

Intellectual Capital

The New Wealth of Organizations

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with a commentary by

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KEY IDEAS...

◆ The information age is a revolution.

The modern economy has been utterly transformed in recent years. The notions of production have had to be totally revised. Each company now possesses an intellectual capital which must be well managed and exploited in order to succeed.

◆ Knowledge circulates at every level of a business (human, structural, customers).

In order to develop, enrich and benefit from the intellectual capital of a company, information must be allowed to circulate. These days, it is

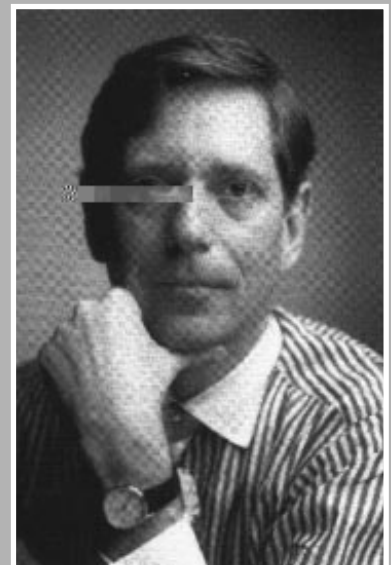
important that companies make access to knowledge easier for their employees, and that they enrich the structure of that knowledge and share it with their customers.

◆ An economy based on knowledge gives rise to a new type of business, new workers and new professions.

The organization of companies can no longer succeed without the networking made possible by new technologies. These new working methods mean that management techniques have to be revised.

by
**Thomas
A. Stewart**

Thomas A. Stewart is a member of the editorial board of American economic magazine "Fortune". He has been a veritable pioneer in the field of knowledge management, and has written a number of seminal articles on the subject. Today, he is universally and uncontroversially regarded as an expert in the field whose contributions have been rewarded by the British research group Business Intelligence. He has also been named principal promoter of knowledge management by the Planning Forum. Thomas A. Stewart lives in Manhattan.



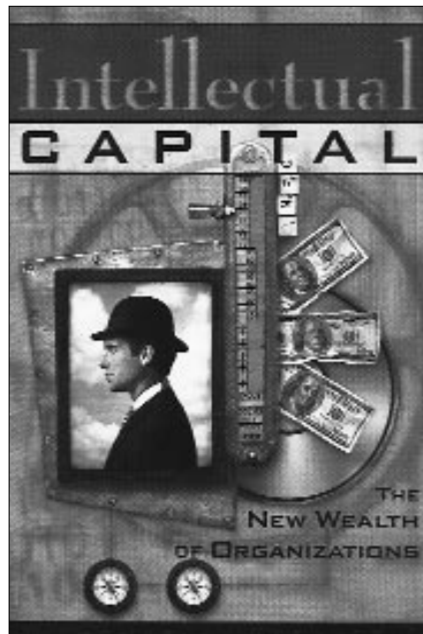
THE SUMMARY

Recent business history has shown just how important intellectual capital is. It is what has forged the difference between Microsoft and IBM, or between Toyota and General Motors. By intellectual capital, we mean the sum of what everybody knows within a company and which gives it a competitive advantage. It is true that it is not easy to identify, and even less so to use, this particular form of capital, but the benefits are as great as the difficulty. It is no coincidence that this essential new economic feature should appear now: we have entered, after the Industrial Age, the Information Age. Wealth has become a product of knowledge. This knowledge has in turn become the most important production factor, and yet it generally does not feature in a company's profit and loss account. This kind of change leads to transformations at every level, in career paths and in business hierarchies. This is why two thirds of the companies listed in the 1954 "Fortune 500" classification are no longer there.

The information age consecrates knowledge

The advent of the Information Age is a revolution. The foundations of the economy, the forms of the companies and the functions of the workers are being radically transformed. Knowledge is the basis of success.

There is no doubt that we are in the midst of a revolution, just as the 19th century went through the Industrial Revolution. Globalization, distribution of information, computer networks... all of these phenomena have taken on a huge importance. This is a new era, in which



the fundamental sources of wealth are now knowledge and communication. There is no denying it: knowledge has transformed the economy. Take the example of a microchip. Its value is clearly vastly superior to the metal from which it is made. Its price comes from its intellectual content.

