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# **Valuation of Information Assets**

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## ABSTRACT

Information is an important asset for organisations. The concepts of intellectual capital and knowledge management have focused managers' attention on how organisations can exploit information assets for commercial gain. Yet, without acceptance of the need for or means of evaluation of information assets, it is difficult to highlight the benefits of such concepts in commercial terms. This paper deals with some of the conceptual issues relating to this issue.

The term 'information assets' can be defined as *data that is or should be documented, and which has value or potential value*. Information is often seen as a raw material and knowledge is an end result achieved through learning. However, knowledge is also raw material, and information an end result through formalisation.

Among the identifying attributes of information one can include expandable, compressible, substitutable, easily transportable, diffusable and shareable. These attributes are manifest in organisational activities such as monitoring how processes are performed, integrating different business processes, customising products and services, and creating information products as the primary output of a business. It is evident, therefore, that the scope of information assets within organisations can be extremely far reaching.

The accounting concept of assets does not easily accommodate information assets. Since information cannot be readily measured in monetary terms, and since cost is not a measure of value, there is the problem of how the value of information assets might be ascertained.

Approaching this issue requires a consideration of the two main reasons for valuing information assets. The first is for financial reporting purposes whilst the second is to encourage the better management of information assets. With regard to the former, there are two potential paths which financial reporting may take in the future which may accommodate information assets. The first is for a major review of accounting practice to include intellectual capital, and the second involves reporting information assets which may impact on the performance of a company as an additional commentary in a company's annual Operating and Financial Review. With regard to the latter, a possible approach might be to value information in the light of its

contribution to making improved decisions, although this has both conceptual and measurement problems associated with it.

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## **1. Introduction**

Information is an important asset for organisations. The concepts of intellectual capital and knowledge management have focused managers' attention on how organisations can exploit information assets for commercial gain. Yet, without acceptance of the need for or means of a valuation of information assets, it is difficult to highlight the benefits of such concepts in commercial terms.

## **2. The UK accounting standard for Goodwill and Intangible assets (FRS10)**

The starting point for this project was the publication of a new accounting standard for intangible assets. The UK Accounting Standard for Goodwill and Intangible Assets FRS 10 (ASB, 1997a) recommended three methods which could be used to value intangible assets in UK companies.

These are:

- the amount for which such an asset could be sold;
- the difference between cost and fair value if it has been purchased;
- by reference to any active market where frequent buying and selling of such an asset takes place.

FRS10 required that, from 23 December 1998, UK companies capitalise their intangible assets (defined as non-financial assets that have no physical substance but which are identifiable and are controlled by the company through custody or legal rights) as long as they have "readily ascertainable market value". Such intangibles should be amortised over their useful economic life. The main focus of FRS10 was in setting out general guidance on accounting for intangibles. We sought to investigate whether information assets were being valued by organisations using FRS10 and, if so, by which method. This paper deals with some of the conceptual issues, and a second paper deals with the empirical findings.

In 1989, the Accounting Standards Committee (forerunner of the Accounting Standards Board) suggested that the UK adopt what were essentially US rules for goodwill, ED47 (Exposure Draft); and for other intangible fixed assets, ED52 (Higson, 1998, p.142). These proposals did not become accounting standards. In 1993, the Accounting Standards Board invited comments on a number of options, including the existing alternatives of netting and capitalisation, but also with a proposal that purchased goodwill be carried in the balance sheet unamortised as long as it was subject to an annual “ceiling test” to ensure that its continuing value was above cost. This eventually became FRS10, which is now one of the most widely consulted standards ever published by the ASB.

One of the most important aspects of FRS10 was that it aligns the treatment of goodwill and purchased intangibles in the UK. Farmer (1998, p.24) notes how the accounting treatment of purchased goodwill and intangibles are aligned:

*“the clear intention of the standard is that brands and other intangibles, e.g. licences, patents and copyrights should be treated in future in the same way as goodwill. It was a seen anomaly of previous practice that whilst purchased goodwill was, most often, immediately written off against reserves avoiding any charge to profit and loss account but depleting the company’s capital base, acquired brands could and were capitalised. Now both categories must be capitalised, and unless evidence to the contrary can be shown by impairment reviews, they must be written off over a maximum of twenty years”.*

As Kennedy notes in 1996 on the publication of FRED 12 (Financial reporting exposure draft) a key problem with intangibles may always remain:

- Purchased intangible assets to be recognised separately from goodwill when their value can be measured reliably (Kennedy, 1996, p.122).

This requirement has led to the view that purchased intangible assets can be recognised separately from purchased goodwill only when their value can be measured reliably. Subjective decisions will be made on the valuation of intangibles, as there are no agreed valuation methods



for intangibles a reliable measure is unlikely to be agreed (Kennedy, 1996, p.122). However, FRS10, for the first time, sets out methods by which a valuation might be achieved. These could, in principle, be applied to valuing information as an asset. We sought to investigate whether information assets were being valued by organisations using FRS10 and, if so, by which method.

### **3. What are information assets?**

Many organisations recognise that managing and exploiting information as a corporate resource can produce benefits, (for example, in gaining competitive advantage). In a recent Reuters report, *Out of the abyss, surviving the information age* (1998), it was found that 87% of UK managers view information as “mission critical to their business”. However, identifying what comprises this “mission critical” information is difficult.

