KNOWLEDGE OR INFORMATION
DIFFERENCES IN MANAGEMENT

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The relentless change in market expectations and the demands for new products have seen an emerging trend towards the replacement of capital and labour intensive firms and economic activity by knowledge intensive firms and activity, and routine work by knowledge work.

Knowledge work involves the creation of new understandings of nature, organisations or markets and their application by a firm in valued technologies, products or processes. It is easy to observe the importance of knowledge work in new product development environments. However, commentators have noted that practically all organisations across the service, industrial and government sectors are becoming more knowledge intensive.

Interest in Knowledge Work

Three main areas of interest have developed for researchers and for organisations engaged in knowledge work:

Knowledge as Intellectual Capital

The first area is the field of intellectual capital. This focuses on intangible assets and the importance of their contribution to company performance, and hence how to reflect their value in the accounting process. Several organisations, for example Skandia, have developed models to assess and increase their intangible assets.

Sveiby has introduced ‘the invisible balance sheet’ as a model to account for knowledge-based assets. According to Sveiby, intellectual capital focuses on building and governing intellectual assets from strategic and enterprise governance perspectives with some focus on tactics.

Management of Knowledge

The second area is the field of knowledge management itself. Here researchers and organisations are concerned with optimising the knowledge creation and flow within a company. For Sveiby knowledge management is more detailed and focuses on facilitating and managing knowledge-related activities, such as creation, capture, transformation and use of knowledge.

Knowledge Economy

The third area is the field of the knowledge economy. This area is concerned with the emerging role of knowledge in economic activity, and the influences that the development of explicit knowledge management tools and knowledge companies will have on the economies of the world.

Now Markets

Recently, a new market has emerged for products and services in the three areas identified above. The estimates for business are high. In a 1997 survey by Ernst and
Young's Centre for Business Innovation and Business Intelligence, 94 per cent of respondents said they believe they could leverage the knowledge in their organisation more effectively through deliberate management. This is being converted into substantial business opportunities. U.S. Companies paid US$1.5 billion in 1996 for knowledge management and it is estimated they will be spending US$5 billion a year by 2001-2002.

As a result, the major management consulting companies have made their move to offer services and produce information on the subject. But, in addition, major software companies such as Lotus, Canon and soon Microsoft, are offering knowledge management applications. The present tools are based on computer networking as a solution to the problems of managing knowledge. Products like Lotus Notes and Lotus Domino® or CantoCentral® are claimed to provide a knowledge management capability.

Central Issues in Knowledge Management

At this stage of market development, it might be assumed that the task of managing knowledge is substantially understood and appropriate tools and methods are available. However, there are still many questions to answer.

What understanding of knowledge management has Australian Industry?

Results of a survey of 30 leading companies in Australia in 1999 show that 90 per cent consider knowledge management to be an important tool for the future; 85 per cent consider that knowledge management will transform the way they do business.

With regard to knowledge management initiatives (Figure 1), the most common was the establishment of formal knowledge management networks, in which IT tools are used to manage information storage and access. The next most common was knowledge management training and establishing informal knowledge management networks, to promote the transfer of knowledge.

Figure 1 Knowledge management initiatives planned (Note: percentage, multiple nominations possible)

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge Management Training</td>
<td>25</td>
</tr>
<tr>
<td>Create knowledge Management Strategy</td>
<td>20</td>
</tr>
<tr>
<td>Benchmark/Audit current situation</td>
<td>15</td>
</tr>
<tr>
<td>Develop/Measure intangible assets</td>
<td>10</td>
</tr>
<tr>
<td>Promote informal Knowledge Management networks</td>
<td>5</td>
</tr>
<tr>
<td>Establish formal Knowledge Management networks</td>
<td>10</td>
</tr>
<tr>
<td>Incentive and reward program for knowledge sharing and use</td>
<td>5</td>
</tr>
</tbody>
</table>

In terms of performance (see Figure 2), companies rated their performance as better than good in accessing external knowledge and using knowledge in decision-making, and almost good in knowledge creation. However, performance was assessed as poor in embedding new knowledge in other parts of the organisation, and facilitating knowledge growth.

