



The 'puzzle' of the knowledge society

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Introduction

The knowledge society has arrived in Europe: however, it is not yet evident everywhere and among all people. This is one of the main conclusions of the Euphoria project, carried out by the European Foundation for the Improvement of Living and Working Conditions in 2002 (see the web page at

<http://www.eurofound.eu.int/areas/industrialchange/knowledgesociety.htm> for more information).

Many knowledge society indicators show that there are rapid developments in this area, especially those indicators concerning information and communication technology (ICT) uptake and use. Nevertheless, there are considerable differences within the EU regarding the extent to which the knowledge society is advancing. The Nordic countries and the Netherlands take the lead in relation to most of the current knowledge society indicators. In comparison, the southern Mediterranean countries lag behind other countries, while the continental countries, together with the UK and Ireland, fall between these two groups as average countries.

Similar results can be seen in the World Economic Forum report, which benchmarks the advancement of the EU15, the 10 new Member States (NMS) and the US in terms of the Lisbon Strategy, and in relation to deficiencies of their economic institutions and policies. The report found that the same countries were on top in relation to factors such as the information society, liberalisation, innovation and research policy, network industries, efficient and integrated financial services, enterprise environment, social inclusion, and sustainable development. More average countries showed similar consistency to each other in these areas, as did the less progressive countries. In spite of these consistencies, major differences exist between the countries in their accomplishments pertaining to the Lisbon Strategy. In recent times, this is an issue that has been strongly highlighted in the European Commission's mid-term analysis of the implementation of the Lisbon Strategy (Kok, 2004).

These research results underline the main question that is raised in this article: why does the speed and level of advancement of the knowledge society vary so significantly between the different EU Member States? Moreover, how can these differences be explained, and what policy options should the EU be following in the years ahead in relation to this issue?

This article explores these issues – or the puzzle of the knowledge society – in light of the Euphoria project results and other general literature, and aims to identify areas for future analysis. In the first chapter, it defines the 'puzzle' by presenting some observations from the different research. The second chapter explores different models of knowledge societies within the various countries. The third chapter focuses on different building blocks of knowledge societies, looking at issues such as human capital, social capital and knowledge competitiveness. The fourth chapter examines key drivers of the knowledge society. In the concluding chapter, the main observations, hypothesis, as well as proposals for further analysis, are outlined.

Main features

Main trends

In the literature to date, there appears to be no clear definition of what the knowledge society is. However, it can be hypothesised that the knowledge society refers to something distinctive and contemporary, relating to the intersection of several trends of the late twentieth and early twenty-first centuries. Some of the trends associated with the knowledge society concept (Euforia/Prest, 2004) include:

- the ongoing evolution of the information society and its related shift towards networked computing power, compared to earlier generations of stand-alone and one-to-one computing;
- the increasing importance of innovation as a source of competitiveness and as an instrument for increasing the efficiency and effectiveness of organisations of all types. Innovation can be defined as the widespread application of knowledge to establish new ways of doing things;
- the development of service economies, a notion at the heart of ‘post-industrialist’ theories, which tended to stress the role of service sectors in delivering intangible products to specific clients (especially information processing and human interaction);
- social learning – a concept that involves substantial investment in improving education and training, and in determining what type of skills and knowledge are socially and economically important. At a policy level, the idea of ‘lifelong learning’ has been widely recognised as a key priority, with particular emphasis on enabling people to become adaptable and to acquire new skills and knowledge, making them more informed workers, citizens, and consumers;
- challenges associated with globalisation, which stimulate the above trends and which further reinforce the trend towards globalisation.

Although these mutually reinforcing trends do not provide a detailed map or model of a knowledge society, they do point to important and interesting features of the current era which are still evolving, with uncertain implications. While these general trends guided the selection of indicators on the knowledge society, they are very general and relate to both the information society and the knowledge society. As a result, the Delphi project was used to analyse trends in greater detail (Euforia/Popper 2003). Statistical indicators were also analysed in order to differentiate between countries and to identify the level and speed of advancement of the knowledge society (Euforia/Empirica, 2003).

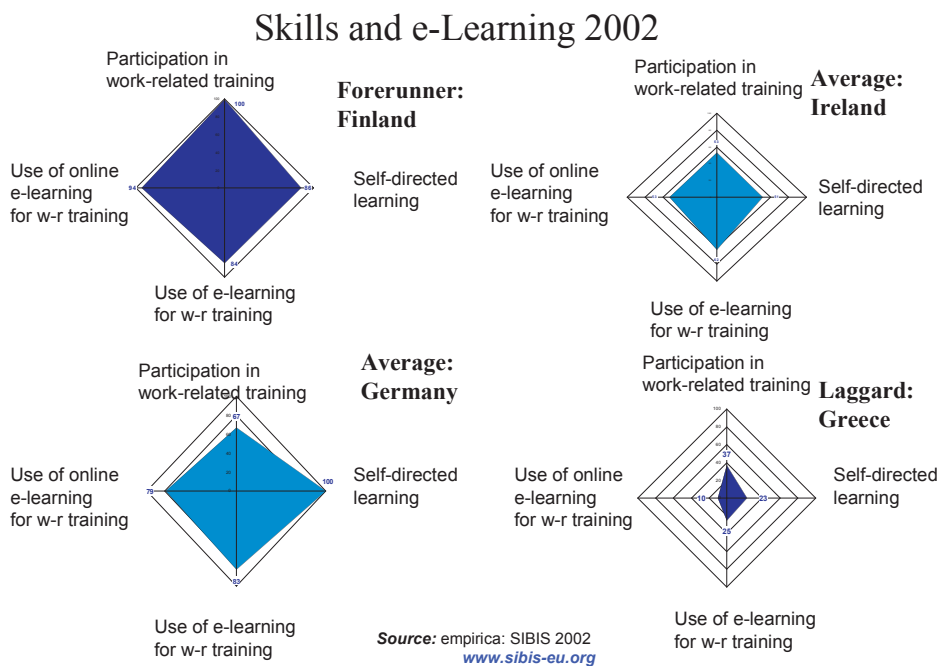
Key dimensions

All of the trends mentioned above can be measured according to the different indicators. For example, the indicators regarding e-learning and skills (Euforia/Empirica 2004, 2003), essential for advancement towards the knowledge society, are as follows:

- self-directed learning, i.e. learning that people use by themselves when they want to learn something new;
- use of online e-learning for work-related learning;
- use of e-learning for work-related training;
- participation in work-related training, which is provided by the employer.

The hypothesis is that all these forms of learning are related to the knowledge society. Another theory is that countries differ greatly in the extent to which they have advanced towards the knowledge society.

Figure 1: Skills and e-learning, 2002



Source: Werner Korte, empirica, 2003, *Advancement of the knowledge society in the European Union, US and Japan – Comparative statistical data on the advancement of the Knowledge Society, Euforia project report*

In Figure 1 above, the size of the four-dimensional shaded areas relates to how well the countries have fulfilled the Lisbon Strategy with respect to certain technology related learning issues. These pictures are comparative and show that Finland, in contrast to other EU countries, is more advanced in the use of online e-learning for work-related training, in participating in work-related learning, in the use of e-learning for work-related training and in self-directed learning. Both Germany and Ireland are average in this respect, while Greece represents one of the least progressive countries. Similar results could be presented regarding other dimensions of the knowledge society, and would show the difference in the speed and level of development of the knowledge society (Euforia, 2003).

