

## Executive Summary

The vision of social cohesion in this report is informed by the human centred perspective of information society. This perspective extends the techno-centric notion of information society to the social dimension, emphasising the interdependence between technology, knowledge and society. Social cohesion is about promoting a culture of shared communication, values and knowledge, seeking coherence through valorisation of diversity. It is about shaping of ICTs as tools for participation, human choice, reciprocity, subsidiarity and social innovation. Knowledge is a social and cultural resource. Sadly the dominant view in many circles sees knowledge as a commodity and an instrument of bargaining power. Knowledge networking is about creating new alliances of universities and the civic society. At the global level, it is about a symbiotic relationship between the local and the global.

The human centred philosophy seeks a symbiotic relationship between technology and society. It transcends the 'causal' view of technology to the 'purposive' view of social shaping of technology. It holds that the causal view, rooted in the separation of the objective and the tacit dimension of knowledge, leads to designing technology in which people adapt to the machine. The purposive view, rooted in the dynamic interdependence between the tacit and the objective dimensions, leads to designing technology in which the machine adapts to people.

The objective of this report is to transcend the techno-centric discussion of information society and propose a human centred framework for research into ICTs and social cohesion. It emphasises a new vision of social cohesion in which *shared communication and shared knowledge drive cohesion and cohesion generates shared communication and shared knowledge.*

Knowledge networking reflects a belief in the need for much wider diffusion of knowledge and experience in society. The discussion accepts the argument that whereas the notion of technology transfer has been central to the development of industrial society, knowledge transfer in the wider sense has become a cornerstone of innovation in the information society. Knowledge networking is not about increasing the quantity of information, the speed of its transmission and 'user friendly' interaction, it is rather about the quality, appropriateness and situatedness of information, and the processes of conversion of information into knowledge.

The 'techno-centric' focus of social and economic development is neither 'pre-ordained' nor predetermined. Just as technology can be shaped to serve human purpose, so we can shape social and economic innovations to meet the challenges of employment, health, welfare, inequality and poverty. But this requires a fundamental shift in our view of science and technology, a shift from 'causal' science to 'purposive' science. It also requires a fundamental value change on our part: a shift from the technical to the social, a shift from technical capital to social capital.

Central to the discussion on social cohesion are the concepts of participation, 'valorisation' of diversity, subsidiarity, human machine symbiosis, tacit knowledge, human purpose, dialogue, and coherence. The discussion draws upon current European research on Human Centred Systems, European Information Society, Learning Society, Telematics and Social and Economic Cohesion.

In the face of the widespread economic pessimism, personal uncertainty and social vulnerability prevalent today, a human centred vision of Information Society seems to be one of the most significant available catalyst on offer for renewal and innovation. The human centred approach provides a way forward for social cohesion which transcends the organised and managed participation of citizens. It induces an active citizenship rather than a passive claimant relationship. It argues for broadening the knowledge base of society by building new networks of alliances between the academic knowledge networks, the community (grassroot) networks and social actor (e.g. voluntary and trade union) networks.

## **Introduction**

- **A Challenge of Social Cohesion**

The challenge of social cohesion is part of the wider presence of information and communication technologies which has become so substantial in the information society, that it is beginning to underpin all human activities and human relations. Social and economic forms of working and living including social concepts of service, identity, and society are being redefined and represented in the image of the technological paradigm. Technological innovations offer a great potential for a new social and economic renaissance, but are also threatening exclusion of people and their aspirations from shaping the information society. New technologies provide opportunities for the creation of new forms of employment, human services and living conditions, but at the same time there are dangers of decontextualising identity and thought, and closing down of human capacities of social innovation and sustainability. Information and communication technologies are being employed to transfer and control the flow of information, knowledge, money, goods, and services across national boundaries. A great gap is already emerging between this global image of information society and the human centred vision of developing socially useful technologies which deal with wider societal issues of employment, welfare, education, health, education, literacy, hunger, and poverty.

The proposal for the pilot study on knowledge networking and social cohesion arose from the recent international conference on 'New Visions of the Post-Industrial Society', which was organised by the SEAKE Centre, University of Brighton in July, 1994. The theme of the conference was concerned with the above conflicts and dilemmas, and exploration of the ways in which we may shape technologies and systems which respond to social and economic needs, aspirations and interests of peoples and societies. One of the major reflections of the conference was that there is an urgent need to build new alliances between universities and civic communities, which serve aspirations, needs and interests of people and communities, including those who are either already excluded or may be further excluded from the mainstream of social and economic activities of society.

A major technological challenge of social cohesion facing the EU is how to use ICTs and media technologies for enabling citizens to participate in the shaping

the processes of social and economic innovations. This means involvement in generating, maintaining and regenerating social knowledge bases for a sustainable information society. This challenge of social cohesion requires a fundamental shift from a focus of techno-centred vision of information society to the human centred vision, a shift from seeing cohesion in terms of technology shaping of society to envisioning social cohesion in terms of social shaping of technology. This vision emphasises the continuity of technological and social innovations building upon the dynamic interdependence between technology and the knowledge base of society. It sees knowledge as more than a matter of technical innovation, neutral, objectified and separated from the social and cultural contexts. Rather it sees knowledge as the core resource for social cohesion, a tool for personal, and social and economic development. This view of social innovation shifts the central problematics of information society from technology transfer to knowledge transfer, and from designing technical interfaces to shaping socio-communication interfaces between society and technology.

The study on Knowledge Networking and Social cohesion in the Information Society is concerned with the potential and limitations of information and communication technologies (ICTs) for building and enhancing the social and cultural interfaces between citizens, social systems, and knowledge resources of society. The aim of the interface is to facilitate the transfer of knowledge and models of experiences at local and global levels, and thereby support and maintain the process of social sustainability of social cohesion

This report reflects on some of the above dilemma and paradoxes of information society, and proposes a human centred framework for knowledge networking and social cohesion. The discussion builds on the EU concepts of 'valorisation' of diversity, subsidiarity, cohesion, and draws upon current European research on Human Centred Systems, European Information Society, Learning Society, Telematics and Social and Economic Cohesion.

# 1. Information Society and Cohesion

## 1.1 Problems and paradoxes

One of the paradoxes of the information society is that while knowledge is seen as the new social and economic resource, the techno-centric focus of technology leads to homogenisation of knowledge and standardisation of communication. This techno-centric view of innovation tends to eliminate diversity, thereby limiting the potential of new technology as a tool for knowledge transfer and cohesion. While there is an increasing belief in the notions of knowledge society, common economic and cultural spaces, we face dilemmas of exclusion and inclusion, identity and integration, and valorisation and homogenisation. *Despite a rhetoric of inclusion, access and communication, we observe a variety of new mechanisms which promote their opposites, and against which the techno-centric paradigm offer no remedies.*

Various established notions of the human condition, such as those of knowledge and power, work and living, identity and cultural space, products and process, are being increasingly challenged, redefined and refined. The distinction between working, living and learning is being blurred; individual and community identities which until now have been rooted in physical locations and local cultures, are being seen as part of global economic and cultural spaces. This blurring of distinctions and globalisation of identities are some of the issues which provide a catalyst for discussion on social cohesion. Social cohesion is defined as the opportunity and ability to participate in society. It is about promoting a culture of shared communication, values and knowledge, seeking coherence through valorisation of diversity.

The Information Society is characterised by major social, economic and technological changes. At the individual level, there is an increasing insecurity at work and uncertainty about the future. At the social level, the gap is widening between peoples needs and the availability of traditional health, education, welfare, social services, and education. At the organisation level, there is an increasing 'mismatch' between the individual's skill and potential and the organisational demands of flexibility, adaptability, and competition. At societal level, new relationships between work, employment and living raise questions about the place and worth of work in people's lives, particularly for

the large numbers of people faced with unemployment, under-employment, or unstable employment patterns. (HLGE, 1996)

*Technical efficiency has its limits, it leads to brittleness, suffocating creativity and imagination, leaving people with no platform for participation and democratic involvement..*

The changing relationship between society and technology affect our social roles as individuals, as members of our local communities, and as social actors in global information society. *We need a new vision of information society which seeks social cohesion by promoting a culture of shared communication, values and knowledge, seeking coherence through valorisation of diversity.*

## **1.2 Technology: regulator or agent of exclusion**

We note a growing belief in competitive technological innovation as the only effective regulator of the logic of dynamics of the fight for survival. The novelty of recent microelectronics technology lies in the nature and the way in which it has penetrated the main pillars of human society, and the way our knowledge of the world and our actions are being shaped by it. The new technology has influenced the design and production of goods (automation, AI); the way we manage animals, plants and human bodies (drugs, genetic engineering etc.); the way we interact and communicate (computer networks, multimedia ); and the way we express our individual and collective creativity (virtual reality, imaging, computer animation). Information and Communication technologies (ICTs) are glamorised in terms of hyper-definitions such as "information society", "paperless society", "information economy", "inmediation society", "information technology paradigm", "information is power", "information poor and information rich societies" (FAST, CEC, 1991)

But some see Information Society in wider economic and political contexts, They argue that the reality of the "information society" is that a huge explosion and globalisation of financial and business services have taken place, and market forces have been seen as the main vehicle for social and economic transformation. ICTs have contributed to the redesigning of firms and countries' industrial cultures, leading to the crisis of employment, social, welfare and educational services. It has also led to an increasing concentration

of the access of information decision making and control of power, resulting in the further weakening of democratic participation.

The emergence of ICTs infrastructures in the form of telematics, email, internet and WWW provide abundance of access to data and information while at the same time highlight the increasing problems of information overload and consequent limitations of the value of information. The issue of information society is not just access to data and information, but more seriously how to evaluate the connectivity and quality of information. It is the process of transformation of data and information into knowledge that enables informed interpretation, and sharing of knowledge and experiences, and thereby support participation. Knowledge transfer and participation are therefore defined as two determinants of social cohesion where social cohesion is defined as the opportunity and ability to participate in society.

*At a local level, social cohesion is about social innovation and social citizenship, participation in social, economic and cultural activities. At a global level it about a sustainable balance between local and global participation.*

However, the value of knowledge depends upon the nature and the processes of its transfer. Moreover, it depends on the knowledge trajectory and models of knowledge networking. Knowledge trajectory is described as the way knowledge is shaped by scientific and cultural factors and the way it is communicated across social, economic and cultural domains. Knowledge networking and social cohesion is defined as the creation of a network of local knowledge bases for learning and social innovation at the local level. At a global level it is defined as the creation of a network of networks of knowledge bases, which enable and support the access, transfer, and sharing of knowledge and models of experiences across regional and cultural boundaries.

*Knowledge networking and social cohesion requires investigation into the models of knowledge transfer and the processes of participation. This demands analysis of the nature and common values of knowledge and transfer processes, and how ICTs may be shaped to narrow the gaps between knowledge trajectories and society.*

The main focus of information society has until recently been on technological aspects of the convergence of information, communication and media

technologies. Although the EU programmes such as the Telematics and TSER recognise the social potential of ICTs, there is still rather a wide gap between ICTs and the social dimension. The bridging of this gap is one of the core issues of social cohesion.

New forms of working, living and learning patterns such as teleworking, telecommunities, virtual resource centres, and open and distance learning are emerging. These pattern may eliminate and disrupt many of the traditional patterns of social, cultural and economic life.

*We need to shape ICTs to create a dynamic balance between the traditional and new patterns to ensure the social learning and absorption of new skill and new knowledge.*

We are witnessing a paradox of electronic shaping of society. On the one hand it offers opportunities for democratisation of information society, on the other hand, it becomes an instrument of 'electronic governance' and control. The Virtual Society Programme of the ESRC (1996) acknowledges the impact of electronic communication technologies on social cohesion. It notes that traditional patterns of face to face-to-face interaction are being both replaced and enriched by electronically mediated forms of interaction. The trend towards on-line communities replaces the traditional inter-personal relations and understandings of identity in communities and organisations, while facilitating the flourishing of new subculture, rooted in anonymity and individualisation. There is a concern that new technologies of communication may undermine the "glue" of social life by detaching people from their local worlds and modifying social order and identities based proximity. Increasing use of electronic forms of social control (e.g. surveillance, smart cards, intelligent agents, video cameras and access codes) and replacement of social communication by visual technologies (e.g. video conferencing, video-phones) may lead to new forms of exclusion both from public places and social spaces. while ICTs and virtual realities may open up new world, they may also lead to new forms of control, exclusion and marginalisation.

ICTs may allow for the direct control and management of human services such as health, welfare, legal services and social security, but this process is also weakening and often replacing the intermediary agencies such as voluntary groups, associations and community centres which performed the role of filters and analysts of information and mediators on behalf of citizens for dealing with

the bureaucracy. While electronic media may provide for democratic participation, there is a risk of further social divisions between the so called "information rich" and information poor", even though many of the so called poor may be "knowledge rich" in the social and cultural sense. ICTs may offer opportunities for new forms of working in the form of Teleworking, Telecommunities and Telecottages, but there is a concern that in the future electronic world, work may no longer be regarded as social or economic concept, it may be just regarded as an electronic concept, totally explicit, symbolic, certain, quantifiable and measurable. The elimination of work as a source of the "human condition" and a "glue" of social cohesion may lead to a situation in which there are only jobs but no work. There may no longer be any room for intuition, creativity, uncertainty, error, or initiative, the very basis of innovation and regeneration. The danger of this electronic world view is that neither the governance nor the governed would be left with the capacities of dealing with the complex social, cultural, political and economic issues arising from the industrial decline and the break down of the civic, social and cultural boundaries.

