



# Intellectual capital: disentangling an enigmatic concept

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## Abstract

**Purpose** – The purpose of this article is to review current literature on intellectual capital and its second-tier sub-components with a view to developing an improved research framework and a foundation for measures.

**Design/methodology/approach** – Refereed journal articles were selected from social sciences citations index (SSCI) and business source premier with a time limit of ten years.

**Findings** – Clear definitions are developed for each sub-component of intellectual capital. This was done after identifying, for each sub-component, the dimensions along which current definitions and research differ. A research framework is developed, which emphasizes the interaction between sub-components of intellectual capital.

**Originality/value** – The paper provides a clear integrated framework and measures of forms of intellectual capital to guide and inform future research.

**Keywords** Intellectual capital, Human capital, Social accounting

**Paper type** Literature review

## Introduction

Intellectual capital (IC) has been considered by many, defined by some, understood by a select few and formally valued by practically no one (Bontis, 1998). The growing interest in IC coincides with the dawn of the knowledge society and the newly seen importance of its knowledge workers (Porter, 1985). It is within this context that many authors discuss the importance for firm survival and performance of human and social capital at the organisational level (Kogut and Zander, 1996; Pfeffer, 1994; Uzzi, 1996). Furthermore, concepts such as intangible assets, embedded tacit routines, core competence, knowledge creation and innovation take centre stage in the explanation of the firm's assets that continually create value over and above physical and financial resources (Barney, 1991; Bowman and Ambrosini, 2000; Swart and Bowman, 2003; Davenport, 1999; Polanyi, 1966; Ulrich, 1998). The combination and integration of these concepts in explaining phenomena such as firm survival, performance, innovation and competitive advantage has led to a set of concepts that have often been grouped under the umbrella of IC but on close inspection is found to have been defined and applied in rather different ways.

The obliqueness of definitions that have been used in the theoretical development of intellectual capital and its core components has also been fuelled by practitioner interest (Brooking, 1996, Edvinsson and Sullivan, 1996, Saint-Onge, 1996). Indeed, the challenge for academics is to frame the phenomenon using extant theories in order to develop a more rigorous conceptualisation of this illusive intangible (Bontis, 1998).

A review of the literature on IC reveals a tendency to focus on some of its sub-components in considerable detail, often combining theoretical strands such as human capital theory (Becker, 1964), the resource-based view of the firm (Barney, 1991)



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and social capital theory (Burt, 1992; Uzzi, 1996; Granovetter, 1973). Although these developments are most useful in enriching our understanding of the sub-components of IC, they do not constitute clear frameworks of what intellectual capital is and how it contributes to firm performance.

This article reviews the literature on IC from the viewpoint of its sub-components and disentangles some of its key definitions. The key contribution of the article lies in unpacking the definitions and measures of IC and its sub-components and in disaggregating their interconnection. The paper also seeks to develop clarified definitions of the sub-components of intellectual capital as part of an improved framework for research. This analysis forms an important foundation for future research on valuable, rare and inimitable assets.

### Viewpoints on IC

Most of the literature on IC makes a set of claims that are related to the value and intangible nature of this resource. The term was first introduced by Kenneth Galbraith in 1969 (Bontis, 1998) who believed that IC was more than pure intellect but included “intellectual action”. It is the move from “having” knowledge and skills to “using” the knowledge and skills that is captured in a circuitous way in the literature. That is, the “using” of knowledge implies that relationships and processes are needed to transform knowledge into a product or service that is of value to the firm and its stakeholders. It is also precisely due to this conversion/combination process, which takes us from having knowledge (often referred to as human capital (HC)) to using knowledge (IC) that leads to diffuse definitions of IC. An analysis of the literature indicates that confusion most frequently stems from using interchangeably the terms IC and human capital.

The difference in the various definitions presented lies in the level of analysis applied, its temporal dimension and the qualitative nature of IC. Many authors regard IC purely as an individual level construct akin to knowledge and skills that individuals have (HC). For example Ulrich (1998, p. 15) argues that intellectual capital lies with skilled employees who are committed to business goals. That is, IC equals competence multiplied by commitment. Here the sum of capital at the employee level is presented as the IC of the firm. Others view this asset as functioning at the collective level and regard it as a meta-competence. Rastogi (2002), for instance, views IC as a firm’s holistic capacity or meta-capacity to meet the challenges and exploit opportunities in its continual support of and search for value creation. On this view IC represent assets interwoven through the fabric of the firm. A similar approach is used by Mouritsen *et al.* (2002, p. 12) who view IC as organisation-wide knowledge resources that, in combination, are constitutive for capabilities, making it possible for the organisation to take action.

Both sets of definitions (individual and collective levels of analysis) differ in their temporal approach to IC. That is, some argue that IC is something that can create value in the future, or has the potential to create value (Bouty, 2000; Keenan and Aggestam, 2001) whilst others argue that IC is central to firm performance because it is of value in itself (it doesn’t have to be turned into something valuable). By way of illustration, on the one hand Skaikh (2004) views IC as knowledge that can be converted into value or intellectual material (knowledge, information, intellectual property and experience) that can be used to create wealth. Another key definition which falls within this category is that of Edvinsson (2000) who views IC as the future earning potential

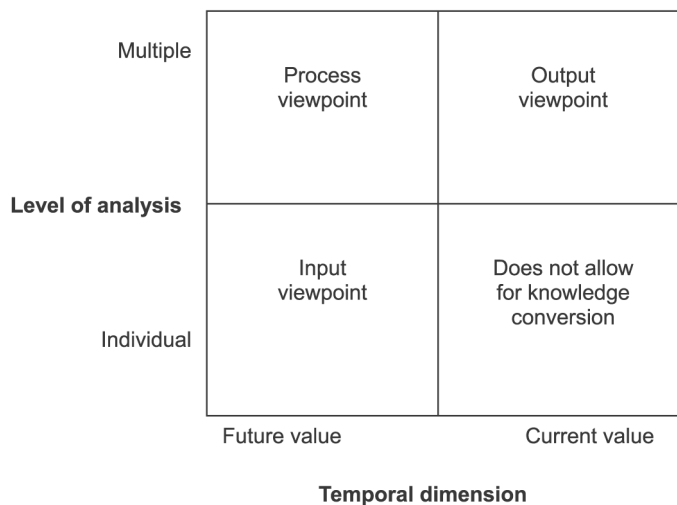
deriving from a combination of human capital and the potential of an organisation's people. On the other hand, authors who use the resource-based view of the firm as a theoretical foundation regard this asset as a form of capital that has value in the current time dimension. That is, IC is a resource, whether at an individual or firm level, that adheres to the criteria of a valuable resource as set out by Barney (1991). Here, knowledge and skills are regarded as valuable, rare, inimitable and non-substitutable.

The interplay of the levels of analysis (individual/collective) as well as the temporal dimension (current value/future value) determine whether IC is regarded as an input into the value creation process, a value creation process in itself or tangible output from the firm's value creation processes (Figure 1). Research that approaches IC as having potential value or future earning potential concurrently views this asset as an input into the value creation process (quadrant 1 of Figure 1). It is under these definitions that IC is seen as knowledge, skills and abilities (individual level of analysis) that can create value or needs to be converted into valuable output.

Alternative approaches that integrate various levels of analysis (individual and collective knowledge and skills together with organisational processes and structures) also view IC as a process function within and across organisations (quadrant 2 of Figure 1). Here the particular organisational routines and organisational culture, which create value, are seen as a form of capital in itself. It is important to note that the view of potential value still dominate these approaches.

A final set of approaches regards IC as an output, a tangible product or service within which the knowledge, skills and processes in the organisation are embedded (quadrant 3 of Figure 1). This viewpoint often uses a multiple-level of analysis approach; combining individual knowledge and skills with intra- and inter-organisational relationships and organisational processes. It also professes a current value of the IC construct, that is to say, a product or service that holds current value and contributes to the shareholders.