A company which participates fully in the Information Age is a "company of knowledge". It is able to handle the flow of information and make a success of things. Things are already going that way. Investments in IT equipment over the last few years have literally exploded: in 1991, in the United States, they accounted for 112 billion dollars! At the same time, purchases of production technologies

have stagnated (see panel). The prime objective of these investments is, of course, to go faster or more cheaply. It is not easy to see exactly what all the aspects of the changes in company policies will be, since we are only at the beginning stages. It is possible to say, however, that a real "company of knowledge" is one which involves itself wholeheartedly in the search for information, for its intrinsic value. Spending money on equipment which creates, codifies, manipulates and distributes information is more productive than buying something to produce or transform materials. It is true that many people continue to doubt that, because it is not easy to calculate the profitability of information. But some economists at the time were unsure about the benefits to be gained from investing in computers... Professor Franck Lichtenberg, of Columbia University, calculates that investment returns in research and development are eight times higher than those gained by buying a new machine. Information enables stocks to be limited, for example, by linking them more efficiently to production plans, to the evolution of the market, and so on. Knowledge can be substituted, therefore, for a number of physical assets.

However, dematerialization is not the be all and end all. Information

KNOWLEDGE AND IGNORANCE

	KNOWLEDGE	IGNORANCE
KNOWLEDGE	Knowledge that you know you have (explicit knowledge)	Knowledge that you know you do not have (known ignorance)
IGNORANCE	Knowledge that you do not know you have (tacit knowledge)	Knowledge that you do not know you do not have (unknown ignorance)

has its own reality. It does not necessarily follow the material flow of a product it accompanies. This means that it has to be handled separately, like any other asset. Up until now, a company was the simple sum of all its tangible assets, which belonged to a "capitalist". Things are not as simple in the case of intangible wealth: who does it belong to? How can its value be raised? For example, while IBM has sales figures which are higher than those of Microsoft, it is Microsoft which fares better in the stock market. While IBM displays over 16 billion dollars of tangible assets in its accounts, Microsoft has less than a billion. In short, modern companies are divesting themselves, more than anything, of their tangible assets: they rent their head offices, sub-contract their transport needs, etc. This does not mean that companies which need these tangible assets will not make any money any more. EDF, for example, is successful in selling its expertise in factory construction and power station management, through its knowledge of the networks.

Seeking intellectual capital

While it is true that there is a genuine understanding of the economic value of ideas, identifying the intellectual capital of a company is not easy, and requires a strategy to be defined beforehand.

In spite of what is often said, there is nothing odd about giving a company a stock market value which is ten times higher than its state of accounts. It is a question of mind set: we are better at counting forms than we are substance. In general, our accounting systems are not suited to the purpose. In fact, they have not fundamentally changed

for centuries. And yet, ideas have acquired an intrinsic value which is sometimes best represented by an individual. When Maurice Saatchi had to leave Saatchi & Saatchi, the share price of the advertising company quickly lost half of its value, while the balance sheet remained intact! Assets of an intellectual nature are generally a bonus on top of the value which appears on the balance sheet. We cannot ignore them, therefore, in the way that accounting procedures do. It remains true, however, that their productivity is not easy to gauge. Most managers are aware that managing knowledge is essential - companies such as Dow Chemical or Skandia have created management divisions for this purpose alone - but they also acknowledge they do not do so, or very little.

Acknowledging the importance of knowledge is not enough, therefore. It must also be managed and tangible results obtained. The first problem is to define the intellectual material which must be accounted for. To do so, it must be determined for what purpose it is to be used. Above all else, it is essential to distinguish between transitory, daily information and the genuine intellectual capital. A telephone number is not a capital, but an address book is. Genuine intellectual capital is either a semi-permanent corpus of knowledge, or something which can make the corpus grow. Much of the knowledge of a company is tacit, just like the knowledge one has of a mother tongue. This type of information is instantaneous, but difficult to transform and communicate. The Americans, for example, were implicitly convinced that it was cheaper to have production with a few defects rather than to seek excellence. The implementation by the Japanese of total quality theories proved them wrong...

Knowledge must therefore be made explicit in order to be examined, improved upon and shared. Intellectual capital can be found at all levels in any company: the men, the structures and the customers. This is the model adopted by Skandia or the CIBC.

