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ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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FOREWORD

The OECD Workshop on Information Infrastructure and Territorial Development was held at the OECD on 7-8 November 1995. It was organised jointly by two OECD Committees, the Committee for Information, Computer and Communications Policy (ICCP) and the Group on Urban Affairs. This document contains the report and the summary of policy conclusions by the rapporteur Professor John Goddard, the background paper prepared for the Workshop by consultants Andrew Gillespie, Ranald Richardson and James Cornford, the Workshop Programme and Summaries of most of the presentations, prepared by the speakers, and finally the list of participants.

SUMMARY OF RAPPORTEUR'S POLICY CONCLUSIONS

Professor John Goddard,
University of Newcastle upon Tyne (UK)

Public policy makers should not be taken in by the hype which suggests that ICTs (Information Communication Technologies) are abolishing geography and uneven development -- the telecommunications revolution is not happening at the same speed everywhere, and some areas are gaining competitive advantage because they are quicker to exploit the opportunities.

The fact that ICTs are not being introduced onto a level playing field, for example in terms of the differential penetration of older telephone technology among households by social group, large organisations, SMEs and localities, must be recognised in public policy.

The rapid diffusion of ICTs into a wide range of business processes is happening now and providing organisations with a widening range of locational options -- this presents both threats and opportunities for area development.

Public authorities need to undertake an audit of the risks and opportunities. These include threats to local jobs since ICTs can increase the supply of labour from elsewhere and enable distant enterprises to enter local markets previously protected by distance. The decoupling of the need to match local demands with local supply for information based services, particularly public services, is a particular threat that cannot be ignored.

At the same time there are opportunities to attract mobile jobs (eg back offices and tele-sales) to lower cost/amenity rich locations (exogeneous development) and to facilitate the entry of local enterprises into global markets (indigeneous development).

Realisation of the opportunities for ICTs to support endogenous development through innovative product, process and managerial innovations will not be easy given the key role of tacit knowledge exchange in these processes. ICTs are not a "magic bullet" for economic development and must be integrated with a wide range of other policies.

Local and regional authorities should play a key role through the incorporation of ICTs into their economic development policies (eg to support a re-engineering of inter-agency operation in the economic development support process embracing skill development, financial assistance, provision of sites etc) and through their direct use of ICTs in the delivery of services in such areas as education and health.

National government should follow the lead of a few local and regional authorities in the creation of a territorial dimension to their own information society policy agendas. These policies should recognise that the widespread geographical diffusion of applications, which meet the needs of users, is essential to pull through the demand that will justify investment in electronic highways; policies should focus as much on the "slip roads", easy to use "cars", and "driving lessons" as on the highways themselves.

Demand generation initiatives must be matched by territorially sensitive communications regulation policies. Local and regional authorities should acquire responsibilities and skills to monitor the implementation and impact of telecommunications competition policy and national regulatory bodies should become more familiar with issues of area development. They should also use that bargaining power as a major user to shape the development of the telecommunications infrastructures in their territory.

National governments and trans-national organisations should include area development in discussions about the future shape of universal service obligations given that these will now need to be applied on both an inter-operator and international basis. Without such policies the provision of advanced communication infrastructures is likely to reinforce existing territorial inequalities.

RAPPORTEUR'S SUMMARY

Professor John Goddard
University of Newcastle upon Tyne (UK)

Introduction

By focusing on the territorial dimension of the telecoms revolution the Workshop sought to throw into sharp relief some of the fundamental yet unanswered questions that must lie behind slogans about the information society. In particular:

- is the telecoms revolution happening at the same speed everywhere?
- will the capacity of telecoms to overcome the barriers of geographical separation lead to a reduction of differences between places?
- will some places gain competitive advantage because they are quicker to exploit the telecoms revolution?
- who has access where to the information super highways and the information resources they could provide?
- will the information society exhibit less geographical inequalities than the old order it is supposedly supersedes?

The results of a recent household survey of the availability and use of communications technology in the USA undertaken by the Bureau of the Census for the National Telecommunications and Information Administration of the US Department of Commerce and tabled at the Workshop by the secretariat provided an initial response to some of these questions of access. In addition to expected differences according to income, age and social group this survey revealed pronounced variations in household availability of communications technology between rural, suburban and inner city locations. For example, the poorest households in inner city areas have the lowest access to the telephone, (available to 79.8 per cent of households), compared to 98.9 per cent of the suburban wealthy. Variations in computer availability are even greater from 4.5 per cent of poor households in rural America to 66.4 per cent of the wealthiest households in the suburbs. Despite the obvious need for access to distant information in rural areas only 23.6 per cent of poor households that do have a computer in rural areas also have a modem compared with 44.0 per cent of the same income group in the suburbs (and 58 per cent of the suburban wealthy). In short, socio-economic and locational variations in access to new communications technologies are greater than old technologies; insofar as the new technologies depend on the old, the information revolution is taking place on a far from even playing field. These figures were depressing for those participants who saw telecommunications as a means of improving social access.

However, other data obtained from the same US survey showed that once success has been achieved, the disadvantaged did make considerable use of electronic information services. The survey showed that a significant number of the poorest and least educated are using computers and modems to gain access to education in both inner cities and rural America. Similar patterns apply to other services such as the search of classified advertising and on-line accessing of government information.

Taken as a whole these figures suggest that the telecommunications revolution can be both a threat and opportunity for people and places. Far from the consequences being technologically determined, the challenge for public policy at the urban, regional, national and international stage is to shape access to the information society in ways which maximise the benefits in the public interest. Because of the inherently geographical nature of the information and communications technology, the territorial perspective provides an opportunity to address some of the wider economic and social development issues raised by the emerging information society.

Because access to employment opportunities is one of the key development issues, the first part of the Workshop on problems and opportunities focused on how the use of these technologies was affecting what work tasks are carried out where, within and between organisations. If computers are decreasing the demand for labour within workplaces in an area, is telecommunications increasing its supply from elsewhere, thereby contributing to an increase in local unemployment? Electronic Highways which provide organisations with an opportunity to reach distant markets are a threat to organisations in areas previously protected by distance but nevertheless a necessary if not sufficient condition for area economic development; in an era of increasing competition in telecommunications is there evidence that some areas have poorer access to electronic highways than others? The discussion is summarised below under the following headings:

- Locational Flexibility and Territorial Competitiveness
- ICTs and Employment Distribution
- ICTs and Territorial Governance

The second part of the Workshop focused on the policy implications to the issues raised by such questions. More specifically, what role could public bodies concerned with urban, regional and rural development play in attracting and retaining information intensive business? Could local authorities, through their own use of ICTs in administration and the delivery of public services generate opportunities which could pull through demand which would justify investment in electronic super highways? Last but not least, was there a place for an explicit territorial dimension to the regulation of the telecommunications industry, particularly through the allocation and monitoring of licenses and discussions about the future of universal service obligations? The debate is summarised below under the following headings:

- The Role of Regional and Local Government in the Realisation of the Information Society
- Liberalisation, Communication Infrastructure and their Role in Territorial Development
- The Integration of a Territorial Dimension within National and Global Infrastructure Policies and Programmes

Locational Flexibility and Territorial Competitiveness

The background paper highlighted the fact that ICTs provide organisations, particularly those operating on several sites, with a wider range of locational repertoires. The telecommunications revolution is indeed happening, being implicated in the re-engineering of business processes in all sectors of the economy from manufacturing through to public and private services. Affected areas include the design, development and manufacture of new products; the creation of new services; linkages with suppliers, including joint production and service development; the interface with customers, including support services; and last but not least the central co-ordination of operations so that organisations can achieve economies of scale as well as scope. ICTs are therefore being normalised and incorporated into everyday business operations -- it is no longer a matter of leading edge applications in high technology sectors.

It was clear that the application of ICTs by organisations is producing contrasting locational tendencies in terms of multi-site organisations. With respect to organisations as a whole there is geographical centralisation and decentralisation, with both processes operating at global, national and regional scales; in terms of individual work places, there is both concentration into fewer and/or larger sites and deconcentration into more and/or smaller sites. The geographical reorganisation of commercial banking provided a good example. With the introduction of automatic telling machines and service innovations like tele-banking many front office sites in the high street are being replaced by concentrated back-offices which are being decentralised from global financial centres to peripheral regions. ICTs therefore enable such regions to "mobilise their assets", particularly education, lower cost labour and suitable premises. The Toffleresque vision of a uniform deconcentration and decentralisation of economic activity is far from being realised; indeed, such a vision runs contrary to a generally observed phenomena, namely that the lower the barriers to communications the greater the sensitivity of organisations to variation between places and by implication the greater the incentive for places to differentiate themselves to attract/retain investment.

Comments on the above perspectives set out in the background paper were provided by spatial scientists and management scientists. From the spatial perspective the discussion confirmed the complex outcomes arising from the adoption of ICTs by organisations. A key factor likely to constrain the revolutionary impact of these technologies is the close connection, apparent over a long period of time, between transport and communications, a connection strongly influenced by the sunk investment in existing transport facilities. Metropolitan areas, with their excellent rail and air links, remain the key nodes within the global economy for processes of knowledge (as distinct from information) generation and exchange, processes which depend heavily upon tacit knowledge gained from personal contact. The much looked for growth in new ICT based information services are most likely to arise from innovation within metropolitan contact networks, so reinforcing the position of these cities.

From a management science perspective, the re-conceptualisation of the firm as a "problem solving institution" raised the question as to the ways in which the use of ICTs to reallocate access/tasks between locations and to redefine the boundaries of the organisation might affect processes of continuous innovation. There is little evidence that firms use territory creatively to support innovative processes. The main thrust of the case studies presented in the Workshop was to use ICTs to minimise short run costs -- to escape inflexible working in old locations, seek out cheaper locations, and to assert control over distant sites/markets. It seems that ICTs have yet to sufficiently penetrate into the process of new knowledge creation in ways that lead to a fundamentally new and positive reconfiguration of the relations between organisations and territory.

ICTs and Employment Distribution

One of the much heralded impacts of ICTs on organisations has been "teleworking". This is popularly associated with individuals working from home but a wider definition would also include collectively organised works tasks such as tele-sales, where ICTs are central to the activity. Teleworking is expected to be a major contributor to new job creation -- for example the report of the European Commission's high level group on Europe and the Information Society (the Bangemann Report) notes that "the aim is for 2 per cent of white collar workers to be teleworkers by 1996 and 10 million in telework jobs to be created by the year 2000". At the same time the EC White Paper on Growth, Competitiveness and Employment (The Delors Report) notes that "we are once again passing through a period in which a gap is opening up between the speed of technical progress, which is concerned finally with how to produce (manufacturing processes and work organisations) and therefore destroys jobs, and our capacity to think of new individual or collective needs and which provides new job opportunities". In identifying the promotion of information networks as its first "developmental theme" the Delors report points to their contribution to competitiveness and employment growth by the resolution of market failure "resulting from the distance of peripheral regions or rural areas to central or urban based employment opportunities". The Delors Report therefore identifies ICTs as both part of the problem and part of the solution to the European jobs crisis.

Discussions at the Workshop highlighted the difficulties in arriving at any quantitative assessment of the job gains and losses in less developed areas arising from teleworking. There are problems of definition; of the inadequacy of current economic models when capital and labour are found in different locations; and of organisational models which underplay the changing relationships between enterprises made possibly by ICTs. In this situation geographical case studies have provided a rich vein of insight and these have generally revealed that tele-mediated job gains in one area are often associated with larger job losses elsewhere.