*The social cost of the 'electronic governance' may be very high. There is a case for an analysis of the social and human cost of electronic regulation of social systems.*

### **1.3 Knowledge and the citizen**

Whereas in the past technology had a much longer time scale of innovation than the human life cycle, societies had a much longer period to disseminate, experiment, reflect and absorb technological innovations. As the human life span has increased, the life cycle of technological innovations has shortened to the extent that a serious mismatch has emerged between technological innovation and societies. This *mismatch* between the human and machine cycles puts the citizen and society into difficult dilemmas.

The basic contradiction of the technological paradigm is that it is widening the social gap between those who are employed and those who are unemployed or under-employed, and creating a new 'competitive' world of winners and losers. The consequences of this game of winners and losers are that increasing number of young people already consider themselves to be outside the 'competitive' system. The increasing automation of human mediation forums

means that increasing number of people at work no longer feel participants in the organisational processes, and are inclined to exclude themselves from the workplace innovations which are essential for social cohesion both at and outside the workplace. This 'forced' self exclusion further weakens the place of the social in the institutions, and leads to situations in which the relationship of the individual to the institutions is governed by an 'electronic mediating systems' which is predetermined and preordained, and which offer little space or opportunity for participation or adaptation to new innovations and uncertain world.

It is argued that there is even more urgent need for citizens to understand the increasing complexity of democratic process in order for them to fulfil an enlightened role in making choices which affect their environment and to understand in broad terms the social implications of information society debates. There is similarly a need to create environments in which everyone feels capable of making socially responsive and considered decisions as producers and consumers. Citizens also need to cope with the indiscriminate bombardment of information from the mass media and, in the near future, from the large information networks. They will also need to cultivate powers of discernment and a critical sense as the best protection against manipulation, enabling people to interpret and understand the information they receive.

The apparent 'economic imperatives' of the new system have abandoned more and more social support functions to the individual and marginal communities without shifting power relationships in ways which enables innovative approach to these functions. The traditional intermediary and mediating human agencies ('third' life agencies) which provided forums for participation and inclusion are either being replaced by technological systems or are being forced by the 'economic imperative' to abandon their social mediation role.

The radical changes taking place in the scientific and technological landscape, require individuals increasingly to be able to grasp the meaning of things without contextual knowledge or human mediation. In this situation, individuals must also learn to think more in terms of self development and to position themselves both as users and as citizens, as individuals and as members of the community in order to cope with social vulnerability arising from the techno-centric vision of the information society.

*There is need to create a broad based common knowledge base which enables people to find their way in the information society, to be able to interpret in a critical way the images and information they receive from a variety of sources, and reshape them to suit their diverse needs, aspirations and interests. It is the sharing of a common knowledge base which continuously building upon local knowledge bases which is at the heart of the notion of knowledge networking for social cohesion.*

It is now generally argued that in the future, individuals will be called upon to understand complex situations which will change in unforeseeable ways. They will also be confronted with an increasing variety of physical objects, social situations and geographical and cultural contexts. In addition, they will have to contend with a mass of fragmentary and incomplete information open to varying interpretations and partial' analysis.

*There is a risk of a rift in society between those that can interpret; those who can only use; and those who are pushed out of mainstream society and rely upon social support: in other words, between those who know and those who do not know. The main challenge in this kind of society is to reduce the gap between these groups whilst enabling the progress and development of all human resources (CEC, 1995).*

It is argued that it is possible to understand the world if the way it interacts and functions can be grasped and a sense of personal direction found. This is the main function of education. By imparting a broad knowledge base to young people enabling them both to pick their way through its complexity and to discuss its purpose, education lays the foundations of awareness and of European citizenship. By the same token, the development of a broad knowledge base, namely the ability to grasp the meaning of things, to comprehend and to make judgements, is the first factor in adapting to economic and social changes.

In an essentially universal society based on knowledge, a social and cultural identity can only be passed on in part. It has to be *built up*, not only by educational institutions, but also by the individuals who draw on the collective memory while assimilating the variety of information, through their involvement in different, vocational, cultural, social and family circles.

*The future of a culture depends on its capacity to equip young people to question constantly and seek new answers without prejudicing human values. This is the very foundation of citizenship and is essential if European society is to be open, multicultural and democratic (The White Paper, CEC, 1995).*

Another aspect of information society which concerns the citizen is that increasing dependence on technology would lead to an excessive standardisation of knowledge. This may then lead to seeing education and learning in terms of rule bound and logically ordered activity, following a pre-determined path, playing a pre-determined role.

The concern is that this techno-centric vision of education may cultivate passivity, restrict imagination and inhibit creativity, observation, common sense, curiosity. It may also restrict interest in the physical and social world around us and the desire to experiment which are qualities which are often neglected. Yet these are the qualities which will enable us to produce inventors rather than mere managers of technology.

The core function of education and learning systems is to create and service knowledge and skill bases of society, emphasising a balance between the theory and practice, and between the formal and informal systems. The danger is that technical focus of information society may undermine the tacit knowledge (experiential and practical knowledge) base of society, thereby creating an automated, media-dominated society.

*The tacit dimension of knowledge needs to be brought back into the broader knowledge base as a way of preparing individuals to master the technology, rather than technology mastering them.*

#### **1.4 The democratic deficit of knowledge**

It is argued in many circles that among the factors which enable citizens to participate in society are the transparency of administrative procedures and accessibility of the information base. Information technology is seen here a logical tool for implementing the idea of perfect market model, a rule based, explicit and transparent. Perfect market model, however, requires perfect information. But perfect information contains large components of information which is either implicit and hidden from transparency or it is often tacit which

is not amenable to explicitness and transparency. Thus the popular notion of transparency only concern the instrumental part of information, hiding from the citizen the contextual and grounded information which enables the citizen to interpret and make effective use of information. The issue here is how to ensure information technology as a tool of transparency does not become just another instrument of management control at the work place and political control in the social space. The notion of transparency is thus of little value if it does not enhance ability and knowledge of the citizen to participate effectively in society.

There is a also concern that this notion of transparency arises from a confusion of equating large amounts of data and speculative information available on the internet with knowledge which is necessary to arrive at considered judgements. The gap between data and knowledge also arises from increasingly shortened time period between the diffusion of data and its transfer to knowledge necessary for the understanding of events and making judgements.

The danger is that this shortening of time period between data and knowledge may reduce further the pluralism of ideas, analysis and judgements, thereby seriously undermining the potential of peoples ability to participate in society. Further there is concern that combined impact of information explosion and information load may give an allusion of transparency and democratic participation, while in reality it may widen the democratic deficit by providing undifferentiated information.

*Here we see the need to develop knowledge transfer processes which counter the problem of increasing democratic deficit arising from the gap between data transmission, inter-personal communication and the acquisition of knowledge.*

- Externalising the social dimension

ICTs as informational technologies are seen as tools of innovation for creating distributed organisations and distributed workplaces in terms of networks of information flows. This potential of ICTs for enabling a shift of the hierarchical modes of work to distributed modes of work is seen in terms of shift from economies of scale to economies of scope and economies of networks. It is argued that the potential of ICTs for the “codification” of large parts of the routine skills and tasks enables companies to distribute work and employment over time and space.

The argument is that just as codification of knowledge in compact and standardised formats makes knowledge more accessible to all economic sectors and actors linked to information networks, similarly skills can be codified for distribution. Here we have codification of both the content and the agent of the content, both accessible and transferable as packages of information. Although it is recognised that tacit knowledge remains a crucial factor in the use and absorption of knowledge, there is, however, an increasing belief in the codification of knowledge and skill on technological and economic grounds. Codification thus not only leads to the externalisation of the human dimension (tacit) of knowledge, but also to the externalisation of the social dimension of skill. The logic of this externalisation is that the notion of physical workplace and traditional community of workers may well be replaced by the electronic workplace and virtual communities of employees.

The paradox of the externalisation of the social dimension is that while it makes knowledge and skill more and more reproducible, at the same time it undermines the traditional forms of participation and social cohesion at work, and thereby to the separation of the human work from the work place. There is a concern that this separation of workplace and work may lead to increasing *externalisation* of many of the traditional social and democratic features of the workplace culture, such as solidarity, team working, participation, social responsibility, welfare, and ethical values. The logic of this form of externalisation is that the management may see new patterns of work and organisation primarily in terms of management of information flows in which employees, customers and products are seen as components ('bytes') of the information network. This may then lead not only to separating the workplace from the wider community, but it may also lead to the externalising of social and ethical responsibilities of management to its employees.

*There is a need to study the role of ICTs in externalising the human dimension from the workplace and its wider implications for social cohesion at the workplace and in the wider society.*

- Creating a new social dimension

A more positive vision of electronic networking is that ICTs makes it possible to bring work back to the local community or even be placed back into the home environment. This vision of teleworking and telecommunities assumes that work can again be re-integrated into the social and cultural domains on the

models of traditional family based and neighbourhood communities. Such network developments are already seen as sources of social and economic regeneration of many rural, inner city and regional communities. These centres combining the cultural dimension of the community and economic dimension of the workplace can be developed into centres of social wealth, the so called "*third sites*" of socio-economic activity. The third sites are seen to provide countervailing centres of activity to the traditional workplace mediated by NICTs. Here knowledge networking is seen as a major resource for social innovation of new forms of participation, quality of life and social relations. However, knowledge networking cannot be separated from the social and economic consequences associated with the change of the work place back to the home or community.

*There is need for further analysis of the new patterns of work life, the effects of increasing transparency, lessening security and predictability of working lives, and their impact on cohesion of the family and community in the information society.*

## **1.5 The learning society and knowledge deficit**

The White paper, *Towards a Learning Society* (1995) notes that three major, profound and wide-ranging factors of upheaval which have transformed the context of economic activity and the way our societies function in a radical and lasting manner, namely: the onset of the information society; the impact of the scientific and technological world; and the internationalisation of the economy. They bring risks, but also opportunities which must be seized. The construction of this society will depend on the ability to respond to the implications of these events.

As this century draws to its close, we can see that the causes of change in society have been diverse and have affected our education and training systems in different ways. Demographic trends have increased life expectancy radically changing at the same time the age structure of the population, thereby increasing the need for lifelong learning. The substantial rise in the number of working women has altered the traditional place of the family in relation to school and the upbringing of children. The question is how our universities can promote social cohesion by adapting their educational systems to address the vocational and non-vocational interests and needs the wider community, particularly the disabled, unemployed, women, minority groups, early, and

“active” retired, and less adaptable older people in adapting to the information society.

Expansion of technical innovation in all areas has generated new knowledge requirements. Consumption patterns and lifestyles have changed. In addition, people have been alerted to environmental problems and the use of natural resources and this has affected both education and training systems and industrial activities. The ultimate goal of training, to build up the individual's self-reliance and occupational capacity, makes it the linchpin of adaptation and change. The two main responses focused upon in the White Paper (CEC, 1995) are accordingly to give everyone access to a *broad base of knowledge* and to build up their abilities for *employment and economic life*.

ICTs are increasingly seen as instruments of shaping education and training systems, emphasising innovations such as Telematics and distance learning, virtual training centres, electronic campuses, and electronic universities. The case for extending education and training to majority of citizens is undeniable, and ICTs do offer a distributive infrastructure to make a substantial contribution in this direction. However, the increasing quantification and standardisation of learning raises "the question of whether the educational content it carries will enhance or, on the contrary, diminish the knowledge of the individual".

*The risk is that the emphasis on quantity and standardisation of information, could lead to knowledge of the "lowest common denominator" in which people lose their historical, geographical and cultural bearings.*

It is argued that this push is leading to the "one best way" of knowledge, imposing it as the "common denominator" of electronic governance. This view of learning is rooted in the techno-centric vision of the "learning society" which focuses primarily on the updating the technical skill base of society. The human centred perspective, on the other hand, views learning society as a developmental concept. The value of education resides in not just for its instrumental role in developing skills, but also for its role in the development of social capital and social cohesion. This focus requires the creation of convivial learning environments which support education as transmission of cultures, as a collective experience and social resource for self development and overcoming barriers of adaptation. Here the role of university should shift from

its role as an institute of diagnostic expertise to being a proactive social partner for social innovation.

*There is a need to investigate the role of ICTs in creating the "common denominator" of knowledge and its implications for subsidiarity and cohesion in Europe.*

## **2. The Knowledge Society**

### **2.1 Knowledge society in transition**

It is now widely accepted that we are now in a period of a shift from industrial society to post-industrial (information society) and a transition from information society to knowledge society. In this age of the *Knowledge Society*, it is argued that the knowledge economy replaces the production economy and knowledge becomes a new economic resource. In other words the 'means of production' are no longer capital, natural resources, or 'labor', but knowledge. The application of knowledge to 'productivity' and 'innovation' creates new social groups in the knowledge society: 'knowledge workers', 'knowledge professionals' and 'knowledge executives'. Knowledge workers own tools of knowledge. The new economic challenge is about productivity of knowledge work and of the knowledge worker (Drucker 1993: 7).