Figure 2 Company Performance (rating scale: 1-5)

<table>
<thead>
<tr>
<th>Performance Area</th>
<th>Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access external knowledge</td>
<td>3.2</td>
</tr>
<tr>
<td>Create knowledge</td>
<td>3.1</td>
</tr>
<tr>
<td>Embed new knowledge in the organisation</td>
<td>3.0</td>
</tr>
<tr>
<td>Facilitate knowledge growth</td>
<td>2.9</td>
</tr>
<tr>
<td>Transfer of existing knowledge to other parts of the organisation</td>
<td>2.8</td>
</tr>
<tr>
<td>Knowledge use in decision-making</td>
<td>2.7</td>
</tr>
</tbody>
</table>

What is the difference between information and knowledge?

The central question is whether information is, or can be treated as equivalent to knowledge.

One of the common approaches is to relate information to data. Schwabert et al. use the word 'information' as restricted to facts with meaning, opposed to 'data', as unstructured and without meaning. Peter Drucker has eloquently defined information along the same lines, as "data endowed with relevance and purpose". This is part of an almost common-sense hierarchy:

- Data as simple observations;
- Information as data endowed with relevance and purpose; and
- Knowledge as valuable information from the human mind that includes reflection, synthesis and context.

The result is that information is described as structured and with meaning, but not as with the same features as knowledge. Knowledge includes information, but combines with other features of an intelligent system like experience, context and reflection.

Can we manage knowledge with similar tools to those we use to manage information?

The implication of the assumptions above is that, because knowledge has component-like experience, context and reflection, it needs an intelligent system to exist. This is, at the moment, only represented by the human mind, though it may also be possible in the near future in computers with artificial intelligence. However, for the moment, we are stuck with the human brain as the
only medium that can hold and create knowledge in a variety of situations.

On this basis, it would seem appropriate to challenge the labelling of simple information management systems as knowledge management systems. Claims that an Intranet, which was designed to disseminate information, has become the No.1 factor in employees sharing knowledge², should be suitably discounted. The Intranet might enable intelligent systems to create new knowledge, but it will never be able to disseminate knowledge itself.

**Organisational Interaction**

As indicated earlier, information cannot be a direct substitute for knowledge. Indeed, misconceived efforts that have the effect of displacing knowledge management by information management are likely to be at best unsuccessful and at worst disastrous. The transmission (or diffusion, or sharing) of knowledge requires that it be translated into information and transferred. Successful transfer will usually lead to a re-translation into knowledge.

Of course, not all knowledge can be translated into information at any given time; the translation will depend on the extent to which the knowledge has been able to be codified — an element of the knowledge cycle that the sociology of scientific knowledge appears to have ignored. Furthermore, to be translated back into knowledge, the information has to ‘make sense’ in the context of the user. This context is constructed from experience, culture, social links and education⁵. It functions as a filter and enables the owner to create links between different sets of information.

**The Knowledge-Information Cycle**

The Knowledge-Information Cycle developed here is designed as an explanatory model of the ways in which the boundaries and the links between knowledge and information operate during their use in an organisation. The cycle is designed to reflect the relationship between knowledge and information.

On the knowledge side of the cycle, there are the two basic steps of knowledge creation and knowledge use. Knowledge creation, it is argued, occurs in a wide range of processes, but they all involve the interplay of information with an intelligent system. This knowledge is ‘held’ within the mind until an encounter with a situation or other knowledge arises that draws on the explanatory power of the accumulated knowledge. The process of knowledge use can, on special occasions, lead only to knowledge creation. Far more commonly, the process of application to the real world requires that it be translated into some form of information. This might be visual, a written report or oral communication. The new information that has been created can then be stored in some codified form, and/or directly used in addressing an issue, or communicating.
There are, however, two extra features of this model. Firstly, the inter-connectedness of knowledge and information. The arrows that run in counter direction on top and bottom of the model signify the combination of information and knowledge that is necessary to perform a task. A task with poor information content on which to build needs a rich base of knowledge to be performed (far left-hand side of the model). This scenario is common during new development phases. In contrast, a task with a rich information base may require only a low knowledge content (far right-hand side of the model). This is common in standardised work or processes.

Secondly, on the right-hand side the information content can never substitute all knowledge necessary, because knowledge is essential to connect and put information into action. This is the area that is called core knowledge in this model. This is illustrated in the following two examples.