As a complement to case studies of organisations a very helpful approach was to audit the nature of tele-mediated jobs changes in a particular area, both in terms of the type of jobs created by occupation, size of business and sector, and the extent of local "rooting" of these jobs. In the Highlands and Islands of Scotland it was estimated that 600 jobs had been created over the five period following the early introduction of ISDN services. The majority of these were in back-office functions, including business processes such as money collection outsourced from Local Authorities in deprived London boroughs. New information based businesses in areas such as publishing, generally established by return migrants seeking a higher quality of life, accounted for a further quarter of the jobs and home based teleworking, such as medical editing a further one fifth. Jobs in sheltered "telecottages" were not common. These calculations of course, do not included jobs displaced by distant suppliers of information based services entering markets in the Highlands previously protected by distance.

Experiences reported from Sweden confirmed the Scottish experience of back-offices, outsourcing and the relocation of work to the more remote parts of Sweden. Telecottages appear to be more successful than in Scotland, perhaps reflecting a more collective business culture. In terms of home based working, the Swedish experience supports UK evidence that this is predominantly a metropolitan suburb phenomenon. This group probably includes former commuters to down-town head offices whose work had been outsourced and who are now operating as freelance consultants from home, but who still rely on personal contacts maintained through frequent travel, particularly necessary for winning new business.

One particular employment implication of teleworking linked to outsourcing noted at the Workshop was the consequences for training and staff development. There was a danger that the skills acquired through formal and informal learning within the organisation could not be easily replaced and this would yield long term adverse consequences both for companies and localities.

In terms of job creation, much emphasis is generally placed on the contribution of SMEs and the service sector. However, evidence presented in the Workshop from the Miyagi prefecture in Japan confirmed that SMEs can be slow to respond to opportunities provided by ICTs. In this area, which did not have a history of aggressive entrepreneurship, there were a limited number of SMEs taking advantage of new technology. At the same time larger manufacturers were using ICTs to support outsourcing beyond the boundaries of the prefecture, causing serious problems for local SME suppliers. In the service sector, Tokyo based large businesses were expected to close branch offices, serving local markets electronically from the capital.

Such impacts of ICTs on the location of service sector jobs is particularly significant. Here, the traditional close geographical relationship between the customer and supplier of services was breaking down; for example, customers no longer have to go physically to their local bank but can be served electronically from a central and distant location. As well as being "de-localised" services are being "industrialised" as the skills of front office staff are incorporated into back office software and systems. In the case of services, "product" cycles have been the reverse of that which characterised the traditional factory system; the sequence has gone from investment in order to gain efficiency to improvements in the quality of services and finally a widening of the range of services. Public services have generally lagged behind private services in the adoption of ICTs. However, as a result of the pressure on government to make economies in public expenditure and to bring market criteria into the public sector, either indirectly or directly through privatisation, the gap between public and private services in relation to ICTs is beginning to narrow. In particular, a widening range of electronic information services are being introduced into central and local government. Government computing services are also being contracted out to private agencies. These changes not only affect the number of jobs but also their location. At the local level jobs in local government services have traditionally provided a buffer against cyclical variations in employment in the traded part of the local economy. Once local government information jobs are provided electronically they also become potentially mobile and part of the traded sector. One interesting example noted at the Workshop, was an electronic system for processing town planning applications in Melbourne -- this has led to the closure of local planning offices throughout the State of Victoria. Similar arguments apply at the national level; once central government services are provided electronically they are potentially mobile internationally. Such considerations imply that the traditionally Keynsian view of the role of the state as a counter-cyclical provider of employment may no longer be a viable option either locally or nationally.

ICTs and Territorial Governance

The discussion of locational dynamics highlighted many of the threats to area economic development arising from ICTs. The essential problem is that ICT mediated structural changes in the organisation and location of work are happening NOW ahead of the public policy response to counter the threats and exploit the opportunities. Potential responses include encouraging the adoption of ICTs as part of regional industrial innovation policies and thereby raising competitiveness, investment in communications infrastructure ahead of demand, direct stimulation of tele-mediated telematic services by local and regional governments, and last but not least the introduction of a territorial dimension to national and global communication policies.

One of the best ways of countering the threat of job losses or at least dependent development based on the attraction of mobile but routine jobs is to use ICTs as part of a strategy of endogenous development focused on innovation. The first paper presented to the session on territorial governance summarised a growing amount of evidence on the importance of a local dimension to national innovation policy. Local and regional agencies could play a key role in facilitating the exchange of information and know-how between enterprises within an area, creating value added knowledge based resource networks for clusters of businesses. Such networks, based on the trust arising from personal contact, could also provide a basis for creating local electronic market places that could then go global.

However, it was noted that such endogenous development strategies are notoriously difficult to pursue and generally have not made much use of ICTs. These technologies are as yet unable to handle the generation and exchange of tacit knowledge, processes which are at the heart of successful industrial clusters. Hence the main thrust of policy has been towards exogenous development; in this sphere the traditional instruments to attract inward investment -- such as sites and premises and the provision in this case of telecommunication infrastructures, have been proven to work. The Workshop noted the Japanese promotion of sites for high technology mobile projects (Tele-topia). The Teleport concept, also supported strongly in Japan, raised the question of the experience of the contribution of freight platforms and sea ports to economic development. In the case of both teleports and sea ports, the key to success would appear to be strong economic regulation and physical planning which steers users to particular infrastructure nodes. Logistic platforms, supported by ICTs and which capitalise on the links between communications and physical transport, could also be a key asset in promoting area economic development; however, it was noted that excessive competition between locations, which was a particularly strong phenomena within Europe, could inhibit the realisation of such opportunities.

Finally, in discussing ICTs in rural development, it became clear that these technologies should not be regarded as universalistic panaceas for problem areas. Because of differences in history and geography and of business and administrative culture, policies that worked in one area would not necessarily work in another. In the case of rural areas, ICTs were enabling localities to realise latent assets such as sites and premises, skills, attitudes to work, amenities and quality of life, supportive public agencies and cohesive business networks. Policies directed at shortcomings in any of these processes (eg. education and training) were just as important as those focused on ICTs. The challenge was to integrate ICT policies into overall area economic development strategies.

The Role of Regional and Local Government in the Realisation of the Information Society

The conclusion that effective use of ICTs to achieve area economic development goals required a strong linkage with other policy domains pointed to a key role for those public bodies that have an overarching responsibility for their particular territories. Here discussion focused on city regions. On the one hand cities are sites of innovation in the information service revolution; on the other there is increasing evidence of a sharp intra-urban polarisation between information haves and have-nots, with certain parts of the city strongly linked to the global information society and others completely disconnected. At the same time city authorities are potentially major players in the information society through the application of ICTs within their own business processes, including electronic delivery of public services, and through their direct and indirect control over wayleaves.

The results of a survey of information society policies being pursued by 15 metropolitan authorities within Europe revealed a wide variety of responses to the threats and opportunities, ranging from a do-nothing stance, individual but uncoordinated policy initiatives, focused tele-service provision and physical incentive packages to attract inward investment. There are also emerging policy networks between cities like the association called Tele-cities which has 58 members and which seeks to share

experience between the members. There can be no doubt about the interest of local authorities in information society initiatives; for example the European Commission's 4th Framework RTD Programme on telematics in urban and rural areas and DGXVI's Regional Information Society Initiative are both heavily oversubscribed. This contrasts with a general lack of interest in the territorial dimension of the information society on the part of national governments.

The case studies of Manchester and Bologna/Emilga Romagna presented at the Workshop provided good examples of how local/regional authority initiatives might be able to pull through the social/institutional/political innovations necessary to realise the information society agenda. Given their responsibilities for the entire population living in their area, it is not surprising that cities and regions have adopted approaches which emphasise universal access and the public sphere -- tele-democracy as distinct from tele-aristocracy. Both cities are heavily engaged in initiatives like electronic village halls which rely on cheap and presently available technology like local telephone lines, modems and PCs. Public demonstration projects involving schools, libraries, the Health Service, the voluntary sector, consumer groups and trade unionists and which are close to end users have been designed to plug the applications gap which is currently holding back the information services revolution. This "development from below" and social experimentation is laying down knowledge and experience which can then be scaled up to produce a critical mass of user demand which will in time justify investment in electronic highways. The Manchester paper pointed out that "while it is important that superhighways are introduced, there needs to be just as much, if not more, attention given to the building of slip roads to the development of low cost, easy to use cars and public transport and to meet training needs through readily available and high quality driving lessons in order to support people in exploiting opportunities which the superhighways could offer".

Liberalisation, Communication Infrastructure and their Role in Territorial Development

Whilst the local authority perspective quite rightly emphasises demand for communication services and infrastructure, it is equally important that this demand can be met by the appropriate supply side response. The background paper highlighted the uneven geography of the communications infrastructure(s) within and between countries, an unevenness which was being heightened by technological change and liberalisation.

Within the European Union the contribution from the Commission noted that ICT developments have generally served to reinforce the advantage of the core countries and regions. For example although the number of main telephone lines in Portugal did increase by over 75 per cent between 1987 and 1992 the country still has the lowest telephone penetration of any EU member state at 27 users per 100 inhabitants. Ireland, Spain and Greece also had figures below the EU average. These differences between countries assume greater significance when variations within countries are considered. For example tele-density (lines per 100 inhabitants) in Lisbon, Madrid and Dublin is between twice and two-and-half times that found in the rest of these countries.

The introduction of competitive telecommunications in the UK has not reduced regional disparities in telecommunication services. In the City of London, customers have a choice of a multiplicity of suppliers. In the central areas of most other major cities there may be three suppliers -- BT, Mercury and the local Cable Company. In the suburbs of some large cities (but not deprived inner city areas) customers may have a choice between BT and a Cable Company. For the rest of the UK, BT is a de facto monopoly. There is also a distinctive regional pattern to competition with the spread and take up of cable telephony proceeding most rapidly in the south as compared to the north of England.

Discussion of the policy implications of such variations focused on questions of the territorial dimension to telecommunications regulation, and more specifically the need to revisit the universal service obligation (USO) imposed on telecommunications operators and the framework for re-balancing tariffs between profitable and less profitable sectors and geographical areas. While some attempts have been made (for example the EC STAR Programme and the Scottish Highlands and Islands ISDN Initiative) to bring forward the investment in new telecommunications infrastructure ahead of demand, the focus of policy is now on service provision. The imposition of USO raised three main questions; what services should be specified as available to all at a standard tariff (scope)?; how should the cost be calculated and by whom? (costs)? and how and from whom should the cost be raised (funding)?

These questions all have a strong territorial dimension to them. National policies generally use an area based approach to implement regulation, for example licences for new services can be for a particular region or require a service to be provided over a defined territory by a given date. However, with notable exceptions these regulatory requirements are not operated through local or regional authorities. The exception noted at the Workshop was Spain where the Autonomous Regions have a voice in the Spanish Telecommunications Advisory Council and the US where Public Utility Commissions have a role in telecommunication regulation. Otherwise this lack of engagement of local authorities with telecommunication policies in part reflects the highly specialised skills associated with this industry, skills not generally present in public bodies other than regulatory agencies. In general, local authorities lack the powers, resources and capacities to engage in the fast moving world of the global telecommunications industry. At the same time, most players in this industry have very little experience of mainstream issues in local economic and social development.

It was noted that the entry of local/regional public utilities into the telecommunications businesses in some areas, together with the granting of territorially based franchises to cable TV/telephone companies might provide the opportunity for a better linkage between telecommunications and development agendas. Local authority control of rights of access and their purchasing power as users also could give them some leverage. Local authorities could also play a role in monitoring license conditions laid down by national regulators. Nevertheless, from the experience of participants, there was little evidence that local and regional authorities were playing a significant role in shaping the evolution of telecommunications infrastructure in the member states.

The Integration of a Territorial Dimension within National and Global Infrastructure Policies and Programmes

Discussion in the final session identified two groups of factors which suggest that a territorial approach to the information society could be justified from national and global perspectives. First, if certain areas and social groups are excluded from the information society then nation states will not realise the cumulative benefits which arise from a network technology that could enable everyone to communicate with everyone else. Put another way, many of the social and organisational innovations that ICTs could make possible depend on all areas in the global economy and all social groups having access. The geographical diffusion of access to information based services is therefore a sine qua non of the information society.