The Hawley Report (1994) first coined the term “information assets”. Information assets are defined as “data that is or should be documented, and which has value or potential value” (Hawley Report, 1994, p.7). The Hawley Committee chose the term “information assets”, because every board of directors can relate easily to managing and reporting assets (Skyrme, 1998, p.76). The Hawley Committee proposed that information should be treated like any other corporate asset and as part of the good governance of an organisation (Horne, 1998, p10).

The Hawley Report (1994, p.9) found that when organisations looked at and listed their information assets, they did so by type. However, there was no comprehensive approach to identifying information assets nor consistency in identification across organisations. The Hawley Report (1994) recommended that those assets that were identified should be valued.

Among the types identified were:

- Market and customer information.
- Product information.
- Business process information.

- Management information and plans.
- Human resource information.
- Supplier information.

In 1995, Reuters published *Information as an asset: the invisible goldmine*, (Reuters, 1995) which reported the results of 500 telephone interviews with senior managers in UK companies. The main conclusions of this report, which received wide publicity, were that one in four UK companies said that information was its most important asset; half thought it was more important than trade names and Registered Trade Marks; and one in ten valued its information more than its staff. More than 40% of respondents said their companies had not woken up to the value of their information assets. The results showed that companies want to capitalise their expenditure on information: one in six already did so at the time of the research, and a further 10% hoped to do so in the near future. Some 25% of the respondents said they could not capitalise information assets because they found it too hard to identify what the value of the assets were (Reuters, 1995, p.4).

The concepts of knowledge management and intellectual capital have widened perceptions of how information assets can be exploited for commercial advantage. Knowledge management and intellectual capital have perhaps added to rather than clarified the debate on information assets. They have brought ideas such as know-how, intellect and the creative spark to the forefront.

Skyrme (1998) defines knowledge management as:

*“the explicit and systematic management of vital knowledge and its associated processes of creating, gathering, organising, diffusion, use and exploitation”.*

- Knowledge management experts typically identify two types of knowledge within organisations: Explicit knowledge.
- Tacit knowledge.

Explicit knowledge is recorded knowledge that can be found in the form of documents of the organisation, reports, articles, manuals, procedures, videos, software and so on. Tacit knowledge is personal knowledge, embedded in individual experience, and is usually shared and exchanged through direct face to face contact (Willard, 1997, pp.31-32). Tacit knowledge can be communicated quite quickly, whereas explicit knowledge has to be found, read, digested and understood. However, the recording of tacit knowledge can be difficult; it lies in unique expertise and cultural experiences.

Explicit knowledge in the form of reports or documents can be exploited as information assets. It is, however, the tacit knowledge of organisations and the ability to formalise such knowledge in an accessible way which has become a widely discussed area. This is especially clear in the development of intellectual capital programmes to capture intellectual assets.

Information assets and their valuation may help companies identify where expertise is growing within a company and where it can be exploited both internally and externally. However, there have been, so far, few attempts to value information assets in organisations. This may, at least in part, be due to the continuing confusion on the role of information and knowledge in organisations.

#### **4. Information and knowledge**

There is a great deal of confusion as to what constitutes information and knowledge within organisations. In Exhibit 1 below, Badenoch et al. (1994, p.11) trace the development of the concepts of information and knowledge.

Exhibit 1. Definitions of information

Source	Definition of information	Information and knowledge
Blumenthal, 1969	Data recorded, classified, organised, related or interpreted within context to convey meaning.	Information is the link between knowledge and observed phenomena.
Bell, 1979	A pattern or design that rearranges data for instrumental purposes.	Information is the link between knowledge and observed phenomena, emphasising interpretation of phenomena (data).
Burch, 1974	The result of modelling, formatting, organising or converting data in a way that increases the level of knowledge for its recipient.	Information supplies and supports knowledge.
Deeson, 1991	That which adds to human knowledge.	Information supplies knowledge.
Arrow, 1984	The reduction in uncertainty.	Knowledge is manifest in terms of uncertainty about outcomes in the real world; information is a change in this probabilistic state; implies that information is “useful knowledge”.
Stonier, 1990	Information is a function of complexity.	Knowledge is “organised information in people’s heads”.
OED	Knowledge communicated concerning some particular fact, subject or event.	Information is an expression of knowledge.
Farradane, 1976	Representation of knowledge or of thought.	Information is an expression of knowledge.

Information is often seen as a raw material and knowledge is an end result achieved through learning. However, knowledge is also a raw material, and information an end result through formalisation. In an organisational context information and knowledge have impact only to the extent that they result in action.

It is clear that some information assets, as suggested by the Hawley Report (1994), will be easier to identify and value than others, most notably those that already have formalised stores and transaction records. However, it is also recognised that intellectual capital and knowledge management concepts may enable the identification of what a company needs to value. This assumes that information is a special asset, which has a role far beyond traditional intangible assets.

## **5. Is information a special asset?**

There have been attempts to identify the attributes of information which make it essential for organisational success or which mark information out as an important organisational asset.

Repo identifies the unique characteristics that information possesses:

- Information is human. It exists only through human perception.
- Information is expandable. The free flow of information maximises its use.
- Information is compressible.
- Information is substitutable. It may save money by substituting the use of other resources.
- Information is easily transportable by using applications of new information technology.
- Information is diffusable. It tends to “leak” though we try to contain it.
- Information is shareable, giving it away does not mean losing it (1986, p.374).