This evolving nature of the meaning of knowledge over centuries signifies the place of knowledge as a crucial determinant in the evolution of societal innovations. Each shift in the meaning of knowledge has coincided with a new innovation, be it an industrial, technological, organisational or social one. This is illustrated in the change in the meaning of knowledge from knowledge as '*being*' and *skill* during the pre-industrial era to knowledge as *technology* during the industrial revolution, to knowledge as '*production resource*' during the Productivity Revolution, and to knowledge as '*organisational resource*' during the Management Revolution. We have come a long way from knowledge as being a 'private good' to knowledge as being a social and economic 'resource', and a traded commodity.

*The shift from industrial society to knowledge society changes the nature of the relationship between society, knowledge and technology. This shift*

*affects in a fundamental way the role ICTs for the distribution of knowledge, the development of network economies, networks of social innovation and networks of co-development.*

## **2.2 Reconstructing information society**

The Encyclopédie (Denis Diderot and Jean d" Alembert) project of the Enlightenment period, provides a deep insight into the nature and the dominant trajectory of information technology. The project brought together in organised and systematic form the knowledge of all crafts (Drucker: 25). The significance of this information innovation was a fundamental shift in the meaning of the technologist from being a craftsman to being an 'information specialist'. The *Encyclopédie* project made two significant contributions: i) a systematic analysis and purposeful application of knowledge led to effective results in the material universe - in tools, processes and products, and ii) the shift from *craft* to *information* enabled the generalisation of results, and thereby the transfer of knowledge across social and professional boundaries (ibid.: 25-26). By separating the skill (experiential knowledge) from information (objective knowledge), the enlightenment project laid the foundation for the productivity and management revolution and for the current information society revolution.

Drucker argues that the change in the meaning of knowledge over the last two centuries has transformed society and economy. Formal knowledge is now seen as both the key personal resource and economic resource, replacing the traditional key resources of land (natural resources), capital and labour. In its new meaning, knowledge is seen as the only meaningful resource, a social and economic utility, and a resource for systematic innovation, while traditional resources are seen as constraints. Knowledge as the key resource rather than as a resource defines the post-capitalist society. "It changes, fundamentally, the structure of society. It creates new social dynamics. It creates new economic dynamics. It creates new politics" (ibid.: 41).

The *risk of the exclusion* of experiential knowledge (tacit) from the objective (formal) knowledge is that it undermines the diversity of social and cultural contexts of knowledge and linguistic diversities of interaction. This leads to defining the potential of information society mainly in terms of technical infrastructures; and defining the transfer and dissemination of knowledge in terms of technical determinants of access such as standardisation and quantity. The danger of this focus is that is likely to cause the exclusion of knowledge of

communities and societies whose knowledge does not fit into the techno-centric notions of information society.

The danger of this exclusion is that those with knowledge determine access to it by their political/economic control of, for example, education and training. A political model is emerging which rationalises this direction in terms of economic imperatives, but which can also be interpreted as a counter-democratic entrenchment of a nexus of control. The establishment and encouragement of new knowledge "trajectories" is an essential component of social and economic re-integration.

*The challenge facing the information society thus is how to re-integrate diversity and subsidiarity into the present techno-centric project of the information society. One way forward is to develop knowledge networking for co-development, building upon the notion of human machine symbiosis.*

The notion of co-development here refers to the interdependence between local and global social systems. The notion of subsidiarity refers to bringing science and scientific knowledge nearer to people. The notion of 'valorisation' here refers to common/global knowledge networks which build upon the commonalities of local knowledge bases while sustaining the local diversities. These notions are rooted in the idea of the symbiosis between human and the machine; between technology and knowledge, and in this particular case a symbiosis between the 'objective' knowledge and the 'tacit' dimension of knowledge. This symbiosis recognises the essential contribution of the 'objective' knowledge as a global resource for knowledge transfer and development. However, it emphasises that sustainable development depends upon the local capacity for the absorption of the transferred knowledge, and this in turn depends the level of interdependence between the local knowledge and global knowledge.

### **2.3 Transcending the exclusivity of scientific knowledge**

A move towards the human centred notion of knowledge transfer faces the barrier not only of the scientific notion of knowledge but also the professional barrier of knowledge and expertise. These barriers are rooted in the traditional university education and research. It is sometimes asserted that the social exclusion of the majority from the places of learning is mirrored in an attitude towards knowledge, that it is "exclusive, esoteric and property of the elite".

This image of knowledge is mirrored in the cult of the professional, expert, and the specialist. It also arises from the need of specialisation of knowledge in many sciences and professions which leads to exclusion of those who are not participants in those sciences or professions, thereby producing an image of knowledge as something that is difficult to access and is the preserve of the elite. In spite of the increasing opportunities for university education, knowledge is increasingly being regarded as a scarce commodity, especially in the name of global technological and economic competition.

In contrast to the 'exclusive' notion of knowledge, the human centred notion seeks a symbiosis between the scientific knowledge and the social knowledge which is rooted in the social and cultural practices of society. The social knowledge includes a multiplicity of overlapping expertise, experiences, practices, norms and diversities, at one point it may be exemplified by the knowledge of the nurse, at another by the skill of the artisan, at another by the practice of a community group, and yet at another point by the forms of working and learning organisations. The scarcity value of the scientific knowledge also resides in the notion of 'pure' or 'objective' knowledge. This notion of 'pure' knowledge separating the 'disinterested' or 'objective' from the social and practical, has in modern times been shaped by the technical rationality rooted into the university culture. Experiential Knowledge and practical skills embodied in social and working life activities have been perceived to be at lower levels of the hierarchy as compared to the 'pure' knowledge. The traditional university affirms this hierarchy of knowledge by sustaining existing and creating new "alliances between power and knowledge", as well as "through its capacity of exclusion of certain types of knowledge and certain types of people" (Cook, quoted in Gill, 1996a).

A paradox of the knowledge society is that while new communication technologies offer more and more facilities for sharing the scientific and technical knowledge and enriching the social knowledge base of society, the increasing focus on IPR (Intellectual Property Rights) without moral and ethical constraints may lead to new forms of knowledge exclusiveness even in traditional area of social and cultural knowledge.

The exclusion of people and their social knowledge from traditional university culture is increasingly being reflected in form of a *new paradox* of the post-industrial society: While it is generally argued that the knowledge society requires highly educated and multi-skilled knowledge workers, in reality we,

however, see that cost-effective criteria of the 'social market' leads either to the exclusion of the majority from higher education, or to the marketing of education as a product, again excluding those who cannot afford it. It seems that the notions of 'scarcity' and 'exclusiveness' of knowledge still hold as firmly as ever. What is new to this paradox is that 'scientific' rationality of exclusion is being replaced by the rationality of the 'social market'.

It is asserted that the traditional separation of scientific and social knowledge is no longer sustainable. At a global level, social knowledge base of society consist of more than scientific and technological knowledge, it also consists of economic, commercial, historical, cultural; explicit versus tacit knowledge; embodied versus disembodied knowledge. Knowledge is embodied in people (e.g. literacy, educational), it is embodied in plant (e.g. capital equipment ), in economically active population involved in knowledge intensive activities (e.g. professionals, management), in Institutions (associations, enterprises) and in the structures and processes of organisations, and it is embodied in the market. (John Daly, Learning nations, Technet debate, 1996). We need to find new ways of interlocking scientific and social knowledge bases for social and economic development, in order to meet the human conditions for social cohesion.

The optimistic view of technology is that ICTs can be shaped to overcome the limitations of the rationality of the social market by including the majority of citizens within the information society networks such as the internet, superhighways, and telematics (see for example, Bangemann 1994).

*It must, however, be emphasised that the essential condition of knowledge transfer is that the diffusion of mass information can only contribute to social cohesion if societies possess the educational and learning infrastructures which support the sharing and absorption of knowledge.*

The Information Society programme of the EU (e.g. Telematics programme) is already supporting the development of new forms of networks of education and training to fill the knowledge gap. There is, however, a concern that the 'techno-economic' focus of the ICTs may hinder the necessary knowledge input into wider society, and may not exploit the full potential of ICTs to narrow the 'mismatch' between knowledge and society. There is a strong case for shifting the emphasis from 'techno-economic' focus to the 'socio-communication' focus to support the acquisition and diffusion of knowledge in the wider society.

*There is a need to investigate the potential of ICTs for creating informal and social forms of education and learning for overcoming the barriers of formal education and the mismatch of the production of knowledge and its diffusion, and for creating learning and training horizons for those who may otherwise be excluded from the system of formal education.*

There is already a considerable movement towards creating ICTs networks for social and economic innovations by linking community resource centres, voluntary organisations, research institutes, educational institutions and local councils. These networks could be transformed into crucial information and knowledge mediation and diffusion agents, playing a proactive role in bringing universities, local communities and social actors into knowledge networks for social cohesion. This will, however, require a shift in the traditional university culture from being producer of 'pure' knowledge to being a knowledge resource for broader society. Models of research and education networking at the EU level (e.g. ERASMUS, Telematics Programmes) illustrate that universities with their rich sources of specialist knowledge can contribute to the creation of knowledge networks for life long learning and social cohesion.

*This change of focus from knowledge production to knowledge resource, provides an exemplar for knowledge networking for social cohesion. Local communities, universities, research institutes, and local councils can be linked up to form knowledge resource centres for social citizenship, contributing to meeting central requirements of social cohesion, diversity, participation and learning.*

In the past, the collaboration of the universities, firms and the state was more imbued with national concerns. They were more closely tied together on the national level, but their activities are now becoming more transnational and global. The role of universities is shifting from education and research to high quality training institutions, building skills, competencies and knowledge that are deemed to be of strategic importance to economic and societal performance.

*This search for globalisation of knowledge by universities illustrates a move towards globalisation of knowledge and economy. The challenge is how universities can be integrated into the social dimension while contributing to global knowledge .*

## **2.4 Global knowledge, local Roots**

One of the characteristic of the global knowledge society is the emergence of new patterns of knowledge structures and a new borderless professional class. Shaped by media and supported by communication technologies, a new breed of knowledge professionals such as communication consultants, lawyers, biotechnology engineers, economics editors, software designers, and strategic planners, have become 'added value' professionals, serving the interests and demands of the global market. Unlike the local school teacher, the nurse, local planner, blue collar worker or the local shopkeeper, their 'added value' is no longer linked to a regional or even a national economy. We are again seeing the emergence of knowledge professionals who are serving the needs of the global market outside the social and cultural bases of societies, and beyond the social and economic horizons of ordinary citizens, communities and even nations (Kennedy quoted in Gill 1996a).

*We can learn from the emerging models of global expertise, and create networks of knowledge professionals and social actors as a human resource for social innovation and cohesion at the global level.*

Here the learning model of the British Open University, the human services model of the OXFAM and the social action models of international voluntary organisations provide frameworks for knowledge networking of local and global expertise in the form of and 'virtual universities' and 'virtual institutes'.

## **2.5 The limit of the technical interface**

The world of work and living is changing rapidly. In this age of information networks, the symbiosis is not between the single machine and the single user, it is a matter of symbiotic relationships between networks of users and networks of machines. It is no longer a matter of interaction between the machine and the individual user, it is rather a matter of communication between groups and between human and machine networks. It is not a matter of the interaction between skilled worker and the machine, it is a world of collaboration of users with variety of skill levels and the network of machines performing at variety of functional levels. The 'tacit' knowledge no longer resides in the individual artisan but resides in the community of users in the form of social knowledge base or a network of social knowledge bases. It is not

just a question of objectification of the experiential knowledge, but a question of objectification of social and professional knowledge at a variety of levels of objectivity and ambiguity.

Seeing knowledge transfer in terms of human computer interface lends to seeing knowledge as an objectified entity, amenable to universal interpretation. This view of transfer, separating the objective from the tacit dimension, leads to a belief in the elimination of the uncertainty, ambiguity and diversity. This techno-centric view of transfer is rooted in the belief that knowledge as an exact language outlines the contours of 'secular technological culture' by transcending the national, cultural, linguistic and religious boundaries. The danger is that this 'technological dream' may lead to the separation of the individual and the community, private and public, reason and the emotion, and function and the social. Or it may lead to redefining and redirecting societal issues and the social agenda in terms of the technical culture of 'sameness' and the method of the 'one best way'.

Knowledge transfer is more than transmission of information, it is also about the interpretation, absorption, and use of knowledge in diverse situations. So evaluating knowledge transfer in terms of the capacity of the technological interface not only limits the potential of knowledge networking for widening the communication and knowledge bases of society, it also limits the broader societal scope of technological innovations.

There are concerns that the abstract nature of interaction through screens could lead to an abstraction of reality. The sheer volume and immediacy of information raises fears that people are no longer in control and need new techniques and strategies to help them cope. In addition, these technologies extend people's availability, so that they are on-line and on-call wherever they are and at all times. Such accessibility could easily become invasive. Its effects on social life need to be better understood.

Another concern is that the technical focus of interface may lead to an isolation of many people in society, with human contact increasingly replaced by telepresence and electronic communication. The concern lies in seeing complex human interactions in terms of technical access, technical literacy, and user friendliness. The alternative human centred focus sees ICTs as a tool for social cohesion through building up community networks at the local level. The optimistic view is that we can shape ICTs to reinvigorate stronger social cohesion and a sense of belonging.