Human, structural and customer capital

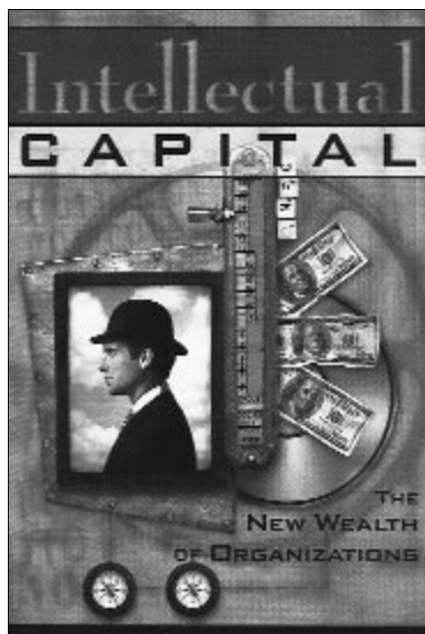
Human capital is the capacity of individuals to provide solutions for their customers. Structural capital transforms know-how into the group's property. Customer capital allows relations with customers to be perpetuated.

There is abundant literature on the economy and management of human capital, which shows its economic value. The question is how to define the value - and not the cost - of work, to acquire as much human capital as possible, to use it for the benefit of the company in the areas where it is most needed. As always, the coherence with the strategy is essential. One approach consists of dividing the personnel into categories, according to their "replaceability" and the high or low added value this provides. The critical section is, of course, made up of those whom it is difficult to replace and who provide high added value: those whose expertise and talent create the products or services, who link the customer to the company. Investment must be prioritized here.

The company must follow a basic principle: people can be "hired" and not possessed. Under these conditions, how can the human capital be made an advantage to the shareholder? A strong link has to be created, a kind of reciprocal property arrangement between the company and the employee.

Paradoxically, it is by acknowledging the virtual ownership by the employees that a company can best protect its own capital. It is no coincidence that employee shareholding and profit sharing schemes have gone hand in hand with the information age.

Structural capital belongs to the organization as a whole. Each of us can waste a huge amount of time looking for information that other people have. The company therefore has every interest in allowing this collective knowledge to be shared and added to, thereby leading to gains in productivity. Here lies the importance of knowing how to handle structural capital, in terms of flows and stocks. This is still a new notion, but examples can be found. Some major consultancy firms (Andersen, Ernst & Young or KPMG) have set up knowledge management departments, and are creating an organizational capital with undeniable financial returns. The most difficult aspect is perhaps situating the intelligence within a company in order to be able to



function even in a situation where there is a great deal of turnover. Since knowledge evolves very swiftly, it seems simpler to target those who have the knowledge rather than the knowledge itself. It is therefore relatively simple to set up a company directory, a simple system which enables those seeking information to be connected to the experts.

The core of structural capital management is the organization of information flows, and above all, making them easier. At Xerox, the importance of conversations around the coffee machine has been understood. All the sales representatives have radios in their cars to make it easier for them to communicate with one another without having to eat into time spent with customers. In addition, collective knowledge must be spread around the field. For example, the clients of the insurance company Cigna build up and maintain, both with the company and individually, a database (customers, contacts...). A process which collects and distributes information can replace a number of vertical flows which are typical of pyramid structures. It is also an efficient response to the challenges posed by geographical dispersal and the increase of the number of people in the field.

Whatever the situation, these structures must have a precise objective. McKinsey, for example, began by reexamining the needs of its customers in order to discover their precise needs in terms of expertise. The result was greater specialization and globalization of the company. The core of McKinsey is now to be found in New York, where a handful of information officers and researchers are on hand to answer the questions posed by consultants and to put them in touch with colleagues who may be able to provide an answer.

Hewlett Packard, whose equity capital profitability went from 11.1 % to 23.3 % between 1991 and 1995, set up an new information system in 1991, giving users access to "all data which can help them do their job, unless specific limits are imposed by management." HP underwent a veritable

CHANGES IN INVESTMENTS IN PRODUCTION AND INFORMATION TECHNOLOGIES

Year	Investments in Production technology*	Investments in Information technology*	Ratio of investments in Information technology against Production
1965	60.3	18.8	0.31
1970	63.4	28.6	0.45
1975	68.6	27.4	0.40
1980	96.7	52.0	0.54
1983	77.2	61.5	0.80

* In billions USD dollars 85

information explosion: by mid-1994, 97,000 employees were exchanging over 20 million e-mails a month. Generally speaking, employees only receive information which is "pushed" their way. Now, this tendency must be reversed: each person must be able to "pull" the information in towards him or herself. Knowledge is valuable, and it must be paid for. This basic principle is not only applicable to customers. HP applied it to its logical conclusion: the Product Processes organization (PPO), an in-house "consultancy" responsible for promoting internal expertise, is a service which other parts of the group have to pay to use. Ultimately, the "company of knowledge" initiates a virtuous circle: human capital feeds structural capital which itself feeds human capital.