The stance taken in this paper is consistent with the latter set of approaches (quadrant 3) of IC. That is, I define IC as the tangible output in the form of products and



**Figure 1.**  
Key differential  
approaches to IC

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services within the firm's market place. The unique and valuable knowledge and skills at both individual and collective levels are embedded within these products and services. This definition resonates with many of the measures that are used to represent IC such as listings and perceived value of trade markets, patents and branding (Fits-Enz, 2003). This definition enables further examination of the second tier sub-components which dynamically integrate to produce IC. The paper poses questions to the conversion process of individual and collective knowledge and skills (HC) into products and services (IC). Careful attention is paid to relationships, structures and organisational processes which may influence this conversion process. That is, in the section that follows I carefully review the second-tier sub-components which form part of the IC generation process (Bontis, 1998).

### Methods

Refereed journal articles were selected from social sciences citation index (SSCI) and business source premier with a time limit of ten years in order to include recent work within the management, business and social science disciplines. This was not an act of drawing arbitrary boundaries and key articles that stretched beyond this time horizon were also included. This allowed for the review of main contributions from sociological thought, philosophy and economic theory. Examples of such inclusions are Granovetter (1973, 1985), Burt (1992); Becker (1964); Schultz (1961); Coleman (1988); Putman (1993).

The original detailed search of recent research articles exceeded a total of 1,643 refereed journal articles. The following selection criteria were applied to reduce the number of articles reviewed here. First, the inclusion of empirical papers was limited to those from the management and social science disciplines. This was because these fields are the intended application fields of the author and therefore constitute the theoretical lens for application. As mentioned above, this selection did not exclude a review of originating works found in economic theory and sociological thought. Second, articles were selected on the basis of their reference to the interaction between forms of capital, since, it is the understanding of the various sub-components of IC and their subsequent interaction that allows the disentangling of previous definitions and that underpins future work.

The most prominent sub-components that were identified in previous research include human capital, social capital, structural capital (also referred to as organisational capital) and customer capital. Each of these forms of capital was reviewed according to the key thematic structures found in the literature, which comprise; core definitions used to build an understanding of the construct; dimensions used in deconstructing the form of capital and measures applied in empirical exploratory analysis.

### Human capital

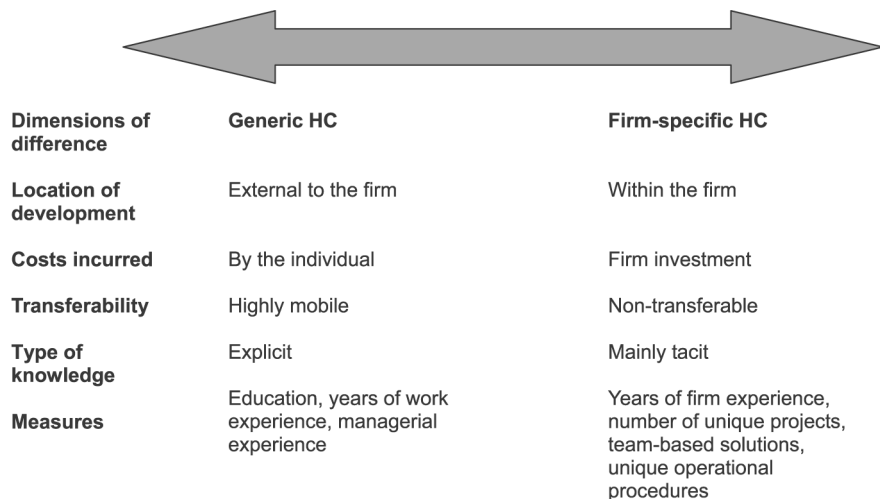
HC theory (Becker, 1964) uses economic logic to study individual decisions dealing with investments in productivity-enhancing skills and knowledge (schooling, training, firm-specific knowledge investment), career choices (decision to work, switching employment, labour mobility) and other work characteristics (wages, reservation wages, hours of work) (Gimeno *et al.*, 1997, p. 754). According to this theory, individuals choose an occupation or employment that maximises the present value of

economic and psychic benefits (satisfaction) over their lifetimes. Lepak and Snell (1999) argue that HC theory emphasises the labour cost relative to the return on investment (i.e. future productivity) for developing employee skills and knowledge.

Most definitions of HC agree that it is an individual level construct (Lepak and Snell, 1999; Bontis, 1998; Pennings *et al.*, 1998; Zucker *et al.*, 2001; Walker, 2002; Davenport, 1999) and view it primarily as comprising knowledge, skills, intellect and talent of individuals (regardless of whether the context of the firm). For example, Pennings *et al.* (1998, p. 426) state that HC of a professional services firm is the knowledge and skills of its professionals that can be used to produce professional services. In a similar vein Davenport (1999) argues that employees take a rent on time, energy and intelligence invested in the form of compensation, development and an enjoyable work environment.

There are, however, exceptions to this approach that allow for a socially constructed view of knowledge. One such example is the work of Chillemi and Gui (2001) who advocate that HC is a non-material asset embodied in a team. Along with other Japanese studies (Nonaka and Takeuchi, 1995, p. 568), these authors find the notion of individual HC excessively individualistic, adumbrating the notion that some skills and knowledge can be formed only in an organisational context and embodied only in a team of employees. HC is therefore seen not as specific to the firm but to a “network of workers” (Mailath and Postlewaite, 1990).

One aspect of particular importance to a review of HC literature is how the development of this form of capital (method of skill accumulation) is viewed. The core themes identified in this context relate to the specificity of the HC, with particular variations relating firstly to generic forms of HC and secondly to firm-specific HC (see Figure 2). Lepak and Snell (1999) in their valuable development of HR architecture offer a theory as evidence that two dimensions – value and uniqueness – are ubiquitous dimensions that differentiate most, if not all, human capital (Lepak and Snell, 1999, p. 33). The concept of uniqueness represents the degree of firm specificity of the HC.



**Figure 2.**  
The degree of uniqueness of HC

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On the one hand HC can be generic, which results from development outside the boundaries of the firm. This form of capital is also easily transportable across firms. Generic HC can also be seen as component knowledge (Tallman *et al.*, 2004) that is an identifiable element of a body of knowledge having mobility amongst organisations. It is the transferable and easily identifiable nature of generic HC which represents the largely explicit nature of this form of HC. According to HC theory the individual would invest in the costs of generic HC development. The most frequently used measures for generic HC include: level of formal education, years of work experience and level and number of years of managerial experience.

Firm-specific HC is often extremely valuable to the firm because the knowledge and skills, held by employees are unique to the firm and cannot easily be transferred to its competitors. It is this type of HC that has been labelled as knowledge of natural excludability which can arise from the complexity or tacitness of the information required to bring about an innovation within the firm (Zucker *et al.*, 1998, p. 291). The cost of the development of firm-specific HC is therefore incurred by the firm due to employees' sacrificing of employability opportunities (Valcour and Snell, 2002) and is tied into the firm-specific process. This method of skill development is also widely known as a strategy to retain key knowledge workers by erecting mobility barriers (Swart *et al.*, 2003). Unique skills are often developed when employees engage in the solution of firm-specific problems or when unique operating procedures are followed.

Research indicates further that firm-specific HC results from idiosyncratic learning processes (Lepak and Snell, 1999; Crossan *et al.*, 1995) and is path-dependent (Barney, 1991). The knowledge and skills that develop from these learning processes are woven into the fabric of the organisation and are, thereby, mainly tacit in nature (Polanyi, 1966; Tsoukas, 1996). Some of the key measures that are used to identify the extent of firm-specific HC include firm tenure, time taken to get up to speed in the firm, extent to which explicit work templates can be followed, extent of project-based problem solutions and unique operating procedures in the firm.

Previous investigations that focused on professional services firms in particular (Sherer, 1995; Gimeno *et al.*, 1997; Pennings *et al.*, 1998; Tallman *et al.*, 2004) have identified a further form of HC, i.e. occupation or industry-specific capital. This form of capital is mainly developed through a theoretical body of knowledge and subsequent industry experience. For example, lawyers, medical doctors, accountants and psychologists generate occupation specific HC at law school, medical school and university and then continue to apply and create further HC as associates or interns. The costs associated with the development of this form of capital are incurred both by the individual (at university) and the industry (as an associate/intern). The knowledge therefore comprises both an explicit body of theoretical knowledge and tacit knowledge developed through the practice of a profession. This particular form of tacit knowledge is transferable between firms and is therefore industry-specific. Some of the measures applied to understand occupation/industry-specific HC include formal education (normally a measure of generic-HC) average years of industry experience (industry tenure-firm specific tenure) and engineering knowledge or application of scientific principles.

