

# The attributes of information as an asset, its measurement and role in enhancing organisational effectiveness

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## Abstract

This paper reports early findings from a research study being conducted in the Department of Information Science and The Business School at Loughborough University. The Arts and Humanities Research Board (AHRB) is funding the research. This three-year project is due to conclude in December 2002.

Information assets such as market and customer information and management information identified by the Hawley Committee in 1994, are reviewed and updated. Reviewing and updating information assets was conducted in January 2001 using a discussion forum with senior British information managers. A matrix of revised information assets is then developed and some attributes of information assets are identified from the information science literature. A scoring mechanism for attributes of information assets is proposed. Finally, an interview with the Finance Director of a large UK organisation is reported. This interview uses repertory grid analysis to identify the attributes of information assets considered significant by this individual.

These attributes are then compared to the attributes of information as an asset identified from the information science literature. The latter show little relation to those identified by the Finance Director, an individual responsible for decision-making on information investment and budgeting in his organisation.

## Introduction

The value of information and its identification as an organisational resource has long been discussed in the information science literature (e.g. Badenoch et al. 1994). There is little evidence, however, that the many models, formulae and equations (see, for example, Burk and Horton, 1988, Griffiths and King, 1993, Keyes, 1995) developed over the years have convinced many senior managers that information is an essential resource. The view that information and information services are luxuries seems to persist in many organisations and despite the numerous studies that have shown a link between the effective use of information and business success. For example, Abell (1994) linked an "information culture" to improved business perform-

ance, whilst Owens and Wilson (1997) identified high-performing companies as possessing an "information ethos". Information has also been identified as a key driver of competitive advantage (Porter, 1980, Hamel and Prahalad, 1996) and as an effective method of strategic risk reduction (Marchand, 2000). Despite the high profile of these authors, their message has not been widely adopted.

It is, of course, not information itself which is useful, but the ability of people to exploit it for business advantage. However, unless information is collected, organised and made available, then opportunities for exploitation are limited. One approach to enabling better recognition and identification of information value is to define information as an "asset".

## Information as an asset

The Hawley Committee recommended the identification of information as an asset in 1994 (KPMG/IMPACT, 1994). The Hawley Committee comprised a leading group of business executives from the financial, retail and security industries. Dr Robert Hawley, former Chief Executive of Nuclear Power plc, explained that the failure of organisations to address their information resource and its value would result:

*"...at best, in a lack of consistency in strategic understanding, planning, budgeting, management and control and, at worst, the very existence of organisations can be under threat". (Hawley, 1995:237).*

Hawley (1995, p. 237) pointed out that, while intangible assets like brands and intellectual property were discussed in the business literature and so brought to the attention of boards of directors, information was still a mysterious and little discussed resource. Information typically only came to the attention of senior management when disaster struck. The Committee recommended defining information as an asset because:

*"...every board of directors can relate to managing and reporting assets". (Hawley, 1995:237).*

The Hawley Committee's main aim was to bring information under the control and governance of boards of directors. This did not deny the dynamic nature of information, but did provide a framework for its management. This moved forward the perception of information as a resource established in Information Resource Management (IRM) to a perception of information as an "asset" in its own right. IRM identified information as an organisational resource that had a lifecycle of creation, distribution, use and disposal (Burk and Horton, 1988:18). The focus of this approach was to maximise productivity relative to costs (Black and Marchand, 1982:206). Such an approach limited an interpretation of information as a dynamic and changing resource which had the ability to acquire and lose value depending on "context and use" (Eaton and Bawden, 1991:163). Identifying information as an asset refocused attention on the information itself.

### Information assets

The Hawley Committee (KPMG/IMPACT, 1994) argued that the first step in benefiting from the information held and used by organisations was a formal process of identification. They found that a number of information types or assets were consistently identified across organisations.

These information assets were:

*Market and Customer Information* e.g. regional utilities have large amounts of data on every household in their region, trade names and marks.