Orna (1999, p.140) describes the well-being of an organisation being linked to the value which knowledge and information confer:

- The organisation’s purposes, goals, and values. How intangibles such as knowledge and information contribute to achieving what it most values.
- The value of knowledge and information in gaining sustenance and keeping the organisation successful.
- Identifying critical knowledge and information for the organisation and managing it.
- Intelligence about its markets, and the flow of information about them.

Davenport lists organisational activities where information is both an essential element without which activities could not take place and which has the potential to confer value through:

- Monitoring how processes are performed - businesses that are effective in managing/monitoring information about quality have a competitive advantage.
- Integrating different business processes, and integrating stages within individual processes - information is the glue that holds the organisation structure together.
- Customising products and services – when information about customers is managed to create offerings tailored to their needs, it gives a competitive edge to the organisation. Supporting strategic decision-making processes with vital unstructured and externally-originating information, which is more relevant than the “historic” financial information from accounting systems which is generally used.
- Creating information products as the primary output of the business. More and more businesses have these as their main output. Those that use their resources of information fully to support the process of creating such outputs are more likely to succeed (1993, pp. 73-81).

The scope of information assets within organisations can be extremely far reaching. The information assets, which are perceived to have the most value, may indeed be in individual expertise or knowledge. While it is difficult to value these qualities, it is likely to become easier as more of this tacit knowledge is formalised through knowledge management and intellectual capital systems. One way to approach the valuation of information is as an intangible asset similar to other intangibles like brands and trade names.

## **6. Information as an intangible asset in accounting**

The accounting concept of assets does not easily accommodate information assets. In accounting, only those items that can be expressed in terms of money are recorded. Achieving a valuation of information assets in UK companies depends on the recognition and definition of information as an asset in accounting terms. To be accepted as an asset in accounting terms, however, is complex and depends on information assets fulfilling requirements of both

recognition and definition. For information to be recognised as an asset in accounting terms, it must give:

*“rights or other access to future economic benefits.”*

(Draft Statement of Principles for Financial Reporting, Accounting Standards Board. 1999b)

If we consider that no information assets can bring no future benefits and that information whether self-generated or selected from public sources, is of value in pointing the way to commercial opportunity then information may give rights to future benefits and should be considered an asset. However, information assets that are not leveraged cannot be considered assets. Unless the information asset impacts on an organisation’s capability to make better decisions and get better results then it does not give “rights or other access” to future benefits. Yet, if the information asset does not exist or is not kept up to date, the potential for leveraging in a significant way is greatly reduced.

The ownership of information assets also traditionally presents problems. The words “rights or other access” emphasise that what constitutes an asset is not a particular item of property itself, but rather benefits deriving from ownership, occupation or use (Davies, Paterson, and Wilson, 1997, p.97). This means that the ability to enjoy benefits does not necessarily imply an ownership principle (Davies, Paterson, and Wilson, 1997, p.97). Information can therefore be recognised as an asset in accounting terms even if it is not owned by the organisation, if it can be shown to give future benefits. One example of this might be through licence rights, where one company pays fees to another for access to a newly-developed product or service. Although the company that pays the licence fees does not own the product or service, the licence implies “rights or future access” and so may be considered an asset.

It is control of the information asset and its propensity to “leak” (Repo, 1986, p.374) that is the greatest barrier to the definition of information as an asset in accounting terms. Control in the context of the definition of an asset means the ability to obtain economic benefits and restrict that of third parties. Therefore, “items that cannot be separately identified from the business as a whole cannot be individually controlled by the entity and hence are not assets” (Davies,

Paterson, and Wilson, 1997, p.97). Information is typically diffused through all aspects of the business (Davenport, 1993, p.79). For example, a business may, in principle, sell a database as a separate asset. Yet, the idea that the information included in the database was selected by the organisation's employees according to their own criteria and created from many different areas creates difficulties as does the currency of the database. Unless the business could also sell all of the inputs which created and which update the database then it is not "separable". This would, in many cases, mean selling the entire business.

The requirement that an asset must be "separable" and "controllable" by the entity, that it must be capable of being sold separately from the business, means that in principle, information cannot be considered as an asset. Indeed, the control of an asset questions the premise that an asset does not have to be owned. If an asset must be "controllable" then this implies ownership rather than "rights or other access".

Even if information assets could be readily defined and recognised as assets in accounting terms, there are difficulties. In practice, according to Davies, Paterson, and Wilson, (1997, p.100) the recognition process for assets, which currently takes place, is based on the recording and analysis of transactions. This would be difficult in the case of information, as information assets are not transaction based. If information were accepted as an asset in accounting, it would be as an intangible asset, and there is a good deal of controversy surrounding this area in accounting.

The traditional view (Donaldson, 1992, p.35) has been that intangible assets comprise brand names and patents. Companies including brand valuations on their balance sheets in the 1980's, such as Ranks, Hovis MacDougall, gave the impetus to the debate on the inclusion of intangible assets in financial accounts (Campbell, 1989). The traditional view (Donaldson, 1992, p.35) has been that intangible assets comprise brand names and patents. Intangible assets now have a much wider definition and may include information assets. Information does have qualities, which differentiate it from traditional intangibles. These are qualities which perhaps make the valuation of information assets more pressing than for any other intangible asset.

They are:



- If information is exchanged and traded, the value from it can increase for all parties (Orna, 1999, p.141).
- The value of knowledge is not diminished by the knowledge being used (Orna, 1999, p.141).
- Information is a diffused resource, which enters into all aspects of the business (Davenport, 1993, p.79).