Although the uniqueness of HC or the degree of specificity has been widely used, the value of HC has been referred to on fewer occasions (Lepak and Snell, 1999). It is predominantly the inclusion of the resource-based view of the firm (Barney, 1991;

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Porter, 1985; Quinn, 1992) that highlights the centrality of sets of knowledge and skills to the core competence of the firm. An analysis of the value of HC evaluates each set or “pocket” of knowledge and skills in the firm according to its contribution to the enactment of strategies that improve efficiency and effectiveness. The value of HC can therefore be measured as the ratio of strategic benefits to customers derived from skills relative to costs incurred (Snell *et al.*, 1996). It is according to the dimension of the value of HC to the firm that we can assess whether employees either reduce costs or provide increased benefits to the firm.

The value of HC is of particular importance when considering its nature in professional services firms, because here, a client may often contract with a firm to gain direct access to valuable HC. Thus, the dimension of value should not only be the judgement of how central the knowledge and skills are to the competitive advantage of the firm but also whether it sits at the heart of the client’s core competence. For example, it is frequently cited that clients form long-term relationships with consulting firms because principal consultants develop expertise that contribute directly to the effectiveness of the client. That is, the development of core skills may be bought into the firm through the knowledge networks that are available to the firm.

The social constructionist view of knowledge creation and skill development (Gergen, 1999) indicates that individual level processes, such as skill development, cannot be understood without taking into account their social context (Coleman, 1990). Knowledge is thus created through relationships within a firm or network and is therefore held at both an individual and collective level. In the section that follows the social nature of capital or social capital (SC) is reviewed and an understanding of “knowledge that is embedded in relationships” as well as “knowing how to relate” is developed.

### **Social capital**

The emergence of social capital (SC) in the explanation of firm performance is due to the application of economic theory to sociological thought. The concept was popularised by Robert Putnam (1993) who likened SC to a “moral resource”. Putnam (1993) refers to SC as the combination of local institutions and relationships of trust among economic actors that evolve from unique, historically conditioned local cultures. According to this view SC is embodied in “networks of civic engagement”. Within this rich web of engagement Putnam believes there to be a connection between the degree of social capital accumulated within a region and its economic performance. That is, where there is a vibrant civil society there needs to be bonds of trust and reciprocity. This view brings together Marshall’s (1961) notion of economic vibrancy (external economies of scale) and Thorstein Veblen’s (1924) thoughts on how institutions create competitive trajectories of growth and technological innovation by adapting to evolutionary market processes.

Theories on SC vary in their approaches to the origins, functions and structure of this valuable resource (see Table I) Bourdieu (1986) regards the origin of SC to be the relations between individuals within specific groups or categories. Whilst the relationships amongst individuals are seen to be the key defining factor, the level at which these relationships are deemed to exist differ widely across the literature. For example, Nahapiet and Ghoshal (1998, p. 243) advocate that SC is the sum of the actual and potential resources embedded within, available through, and derived from the

Knowledge types and measures	HC	SC	Structural capital (STC)	Organisational capital (OC)	Client and network capital (CNC)
Knowing what	Technical knowledge Guidelines and procedures "boiler plates"	Knowledge of relationships	Knowledge of structures	Collective explicit knowledge: Competitive strategy Policies Process manuals	Knowledge about your client or network partners (knowing what they know)
Knowing what: measures	Generic HC: Education Years' working experience	Socio-gramme (where relationships lie) Interchange exchange document (extent/frequency relationships) Cultural audit (nature of relationships) Knowing how to build relationships within the firm	Organogram Project teams	QA structure (procedure manuals) Standing orders Specification Amount of "boiler plates"	Socio-gramme (where relationships lie) Interchange exchange document (extent/frequency) Cultural audit (nature of relationships) Knowing how to access the knowledge held in these relationships (knowing how to know)
Knowing how	Individual tacit knowledge		Knowing how to organise work to optimise job challenge and intra- and inter-firm relationships (knowing how to create knowledge through work organisation) Effectiveness of joint project teams Individual perception of the effectiveness of work organisation (I feel challenged in this team/ I have the opportunity to create knowledge across teams)	Collective tacit knowledge: Embedded routines Cultural type Unique procedures Problem-solving focus Explorative learning Extent to which procedures are followed Performance audit Work study analysis Activity analysis	
Knowing how: measures	Firm-specific HC Number of years' working experience in the firm	Degree of knowledge sharing within and between teams			Content-sensitive stakeholder map Creation of knowledge within a network Innovation at an inter-organisational level

(continued)

**Table I.**  
Knowledge types across various sub-components of IC together with suggested measures

Table I.

Knowledge types and measures	HC	SC	Structural capital (STC)	Organisational capital (OC)	Client and network capital (CNC)
Knowing why	Process-specific HC	Knowing why relationships are important. Is the purpose innovation or standardisation? What is transacted across the network ties?	Knowing which structures will be most effective for the purpose	Reflexive capacity in the organisation	A shared understanding of the end-game (what is the purpose of the collaboration?)
Knowing why: measures	Number of years' experience in the occupation or industry	Shared understanding of the problem with which the organisation is faced	Client surveys re effectiveness of work organisation (e.g. builders with speciality/trade versus generalists) Aircraft building – systems integration	Understanding the history of the procedures Semiotic analysis of the internal strategic communication Double loop learning Questioning underlying principles	External value chain analysis Transaction cost analysis Portfolio risk management Degree of shared understanding Analysis of internal knowledge structures (knowing what I know) NPV analysis

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network of relationships possessed by an individual or a social unit. Furthermore, Leana and van Buren (1999) view SC as a resource reflecting the character of social relations within the firm. Pennings *et al.* (1998) extend the boundaries of the social capital to include supporting relationships with other economic actors, most notably, potential clients. These relationships are formed in many different ways: mutual schooling, family and other personal connections (*guanxi*), overlapping memberships, interfirm mobility, joint ventures and other collaborative arrangements.

In summary, most prior definitions regard the social relations amongst individuals as the key origin of SC. However, the unit of analysis with which the supportive relationships are explored may vary. These variations include relations at the individual level, e.g. advancing one's own career or educational opportunities (Burt, 1992; Coleman, 1990; Robinson *et al.*, 2002; Teachman *et al.*, 1997), the business unit level (Snell, 2002), the organisational level (Nahapiet and Ghoshal, 1998; Snell, 2002), the customer or network level (Pennings *et al.*, 1998; Bontis, 1998; Keenan and Aggestam, 2001; Burr and Girardi, 2002) and the societal level (Putnam, 1993; Teachman *et al.*, 1997; Coleman, 1990).

For the purposes of clarification, measurement and further research it is important to disentangle the boundary classifications of SC. That is to say, what is the level of analysis? Although it is accepted that, in essence, all forms of SC are essentially supportive and are constructed in pursuit of a specific function or benefit, it is also the case that within organisational life different types of relationships have different functions. That is, the nature of the trust within a team and the reciprocal information exchanges in a team may vary from that with the client or customer. The boundary distinction is of particular importance in the professional services firms, not least because social capital that is built with clients or potential clients (later referred to as client capital) may be structurally denser (Burt, 1992) than the relationships within the firm. The need to disentangle various boundary classifications of SC is sharply delineated when the functional perspectives of SC are reviewed.

Coleman (1990) argues that social capital is function-specific. That is, SC is created to fulfil a specific function. However, social capital also sets the context within which other forms of capital interact. Here the contextual nature of SC can be regarded as a function in itself. That is, SC is the fibre of the process of conversion of HC into IC. Some authors go so far as to say that the more SC a society has the more efficient its transactions and the more productive it is (Bothwell, 1997, p. 249).

Through the development over time (Bourdieu, 1986), SC, serves several different functions. First, it is regarded as a means of enforcing norms of behaviour among individuals or corporate actors and thus acts as a constraint as well as a resource (Walker *et al.*, 1997). The main function of SC can also be seen (Nahapiet and Ghoshal, 1998) to provide access to resources. In other words, SC is seen as the medium through which other "desired" resources can be made available.