A second group of reasons is that the regional perspective provides an arena, a laboratory and an observatory where the many facets of the transformation to an information society can be integrated, tested and monitored. For example a regional approach to technological development cannot fail to be user orientated; it must inevitably recognise users as people in places; they are individuals, the same whether the applications targetted at them are in the area of health, education, transport or employment. From a network provider perspective it is also clear that these users can share a common infrastructure. And from

the perspective of telecommunications regulations the territorial approach can identify where principles of open competition and universal service are falling short of their desired goals. In short, a territorial approach to the information society can provide a framework within which to address a wide range of public policy concerns -- such as access to employment, the prevention of social exclusion, the encouragement of technological innovation and the stimulation of competition in telecommunication services. The Workshop noted how this approach was beginning to take root within the programmes of the European Union. Following the lead established by the Commission's Community Initiative STAR (Special Telecommunication Action for Regions) and its successor, TELEMATIQUE, a greater proportion of the expenditure agreed with member states under the Structural Funds has been devoted to ICT related initiatives -- in the case of Spain it was estimated that this amounted to 5 per cent of the total allocation. To sustain the policy momentum, the Commission has just announced a Regional Information Society initiative which will facilitate the preparation of regional strategies and the launch of pilot projects in networks of regions with funding provided by the ERDF. European Union RTD programmes in the field of telematics application have also funded an initiative entitled "Tele-Regions" which will involve the development of new services across a network of regions. Both of these initiatives strongly resonate with the idea of the region as a laboratory for testing the information society agenda noted above. Last but not least, a major study of Economic and Social Cohesion in the Information Society has just been completed as an input to shaping EU telecommunication policy, particularly regarding the future shape of the universal service obligation.

The Commission clearly recognises that with respect to advanced services the USO does not necessarily lead to supplying every household or every SME. This position was based on its report on cohesion which is worth quoting at length:

"The original conception of universal service put forward by Theodore Vail before the First World War, conceived of the universality of the telephone more in the manner of the then extensive Western Union telegraphy system with widespread public access, not in the private realm of the home, but rather in the context of some public location (a shop, post office, library or other building open to the public). More recently, this conception has been resuscitated in the context of the US plans for a National Information Infrastructure through a proposal to ensure that advanced communications services be made accessible to, or at least of benefit to all, through their provision to every school, healthcare centre and library in America.

Such an approach with its focus on universality at the community, rather than the domestic, level would help to ensure wider diffusion of relatively advanced services, without incurring the prohibitive costs of providing "domestic" universal service since the local loop would not have to be installed. Further, such a community-based approach to universal services fits well with the basic concept of the information society. The latter has, since its inception, leant heavily on the idea of people as not simply consumers of information, but as involved in interactive educational, political and social activities, deepening their cultural life and invigorating democratic participation. In relation to advanced services to the home, on the other hand, the emphasis has almost entirely been on entertainment services and the pure consumption of information society goods: where interactivity comes in, it generally relates to gaining more immediate control over the type of consumption preferred. By contrast the community approach might be built into a longer-term strategy to encourage active and creative participation in the information society, linked to future employment possibilities, and from there be seen as a component of cohesion policy."

At a higher political level the discussion of universal service pointed to a possible analogy with the Single European Market programme. Here it has been recognised that increasing economic integration would inevitably bring short run costs to those regions of the EU with uncompetitive industries. To

compensate for these likely impacts, the Structural Funds have been significantly increased; indeed, the Maastricht Treaty established a new Cohesion Fund through which the more prosperous countries and regions cross-subsidise the least prosperous. Similar arguments could be applied to the information society and the European-wide information infrastructure. Here the issue was not so much one of universal service obligations as the transition from a cross-subsidy in telecommunication service provision within a single operator (such as a monopoly PTT) to a system of cross-subsidy between operators and furthermore applying this system on a trans-national basis. In short, ways would have to be found of funding currently uneconomic services in certain areas by a charge on more profitable operators in more dynamic areas.

While the European Commission was addressing such issues, it was far from clear that the challenge was being taken up by member states (with the possible exception of Sweden and Finland). Indeed, an over-riding impression of the Workshop discussion was that while supra-national bodies and local/regional authorities are actively addressing the territorial dimensions of the information society, national governments on the whole remain unaware/uninterested.

Conclusion

From the discussion and evidence presented to the Workshop the unequivocal answers to the question posed at the outset is that on the basis of current trends electronic highways are unlikely to fundamentally alter well established patterns of social and geographical differentiation. Whilst the potential to reduce geographical inequalities is considerable, the technology has no meaningful influence independent of the social and economic processes that are shaping access to it. Insofar as we live in a society with increasing polarisation, electronic highways are only supporting that tendency.

Having said this the ways in which access is shaped or configured is a matter of social and political choice. A social objective of more equal access to information in rural or inner city areas is a realisable objective. Telecommunications can be used to attract new jobs to hitherto inaccessible areas or facilitate SME's in these areas to access distant markets thereby increasing their competitiveness and employment. Doctors and teachers wherever they are, now have the means to access world-wide knowledge as they undertake their work, thereby raising health and educational standards everywhere.

Whatever the outcome it is clear that electronic highways can bring both threats and opportunities: threats that already backward areas and disadvantaged groups will lag further behind as the more advantaged structure electronic systems to reinforce their position; and opportunities for imaginative development programmes which `accelerate network extensions and service applications in lagging areas, and for re-regulation of telecommunication services to redefine principles of universal service. Local and national action and new partnerships between the public and the private sector are required if the opportunities are to be seized before it is too late.

DRAFT AGENDA

Tuesday, 7 November 1995

Chairperson: Anne-Margrete Wachtmeister, Swedish Government IT Commission, Sweden, and European Commission

Rapporteur: John Goddard, Director, CURDS, Newcastle, UK

1. INTRODUCTION

Welcome and Introductory Remarks (10:00 - 10:15)

Anne-Margrete Wachtmeister Chairperson

Ariel Alexandre Head of the Urban Affairs Division, OECD

John Dryden Head of the STCP Division, OECD

Information Infrastructures and Territorial Development - Key Issues (10:00 - 11:15)

This session set the framework for the seminar by illustrating the significance of the use of network-based technologies by firms, people and institutions, and the nature of the policy responses and initiatives which can be applied to enhance territorial development processes. A background paper "Information Infrastructure and Territorial Development" [COM/DSTI/DT(95)109] was prepared by Andrew Gillespie, Ranald Richardson and James Cornford, of CURDS, UK.

Andrew Gillespie Executive Director, CURDS, Newcastle, UK

Ake Andersson Director, Swedish Institute for Future Studies, Stockholm, Sweden

2. PROBLEMS AND OPPORTUNITIES

Information Infrastructures, Locational Flexibility, and Territorial Competitiveness (11:15 - 12:30)

Availability of Information Infrastructures is becoming an increasingly important factor in defining locational choices. This session examined how firms are reorganising their internal and external links and what influences these changes may have on competitiveness across territories.

Themes: SMEs, inward investments, corporate restructuring, organisational changes, supplier/customer relationship, globalisation processes, knowledge-based firms, etc.

Claudio Ciborra	Professor, University of Bologna, Italy, and Theseus Institute ("Firm, Knowledge and Issues of Spatial Distribution")
Anita Rozenholc	DATAR, Paris, France ("New Forms of Production, Employment and Land Use")
Michel Frybourg	Professor, President of the ENOES, Paris, France ("Opportunities for Peripheral Areas: The Case of Tourism")
Takeshi Tanaka	Director of the TELETOPIA Project Office, Regional Communications Development Division, Communication Policy Bureau, Ministry of Posts and Telecommunications, Tokyo, Japan

Lunch (12:30 --14:30)

Use of Information Infrastructures and Effects on Employment Distribution (14:30 - 16:15)

This session, on the basis of current experiences, discussed to what extent Information Infrastructures may facilitate the utilisation of place-bound assets, and especially labour, and provide opportunities for peripheral regions.

Themes: Teleworking, delocalisation of functions, telecottages, skills, etc.

Ursula Huws	Analytica, Social and Economic Research, London, UK ("ICT's, Employment Opportunities and Territories: An Overview")
David Henderson	Highlands & Islands Enterprise, Inverness, UK ("Tele-based Employment in the Highlands & Islands of Scotland")
Gun-Britt Hansen	Head of Department, NUTEK, Stockholm, Sweden ("ICT, the Tool and Opportunity for the Labour Market of Tomorrow. Distance Bridging Activities give New Conditions for Employment and Regional Development")
Dimitra Katochianou	Head, Center Planning and Economic Research, Athens, Greece ("Technologie des télécommunications et de développement pour les régions les moins favorisées de la Grèce")
Akihiro Sawa	Deputy Director-General, Department of Commerce, Industry and Labour, Miyagi Prefectural Government, Japan (Use of ICTs and Information Infrastructures and effects on Regional Employment - The Miyagi Case)

Break (16:15 - 16:40)

Liberalisation, Communication Infrastructures and their Role in Territorial Development (16:40 - 18:00)

The aim of this session was to examine, in the context of liberalised environments, evidence relating to the role of information and communications infrastructures in territorial economic development processes and the emergence of territorially-differentiated supply in different OECD countries.

Gérard Pogorel	Professor, Ecole Nationale Supérieure des Télécommunications, Paris, France, ("Factors influencing the Territorial Impact of Cross-border Communications: Technical Alternatives and Policy Initiatives")
Jose Cotta Antunes	Head of Unit, DG XIII, European Commission, Brussels, Belgium
Anu Lamberg	Ministry of Transport and Communications (Information Infrastructure Strategy Group), Finland
Ricardo Gaitan	FUNDESCO, Madrid, Spain ("White Paper in Spain as strategic action plan for ICT applications in regional development")

Cocktail (18:15)

Wednesday, 8 November 1995

Chairperson: Anne-Margrete Wachtmeister, Swedish Government IT Commission, Sweden

Rapporteur: John Goddard, Director, CURDS, Newcastle, UK

3. POLICY IMPLICATIONS

Information Infrastructures and Territorial Governance (9:30 - 10:40)

The effects of Information Infrastructures on the organisation of territories is far from clear. This session examined the balance between centralising and decentralising effects of Information Infrastructures' use and their likely implications for territorial governance.

Themes: Urban and rural policies, regional policies, land-use planning, transportation, urban governance

Thierry Bruhat	Expert auprès de la DATAR et de la CEE, TBC, Paris, France ("ICTs and Territorial Development: The Case of Public Policies Supporting Innovation")
Richard Ebbs	CEO, Stratagem, Melbourne, Australia
Daniel Bollo	Senior Researcher, INRETS, Arcueil, France ("Freight Platforms and Cargo Community Systems -- The Role of Advanced Specialised Telecommunications Networks")
Jeremy Millard	Managing Consultant, Teledanmark Consult, Viby J., Denmark ("The Policy Implications of ICTs for Rural Development")

Break (10:40 - 11:00)

The Role of Regional and Local Governments in the Realisation of the Information Society (11:00 - 12:30)

The session examined the role sub-national government tiers may play in shaping existing national and supra-national information society policies and, drawing on examples from different countries, identified ways in which territorial interest and competencies can be most effectively harnessed within information society strategies.

Themes: Development of local demand, training, education, innovative financial mechanisms, monitoring access, supports to SMEs, etc.

