Recognition and Measurement of Intellectual Resources: the accounting-related challenges of Intellectual Capital

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Abstract

The key to competitive success is likely to be the ability to create, leverage, and develop specialised knowledge and intellectual resources. This new reality presents both challenges and opportunities for accounting, a discipline which has traditionally found it difficult to deal with the recognition and measurement issues surrounding intangible assets. This paper makes two contributions to the emerging literature on intellectual capital. Firstly, it offers some preliminary results of a study of the drivers and generators of intellectual capital. Secondly, it posits a theoretical/ methodological approach to intellectual capital based upon Habermas' concept of communicative action, a concept that allows the premium attaching to the human and dynamic elements of organisations to be accentuated.

Introduction

Drucker's (1994) claim that knowledge is becoming the *only* meaningful economic resource is complemented by Quinn's (1992) assertion that the ability to manage this resource is *the* critical skill of the modern era. Those charged with the financial management of commercial resources concur. The International Federation of Accountants (1998), for instance, notes that knowledge is *the* primary competitive factor in business; that it is a non-traditional intangible resource; and that the accumulation, transformation, creation and valuation of this resource lies at the heart of intellectual capital management (IFAC, 1998).

However, industrial era managerial paradigms, based on the tangible sources of value (land, labour and financial-capital) and the predict-direct-exploit-control bureaucratic machine metaphor are proving increasingly incapable of dealing with the emergent complexities of visualising, creating and leveraging this resource. Furthermore, little is known about how these intellectual resources, structures, institutions, processes or dynamics actually develop, or how they should be managed, utilised, valued or accounted for. A concept such as intellectual capital, even with the accumulated tools of the philosophy of consciousness and the recent move to the philosophy of language, cannot be precisely defined. This should not, however, prevent us from using it at a time when the intangible is rapidly gaining economic and social supremacy over the tangible (O'Regan & O'Donnell, 2000).

This paper proceeds in six sections as follows: Section 1 briefly summarises the emerging literature on Intellectual Capital. Section 2 identifies a number of the issues of relevance to financial and management accounting raised by the emergence of an intangible asset such as 'intellectual capital' as a primary driver of corporate wealth. Section 3 introduces a conceptual framework within which this dynamic can be imagined. Adopting the Habermasian (1984) notion of 'communicative action', an action-theory allowing for the exploration of the role and nature of relationships amongst employees as the main drivers and repositories of corporate wealth, this section challenges a literature which already leans heavily towards systems-theoretic approaches which facilitate the colonisation of this space by the owners of capital. Section 4 outlines a very preliminary analysis of data collected in a survey of

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CEOs of thirty indigenous, knowledge-intensive firms operating in the IT sector in Ireland, and presents some of the accounting issues which this raises. Section 5 discusses some of these issues in the context of Habermas' theory of communicative action. Section 6 offers some indications of future research possibilities.

1. Current Approaches to Recognising and Measuring Intellectual Capital

In the absence of any accounting-specific methods to recognise and measure intellectual capital, various templates have been developed by others to facilitate its identification and management. Although there is substantial variation as to how each dimension is conceptualised, theorised or measured, and a glaring dearth of good empirical studies, a broad consensus is now emerging in which most intellectual capital models assume a three way distinction between People, External, and Internal dimensions (Bontis,1998; Edvinsson & Sullivan, 1996; Roos et al., 1997; von Grogh & Roos, 1996; St. Onge, 1996; Stewart, 1997; Sveiby, 1997; Kaplan and Norton, 1997). This is indicated in Table 1 which provides an outline of three of the more developed intellectual capital models.