The valuation of information as an intangible asset may provide organisations with assets which increase in value when used, which do not deplete no matter how much they are used and which are inherently present in everything an organisation does. To include such assets on the balance sheet would be a major recognition of their importance and an indicator of management's ability to identify and exploit them.

## **7. Measurement of information assets**

If information assets are to be included on the balance sheet of organisations, then they must be capable of being valued as assets in financial reports. A necessary condition for initial recognition or subsequent re-measurement of an asset for financial reporting is that an element or a change in an element can be measured with sufficient reliability (Davies, Paterson, and Wilson, 1997 p.100). The reliability or measurement is affected by three factors:

- the ability to measure the benefits inherent in the item in monetary terms;
- the variability of the size of these benefits (both the spread of possible levels of benefit and the chance of any particular level of benefit occurring);
- the existence of a minimum amount.

The benefits of information assets are often found in the internal business processes of organisations. While information assets may underpin important revenue-generating activities, there may be no benefits in monetary terms. The creation costs involved in information are often significant. This is clear even in the acquisition of materials. For example, a survey conducted by TFPL in 1997 (Creaser and Spiller, 1997, p. 29) found that expenditure on printed materials in small special libraries (such as those dealing with law and government) was more than

£50,000 a year. If the valuation of information assets cannot often be based on monetary returns, then the significant costs of information seem the best way of arriving at a valuation.

Burk and Horton (1988, p.82) identified the cost elements of information and divided them into a number of categories:

- Functional elements, i.e. doing things with information like editing, indexing, information acquisition, photocopying and storage.
- Resource elements, such as capital costs and the costs of administrative overheads, hardware and software, information itself, staff and materials.
- Temporal elements, such as depreciation, systems development, life-cycle changes and rental fees.

The valuation of information assets is often based on the cost of acquiring information. This is not a satisfactory solution, however, since quantifying such costs of information is not a straightforward matter. Consider the cost to the organisation of replacing lost information. An information asset may have been built up over many years. It may no longer be available from elsewhere. In any case, the interaction of the various elements of information may have produced a unique information asset, which cannot be replaced at any cost. Similarly, the cost of information is often not related to its value. Information which cost little to acquire may be very valuable in the right circumstances, while information which cost a great deal to collect may prove useless.

The cost of information is therefore not always a reliable figure on which to base value. However, the usual convention in financial reporting is to base value on cost. Certainly there is an argument for assigning such a value on the basis of contingency liability. This means that the loss of information assets would be insured against, the objective being to protect the organisation in the event of legal action rather than to replace or replicate the lost information asset.

If information cannot be readily measured in monetary terms and cost is not a measure of value, then how can value be ascertained? Burk and Horton (1988, p. 91-99) identify attributes in the value of information resource entities. Information resource entities or IRE's are defined as a configuration of people, things, energy, information, and other inputs that has the capacity to create, acquire, provide, process, store or disseminate information (Burk and Horton, 1988, p.21).

- (i) Quality of information itself.  
Degree of accuracy, comprehensiveness, credibility, relevance, simplicity and validity.
- (ii) Utility of information holdings.  
Degree of intellectual and physical accessibility, ease of use, flexibility, presentation.
- (iii) Impact on productivity of organisation.  
Contribution to improvement in decision-making, product quality, efficiency of operation, or working conditions, time-saving, promotion of timely action.
- (iv) Impact on effectiveness of organisation.  
Contribution to new markets, improved customer satisfaction, meeting targets and objectives, promoting more harmonious relationships.
- (v) Impact on financial position.  
Contribution to cost reduction or cost saving, substitution for more expensive resource inputs, increased profits and return on investment.

Such an approach also presents problems. For example, it is difficult to “know” what information (if any) has contributed to making a decision. It may be even more difficult to demonstrate ex post or ex ante that information has a positive effect on the financial position of a company in terms of increased profits. While information may underpin many revenue-generating activities, it is difficult to identify any particular piece of information as revenue-generating, unless it is sold. Despite difficulties of recognition and definition of information as

an asset, it is accounting rather than information which may provide a general framework for valuing information and one that may be readily recognised by managers.

## **8. Valuation of information assets in accounting**

There are two main methods of valuing assets, historic cost and current cost. Historic cost is the major valuation method employed in financial accounting. Its main advantage is that it is objective, because costs are based on a past exchange transaction. However, the purchasing power of the unit of measurement (e.g. £ sterling) is not constant over time. The second method, current cost accounting, is concerned with valuing assets in terms of today's purchasing power of the unit of measurement itself. Current cost accounting values all assets at current cost and can be defined as the cost to replace the assets if bought today (Oppenheim, 1998, p.211).

Edwards and Bell (1961, p.74) set out the dimensions of value. They advise that when values are assigned, at least three things should be carefully stated. By specifying these dimensions and indicating the ways in which they can be combined, the ambiguous nature of value can be made clear.

The dimensions are:

- (i) The form (and place) of the thing valued.
- (ii) The date of the price used in valuation.
- (iii) The market from which the price is obtained.

Secondly, there are three ways to describe the asset according to Edwards and Bell:

- (i) In present form.
- (ii) In terms of input.
- (iii) Ultimate output.

In whichever way an asset is described for valuation purposes, the prices must carry dates before the values can have significance. Therefore, the list of inputs, which the company used in bringing the asset to its present state, can be assigned prices that are past, current or future. The

price assigned to the asset in its present form could also carry a past, current or future date and the prices assigned to the asset in its ultimate form could also bear past, current or future dates.