*The challenge here is to design human machine collaboration which contributes to new forms of communication, participation and inclusion. One way forward is to shift the design focus from technical interface to the socio-communication interface. Such a shift of focus should aim at overcoming the trends towards homogeneity of knowledge and communication, thereby avoiding exclusion of diversity of languages, traditions and practices.*

## **2.6 The socio-communication interface**

In our technological culture, the scientific view of knowledge dominates in the area of skill and knowledge transfer. This view assumes a homogeneous understanding of reality and the world as systems of norms and agreements. There is a concern that ICTs are seen as merely another technical medium of transfer, a sort of one-way transmission, separating language and knowledge from their contexts. This separation lends to widening the gulf between knowledge and experiences. Here skill is separated from practice, and language from experience. This separation inculcates isolation of the individual from the group and the social context. It is now generally argued that organisations must adapt to the skills needs defined by the technology. However, technical skills made possible by microelectronics call for, at the same time, organisational responses that rest on the understanding that goes far beyond technical ingenuity, it demands competence and reflective action and adaptive capability.

The growth of knowledge, in all its various shades and forms can never be a uniform linear progression. Nor it can be fed with a series of technical data and technical skills. It is through reflection of experiences, through rhythmic exchanges between participation and distance, between action and reflection, that knowledge grows.

*Simple faith in the technical transfer of knowledge and skill misses the essential condition of the context (e.g. language and cultural space) and human mediation (e.g. skill and tacit knowledge) in making sense and purposeful usability of knowledge.*

These conditions for knowledge transfer do not just concern transfer between cultures, they also concern knowledge transfer within a culture. The transfer here deals not just with knowledge in the technical sense, but also with the complexity of the human domain. The technical transfer may enable the receiver to cope with learnt situations, but is of little value in coping with unforeseen social situations. In this case the learners may acquire new skills and knowledge which they may not be able to practice competently in their new environments. They may also be unable to use these new skills purposefully in their old environments. The attainment of competence and expertise is more than absorption of the static knowledge, it is also about the absorption of the tacit dimension of the knowledge environment.

The exclusion of the tacit dimension raises issues such as: i) how to transfer the context and culture of knowledge from the host environment to the new environment into which it is being transferred; ii) how to cope with the 'Baconian' notion of the "contract of error" (i.e. error, uncertainty, ambiguity, and loss of knowledge) which is natural part of the transfer process itself; iii) how to reskill the learner in acquiring new skills which can be used in both old and new environments.

*The issue of reskilling is to do with the competence, the learner may lose some aspects of the old skill but may retain the core competencies, thus enabling the learner to relearn old skill and cope with the old environment. It is however important not to regard people in this situation simply as 'obsolete industrial plant' - cheap and easy to discard than to modernise.*

Reskilling is seen here as analogous to the actor who learns a new role, a new skill to perform the new role, and after playing the role is able to go back to the old role or to another new role without being deskilled. The actor has acquired competence and tacit knowledge of the acting environment which provide a foundation to learn skill and perform roles. In a technical sense the actor learns the facts and rules of the new role and presents them to the audience. In reality, however, "the performance is much more complex, below the subtext of the actor's role lies in a vast tacit dimension of the role, the likeness of character (the actor is playing), what the character would do in various situations. While the actor convinces the audience of the role he is playing, he does not allow his own identity to collapse into that of his role's, but rather maintains an objectifying, defamiliarising distance" (Hilton, quoted in Gill, 1996a).

*Just as the actor combines dialogue with technology as a medium for communication and transfer, so we need to build a new dialogical medium for knowledge transfer, a new 'socio-communication interface' based on the notion of human and machine symbiosis.*

The notion of socio-communication interface as a medium for the transmission of knowledge requires a deep understanding of the notion of dialogue. The understanding of the concept of dialogue as a medium of transformation can be gained from the domains of theatre and drama. In theatre dialogue occurs where roles meet; it sets them in motion, leading to unexpected results. It turns the scene into a place where firm positions and sharp contours cannot be maintained. In dialogue differences can appear and be played off against one another, both within the individual and between people, and it sets all their various voices and contradictions in motion. "In true dialogue, order and disorder are two sides of the same system; together they serve renewal and growth in society. Dialogue thus requires a certain measure of scepticism: disagreement is not simply reconcilable with dialogue - it is one of the conditions. Here dialogue emphasises reciprocity and mutual dependence". It is this mutuality which fulfils the *human condition* for the transfer of experiential knowledge while the notion of transmission of data and information fulfils the *technical condition* of transfer of static knowledge.

## **2.7 The social interface**

It is argued that since new ICTs are inherently communication technologies, they change the way that people interact; they change the modes and ranges of expression which are available to people using these systems. The limit of the ICT systems is that they give the impression of free choice and participation, while in essence they allow access, browsing and selection of information available on the systems. In addition to the economies of information provision, the users ability of access and choice is also constrained by predefined content and its presentation as well as the nature of the human computer interface.

Ultimately the access and choice depend upon the purpose of knowledge transfer and information provision. If the purpose is social cohesion, then relationships between society and technology can be shaped to promote cultural diversity; the development of local communities and communities of culture.

This shaping must deal with the issue of the "fragmentation of social knowledge base- because of the way that ICTs can reduce all communication and cultural artifacts to the size of bits and bytes". The reverse side of selection and choice is the rupture between the content and its context and environment (HLGE, 1996). Here we are again concerned with the distinction between data, information, and knowledge.

*There is a need for investigation into how ICTs can change the "grammars of expression and the nature and understanding of social relations", and what implications the rupture between content and context has for design of social interfaces for social cohesion.*

## **2.8 The cultural interface**

Cultural diversity enshrines a wealth of experience and knowledge about different ways of living, value systems and approaches to issues. The valorisation of diversity is concerned with the exploiting the potential of ICTs in overcoming communication difficulties, "not just because of linguistic barriers, but also because of differences in setting priorities, methods of resolving conflicts and so on". The socio-cultural interface could be developed to create symbiotic relations between local cultures and other cultures, by building inter-cultural and inter-linguistic bridges. New media can be used to enrich cross-cultural understanding and the emerging European consciousness. It is argued that an interest in and understanding of culture is not only of use in developing a sense of identity, European citizenship and understanding of others, but a valuable resource on an individual level as it can promote the inquiring attitude needed to support the shift towards life-long learning.

*A socio-cultural interface should emphasise the multi-cultural vision of Europe; it should focus on the development of social cohesion through the transfer of cultural knowledge, ideas and artifacts; through the fostering of shared communication between diverse cultural groups; and supporting the multilingual nature of European society.*

There is a concern that the techno-centric focus of ICTs may dislocate the space and time relationships between local communities and global information society, by reducing the diversity of local cultures while facilitating the development of global culture. This trend of cultural homogenisation may eliminate the glue of diversity which enables culture to cohere and renew itself. We need to shape ICTs in a way which harnesses diversity for cultural

cohesion of spatial communities, and promotes social innovation by relocalising cultural resources back into the community. Here the notion of social innovation should emphasise the facilitation of cultural expression in the public sphere, and the development of the public spaces and shared celebration of culture.

*Designing ICTs for social cohesion is also about designing socio-communication interfaces which enable sharing of social and cultural spaces, through shared communication and shared experiences. We need to study how socio-technical models and socio-cultural models may provide a socio-communication framework for knowledge networking and interface design.*

### **3. Paradoxes of Knowledge and Diversity**

#### **3.1 Local-global nexus**

The emerging world of information networks and networks of economies is presented as representatives of the post-industrial world and as an alternative to Fordism. The network model of 'Third Italy' (Emilio Romagna region of Italy) is offered as an exemplar of regional economy based on the decentralised networks of small artisan based companies using new computing technologies. Here the local-global nexus is seen very much a continuum of the post-Fordist era of decentralisation of production, flexible specialisation, and the emergence of economies of scope, such as the centre-periphery interdependence between dominant companies linked to the small and medium size companies in contractor/subcontractor relationships. Information and communication technologies are seen to map onto the networks of economies, facilitating the exchange transfer, sharing and dissemination of knowledge, skill and expertise. The logic of flexible specialisation and customer based standardisation is extended by communication technologies to the social and cultural spaces as part of the drive towards globalisation of economies. This logic is illustrated by the power and scope of the global media industries to determine not only the future shape of cultural spaces but also the shape of the local-global nexus of economies.

*On one hand these economies of scale ignore the difference and otherness of local and regional cultures, and on the other hand they give recognition to the diversity and otherness through the production of cultural products. The issue here is how we can learn from this economic model of scope-scale nexus to shape ICTs for social cohesion in terms of local-global nexus. There is also a need to learn from other cultural models of innovation and cohesion from outside Europe.*

What we are moving towards, it is argued, is a fundamentally delocalised world order articulated around a small number of "concentrated centres for the production of knowledge and storage of information as well as centres for the emission of images and information". In this new global cultural space, global corporations such as Sony and Microsoft produce products on the global assembly lines aimed at world markets (Morley & Robins, quoted in Gill, 1996a).

*This localisation of production and its dissemination at a global level is offered as a new form of local-global nexus based on the plurality of cultures at the local level and its valorisation at the global level. There is a need to examine the impact of this global valorisation on the sustainability of local cultural innovations.*

This view of local-global nexus allows for the distribution of local cultures as an integral component of the dynamic global cultural network. There is a concern that the thesis of global assembly line may contribute to the *externalisation of risks* and exploitation of local and regional cultural resources without making purposeful contribution to the local-global cohesion.

*There is a need to explore the notion of culture as another form of information flow and the implication of externalisation of risks for social cohesion. Further what implication it may have for the building of symbiotic relationship between local plurality and global integration.*

This local-global nexus is at the heart of the 'European Home' project, building a common knowledge and skill base linking universities, SMEs, cities, and regions under the EU programmes such as Telematics, Socrates and Leonardo. The larger vision of the European project is about the creation of a common economic and cultural space based on "common cultural roots as well as social and economic realities". The emphasis is on "maintaining and promoting the cultural identity of Europe", of "improving mutual knowledge among our

peoples and increasing their consciousness of the life and destiny they have in common" (CEC 1983, quoted in Gill, 1996a). The focus on cultural and economic spaces in the European project illustrates an *increasing awareness of the place of diversity and its valorisation as against the forces of homogenisation* and standardisation being brought out by the convergence of information, communication and media technologies. While emphasising the local and regional identities of Europe and at the same time supporting global communication and media industries, the European project seeks a symbiosis between the local and the global both within the European as well as in the global contexts. Here the individual is both a part of the local and the global, being situated within a particular social and cultural space, while identifying with virtual social and cultural spaces mediated by the ICTs and media technologies.

At a certain level, this relationship between the local and global identities is a continuum of the symbiotic relationship of the subjective and the objective, with the subjective remaining rooted in the social domain and the objective embedded in the technological domain. The difference, however, is that while the objective has until now been mediated by human experience, the virtual is only mediated by technology. If virtual reality is about blurring of the subjective and the objective, then it is also about the blurring the local and global. The issue here is not of the valorisation of diversity of local identities but the globalisation of a particular local/regional identity through control of the communication and media technologies. It is in this context that the debate on the information society, involving an integrated vision of culture, technology and economy, is dominated by the issues of ownership and control of the infrastructure on the one hand and the creation of European cultural and economic spaces on the other hand.

*The paradox of information society is that it promotes borderless communication and media technologies in the name of common cultural space, while at the same time defending national and regional boundaries in the name of diversity. "This European paradox is what will shape the reality of information society in Europe".*

Communication and media infrastructures cannot in themselves be either determinants or mediators of common economic and cultural spaces, they are just one of many social and technological determinants which vary from society to society and culture to culture. The infrastructure may be global but

its applications and impacts can only be determined by the local human condition. The local and regional determinants include unemployment, poverty, exclusion and inequality. This is in addition to culture, language, and social and economic factors.

*Replacing human infrastructures of social welfare, health, education, and training by information technology may expand and speed up information flows and create virtual spaces of global cultures, it is unlikely to solve any deep social, economic or political problems.*

What we are beginning to see is a much more fundamental process of transformation, in which the aim of the electronic superhighway is to push the process of standardisation to the limit, and move us beyond the era of mass media into that of personalised media and individual choice. The standardisation makes it easy to deliver more precisely defined consumer 'packages' into the hands of the advertising and marketing agencies, transforming personal choice into choice made for us by the media. While global networks push towards greater standardisation and homogenisation, there are contrary forces at work which challenge the imperative of globalisation, as exemplified by the "resurgent interest in regionalism in Europe, appealing to the kind of situated meaning and emotional belonging that appear to have been eroded by the logic of globalisation. This new regionalism puts value on the diversity and difference of identities in Europe, and seeks to sustain and conserve the variety of cultural heritage, regional and national".

The European Community's debates on European identity and citizenship reflect the dilemmas of the global-local nexus. New alliances of local and regional identities mark a preference for a particularistic sense of community. The notion of 'unity through diversity' holds up 'rich pluralism' of regional traditions, languages, dialects and cultures as the basis of a more meaningful experience of the community. It is also seen as a European project working against the tide of homogenisation which threatens the very idea of European culture. Here "the language of the European Community's 1992 project on 'integration', such as cohesion, community, unity, integration and security illustrates a possibility of a new European order defined by a clear sense of its own coherence, and integrity as a counter to the global world order" (Morley & Robins, quoted in Gill, 1996a).