Christopher Pannetier	URBA 2000, Lille, France ("Strategic Scenarios for Local Authorities to Develop ICT Services")
Dave Carter	Manchester City Council, UK ("Cities as Engines of Regional Economies -- The Role of ICTs in Supporting Economic Regeneration and Urban Development")
Leda Guidi	Telematic and Communication Department, City of Bologna, Italy ("The Iperbole -- Internet Project: The Case of Bologna")
Annaflavia Bianchi	ASTER, Emilia-Romagna Region, Italy ("Telecommunications Policy at the Regional Level: The Case of Emilia-Romagna")
Busso Grabow	German Institute for Urban Affairs, Berlin, Germany ("Local Information and Communication Policies in Germany")

Lunch (12:30 - 14:30)

How can a Territorial Dimension be integrated into National and Global Information Infrastructure Policies and Programmes? (14:30 - 16:30)

The aim of this session was to identify a range of policy directions and related tools which can be taken into consideration at the international and national level in order to prevent undesirable developments and to attain given economic, social and environmental objectives.

Themes: Policy integration, fairness, universal access, evolution of ICTs, regulation, licensing, ...

Jean Charles Leygues	Director, DGXVI.A, European Commission, Brussels, Belgium
Myrna Smitt	Head of Section, Ministry of Labour, Stockholm, Sweden ("ICT and Regional Development. Tele-infrastructures and Technique for establishing good living conditions in different parts of Sweden. The Government Role in this Process")
Paul Hoffert	Director, CulTech, York, Canada
Pierre-René Lemas	Adjoint au délégué de la DATAR, Paris, France
John Goddard	Director, CURDS, Newcastle, UK, Workshop Rapporteur

Closing remarks by the Chairman (16:30 - 16:45)

SUMMARIES AND OUTLINES PROVIDED BY SPEAKERS

TELECOMMUNICATIONS POLICY AT THE REGIONAL LEVEL: THE CASE OF EMILIA-ROMAGNA

Annaflavia Bianchi, ASTER, Bologna, Italy

The analysis of the potential and of the problems of the telecommunications sector brings us to consider the impact of telecommunications on the ways in which the activity at the firm level and in the economic system is carried on, as well as the institutional framework devoted to define the characteristics of the telecommunications sector, and the consequent domain of action for a relatively new potential actor in this field: the Regional Government.

The opportunities to communicate and to organise the economic activity raised up by the new telecommunications services can decrease the upward and downward management costs of the firm -- in their relations with providers, other firms, institutions and the market; on the other hand, they may change the power of one firm *vis à vis* the other ones. The capacity to adopt telecommunications technology differs from firm to firm and at the regional and national level. In fact, in order to exploit the new opportunities some conditions are needed. The main ones are: quality and diffusion of networks and services, accessibility to them both on the basis of technical and economic aspects, consciousness of potential and the ability to design and plan the adequate applications, the context in which the potential user is acting as regards rules, information diffusion, technique and design services, etc.

Given similar networks and service conditions, the ability to use and adopt telecommunications tools by firms differs because of the mentioned aspects and of the structure, size and activity of the firm.

More appropriate applications could result from: the interaction between providers and users, the capability to indicate and make clear the communications needs by firms, the characteristics of the industrial aggregates which condition the evolution dynamics and the geographical diffusion of telecommunications.

Given the complexity of this field and its growing potential in the telecommunications system -- made up by various actors taking part in its definition -- the existence of mechanisms devoted to facilitate the match between the imprecision of the demand side and the capability to respond of the supply side is crucial.

The strong de-regulation and re-regulation dynamics that occurred in the telecommunications field during the last years have been influenced mainly by the supply side actors, besides regulation institutions and some large users. The technological level already available is high, there is a vast supply of equipment, networks and services, but on the other side it does not always respond to demand needs. The actors involved, apart from the users, frequently tend to cover a hegemonic position either pretending to generalise their choices or threatening companies acting in contiguous fields.

This behaviour can be considered as a less useful alternative to the desirable interaction between companies acting in contiguous fields, which confines synergies and co-operation within the boundaries of the company pretending to be hegemonic.

It seems thus to be useful to focus more on the users' sphere, on their typologies and needs. This means not only the evaluation of the potential users of a predetermined product, but also the redefinition of the supply on the basis of the interpretation and the qualification of demand.

An active role in this direction can be played by local authorities mainly at the regional level, in order to facilitate the access of less favourite firms and areas to the new telecommunications services. They, in fact, besides their potential influence as large telecommunications users are the institutional economic and territorial planners at the local level, they can aggregate expanding demand, they can give a start to educational programmes and promote new services.

In this field the Regional Government can play different roles, which can be combined. These are mainly:

A set of **roles and functions** are gathered within regional and local authorities, with respect to information and communications technologies (ICTs) and information society (IS):

- these bodies are first of all potentially **large users of ICTs**: this aspect represents an opportunity for them, on the one hand, to accumulate experience which can then be transferred to other potential users of ICT and, on the other hand, to have a bargaining power with the network and services providers;

- they are in charge of **territorial planning** and of the provision of a set of social services and they take part in the definition of industrial policy actions; this gives them the opportunity to take part actively in the definition of the rules for the telecommunications sector, with the major aim of providing some guarantee of consistency between the interlaced development plans of infrastructures, settlements, service provision industrial policy, etc.;

- they can act as gatherers and **representatives of distinct interests for shared aims**, i.e. they can to a certain extent act from a neutral position and can induce a convergence around some projects and initiatives between usually conflicting or not related economic and institutional actors, both on the demand side and in the interaction between demand and supply;

- among their institutional functions there could also be one of **promoting and/or financially supporting *ad hoc* actions** devoted to enhance the use of ICT and disseminate a culture of IS.

Although Regions have not direct attribution in the telecommunications field, they started defining their own telecommunications policy at a regional level.

The policy characteristics result from the economic and territorial political priorities of the Regional Government, from the approach chosen in the regional policy, from the action field which is considered more adequate for the region, from the role the Regional Government considers the more effective in order to influence the regional telecommunications development.

Along these lines, the main actions put in place by the Emilia-Romagna regional government and by ASTER, the regional agency for technological transfer, are presented, both in terms of policies and strategies and of projects and applications.

Emilia-Romagna Regional Government aims as regards ICT

Development and integration of services and functions with **Public Administration**:

- enhance quality of services,
- new services creation,
- efficiency and effectiveness.

Services to the **economic system** (through ASTER, CITER, QUASCO, the whole ERVET System):

- information services (patents, info on markets, laws and technical standards),
- EDI applications,
- European research programmes and directives,
- quality control,
- telework,
- co-operation between firms and partnerships.

FREIGHT PLATFORMS AND CARGO COMMUNITY SYSTEMS (CCSS)
THE ROLE OF ADVANCED SPECIALISED TELECOMMUNICATIONS SYSTEMS

by Daniel Bollo, INRETS, Arcueil, France

Transport infrastructure has always been a major factor in territorial development. The increased importance of the information sector raises the question of whether information infrastructure will play a similar role, but in this case the answers are not as readily obvious.

The transport and information sectors have a lot in common, but there are significant differences between the respective economic and institutional contexts in which each is developing. It is these differences that we shall be examining briefly, in order to shed some light on the topic of cargo community systems (CCSs). Only the freight side of the transport sector will be dealt with here.

Transport requires proper communications: the speed and reliability of transmissions are crucial factors in managing the logistical flows of the 1990s. Apart from making use of public networks, the transport sector has set up entirely new types of infrastructure to provide better solutions for specific needs. Among them, the most widely known is the teleport or, more precisely, the cargo community system (CCS).

Since the transport sector is especially representative of service activities, at least in terms of the number of jobs, it might be useful to look at the example of CCSs for ideas that could be applicable to other service sectors as well.

1. Putting transport and telecommunications in context

Ports and airports play a self-evident role in territorial development. The physical impact of these facilities is such that their development, unlike that of information infrastructure, is closely controlled by the authorities. In contrast, the operation of ports and airports is shared with other parties, primarily from the private sector. This dichotomy poses a number of problems, in particular with respect to the attractiveness of such platforms. From this standpoint, it needs to be borne in mind that Europe also has private airports and ports, which have greater latitude in their choice of suitable telecommunications systems.

The inland sector presents much greater contrasts: roads and canals are public, but most of the road haulage platforms and facilities for combined transport are privately owned. While the private sector could also be given control over road management through the award of concessions, this would have little impact on freight since the infrastructure is shared by a large number of users. Road haulage platforms are hard to analyse, since they have more to do with logistics than with transport itself and they are often governed by purely industrial considerations.

Logistical activity, in the strict sense, has been almost completely deregulated in most OECD countries for the past ten or twenty years. Even though the sector is a traditional one, its efficiency has

increased significantly: goods are being shipped around the world faster and faster, while unit costs have been falling continuously.

2. Community systems and value-added networks

The (international) logistics chain usually comprises a large number of links -- shippers, forwarding agents, consignor, agents, carriers, addressees, etc. -- who exchange information as fast as they do freight. But the means they use to communicate differ significantly, depending on where they are located in the chain:

- Full-service operators manage their own sophisticated means of voice-data telecommunication.

- Road hauliers generally make use only of the conventional telecommunications network (i.e. the same one used by the general public) consisting of telephone and fax.

Teleports, or cargo community systems (CCSs), can be seen as a bridge between these two levels of service and, more specifically, as a way to facilitate the work of SMEs in the freight industry. In addition, the systems are closely connected with the platforms, which thus turns CCSs into regional information systems. They consist of a uniform set of specialised facilities for the processing of information and its transmission between the various parties involved in a freight platform. The facilities are designed to expedite the flow of goods, and customs clearance in particular (facilitation of trade). Customs aspects play a major role in most CCSs.

Global value-added networks are used by major logistics operators to communicate with remote, low-volume destinations for which special facilities would not be cost-effective, as well as by small shipping agents to establish connections with carriers or with their counterparts at other platforms. Such networks also provide support for such typical transport functions as goods tracking and tracing.

Cargo community systems are always presented by their promoters as offering an important competitive advantage because they can expedite the flow of goods through a platform and, indirectly, because they provide a guarantee that a local platform is up-to-date. As a matter of fact, all of the major European platforms, maritime and air alike, possess such infrastructure. Examples outside Europe are scarce, with the notable exception of Singapore; nevertheless, CCSs are rapidly spreading in South East Asia.

Close scrutiny of the actual state of these specialised information-processing facilities shows that the reality is fairly far removed from the goal initially proclaimed by the promoters, and that the level of activity of CCSs still falls far short of what might have been expected. While the situation differs significantly from one platform to the next, the use that is made of them quite closely reflects each party's position in the transport chain:

- Intermediaries (forwarding agents, agents, lightermen, etc.) readily employ the facilities, primarily to communicate with customs authorities and their opposite numbers, but as a rule CCSs remain complementary.

- Major carriers (shipowners and airlines) use them only rarely, mainly in connection with customs clearance.

The relative failure of these systems may be briefly analysed as follows:

- Small operators perceive them as too expensive.
- There is no (or very little) software tailored to these servers for forwarding agents' PCs.
- Major operators long familiar with information systems prefer direct hook-ups, with customs authorities in particular.
- Financially, the breakeven point has hardly ever been reached, and the volume of business has been virtually flat.

One example that is frequently cited to counter this rather discouraging assessment is the CCS in Singapore which is truly flourishing, at least in terms of affording port activities a competitive advantage. There are very specific reasons for this, but it is unlikely that these reasons could be replicated in Europe to any significant extent:

- Making use of the CCS is mandatory for local operators and a virtual necessity for others.
- A special effort has been made to provide good service for SMEs.
- Dedicated PC middleware has been designed for use with the system.
- Astute pricing has been conducive to widespread use.

3. An intermediate-level model for the development of information technologies

Here, for the sake of illustration only, CCSs can be examined as a case study on the issue of regional services, as a link in a chain that fosters the development of services and thus of local employment. In Figure 9, we show operators in the logistics chain alongside the information technology they utilise. The illustration is based on platforms and highlights geographical levels of information processing.

In this manner we have tried to underscore the essential role of the intermediate level (middlemen and middleware) in tailoring high-powered information processing systems to use by local operators -- a task that must factor in varying levels of competence and such unavoidable particularities as language.