The combination of the three form descriptions with the three time specifications yields nine possible values for a particular asset (Edwards and Bell, 1961) See Exhibit 2. A current, past or future price for an asset can, however, be obtained from many different markets, so that the possible values for a particular asset are increased. These markets can be divided into two kinds, the markets in which the company could buy the assets in its specified form and at the specified time, and the markets in which the company could sell the asset in its specified form and at the specified time.

Exhibit 2 Nine value concepts

Past	Present	Future
Form and Place	Date	Market
Present Form	Input	Ultimate Output

When buying an asset, the prices obtained in markets are called entry prices; the prices obtained in markets when selling an asset are exit prices. It is assumed that the only significant entry price is the lowest known to the company while the only significant exit price is the highest known to the company. In other words, the company would buy the asset as cheaply as possible and sell as profitably as possible. It is still necessary to show that a difference between entry and exit prices is likely to exist at least for some important assets (e.g. reflecting transactions cost). Edwards and Bell (1961) solve this problem by listing the conditions under which entry prices and exit prices could be expected to be the same.

These conditions are the following:

- (i) There must exist a large number of identical assets traded on one market so that market prices are known for both new and used assets.
- (ii) The company must have non-discriminatory access to both the selling and buying sides of that market.
- (iii) There must be no transportation or installation costs involved in either the purchase or the sale of the particular asset.

The best selling price a company could get for an asset is the price the prospective buyer would have to pay the manufacturer or wholesaler, including delivery or installation less the cost of removal from the seller. The amount is likely to be less than the company's lowest buying price because the company in selling must bear the cost of removal, delivery, and installation for the buyer. Given a difference between entry and exit prices Edwards and Bell (1961) identify eighteen possible value concepts. They identify six as important (highlighted in bold in Exhibit 3) three based on exit prices and three based on entry prices.

Exhibit 3 An array of value concepts

Value date market	Form and place of asset	Initial inputs	Present form	Ultimate form
Past/entry		<b>Historic costs</b>	Discarded alternative	Irrelevant
Past, exit		Discarded alternatives	Discarded alternatives	Irrelevant
Current, entry		<b>Current costs</b>	<b>Present costs</b>	Irrelevant
Current, exit		Irrelevant	<b>Opportunity costs</b>	<b>Current value</b>
Future, entry		Possible replacement costs	Possible replacement costs	Irrelevant
Future, exit		Irrelevant	Possible selling values	<b>Expected values</b>

Source: Edwards and Bell, 1961, p.77

Each of these six methods has its pros and cons, and its proponents and opponents. The historic cost of acquiring an asset is objective and factual. One simply checks the records. However, this does not indicate the value of the asset now. The replacement cost can similarly be estimated with reasonable accuracy. The revenue that would have been generated had the asset been sold in the past is not relevant to a valuation now. The present value if sold now can be estimated with reasonable accuracy. The value if sold in the future is highly subjective, but is arguably the best estimate of the value of the asset. It is the value of the asset in the future which is relevant to the business today not the historic cost. The expected value is therefore not the most practicable method of measuring the value of an asset, but is highly relevant.

In the case of intangible assets, especially information, it is extremely difficult to identify the date of acquisition required by historic accounting. Information is generated by efforts that often do not always have quantifiable costs and may have been acquired over a considerable period of time (Brockington, 1996, p.6). Alternative approaches include the value of the asset if sold today, or the best value of the asset if used in an alternative manner. The advantage of this approach is that it provides a current view of the asset and the potential of the asset. The disadvantage is that tangible assets are typically valued using historic cost accounting and the resulting mixture of the two methods is unsatisfactory.

Many intangible assets such as trademarks, brands, publishing rights and patents have been subjected to valuation. Because of the unavailability of market cost and the inappropriateness of historic cost, most valuations of intangible assets are based on some form of economic valuation. This is the figure that is estimated that someone would pay for the asset given the expectations of cash flows it would generate and the risks associated with these (Oppenheim, 1998, p.212).

Whatever model of valuation is adopted, data has to be collected regarding that asset. In particular, projections of cash flows resulting from the use of the asset will have to be collected. In the case of information, such data collection would be very difficult. If using costs, one must calculate the historic cost to acquire the information, and replacement cost if all the information were to vanish. If one were to base the valuation on the replacement costs problems would also

arise. Firstly, would it be desirable to replace the currently held information? Secondly, would it even be possible? (Oppenheim, 1998, p.211).

The preferred method is to look to future-oriented economic-based valuations and, in particular, to look at the capitalisation of future cash flows generated by the asset (Oppenheim, 1998, p.212). However, information typically has no such cash flows readily identifiable even though it may make up a large part of a company's ability to compete on the open market. The problem with identifying cash flows from specific information assets means that valuation is still very difficult. It is, however, the realisation of expected value of the information assets which is of interest and, while cash flows may not be identifiable, the commercial exploitation of an information asset which is identified and valued even speculatively is greatly increased.

The valuation of information as an asset is therefore subjective but relevant. This is not a new idea (as evidenced by Edwards and Bell, 1961). The importance of recognising value judgements as an important aspect of interpreting financial results was also recommended by Sir Geoffrey Vickers, who called for "an appreciation system where judgements of value give meaning to judgements of reality (facts)" (Wilson and Chua, 1993). It is perhaps the limitations of reporting such assets, and the need to better manage them, which needs to be addressed first, rather than the mechanics of valuation.