### 3.2 Diversity and cohesion

Cohesion in this wider global perspective deals with both integration and diversity, in the sense of 'valorisation of diversity'. Diversity in general presented in two contradictory forms: diversity as an obstacle to exploiting economies of scale or diversity as a 'resource pool' for economy of scope and sustainable competitiveness. The pessimistic view focuses on a reduction of disparities and argues for the implementation of the best *practice* model. The optimistic view argues for the valorisation of diversity as a guarantee to harmonise and to survive in the presence of uncertainty.

The pessimistic view is rooted in the notion of equilibrium in traditional economics, making the economy ordered and coherent. Here the idea of diversity (e.g. opportunity costs) is rather limited and it is a rather well-behaved sort of diversity. Diversity comes into play when the equilibrium is disturbed, rather than on how it holds together. It is suggested that diversity may be the starting point or a catalyst for an equilibrium process, but it plays no role as a long run mover of the system (Cohendet and Llerena quoted in Gill, 1996a).

- The limit of the 'best practice' model

This passive approach to diversity is also a feature of the traditional focus of technology transfer. Technology is considered as information which is available for all and freely floats across national borders. What matters is the availability of the 'best technology', and therefore its adaptation, usage, and diffusion are a matter of time lags rather than industrial and cultural contexts in which technology is developed or implemented. It is argued that since the concept of technology is global, local technologies play a marginal role. Moreover, local technologies are 'deduced' by marginal adaptations from the "ideal" model of the 'best technology'. In this perspective the influence of the local context on the modes and usage of technology can be regarded as 'passive' and marginal, because it consists of local adaptations of the 'best technology' to fit local habits and tastes.

In contrast to the above passive approach to diversity, the evolutionary approach to diversity emphasises a close linkage between diversity of competencies and learning processes. It also recognises that there are intrinsic relationships between technology and society which give rise to tensions arising from diversity and uniformity arising from processes of diffusion and technological interdependence. Keeping the right balance between these two

processes is certainly the key to economic efficiency. It is argued that for *economic cohesion* at the European level the focus should be on the coordination between the different local systems of innovation.

The problem at the European or even world level is to specify how such particular local innovation processes and technological trajectories can in some way cohere themselves. Which mechanisms will allow and generate advantages (or at least no costs) from their simultaneous existence? The advantage of *local innovation systems* comes from their capacity to mobilise local competencies, to reduce the communication costs and the adaptation costs to local needs and characteristics. The global viability of such a "decentralised" system, with several levels of aggregation and decision centres will depend on its ability to "minimise" the coordination costs, but also and more fundamentally to accumulate (and decumulate if necessary) the competencies and know-how. In fact, it is an exercise not only of cost minimisation but also of the creation of an adequate "institutional" learning at a more global level.

*From an evolutionary perspective, diversity stimulates a dynamic approach to learning and knowledge transfer, thereby providing a broader knowledge base and a spectrum of learning activities.*

This progressive enlargement of the base of knowledge confers to the economic system a better ability to react as quickly as possible to match the speed at which the environmental parameters are changing. It obliges the actors to keep a maximum number of options available (and applicable).

The value of diversity as an enlargement of the base of knowledge depends on how the processes of learning are functioning: this may depend on the efficiency of existing institutions. It also depends upon how different learning systems cohere while supporting local systems of innovation. Here coherence reinforces the ability of each local system to proceed to an interactive learning, defining viable solutions for the collective sharing of the mode of appropriation of new technologies, organising the mechanisms of normalisation and standardisation, anticipating the need for gateway technologies when lock-in mechanisms lead to a non-competitive array of technological solutions.

*Coherence as a more flexible formulation of cohesion enables the mobilisation of "collective capability to master the tension between the functioning of local organisations, which is a source of diversity and the*

*process of diffusion of innovation which requires standardisation and uniformisation" .*

### **3.3 Trust and cohesion**

Fukuyama's notion of 'trust' (1995) is another notion which needs to be central to any discussion of cohesion. Fukuyama notes that Information technology has indeed contributed to many decentralising and democratising tendencies of the past generation. The future lies in the formation of "small, networked "virtual" corporations", and that "networks of small organisations, rather than large hierarchies or chaotic markets, will be the wave of the future, all driven by the relentless advance of the electronic technology" (ibid.: 24). He argues that the enthusiasm about the breakdown of hierarchies misses the "crucial factor: trust, and the shared ethical norms that underlie it. Communities depend upon mutual trust and will not arise spontaneously without it" (ibid.: 25). He emphasises that "Trust does not reside in integrated circuits or fibre optics cables. Although it involves an exchange of information, trust is not reducible to information", and he further notes that "since community depends on trust, and trust in turn is culturally rooted, it follows that spontaneous community will emerge in differing degrees in different cultures" (ibid.: 25). Just as smaller firms depend on the degree of trust for their survival, so does a network of small firms for its cohesion and sustainability. Following this argument of trust and sustainability, it can be argued that even if information and new media technologies may be available for the creation of networks of economies, networks of social systems or networks of learning centres, their effectiveness and sustainability will depend upon the level of trust among the components of the network.

*One of the core conditions for sustainable cohesion is mutual trust between participants in network of communities. As a core condition for sustainable knowledge networking, the notion of trust encompasses integrity, quality, and social value of knowledge.*

The notion of social trust promotes another key concept of social cohesion, the idea of "spontaneous sociability" which cultivates the capacity to create new human organisations for proactive participation of citizens.

### **3.4 Beyond the Best Practice Model**

One of the central issue of social cohesion in the information society is how to transcend the dominant belief in the "best practice model" of economy which is rooted in the notions of convergence and exclusion. Delorme (1995) provides an insight into the fundamental weakness of the best practice model, i.e. its dependence upon a global, uniform theoretical representation of the world in terms of market-oriented economies. This dependence entails willingness to imitate the "one best way" inherent in the best practice model without due regard to plurality and differences of social, cultural economic and political systems. Until now this uniform representation of the best practice model has been applied to industrial system such as production models (e.g. JIT), management models (quality control) or working models (e.g. team working). The information and media technology based systems are now extending this notion of the market-oriented best practice model to almost all aspects of social, cultural, economic and political systems. For example the techno-centric models of telematics (e.g. teleworking and virtual organisations, distance training) are increasingly being promoted as technical solutions of employment and training problems. Although the differences and plurality of social systems are acknowledged as features of reality, they "remain contingent and peripheral to the core interpretation of economic mechanisms. A consequence of this is that these differences receive no theoretical status. They are practically absent from theoretical representations. Hence the fascination for the *notion of convergence*. What is missing is an integrated representation taking into account both similarities and differences" (ibid.: 6).

This absence of the differences from the uniform theoretical representation of the world is used to promote "one best way" models of information society, for example information society is "essentially seen in terms of technical tools" and technical solutions without dealing with central issue: "While ... ICTs provide the potential to achieve such goals, their actual achievement itself depends more on the ways those tools are used than on the technology itself. It is the age-old debate about technological determinism: although technology dictates, to a certain extent, what can be done with it, social and cultural factors are likely to be predominant in how and why new technology is used" (McClusky, 1996).

In the image of the best practice model view of information society, we observe that "life-long learning" is increasingly presented in terms of technical solutions. McClusky further comments that " .. current developments in telematics for life-long learning, despite talk of interactivity, are heavily consumer oriented and are likely to provide ready-to-consume 'learning-packages' not really conducive to

learner empowerment. It does not need to be that way. One can effectively imagine exciting possibilities of personal and collective 'growth' via enriched exchange with others. But technology alone will not suffice to get us there".

Murrell (1990: p.8) notes that one of the most profound and subtle ways in which a paradigm [the uniform theoretical paradigm of the best practice model] can influence analysis is in dictating the very categories of discourse. Murrell also notes: "In the battle of competing visions in economic reform, the invisible hand paradigm commands a powerful position. It is only theoretical perspective that affords the possibility of declaring the superiority of one set of arrangements - the unstrained free market" (Murrell 1991: 73).

The uniform discourse inherent in the best practice model excludes the very basis of change and innovation. Murrell argues for an alternative evolutionary theoretical framework for dealing with change, which "is closely connected with notions such as novelty, variation, difference, diversity, heterogeneity and ignorance. Whereas the standard perspective highlights equilibrium and macroeconomic convergence with a great faith in the power of economic knowledge, the evolutionary perspective focuses on the plurality of capitalist trajectories with a moderate, self critical faith in the power of economic knowledge. Whereas the standard practically *excludes* the evolutionary one, the latter, in turn, does not exclude the standard perspective but subsumes it since it accepts its local, limited relevance to suitably identified situations (Murrell 1995:10).

The limit of the "best practice" model lies also in its limit of dealing with uncertainties which in the case of deep structural change are so large that there can be no consensus on the best way to proceed. Here *procedural rationality* advises us to think in terms of *reasonable and satisfying solutions*. And since any situation is the temporary outcome of interaction, the satisfying solution can be revealed only after a process of experiencing and learning. Hence society needs mechanisms to generate experience (ibid.: 10).

Commenting on the diversity and holistic design of socio-economic systems, Murrell further argues that ".. theorising based on empirical investigation, experimentation and social learning [...] allows us to improve our understanding of what the key processes of economic system are, when it is compared to conventional view. It provides an articulated and integrated perspective allowing for differences and heterogeneity which remedies, albeit partially, the too

globalised categories, concepts and guidelines on which deductive reasoning based on homogenisation representations of the world is bound to rely" (ibid.: 18).

Since the very notion of information society reflects a context of high uncertainty and of profound change, in which doubts about the predictive capacities of models are at their highest, it would seem reasonable to pay more attention to the significance of specific assumptions incorporated in explanations. When we are confronted with uncertainty, there is a priori case for relying on a representation incorporating uncertainty. In other words we have to transcend the limits of the "best practice" model of the market economy and the "one best way" of technical solutions.

*A key limitation of the "best practice" model for social cohesion is its refusal to accept the idea of heterogeneity and its inability to give heterogeneity first place in our reasoning. The human centred approach on the other hand places heterogeneity at the core of the effective functioning of information society.*

## **4. A Human-Centred Vision of Knowledge Transfer**

### **4.1 From technology transfer to knowledge transfer**

The 'techno-centric' focus of social and economic development is neither 'pre-ordained' nor predetermined. Just as technology can be shaped to serve human purpose, so we can shape social and economic innovations to meet the challenges of employment, health, welfare, inequality and poverty. But this requires a fundamental shift in our view of science and technology, a transcendence from 'causal' science to 'purposive' science (Cooley, Rosenbrock both in Gill, 1996b). The transcendence here seeks a symbiosis between the 'cause' and 'purpose' in the same sense that human centred vision seeks a symbiosis between the objective knowledge and the tacit knowledge. It also requires a fundamental value change on our part, a shift from the technical to the social, a shift from material wealth to social wealth. The complexity of social, economic and political problems is such that a technological fix is no longer either a realistic or a sustainable proposition. This wider horizon of science and technology transfer reflects a belief in the much wider diffusion of knowledge between societies for mutual benefit. *Whereas the notion of technology transfer has been central to the development of industrial society, knowledge transfer in the wider sense has become a cornerstone of co-*

*development in the post-industrial society.* Just as technical skills and technical training were regarded as determinants for the transfer and use of technology, so are the knowledge and competence now regarded as determinants of knowledge transfer.

The human centred model of the cohesion promotes social dimension of information society and builds upon the notions of communication and learning. Central to the social dimension are the notions of the 'learning society' and 'valorisation' of diversity. The idea of the learning society centres on transfer knowledge and sharing of experiences.

*Knowledge society is more than information society, it is about the transformation of data into information, and information into knowledge, knowledge into action and action into wisdom.*

Human centred perspective of knowledge reflects a belief in the much wider diffusion of knowledge in society. Just as technical skills and technical training were regarded as determinants for technology transfer, so are tacit knowledge and competence now regarded as determinants of knowledge transfer. There is however a fundamental difference between technology transfer and knowledge transfer. Technology is technically produced and its transfer is explicit and linear. Knowledge is socially produced, it is both objective and tacit, and its transfer is both explicit and non-linear. Knowledge is generative, productive and reproductive; it cannot be codified and explicated as if it were data. Knowledge transfer has to deal with both the objective and the tacit dimensions of knowledge. The tacit dimension consists of both the experiential and personal knowledge, and its transfer is constrained by the social and cultural contexts in which they are embedded. In many cases the objectified knowledge may not be meaningful without the creation or generation of relevant contexts, and its transfer may again be limited. In general when we talk about knowledge transfer we talk about the transfer of knowledge which is in the public domain, knowledge which is represented and codified in a format which is transferable. We find that even in the case of public knowledge, we depend upon informal and formal human networks to facilitate knowledge transfer; both academia and industry facilitate the transfer through formal lectures, tutorial, seminars, workshop and conferences.