*Product Information* e.g. the depth of knowledge in particular technologies which support particular products such as fluid and thermal dynamics in the aerospace industry; this includes both registered and non-registered intellectual property rights (IPR).

*Specialist Knowledge* and information for operating in a particular area, which is often in people's heads e.g. retailing know-how amongst managers of grocery supermarkets who find even associated areas of retailing difficult to move into. This type of knowledge is now being addressed in part by knowledge management technique, but, at the time of the Hawley Report, knowledge management was not a well-established concept.

*Business Process Information* that underpins the workings of the business e.g. economic, political, share price and other information in which the equity market trades.

*Management Information*, particularly that on which major policy, competitive decisions or strategic plans will be based, e.g. economic statistics, or cost base information.

*Human Resource Information* e.g. skills databases, particularly in project-based organisations such as consultants in a technology company who need to be brought together to support a client project. Again,

these days knowledge management attempts to address this area.

*Supplier Information* e.g. trading agreements or networks of contacts for services or product development.

*Accountable Information* e.g. legally required information including shareholder information or information to deal with difficult public issues, e.g. information to defend health and safety cases or environmental pollution evidence. (KPMG/IMPACT, 1994:9-10).

These eight information assets formed the basis of a discussion forum held by us in London with a group of senior British information managers in January 2001. The discussions were intended to review and update the information assets identified by the Hawley Committee and to clarify them for the purposes of our further research. A small number of attributes of information as an asset were also presented and debated.

### Our research: revising the list

The project team made two changes to the original listing by Hawley of the information assets before presenting them to the information managers' discussion forum.

These were:

- 1) "Market and customer information" was renamed "Customer information" to reflect the widening application of customer information to inform all aspects of business.
- 2) "Competitor information" was added to differentiate this asset from management information as a whole. Highlighting competitive advantage gained from information assets requires its identification as a separate information asset.

The recommendations from the information managers' discussion group were as follows:

*Specialist Knowledge*: This term was considered confusing and out of place- especially as it brought all of the requirements to identify and define "knowledge" within the process. While recognising the importance of "knowledge" it was felt that concentration on types of information or information assets would provide a firmer foundation for later work.

*Accountable Information*: This term was not understood by the information managers as referring to legal information, for example health and safety information in legal cases. This was identified as one of the most important information assets, one often only identified under pressure of legal action. Renaming the asset as "*Legal and Regulatory*" was recommended.

*Human Resource Information*: This was regarded as an outdated term. The argument was that "people are not resources for an organisation; they are of

course people". The term "*People Management*" was recommended instead.

*Organisational Information*: This asset was suggested as an important information type. It was not included in the Hawley Report (1994), but now is increasingly recognised by organisations as essential to organisational learning and change management.

"Organisations must be aware of the features of their organisational culture that they most value... and look at those features that make a negative contribution to corporate well-being" (Orna, 1999:131).

Of the remaining information assets, *Business Process Information* provided the most debate. Some participants argued that business process information should not be regarded as an information asset at all. Others pointed out that organisations like Cisco, the American technology giant, were packaging and selling their business processes, making such information a financial asset. The arguments for including business processes among information assets outweighed the arguments against.

The revised list of information assets based on the Hawley information assets and the discussion forum with information managers now form the columns of our proposed matrix of information assets. The matrix (Figure 1) is shown below.

The next stage of the research study was to identify the attributes of information that relate most strongly to each of these types of information asset.

**Figure 1: Information assets**

	Customer Information	Competitor Information	Product Information	Business Processes	Management Information	People Management	Supplier Information	Legal and regulatory	Organisational Information

**Attributes of information as an asset**

A literature review was undertaken to identify the attributes of information as an asset. Many of the attributes which have appeared in the literature over the years are summarised by Repo (1986):

- 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 (Repo, 1986:374).

While all of these attributes are significant, two of them have long histories in the information and economics literature making them particularly interesting for thinking about the value of information. These are the attributes "shareable" and "expandable". Arrow (1984) explains that information cannot enter into traditional economic exchange because it becomes the possession of both buyer and seller:

"...information is inappropriable because an individual who has some can never lose it by transmitting it". (Arrow, 1984:142)

Information is not lost when given to others. It is *Shareable*. As such it is unlike any other resource.