## **9. Financial reporting of information assets and management**

Research by Citibank and Interbrand Newell and Sorrell suggests that, in most cases, out of date accounting methods prevent financial reports accounting for about two-thirds of the real value of organisations (Batchelor, 1999, p.84). That value is tied up in brands, copyright, and corporate reputation and other forms of goodwill.

Hope and Hope (1998, p. 180-181) also state that traditional financial reports no longer provide the information required by companies or investors. In 1996, Microsoft's market value was 11.2 times its tangible asset value. This "missing value", to a large degree, represents the market's estimation of Microsoft's stock of intellectual capital that is not captured in its financial reports. This is now not the exception but rather the rule and illustrates one of the major limitations of the



current financial accounting model according to Hope and Hope. Some 50-90 percent of the value created by a company comes not from the management of traditional physical assets, but from the management of intellectual capital (Hope and Hope, 1998, p.170).

An example of the high valuation of intangible assets by the market can be seen in a comparison of Internet companies with few tangible assets and traditional companies. This shows that investors in the knowledge economy have not been deterred from funding companies which have little in the way of tangible assets or structural capital, so long as they have expertise in the Internet, telecommunications or a related technological field. Companies which are well-established in traditional industries and which can rely on many years' proven success are increasingly being valued at similar market capitalisation to the new Internet companies.

Exhibit 4 below, developed by Martin White compares market capitalisation of some selected established and Internet companies. The exhibit was prepared in early August 1999. (N.B. These figures predate AOL's merger with Time Warner).

Exhibit 4 Market capitalisation in August 1999

Market capitalisation	Net world	Real world
\$140Billion	AOL	Glaxo Wellcome
\$35Billion	Yahoo!	Barclays Bank
\$23Billion	Amazon	Halifax Bank
\$17Billion	@Home	Tesco
\$8Billion	Excite	British Airways

Orange, the mobile telephone company, has been valued at £16 billion, more than twice Marks & Spencer's value. Orange has never made a profit, whilst Marks and Spencer is a long established and profitable company in the retail business (Wheatcroft, 1999, p.21).

The high valuation of Internet companies is a reflection of a new information economy (Kelly, 1999, pp.65-82), an economy which can no longer be understood in the terms of the industrial

age. Kelly suggests that investors, both corporate and individual, have a better grasp than accountants in an economy where:

*“the best way to prove the value of your product is to give it away, an economy in which the most valuable commodities are not finite quantities of rare minerals such as gold or oil, but mass-produced ubiquitous items constantly falling in price.”*

There is also growing concern that traditional transaction-based financial reporting does not adequately inform managers or investors within the accounting community. Non-financial measures such as customer satisfaction indexes and employee satisfaction indexes are increasingly being implemented by organisations, requiring managers not to rely solely on traditional financial measures. Company performance is now being measured internally by many organisations using the balanced scorecard developed by Kaplan and Norton (1996, p.85). According to Kaplan and Norton (1996, p.80), as more senior executives gain confidence in using the so-called balanced scorecard to monitor strategic performance and predict future financial performance, management will find ways to inform outside investors about these measures.

Chris Swinson, a recent past President of the Institute of Chartered Accountants in England and Wales, has called for a major review of financial reporting (ICAEW, 1998, p.1). Swinson says:

*“Corporate reporting is at a crossroads. Globalisation, information technology, developments in corporate governance and the increasing importance of intellectual capital are all raising fundamental questions about how companies report on their performance. Leading edge companies are seizing the opportunity presented by the new business landscape to make corporate reporting on performance an integral part of their business strategy, rather than merely a statutory obligation.”*

On behalf of an influential international accounting body, the International Federation of Accountants (IFAC) in a report from its Financial and Management Accounting Committee (FMAC) Dzinkowski has also said:

*“Accounting for intellectual capital will ultimately require the invention of new financial and management accounting concepts and practices.”*

(Dzinkowski, 1998, p.4).

This suggests that major changes may be required. In the UK, the Operating and Financial Review is already designed to encourage companies to analyse and explain the main features underlying their results and financial position. The Operating and Financial Review is a framework for the directors to discuss and analyse the business’s performance, in order to assist users to assess for themselves the future potential of the business (ASB, 1993c, p.4). The Accounting Standards Board (1993c, p.15) has said:

*“The OFR (Operating and Financial Review) could also give a commentary on the strengths and resources of the business whose value is not reflected in the balance sheet (or only partially shown in the balance sheet).”*

There are therefore two paths which financial reporting may take in the future and both may accommodate information assets. The first is for a major review of accounting practice to include intellectual capital as suggested by IFAC. The second is a more conservative yet probably more attainable route. This involves reporting information assets which may impact on the performance of a company as an additional commentary in the Operating and Financial Review.

A double accounting approach to the balance sheet may well emerge, with the main balance sheet containing the traditional assets of the company, and a second balance sheet containing intangible assets such as intellectual property, brands and information assets. The inclusion of information assets on such a second balance sheet would be a major recognition of their importance, and would raise the profile of information with senior management. Such initiatives are already underway in organisations.