*This challenge of knowledge networking for social cohesion is part of a bigger societal challenge as how to integrate technological innovations into*

*the civil society so that technology supports new forms of work life and living environments.*

It is also about the creation of a local-global nexus of economic and cultural spaces. This human centred perspective emphasises the concept of cohesion which is rooted in the notions of participation, sharing, and learning. It is important to recognise that beyond communication and interpretation, knowledge transfer also involves the complexity of transfer between the technological culture and the traditional culture. The integration of tacit knowledge and scientific knowledge faces a number of obstacles such as perceptual and language barriers beyond the need to document it and ensure it is widely disseminated. Tacit knowledge is complex, sophisticated, and certainly not homogeneous or "democratic" in itself. It is rooted in specific societies and reflects and affects conflicts and power of struggle of those societies. It is the result of a particular (sometimes very localised) "worldview", and it feeds and nourishes that worldview, reinforcing local beliefs".

#### **4.2 The issue of specificity of knowledge**

The integration of tacit knowledge and scientific knowledge, however, raises the issue of specificity. Specificity of the tacit knowledge resides in the inter-relationship between knowledge and action. Scientific knowledge on the other hand is characterised by the separation of research and action in time and space, which are the responsibility of different individuals. Thus "the division of labour is fundamental to scientific research, and scientific knowledge lends itself to division into individual components on one hand, and to a high level of abstraction and generalisation on the other". Tacit knowledge, on the contrary, is closely linked to know-how, that of the researcher, practitioner and inventor all rolled into one. ICTs could play an important role in the virtual globalisation of disparate and geographically mobile communities.

The potential and limitations of ICTs to support the transfer of knowledge across cultural and linguistic boundaries again raise issues of local specificities and global integration. Here we can benefit from the experience of development researchers who treat culture as an inclusive factor in planning rather than as a variable for technology assessment. This culturally rooted participative approach, building on cultural diversity (local specificity and global diversity) is increasingly being seen as a basis for seeking solutions to three core problems - poverty, unemployment, and the marginalisation and

disintegration of people and societies. This view of local cultural specificity contributes to the understanding of societies in two ways: i) by providing an "insider" view as against the dominant "outsider" view, which is often distanced from the local culture, and tends to distort reality; and ii) by focusing on the relevance of local problems to local situations, and their social and cultural contexts.

*The challenge of cohesion is to create harmony between cultural specificity and global integration. This means developing knowledge networks which enable innovation and sustainability of local knowledge bases while enhancing the process of building a shared common knowledge resource of humanity.*

The EU in its Fourth Framework (The CEC White Paper, 1993) encompasses social notions such as those of 'valorisation of diversity', cohesion, equality, participation and subsidiarity. These notions situate the European debate on the information society in a broader vision of the knowledge society rather than merely building a technological infrastructures.

*The central issue of cohesion is that there is both a commonality and diversity in our cultural concepts. It is by gaining a deep understanding of the harmony between these dimensions that we can develop conceptual frameworks for cohesion and tools for cultural interfaces.*

### **4.3 Diversity and coherence**

Diversity from the human-centred perspective is about a deep learning experience while sustaining a deep inner coherence of human values, respect, and dignity of human spirit. Coherence resides in diversity and is about the innovation of the choice of alternatives. Without a unique coherence, we cannot agree upon a coherent measurement of technological innovations, and thus cannot achieve 'valorisation' of diversity. Coherence can be achieved through a balance of communication within networks and harmony through networks of relationships; a local-global cultural nexus. This notion of diversity transcends beyond the traditional choice of alternatives and finds coherence in innovation of choices. This coherence of diversity may provide a conceptual framework for knowledge transfer between and across cultural domains.

Coherence here seeks collaboration between human networks and technological networks. Knowledge networks in their wider societal context not only have a role of knowledge transfer, but can also act as actors of 'social critique' in developing the 'social market of ideas, products, and services'. They can act as representatives of plurality, and mediators of the 'valorisation of diversity' at a global level. *Pluralism is a safeguard to societal and individual freedom, but in a world in which we live such pluralism is much compromised and is subject to much distortion* (Whiston, quoted in Gill, 1996a). Seen from an optimistic perspective of ICTs, the European Community's debate on the Information Society illustrates an emerging shift in technological innovations from its traditional focus on technical solutions to societal perspectives such as diversity, innovation, learning, diffusion, participation, and cohesion. It underlines the forging of unprecedented links between technological innovation process and economic and social organisation, and notes the inadequacy of the linear model of innovation to deal with the complex mechanism of innovation and the interdependent world of technology and the market. It identifies risks of exclusion and dangers of a two-tier society arising from the information society, and emphasises the need to mitigate any adverse consequences of individual isolation, intrusion into private life, and moral and ethical problems.

While accepting the global character of the information society, and the need for promoting open systems and international standards, the White Paper (ibid.) emphasises that technological developments should "take due account of European characteristics: multilingualism, cultural diversity, economic divergence, and more generally the preservation of its social model" (ibid.: 95). This intertwining of cultural diversity and technological innovations provides a framework for codevelopment.

*One of the most significant aspects of the European notion of the information society is that emphasises the social dimension of technological innovations, and that it recognises the need to sustain the cultural diversity of Europe. ICTs are seen as resources for common European development while at the same promoting the symbiosis between cultural diversity and European scientific rationality.*

## **5. Knowledge Networking and Social Cohesion: A way forward**

## **5.1 Valorisation of the European diversity**

The development and role of the Community research networks such as those under EU programmes, TELEMATICS, SOCRATES, LEONARDO, and MOBILITY and TRAINING provide models of knowledge networking. The EU Programme, TSER, is contribution to the social dimension of research into cohesion. Although these models of collaboration provide an alternative to the 'integrated-excluded' and 'regionalised-projectionists' models, they are still mainly rooted in the traditional systems of managed innovation. If we are to build a broader knowledge bases for social innovation and social cohesion, we need to develop models of knowledge networking which cut across existing academic, social, cultural and economic barriers. The aim is to achieve wider diffusion of knowledge for proactive participation of citizens.

The human centred networks consisting of civil communities (of which enterprises are integral parts) and universities should form part of new social innovation infrastructures for social citizenship. The aim is to extend the current informal and formal academic networks to the social dimension as partners in social shaping of ICTs. At the epistemological level, it is worth emphasising that the transfer of tacit knowledge is at the core of human networks, and any attempt to impoverish their role may lead to the undermining of the social innovation and social progress.

The human-centred perspective of knowledge networking emphasises the transfer of tacit knowledge through a combination of 'learning by doing', human mediation, group working, social networking, personal dialogue, and through personal contacts. seminars, conferences, workshops. Social and professional actors such as librarians, teachers, social workers, community workers, nurses, consultants and social experts act as mediators to transfer the codified knowledge and the contextual tacit knowledge within varied social and professional settings. In earlier times, apprenticeship and journeyman approaches played a central role as a means of learning, diffusion of skills and the transfer and emulation of knowledge. Scientists and engineers and artists learn by doing, they have their workshops and workshop studies to transfer experiential knowledge. People imitate and modify earlier inventions, thereby learning from the act of doing and undoing.

## **5.2 Technological innovations and knowledge networking**

It is important to note that the intertwinement of knowledge bases of the European education institutions and research centres is regarded central to the continuously updating and servicing scientific and industrial knowledge bases of the European Community. We need to extend these models to build and sustain the wider social knowledge bases by creating learning communities, learning organisations and learning society. Learning for social citizenship enshrines participation, diversity, shared communication, dialogue and empowerment. In the human centred tradition, this coherence can be achieved through a balance of communication within networks and harmony through networks of relationships. This notion of diversity transcends beyond the traditional choice of alternatives and finds coherence in innovation of choices.

The debate on knowledge networking and social cohesion has been central to the human centred development in Europe since early 1970s (Gill, 1996b). Human centredness argues that the production and reproduction of knowledge is a social process and is therefore embedded in the social itself. Another notion which human centredness promotes is that of the human as both the producer and user of knowledge. Basically the motivation of human centredness is to provide an alternative model to the machine-centred model of technological innovations, and the purpose is to promote socially useful and culturally responsive technologies. Over the years human centred debates have promoted ideas of user-centred systems, user involved system, and dialogue and participation as central beliefs of shaping work life environments.

### **5.3 Building social capacities: informing rather than automating people**

The debates on "Learning Society" (CEC White Paper, 1995) and "Learning Nations" (Learning Nations, 1996) indicate a growing recognition of the potential of ICTs as a tool for informing people rather than using it as an instrument of automation. The notion of informing people focuses on building people's capacities for absorption and shaping of information. The instrumental focus, in general rooted in the culture of consumption, tends to over emphasise the significance of information access, on-line society, transparency, virtual communities and participation. The risk of this emphasis is that it tends to sell ICTs as a huge leap over some inter-mediating steps of logic of social and economic development. Jukka Oksa (Community Net, 1996) comments that this type of sell is very different from thinking about concrete

communities, it underestimates the social and cultural realities of communities, their needs for capacity building and their aspirations and interests.

The development of any concrete community needs a different approach from that of the talk about the huge possibilities of participation opened by the new technology. Their futures are full of unrealisable opportunities, opened and closed by a mesh of local, national and international factors. The real possibilities opened by any new factor (or technology) depend on the interaction of all these conditions and actors. Information technology does not always connect to their problems that have a high priority. Commenting upon the need for capacity-building through the creation of information and communication strategies, Henry Norman (Community Net, 1996) notes that it is not just a question of exchanging information about content, it is also a question of exchange of information about how you best manage information.

Steve Cisler (Community Net, 1996) suggests that in general it is not technology which plays a big role in development, it is people's capacity and abilities in organising, planning, and their promoting their dreams which are more crucial to the success. Information society developments including Community networks, Telecottages, Telecenters, Community Communication Centres, should be *anchored* in communities. This means ICTs should augment the traditional services rather than replacing traditional human support and mediation agencies.

Seeing informatisation of people in a broader social context, Taylor (Community Net, 1996) notes that while "information, communication, education, mobilisation and organisation are all elements of a knowledge-intensive approach to community based development", what is missing in the information society debate is the inclusion of tradition and culture both, which he believes, central elements of almost all communities. He argues for the need to move beyond the information technology of production to touch other members of the community; the keepers or maintainers of tradition and culture. They too need to communicate with others, they too need to find some way to resolve tradition with practice, sometimes by finding a connection to earlier local traditions, sometimes by exploring where existing tradition may lead.

Taylor further points that even improvements" can destabilise or collapse that stability and the community it supports. Here culture and cultural knowledge are seen as key "resources" of social cohesion. Social cohesion cannot be met

unless social well-being in general and including cultural stability can be maintained. He also notes that it may be that we are faced with possible conflicts between social stability and technological innovation.

*Information society from the perspective of social cohesion has also to ensure that ICTs do not infringe on social and cultural concerns leading to conflicts.*

## **5.4 Building a common knowledge base for us all**

With the increasing spread of information networking it becomes more and more possible to share and add to the common pool of scientific knowledge. This process of sharing at local and global levels enable citizens, institutions and organisation to develop networks of local knowledge resources while linking to the common pool ( or a network) of scientific knowledge.

*One of the core issue of knowledge networking is how to develop common pool of scientific knowledge and how to share it without loss of competitiveness.*

Another notion relevant to knowledge networking is that of recycling of information into "public discourse," so that it is available for application or debate for modification to new or more efficient application. This recycling can facilitate adaptation of knowledge to local needs and especially for steps to get the information out to the public and into public debate (John Daly, Learning Nations, 1996).

The "high-impact" knowledge should not just concern with knowledge used by firms for productive purposes, it should also concern with knowledge used for social useful purposes. Again the focus of the ICTs "infrastructure" of knowledge access and diffusion on coverage, the cost of access, market structure, and regulation is too narrow to respond to social innovation and social citizenship. Although the importance of intellectual property rights and IPR institutions for developing national knowledge capacity is increasingly stressed, it is important to recognise the limits and narrowness of this overemphasis if we are to achieve the pooling and sharing of scientific, economic, social and cultural knowledge. It is argued that since central to social cohesion is the learning capacity of a society, the channels of diffusion and transfer of knowledge should extend far beyond the inter-organisational and inter-firm walls, they should also include social partners,

public stakeholders and social wealth creating agencies such as voluntary organisations and community centres, and the non-profit sector.

*Instead of weakening the role of intermediary organisations (voluntary, public, private, and public-private partnerships), there is need to build new networks of these agencies to support the social and cultural aspects of knowledge access and diffusion, overcoming the barriers of unequal access to and control of knowledge and bridging the gap between the "have-still-mores" and "havenots".*

This means the incorporation of the social, cultural, and political contexts as the basis for knowledge and cohesion strategy.

An important issue of knowledge networking is how effective and timely are the knowledge systems in the society in bringing the various complementary sources of knowledge to bear on the decision or other knowledge processes in the society? For example, do manufacturing enterprises successfully manage the process of simultaneously bringing knowledge embodied in plant, equipment, and supplies to the factory floor? Does the enterprise successfully manage the process of bringing market and production knowledge together? Does the political process successfully manage the process of bringing knowledge held by different constituencies to bear on policy? (John Daly, Learning Nations, 1996).

Ha Hoang Hop (Learning Nations, 1996) notes that culture, history of a society contains contain tacit knowledge (hidden knowledge) that can be transferred to help development more effectively. This hidden knowledge of a culture may often be perceived as to give a negative value by those who are either outside the culture or are mere observers (rather than active participants) to the culture.