Globalisation of the economy goes hand in hand with the existence of multinational corporations having highly specialised capabilities. End clients, i.e. clients at the local level, do not necessarily wish to deal with such monolithic entities, either for lack of adequate information or because of cultural differences. The intermediaries' role is to adapt available information to the needs of each link in the chain.

The few studies that have been made of intermediation all draw attention to the important role played by specialised information processing in many sectors of the economy. The role of this activity is all the more important in that it will become a major source of employment, provided that the requisite, specially adapted technical facilities are available.

In Figure 10, we have tried to highlight the series of factors, and particularly those connected with information infrastructure, that are conducive to local intermediation. First, the transport sector would not appear to have any problems with telecommunications infrastructure. As a rule, service

activities require only the most basic of systems. Even multimedia requirements can be satisfied by the humble, ubiquitous fax machine; for example, it is now standard practice for ship loading plans -- in the transport sector -- and building plans -- in the construction industry -- to be sent over ordinary telephone lines by fax.

Nevertheless, the fact that middleware has not yet been sufficiently developed still poses a problem. For business enterprises, it is plain to see that office software can be used anywhere, but management functions still require dedicated software produced by a host of small service firms in the 1-10 employee category. Without middleware, the benefits are all but unavailable to local businesses. Such middleware is made accessible through the existence of regional service centres such as CCSs.

4. Conclusion

Successful businesses in the transport sector use extensive and highly inter-linked information systems. Such firms are increasingly turning to local subcontractors, especially when the chain of information is unbroken. It would appear worthwhile to encourage the development of local and regional information systems, based on specific capabilities by economic sector, and on clearly identified concepts of intermediation.

ICTs AND TERRITORIAL DEVELOPMENT: THE CASE OF PUBLIC POLICIES SUPPORTING INNOVATION

by Thierry Bruhat, TBC, Paris, France

Today, the question uppermost in policymakers' minds is how the potential of information and communication technologies (ICTs) might be harnessed to foster territorial development. Based on an analysis of innovation policies already in place or currently emerging in France, we should like to propose three methods for doing so.

1. The role of information in the innovation process

The processes of innovation in a given territory, whether it applies to the creation of innovative businesses, technology transfers or innovatory activity by existing firms, generally stem from and develop out of an association of ideas and projects involving a variety of techniques and functions. In such contexts of innovation, before information can circulate it must first be created. Within a territory, innovation obliges the authorities to look beyond mere flows of information between establishments and to take account of the dynamic of the interactive processes in which innovation and information are created. This distinction is vital if ICTs are to be harnessed to support innovation.

2. Territories as interactive systems for innovation

As R. Chabbal has shown (in "Charactéristiques des politiques d'innovation", p. 8, forthcoming in STI), policy effectiveness stems from the existence of a "system of innovation" -- a cross-roads of interaction and learning processes in which the demands of businesses are matched with the know-how and funding that are needed to develop innovative projects. But in order to be effective, these cross-roads must fit in with the dynamic of local territories -- territories seen not as a substratum of economic action, but as a "factor for organising and elevating ability" (P. Veltz, M. Savy, Les nouveaux espaces de l'entreprise, DATAR/Éditions de l'Aube, p. 64). Networks, both formal and informal, as well as fora for cross-fertilisation -- business nurseries, technology transfer centres, technology parks, technopolises, etc. -- are the spatial manifestations of these systems of innovation. Consequently, it is the informational conditions of the interaction that determine the nature and the workings of the information and communication systems likely to sustain local systems of innovation. Here, it would be patently insufficient merely to establish a link-up between existing sources of information.

3. Government as mediator

In connection with innovation policy for a local territory, a representative of government acting as a partner may be asked to occupy a particular position and make possible a given function. This government partner may occupy a position as mediator between existing producers of information

(documentation, research or service centres, etc.) and the "clients" involved in innovation processes. These clients may be businesses or researchers, or they may be cross-roads of interaction. Additionally, the government partner can function as a catalyst by matching the supply of information with demand, either by engineering a specific project (e.g. that of ADISTE in Nantes), or by making use of cross-roads of interaction bringing together public and private partners from which such engineering can develop. In our view, these conditions must be present if demand for information is to emerge and if services tailored to meet that demand are to be developed. Insofar as neither demand nor supply exists initially (in either the public domain or the market) and both have to be manufactured, the government partner must intervene in a local territory at the pre-institutional and pre-competitive phase.

In conclusion, we feel that the following three conditions facilitate the application of ICTs in connection with innovation policies for territorial development. First, the authorities should attend to the conditions in which information is created, within the context of interactive and local dynamics, before turning to how information is spread; second, the content and workings of ICTs should be defined on the basis of local systems of innovation, and not the other way around; third, the intervention of a government partner at the pre-competitive stage can facilitate the emergence of demand and help match that demand with an appropriate supply of information and communication services.

CITIES AS ENGINES OF REGIONAL ECONOMIES: THE ROLE OF INFORMATION AND COMMUNICATIONS TECHNOLOGIES IN SUPPORTING ECONOMIC REGENERATION AND URBAN DEVELOPMENT

Dave Carter, Manchester City Council, Manchester, UK

This discussion paper outlines the strategic importance of exploiting the opportunities offered to cities by new information and communications technologies (ICTs or “telematics”) to support economic regeneration and urban development. It aims to identify ways in which the applications and services being developed using advanced ICTs/telematics should be made more accessible at the local level in urban areas, both to businesses and the wider community. It highlights the potential for new approaches to teleworking which will enable the benefits of the development of the 'information society' to be maximised at a local level.

1. The impact of the information superhighway in the urban context

New information and communications technologies are playing an increasingly important role, as a key growth sector, in the regeneration of urban economies. This sector is providing the dynamic for the emerging "information economy", or "information society", where multimedia based teleservices (services utilising the integration of sound, text and image) and teleworking represent a major economic change comparable to a new industrial revolution.

Certain cities are well placed to capitalise on this both through having, or gaining, experience and expertise in using these technologies and by having a concentration of existing telematics projects which provides a base for the development of a 'critical mass' in the future. The priority, especially for city councils, is to ensure that these technologies become a means for generating economic growth, employment and an enhanced quality of life through the provision of local access to the facilities and services available on the developing 'information superhighway'.

In terms of urban policy making this is partly a response to the trends identified in both the European Commission's White Paper, "Growth, Competitiveness, Employment", and in the Bangemann Report, "Europe and the global information society", where success in urban regeneration is increasingly linked to the availability of and easy access to appropriate telematics infrastructures and the associated skill levels in the local population. It also reflects recent changes in emphasis in policy making at both national and international levels, especially within the European Union (EU), in relation to strategies for economic regeneration and urban development. There is a move away from economic growth as an end in itself towards employment generation and quality of life issues associated with economic growth. These ideas are influencing the current policy debates about the concept of the 'information society' and how it can best be used in support of wider strategic aims and objectives for economic and social development.

The main scenario being debated is essentially an optimistic one where the information superhighway will be able to support a wide range of new services which will empower citizens and provide for their full participation in an emerging “digital democracy”. There is a serious danger, however, that this ignores the realities of power which support an “information aristocracy” rather than a “digital democracy”. If citizens are not able to have access to the new telematics infrastructures and services, the outcome will simply reinforce existing patterns of inequalities with 'information haves and have nots' in our communities.

At the same time, the development of new services and applications which take advantage of upgraded and enhanced infrastructures is currently dominated by the multinational corporate sector -- either as suppliers or users -- leading to a pattern of “development from above”. If the new infrastructures are to benefit a much wider spectrum of people than is currently the case, there is a need for public support at the local level to support 'development from below' in applications and services.

One of the main constraints on the current development of advanced communications services is the lack of new applications which can generate enough demand to reach a critical mass of users. To extend the “electronic highways” metaphor, while it is important that the 'superhighways' are constructed, there needs to be just as much, if not more, attention given to the building of “slip-roads”, to the development of low-cost, easy to use 'cars' and 'public transport' and to meeting training needs through readily available and high quality “driving lessons” in order to support people in exploiting the opportunities which the “superhighway” should offer.

There is, then, a distinct 'applications gap' at the level of the local citizen. The most effective way of bridging this gap is by experimentation, through field trials and demonstrator projects, working closely with the final users at the local level. Such initiatives could provide a wide range of insights which can be usefully drawn upon by others in developing alternative systems, geared to different local needs in different places. Local experimentation therefore becomes part of city-wide 'learning networks' whereby the insight gained in one environment can be transferred with suitable adjustments to another. If these 'learning-networks' can link up -- regionally, nationally and internationally (especially at the European level) -- then there is the basis for a potentially powerful counter-balance to vested interests, in terms of corporate and state authority, which can be pro-active in taking an advocacy role in relation to consumer, citizen and wider democratic interests.

Developments in advanced communications need to be accompanied by a strategy for development from below which seeks to realise the indigenous potential of cities and regions. Social innovation in the community -- involving local government, schools and colleges, public libraries, the voluntary sector, consumer groups and the trade unions is a necessary counterpart to organisational innovation led by industry, commerce and government departments.

A key principle here is the concept of universal access to telematics services. If there are to be benefits to be gained from the development of the information economy with positive effects on employment distribution, e.g. through teleworking, and the ability to use such services in fully interactive ways, then everyone -- regardless of whether they personally have a phone, a TV or a computer (or the money to buy one) -- must have the right to access these facilities as a public service. The best way of providing such public services will vary enormously from area to area, region to region and country to country. There are, however, some good examples emerging from some of the cities which are developing work in this area, e.g. Amsterdam, Bologna and Manchester, based on the following priorities:

- developing community access centres -- sometimes called local telecentres or electronic village halls; providing the facilities, together with training, advice and support, for local people and organisations to access the 'superhighway' and, in many cases, to develop teleworking opportunities; on the basis of people working in social settings, e.g. a neighbourhood telework centre, rather than at home;

- setting up teledemocracy pilot projects; establishing e-mail and bulletin board communications with decision-makers, e.g. councillors, MPs and MEPs, and running trials of on-line conferencing and consultation projects based on access through community facilities (e.g. access centres, libraries, schools, CABx, etc.) as well as with individuals with the capacity to do this;

- demonstration projects on using the information potential of the community; ensuring that local organisations and people can put information into the system just as easily as they can take it out and that key organisations, such as local authorities, TECs, Health Trusts, Business Links etc., are fully committed to publishing public information on the “Net” as part of a commitment to public accountability.

These ideas are based not only on assessments of the likely impact of these technologies on the urban environment but also on analyses of the likely role of cities in the future. This includes a critique of what might be termed the "utopian school" of future "cyber-lifestyles" which (Bill Gates of Microsoft included) sees cities becoming depopulated, "instant electronic democracy" replacing the need for governmental structures and services and a predominantly "ruralist" lifestyle emerging, at least for a dominant "majority" of the population.

An alternative view is being put forward by networks of cities, such as the Telecities initiative which currently links together 58 cities across Europe, the central themes of which include:

- cities becoming more, rather than less, active as centres of creative activity and sustainable economic, social and cultural growth;

- setting up facilities to provide access to the information superhighway, e.g. access centres, information networks, teleworking centres, within cities, in order to encourage people to continue to use the city but in more flexible ways;

- decentralising workplaces and services within the city rather than transferring facilities out of the city;

- supporting greater flexibility for people working and/or living in the city through extending opening hours of all services, including promoting the evening economy and the idea of the 24-hour city, more residential housing in city centres, improved childcare facilities and better, more-integrated public transport.

2. Telematics and urban regeneration: a case study of Manchester

Manchester City Council, together with organisations with which it is involved through local partnerships, has had a policy commitment to supporting work in this area since 1989. Historically Manchester has had, and retains today, a high concentration of technological expertise in computing and related information technologies, particularly within the local universities, e.g. the invention of the modern computer at Manchester University in 1948 (NB. there are plans to celebrate this with a

50th anniversary international "Festival of the Universal Machine" in 1998). This enabled Manchester to become a centre of excellence in many aspects of the development and use of these technologies and to build up a strong image as such which, in turn, is used to promote the city.