The literature also varies in its view of "what is transacted" across the networks of social ties. Authors who take a societal level of analysis (Putnam, 1993; Teachman *et al.*, 1997; Robinson *et al.*, 2002) view the relationships as comprising a dense and rich social community (Cohen and Fields, 1999) which is developed over time for the society to benefit. According to this view, stemming mainly from Putman's model of SC, cooperation and trust contribute to community development and it is therefore the society which benefits from this function of SC. Here, a central proposition of SC-theory

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is that networks of relationships constitute a valuable resource for the conduct of social affairs, providing their members with the collectively-owned capital, a credential which entitles them to credit, in the various senses of the word (Bourdieu, 1986, p. 249). Relating to the earlier discussion of the disentangling of boundaries applied to SC, it may be expected that this function of SC will operate within teams and within firm boundaries.

Another view of the function of SC is that exchanges across social relations are much more strategic (Bouty, 2000; Zucker *et al.*, 2001) and that researchers, for example, will develop relationships for the particular purpose of an exchange of information. A variation of this view is that relationships are formed by economic and institutional actors for the pursuit of innovation and competition (Cohen and Fields, 1999). This approach is used to explain the nature and function of SC in Silicon Valley. It differs from the former in its longevity. That is to say, in order to achieve the purpose of innovation, longer term relationships with richer knowledge and information exchanges may be necessary. The key issue here is that social relationships constructed for economic benefit will bring about benefits deriving from economies of scale and will reduce the transaction costs for collaborating individuals and social units (Van Deth, 2003). This functional perspective clearly applies at the across firm level of analysis (later referred to as client and network capital).

Another function of SC is that it builds identity (Nahapiet and Ghoshal, 1998; Orlikowski, 2002). In this framework SC is seen as the context within which a “sense of belonging” is created. Furthermore, the function of identity formation is intertwined with the function of normative control. In other words, if the members that invest in their SC behave in similar ways, i.e. follow similar behavioural norms, then the identification with that social unit is strengthened. Interestingly, it is believed that in these instances members of the particular network will be more likely to trust their counterparts and provide more resources without expecting “something in return”. A degree of resilient trust is therefore developed (Leana and van Buren, 1999).

Approaches to SC differ further as to how the structure of relationships, or the morphology (Nahapiet and Ghoshal, 1998), is viewed and with respect to the normative implications attached to the various structural configurations. Reagans and Zuckerman (2001) contrast two diversity-performance views in relation to the structure of SC: closure-perspective (Coleman, 1988, 1990) and structural holes perspective (Burt, 1992). The former advocates network density or strong ties (Fukayama, 1995) that are characterised by frequent communication and emotional closeness between members of a particular social unit (Granovetter, 1973; Marsden and Campbell, 1984; Burt, 1992). This correlates with the dense and rich social community that Putnam (1990) introduced.

The normative implication of this view is, in summary, that it is better to have close-knit relationships within a network. This structural form is believed to produce higher societal returns on relational investments due to shared identity that facilitates mutual coordination and associability, or the subordination of individual goals to the goals of the collective (Leana and van Buren, 1999). Walker *et al.* (1997) state further that within a dense network behaviour is sanctioned and renders this structural form as a reputation building mechanism which leads to effective inter-firm cooperation.

The structural holes approach values network heterogeneity or weaker ties between individuals across social units (Granovetter, 1985). The focus here is more on boundary

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spanning activities and brokerage opportunities (Burt, 1992). An important dimension of the structural holes approach is that of diversity. That is, individual members will use diversity within their own knowledge sets to build relationships with group of networks, thereby enabling their original networks knowledge creating or innovation capability. Thus homogeneity of view is used to bolster understanding of existing knowledge architectures while heterogeneity is the basis for expansion of those architectures (Swart and Powell, 2004). Reagans and Zuckerman (2001, p. 504) point out that the capacity for creative action is enhanced through such boundary spanning activities.

It is important to note that the variety of morphological representations is not mutually exclusive. For example, the structural density perspective is regarded as most effective at the local, or within-team level, whilst the structural hole approach delivers maximum benefits to the firm at the global, or across-teams and organisations level of analysis (Reagans and Zuckerman, 2001). Once again there is substantive reason to separate out the various forms of social capital into its intra- and inter-firm components.

The final dimension along which the various SC approaches differ is the relational dimension, which includes consideration of the types of trust embedded in the relationships and of the norms and values that guide the relationships. In his review on research methods used for understanding SC, Van Deth (2003) argues that these aspects of SC are frequently grouped under the cultural dimension of SC because trust and norms are embedded in the historical development and cultural milieu of the relational network. Nahapiet and Ghoshal (1998) also advocate that the relational dimension of SC is influenced by the historical development of interactions. The particular dimensions that are important in their analysis of the relational nature of SC include trust, norms and sanctions, and obligations and expectations. Leana and van Buren (1999) also pay attention to the nature of trust in their cultural treatment of network relationships. In this work, trust is further divided into fragile and resilient trust and generalised and dyadic trust. Fragile trust is believed to need reciprocal exchanges (give and take) for the relationship to last whereas resilient trust is developed over time and is guided more by the norms of behaviour in the social unit than an actualisation of equal exchanges. Dyadic trust requires knowledge of and contact with another actor whilst generalised trust pertains to the social unit as a whole, rather than specific actors. The normative implications of these forms of trust are that resilient and generalised trust delivers higher returns on the SC invested. Once again this view may be true at the intra-organisational level but it is to be expected that when information and knowledge are highly sensitive and are exchanged across organisational boundaries, a fragile and dyadic form of trust will be present.

The nature of relationships within and across social units as well as the functions that they fulfil is influenced by the structures and process, or embedded routines, within the organisation. This form of capital is frequently referred to as structural capital and is the focus of the following section. It is important to note that there are fewer empirical studies that refer to structural capital than human and social capital.

### **Structural and organisational capital**

These two forms of capital are reviewed here together because the literature that does address this collective level of capital often blurs the boundaries between structures

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and processes in the organisation (Bontis, 1998; Burr and Girardi, 2002; Keenan and Aggestam, 2001). For example, the literature on structural capital (STC) often refers to the “intellect of the organisation” (Winter, 1987) and the processes embedded within it. However, others (Keenan and Aggestam, 2001; Snell, 2002) argue that processes and technologies that function at the organisational level should be defined as organisational capital (OC).

Some authors advocate that the organisation itself embodies structural capital, and liken it to organisational tacit knowledge. Bontis (1998, p. 66) advocates that STC deals with the mechanisms and structures of the organisation that can help support employees in their quest for optimum intellectual performance and therefore business performance. In other words, STC resembles organisational know-how which is focused on converting HC into IC. In this context STC is the critical link that allows IC to be measured at an organisational level (Bontis, 1998, p. 66). The collective know-how is said to reside within the organisational routines or rules (Winter, 1987; Ambrosini and Bowman, 2001).

The view that STC is situated within tacit organisational routines focuses on the informal aspects of organisational life. That is the cultural dimension of an organisation which is often expressed as “the way we do things around here” (Purcell *et al.*, 2004). Keenan (2000) highlights the importance of cultural capital as an influencer of the content and process of communication, the views of space and time, shared objectives and the concepts of organisational membership. The “way of doing things” in the organisation is immanent in and further influenced by the societal or national culture (Hofstede, 1985; Lubatkin *et al.*, 1998).

The cultural dimension of STC plays an important role in the creation of IC. That is to say, only certain types of cultural capital will be conducive to innovation, learning and in essence the conversion of HC into IC. An organisation with strong STC will have a supportive culture that allows individuals to try things, to fail, to learn and to try again (Bontis, 1998, p. 66). This view of strong STC does of course support the explorative mode of learning (Crossan *et al.*, 1999), which advocates experimentation, research and development and innovation. However, it is possible that certain organisations or parts of an organisation may perform better by not innovating but specialising or standardising current processes within the organisation. For example, certain offices of a law firm may specialise in specific tasks and train associates to follow certain precedents (Sherer, 1995). These firms may want to focus on exploitative learning (Crossan *et al.*, 1999). That is, the use and application of knowledge and processes familiar to the firm. The issues of fit and flexibility (Lepak and Snell, 1999) are therefore important when considering the cultural dimension of STC and it could be an oversimplification to advocate one type of culture as suitable to the transformation of HC into IC.