One example of such an approach is the Skandia Insurance Company ([www.skandia.com](http://www.skandia.com)). It has been transformed in recent years into one of the largest and most profitable insurance

companies in the world. It ascribes its success to its understanding of intellectual capital. Skandia states that “activities are currently being carried out at Skandia to develop a complementary accounting taxonomy.” Shareholders receive a special report with the annual report, describing the capitalisation of Skandia’s intellectual capital. Skandia also states “A true and fair view of Skandia’s development requires a broader description of our business than can be read in our financial accounting.”

There is also an opposing argument that organisations do not have to report intangible assets to manage these resources effectively. Microsoft is one example of how a company can effectively manage intellectual capital but not report it. Microsoft does not account for its intellectual capital on its balance sheet. According to the Chief Financial Officer, Mike Brown, it does not need to (Brown, 1997, p.45).

Brown recommends “getting back to basics” in accounting:

*“Accountants are not analysts and should not try to do an analyst’s job. They should rely on the accounting fundamentals that have served the business community for so long. People are Microsoft’s most important asset but they are not on the balance sheet, even though employee costs figure prominently on the profit and loss account because product groups are reorganised frequently in response to new business challenges.”*

The difference between market and book value for Microsoft does not create problems for investors according to Brown. He sums up:

*“If accountants attempted to adjust cost basis financial statements for rapidly changing market valuations, far bigger problems will arise. We would see unnecessary volatility based not on the company’s recent performance but on the market’s short term whims.”*

Microsoft does, however, manage its human capital in line with intellectual capital management principles, through knowledge mapping for their people (Davenport and Prusak, 1998, pp. 74-77). An information systems group has mapped the knowledge of Microsoft systems developers.

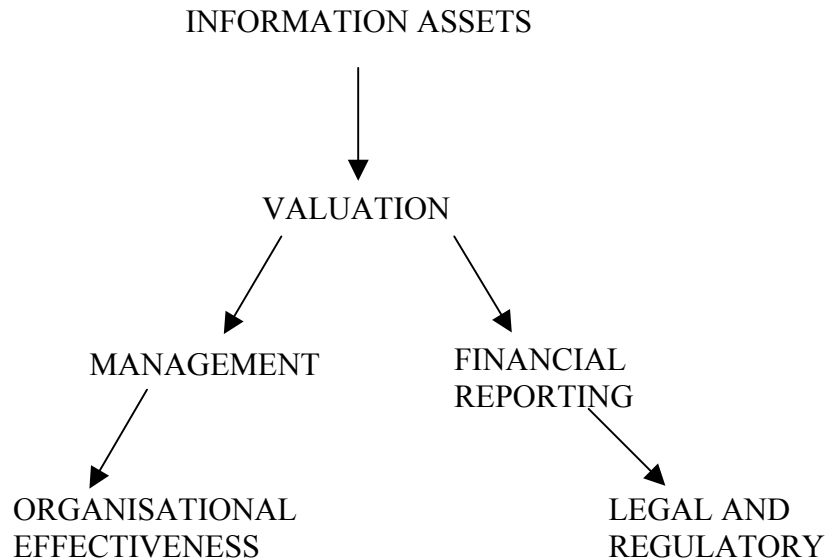
The project focused not just on entry level knowledge, but on the need to stay ahead of the competition: this is a basic tenet of intellectual capital measurement.

Reliance on traditional financial statements as advocated by Brown assumes that there is no need to address any shortcomings. These will become increasingly difficult to ignore. As Dzinkowski (1998, p.4) points out:

*“Standard accounting models were designed for informing company management and stakeholders on stocks and flows of value - value that could be attributed to places, periods of time, products, customers, and activities. Most of these are quantifiable, and subject to generally accepted accounting practices (GAAP). In contrast, intellectual capital is a relatively new and unproved concept, relating primarily to the intangible, highly mutable assets of the firm. The current accounting model does not adequately capture their value nor represent them in a concise, meaningful format”.*

There are ultimately two reasons to value information assets. The first is for financial reporting in order to fulfil the legal and regulatory requirements. The second is to encourage the better management of those assets. It is clear that it will take some time before changes in financial reporting allow the inclusion of non-traditional information assets. This may not be the most significant reason to value information assets. To encourage the better management of information and so facilitate organisational effectiveness, the expected value of information assets could prove an effective valuation method (See Exhibit 5.).

Exhibit 5 Valuation of information assets, a choice.



One example of how the management of information assets can influence the success of companies is that of the Xerox Corporation. Xerox excelled at quality, at team-based management and pioneered many of the important technologies in use today (e.g., laptop computers) (Hope and Hope, 1998, p. 27). However, the company is not a frontrunner in these technologies now. Hamel and Prahalad (1994, p.16) suggest that “Xerox has probably left more money on the table, in the form of underexploited innovation, than any company in history.” They urge companies to build competencies in developing new products and services for the future so that such opportunities can be recognised and exploited. In other words, to be successful companies must differentiate. One of the most effective ways of achieving this is through building on assets like information.

A similar example is cited by Gordon Petrash of Dow Chemical (Manasco, 1998). By developing and managing a rigorous asset management system, Dow managed to cut patent tax maintenance by \$40 million and administration costs by \$10 million more over 10 years. More significantly, Dow could now capitalise on the revenue potential previously hidden in disorganised and orphaned patents. Petrash estimates that annual licensing income increased

from \$25 million in 1994, to more than \$125 million in 1998 (Monasco, 1998, p.2). It is arguable that the intangible assets, which facilitated this new financial return, were newly-recognised and exploited information assets, and not the patent assets, which had previously existed.