This is only the first stage, however, as the shift in policy making outlined above requires the development of new applications and services which directly support employment generation, new training opportunities and social and cultural initiatives. Manchester City Council recognised this in its Economic Development Strategy produced in 1991, where the development of ICTs/telematics was established as a core strategic objective for all future work. In the same year Manchester launched the UK's first public-access computer communications and information system, the Manchester Host, providing electronic mail (with Internet and X400 messaging), bulletin boards and on-line databases as a public service.

Subsequently Manchester City Council has worked in partnership with Manchester Metropolitan University, the other universities and colleges in the city, a network of some 20 voluntary sector organisations and other agencies (including the Chamber of Commerce) to develop new telematics applications and services to support the idea of "Manchester -- The Information City". The emphasis is to establish pilot and demonstration projects that provide practical services for real users, ensuring that these are based on a proper analysis of user needs and local research. This is backed up by a commitment to the involvement of users, and potential users, at all stages of project development, including initial planning, implementation, validation in real-life environments and the dissemination of results and “good practice” guidelines.

It is this commitment and the development of strong partnerships with the educational, private and voluntary sectors which has enabled Manchester to ensure the sustainability of being a centre of excellence for these technologies. The challenge now is to maintain this role in the face of the rapid acceleration of technological change and the increasing priority that these issues have at national and international level. One result of all of this which must be taken very seriously is that the resources available for economic development, and certain aspects of social and cultural development, particularly at national and European level, will increasingly be associated with telematics and the implementation of the “information society” (as outlined in the Bangemann Report). In order to be able to take advantage of these opportunities cities need to be able to demonstrate a strong track-record in terms of the development and implementation of telematics related applications and services which reflect user needs rather than technological requirements.

It is important to stress, however, that it is not the telematics per se which creates employment and economic growth but the context within which these technologies are developed and implemented. This means that maximum support is given to the concept of universal access to telematics -- that is, all people in the Manchester area (whether from community based facilities, from home, from a school or college or from an office) should be able to access telematics resources and services on a low-cost and effective basis for a variety of applications ranging from education and training, business, public information, arts and culture, entertainment, healthcare or environmental services. Equally specific projects must be developed to ensure a direct benefit to the local economy from enhanced applications of telematics. Manchester's commitment has been to build up as strongly as possible a culture of awareness and use of telematics, especially basic services, by as wide a cross-section of society. Only then can we be confident that people and organisations will start to use the more advanced applications of telematics as they become available.

This commitment has led to the establishment of the Manchester Telematics and Teleworking Partnership (MTTP) in 1995. This is a partnership between Manchester City Council, Manchester Metropolitan University, the local business community, local voluntary sector and other community based organisations and a number of individuals and small companies working in the multimedia sector. The Partnership aims to develop local pilot and demonstration projects which will "showcase" advanced telematics based services and to use these to stimulate the development of the local "information superhighway".

The priorities for the Manchester Telematics and Teleworking Partnership are:

a) to enhance the telematics infrastructure of the city to enable greater multimedia capabilities and to maximise access to the information superhighway and related interactive information services;

b) to support the development of new economic activity, particularly through greater use of electronic trading networks and teleworking, with networking at both regional and inter-regional levels;

c) to use both the enhanced infrastructure and the results of pilot and demonstration projects to promote the use of advanced telematics to support growth and innovation in other sectors, including training, cultural industries, healthcare and transport.

The main focus of this work is to develop a network of local telematics access centres around the city which will give local people and organisations direct access to the information superhighway, provide training, advice and technical support and develop new employment opportunities through support for teleworking and electronic trading networks. The initial proposal is to develop 12 local centres, linked to a new Multimedia Centre at the Manchester Metropolitan University (MMU).

Four of the 12 proposed Access Centres will be based on upgrading the facilities at the four existing Telematics Access Centres, known as Electronic Village Halls (EVHs), while eight will be new facilities. The project will also upgrade the Manchester Host computer communications and information system to full multimedia capabilities providing Manchester with a "digital city" system closely linked with the systems developed by Amsterdam and Bologna.

The network aims to:

a) expand the existing centres which will provide a city-wide service with initiatives supporting work in the City Pride area, Greater Manchester and the North West region, e.g.:

- the Telematics and Teleworking Centre at the Metropolitan University;
- the Women's Electronic Village Hall and Telework Centre;
- Bangladesh House Telematics and Telework Centre;

b) expand the existing centres providing targeted geographical support in key inner city areas, e.g.:

- Chorlton Workshop Telematics Access Centre (which covers the south of the inner city area);

- East Manchester Electronic Village Hall;

c) develop new centres with a wide area focus, e.g.:

- a network in the city centre to support teleworking and the cultural industries based on four or five new sites;

- a Disabled Peoples Electronic Village Hall and Telework Centre based within the inner city;

d) develop new centres with a targeted geographical coverage. Currently discussions are taking place about the development of telematics access and teleworking centres covering both inner-city districts ('wards') and more peripheral 'outer-city' areas.

The Manchester Partnership has also been working with a number of cultural organisations, individuals and small businesses in the media and cultural sectors to exploit opportunities for the growth and development of this sector through the use of advanced telematics applications and services. The market situation in the Manchester area is a dynamic one in which an increasing number of businesses and other organisations are beginning to exploit opportunities for growth and economic development through the use of innovative telematics applications and services. The Manchester Partnership focuses on two key areas within that process, i.e. the role of micro- and small businesses and of the cultural industries sector. The arts and cultural sector in particular in Manchester plays an increasingly significant economic role, employing tens of thousands of people and having a turnover of hundreds of millions of pounds although there is still a lot of scope for their potential to be developed further. Linked to this is the increasing significance of tourism and the potential for multimedia telematics applications and services to exploit the inter-relationship between tourism and cultural industries.

The Manchester Partnership aims to exploit this potential both at a regional and inter-regional (European) level by demonstrating the transferability of local responses to these market demands throughout the UK and the EU. The aim here is to ensure that market developments enhance the opportunities for employment for people rather than undermine them. As the market is European-wide, and increasingly becoming global, then responses must be national and European-wide. Action at a local level in isolation is insufficient to respond to this market situation, which is why the Manchester Partnership aims to respond proactively to market developments through collaborative projects with other key players across Europe through networks such as Telecities and the EU Inter-Regional Information Society Initiative (IRISI).

This includes:

- providing support for new initiatives in the media and cultural sectors;

- promoting networking and collective initiatives within these sectors;

- encouraging the development of activities which use, develop and promote multimedia telematics applications and services.

The objective is to use telematics applications in order to develop opportunities for training and employment in European cities based on the expansion of cultural industries through:

I. the development of local and regional cultural heritage and the encouragement of its wider use;

II. enhancing the sense of place and urban culture;

III. promoting wider participation in cultural activities;

IV. encouraging long-term growth and employment opportunities, especially teleworking, through a co-ordinated strategy for developing and promoting cultural industries;

V. promoting economic growth through more effective networking and collaboration within the cultural industries.

At a different level there also has to be a commitment to the "cyberspace" equivalent of public service broadcasting. It would be very easy to respond to the criticisms of the current user bias of systems by talking about how making applications and services more relevant to the "mass of ordinary people" is about greater commercialisation, the "virtual Las Vegas" approach where everyone has access to unlimited teleshopping, video-on-demand and "virtual lotteries", as indeed most of the major manufacturers and suppliers are now pushing for. The challenge is to be critical of both situations while attempting to build experimental systems, on the 'digital city' or 'virtual city' model, which provide practical demonstrations of alternatives to the dominant models stressing not only empowerment and emancipation but also access and accountability.

3. Extending the horizons of the "Virtual City" - Towards a new vision of teleworking

The main challenge facing cities like Manchester at the end of this century and into the next is how to respond to the massive economic restructuring that has taken place while, at the same time, developing innovative and practical solutions which bring real economic and social benefits to local businesses and local people. This paper has highlighted ways in which imaginative uses of ICTs/telematics can provide vital tools to aid that process. The key to success is, however, to ensure that such solutions are sustainable. It is for this reason that we have developed a rather different and critical vision of the role of teleworking in this process.

We believe that there is much too much of an emphasis on teleworking being about the redistribution of work away from workplaces into the domestic environment and away from urban areas to areas defined as "peripheral" as well as being a "natural" solution to traffic congestion and resultant environmental pollution. As a city with an explicit agenda that includes making our city a livelier, busier, more productive but still sustainable centre we are concerned that the pursuit of (what we would term) the traditional telework agenda is in danger of further undermining the fragile social cohesion of our cities rather then strengthening it. We do not want a "green" but dead city, rather we see opportunities for promoting sustainable development while at the same time using strategies, including teleworking, which tackle social exclusion and support intensive but more flexible uses of the urban environment.

The Manchester Partnership is currently involved in a series of studies of the employment and training needs of local people, especially those who face discrimination and marginalisation in the labour market, and of employers which may be able to support new employment and training opportunities. Even at this early stage it is clear that a number of trends are emerging from this work, including:

a) **Home-based telework**: a key finding amongst socially excluded groups, e.g. disabled people, women and other parents/carers with childcare responsibilities and people in the poorest areas of the city is that they do not want to work from home -- their prime concern is to "get out of the house" and to get access to the social and cultural support which they see a “workplace” as providing. What they do want more than anything is access to training, proper childcare facilities and good public transport which will support them achieving this. Similarly the housing accommodation of many people in these categories is seen by them as totally unsuitable for working from home, especially (again) in terms of the lack of locally available childcare facilities and security concerns, i.e. fears that they will be targeted for burglary if they have "valuable equipment" in the house.

b) **The core/periphery divide within cities**: the positive potential for cities to be engines of their regional economies can also have a negative effect on employment distribution within the city, where employees, especially those with greater skill levels, increasingly commute in from suburban and even rural areas. This can leave concentrations of low-skill levels and unemployment, and consequently of poverty, both within the inner city and in poorer “outer city” areas. The commitment to teleworking models which redistribute work even further away from people who live in these areas can only exacerbate these forms of social exclusion in cities.

c) **The role of commuting**: in order to generate a level of sustainable economic activity that provides employment for sufficient numbers of those who wish, or need, to commute plus those who want and need jobs who live in the city there must be more people both living in and working in our cities. In Manchester we want to see 10 000 people living in the city centre by the end of the century (as compared to about 2 000 now) with their needs for goods and services generating new employment opportunities. In addition we believe there is the capacity to support a further 100 000 more people working in the city, providing changes can be made to travel patterns where people do not all have to travel in between 8am and 9am and out between 5pm and 6pm. Consequently telework strategies should be about facilitating increasing but more flexible uses of the city not about encouraging people to stay out of the city.

All of these factors demonstrate the need for cities to think more imaginatively and to act in more dynamic and proactive ways than ever before. The idea of a 24-hour city is not new but it does have a new significance in the age of the information society. Why should local people, business visitors and tourists not take advantage of the opportunities of participating in a working day that starts at 4pm and finishes at 2am one day and starts at 4am and finishes at 2pm another day? Office facilities, retail outlets, public services -- especially public transport, educational resources, cultural and entertainment services could use ICTs/telematics to ensure that the majority of services are available on a 24 hours a day basis. People could combine work, education/training and leisure activities in ever more flexible ways.

Open telecentres, both in city centres and other localities throughout the city, could provide the basis for flexible working, business networking, lifelong learning and access to public and commercial information and transaction services -- from booking theatre tickets to paying local taxes. Interactive video links could provide the opportunity for remote access to consult a doctor, social worker or confidential advisor enabling such workers to operate more flexibly and efficiently. Employers, especially larger companies and public services, could decentralise their operations within the city, offering opportunities for marginalised groups, e.g. disabled people, to have access to high quality, better paid and more permanent employment within a more supportive social and cultural setting by working from a telecentre near their home, backed up by training and childcare facilities. This is just as much

"teleworking" as the "traditional model" but its potential impact on improving the life-chances of socially excluded groups is much more significant, we would argue.