As for customer capital, this is without any doubt the intangible asset which is least well handled by businesses, despite the fact they all potentially possess it. The pharmaceuticals group Merck was "the most admired" company in Fortune magazine surveys for seven years in succession. The problem was that the pharmaceutical's market underwent some profound changes, under the impetus of newcomers like McKesson and Medco. The former created computer links with dispensing chemists and the latter targeted the end user, i.e. the patient, rather than the doctors or hospitals, and placed emphasis on the development of generic drugs and the growing awareness of the need to management health systems more efficiently. The pressure on profit margins in the sector became enormous. In short, at the beginning of the 1990s, things started going downhill for Merck, just as for the pharmaceuticals industry as a whole. In 1993, Merck reacted to the loss of its customer capital by buying out Medco for 6.6 billion

dollars, half of which was for the customer relations.

A company and its customers can together create an intellectual capital which becomes their common property. Customer capital is a source of innovation. Lotus has created a Web site on which it can assist its customers, but the customers can also contact one another and therefore directly help one another. The result is a better service and substantial savings for Lotus, because a considerable amount of the on line technical assistance is in fact carried out by customers. Much of the relationship with a customer nowadays is intangible, which is not to say that it has no value. Rather than negotiate a simple purchase, the tendency today is to negotiate a genuine contract where the supplier becomes an extension of his customer's profession. By developing this kind of partnership, by using reciprocal information to serve the customer, so much added value is created that the company becomes unavoidable in the field.

The network economy

The use of intellectual capital depends on information being distributed. There is no better tool for this purpose than the modern networks. They have greatly affected the management of companies and of careers.

The intangible economy has become as important as the tangible economy. While there is a certain interaction between the two, the former has, in all respects, become largely independent of the latter. Information resources and knowledge are not handled in the same way as cash, natural resources, work or machines. These modern resources are more susceptible to

the passing of time, they depreciate far more rapidly and their value does not depend on rarity. On the contrary, it is sometimes because it is so abundant that knowledge is valuable. Because they are founded on different resources, the "companies of knowledge" do not respect the same laws as other companies. The law of supply and demand is more fickle in the intangible economy, as can be seen for example in the extreme volatility of the secondary financial markets. The law of diminishing returns states that there comes a point at which an additional investor is less productive than

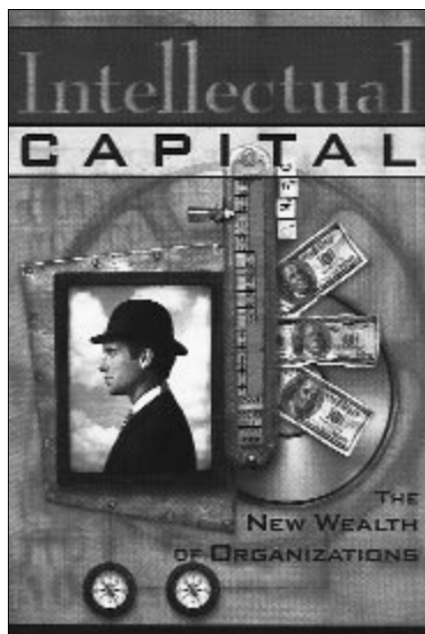
THE ADVANTAGE OF BUILDING UP HUMAN CAPITAL

At the beginning of the decade, Kodak was faced with the emergence of digital imagery technology which threatened its traditional profession, linked to the chemical industry. A host of teams thought long and hard about how to integrate these new technologies into Kodak products. 1992 saw the spectacular launch of its Photo CD. For 20 dollars, Kodak would put your photos onto a CD. Worthwhile? Only if you had the necessary equipment to visualize the photos, and that cost between 400 and 800 dollars! In short, it was a failure. The reason is simple - the working groups within the company each work independently, concentrating on their own product. It would have been better to seek a more general coherence, which can be gained by efficient human capital management, i.e. with better distribution of knowledge.

the previous one. In the Information Age, however, returns increase because it is the costs of initial "manufacture" which are by far the greatest. Above all, the value of knowledge tends to increase because it is widely used, as the Microsoft Windows experience has shown.