Another example concerns eight dimensions of advancement of the Lisbon Strategy in the EU Member States, namely: information society; innovation, research and development; liberalisation; network industries; financial services; enterprise environment; social inclusion; and sustainable development. In the table below, countries are ranked according to how well they accomplished the strategy targets (WEF, 2003). On top are the Nordic countries, the UK and the Netherlands, in the middle group are the main continental countries, and in the least advanced country group, the Mediterranean countries. The new Member States were not involved in the study at that time.

Table 1: *Ranking of EU countries*

	Information Society	Innovation, Research and Development	Liberalization	Network Industries	Financial Services	Enterprise Environment	Social Inclusion	Sustainable Development	Average Rank
Finland	1	1	1	1	2	1	3	1	1.4
Sweden	2	3	6	3	5	6	7	4	4.5
Denmark	4	9	5	4	3	5	4	3	4.6
UK	3	4	2	9	1	2	10	6	4.6
Netherlands	7	8	3	6	4	4	1	8	5.1
Germany	6	2	9	2	8	11	9	2	6.1
Austria	5	7	4	8	9	8	5	5	6.4
Belgium	9	5	7	5	7	10	2	7	6.5
France	10	6	11	7	10	12	6	9	8.9
Ireland	11	10	8	13	6	3	12	13	9.5
Portugal	8	12	10	10	11	7	13	10	10.1
Spain	12	11	12	11	12	9	8	12	10.9
Italy	13	13	13	12	13	13	11	11	12.4
Greece	14	14	14	14	14	14	14	14	14

Source: *weforum, 2003. The Lisbon Review 2002–2003. An assessment of policies and reforms in Europe. www.weforum.org*

As Table 1 shows, there seems to be consistency in relation to all of the indicators among each of the countries. For example, if the country is on the top in relation to one indicator, there is a 70–80% probability that it will show similar results for the other indicators. The same is true for the average and worst performing countries in the group. This suggests that there is a potential for benchmarking of European information societies (Ahokas, Ira & Kaivo-oja, Jari, 2003).

Overall, these results raise a number of questions in relation to the advancement of the knowledge society:

1. Why are the northern European countries, along with the UK and the Netherlands, the most advanced in relation to the knowledge society?
2. Why do the Mediterranean countries lag behind the other EU countries in this respect?
3. Why are the main continental countries and Ireland only average in this respect?
4. Why do the individual countries show similar results for all of the indicators?

Taking all these observations into account, the overarching question can be defined as: why do the levels and rate of advancement differ so much between the countries?

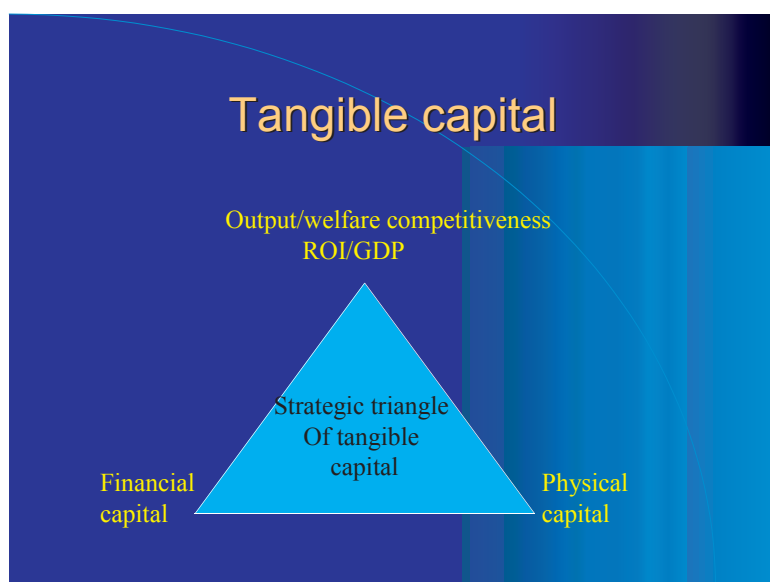
Impact of economic growth

Economists have long been interested in identifying the reasons why economic growth started in the first place and why it has progressed at different speeds in different countries. A particular focus of this discussion has centred on the accumulation of tangible capital, i.e. how financial and physical capital are accumulated and why some countries have managed this better than others.

Although economists have attributed about 40–60% of economic growth to changes in ‘factors of growth’ (Hjerpe, 2003), the reasons for the remaining percentage of economic development are still not explained. Efforts have been made to attribute it to ‘total factor productivity’. However, there is still considerable uncertainty about what the key factors are in the formation of the total factor productivity (Easterly and Levine, 2001).

This puzzle of economic growth can be presented in a more simplified way using the ‘strategic triangle of tangible capital’, the core components of which are financial capital and physical capital. Combining these two types of capital in a successful way will in turn produce goods and services. In companies, output is measured by ‘return on investment’ (ROI), and at a national level, the value of goods and services is measured by the gross domestic product (GDP). The higher the ROI, the more successful and competitive the company is. The higher the GDP, the more successful the society is in protecting the welfare of its citizens.

Figure 2: *Strategic triangle of tangible capital*



During the past 10 years, an increasing number of economists have accepted the idea that this pure economic model does not work in practice and that it only partly explains the reasons for economic growth differences between countries. Instead, answers have been sought from the institutional factors, which may be one of the major reasons for the differences between countries. For example, the Nobel price winner Douglas North (1990) has argued that formal and informal institutions (legal structures and normative ‘rules of the game’) are crucial in understanding economic performance. More recently, economists have explored the concept of social capital and its role in the economic performance of nations, regions, communities and even companies (Hjerpe, 2003).

Another point of interest for economists has been the fact that the range of income differences in the world seems to be increasing, as the World Bank indicates. People on the lowest incomes seem to remain where they have always been, while those on the highest incomes get richer. Moreover, some of the countries have stagnated close to zero growth, while others have approached growth of up to 10% annually, as has happened in Ireland in the last 10 years.

The two puzzles of economic growth and income distribution are similar and closely related to those regarding the different speed and level of advancement of the knowledge society. Statistics show that countries that are doing well economically are generally more advanced in relation to the knowledge society than those that are economically behind.

However, it is too early to create a link of direct causality between these two factors. The question remains, does economic growth result in the advancement of the knowledge society, or is advancement a reason for economic growth? Although this issue needs to be explored further, what is certain is that they are closely related to each other and that there is sufficient reason to analyse the relationship between intangible human and social factors and the advancement and growth of the knowledge society.

Attitudes towards the knowledge society

The concept of knowledge society generates different attitudes in different countries and among groups of people. Employers perceive it as something that will help to increase productivity and competitiveness, as well as flexibility, through new technologies in the global market. Employees are more locally oriented and perceive the knowledge society as something that will help to generate employment. Civil servants perceive it in a positive light and are concerned about slow national technology and skill advancement.