The success of more innovative models of teleworking, and teleservices, will depend on the ability to establish electronic networks at all levels (local, regional, national, international) that owe their existence to active policy making through democratic and accountable action, e.g. on the part of local authorities, community organisations, trade unions, consumer groups and alliances of individuals, rather than to corporate business interests, governments or the whims of rich and powerful individuals. There is no technological "short-cut" to the establishment of such networks but rather the long, hard slog of alliance building, experimentation, negotiation, campaigning and self-organisation. Market forces will not naturally develop either the quantity or quality of applications and services based on ICTs/telematics that is required to meet our requirements but neither will they naturally facilitate the type of surveillance and control increasingly required by state and other interests and feared by users. The "anarchy of the market place" does at least provide space in which to manoeuvre and to create experimental areas of collective space to support social and cultural innovation and to provide real services that could be seen as the interactive multimedia equivalent of public service broadcasting.

The alliances which are beginning to emerge between social forces and (at least) some representative structures (including local authorities) working in this area, which could be broadly termed "socially useful cyberspace", may not be able to transform the forces of global capitalism but they are not without power and influence. Their role in determining how questions of employment distribution and the fight against social exclusion can be resolved should be not underestimated. The ability of small-scale initiatives in cities and regions to use the advantages of the technologies, to use "cyberspace", to create communication and activity networks free from the usual spatial and temporal constraints is a crucial element in providing a democratic counter-balance to other technological and global trends. The essential starting point for this must, however, be a commitment to creating services and applications that are easy (and cheap) to use, that grab people's interest and imagination so that they want to use them and that, having used them, they become part of their lives enough that they would fight any attempt to limit them or take them away. It is in this context that the use of ICTs/telematics needs to be debated backed up by practical examples of how people and organisations are working to achieve liberation and empowerment through innovatory explorations of new applications and services base around these technologies.

FIRM, KNOWLEDGE AND ISSUES OF SPATIAL DISTRIBUTION

Prof. Claudio U. Ciborra,
University of Bologna and Institute Theseus

The source of growth of the enterprise lies in the capability to recombine relentlessly new and established resources. This principle, identified by Penrose at the firm level, has been extended to the whole economy by the "increasing returns" school of thought, from Lucas to Romer.

The aim of this contribution is to identify the main sources of these capabilities of recombination inside the firm. Second, it wants to evaluate different organisational arrangements and evaluate them from the point of view of their capacity to create knowledge. Information technology (IT), especially in its newer forms of groupware and networked corporate memory, will play a major role to enable and extend on a wider scale such processes. Finally, some general implications regarding space and territories are drawn. The scope of the contribution is then mainly methodological and directed to identify a perspective, if not a framework, for further empirical work and research.

In a process of continuous innovation, or creative destruction, that seems to characterise the modern knowledge economy, the key process for the growth of the firm seems to revolve around the creation of new knowledge, both in an incremental fashion (*kaizen*; total quality) and a radical fashion (*e.g.* Benetton re-inventing the commodity apparel). Such processes, both cognitive and social, are not dealt with in a satisfactory way by existing theories. Take, for example, the transaction cost approach, so effective in analysing alternative arrangements for mediating exchanges and contracts, but rather silent on the dynamics of the firm. Efficiency is driving change for Williamson, while the cognitive processes that lead managers and workers to discover new combinations of resources, capabilities and structures are neglected. These very processes are instead at the centre of the dynamics of the knowledge economy. They are essentially processes of mutual conversion of tacit and explicit knowledge residing in the skills of organisation members. They are processes of organisational learning both incremental and radical.

If the view that the firm is a problem-solving institution, that knows what to do, is gaining ground, we still lack a systematic appreciation of the ways in which different structures (arrangements) favour this capacity to solve problems. For instance, if one considers strategic alliances, especially in the high-tech sectors, from a purely efficiency perspective, such alliances make little sense. From a learning perspective, they reveal another dimension: the one of rapidly learning about new skills, markets and cultures in an accelerated way.

Firms establish themselves around a bundle of core capabilities that are rare, unique and not easily imitable. Their competitive edge is maintained if such a bundle of competencies is maintained vital and expanded. IT can play a strategic role only if it is highly integrated (wired) to the "knowledge bundle" that characterises the firm. New forms of IT, such as groupware or the notion of networked corporate

memory, illustrate the possibilities for this new role for technology, somewhat different from the too optimistic promises of Artificial Intelligence.

In the firm, as in society, knowledge is fragmented. IT is neutral, in the sense that it can be harnessed to centralise/decentralise the distribution of knowledge. From a spatial perspective, the definition of the firm as a problem solving institution invites the discussion of what organisational structures (hence centralised versus decentralised arrangements) can foster the processes of knowledge creation and management in an effective manner, taking into account the role of IT. Basically, such discussion boils down to the issue of how to draw the boundaries of the firm, i.e. which knowledge processes should be kept inside and which should be delegated. Flexible, (small) structures that favour rapid, and when needed, radical learning seem to have the level of agility required by the new economy.

OECD WORKSHOP ON INFORMATION INFRASTRUCTURE AND TERRITORIAL DEVELOPMENT

7-8 November 1995
Outline of remarks by Eric Dufeil on "the Information Society and Cohersion"

Let us skim through a few key words to get the general idea.

I. European Union policy for social and economic cohesion

- Article 130A of the Treaty. Major goal for the Union. One of the three pillars of the Maastricht architecture.

- Long-term action to reduce structural disparities by developing the productive capacities of regions, in order to give them a chance to become competitive.

- A social-welfare approach involving financial transfers, but above all a show of common European interests: the development of disadvantaged regions must be seen as a source of potential growth and additional trade, as part of sustainable, harmonious and balanced territorial development in Europe.

- ECU 60 billion; 1994-99: ECU 160 billion (including Cohesion Funds). A significant effort, especially for a number of Member States (up to 2.5 per cent of GDP), but moderate overall (less than 0.5 per cent of aggregate EU GDP).

- The EU neither designs nor administers projects itself. It and the Member States agree on reference frameworks, which include priorities for each planning period, based on a strategic approach.

Proposition: The Structural Funds represent a shared architecture with a high degree of inertia.

II. The information society

Emergence of a kind of new industrial revolution. Shapes the competitiveness of territories and businesses, the creation and location of productive activities, the organisation of production and, above all, the level of employment.

Major risk of a division at both the territorial and the social level between those who have access to the information society and those who do not. Risk of social exclusion because of jobs lost to restructuring, whereas any new jobs that might be created would require new skills. It is not known whether, when or under what conditions genuinely new jobs will be created.

But also, because distance now has less significance, the information society affords interesting opportunities for disadvantaged or peripheral regions, expands the realm of what is possible, offers new ways in which to exploit the intrinsic assets of a region, facilitates access to world markets.

Questions:

a) Is cohesion policy affected by the emergence of the information society? (The answer is obviously "yes".)

b) Is there an arena for policy action? Yes, insofar as neither the risks nor the opportunities are predetermined, and it is even imperative to act, given the stakes with regard to cohesion in a context of increasingly rapid change.

III. Liberalisation

Emerging as a crucial issue.

- First of all, it is a fact, since the decisions have been taken.

- Has positive aspects: lowers the cost of products, raises their quality, widens their range. Therefore relevant to disadvantaged regions as well.

Question:

a) Is it possible to assert that the process of liberalisation alone will be enough to ensure that these benefits will reach disadvantaged regions? And, even more importantly, that they reach them in time (reducing the time lag)?

There is cause for doubt, considering that, in the United Kingdom, 60 per cent of data communication traffic is generated by 300 large companies; in Norway, 25 companies account for 40-50 per cent of communications traffic on the national data network; in Canada, 65 per cent of data communications traffic converges on Metropolitan Toronto[1].

Location decisions will increasingly depend on the quality of telecommunications infrastructure. At the same time, the impact of liberalisation may be to:

- prompt tariff restructuring that would favour the largest users, located primarily in metropolitan areas;

- cause telecommunications operators to withhold services, or to withdraw existing ones, from low-income/high-cost areas;

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[1] OECD, Information and Communication Technologies and Territorial Development, May 1995.

- concentrate investments needed for advanced services in high-demand/low-cost metropolitan areas.

What this means is that if, in a deregulated telecommunications market, the interests of the major corporations were to take priority over universal service, then the geographic distribution of infrastructure would become even more unbalanced than it already is.

It follows, from the standpoint of cohesion, that the issue of what obligations to provide universal service should be imposed on operators is all-important.

However, it is difficult to lay down technical standards in a rapidly changing environment.

Alternatives to mandatory universal service, such as auctioning off unprofitable lines or establishing the principle of "collective universal service," could be envisaged: here, the objective would not be to guarantee that each potential user could be hooked up, but to ensure that the territory would be properly covered by a network of service nodes, which would be aimed primarily at government agencies, hospitals and educational institutions, but to which other users (businesses or individuals) could hook up at a more affordable price.

IV. Action of the Structural Funds

The Structural Funds are already contributing to the development of the information society, but their contribution is difficult to quantify because it takes a variety of forms. According to an initial estimate, it is still slight (in relation to what is at stake, at least), which reflects the lack of attention it has received from decision-makers in the Member States and disadvantaged regions. Programmes in the newest EU countries (Sweden and Finland), where ICTs are well represented, would appear to be an interesting exception.

Clearly the Structural Funds will have to contribute to the establishment of additional infrastructure for telecommunications networks, including advanced systems, in disadvantaged regions. But for want of a market-driven selection mechanism, it will be necessary to determine a criterion for choosing that infrastructure, bearing in mind that not everything can be done at the same time. Moreover, while establishing infrastructure may be a necessary condition, it is not a sufficient one for giving disadvantaged regions access to the information society. For one thing, such infrastructure might contribute to the very centralisation that one wishes to avoid; in addition, there can be no local growth and job creation in disadvantaged areas without the development of services and applications.

The Structural Funds are also able to sponsor pilot programmes that are innovative or that set an example (Article 10).

The ability to draw attention to such programmes, to assess them and to publicise their results, can play a crucial role in making decision-makers in disadvantaged regions sufficiently aware of the phenomenon.

Conclusion

It would seem that the time has come for the Commission to look closely at the information society's impact on social cohesion, as the European Parliament would appear to be urging. A policy stance on the part of the Commission would encourage regional and local decision-makers in the Member States to examine the issue and should probably result in practical initiatives.

OPPORTUNITIES FOR PERIPHERAL AREAS: THE CASE OF TOURISM

by Professor Michel Frybourg,
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The improvements stemming from new information and communication technologies (ICTs) can have widely divergent, even contradictory, results within a given region, and value added can be either lost to the outside or kept within the region being served. It is therefore essential to examine the context in which ICTs are deployed. This context will be shaped by the human resources available and the degree of control exerted over economic globalisation, which must not be allowed to benefit only those regions that were already the least disadvantaged.

Open systems, by definition, are expanding to the detriment of protected markets in which geographical proximity played a role that the disappearance of regulatory barriers has not totally eliminated. But ICTs shorten distances, and all the more so now that production is streamlined and the service sector expanding. ICTs will be put in place in a competitive environment that only regulators can restrain so as to ensure delivery of universal services to the neediest segments of the population.

A pro-active approach to the introduction of ICTs is therefore vital, and trans-European networks will have to reconcile economic efficiency with fairness. In particular, it is important to ascertain which activities are critical to the development of disadvantaged regions, and to make sure that such activities get the basic services they need for growth. Tourism is often the most highly developed economic activity, particularly in southern European regions and in those with natural sites that have not been spoiled by industrial pollution or congestion.