Other perspectives on STC focus more on the formal and explicit aspects of this form of capital. In this context STC is defined as the backbone of the organisation (Burr and Girardi, 2002, p. 79) which includes not only intellectual property (Stewart, 1997; Sveiby, 1997) but also the infrastructure consisting of an organisation’s strategies, processes and policies (Dzinkowski, 2000). This more formal view of STC is further divided into internal STC (structures and processes for constructing the core organisation) and external STC (structures and processes within the firm for relating with external stakeholders) (Keenan and Aggestam, 2001).

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In summary, the key themes that have been identified in the STC literature are:

- informal or tacit routines;
- formal and explicit procedures and rules;
- processes directed toward internal organisation;
- processes directed toward external relationships; and
- all of the above fall within the boundaries of the firm.

The key measures that have been used to understand STC include measures of efficiency (e.g. cycle times to process services or products (Fitz-Enz, 2003); admin expenses as a percentage of sales), transaction times, procedural innovativeness and access to information (Bontis, 1998, p. 66). Most of these measures focus on systems performance at the organisational level (Ryatt, 2003).

STC often represents OC as another definition suggests: structural capital consists of an organisation's strategies, internal networks, systems, data bases and files, as well as its legal rights to technology, processes, inventions, copyrights, trademarks, trade secrets, brands and licences (Knight, 1999). The tendency to use the concepts of STC and OC interchangeably may present some difficulties, particularly when conducting research in professional services firms. This is because in such circumstances, it may well be important to separate structures and processes.

Previous work uses the term "structure" to refer to the internal organisation as well as the way in which work is organised in the firm. For example, a management consultancy may be organised according to geographical areas and management or industry disciplines, however, it may choose to select consultants from the various speciality areas to work together on a project team with a new client. The ability to disentangle these concepts is therefore critical to future research. The last section of this paper makes suggestions for clearer definitions within an integrated framework.

Both STC and OC will enable a firm to develop relationships within networks that are external to the firm. That is to say, the way in which work is organised together with the client/customer relationship strategies within the organisation will determine how permeable the boundaries are between the firm and its client (Swart and Kinnie, 2003) and will not only enable relationships to develop but will also influence the nature of relationships which are developed between the firm and other stakeholders in the wider network. The following section reviews the notion of client and network capital (CNC) otherwise referred to as relational capital, customer capital and external capital.

### **Client and network capital**

Client and network capital (CNC) have often been referred to as a sub-set of social capital. In other words, a proportion of previous research on SC is less sensitive to the level of analysis or the boundaries of the social unit. However, it is important to pay attention to the nature of boundaries when understanding how different forms of capital dynamically integrate. For example, Bontis (1998) highlights that CNC[1] lies external to the firm and HC and defines CNC as the potential an organisation has due to ex-firm intangibles which include knowledge embedded in customers, suppliers the government and other related industry associations. Knowledge of marketing channels and customer relationships sit at the heart of this form of capital (see Table I).

This sub-component is therefore reviewed separately here for three reasons. First, the external tie modalities (nature of the relationships) are often different to relationships that fall within the boundaries of the firm. In short, knowing how to work with your clients is different from knowing how to work across teams within your firm. These qualitative differences arise not least because of the different contractual relationships with employees as opposed to clients. Second, the external tie modalities differ from internal tie modality due to variation in the function of the relationships. That is to say, a firm exchanges goods and services with its clients but not with its employees. Third, the learning processes that span the boundaries of the firms are qualitatively different from those within the firm. Bouty (2000) found that research scientists adopt clear strategies when they build relationships between organisations through which they may learn and exchange information. First, the confidentiality of an information exchange is judged. That is, the scientist would not want to put his/her own firm at risk. This is a step in the process of CNC building that would not be present when relationships are built within the boundaries of the firm. Second, issues of trust and competition are considered, where a high degree of trust, often brought about by long periods of acquaintance, is likely to result in the sharing of scarce resources. Undoubtedly, competition, which is fiercer across organisational boundaries, will have an opposite affect. Finally, strategies are used to assess whether information exchanges across firm boundaries will be profitable. This consideration within CNC may also not be present within the context of SC because of the dominant (Putnam, 1993) model which advocates the associability of the relationships. That is to say, within organisations SC is accrued through the willingness of the participant to subordinate individual goals to collective goals (Leana and van Buren, 1999).

The structural aspect of network relationships represents the final dimension along which CNC differs from SC. It is useful to use the lens of structural hole theory (Burt, 1992) to explain this difference. Structural holes present opportunities for brokering information flows among firms. The essence of structural hole theory is that the partnering and learning transactions that take place across the boundaries of the firm. Burt assumes that partner selection, more than SC determines effective cooperation between firms (Burt, 1992, p. 16). Similar to Bouty's (2000) findings, trust in this context is driven by cross-boundary partner selection rather than long-term stable relationships within homogeneous knowledge networks. Increases in CNC therefore have no effect on the number of relationships but on the quality of selected stakeholder relationships within the network (Walker *et al.*, 1997).

A loose network structure with structural holes holds the further advantage of sharing heterogeneous knowledge sets across a network. That is, firms will partner with other firms who have complementary rather than competing knowledge sets. This enables knowledge networks to generate new knowledge that is valuable to both the focal firms and its partners. For example, life sciences research firms often build knowledge networks with research institutes, universities, patent lawyers and large pharmaceutical firms to research innovations with varying degrees of collaboration. Previous studies (Swart and Kinnie, 2003) indicate that knowledge networks are advantageous to a firm when the skills and knowledge within the focal firm is specialised (PhD scientist) and differs from those in the partnering firms (e.g. radio chemistry as opposed to neurochemistry).

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Several different sets of measures have been developed in acknowledgement of the qualitatively different nature of CNC. Some of these measures are focused on the customer orientation within the firm, e.g. the loyalty of customers created by understanding and meeting their needs (Knight, 1999). Narver and Slater (1990) view customer orientation, competitor orientation and inter-functional orientation as three behavioural components of market orientation, which has been defined as organisation-wide generation of market intelligence pertaining to current and future needs of customers, dissemination of this intelligence and organisation-wide responsiveness to the intelligence (Kohli and Jaworski, 1990).

Other measures focus on the rate and the nature of information exchange between the focal firm and its network partners. These measures point to the nature of relationships developed (often assessed through the type of trust built) and the quality of information exchanged, i.e. is there a profitability or an equality motive that governs the CNC. A final set of measures investigate the nature of the learning relationship within the knowledge network. That is, can innovations truly be attributed to cross-boundary learning? Quantitative measures such as number of product innovations due to inter-firm collaborations, number of inter-organisational project teams (e.g. brand teams in advertising agencies) and establishment of a cross-boundary identity has been used to understand the nature and function of CNC.

Each of the sub-components of IC has been reviewed according to the key themes that were identified within the various sets of literature. Some measures that were used in previous research have been discussed here. The final section of the paper draws together the various sub-components and illustrates how the distinct measures and definitions have been disentangled. Heeding the call for future research (Davenport, 1999; Pennings *et al.* 1998; Tallman *et al.*, 2004) on how the various forms of capital combine to create value, dynamic interaction is at the heart of the suggested framework and the clarified concepts should not be viewed as separate but as inextricably bound together.

### **Towards a clarified research framework and possible measures**

The objective of the article was to review the literature on intellectual capital and to disentangle some of its key definitions. A clearer understanding of IC was developed through a detailed review of the sub-components of IC. The key contribution of the article therefore lies in unpacking the definitions and measures of intellectual capital and its sub-components. The most prominent sub-components that were identified comprise human capital, social capital, structural, otherwise referred to as organisational capital, and client or customer capital. The paper illustrates that each sub-component is riddled with confusion over boundaries, levels of analysis and function of the sub-component.

Three key improvements for future research are suggested here. The first is the achievement of greater conceptual clarity of each of the sub-components. Second, as both research and practitioner communities we need to understand the interconnection between the sub-components better and begin to develop both qualitative and quantitative work to inform our understanding of IC management. Thirdly, clear measures of each of the sub-components need to be developed in order to facilitate specifically quantitative work in this area. Each of these improvements will be discussed with a view to future research.