The following results were drawn from the national tripartite foresight reports, set up under the Euforia project (Ahokas, Ira and Kaivo-oja Jari, Finland Futures Research Centre, 2003; Amanatidou, Effie, Damvakeraki, Tonia and Psarra, Foteini, Atlantis, 2003; Korte, Werner B. and Mayer, Ingo, Empirica, 2003). Among the countries examined, Finland was selected to represent one of the forerunner countries, Germany the average country and Greece the least advanced country. In addition to group and individual differences, there were differences in national perceptions, which can be summarised as follows:

- In the Nordic European countries, the knowledge society was very much related to the welfare society and to equal opportunities. The knowledge society was seen in a positive light and as a source of opportunities.
- In the middle European countries, the knowledge society was associated with economic growth and discussed in a practical and technically oriented way, although not as future-oriented as in the Nordic countries.
- In the southern European countries, the knowledge society was much more related to people's relationships with each other, friends and family. In this sense, it was seen in quite a negative light, as something that would destroy old traditions and structures and that would demand increased modernisation.

These results may partly explain the reason for different speeds and levels of advancement of the knowledge society. For example, they help to explain the reasons behind the faster speed of advancement in the Nordic countries compared to the Mediterranean countries.

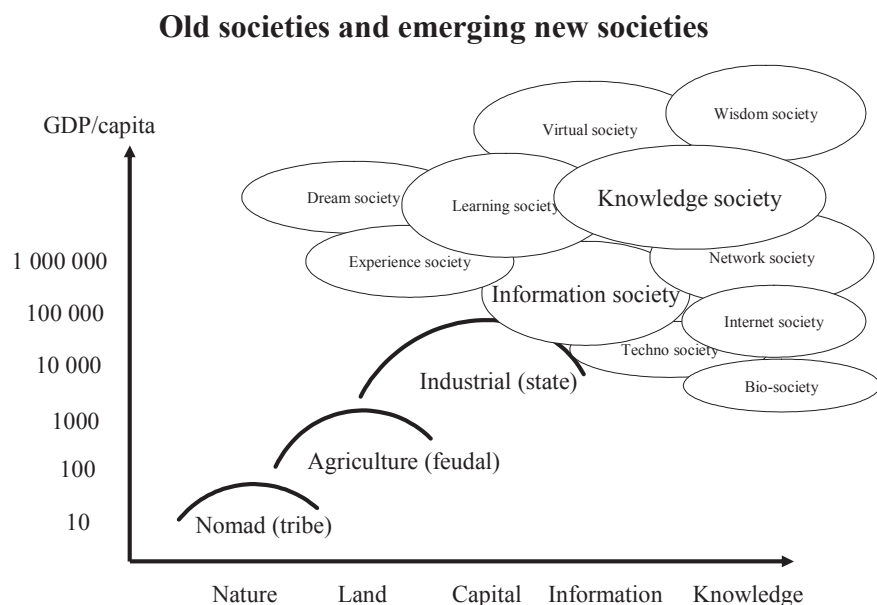
Nevertheless, it is too early to generalise results from these three country groupings, although it could be suggested that there are different phases or thresholds in their development. For instance, at the beginning of the change process, there tends to be resistance. In the second phase, the positives and negatives of the change process are evaluated from a practical perspective. The third phase of change takes place when people start to look at the possibilities that can arise from the changes, and view change as a way of finding new opportunities. In this way, the change process starts to be perceived in a more positive light as a source of opportunities, once initial fears have been overcome.

Different models

Emerging new societies

Analysis of trends and indicators, as well as the different attitudes and discussions in the national foresight reports, seem to indicate that perceptions of the knowledge society vary significantly. Trends capture something about the direction in which the knowledge society is going, and indicators about the actual advancement and attitudes in relation to the desirability of the knowledge society. In addition, perceptions of different models of the knowledge society also exist. An exploration of the literature showed that there are many different views on emerging future societies.

Figure 3: *Old societies and emerging new societies*



A historical analysis shows that older forms of society have very distinctive features. Society has evolved from a nomadic, to an agrarian, to an industrial society. In the nomadic society, the main driving force was nature and the main organisational form was the family. In the agrarian society, land ownership was the driving force and the organisational form was feudal, consisting of landowners and their subordinates. In the industrial society, financial capital became the driving force, and hierarchy and work sharing dominated the industrial organisational structure (Commission, 1993; Heinonen, 2003). Jokinen, Malaska and Kaivo-oja (1998) speak about the transient period before the emergence of the information society, referring to technology as the driver for change in agrarian and industrial societies.

There is also agreement in the literature that all these societies are still evident, but that their dominance is diminishing with the emergence of a new type of society. There are many possibilities for potential future societies, ranging from the information society to the knowledge society or to the learning society, virtual society, techno-society, dream society, network society, bio-society, and wisdom society. It is possible that all these models may be found at the same time, or that the future may be totally different to any of these theoretical models.

Most definitely, skills formation will be an essential feature of all future societies. In the knowledge society, learning takes on a wider human and organisational perspective. Lifelong learning means that people are learning throughout their lifetime. Learning as an organisational concept refers to the organisation that learns from its mistakes and successes. These types of organisations provide people with broad opportunities to participate in decision-making processes and learn from each other. People learn from changes just by participating in learning processes and their implementation

(Ranson, 1998; Coffield, 2000; and Heinonen et al, 2003). In the future, it is expected that learning will increasingly take place through new technologies, networking, and virtual communications. The learning society will provide the framework for this.

All visions of future societies are also based on the development of new technologies. However, there are different theories as to how much weight should be given to the importance of technology. One group believes that technological development is of enormous importance. The 'techno-society' describes a society where new technology affects all areas of human life, and shapes people's personalities and culture.

Information is another key concept related to all future models of the knowledge society. Yoneji Mashuda (1983) introduced the concept of the information society, to replace the concept of the post-industrial society. For Mashuda, the information society is the highest form of the welfare society, and one in which intellectual creativity flourishes instead of industrial consumption. In this society, citizens are connected to each other through information networks and information values replace material ones. The information society can thus be defined as a society in which information is a core component of civilisation and of production, and where information and communication technology (ICT) enhances cooperation and communication of companies and citizens within this society (Sitra, 1998). Aspects of the information society are included in all visions of future knowledge societies.

In a sense, the concept of the information society can be distinguished as a creative society and one that is based on interaction. One of the most important aspects of the information society is not so much new technologies but finding new ways of doing things. From a theoretical perspective, the key concepts include organisational forms based on networking and growth based on innovation.

The concept of the 'virtual society' is also common when talking about networks and ICT. This type of society is a more technologically advanced and equipped form of information society. The virtual society concept emphasises the possibility that all societal functions can be realised virtually, with ICT spreading to all aspects of society, e.g. working life, leisure time, home life, hobbies, education, training and culture. Similarly, work commuting can be replaced by virtual commuting and many other services can be provided virtually (Agres and Edberg, 1998; Heinonen et al, 2003).

More recent discussions on emerging new societies have concentrated much more on networking – or the 'network society', 'network state', or 'network economy' (Manuel Castells, 1996, 1997, 1998). The network society refers to a more qualitative change in the people's lives, where people have greater cultural autonomy in relation to the material basis of their existence. In particular, the internet has enabled widespread communication on a global scale. The diffusion of the printing press in the West created what MacLuhan referred to as the 'Gutenberg galaxy'. According to Castells (2001), civilisation has now entered a new world of communications, which can be referred to as the 'internet galaxy'. This seems to indicate that civilisation is moving towards an e-society, which is defined by e-business, e-learning, e-company, e-working, e-leisure. Technology, in particular the internet, will lead to a 'global village', the 'death of distance' and a 'virtual community' inhabiting 'cyberspace'. Kopomaa (2000) speaks about the 'city in our pocket', while analysing the birth of the mobile information society via the internet.