The publication of the Turnbull Report in September 1999 (ICAEW, 1999) has brought the concept of the internal management of assets to the forefront. The report deals with risk assessment and requires that internal control systems are set up and their effectiveness reported in annual accounts. The report represents the final element in the Combined Code on Corporate Governance and full compliance with the code will be required for UK companies from 23 December 2000. Companies will be formally required to identify and manage their significant risks, and internal control systems must be designed and regularly reviewed. There is a clear statement on information and communication:

- *“Do management and the board receive timely, relevant and reliable reports on progress against business objectives and the related risks that provide them with the information, from inside and outside the company, needed for decision-making and management review purposes? This could include performance reports and indicators of change, together with qualitative information such as on customer satisfaction, employee attitudes, etc”.*
- *“Are information needs and related information systems reassessed as objectives and related risks change or as reporting deficiencies are identified?”*
- *“Are periodic reporting procedures, including half-yearly and annual reporting, effective in communicating a balanced and understandable account of the company’s position and prospects?”*
- *“Are there established channels of communication for individuals to report suspected breaches of laws or regulations or other improprieties?”*

The protection and insurance of information calls for a valuation of information assets which goes beyond fulfilling legal and regulatory reporting requirements. Information loss is a significant risk for business. For example, the World Trade Center bombing in 1993 resulted in 150 out of 350 businesses that were evacuated going out of business. (Back pages, 1996, p.76). There are problems involved in valuing information for risk assessment, most obviously in how much not getting the benefits from information assets can be seen as a risk. However, these are areas that merit attention and where information assets which are managed and reported internally, could well transfer to an external-reporting environment.

Such developments suggest that if information assets can be identified and managed, recognised and valued they should be included on the balance sheets of companies. It is clear that unless real and consistent financial benefits can be demonstrated from investment in and management of information assets, there will be little impetus for companies to develop strategies to exploit them. This essentially means including information assets on the balance sheet of companies in order that they will be treated more seriously. A figure for information assets may be represented as an “expected value” on the balance sheet.

## **10. Two accounting measures for intellectual capital**

Standfield, (1999, p.1) reports on “Knowcorp” which has developed Intangible Accounting as a solution to the problem of measuring intellectual capital.

*“As only tangible costs and tangible benefits with a high-probability of occurring are estimated when we benchmark the potential impact of intangibles we can say that all ‘intangibles’ will one day become tangible and so be defined and exactly quantified.”*

In other words, all activities that create intangibles lead to a set of tangible outcomes. Knowcorp proposes a solution in Intangible Accounting, it is a “mirror image to conventional accounting.”



Tangible assets	↔	intangible assets
Tangible liabilities	↔	intangible liabilities
Tangible capital	↔	intangible capital
Tangible expenses	↔	intangible expenses
Tangible revenue	↔	intangible revenue
Tangible profit/loss	↔	intangible profit/loss

(Standfield, 1999, p.3).

Knowcorp use this method to benchmark the intangible operating structure of any business. Such an approach appears attractively simple, yet accounting for intangibles in the same way as tangibles is fraught with difficulty. The premise that intangibles will have tangible benefits ignores intangibles which underpin value-creating processes and which will still be recorded as costs. The approach does not take into account the unique attributes of intangibles which may give an organisation competitive advantage. Moreover, it does not explain why one company with the same intangible assets as another will outperform its competitors. The challenge is not only to account for intangibles but to focus attention on value-creating processes.

A second method is VAIC™ (value added intellectual coefficient): <http://www.measuring-ip.at/Papers/ham99txt.htm> Its developer, Pulic, has taken a new approach to value creation and monitoring operations to account for intellectual capital. He argues that modern business reality is not served by traditional evaluation methods. In Pulic's view, there are three essential elements that form the difference in business activity today:

- (i) the introduction of knowledge into products and services (quality not quantity is important). Labour has a different position now than it did in the industrial era, now the majority of labour is transforming knowledge into useful products. The same amount of labour may produce completely different business results;
- (ii) price now falls with increased information content rather than increased quantity;
- (iii) totally altered structure of expenditures. In a traditional company the ratio between production and all other costs was 80:20, today that ratio is reversed. In the traditional

company monitoring labour cost and materials was developed almost to perfection. However, today's significance of those costs is marginal. (Pulic, 1999, p.1).

There are appropriate information models providing necessary information on intellectual capital business activities or intellectual capital measurement systems, which can be used to identify value creation opportunities. The Skandia Navigator is one such system ([www.skandia.com](http://www.skandia.com)). The Skandia Navigator was one of the first methods to calculate and visualise intangible capital, but two important aspects are yet unresolved by this approach according to Pulic. These are:

- (i) Market based IC cannot be calculated for most companies. Only listed companies have a market value. These companies need to be valued in alternative ways to determine their market value.
- (ii) There is no adequate system monitoring the efficiency of current business activities performed by employees. This would indicate whether their potential is directed towards value creation or value destruction.

Pulic's solution, the "value added intellectual coefficient", is designed to provide information about value creation, and the efficiency of tangible and intangible assets within a company. The method can, according to Pulic, show if a company has become better or worse at managing its intellectual capital. The method has been tested by Pulic in a number of banking organisations but more extensive testing is required.

Both of these methods show that new ways of accounting for the intangible assets of organisations are being developed. However, we have to ask how receptive are those who will potentially benefit from these developments to the valuation of information assets?

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