Table 1: Emerging Intellectual Capital Templates

	People	**Internal**	**External**
Sveiby	*People's Competence*	*Internal Structures*	*External Structures*
Kaplan and Norton	*Learning and growth perspective*	*Internal processes perspective*	*Customer perspective*
Edvinsson	*Human capital*	*Organisat-ional capital*	*Customer capital*

Source: Sveiby http://www.sveiby.com.au

In this scheme the 'People' dimension refers to people competencies, knowledge, know-how and experience - the 'traditional human resource'. The 'Internal' refers to the set of inner organisational structures, routines, processes, management systems and so on. The 'External', often referred to as 'customer capital' refers to external constituencies and structures such as links to customers, suppliers, and various other external networks.

Common measures or indicators of these dimensions have been identified and developed Examples are listed in Table 2. Significantly, several of these are already produced by accounting-based internal management and information systems (IFAC, 1998; Roslender, 2000).

Table 2: Intellectual Capital Indicators

People	**Internal**	**External**
Employee satisfaction	*Number of patents*	*Sales per customer*
Value Added per employee	*No of multi-functional teams*	*Satisfied Customers Index*
Rookie ratio	*Database use frequency*	*Frequency of repeat orders*
Level of education	*Investment in IT*	*Brand loyalty*
Training and Education cost	*Proportion of support staff*	*Customer complaints*
Years of experience	*R&D expense*	*Customer satisfaction*
Reputation with agencies	*Age of organisation*	*Profitability per customer*

Sources: Dzinkowski 2000; Sveiby 1997.

These approaches are supplemented by various methods developed to enable inter-firm comparison. Among the more common approaches facilitating this relative assessment of the existence and valuation of intellectual capital are:

1. Market-to-book ratios: the simplest of the calculations, this takes the difference between the book value of a company as represented by its balance sheet and the market value, whether from stock exchange or internal market to be equal to the level of intellectual capital in the business;
2. Tobin's 'q': 'q' is the ratio of market value to replacement cost of a company's assets and can be used as a comparative base between firms;
3. Calculated Intangible Value (CIV): using industry norms to establish rates of return for tangible assets, this measure calculates the level of intellectual capital by attributing to it any return in excess of the industry norm.
4. 'Colorised' reporting: proposed by SEC commissioner Steven Wallman, this approach places the emphasis on additional narrative reports (the 'colour') which supplement the more traditional (the 'black and white') financial statements, with information which helps to identify and classify intellectual capital in a relative context.

While all of these can be faulted on a number of grounds, their primary usefulness is that they provide a common measure allowing firm performance to be benchmarked, thus enabling comparative measures of intellectual capital to be established (Dzinkowski, 2000).

2. Accounting for Intellectual Capital

Accounting has traditionally focused its attention on capturing and representing items which can be fully objectified. Underpinned by a system of historical cost accounting which ascribes 'value' to transactions involving tangible entities, generally accepted accounting practices (GAAP) have been developed which reflect accounting's fundamental stewardship role, that is, of accounting for and informing company

management and its various stakeholders of the existence and progress of its resources, activities and investments (Power and Laughlin, 1996; Lodh and Gaffikin, 1997; O'Regan and O'Donnell, 2000).

Reflecting this historical emphasis upon its stewardship role in relation to tangible items, accounting has found it much more difficult to deal with items which its limited conceptual framework neither recognises nor values. In fact, since such intangible resources can never be fully objectified, accounting's cognitivist paradigm is incapable of embracing them within its worldview. One of the principal catalysts in causing the efficacy of current financial reporting and management accounting concepts and procedures to be revisited has been the gradual realisation that intangible assets can no longer be dismissed as the incidental and troublesome offspring of activities undertaken by relatively few, albeit large, entities. The dawning awareness that intellectual capital in its various guises now forms a major part of the resource base of not only individual firms, but also entire industries, has challenged accounting regulators to review the manner in which these are treated. In an environment in which international trade in the knowledge sector is growing five times faster than in natural resource-intensive industries, where the costs of information long ago surpassed the costs of equity (Strassman 1996), and where tangible assets often represent less than one-third of corporate value (Van Buren, 1999), an accounting system designed to satisfy the needs of 'financial' capital is incapable of embracing the measurement and reporting needs of knowledge-based entities (IFAC, 1998). As Lev (1997, p.35) puts it:

> 'In recent decades the usefulness of financial reports of public companies has steadily declined, despite their increased gloss and girth. One indicator: In the 1960s and 1970s, about 25% of the differences in stock price changes could be attributed to differences in reported earnings. But by the 1980s and early 1990s, this figure had dropped to less than 10%. That's a lot of lost relevance. Everybody in this economy ought to be concerned. Reliable financial reporting guides capital to the most promising investments. But bad or outdated information can lead to an inefficient allocation. This leads to volatile markets and investors who demand higher-risk premiums to cover the increased uncertainty. That's why, for capital markets to function best, financial statements need to be as informative as possible. Conventional accounting performs poorly with internally generated intangibles such as R&D, brands, and employee talent—the very items considered the engines of modern economic growth'.

In recent years some attempts have been made by accounting regulators to redress this deficiency. Accounting standard setters, for example, have begun to review the conceptual scaffolding that has seemed to preclude the discipline from addressing issues of relevance in the modern commercial milieu. Hermannson (1964) and Brummet *et al*. (1968) were seminal figures in the attempt to advance the recognition and measurement of human resource costs under the term Human Resource Accounting (Flamholtz, 1985). The accounting profession has, however, largely ignored HRA, citing the traditional objections put forward by those aware of the challenges posed by accounting for such resources (Grojer and Johanson, 1998; Guerrero, 1998). Furthermore, while there have been efforts to address some of the more troublesome intangible assets such as goodwill and brands, the solutions proposed have disappointed, particularly in failing to deal at a fundamental level with the conceptual and epistemological challenges posed. In essence, while some progress has been made, the opportunity to critically reconsider the nature and role of accounting in this context has been largely eschewed.

3. Communicative Action

The traditional accounting model is one which views an individual being as capable of gaining knowledge about a contingent environment and using this knowledge effectively by intelligently adapting to and manipulating that environment (O'Donnell, 1999a). This perspective assumes that this world is pre-given and that the goal of any cognitive system is to create the most accurate representation of this world. Representations can be stored in and retrieved from individual schemata, and if the events represented occur frequently they can be stored in scripts; these schemata and scripts are often referred to as knowledge structures (von Krogh and Roos, 1996). At a general level, most contributions in this vein assume that managers and organisations create representations of their environments through processing information available to them in this external environment (see Lyles and Schwenk, 1992 for a seminal example). The phenomena in need of explication in intellectual capital research, however, may not be simple facets of objective nature but the inter-subjective dynamic processes of understanding and agreement at both the interpersonal and intra-psychic levels. Processes of knowing grow when they are shared (Baumard, 1999; Bontis, 1998; Nonaka, 1994; von Krogh and Roos, 1995; Spender, 1998; Sveiby, 1997), whether these be individual or collective, tacit or explicit. Knowledge workers are idea and revenue creators, not mere reified cost factors of production.

We claim that a more suitable point of departure for exploring this emergent dynamic, with implications for people management and accounting professionals, is the set of symmetric and reciprocal relations

presupposed in Jürgen Habermas' (1984, 1987a, 1987b) *Theory of Communicative Action* (O'Donnell, 1999a, 1999b; O'Donnell *et al*., 2000; O'Regan and O'Donnell, 2000). Communicative action theory provides an ontological and epistemological foundation that has yet to be adequately developed in intellectual capital research. The dynamic intellectual capital-creating process of knowing that can be leveraged into market value can be viewed as existing in the communicative relation *between* human beings. Through communicative processes people continuously learn, develop, unlearn, relearn and apply common understandings by which to exchange, combine, create, renew and transfer tacit, implicit, explicit and codified processes of knowing from blueprints, ideas, emotional states and fuzzy hunches into problem definitions, solutions, added value and markets (O'Donnell *et al*., 2000). The universal communicative relation between human beings, which satisfies the scientific requirements of objectivity in a specific sense (Habermas, 1984, p137), is suggested here as the germ-cell of intellectual capital creation. Nahapiet and Ghoshal (1998) cite Edith Penrose's (1959, p.53) observation that the communicative experience:

> ... develops an increasing knowledge of the possibilities for action and the ways in which action can be taken by ... the firm. This increase in knowledge not only causes the productive opportunity of a firm to change... but also contributes to the 'uniqueness' of the opportunity of each individual firm.