All new emerging societies include ideas about the changing nature of knowledge. In the nomadic society, tribes required knowledge about nature, in the agrarian society about cultivation, and in the industrial society about industrial production. 'Meaningful knowledge' was typical in the years marked by the revival of learning, when knowledge was acquired in order to better understand the world. This was followed by a period marked by 'productive knowledge', when knowledge was applied to suit the needs of industry (Stehr, 1994). At the moment, society is said to be in the period of 'action knowledge', when knowledge is an elementary basis for everyday life.

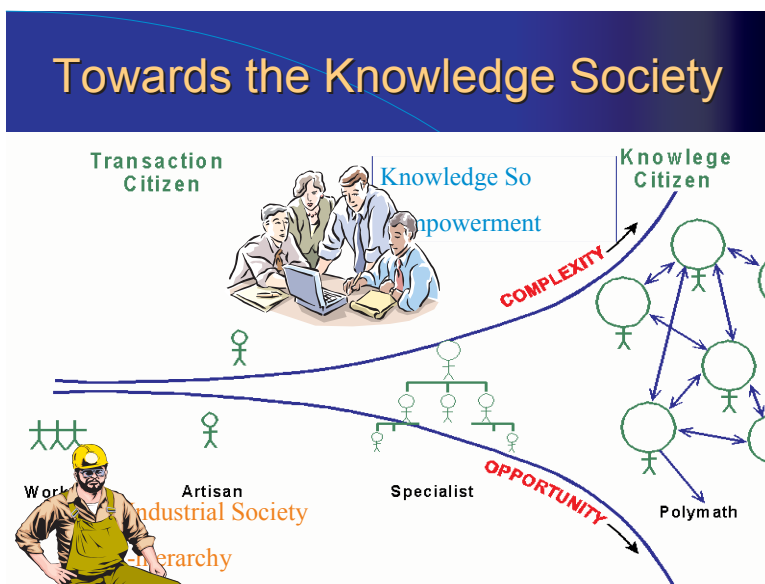
In the 1940s, F.A. Hayek first used the concept of the knowledge society when he wrote about the importance of knowledge for people, inventions and for society in general. Peter Drucker (1957) wrote about the importance of mental resources compared to manpower resources. Taichi Sakaiya (1991) made a connection between the knowledge society and values, and argued that the main driving force is knowledge. In the industrial society, the economy was materialistic, but in the knowledge society it can be referred to as a ‘symbolic economy’ (Stehr, 1994), and one which has many important impacts, for example, on employment (Kaivo-oja, Jari, Ahokas, Ira, Malaska, Pentti & Luukkanen, Jyrki, 2002).

Gunnar Eliasson talks about the ‘experimentally organised economy’ and argues that the growth in information is making the world increasingly complex, heterogeneous and unpredictable: ‘Information technology has increased our capacity to gather, process and analyse information, but at the same time also diminished our possibilities of being informed about the whole, by increasing the total of circumstances that we can be informed about at a faster rate than we have learned about the previous state of affairs’.¹ He also speaks about ‘information paradoxes’² and asks if the world is becoming less informed because knowledge levels are growing at a faster rate than the rate at which people can learn. In other words, is the world becoming less and less informed about what is becoming more and more important? Is society moving from a knowledge based information economy towards a ‘misinformation society’?

Knowledge society citizens

As a concluding remark, it can be said that the industrial society is losing its dominance as a social and organisational structure. The world is moving more towards the knowledge society where knowledge is becoming the dominant driver of change. This change can be described and symbolised by the growing importance of mental capacity, unlike the industrial society where the physical capacity of workers was more important and where the thinking was done by people in management and planning positions.

Figure 4: *From the industrial society towards the knowledge society*



¹ Gunnar Eliasson, *The nature of economic change and management in the information based knowledge economy*, 1998. <http://www.druid.dk/conferences/summer1998/conf-papers/eliasson.pdf>

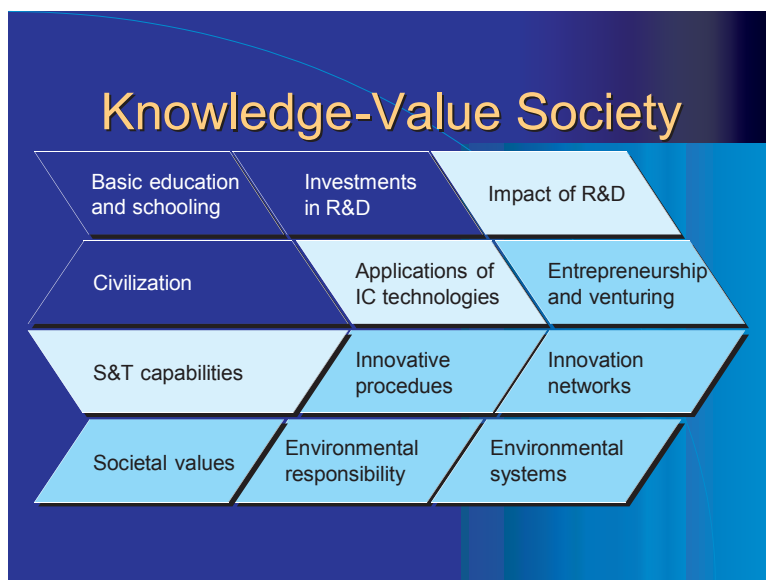
² Gunnar Eliasson, *Ignorant actors in the resource rich world of the knowledge based economy*, 2004. <http://ideas.repec.org/p/hhs/ratioi/0047.html>

One of the distinguishing features of the information society is its capacity for dealing with data and for producing information in an efficient way. Reproduction of information is cheap and rapid. Knowledge, however, is a matter of cognitive capability and is not easily reproduced and transferred to others. The knowledge society is best understood as empowering its citizens with a capacity for intellectual or physical action (Webster, 2001).³

In the knowledge society, workers are empowered to think, and greater transfer or 'networking' of information is enabled through new information and communication technologies. In this digital age, complexity and opportunities are increasing. Face-to-face networking is increasingly replaced by networking through new ICT.

Mika Naumanen has built a conceptual model of a knowledge society, which can be used as a knowledge society barometer. The model is composed of basic elements of the information society and the knowledge society, the outcome of which would be a 'knowledge-value society'. The information society is composed of elements like basic education, investment in research and development (R&D) and in people. The knowledge society would include components like application of ICT as well as impacts of R&D. The final purpose is to enhance value for the citizens and this can be seen in measures like entrepreneurship, innovation, environmental awareness, and also in the development of values (Naumanen, 2003).

Figure 5: *Knowledge-value society*



The focus on moral and ethical dimensions of future societies has resulted in the emergence of a special school of 'risk society' thinkers (Ulrich Beck, 1990). According to Ulrich Beck's hypothesis, there is a possibility that a totally new society will emerge, which will be guided by new rules unlike those of the industrial society. These rules could relate, for example, to issues such as unmanageable technology, unsustainable use of nature, disease, lack of equal opportunities, genetic technology, wars and terrorism.