This new situation gives rise to a number of strategic challenges. Netscape and Sun's answer has been to distribute their technology as widely as possible. The former was able to create strong demand for its Web browser. Once a market leader, marginal costs are negligible and the costs can be spread over a large number of customers. This leverage must be used to create customer capital. Alliances, market power, customers, technologies and processes are all tools used to help expansion. We learn from customers and vice versa, and this creates a relationship of mutual dependency.

Networking is more than a mere technological phenomenon. It is the biggest development in management since the creation of the modern companies before the



Second World War. The networks existed before computers, of course, but what is new is deliberate organization into networks, which has been made possible by considerable drops in the costs of implementation. On line operations form an ever greater part of the business conducted by companies. This is a real revolution, helped on its way by two major factors: the introduction in 1984 by Apple of the user friendly Macintosh, and the end of the AT&T monopoly in the United States. Networks of computers lin-

ked by telephone have become the major technology by which companies handle knowledge. Networks are expensive to set up, but cheap and fast to use, accessible everywhere and all the time, and they have an extraordinary economic power which every company can harness to obtain the best returns possible on its intellectual capital. The greatest challenge facing the modern manager is to create an organization to share knowledge. Networks do so by connecting people and data together.

Networking, however, changes a company radically. For example, it introduces a less formal style, and necessitates that relations of authority be revised. Previously, management tasks were planned, organized, executed and measured (POEM). Now, DFA has become the watchword: define, feed, allocate. Define the identity, the mission, the vision and the value you wish to provide to the customer. Feed the human, structural and customer capitals. Allocate, that is to say choose the opportunity on which you are going to invest and assess the resources necessary.

Three new forms of organization have appeared. We have already seen what organization in terms of internal networks looks like, a product of structural capital management. Next came the virtual companies. An example of this is Skandia Assurance and Financial Services, which devoted its money and intel-

OUTSOURCING, A FORM OF NETWORKING

It is frequently useful for a company to seek services elsewhere on the market by other companies. It is a way of carrying over the costs of a certain part of a company's profession into the balance sheet of another company. For example, GE Credit manages the credit cards belonging to distributors or banks. Montgomery Ward therefore entrusted this charge to GE, which was better able to do so because of its direct links with retailers. GE also issues the credit cards, sends and collects the invoices to and from the cardholders. Ward is thereby able to save on the IT costs and investment linked to this activity, while GE is able to spread the cost over its huge number of customers. In addition, Montgomery Ward is able to devote itself to the core of its profession, the management of debts and information systems.

The "Key Ideas" and "Summary" sections are intended to be the most faithful presentation possible of the ideas and reflection of the author of the original book, without any form of critical interference. These sections, which are original descriptions for which we are wholly responsible, are intended as summaries: they are neither extracts from or abridged versions of the book by Thomas A. Stewart. We recommend that the reader turn to the original book.

ligence to developing new insurance products, working through internal and external networks. Skandia does not manage its funds directly and is not in direct contact with the public. All of these functions are carried out by partners in its virtual network. This organization benefits everybody involved: the local sellers (banks, brokers and financial consultants) benefit from Skandia's experience in insurance matters. Finally, the economic Web, to borrow the expression used by John Hagel from McKinsey, is the culmination of the organizational architecture by which the network logic is expressed. This logic defines the organization of companies which work together with a specific technology and use a common architecture to produce elements which are independent of a global proposal of value, which rises along with the number of participants. An example might be local telephone companies, or television channels which give programs to others such as CNN. This method involves facing up to the twofold challenge of competition and cooperation.

Because of its influence on organizations, the advent of the information age necessarily has an impact on careers. Professional career paths no longer travel in a straight line. In one space of one decade, people have learnt, often rather abruptly, the new features of a career model. A job is temporary. Each person works for him or herself more, like a free-lance, and a career is defined more by a profes-

sion than by the company in which a person works. It is the market more than the hierarchy of the company which will structure the career paths of tomorrow. Rather than jobs, we have projects which we hope to see through. The signs of individual progress are to be sought more in the richness of work and the effect it has on the company than in personal promotion. In short, the hiring of a worker has become more a market transaction than a fait accompli decided by the upper reaches of the hierarchy. Even a horizontal organization needs a degree of authority, but this authority is to be found elsewhere than in the hierarchy: expertise, reputation, entrepreneurial spirit or negotiating skills. Everybody must bear in mind that intellectual capital is a source of wealth - for the company, as we have seen, but also for the employee. It is an object of common ownership, and both parties must seek to extract the greatest returns possible from it. That is yet another revolution, and one of the major challenges posed by the Information Age.