Roos and his colleagues (1997) note that most strategic contributions on knowledge focus on two main issues; the way knowledge is created and the way it is leveraged into value, although there is no definitive boundary between the two. As customer relations in knowledge-intensive businesses are no longer seen as one-way driven, but, rather, partnerships in which solutions are co-created and knowledge flows both ways (Sveiby, 1997), both internal architecture and external architecture should be considered in any comprehensive analysis. We are dealing with people and/or systems, with action theory and/or systems theory.

Kogut and Zander (1993) argue that the firm may be viewed as a social community that specialises in the creation and internal transfer of knowledge, and that this productive knowledge defines the firm's competitive advantage. From this perspective, which complements Edith Penrose's (1959) seminal work on the growth of the firm, competitive advantage may be viewed as a sufficient condition governing firm trade, direct investment, and growth, and it is probable that the ability to both create and leverage intellectual capital is becoming its primary source. Nevertheless, the partly tacit and socially unconscious nature of intellectual capital embedded in various lifeworlds (the people element) is such that it can never be completely observed by either participants or observers: intellectual capital embraces not only what is known or *stocks*, but also the processes of knowing, or *flows*. (Bontis, 1998; Nahapiet and Ghoshal, 1998; Roos *et al*., 1997; Sveiby, 1994; Van Buren, 1999).

In this worldview, the nexus of intellectual capital creation may be viewed as residing in the set of interactional social relations that exist between people whose 'value' is greater than the sum of their individual parts. Moving beyond traditional concepts of human capital (Becker, 1964), which refer to an individual's acquired knowledge, skills and abilities, intellectual capital refers to the knowledge and knowing capability of a social collectivity (Nahapiet and Ghoshal, 1998). This collective phenomenon represents both a key resource and a capability for action based on knowledge and knowing that can be leveraged into value. People and action are given some priority over system and structure as it is people through the process of communicative interaction who define situations, define problems, capture know-how, share insights, and innovate. Intangible values are created by people; money and technology are merely the tools that people use and are themselves expressions of knowledge. The emerging system dynamic is based more on informational and telecommunications structures with probable new lifeworld-system relationships experiencing their genesis at the moment. We know very little about what an economy and society based on the economics of intangible values would look like, or how those aware of the shifting sands could possibly attempt to steer it.

4. Research

One of the persistent obstacles confronting managers and, indeed, accountants as they struggle to develop measurement and management techniques appropriate to the dynamics of the knowledge economy is the lack of empirical data. Thus, while considerable work has been done by individual companies such as Skandia and Dow Chemicals to develop indicators of intellectual capital, little is known about the changing internal dynamics within firms and, indeed, economies, that parallel the knowledge era. A joint research programme undertaken by the University of Limerick, the Irish Management Institute and the University of Maryland involving the collection of detailed and extensive perceptual data from Chief Executive Officers, Top Management Team members and Core Employees in indigenous Irish firms operating in the knowledge economy is, however, yielding considerable insights into these dynamics. Supplemented by internal and external data on the financial performance of these firms this research may provide some early indicators of the extent of the challenges posed for managers, accountants and national planners by the 'new

economy'.[1] More specifically the perceptual data derived to date from interviews with CEOs of thirty of these indigenous Irish firms provides empirical evidence of the significance of intellectual capital in terms of company value, the principal drivers of that value, and the extent of the challenge facing accountancy as it attempts to grapple with the recognition and measurement issues associated with intellectual capital.