To conclude, it can be said that the knowledge society concept unites both economic and cultural factors, which are very often kept separate from each other. It can even be argued that we are moving towards a cultural society where the main drivers are cultural learning and knowledge, factors which in turn encourage human and organisational creativity (Wilenius, 2004). Cultural learning is built on and composed of all human capabilities and organisational structures which promote the use of cultural capital in the cooperation between citizens and in productive action.

³ Frank Webster, *I=0 (Information has no intrinsic meaning)*, 2001. <http://www.fernstar.com.au/publications/papers/i=o.htm>

Building blocks

The building blocks of the knowledge society consist of aspects of previous societies, such as tribal, agrarian and industrial societies. Building blocks also relate to future emerging societies, such as the information society, learning society, techno society, network society, and virtual society. All of these new societies have their own drivers, such as new technology, information, networking, new organisations, or virtual capabilities. At a fundamental level – just as nature was a driver for the tribal society, land for the agrarian society, and tangible capital, finances and machines, for the industrial society – knowledge has also been one of the main drivers for all past societies and will be a key driver for emerging societies. The big difference is that today, in the knowledge society, the importance of knowledge is increasing more rapidly as one of the main drivers. Just as capital investment fuelled the industrial revolution, knowledge investment will drive today's information and knowledge revolution.

Knowledge capital

In the Oxford dictionary, capital is defined as the amount of wealth, power, advantage or influence that a person has. This concept relates to 'capitalism', which really began in the eighteenth century. Capitalism refers not only to the accumulation of material wealth, but also to power over other people to manipulate, influence and make a profit from them (Zohar, 2004).

In the last 30 years, the emphasis on material value has shifted slightly to other forms of capital. John Kenneth Galbraith (1969) was first to use the concept of 'intellectual capital' in an article that analysed invisible elements which companies tried to generate to add value to their operations (Campbell and Grantham, 1998). Although Galbraith does not make any clear definition of intellectual capital, he uses it as a general concept to refer to the production of information and to the intangible capital of success. At that time, the concept was closely related to the idea that part of the value creation in a company was based on the application of financial capital, and part was related to the use of intellectual capital. However, it was not clear what level of importance was assigned to these different types of capitals.

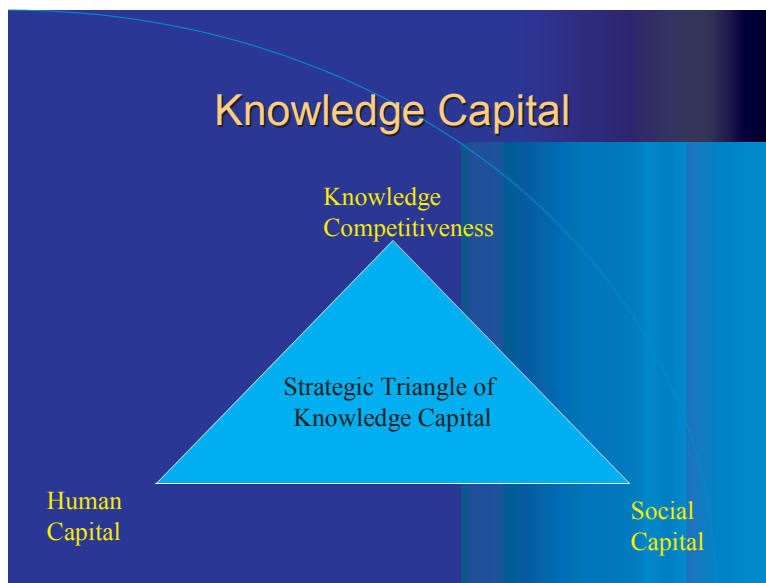
One challenge was to devise certain indicators for measuring the value of these two elements. Nonaka, Toyoma and Konno (2000) tried to do this by categorising intellectual capital according to four types of company capital: experimental capital; conceptual knowledge capital; systemic knowledge capital; and routine knowledge capital. This was useful in that it helped to demonstrate the importance and complexity of the concept. However, it was not particularly useful for measuring the value of companies. For example, how could one measure the value of production equipment against that of more intangible assets such as the company brand, or the market share, or its intellectual capital?

Today, discussion about intellectual capital is no longer merely theoretical, although the concept of intellectual capital has been replaced by the concept of knowledge capital. In Denmark, for example, the Government adopted a law on knowledge capital in the late 1990s. One of the major focuses of knowledge capital reports is to show how different statistical models can measure a company's competitiveness. These are relevant figures which relate to factors such as the skills of personnel, public relations, customer relationships, patents, information channels and the importance of the legislative changes for the company. If a company wants to be perceived as a 'knowledge company', it has to indicate how it is managing its intangible assets. For example, in 2005, UK companies have to provide an 'operating and financial review', which includes information on principal drivers of company performance, both in the past and future (David Coats, 2004). This information relates to issues such as company objectives and strategy, employees, customer and environment issues. It is an indication that the previous emphasis on material capital value is shifting more towards an increased understanding of knowledge capital. This not only has high symbolic value, but also concrete value when knowledge capital is linked to knowledge channels and knowledge carriers. These represent the creation, dissemination

and exploitation of knowledge. Collectively, they will provide companies and societies with core information that they need in order to increase their knowledge competitiveness.

The core elements of knowledge capital can be described by the strategic triangle of knowledge society, shown below, in which human and social capital lay the foundation for increased accumulation of knowledge capital. This type of capital, in turn, provides the raw material for knowledge competitiveness required to enhance the welfare of citizens. The higher the knowledge competitiveness of the company, region or country, the more successful its welfare building capacity will be, and the more advanced they will be in moving towards the knowledge society.

Figure 6: *Strategic triangle of knowledge capital*



The concept of 'knowledge capital' highlights the importance of human capital and social capital. Financial capital and physical capital are also significant, but knowledge starts to acquire an even more important position than that of raw materials. Knowledge capital is the driving force of the knowledge economy, referring to the society or region's capacity for creating new ideas, and converting knowledge into commercial values. Knowledge competition, therefore, is a key component when trying to understand the reasons behind the different speed and levels of advancement towards the knowledge society.

The OECD (2004) has argued in its studies that a knowledge society is characterised by the emergence of knowledge intensive networks as key agents for promoting the use of knowledge capital and its development in all significant domains of activity. Only when an increasing number of communities, displaying those very characteristics, are formed across a wide variety of cognitive fields, and when professional experts, ordinary users of information, and students are brought together by their shared interest in a given subject, will the knowledge society become a reality rather than merely a vision of a possible future.

Human capital

Human capital is particularly crucial in today's knowledge-driven economy (Fuente and Ciccone, 2002). It is defined as the knowledge, skills, competencies and attributes embodied in individuals, which facilitate the creation of economic, social and personal well-being. Human capital is closely linked to characteristics of the individual worker and explains

why one worker may be more productive with the same capital equipment than another (EMPL/G3/03). Human capital is also referred to as 'intellectual capital' and forms part of the organisation's invisible assets. It is an asset that is easily overlooked, rarely audited, and often neglected (Hargreaves, 2004).

