therefore difficult to trade-off either one against another, or to justify by comparison with other more tangible investments. This framework and its use of the intellectual capital concept therefore provides a platform for a field-based research agenda to gather the requisite evidence to support, develop and modify our understanding of virtual teams and the benefits they deliver to organisations.

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