The second economic attribute identified by Repo (1986:374) is *Expandable*. Information expands as more uses are found for it. This does not mean that information cannot be out of date or defunct, but even out of date information can be reused and it is this reusability of information which again makes it unique as an asset.

Attributes of information assets relating to utility are also well documented. According to Boisot (1998:83) the "...value of an information asset is derived partly from the utility of the service and partly from its positional status". *Currency* and *Accuracy* are necessary attributes for information assets (Burk and Horton, 1988:91-99). Another attribute related to quantity of information proposed by Burk and Horton (1988:91-99) is comprehensiveness. This was redefined as *sufficiency for purpose* on the recommendation of the information managers' discussion group. Even a comprehensive information collection is not useful if it does not fulfill its purpose. These attributes form the rows of the matrix of information assets. These various attributes crosscut the different information assets. This is shown in Figure 2 below.

**Figure 2: Attributes of information assets**

	Customer Information	Competitor Information	Product Information	Business Processes	Management Information	People Management	Supplier Information	Legal and regulatory	Organisational Information
Attributes									
Shareable									
Expandable									
Current									
Accurate									
Sufficient									

These attributes are by no means exhaustive, but they focus attention on some of the important features of information and on the need to manage information

actively. It is also possible to think about scoring or rating the importance of attributes to individual information assets when they are presented in this way.

### Scoring of attributes of information as an asset

The question of how to measure or score attributes of information assets once identified is a difficult one to answer. The project team first suggested a numeric system which assigned a one to five score for an attribute as related to each information asset. A score of one would mean this is a minor attribute, whilst a score of five would mean this is a crucial attribute of that particular asset. The information managers' discussion group pointed out that the temptation to add these scores up meant that an attribute which scored one for many information assets would be rated more highly than one that scored five (and was therefore essential) for just one information asset. A more visual system involving scoring by the Olympic gold, silver, bronze categories and even tin was suggested and later approved by the project Advisory Committee. The benefits of such a system were that it could be easily understood by all managers and encouraged the visualisation of a varied collection of information assets and attributes. This system will be used during the development of case studies for the project.

Another difficulty with presenting an exhaustive list of information assets and attributes from the literature is that these may not be the attributes considered significant by the managers responsible for making decisions about investment in information and information services. Five interviews were conducted with senior finance directors, information managers and strategy directors to identify those attributes of information assets which were considered significant by them. The first of these interviews is reported here.

### Interview with Finance Director – Company A

Company A was represented by its Finance Director. The company is a well-known services organisation. The purpose of the interview was to identify attributes of information as an asset, which were considered significant by this individual manager. The Finance Director's position within the organisation carried responsibility for strategic and short-term decision-making about information. A technique known as repertory grid analysis was used, this technique was pioneered by the psychologist George Kelly (Kelly, 1955). Although originally developed for Kelly's quite different purposes, this technique has frequently been used as a tool in management development and change (Easterby-Smith et al., 1996:12). Some examples of applications of repertory grid are job analysis, employee selection, task analysis, performance appraisal, management and development training and needs (Easterby-Smith et al., 1996:13).