The Irish software/telecoms sector provides an ideal research framework for any such investigation. In recent years it has established itself as the largest software exporter in the world and been one of the primary engines of growth in an economy that has experienced real growth of 37% in 5 years, a rate unparalleled in the developed world. It also provides a 'new economy' environment in which the scope to develop new managerial practices is greater than in traditional industries. Within this sector indigenous Irish firms play an increasingly significant role, employing over 20,000 people in more than 900 firms (OECD, 1999).

As one part of the interview process CEOs were asked to provide perceptual data as to the extent of intellectual capital as a source of corporate wealth. This involved indicating the percentage of company value deemed to derive from 'intellectual capital'. In line with existing typologies, intellectual capital was presented as consisting of people, internal structure and external structure and CEOs were also asked to indicate the degree to which the drivers of this wealth can be traced to these factors by distributing 100 points between them. Finally they were asked to estimate any increase or decrease in company value over the course of the preceding twelve months. Table 3 provides a summary of this feedback.

Table 3: Results of CEO Interviews

	% value in IC	% IC in People	% IC in Internal Structures	% IC in External Structures
Average (n=30)	**66.07**	**49.80**	**18.68**	**31.52**

The most striking finding is that Chief Executive Officers in the fastest growing sector of the fastest growing economy in Europe believe that, on average, almost two-thirds of their company value is attributable to intellectual capital. This crystallises the extent of the challenge for accounting in that currently this corporate value not only commonly remains off the balance sheet, but is absent from internal management reporting processes intended to facilitate decision-making. It is imperative, therefore, if it is to retain its traditional information supplying role, that accounting develops new internal and external measurement concepts and reporting methodologies that recognise the central role of knowledge as a source of wealth. These will need to be supplemented by new financial management techniques that incorporate information resources and knowledge into investment appraisal techniques. This can only be achieved initially by focusing on relative, indicative disclosures rather than on the development of objective recognition criteria and measurement techniques. Such an approach allows the possibility of building upon existing techniques such as those management accounting approaches that already recognise quality and strategic management issues or reporting practices which recognise the usefulness of 'softer' disclosures in narrative form (Roslender, 2000).

The interviews are also significant in confirming that the greater part of this intellectual capital can be traced to the people element in these businesses. CEOs perceive that almost fifty per cent of this intangible value links directly to the people employed in these knowledge-intensive firms. This challenges the traditional accounting model which classifies labour as an expense. The knowledge economy views employees as assets whose primary function is to generate revenue by converting knowledge into a marketable form. The extent to which people are perceived as assets rather than costs suggests that one way in which intellectual capital may be better accommodated is by revisiting the whole concept of Human Asset Accounting and developing templates and new conceptual approaches which will result in the recognition of employees as the principal asset of a business. It should also lead to the development of new tools to better assist in the management of, and investment in, people (O'Donnell et al, 2000; Van Buren, 1999).

This links to another related consequence of the new dynamics of the knowledge economy – the changes being induced in corporate governance models. The existing corporate model strongly favours the providers of financial capital. However, in an environment in which the primary resource is seen as knowledge embedded in people, together with their relationships both to one another and to knowledge and ways of knowing, then the existing governance model will be challenged to embrace a stakeholder approach which recognises the claims of employees to a share of ownership reflecting the fact that they provide the primary value creating resource. Nor is this likely to be satisfied by stock option schemes which are predicated upon notions of reward. A governance model which has traditionally linked ownership to provision of capital may be forced to recognise the consequences of this paradigm in an economy in which intellectual capital is

[1] The data set developed here forms part of the joint Irish Management Institute-University of Limerick research programme on knowledge-intensive Irish companies. A collaborative arrangement is in place with the University of Maryland at College Park in the USA. This programme is directed by IMI-UL Professor Patrick Flood and Tony Dromgoole of the IMI.

provided by other than financial capitalists. It is also likely that as part of this process the attempts of financial capitalists to capture and establish ownership by means of patents or its physical expression in the form of recipes and manuals will be resisted by employees. The nature of relationships internally will also be affected with power correlating more closely to knowledge and knowledge networks than to hierarchy within a traditional organisation structure.