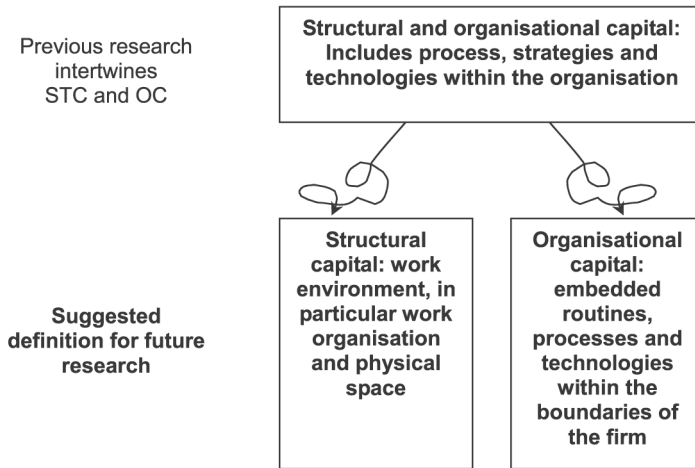
In order to achieve the first aim it is suggested that a clear definition of human capital take into account the dimensions of value and uniqueness of knowledge and skills to the firm. Importantly, future research needs to move away from the interchangeable use of human and intellectual capital. Human capital can accordingly be defined as the knowledge, skills and abilities of employees that vary according to the degree of uniqueness (generic/firm-specific/occupation or industry-specific) and value or core contribution to the strategic ability of the firm and its clients.

The two key sub-components which need further clarification and unravelling include social capital and structural capital. First, SC was strictly taken to be an intra-firm construct in some research papers, however, other authors referred to relationships within social units that spanned the boundary of the organisation. Previous research described SC as inter and intra-organisational relationships thereby creating an opportunity to “overuse” the term to describe everything in the realm of relationships. Future research needs to be sensitive to boundaries, levels of analysis and the functions of relationships. It is suggested here that definitions of SC focus on the social ties within the boundaries of the organisation that mutually support and reinforce the knowledge creation process. The key suggestion for future work is to be sensitive to the boundaries (inter and intra-organisational) and the tie modalities (nature of relationships). Here the suggested research framework differentiates between SC (internal to the firm) and CNC (between the firm and clients or stakeholders). With this sensitivity in mind the suggested definition for CNC relational ties that stretch across the boundaries of the organisation within which knowledge of clients and processes of collaborative learning are embedded.

Second, clearer boundaries need to be drawn between structural and organisational capital as much of the research on structural capital referred to structures, processes and embedded routines within the organisation with mirror-images of these concepts was found in the sparse literature on organisational capital. These two sub-components need to be separated out because sensitivity to their subtle differences may be important to future research (Figure 3).

An improved framework for research into IC needs to be cognisant of previous research on the impact of work and project design (Burr and Girardi, 2002; Pennings *et al.*, 1998; Sherer, 1995) and physical space on intellectual capital generation. Particular dimensions that deserve attention here are the fluidity of project team boundaries and the extent to which physical space facilitates intellectual capital generation. STC is defined here as the work environment and in particular the work organisation and physical space that impact on IC generation. These aspects may be related to OC yet it is of critical importance to understand their separate (and interconnected) influence on knowledge-rich products and services offered by the firm. It is therefore important to pay attention to how STC, or work environment, facilitates the development of relationships and knowledge and skills. The process and routines within the organisation (OC) are equally important in the process of intellectual capital generation, but qualitatively different to STC. OC can be considered as the vehicle for STC and is defined as the embedded routines, processes and technologies used within the boundaries of the firm.

The second suggestion for improvement for future research was to construct a framework which shows the integration of the forms of capital. Several authors (Bontis, 1998; others) acknowledge the various forms of capital and their interaction



**Figure 3.**  
Disentangling STC and OC

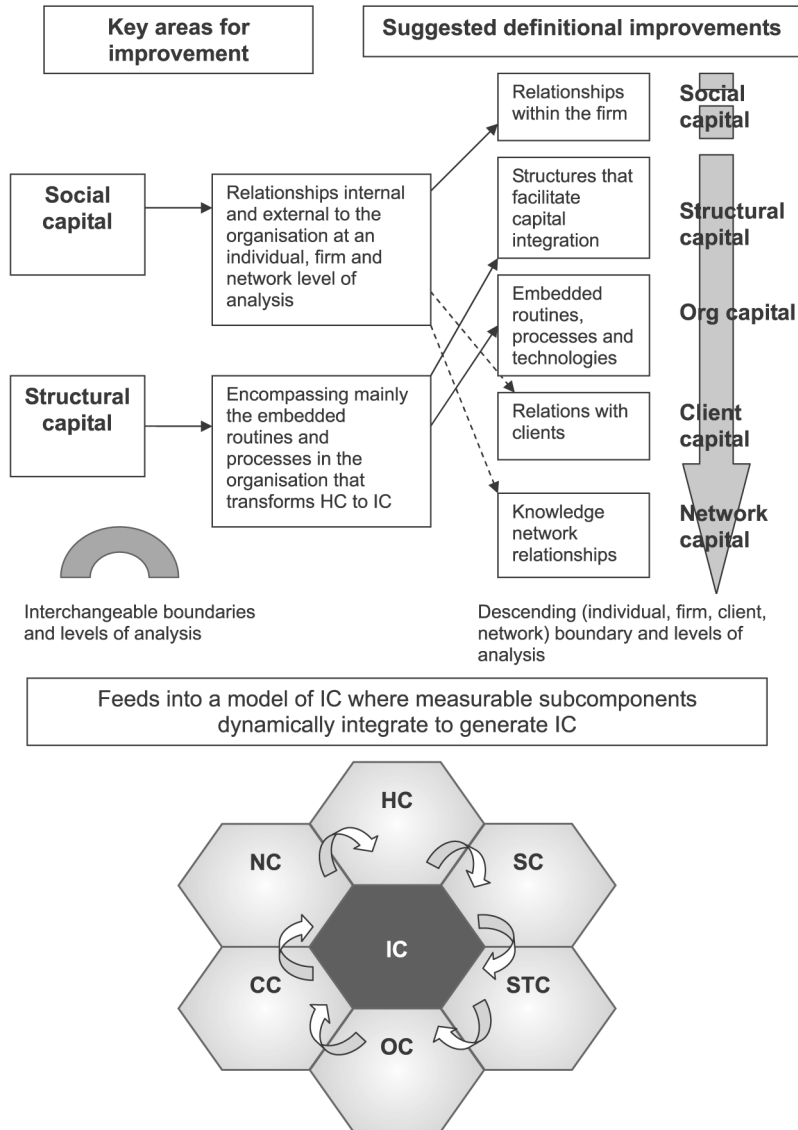
but mainly displays linear models to further our understanding of IC. An important contribution would therefore be to develop a model for research that clearly illustrates the dynamic interaction between the sub-components of IC. Figure 4 begins to lay this foundation. Its key aim is to illustrate that each form of capital will influence and be influenced by all the other forms of capital. This framework can be used as a guide in qualitative observations of intellectual capital generation.

In order to meet the requirements of the third improvement suggestion (measurement of the sub-components), previous measures need to be reviewed in the light of new, clarified definitions developed here. One possible way of developing such an overview is to review measures according to what each sub-component enables the firm to do or dynamically affords the firm (Cook and Seely Brown, 1999). Within this context it is important to note that each form of capital represents:

- knowledge of or “knowing what” which is akin to Tallman’s (2004) component knowledge;
- knowledge of an action or “knowing how”. This form of knowledge would be more tacit (Polanyi, 1966) and experience-based; and
- knowledge that functions at the meta-level or “knowing why”. This form of knowledge capital represents a holistic or systems level understanding.

Table I illustrates the presence of each knowledge type in all the sub-components together with possible measures that can be used to explore and understand the fabric of the particular sub-component of IC.

The analysis of the various sub-components of IC could be used as a foundation for future research on valuable, rare and inimitable assets. Within this context it is important to remember that constructs were disentangled in order to improve the clarity of the definitions presented, however, all the constructs are seen as inextricably linked. The framework which integrates the revisited sub-components (Figure 4) could be viewed as a particularly useful contribution to further explorations of IC. Finally, Table I which shows the nature of knowledge within each sub-component together



**Figure 4.**  
A suggested research  
framework

with suggested measures could also serve as a guide to empirical research on IC or any of its constituent parts.