Many different societies have attributed their success to human capital, human creativity and innovation. However, in older societies, much of the success has also been attributed to manpower capital. In the industrial society, manpower was transferred to machines and increasingly, success became based on ideas, theoretical knowledge and understanding. Compared to previous societies, the knowledge society requires more people with the know-how and, in particular, skills to build and develop ICT hardware and software. The real significance of ICT for human capital is not so much related to work in the ICT production sector, but to the ever-increasing number of knowledge workers. At the moment, over 50% of all workers in the EU use a computer as part of their job. Digital skills are almost as essential as basic literacy in today's world of work. Lifelong learning is also seen as an important investment, encouraging individual success and innovation. It is well known that more highly educated citizens are better paid and have increased possibilities of finding a job than those who are less educated (EU Commission, 2003).

Very often, human capital is perceived as skills and competencies only, without taking into account the 'real human capital', its components and its changing nature. Traditionally, human capital is associated with IQ – people's rational problem solving intelligence. Some 10–15 years ago, however, Daniel Coleman added to this the concept of 'emotional intelligence – self-awareness, the ability to read the feelings of others, and to respond appropriately. Danah Zohar and Ian Marshall (2004) then devised the concept of a third type of intelligence, i.e. 'spiritual intelligence' – being connected to our deepest meanings and values, our visions and purposes. Human capital can therefore be said to be composed of intellectual, psychological and sociological dimensions. Accumulating human capital in all its forms is essential when creating social capital and intangible capital; material capital on its own is not enough for welfare building in the knowledge society.

Social capital

In recent years, the concept of social capital has attracted much attention in relation to discussions about the knowledge society. Coleman (1988, 1990) and Putnam have brought the concept into the scientific arena. In OECD symposiums, social capital has been defined as comprising the norms and networks that facilitate joint and other collaborative actions. The World Bank has tried to measure different features of social capital at micro-, meso- and macro levels. Also, the Foundation has tried to identify what relevance the concept could have in political decision-making (Strategies to combat social exclusion and unemployment in disadvantaged regions: the role of regional social capital, Interim Report, October 2003, LRDP).

These references show that there is no universally accepted definition of social capital. The concept is relatively new in academic literature and in the social sciences. However, policymakers place increasing emphasis on the concept. For example, it has been used as a concept to explain economic development and good governance. It has also been regarded as an important concept in inclusion and exclusion policies. Lack of clarity about its definition is in a sense the strength and the weakness of the concept. Although the concept encourages more creative thinking, at the same time, it can be difficult to measure, and there is also a lack of consistency in assessing levels of social capital.

One particular problem is the fact that social capital encompasses such a wide range of theories on the importance of the social dimension, that it is difficult to be clear about its exact definition (e.g. it is everything from an individual's own informal networks to formal state institutions). Woolcock (2001), while accepting all of these perspectives, argues in favour of a more concise definition focusing on norms and networks – i.e. 'norms and networks that facilitate cooperative action' – which distinguishes between 'bonding' (within groups), 'bridging' (horizontal networks) and

'linking' (linking people or groups at different levels in hierarchies). This definition regards the functioning of institutions as being relevant to, but not part of, the definition of social capital.

The notion of trust in relation to social capital research has also evolved. It can refer to interpersonal trust or organisational trust, such as cohesion and collaboration, networks, and mobilisation that facilitates coordination and cooperation for mutual benefit. Fukuyama (1995) spoke about generalised trust, which extended to strangers, and argued that, when trust does not extend beyond the family, the supply of capital and of qualified managers is limited, thus constraining the scale of private firms.

From an industrial relations' perspective, the trust relationship, or 'social corporatist values', and 'encompassing interests' between the social partners would be stressed as the drivers of economic growth. This is also related to income distribution. Unequal distribution is detrimental to growth. Equal distribution promotes solidarity and tends to reduce the potential for social conflict.

To summarise, it can be said that social capital refers to networks and participation in public life, together with shared norms, values, culture, habits, trust and understanding, all of which facilitate cooperation within or among groups in the pursuit of shared objectives. Appropriation and accumulation of social capital involves individuals, communities, organisations, and society as a whole. Social capital is an invisible asset in society. It reflects levels of internal trust, the quality of internal and external relationships, and the depth of engagement with stakeholders. Social capital is embodied in networks of interpersonal relations, and can be strengthened by a deeper understanding of these networks. On its own, however, this form of capital is usually not enough, which is why another form of invisible capital, called 'organisational capital' (Hargreaves, 2004), is also required. Organisational capital refers to the know-how and skills available and required to make effective use of intellectual and social capital. High levels of organisational capital can be deployed to strengthen other invisible assets.

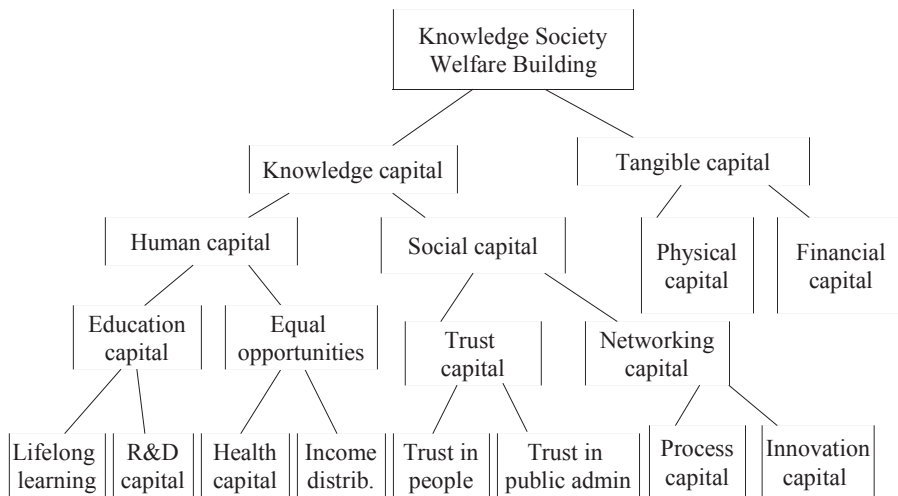
An interesting question is whether social capital could be one of the most important drivers in relation to the speed at which a country develops the knowledge society? New technology is available almost everywhere, at a relatively cheap price, but countries have capitalised on this at different speeds. Although economic factors partly explain the reasons for these differences, could social capital and knowledge competitiveness also be used to explain these differences?

Pyramid of knowledge society welfare building

The market value of any company is based on shareholder equities and intellectual capital, where intellectual capital is built on the company's structural and human capital. Structural capital, in turn, is built on customer capital and organisational capital. This model forms a pyramid of material and human assets belonging to a company (Sveiby, 1999). In 'knowledge companies', invisible assets may be 14-fold compared to the company's visible assets, a fact which highlights the importance of analysing knowledge capital.

In the previous chapters, economic explanations for growth of both tangible capital and knowledge capital were explained using the strategic triangle model. While the tangible capital model focused on financial and physical capital building, the knowledge capital model focused on human and social capital building. Together, it was argued, knowledge capital and tangible capital constitute the main assets required for knowledge society welfare building. The higher these capitals are in society, the greater the speed will be towards the knowledge society.