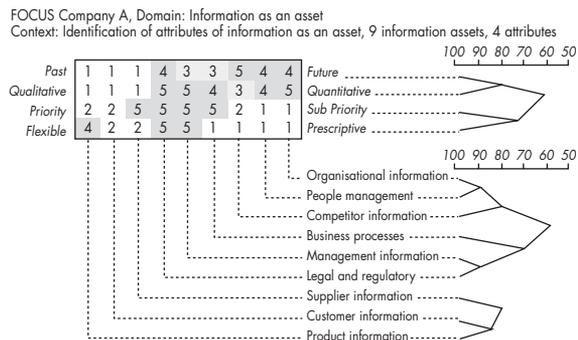
### METHOD

Company A's representative was presented with the set of nine information assets specified in Figure 1 as a set of nine cards. Company A's representative was then asked to consider a triad of the information assets (*Customer Information, Competitor Information and Product Information*) and chose two which had similar attributes, and one which had different attributes. He then had to describe why the two chosen were similar and why one was different creating "constructs" or attributes which could then form opposite poles on a one to five scale. The remaining six information assets were then positioned along the one to five scale in relation to the attributes identified for the triad. This process was then repeated, until in all, four triads were presented. These were 1,2,3 as above; 4,5,6 *Business Processes, Management Information, People Management*; 7,8,9 *Supplier Information, Legal and Regulatory, Organisational Information* and finally, 1, 5, 9 *Customer Information, Management Information, Organisational Information*.

The findings were then analysed using WebGrid II software (available at: <http://tiger.cpsc.ucalgary.ca/>). WebGrid II uses a "city block" distance measure (Shaw, 1980). This measure when applied to the "constructs" or attributes as described by the individual allows natural clusters to emerge. These may then be grouped as part of a coherent concept, for example Future - Quantitative. In Figure 3 below the darker green areas, mainly in the centre for Finance Director, Company A, show a high score i.e. the asset is felt to be more significant to the right attribute. The white areas show a low score i.e. the asset is felt to be more significant to the left attribute.

**Figure 1: Finance Director, Company A: Attributes of Information as an Asset.**

The findings for Finance Director, Company A were as follows:



### ASSETS

High matches indicate that the relevant assets share a similar or identical rating. For the Finance Director of Company A information assets are clustered into four main groups.

*Group one* contains *Organisational Information*, *People Management* and *Competitor Information*. *Organisational Information* and *People Management* matched at 94%, showing a strong linkage of organisational culture and people, as might be expected. *People Management* also linked to *Competitor Information* at 82%, showing a perception of dependence on people for competitive advantage.

*Group two* contains *Management Information* and *Legal and Regulatory* which matched at 94%, clearly linking these formal information assets.

*Group three* contains *Supplier Information*, *Customer Information* and *Product Information*. *Customer Information* and *Product Information* linked at 88%, while *Supplier Information* joins *Customer Information* at 82%. By linking products and customers and suppliers and customers, Company A shows that it is flexible in a changing consumer market. Company A is quick to meet the demands of the market, no doubt often negotiating with suppliers and changing products. It should be noted that this group did not join to the other Information Assets above 50%, reflecting perhaps the Finance Director's overall view that the identification and use of information assets should change as business priorities change.

"We identify the area we want to go into and then we find the information we need".

Finance Director, Company A

Finally, for the Finance Director of Company A, *Business Processes* matched with *Group two* at 69%. *Business Processes* and *Group two* matched with *Group one* at 63%.

#### ATTRIBUTES

The attributes identified by the Finance Director of Company A are made up of two main groups:

*Group one* contains Past - Future and Qualitative - Quantitative and match at 80.5%. The linking of these attributes suggests that information presented either in qualitative or quantitative form is essential for both future planning and evaluating past performance.

*Group two* contains Priority - Sub-Priority and Flexible - Prescriptive and match at 72.2%. This appears to suggest that information is viewed as a means to an end, it can be prioritised according to business needs. Information format is also important, either providing flexibility or limiting and prescribing use.

*Group one* and *group two* link at 57.3%.

It is clear that the attributes identified by the Finance Director of Company A do not have similarities with those identified in the information science literature. The participant's perspective is much broader and concerned with business direction and development rather than individual types of information. The

overarching impression is of an organisation comfortable with its information and secure in the view that it can acquire any necessary information externally to fulfil a future business need.

## Conclusion

This paper has identified information assets and some attributes of information assets as discussed in the information science literature. It has also presented an analysis of the attributes of information assets considered significant by a Finance Director in a large information intensive UK organisation. It is clear from these initial findings that the attributes identified in the literature are not those on the mind of this particular senior manager. Further interviews will illuminate this further and add to the list of attributes identified.

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