Furthermore, in an economy in which the importance of teams, knowledge flows, processes and collegiality are commonly seen as facilitators of value creation, the traditional predict-direct-exploit-reward paradigm which underpins the agency view of firm organisation may be increasingly challenged by models which emphasise notions of trust, empowerment, alliance and transformation. These will require the development of internal management techniques which recognise and encourage the accommodation of these concepts as well as reporting methodologies which distinguish between entities in which these traits are increasing and those in which they are decreasing. These techniques will also need to recognise the often chaotic and intuitive process of creativity and 'knowing'.

5. Discussion

The challenge for accounting therefore becomes one of a fundamentally ontological nature: continue with and modify a positivist model which has traditionally had difficulty with either recognising or measuring assets which cannot be fully objectified, or contemplate a new model in which the insights provided by Habermasian theory, or others, could inform the nature of the new paradigm.

In fact, there has been a willingness on the part of some accounting academics to consider the relevance of Habermas to managerial accounting practices and financial statements that are proving increasingly incapable of meeting the requirements of their principal users (O'Regan and O'Donnell, 2000). Thus, Laughlin (1987), Arrington and Puxty (1991), Broadbent and Laughlin (1994) and Power and Laughlin (1996), have attempted applications of Habermas' notion of communicative action within accounting and have sought to extend beyond the traditional technical/objectivist paradigm to include both interpersonal and subjectivist dimensions (Power and Laughlin, 1996). However, their main focus has been on identifying and exploring the implications of the self-legitimating role of the 'expert', to 'question *who* can monopolise public dialogue opportunities' and to explore how Habermas' idea of 'internal colonisation' might be applied (Power and Laughlin, 1996; Collins, 1979; Fischer, 1990).

However, the real significance of Habermas' notion of communicative action lies in the fact that at a time when accounting is being forced by commercial realities to reconsider its ontological and epistemological framework, it offers a theoretical, substantive and real platform on which a paradigm shift, as called for by Spender (1998), might be explored (O'Donnell, 1999b). We claim that applying Habermasian theory from a lifeworld perspective has the potential to facilitate a broadening in the conceptual discipline of accounting, a broadening which is capable of providing insight into the intangible nature of intellectual capital. It may offer the means by which the colonisation by the system of accounting technology and regulatory bodies of the accounting 'lifeworld', that is the social, cultural and communication context within which the accounting system is located, may be renegotiated (Burrell, 1994; Laughlin, 1987; O'Regan & O'Donnell, 2000; Power and Laughlin, 1996).

6. Conclusion

As confirmed by this research, by creating competitive advantage intangible assets such as intellectual capital are playing an increasingly important role in the wealth-creating dynamic of the knowledge economy. If it is to be properly managed, however, information systems appropriate to intangible resources and to the needs of an increasing range of users and stakeholders will need to be satisfied. Accounting has traditionally been the principal supplier of such information, gathering and presenting it in a manner such as to allow timely and informed decision-making by management and stakeholders. But accounting's capacity to continue to function as a primary information provider has been compromised by its inability to respond more rapidly to the demands of a new economy in which intangible resources have emerged as the principal catalysts for growth, with consequent radical changes in organisational structure and knowledge flows.

The information revolution, therefore, offers a number of challenges for accounting, and this research project is being extended to investigate ways in which existing accounting methodologies and paradigms are being adapted by firms operating in this new economy. Significantly, these challenges may be best met by those who learn to apply traditional collection, valuation, reporting and auditing skills in developing new ways of facilitating the creation, integration and management of knowledge in a transparent manner. This will involve the development of new accounting concepts and approaches which not only identify, evaluate and classify, but which are sensitive to the novel stakeholding and knowledge-creating dynamics of the new economy.

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