Figure 7: Pyramid of knowledge society welfare building



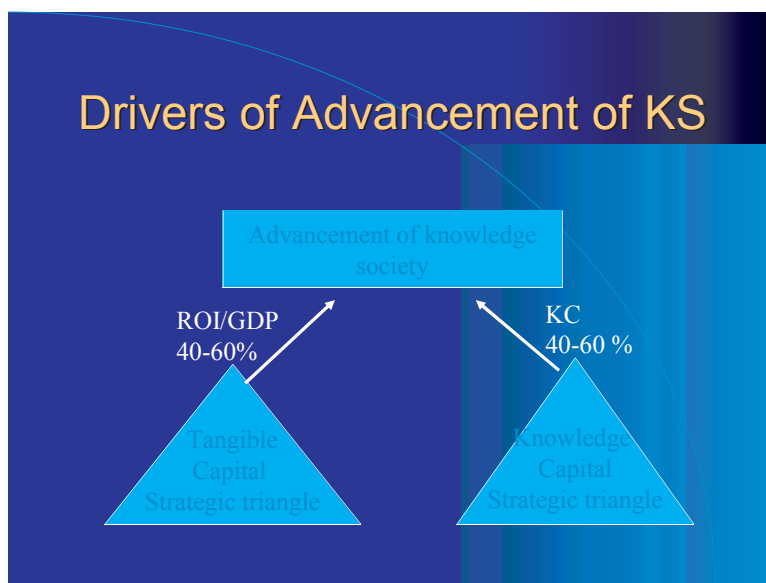
Using the pyramid model, knowledge society welfare building can be explained according to specific components of the emerging knowledge society. For example, education and equal opportunities are essential elements in building human capital. Lifelong learning and R&D are essential elements of educational capital. Health and income distribution are essential in building equal opportunities and in promoting knowledge society welfare building. Societies that have well developed education systems and equal opportunities, in turn, are advancing at a faster speed towards the knowledge society.

In relation to social capital, the main components are trust and networking. Trust capital is composed of trust among people, enterprises and public administration. Networking capital includes processes that encourage greater cooperation and innovation. The more trust and networking capital there is in a society, the higher the speed of its knowledge society welfare building will be.

Key drivers

For Schumpeter, the success of a company was related to the level of knowledge it possessed, particularly knowledge that other companies did not have. Similarly, knowledge competitiveness, arising from successful innovation policy, can be seen as a key component of a nation's success. It enhances opportunities for increasing trade, developing the public sector, and increasing productivity and employment. Traditionally, investment has focused on technological innovation, but in the future, social, process and cultural innovation will become increasingly important. In the knowledge society, investing in knowledge is crucial for greater knowledge competitiveness. Developing creative and dynamic national innovation systems is particularly important for enhancing the nation's wealth. A crucial issue will be finding answers to the question, from which components is knowledge competitiveness built? 'We now understand better than ever that innovation is very often a social, interactive process rather than one of individual creativity, and that networks play a vital role in the creation and the transfer of new knowledge and innovation'.⁴

Figure 8: Drivers of advancement of the knowledge society



Already, it has been outlined how knowledge society welfare building is composed of two core elements: tangible capital and knowledge capital. Economic theories have succeeded in partly explaining the reasons behind different speeds and levels of economic growth. The main hypothesis in this article is that knowledge capital – which is translated into knowledge competitiveness (KC) in the market – can also be used to explain differences in economic growth. It should be pointed out, however, that although economic growth and advancement of the knowledge society are closely related, the direction of causality is not totally clear. Does economic growth increase knowledge competition, or is knowledge competition the reason for economic growth? This question leaves room for further analysis to assess the reasons for advancement in relation to global drivers, EU drivers and policy challenges.

Another challenge relates to the organisation of tangible capital, such as financial capital, equipment and buildings, alongside knowledge capital, such as human, social and organisational capital. For Manuel Castells, the merging of these two forms of capital constitutes the network society⁵ – a society which characterises the present age and the process of

⁴ David Hargreaves, 'Networks, knowledge and innovation' in McCarthy et al, 2004. <http://www.demos.co.uk/catalogue/networks/>

⁵ Manuel Castells, *Material for an exploratory theory of the network society*, 2000. http://sociology.berkeley.edu/public_sociology/public_sociology_pdf/Castells.pdf

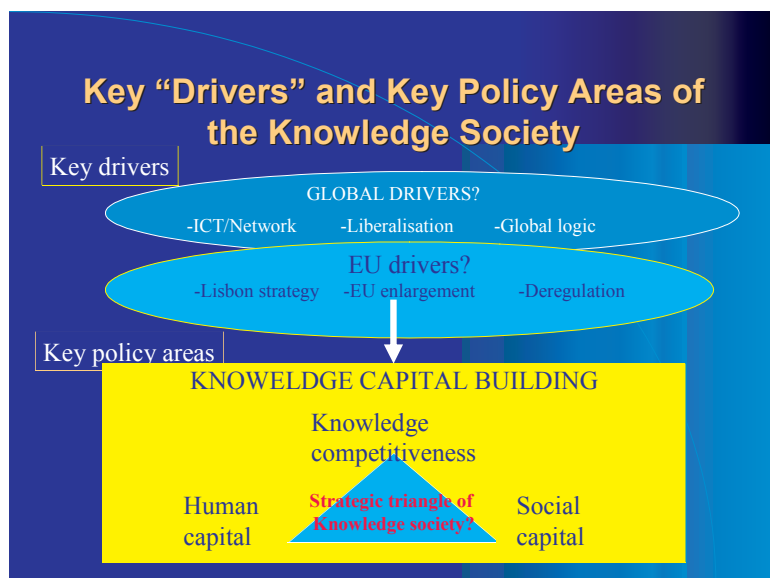
transformation to the knowledge society. Nevertheless, the mere existence of these types of capital does not necessarily mean that they are being mobilised effectively to increase competitiveness. Resources have to be actively mobilised: organisational capital is the best resource for achieving this⁶.

In the 1990s, it was hoped that ICT could provide the answer. Today, however, it is clear that ICT alone can do little to influence overall performance, unless it is combined with investment in work practices, human capital, and organisational restructuring, including decision-making rights, incentive systems, hiring, and training (Brynjolfsson, 2003)⁷. Innovation is also thought to be increasingly important. Effective collaboration is another crucial aspect of a knowledge-based organisation (Svejby, 2003)⁸. Poor collaboration reduces the effectiveness of communication and hinders creativity. Good collaboration increases knowledge sharing abilities and creates valuable social capital and trust relationships.

Global drivers of the knowledge society include things like new technologies, increased liberalisation, and global logic. Although these drivers exist in all countries, they do not explain the differences in speed or level of advancement of the knowledge society. New technology is cheap and available almost everywhere, but there are huge differences in the uses of new ICT. Liberalism is progressing but at a different speed in different countries. Global logic penetrates market economy thinking, even in China and India, and moves the direction of investments. These are general global drivers, which influence national practices and which have a significant impact on the behaviour of nations, companies and people.