*The tacit knowledge can make a value-added contribution to development provided there is a genuine symbiotic relationship between the scientific and social knowledge bases of society, and that mechanisms can be created to transfer and exchange tacit knowledge within and between cultures. This means creating knowledge and skill acquisition processes which enhance the absorption capacity of people and society.*

## **6. Case Studies in Knowledge Networking**

## **6.1 ERASMUS Inter-University Network: an exemplar of knowledge networking**

- the European network for human centred education and research

The 1970s saw the emergence of human centred systems as a new tradition for socially responsive technological innovations. The tradition grew out of the British LUCAS PLAN of the 1970s, and became an inspiration for other European developments of the 1970s such as the Scandinavian traditions of Democracy, participation and Co-determination, and the German projects on Humanisation of Work and Technology. The ESPRIT Project (1217) , Human Centred CIM (1986-89) brought these various traditions together and provided a launch pad for the recent FAST (CEC) programme, Anthropocentric Production Systems (APS). The 1980s also saw the broadening of the human centred systems debate from the traditional production and work life issues to social, economic, educational, welfare and developmental concerns. To reflect and support this broader vision of human centredness a new international journal, *AI & Society*, was launched in 1987, followed by the launch of a new book series, *Human Centred Systems Book Series* in 1989, both published by Springer, London.

At the beginning of the 1990s it became clear to many of us that there was an urgent need to build upon the human centred systems work, and cultivate an alternative humanistic tradition to the dominant machine-centred ethos of education and research in information technology in European universities. This led to a series of workshops and conferences in human centred systems in Europe, and Japan resulting in an international university community committed to this new development. ERASMUS support was sought in 1990-1991 to develop a European framework for postgraduate education in the EU, and the result was the formation of the Inter-University Network into Human Centred Systems.

The ERASMUS Inter-University Network in Human Centred Systems is founded on two fundamental human centred notions of diversity and mobility. Diversity underpins the different cultural traditions of human centredness, and mobility underpins the transfer and exchange of knowledge. The common aim is to establish a European wide academic network of supporting postgraduate courses and research offered at collaborating universities, enabling the mobility of students and staff within the Network. The Network also aims to contribute

to new interdisciplinary directions of postgraduate education and research in human centred systems within broader social and economic contexts.

The ERASMUS Inter-University Cooperation Programme (ICP) started in September 1991 with 10 participating universities from 6 CEC countries aiming to develop a European postgraduate course in human centred systems. During the second year, the Network grew to 12 universities from 7 countries, and during the third year it grew further to include 15 universities from 10 countries. The collaborating departments range from computer science, engineering, electronics, Informatics, communication and media sciences, and library and information studies, to social sciences, sociology and psychology. The network consist of interdisciplinary group of people with backgrounds in such varied areas as sociology, languages, computing, economics, mathematics, philosophy, psychology, electrical engineering.

The Network has developed a framework of intensive courses, workshops and annual conferences to support the European wide developments in postgraduate studies and research in human centred systems. This development provides a foundation for forming links with other international networks involved in human centred issues arising from new information and communication technologies.

## **6.2 IRIHCS: An Institute without walls**

At the international level, the European human centred systems network is complemented by the International Research Institute of Human Centred Systems (IRIHCS). The Institute provides a forum for a strategic debate on new challenges of social and cultural vulnerability, environmental and ecological risks, the brittleness of political, economic and industrial orthodoxies, and an increasing dependency on technological systems. The Institute's human centred tradition moderates science and technology by mitigating the 'mechanistic paradigm' through concepts such as diversity, human purpose, participation, equality, social responsibility, ethics, and creativity, empathy and beauty.

The Institute facilitates international collaboration on human centred research. Through its members it organises international workshops, symposia and conferences. It facilitates the exchange of researchers and students between institutions and across national boundaries. It produces and publishes reports,

journals, book series, and videos/films on questions fundamental to the frameworks, practices and methodologies of the human-centred tradition.

The Institute's influence derives from its individual members, its links with supporting research centres, and associated institutions. *The Institute is a human network rather than a physical entity in the traditional sense.* Its members are not bound by any constitution. They work together because they share a common belief in enabling people to shape new technology appropriate to their working and living environments. The Institute is coordinated by a Secretariat.

### IRIHCS as an Exemplar of Successful Networking

The evolution of the IRIHCS as institute without walls go back to the setting up of the SEAKE (Social and Educational Applications of Knowledge Engineering) at University of Brighton, and the launch of social innovation debate at the first International Conference on *Artificial Intelligence for Society* held at University of Brighton in 1984. The 1984 events led to the foundation of the AI for Society Club (UK) in 1988, the foundation of the International Research Institute in Human Centred Systems (IRIHCS) in 1990, and the formation of the ERASMUS Research Network in Human Centred Systems in 1991.

An international conference on AI FOR SOCIETY organised by the SEAKE Centre in 1985, provided a forum from which developed strategic research links between the Centre and University of Urbino; Greater London Enterprise (GLEB), London; Bremen University; Swedish Centre for Working Life, Stockholm; Segami Womens University, Tokyo Keizai University and RISS, NTT Data, Japan. Collaboration with Japan led to the organisation of the first international conference/workshop in Human Centred Systems in 1990, and the setting up of the first human centred systems research network in Japan supported by the RISS. This 1990 event in Japan was central to the launch of the European Community programme on Anthropocentric Systems and Technology (APS) programme by FAST (DGXII).

Over the years, the SEAKE Centre has played a proactive role in pioneering research into social innovation and has collaborated with local community and voluntary organisations, national and international research centres to develop socially responsive information technology projects. During the 1980's,

Centre's links with the GLEB (London) and IMES (University of Urbino) were crucial to widening the AI FOR SOCIETY debate. The GLEB supported the creation of links with research centres in North America and Europe, and IMES supported the consolidation of these links by hosting annual workshops and conferences in collaboration with the Centre. Support for the human networking activities of the Centre came from a number of research centres especially Bremen University, SCWL, MIT, and Universities of Bologna, Edinburgh and Exeter, Stanford, Sussex. Since its inception in 1987, *AI & Society* has provided forum for widening the human centred debate from its production focus of the 1970s to broader issues of culture and technology, industrial cultures, work and technology shaping, technology policy, and broader social, economic, philosophical and political implications of new technologies. *AI & Society* has also provided a forum for new debates on: Language, Culture and Artificial Intelligence; Culture of the Artificial; Social Citizenship; and Anthropocentric Production Systems. It also brought to the notice of new international readership the historical British LUCAS PLAN of the 1970s, and other European developments of the 1970s such as the Scandinavian traditions of democracy, participation and co-determination, and the German projects on Humanisation of Work and Technology.

The 1980s collaboration of the SEAKE Centre with GLEB is now enshrined in the work of the IRIHCS, an institute without "walls". Throughout the 1980s, IRIHCS has provided a forum for bringing together a number of intersecting research networks, prominent among them are networks: Culture of the Artificial (Urbino); AI for Society Club (UK); Social Citizenship (Bologna, IFIP); Culture, Language And Artificial (SCWL); CAPIRN (Bremen); Anthropocentric Production Systems (APS) (FAST, DGXII); Social Shaping Of Technologies (IRES); Japan Forum On Human Centred Systems (RISS, NTT DATA, JAPAN); Inter-University Network In Human Centred Systems (ERASMUS)

The intersecting research networks are maintained and serviced through workshop and international conferences. The main network workshops and conferences organised by the IRIHCS to provide a forum for human centred debates over the years include: International Conference: International Year of the Disabled People, Brighton, 1981; International conference on Artificial Intelligence For Society, Brighton 1983, 1984; 1985; International conference on The Problem of Knowledge and Artificial, Intelligence Technology, Forlì-Ravenna, Italy; 1987; The launching of *AI & Society*, Computer Professional

for Society Responsibility CPSR87, AAAI conference, Seattle, California, 1987; The British Computer Society Conference BCS88: the launch of the AI For Society Club, 1988; International Conference on Culture, Language and Artificial Intelligence, Stockholm, Sweden: the launch of human centred systems book series, 1988; International Workshop/Symposium on Human Centred Systems, Tokyo, Japan: the launch of the Japan Forum on Human Centred Systems, 1990; First International Conference on The Culture of the Artificial, Lugano, 1990; International Workshop in Human Centred Systems, Brighton: the launch of the ERASMUS Inter-University Network, 1991; EC-Japan Conference on The Future of Industry in the Global Economy, Tokyo, Japan: ATSUGI DECLARATION, 1991; International Workshop on Human Centred Systems, NISTADS, New Delhi, India: 1991; The Future of Industry in the Global Context, ESSEN, Germany, 1993; Second International Conference on The Culture of the Artificial, Ascona, Switzerland, 1993; International Conference on New Visions of the Post-industrial Society, University of Brighton, 1994; European Summer School in Human Centred Systems, University of Urbino, Italy, 1995.

The work of the Institute and the ERASMUS Network is coordinated by the SEAKE Centre. Through *AI & Society*, the Centre has provided a forum for widening the human centred debate, and the creation of a network community of researchers and practitioners. The book series in human centred systems and *AI & Society* provide a rich reference resource for interdisciplinary work in humanistic traditions of science and technology. The ERASMUS and the IRIHCS provide a foundation for an international doctoral and post-doctoral programme in human centred systems. Workshops and conferences organised by the human centred community continue to provide a forum for disseminating and expanding the work of intersecting networks.

The integrated IRIHCS and the ERASMUS Network model interlinks individual researchers and practitioners, and academic institutes in a network of education and research in human centred systems, and networks of knowledge transfer, social innovation and information society. This model can be used as a basis of an operational framework for knowledge networking for social cohesion bridging the knowledge gap between the traditional academic networks and the managed networks of social and economic regeneration.

### **6.3 Towards a new symbiosis for knowledge networking**

The world of work, learning and living are, however, changing rapidly. In this age of information networks, the notion of symbiosis goes beyond the single user-machine relationship, it is a matter of symbiotic relationships between the network of users and the network of machines. It becomes a matter of communication between groups and between the human and machine networks. It is not a matter of the interaction between the skilled worker and the machine, but of a world of collaborating users, who have a variety of skill levels, and networks of machines performing at a variety of functional and cognitive levels. The 'tacit' knowledge no longer resides in the individual artisan but resides in the community of users in the form of the social knowledge base or a network of social knowledge bases. It is not just a question of objectification of the experiential knowledge, but a question of objectification of social and professional knowledge at a variety of levels of objectivity and ambiguity.

In the technological age of networks of consumer, user and producer communities, networks of economies, and networks of communication technologies, the challenge of human-centredness is how to move beyond the traditional notion of human-machine symbiosis, and promote notions and concepts which deal with a variety of human-human and human-machine relationships and networks of relationships, both at local and global levels. We have moved beyond the age of ergonomics and human factors, human computer interaction, machine usability and cognitive performance of the individual user. It is an age of communication networks and networks of communication producing, reproducing, and sustaining varieties of skill and knowledge bases.

This challenge of technology design is part of a bigger societal challenge as to how to re-integrate technological innovations into the civil society so that technology supports new forms of work life and living environments. This requires the innovation of new forms of social structures and organisational cultures which respond to and cope with the changing world of work and living.

At the intellectual level, the way forward is to cross the wall of 'causality' embedded into the scientific method, and find a harmonious relationship between 'cause' and 'purpose'. Causality is not something that is imposed on us but resides in our scientific view of the world. It is a presupposition which

we adopt before we begin to study the world and explain it. It is equally in our gift to take an alternative 'purposive' view of technology (Rosenbrock, 1990).

At the epistemological level, the way forward is to rethink about the epistemological issues arising from the changing nature of the relationships between humans and machines. One way is to seek harmony between the 'tacit' knowledge and the 'objective' knowledge in a network of human machine relationships.

At the methodological level, the way forward is move beyond the cognitive and social spaces of the individual embedded in human machine interaction, to human machine relationships required of the network of cognitive and social spaces. Here we can learn from the human-centred approaches, such as the social action approaches, the participatory approaches, social shaping, and the culture of the artificial.

At the level of 'cultural pragmatics', the way forward is to build on the 'valorisation of cultural rationalities', in order to support the symbiotic relationships between local identity and cultural plurality. The issue here is to formulate a research agenda for multimedia environments, which recognises the dynamic relationship of local specificity and global diversity (Gill, 1996 b).

## **6.4 Building upon the diversity of human centredness**

The discussion on knowledge networking and social cohesion has emphasised the centrality of the human centred notions of cohesion, 'valorisation of diversity', symbiosis, purpose, and social innovation. These notions rooted in the European scientific and intellectual traditions give glimpse of the diversity of European traditions of human centredness, reflecting the nature of industrial cultures, socio-political traditions, and historical situations. For example, the British perspective reflects the human-centred tradition of socially useful production, and the notions of 'human-machine symbiosis', purpose, and social innovation. This perspective also reflects the constraints and opportunities of innovation of the individualistic culture and voluntarist traditions, as well as the limits of the industrial culture rooted in the separation of work and learning. It is perhaps not surprising that the 'home of human-centredness' has not been open to its practice.

The Scandinavian tradition emphasises participation and user-oriented work life, with the Danish and Norwegian perspectives reflected in the 'collective resource' and 'action research', and the Swedish perspective defined by the 'humanisation of work', 'science of work' ideas. On the one hand the Scandinavian tradition reflects the 'inclusiveness' of the emancipatory and democratic practices, and on the other hand, it reflects the 'exclusiveness' of the rationalist tradition. It may be that this dialectics of the Scandinavian tradition attracts the insiders (of the rationalist tradition), and that the ambiguity of this dualism attracts the outsiders. This may also say something about the amenability of this tradition to both social innovation and competitive anthropocentricity.