The review presented here has some limitations. First, given the vast number of peer reviewed journal articles available on IC, a boundary had to be drawn regarding the inclusion of previous research. It may be that ten years was not the most optimal time period for review. Second, the selection criteria applied were: articles that focused IC as well as its sub-components; and the measurement of IC and other forms of capital. A different theoretical lens applied during selection may also have resulted in different

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themes identified. Finally, the disciplinary boundaries that were drawn centred on managerial and social sciences. This too influenced the papers that were reviewed and the analysis that was presented here.

Notwithstanding these limitations the paper does hold implications for further research on the nature of IC as well as the dynamic interaction between the forms of capital. The framework and measures suggested here can be applied in both qualitative and quantitative studies across a variety of settings. An area of particular interest for this application would be the knowledge intensive industries and professional services firms.

Previous research indicates that these types of firms are solely reliant upon their employees' knowledge and skills to survive and to be successful (Swart *et al.*, 2003). It would however, be interesting to explore whether brilliant people make a brilliant company. That is, the contribution of HC relative to other forms of capital as well as the nature of the interaction between these forms of capital. Similar questions can also be asked in more traditional organisations, however, in these settings it may be important to account for the impact of physical and financial forms of capital as well. In other words, the metaphor of capital would need to be extended and applied strictly.

The framework presented here also holds implications for practice. Several organisations have embarked on IC reporting processes and have experienced the challenges that go hand-in-hand with intangible asset management. The various sub-components of IC and their measures can be applied to meet some of these challenges. Secondly, the suggested framework, and future research that results from it, can be used to guide managerial decisions regarding capital investments. This framework shows that training and development investments alone will not improve business performance but that investments need to be made in all the forms of capital that play together to convert knowledge and skills into tangible products and services. Finally, the suggested view of IC can be applied to knowledge management and organisational learning strategies. Similarly, here it would be important to focus managerial effort on each sub-component and understand, in detail, how the components integrate dynamically to generate stakeholder value.

#### Note

1. Referred to as customer capital in Bontis (1998).

#### References

- Ambrosini, V. and Bowman, C. (2001), "Tacit knowledge: some suggestions for operationalization", *Journal of Management Studies*, Vol. 38 No. 6, pp. 811-29.
- Barney, J. (1991), "Firm resources and sustained competitive advantage", *Journal of Management*, Vol. 17 No. 1, pp. 99-129.
- Becker, G. (1964), *Human Capital*, Columbia University Press, New York, NY.
- Bontis, N. (1998), "Intellectual capital: an exploratory study that develops measures and models", *Management Decision*, Vol. 36 No. 2, pp. 63-76.
- Bothwell, R. (1997), "Indicators of a healthy civil society", in Burbridge, J. (Ed.), *Beyond Prince and Merchant: Citizen Participation and the Rise of Civil Society*, Pact Publications, New York, NY, pp. 249-62.

- Bourdieu, P. (1986), "The forms of capital", in Richardson, J.G. (Ed.), *Handbook of Theory and Research for the Sociology of Education*, Greenwood Press, New York, NY, pp. 241-58.
- Bouty, I. (2000), "Interpersonal and interaction influences on informal resource exchanges between R&D researchers across organisational boundaries", *Academy of Management Journal*, Vol. 43 No. 1, pp. 50-65.
- Bowman, C. and Ambrosini, V. (2000), "Value creation versus value capture: towards a coherent definition of value in strategy", *British Journal of Management*, Vol. 11 No. 1, pp. 1-15.
- Brooking, A. (1996), *Intellectual Capital: Core Asset for the Third Millennium Enterprise*, International Thompson Business Press, London.
- Burr, R. and Girardi, A. (2002), "Intellectual capital: more than the interaction of competence  $\times$  commitment", *Australian Journal of Management*, Vol. 27, Special Issue, pp. 77-87.
- Burt, G. (1992), *Structural Holes*, Harvard University Press, Cambridge, MA.
- Chillemi, O. and Gui, B. (2001), "Team human capital and worker mobility", *Journal of Labor Economics*, Vol. 15 No. 4, pp. 567-85.
- Cohen, S.S. and Fields, G. (1999), "Social capital and capital gains in Silicon Valley", *California Management Review*, Vol. 41 No. 2, pp. 108-30.
- Coleman, J.S. (1988), "Social capital in the creation of human capital", *American Journal of Sociology*, Vol. 94 No. 2, pp. S94-S120.
- Coleman, J.S. (1990), *Foundations of Social Theory*, HUP, Cambridge, MA.
- Cook, S.D.N. and Seely Brown, J. (1999), "Bridging epistemologies: the generative dance between organisational knowledge and organisational knowing", *Organization Science*, Vol. 10 No. 4, pp. 381-400.
- Crossan, M.M., Lane, H.W. and White, R.E. (1999), "An organizational learning framework: from intuition to institution", *Academy of Management Review*, Vol. 24 No. 3, pp. 522-32.
- Crossan, M.M., Lane, H.W., White, R.E. and Djurfeldt, L. (1995), "Organizational learning: dimensions for a theory", *The International Journal of Organizational Analysis*, Vol. 3 No. 4, pp. 337-60.
- Davenport, T. (1999), *Human Capital*, Jossey-Bass, San Francisco, CA.
- Dzinkowski, R. (2000), "The measurement and management of intellectual capital: an introduction", *Management Accounting*, February, pp. 32-6.
- Edvinsson, L. (2000), "Some perspectives on intangibles and intellectual capital", *Journal of Intellectual Capital*, Vol. 1 No. 1, pp. 12-13.
- Edvinsson, L. and Sullivan, P. (1996), "Developing a model of managing intellectual capital", *European Journal of Management*, Vol. 14 No. 4, pp. 356-64.
- Fitz-Enz, J. (2003), "The ROI of human capital", *Human Capital Development*, Vol. 1, November.
- Fukayama, F. (1995), *Trust: The Social Virtues and the Creation of Prosperity*, Free Press, New York, NY.
- Gergen, K. (1999), *An Invitation to Social Construction*, Sage, London.
- Gimeno, J., Folta, T.B., Cooper, A.C. and Woo, C.Y. (1997), "Survival of the fittest? Entrepreneurial human capital and the persistence of underperforming firms", *Administrative Science Quarterly*, Vol. 42 No. 6, pp. 750-83.
- Granovetter, M. (1973), "The strength of weak ties", *American Journal of Sociology*, Vol. 78 No. 8, pp. 1360-80.
- Granovetter, M. (1985), "Economic action and social structure: the problem of embeddedness", *American Journal of Sociology*, Vol. 91 No. 3, pp. 481-510.