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IN THE AUTHOR'S OWN WORDS

"Nobody can be sure what new working methods and prosperity this revolution (Ed: the information revolution) will bring about [...], but it is already clear that in a knowledge-based economy, success depends on new structures and new forms of organizations and management."

"The efficacy and skill with which a company is able to increase its human capital is the real yardstick of its efficiency in the Age of Knowledge."

"Knowledge, now that it has been dematerialized by the digital revolution, is becoming ever more widely available [...]. In order to move through this immaterial economy, the organizations and individuals have to find working methods which are different from their old ways as a bird is from a stone."

FOR FURTHER INFORMATION...

The living company. Growth, learning and longevity in business, Arie de Geus, Harvard Business School Press, April 1997.

The long awaited thoughts of Dutchman Arie de Geus, creator of the "learning organization" concept. In order to achieve longevity, companies must apply knowledge management at all levels. This book is available in French, entitled "La pérennité des entreprises", Editions Maxima - Laurent Dumesnil.

THE COMMENTS

Although Thomas A. Stewart "omits" a number of important references (work by Peters or by Quinn on the dematerialization of assets, research on the transmission of tacit knowledge by Argyris, Nonaka and Baumard, etc.), this book remains - once these connections have been acknowledged - profoundly salutary. It is true that modern day active knowledge management within companies is hindered by a number of obstacles, many of which are clearly identified by Thomas A. Stewart:

- Accounting procedures still find it difficult to quantify immaterial assets.
- A general lack of training or awareness often leads to projects not being undertaken, or being mishandled or overwhelmed by a new change to IT or information procedures.
- The necessity of actively sharing information through a vast network both within and without a company does not appear to be obvious to a generation of managers brought up in the framework of purely individual assessment.
- The ideological acceptance that the "intellectual capital" of a company is unequally spread between employees is still difficult.
- Because the proficiency in the use of information tools and systems has not progressed sufficiently (particularly at an individual level and, more often than not, among the older "experts"), the formalization necessary to capitalize knowledge is often seen as an unnecessary chore... Beyond these - alas, uninvigorating - observations, the main merit of the author is to have



by Hugues Robert

Director of The Carlyle Group France, specialist in merger-acquisitions and stake holding

thrown light on the articulation, necessary though difficult, between "human capital", "structural (or organizational) capital" and "customer capital". The "intellectual capital" of a company is built up through a long term process of ceaseless exchanges between these components, each of which, were it left isolated, would be sterile: the "creative boutiques" have little longevity because their only capital is the brain power of the people behind them, the "dinosaurs" provide themselves, in vain, with the best systems if they do not make the best employees want to work with them, yet brains and tools are no good if there are no customers to give value to the "production".

Without going into the detail of the measurement tools, recipes and resources suggested by

Thomas A. Stewart - which in any case require each company to adapt and think about them individually - there are two ways that are given to "get down to it" quickly:

- identify the areas where important information circulates naturally (the "practice communities" so dear to the author and to many consultancy firms), to help them to develop,
- creating an ad hoc system (from the most rudimentary to the most sophisticated), linked in with real practice, to capture, formalize and (in the long run) capitalize this informal knowledge to which the customers give value.

The task is no easy one, but there is no need for pessimism. The recent experiences of a number of companies (Stewart gives many examples, to which we might add Airbus Industrie or Framatome) have been positive. Among the major successes, the major consultancy firms (McKinsey, studied by Peters in 1991, or the Boston Consulting Group), here considered to be "normal" companies, shows the important role to be played by managers, their awareness and conviction, in the field of active management of company knowledge. The fact that they "lead by example", and that the superior management are fully committed, seems to be particularly important.

This strong capacity of managers to directly influence the rapid changes to an essential aspect of their company is sufficiently rare to merit a mention, and above all to be implemented!

Hugues ROBERT