**Scenario 1: Poor information-base/rich knowledge-base**

Someone who wants to travel to Singapore and only gets this information needs to have a high level of knowledge to compensate for the limited information base. Normally, we would give this small amount of information to someone who has already been to Singapore and has experienced 35 degrees Celsius there. The recipient will be able to interpret the information and will know how to dress, relying on a large area of core knowledge to compensate for the small amount of information.

**Scenario 2: Rich information-base/poor knowledge-base**

Someone is given detailed weather information on Singapore (humidity, temperature). Nevertheless, if they do not possess knowledge of how these conditions influence comfort, then despite all the information they will have difficulties selecting the right outfit. If they have some knowledge of similar conditions at another place (their core knowledge) they might be able to make an appropriate judgement.

This concept of core knowledge applies also to organisations. It is possible to draw two different scenarios according to the kind of industry an organisation operates in. These scenarios explain the different emphasis that can or should be given to the area of core knowledge.

The first scenario represents a Knowledge-Information Relationship Model for a manufacturing company (Figure 5). The necessary core knowledge is small because processes are mainly standardised and tasks are repetitive. The remaining knowledge to perform certain tasks does not have to be very large. It represents the typical scenario on a process line. The workers get all their instructions (information) prepared by engineers and just need the basic knowledge to understand them. This links closely with the standardised procedures of ISO 9000 and Quality Management.

Figure 5 Knowledge-Information Relationship Model for a Manufacturing Area

![Knowledge-Information Relationship Model for a Manufacturing Area](image)

The second scenario represents a Knowledge-Information Relationship Model for a service company (Figure 6).

In the service industry or function many tasks are based heavily on customer involvement and therefore the service area is in need of wider flexibility. This reflects on the amount of work standardisation and as a result the amount of core knowledge that is necessary to fulfil the tasks successfully is greater.

Figure 5 Knowledge-Information Relationship Model for a Service Area

![Knowledge-Information Relationship Model for a Service Area](image)

These two scenarios give an example of how the model can be applied in an organisational framework. It helps to identify the combination between knowledge and information. The model opens the possibility of assessing the ratio between knowledge and information for different areas in the organisation as well as for the whole organisation.

Several conclusions can be drawn that affect the performance of a company:
- Even if much information is created and distributed in the organisation the deciding factor is the core knowledge base. It cannot be replaced with information and has to be taken into account as a main factor for the performance of the organisation;
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The interaction of knowledge and information can be described in the Knowledge-Information Relationship Model. To use information, a certain standard of knowledge is necessary because information cannot substitute for knowledge. This is labelled core knowledge. This interaction shows that each amount of information needs an appropriate level of knowledge to be dealt with.

The management of information is already developed; the management of knowledge is still in its infancy. Information management systems are widespread and becoming more sophisticated every day. Technology-based, their introduction presents challenges akin to those of any other management system.

Knowledge, because of its complexity and its union with intelligent systems, poses a greater challenge.

**References**


J. Hibbard, 'Knowing What we know', InformationWeek, 633, pp. 46-64, 1997.

As quoted in J. Hibbard, 'Knowing What we know', InformationWeek, 633, pp. 46-64, 1997.


**Summary**

Knowledge and information are different. Knowledge requires the context of an intelligent medium. Knowledge results from combining information in order to form a mental picture and to act on the basis of this picture. In these circumstances, knowledge is used as a tool during the thought process. Information is created when knowledge is expressed and represents the outcome of a knowledge process. It supports knowledge but cannot substitute for it. Consequently, even the best information management systems are not able to manage knowledge.

A boundary between knowledge and information can be established. Using the definitions of knowledge and information as knowledge systems and information outside an intelligent system, a boundary between the two can easily be established. This boundary is obvious in every communication that an intelligent system is involved in (visual, written or spoken) because what is communicated is not knowledge but the result of a knowledge process and can never contain all the parts that have been involved in the process of reaching this result.

Knowledge cannot be managed with the same tools as information. Software and electronic network-based information management systems have no capacity to manage knowledge. Attempts to capture or store knowledge on a medium without intelligence requires the knowledge to be transformed to information, whereby the essential knowledge ingredients are lost. Other non-digital methods of capture and storage are required to manage knowledge. To manage knowledge, tools have to be developed that address the special features of knowledge. These include the complexity of knowledge structure.

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