- 
- Hofstede, G. (1985), "Culture's consequences, international differences in work-related values: cross-cultural research and methodology", Vol. 5, Sage, London.
- Keenan, J. (2000), "Intellectual capital perspectives for information systems", in Bradley, G. (Ed.), *Information Systems*, McGraw Hill, London.
- Keenan, J. and Aggestam, M. (2001), "Corporate governance and intellectual capital: some conceptualisations", *Corporate Governance*, Vol. 9 No. 4, pp. 259-75.
- Knight, D. (1999), "Performance measures for increasing intellectual capital", *Strategy & Leadership*, March/April, pp. 22-7.
- Kogut, B.U. and Zander, U. (1996), "What do firms do? Coordination, identity and learning", *Organization Science*, Vol. 7 No. 5, pp. 502-18.
- Kohli, A.K. and Jaworski, B.J. (1990), "Market orientation: the construct, research propositions and managerial implications", *Journal of Marketing*, Vol. 54 No. 1, pp. 1-18.
- Leana, C.R. and van Buren, H.J. (1999), "Organizational social capital and employment practices", *Academy of Management Review*, Vol. 24 No. 3, pp. 538-55.
- Lepak, D. and Snell, S.A. (1999), "The human resource architecture: toward a theory of human capital allocation and development", *Academy of Management Review*, Vol. 24 No. 1, pp. 31-48.
- Lubatkin, M., Calori, R., Very, P. and Veiga, J. (1998), "Managing mergers across borders: a two nation exploration of national bound administrative heritage", *Organization Science*, Vol. 9 No. 6, pp. 670-84.
- Malaith, G.J. and Postlewaite, A. (1990), "Workers versus firms: bargaining over a firm's value", *Review of Economic Studies*, Vol. 57 No. 3, pp. 369-80.
- Marsden, P.V. and Campbell, E.K. (1984), "Measuring tie strength", *Social Forces*, Vol. 63 No. 2, pp. 482-501.
- Marshall, A. (1961), *Principles of Economics*, 2 Vols, Macmillan, London.
- Mouritsen, J., Bukh, P.N., Larsen, H.T. and Johansen, M.R. (2002), "Developing and managing knowledge through intellectual capital statements", *Journal of Intellectual Capital*, Vol. 3 No. 1, pp. 10-29.
- Nahapiet, J. and Ghoshal, S. (1998), "Social capital, intellectual capital and the organization advantage", *Academy of Management Review*, Vol. 23 No. 2, pp. 242-66.
- Narver, J.C. and Slater, S.F. (1990), "The effect of a market orientation on business profitability", *Journal of Marketing*, Vol. 54, October, pp. 20-35.
- Nonaka, I. and Takeuchi, H. (1995), *The Knowledge Creating Company*, Oxford University Press, Oxford.
- Orlikowski, W.J. (2002), "Knowing in practice: enacting a collective capability in distributed organizing", *Organization Science*, Vol. 13 No. 3, pp. 249-73.
- Pennings, J.M., Lee, K. and van Witteloostuijn, A. (1998), "Human capital, social capital and firm dissolution", *Academy of Management Journal*, Vol. 41 No. 4, pp. 425-40.
- Pfeffer, J. (1994), *Competitive Advantage through People: Unleashing the Power of the Workforce*, Harvard Business School Press, Boston, MA.
- Polanyi, M. (1966), *The Tacit Dimension*, Routledge & Kegan Paul, London.
- Porter, M. (1985), *Competitive Advantage: Creating and Sustaining Superior Performance*, Free Press, New York, NY.
- Purcell, J., Kinnie, N., Hurchinson, S., Rayton, B. and Swart, J. (2004), *Vision and Values: The Big Idea*, Executive brief, CIPD, London.

- Putnam, R.D. (1993), *Making Democracy Work. Civic Traditions on Modern Italy*, Princeton University Press, Princeton, NJ.
- Quinn, J.B. (1992), *Intelligent Enterprise*, Free Press, New York, NY.
- Rastogi, P.N. (2002), "Knowledge management and intellectual capital as a paradigm of value creation", *Human Systems Management*, Vol. 21 No. 3, pp. 229-40.
- Reagans, R. and Zuckerman, E.W. (2001), "Networks, diversity and productivity: the social capital of corporate R&D teams", *Organization Science*, Vol. 12 No. 4, pp. 502-17.
- Robinson, L.J., Schmid, A.A. and Siles, M.E. (2002), "Is social capital really capital?", *Review of Social Economy*, Vol. LX No. 1, pp. 1-21.
- Ryatt, A. (2003), "Measuring know-how", *TD*, July, pp. 37-9.
- Saint-Onge, H. (1996), "Tacit knowledge: the key to the strategic alignment of intellectual capital", *Strategy & Leadership*, Vol. 2, March-April, pp. 10-14.
- Schultz, T.W. (1961), "Investment in human capital", *American Economic Review*, Vol. 51, March, pp. 1-17.
- Sherer, P.D. (1995), "Leveraging human assets in law firms: human capital structures and organizational capabilities", *Industrial and Labor Relations Review*, Vol. 48 No. 4, pp. 671-91.
- Skaikh, J.M. (2004), "Measuring and reporting of intellectual capital performance analysis", *The Journal of American Academy of Business*, March, pp. 439-48.
- Snell, S.A. (2002), "Social capital and strategic HRM: it's who you know", *Human Resource Planning*, Vol. 22 No. 1, pp. 62-5.
- Snell, S.A., Youndt, M.A. and Wright, P.M. (1996), "Establishing framework for research in strategic human resource management: merging resource theory and organisational learning", in Ferris, G.R. (Ed.), *Research in Personnel and Human Resource Management*, JAI Press, Greenwich, CT, pp. 61-90.
- Stewart, T.A. (1997), *Intellectual Capital: The New Wealth of Organizations*, Doubleday, New York, NY.
- Sveiby, K.E. (1997), *The New Organizational Wealth: Managing and Measuring Knowledge-based Assets*, Berrett-Koehler, New York, NY.
- Swart, J. and Bowman, C. (2003), "Lord of the Rings or Lord of the Dance? Competing for embedded capital", paper presented at the EGOS Conference, Stream: Creative industries, Copenhagen, 2-4 July.
- Swart, J. and Kinnie, N. (2003), "Knowledge-intensive firms: the influence of the client on HR systems", *Human Resource Management Journal*, Vol. 13 No. 3, pp. 37-55.
- Swart, J. and Powell, J. (2004), "Homogeneity and heterogeneity of knowledge structures", work in progress.
- Swart, J., Kinnie, N. and Purcell, J. (2003), *People and Performance in Knowledge Intensive Firms*, CIPD, London.
- Tallman, S., Jenkins, M., Henry, N. and Pinch, S. (2004), "Knowledge, clusters, and competitive advantage", *Academy of Management Review*, Vol. 29 No. 2, pp. 258-71.
- Teachman, J.D., Paasch, K. and Carver, K. (1997), "Social capital and the generation of human capital", *Social Forces*, Vol. 75 No. 4, pp. 1343-59.
- Tsoukas, H. (1996), "The firm as a distributed knowledge system: a constructionist approach", *Strategic Management Journal*, Vol. 17 No. 1, pp. 11-25.
- Ulrich, D. (1998), "Intellectual capital = competence × commitment", *Sloan Management Review*, Vol. 39 No. 2, pp. 15-26.

- 
- Uzzi, B. (1996), "The sources and consequences of embeddedness for economic performance of organisations: the network effect", *American Sociological Review*, Vol. 64 No. 4, pp. 674-98.
- Valcour, P.M. and Snell, S.A. (2002), "The boundaryless career and work force flexibility: developing human and social capital for organisational and individual advantage", paper presented at the 2002 Annual Meeting of the Academy of Management, Denver, CO.
- Van Deth, J.W. (2003), "Measuring social capital: orthodoxies and continuing controversies", *International Journal of Social Research Methodology*, Vol. 6 No. 1, pp. 79-92.
- Veblen, T. (1924), *The Theory of the Leisure Class: An Economic Study of Institutions*, Macmillan, New York, NY, pp. 22-34.
- Walker, G., Kogut, B. and Shan, W. (1997), "Social capital, structural holes and the formation of an industry network", *Organization Science*, Vol. 8 No. 2, pp. 109-25.
- Walker, W.W. (2002), "Human capital: beyond HR?", *Human Resource Planning*, Vol. 24 No. 2, pp. 4-5.
- Winter, S.G. (1987), "Knowledge and competence as strategic assets", in Teece, D.J. (Ed.), *The Competitive Challenge: Strategies for Industrial Innovation and Renewal*, Ballinger, Cambridge, MA, pp. 159-84.
- Zucker, L.G., Darby, M.R. and Brewer, M.B. (2001), "Intellectual human capital and the birth of US biotechnology enterprises", *The American Economic Review*, March, pp. 290-306.

### Further reading

- Allen, T.J. (1977), *Managing the Flow of Technology*, MIT Press, Cambridge, MA.
- Crossan, M. and Guatto, T. (2003), "Organizational learning research profile", *Journal of Organizational Change*, Vol. 9 No. 1, pp. 107-12.
- Davenport, T.H. and Prusak, L. (1998), *Working Knowledge: How Organizations Manage What They Know*, Harvard Business School Press, Boston, MA.
- Devine, F. and Roberts, J.M. (2003), "Alternative approaches to researching social capital: a comment on van Deth's measuring social capital", *International Journal of Social Research Methodology*, Vol. 6 No. 1, pp. 93-100.
- Flamholtz, E. and Lacey, J. (1981), *Personnel Management: Human Capital Theory and Human Resource Accounting*, UCLA, Los Angeles, CA.

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