The German perspective is shaped by the ideas of 'co-determination', the practice of rationalisation, the initiatives of 'humanisation of work', education rooted in the notion of qualifications, and working culture sustained by the enterprise competitiveness. This perspective of 'integrated rationality' deepens the mechanisms and processes of the 'productive' industrial culture, which may not be easily amenable either to the ideology of the antagonism of two cultures of industrial work, workers and managers' (such as the French ideology, and the British tradition) or to the 'pragmatic' cultures rooted in individualistic and voluntarist traditions of the Anglo-Saxon world.

The French perspective is influenced by 'fayolism', French rationalism, the notion of the place of man in the workplace, and ideas of 'collective expression groups', and the French ideology of the antagonism of two cultures, workers and managers. Just like the British tradition of the separation of managers and workers, the French ideology of antagonism, does not seem to provide a hospitable work environment for the human centredness. Alternatively the 'integrative rationalism' of the human centredness may be inappropriate to the ideology centred and individualistic cultures.

The Irish perspective is cultivated by the notions of 'social contract', and the concept of 'social partnership' at work. The developing nature of Irish industrial culture together with a network of craft skills and small scale enterprises, may make Ireland, like Greece and Portugal, more receptive to the more emancipatory ideas of anthropocentricity.

Reflecting upon the human centred traditions, there emerges a glimmer of emancipation and 'inclusiveness' in its diversity, while raising issues of the 'exclusive' nature of the 'integrative' and 'collective' rationalities embedded in the notions of 'co-determination' and 'semi-autonomous group work', as well as, the limits of 'separation' inherent in the individualistic and hierarchical cultures. While the voluntarist and 'individualist' traditions may be amenable to the diversity of culture, in the sense of a 'network of diversities', the 'integrative' rationalities may be too restrictive to respond to the 'fuzzy' and 'ambiguous' nature of the diversity (Gill, 1996b).

*A challenge social cohesion is how to develop knowledge networks rooted in the notions of the 'valorisation' of diversity, subsidiarity and coherence, and how to support developmental notions of 'inclusion' in the emerging networks of the 'information society'.*

## **7. An agenda for further research: towards a university of social innovation**

The agenda for further research is concerned with the processes and models of informal and formal networking for social cohesion. The focus of this agenda is to investigate the broadening and qualitatively changing of the knowledge base of society by inter-linking the scientific knowledge bases of the university and the social knowledge base of the civic society. One way forward is to investigate the integration of university into the society in the form of building new networks of alliances between the civil communities (of which enterprises are integral parts) and the universities.

*It is clear that techno-centric ideas have failed, and that engineering models can only be weakly applied to the social domain. We need a strategic direction of research into social cohesion which overcomes the conceptual limit of the techno-centric model and social errors of engineering models. The cohesion research has to be situated in the societal processes, the root of the human centred approach.*

The human centred approach provides a way forward for social cohesion which transcends the organised and managed participation of citizens. It induces an active citizenship rather than a passive claimant relationship. It argues for the socially (in the societal sense) useful application of new technologies for the

creation of new forms of social wealth which transcend beyond the traditional notions of economic and technological wealth. The research is informed by the concepts of human centredness, subsidiarity, communitarianism, and social citizenship.

### **Subsidiarity and cohesion**

The notion of subsidiarity, located in diversity, is about reciprocity and pro-action. It implies being close to people, listening, empathy and sensitivity to differences. Subsidiarity from the perspective of social cohesion is about interaction between people, empowerment, information/knowledge, participation and learning. But people have to be capable to participate, they need information and knowledge to propose and test their solutions. The issue for them is how can they move beyond the organisational boundaries of systems, and become proactive participants and social actors in their own right. The challenge for the researcher is how to build upon the notion of subsidiarity to shape ICTs networks for involving people with minimum mediation, coordination and management.

Subsidiarity for social cohesion raises broader questions of social citizenship. For example, what new mechanisms can be created to empower people in the old sense of the 'governance of the polis'? How to inform and involve people in strategic decision making? How to use ICTs for the emergence of new politics of participation and social citizenship? How do we create new institutions of social innovation? These questions are part of the bigger picture of shaping information society for the social dimension.

*ICTs are just one of the tools for innovation, we need human institutions and processes in place to exploit the potential of ICTs for participatory and consultative activities. We need to investigate the means and processes of providing information and knowledge to people so that they can devise their own initiatives.*

### **Democracy as a process of transparency**

At this point it is useful to consider another concept - of democracy as a process of transparency, and how this affects participation. Transparency in the use of ICTs involves the externalisation of risk. The 'core-periphery' model of production and distribution processes in manufacturing industry illustrates vividly the danger of externalising the risk of resources and skill, thereby leading to unemployment and social exclusion. There is a concern that this 'core-periphery' model may exploit the distributive nature of ICTs (e.g. email, telematics) in externalising the social dimension of information society. ICTs at one level may appear to be democratic, yet externalise diversity, and so eliminate subsidiarity. As a result, the social glue of diversity may be weakened.

*We need to further investigate the paradoxes of transparency and democratisation, and their impact on social cohesion.*

### **Communitarianism and cohesion**

The notion of 'communitarianism' shifts the idea of cohesion from a managed participation to a socially distributed notion of participation. It does so by refocusing the provision of "universal service" to that of "universal community service" (not just community in the grassroots sense but also in the institutional sense). In this new focus, the receiver has both rights and obligations to seek, access and contribute to the social resources of society. To put this conceptual idea into practice, however, requires both the receiver and the provider to have the ability and opportunity to participate effectively in society. The dilemma here is that many disadvantaged citizens may be further excluded from this participation without having access to the knowledge necessary for communication and the expertise necessary for mediation.

*We need to explore how distributed nature of ICTs can be used to create knowledge networks for distributed participation of citizens in the provision of "universal community service" as an integral part of social cohesion.*

### **From managed innovation to social innovation**

The notions of 'subsidiarity' and 'communitarianism' when seen within the social cohesion debate raise issues of democratic participation and social responsibility. This means innovation of knowledge networks and coordination processes through human networks aimed at involving people in these

networks and enabling them to participate in broadening the social knowledge base of society. Technology is just a communication tool, it enables and facilitates access but cannot in itself create processes for participation. The issue is how can we make the ICTs part of the democratic process building upon the idea of subsidiarity. But, the current focus 'subsidiarity' is located in the traditional ethos of social and economic regeneration 'regeneration' which is managed and directed.

The issue thus becomes how can this managed concept of subsidiarity be extended into the social domain. Moreover, current social innovations, be they technological, economic regeneration and educational, are managed and coordinated by mechanisms which are not accessible to ordinary citizens, they are excluded from the formal mechanisms and processes. Those outside the formal innovation processes have to cope with layers of mediation at the local, regional, national and European levels. The issue of subsidiarity is how to use ICTs to bring people nearer to strategic policy makers by removing the competitive mediation hoops.

*We therefore need to investigate how do we create a culture of social innovation which is inclusive and communicative. At the EU level, there is urgent need to reflect on the question: What does Information Society mean to the citizen of Europe?*

## **The university of social innovation**

Cohesion from the perspectives of subsidiarity and communitarianism raise questions of how to extend informal and formal academic networks to broader society without weakening the integrity and quality of knowledge. Although the balance between the function of the university and its obligations to wider society is an ongoing debate, we do need to refocus the participation of the expert in the society, and the inter-linking of the scientific knowledge base of the university to the social knowledge base of society. From the perspectives of social cohesion, the relationships between the expert and public is seen no longer a matter just for the expert, it is also a matter for the wider society. The university here is seen as a symbiotic component (in the sense of balance and mutual benefit) of the society, it is no longer separate from the society. Contribution to knowledge means contribution to the society. But currently the institutional role and status of the expert expresses the quality and accessibility

of knowledge. The issue of the knowledge debate therefore is how to develop a dialogical relationship between experts and the social community for improving access to the societal knowledge bases and enhancing participation. This means experts making their knowledge accessible to people without compromising the quality, accessibility and availability of knowledge. It also means extending social responsibility and participation of the researcher as a social citizen .

In this endeavour we should, however, not underestimate the importance of the "specialisation" of knowledge production activities of the universities, as well as very sophisticated hierarchies of concepts and relations which many sciences have built in order to explicate and verify scientific knowledge.

*We need to investigate further what social innovations are required to integrate university, its knowledge base and its expertise into the civic society, in other words how to innovate the university of social innovation.*

## **8. Recommendations**

DGXIII should set up a research forum on social wealth (in the societal sense) for the regeneration of social and economic cohesion of Europe. Initially it should include:

- the development of a conceptual framework for social wealth
- models of social innovation for new forms of work, living and learning
- models of social citizenship and social sustainability
- models of socially useful production and services
- models of the learning society
- models of the university of social innovation
- models of knowledge networking for social wealth

These recommendations move forward the debate on two major problematics of unemployment and global competitiveness which seem to be the main concern of the European Information Society debate. These problematics are situated in the societal world, and not just in the industrial and technological worlds. It is now beginning to be self evident that employment will not go away, and that competitiveness may not be sustained without sacrificing the traditional determinants of social cohesion: employment and social well-being.

If traditional wealth creating industries cannot create employment and enhance social well-being of people, it is timely to rethink our notions of wealth and consider how the accumulated talents and abilities of our societies might be redirected and mobilised to create a parallel form of wealth- namely social wealth . Social wealth may be identified by characteristics such as: the quality and capability of human services such as health care and education; the vitality and sustainability of communities and a sense of belonging and involvement through active citizenship; the capacity for social innovation and the making of the learning society; the capacity of the generation and regeneration of social and cultural knowledge bases of society; socially useful production of goods and services; social citizenship- heightening awareness of citizens rights and also their responsibilities as a contribution to the vibrant, constructive and caring society.

The human centred vision of social wealth:

- is concerned with both technological opportunities and societal possibilities for codevelopment. Within this context, the challenge of knowledge networking for social cohesion is part of a bigger societal challenge as how to integrate technological innovations into the civil society.
- promotes information society where social cohesion strengthens a new social contract of social rights and responsibilities involving individuals, communities and institutions at the societal level. This should go beyond the consumer-oriented focus of individual transaction and individual contentment.
- promotes inclusive, participatory and pluralistic notions of knowledge society as an alternative to virtual society where the citizen is not just a consumer of information but also producer and user of knowledge and wealth.
- proposes an alternative evolutionary framework to the "best practice" model for change, which embodies notions such as novelty, variation, difference, diversity, heterogeneity. Such an evolutionary framework transcends a key limitation of the "best practice" model which is its inability to cope with diversity. The human centred approach on the other hand places diversity at the core of the effective shaping of information society.
- promotes a culture of effective interdependence and social solidarity through valorising accumulated experiences and historical, social and cultural potentialities, creativity and appropriation capacities. This requires holistic and fractal approach which considers global ethics and intercultural dialogue and collectively responsibility. This also means creating knowledge and skill

acquisition processes which enhance the *absorption capacity* of people and society.

- promotes the learning society which aims at possibilities for personal and collective "growth". It transcends the current constraints of life-long learning and learning society: "technology centred interactivity; the heavily consumer oriented and ready-to-consume information transfer and "learning-packages"; the capacity to externalise ownership and control of information from the user to the provider; the capacity to create a homogeneous culture of learning and training, excluding variety and plurality".

## 9. Conclusions

Information Society as a catalyst for change and innovation is more than a technical fix of problems, it is a tool for enabling people to participate in the processes of social and economic renewal. While recognising the change as a fundamental human condition, we must also recognise that change takes place in the real world of work, living and learning, and technological innovations cannot be divorced from the social dimension of these realities. It is this dynamic interdependence of the technical and the social which is at the heart of the debate on knowledge networking and social cohesion.

The report reflects on some of the core issues of social cohesion, such as shared communication and shared knowledge, local-global nexus, local specificity and global integration, subsidiarity and cohesion, diversity and coherence, the inter-linking of social knowledge and the scientific knowledge. It also reflects on the risks arising from the emphasis on quantity and standardisation of information, the implication of the "one best way" of knowledge; the mismatch between the production of knowledge and its diffusion in wider society; and the gap between the expert and the citizen.

Essentially the human centred vision of social cohesion is concerned with the central question: What does Information Society mean to the citizen of Europe and what is required to make ICTs work for society and social cohesion? The report argues that we need a broad social agenda of social cohesion and knowledge networking.

We propose a research agenda of knowledge networking which envisions knowledge as the core resource for participation and social innovation. This knowledge centred view of cohesion refocuses our view of information society

from technology transfer to knowledge transfer; from managing the technical knowledge base to the building and continually servicing of the socio-technical knowledge of society; from designing technical interfaces to building tools for socio-communication.

A way forward is to develop new network alliances between universities (including other centres of scientific knowledge bases) and the civic society to integrate the scientific knowledge base of the university and its expertise into broader social base of society. The human centred network model presented in this report provides a basis for further research into knowledge networking and social cohesion.

The recommendation for a forum on social wealth is aimed at meeting some of the challenges of information society which arise from increasing unemployment and insecurity undermining the very sustainability of societies.

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