Besides these global drivers, there are also regional drivers. Major goals within the EU include free movement of financial capital, people, goods and services. Deregulation is a key driver for these goals. The Lisbon Strategy is another driver, which was devised to support Europe in becoming the most dynamic, knowledge-based society in the world. Enlargement of the EU has speeded up structural change, capital flow and migration – all new drivers in the EU.

Figure 9: Key drivers and policy areas



⁶ David Hargreaves, 'Creating an education epidemic in schools', in Bentley and Wilson, 2004. http://www.demos.co.uk/catalogue/theadaptivestate_page333.aspx

⁷ Eric Brynjolfsson, *The IT productivity gap*, June 2003. <http://www.optimizemag.com/showArticle.jhtml?articleID=17700941>

⁸ Ibid Svejby, 2003.

At company level, a number of main drivers can also be identified, e.g. customers and markets, shareholders and governance systems, stakeholders, human resources practices, creativity and innovation management.

All these key drivers are actively pushing countries to move towards the knowledge society through building of knowledge capital, the main components of which are human capital, social capital and knowledge competitiveness. The key question is how to put these elements together in the most productive way and how to combine them with the strategic triangle of tangible capital building.

The pyramid of knowledge society welfare building clearly shows that advancement cannot be encouraged by solely concentrating on only one or two knowledge society components. Advancement should be a holistic process, encompassing all elements. For example, if new technologies have been developed, they will also require the development of human capital, education, training, lifelong learning, and innovation policy. All these components are bound together in the strategic triangle and pyramid of the knowledge society.

Conclusion

The main ‘puzzle’ of this paper has been to explain the reasons behind differences in the speed and level of advancement of the knowledge society. It aimed to do this by identifying the main drivers of the knowledge society. From a Lisbon Strategy perspective, solving this ‘puzzle’ could prove particularly useful as it may provide clues on how best to implement the Strategy. It is also relevant from a social scientific perspective, as it may help researchers to develop better concepts and indicators for monitoring the development of the knowledge society (OECD, 1996, 2001, 2003).

The Euforia project results have shown that people in different countries have very different attitudes towards the knowledge society, ranging from the sceptical attitude of the Greeks to the rational German and enthusiastic Finnish attitudes. This could indicate that attitudes may partly explain the reasons for variations in the speed of knowledge society advancement. However, the question still remains, what is the explanation for differences in attitudes to begin with? Further cross-comparative studies could help to answer such a question.

The short literature review showed that researchers have very different visions about what the knowledge society is, ranging from technology-oriented to information-, bio-, culture-, and knowledge-oriented visions. How these visions are related to attitudes and to the advancement of the knowledge society itself is not yet known, but such a question certainly warrants continued research on this issue.

The literature also showed that econometric models have succeeded in partly explaining the reasons for differences in economic growth between countries. More recent approaches to understanding this gap are related to the concept of social capital. However, the Euforia project country profiles showed that social capital would be too narrow an approach to explain such differences. The results also show that there is an empirical association between knowledge capital and the advancement of the knowledge society, which includes social capital but which is broader in meaning. While the evidence seems to indicate that they are closely related, it is too early to say anything about the direction of causality. For example, it would not be accurate to say that knowledge capital results in advancement of the knowledge society. In many ways, the causality may run the other way round: rapid advancement of the knowledge society enhances innovation and knowledge capital.

Even if the direction of causality has not yet been determined, it does not mean that our understanding of the relationship between advancement of the knowledge society, knowledge capital and the nature of knowledge competitiveness cannot be improved. Again, this warrants more in-depth analysis. Policy-oriented studies could also be initiated to explore ways of promoting knowledge capital and knowledge competitiveness. For example, how can human and social capital be combined to help promote knowledge society welfare building?

One issue related to this question is the continuous and rapidly increasing changes that are underway in society and the importance of human and social capital. This indicates that, in addition to greater job stability, there also needs to be greater guarantees in relation to job mobility (Price and Vinokur, 1995; OECD, 2004). Related to this is the need to re-frame labour policies and welfare systems in order to better protect workers ‘in the labour market’ and not ‘from the labour market’. In other words, it is now widely recognised that instead of merely protecting people’s jobs, they should be supported in their capability to cope with occupational transitions.

There is also a shortage of appropriate datasets on knowledge society welfare building. Although the process of generating sufficient datasets is slow, they should be created (OECD, 1997, 2000, 2002). This leaves room for the development of reliable foresight methodology for the production of knowledge society barometers, which would monitor actual development, and also produce foresights for the development of knowledge capital and knowledge competitiveness, including human and social capital. The knowledge society barometer could be a valuable tool for decision-makers, and for the creation of a knowledge society welfare scoreboard used to measure the ‘added value’. Benchmarking knowledge competitiveness would also help in creating valuable policy options for the EU, for Member States and for regions.

Country profile results in relation to the knowledge society indicate that national innovation systems have played an important role in its advancement (Lundvall and Rodrigues, 2002). However, it is not yet known if innovation systems are a result or a cause of national differences in the advancement of knowledge society welfare building. A study on national innovations systems, and particularly on the role of social partners in innovation creation, would be a very important research topic. The research could begin by analysing existing workplace innovation practices and by developing tools for promoting knowledge capital building. Work and enterprise panel inquiry would be one concrete step towards realising this challenge.

The article has shown that there are many shortcomings in relation to existing definitions of the knowledge society. However, the lack of an accurate definition does not necessarily mean that the knowledge society cannot progress. Moreover, the concepts of knowledge competitiveness and knowledge capital are useful insofar as they attract attention to these particular areas, which are related to the advancement of knowledge society welfare building. Concentrating on societal decision-making, and particularly the implementation of the Lisbon Strategy, could be an important challenge for future research, in turn creating a better understanding of knowledge society concepts for future policies on improved living and working conditions. More research on national and company level innovation strategies would also be beneficial, and could be useful in developing national and company-based policies for welfare creation.

Current economic and social changes underway in Europe are being attributed to the development of new forms of tangible and intangible goods and services. They require a continuous restructuring of industries, supply chains and individual organisations. This is part of a more general and permanent restructuring and reorganisation of companies (Gowing et al, 1998; Burke and Cooper, 2000), which very often involves the relocation of plants at an international level, and the outsourcing of many activities both to national and foreign suppliers. Relocation and outsourcing have in turn led to job losses, as well as the increasing prevalence of temporary and flexible contracts. Against this backdrop, Euforia results show how important it will be to study the impacts of knowledge society on working conditions, living conditions and industrial relations.

These important changes are often credited with paving the way for a 'knowledge-based economy', whose consequences are so far-reaching that they have the potential to reshape all relevant extra-economic domains of human life, so that individuals, families, local communities, and nations may find themselves living in a new 'knowledge-based society'.

Finally, it is worth noting that the Euforia project is part of a Foundation 'developmental project'. This means that the project is intended to be, at the same time, explorative, experimental, and forward looking in its approach. As a general guideline, it should bring to the Foundation new ideas, explore less analysed topics, outline potential future weaknesses, and experiment with new methods. Objectives were defined in the project process, and outcomes include research reports, ideas, hypotheses and proposals for other new research projects.

This paper is based on the Euforia project results, and on other research literature, as well as discussions, seminars, and workshops. It aims to conceptualise the various empirical research results by discussing the concepts of knowledge capital, knowledge competitiveness, and some of its main components, such as human and social capital.

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