Tourist services will increasingly be accessed through global distribution systems (GDSs), the first of which were set up in the air transport industry, including SABRE, the best-known. But while tour operators in generating countries have become thoroughly familiar with the systems, the same cannot be said for those in receiving countries; the result is that the former have despoiled the latter of the value added deriving from the use of such systems.

The presentation examines, by way of illustration, the TOS system which was set up in Belgium -- a generating country -- for tour operators, and looks at the large variety of reservation systems in host countries such as France. Each reservations centre tries to cope single-handedly with all of its markets, working through tour operators for the most remote destinations. Commercially, the result is a tremendous waste, the full range of what is on offer being masked because everyone wants to go it on their own.

This situation disrupts the "balance of power" to the advantage of generating countries and the detriment of receiving countries, since whoever has best access to a market can set his own margins. An effective strategy would be to present customers with a comprehensive selection of comparable tourist products, along with quality assurance. Only high-capacity products offering guaranteed quality would be allowed access to travel agencies in the major generating areas.

LOCAL INFORMATION & COMMUNICATION POLICIES IN GERMANY

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1. The role of local policies (compared with activities at the national and the Lander levels)

- Regulation and liberalisation, fall of network and telephony monopolies in 1998.
- Promotion of information and communication technologies (ICTs) by the Landers.
- Responsibilities of local authorities.

2. Framework conditions for activities in German cities

- Precarious financial situation.
- Widespread unemployment.
- Tertiarisation of the economy.
- Environmental problems, especially in the cities and the New Landers.
- Traffic problems.
- Some scepticism toward technology (not among the youth).

3. Objectives of ICT activities at the local level

The need of cities themselves to become active is generally acknowledged.

Most important are the stabilisation and improvement of the competitiveness of the city as a business location.

Closely related to the above is the aim of stabilisation and generation of jobs.

The internal use of telematics for improving the efficiency of public administrations and rationalisation purposes is important as well.

Particular projects are initiated to resolve or to ease specific city-based problems in areas such as traffic, environment, etc.

The improvement of living conditions of citizens as a result of ICT applications is less important (but all other objectives should contribute to this objective anyway).

4. Activities and instruments

- Extensions of local network infrastructures.

- Service providers on local networks.
- Construction or supply of infrastructure for providers of ICT services.
- Supply of public infrastructures for the installation of telematic services.
- Support of development of ICT application in SMEs.
- Subsidies for ICT transfers between enterprises, universities, public administrations, etc.
- Subsidies for specific ICT (telematic) applications (traffic, environment, health care, elderly people, etc.).
- Preference for local ICT suppliers.
- Enhancement of ICT applications in public administrations.
- Subsidies for the acquisition of hard- and software in certain institutions or for certain groups.
- Information on and facilitation of the access to subsidies of higher level.
- Training of potential users (adult education centres, schools, etc.).
- Supply of local information sources for information providers.
- Compilation of information supply for specific target groups, user adequate information supply.
- Co-ordination of local ICT activities (master plan of ICT development).
- Compilation of the expertise of different public and private actors (evaluation of the local knowledge base), moderation.

5. Local strategies between uncoordinated (chaotic, reactive) and focused activities

6. Local authority actors

Currently a large variety of different departments have taken responsibilities in the ICT area, low co-ordination.

Need for co-ordinating instances at top levels, i.e. the mayor or the city head of administration.

Conclusions and recommendations (concerning local ICT policies)

❶ Discussion and information exchange within and between cities about the chances and risks of ICT.

❷ Technology assessment to identify the impact of different ICT applications.

❸ Telematics responsibility at top level in cities -- co-ordination unit for internal and external telematics activities.

❹ A shift of emphasis of the economic driven approach of ICT policy in favour of the enhancement of quality of life.

❺ "Best Practice Demonstrators" or "Showcases", demonstrating problem solutions.

❻ Strategy concerning the development and operation of local telecommunications networks.

❼ Co-ordination of ICT application development between cities.

❽ Creation of a coherent and co-ordinated policy on the four levels of ICT-promotion (European, Federal, Lander, municipalities).

THE "IPERBOLE/INTERNET CIVIC NETWORK" PROJECT/SERVICE

Telematics for the general public, enterprises and administrative innovation
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Operation site: City and metropolitan area of Bologna (Emilia-Romagna/Italy)

Telematics and the new rights of citizens. Local public administrations and their role in guaranteeing access to global link-up for all. The Iperbole/Internet free "civic network", an instrument for democracy in the computer age as well as for economic and social territorial development. SME services, training, literacy schemes and how to set the ball rolling. The information society and local projects.

The Service, which was launched in January 1995, considers the introduction of a free "civic network" on Internet as one of the prerequisites for the implementation of teledemocracy as an exercise in new forms of learning and communication, as a genuine "new right of citizens", as well as an economic tool, which should be guaranteed or at least supported by the public sector. It is also a "public gateway" to global link-up.

The Public Local Network -- connected to the world network -- is therefore a means of diffusing information of use to the public and of achieving two-way communication between administrations and companies, and among members of the public. It is also a means of monitoring and collecting requirements, suggestions, proposals and requests. It is a way of ensuring transparency and participation in decision-making, and a tool for "electronic democracy". It is moreover a test bed for an advanced system of service distribution and quality control, a system for simplifying bureaucratic methods, for monitoring and analysing feedback, for diffusing and exchanging know-how, for releasing resources at all levels, thereby revitalising the competitiveness and dynamism of the economic and productive fabric.

The Iperbole/Internet service is based on the principle of using telematics and new technologies for territorial management and development, administrative innovation, widespread exercise of the right to information as a socially necessary service and the rationalisation of planning and actions in offices and sectors. Telematic communication, within complex systems as well as to and from the outside, has a strategic function in this regard and is one of the bases for revitalising public administrations, especially at a local level.

Furthermore, innovative and efficient communication systems -- whether they be physical or "virtual" -- are basic elements of interest and attraction to any city and even more so, to a metropolis such as Bologna. The municipal administration of Bologna considers that local authorities should have a prime function -- a leading role that is not subordinate to the market place -- in both creating and promoting suitable conditions -- including infrastructure -- for the transfer of knowledge held by individuals or by groups of interest at all levels, in the setting-up of a society of information.

Through experimenting with interactive, direct channels between members of the public and local authorities, the administration is entering the home, the work place, businesses, offices, schools and places of public consultation, mobilising internal energy and optimising resources to the benefit of the citizen/customer/contributor. The "civic network" is moreover a spontaneous factor of social multiplication, an instrument for extending, educating and achieving critical mass in the use of the information society's own technologies, taking practical steps to fight against elitism, but also social exclusion and various up-and-coming forms of illiteracy, while creating professionalism, markets, products and jobs, and diffusing telework, transfer of know-how, telelearning, etc.

According to the "philosophy" underlying the Iperbole/Internet project, access to means of communication, and their active and productive use are an instrument of economic and cultural development, a citizen's right (universal service). In addition, a complex organisation such as a large city needs to experiment all ways and means, including the most technologically advanced ones, in order to counter the tendency towards "entropy" common to public systems, assuming greater awareness and social know-how with a view to producing results up to the community's expectations: upgrading resources, shortening times of performance, clarifying managerial and political responsibilities, acquiring input to programme and plan in a concerted way, searching for consent concerning current or future decisions.

Iperbole/Internet is to provide free network use for civil purposes, for dialogue with the City administrators, offices and services and a great many public and private organisations and, in addition, for industrial and commercial purposes, to the benefit of self-help economic associations. These associations have in fact a multiplying effect in the sense that they disseminate to their own members the computerised and telematic culture that they are able to produce. In addition, such interlocutors can be basic actors in the development of specific services for the benefit of companies. Iperbole/Internet also offers discounts for full-Internet users belonging to the small and medium-sized enterprises operating in the metropolitan area. The aim of this decision is to stimulate the use of network technologies so as to create efficient information circuits, sharing and co-operation, and to promote contacts "at a distance" with industrial zones sharing similar backgrounds, documentation and research centres, universities, etc.

In order to connect up with the system all that is needed is a computer and a modem. The cost of the line is that of an urban telephone. For those who do not own the equipment, public and assisted link-up points are available. All citizens resident in the city may connect, as well as the P.A.s of the metropolitan area, associations, various institutions, public and private bodies, businesses, professional offices, economic associations, etc. The free services offered by the City of Bologna are as follows:

- exchange of messages with an international mail directory (e-mail);
- discussion and debating groups (newsgroup) with the possibility of extending the local debate world-wide, handling specific arguments put forward by citizens, associations, businesses, public and private organisations, and by the same municipal administrations on matters considered as essential for the development and government of the city;
- the direct and immediate visualisation of information of public interest, with networks available from the City and its public and private partners.

Users may thus gather information, obtain services and communicate by electronic means with the City Administration and propose subjects for debate and discussion over the network. These interactive processes enable the development of an increasing wealth of reciprocal knowledge and democratic two-way collaboration between the local authorities and the public. To connect into the network's services the Internet code address is http://www.commune.bologna.it/

The Iperbole/Internet project/service participates in European projects, thereby extending its features and applying its principles in specific fields (tourism, culture, joint editing, teleconferencing, telelearning, etc.). Its users total (in September 1995) approximately 2 000, of whom 200 are groups (associations, syndicates, P.A.s etc.). There will be 3 000 at the end of the year. Another 100 institutions, including prove ones, and cultural, non-profit making and economic associations, use free lines and, together with the City of Bologna, have started joint projects for developing the service, training and diffused literacy (these last two themes are absolutely crucial for full implementation and extension of the service).

Network security, defence of privacy, "user-friendly" interface, increase in the number of public access points, use of the natural language, creation of new services are the main work objectives for Iperbole in the short term. The four-year development plan -- until 2 000 -- plans for large investments (laying optical fibre cables in the city) and the connection of at least 15 000/20 000 subscribers. Today there are around 10 000 "telematic visitors" to Bologna, of which 50 per cent are Italian, 40 per cent European, and 10 per cent coming from the rest of the world, mainly from the United States.

ICT - THE TOOL AND OPPORTUNITY FOR THE LABOUR MARKET OF TOMORROW

Distance bridging activities give new conditions for employment and regional development. Experiences from Sweden

Gun-Britt Hansen, Head of Department, Regional Development Co-ordination, NUTEK, Stockholm, Sweden

Sweden is a peripheral, large, sparsely populated country. Nowadays, ICTs have become one of the most important tools for regional development, employment creation, and so on.

1. Good ICT infrastructure -- a prerequisite

Good ICT infrastructures are fundamental for distance bridging activities, including telework.

A study performed by NUTEK last year about the ICT infrastructure in Sweden, showed a quite good territorial coverage with less differences between the northern and southern parts of the country than expected. Nevertheless, the study showed a general gap between densely and sparsely populated areas in terms of both ISDN and AXE coverage.

The total cost of use differed between the northern and southern parts of Sweden. Some equalisation for both connection and use costs has been reached since then.

In the near future, a complementary study, also by NUTEK, on how the infrastructure is used and what prevents being broadly used, will be presented.

2. Incentives for starting up business in sparsely populated areas

Relocating private service companies to support development in sparsely populated areas has proceeded since the 80s with good results. About 5 000 new jobs have been created in regional policy development areas and in support points connected with them. About 70 per cent of the total number of job vacancies have been filled by women.

Earlier, a large number of the job vacancies were located to larger regions in or near the regional policy development areas. There has been a noticeable change recently. More and more companies are establishing themselves in the centre of the regional development areas. The reason for this is probably increased awareness of the basic requirements for setting up in business -- access to good infrastructures, modern technology, lower rental costs and the availability of a well-trained labour force.

Furthermore, there has been a shift from relocation of existing companies to establishing new ones. The latter set up according to a new business concept, often locating their head office and support functions in the Stockholm area whilst service production is located in the regional policy development areas. This new organisational concept is a development of the consultative process that was originally just intended to move units out of the Stockholm area. In future, the aim will also be to decentralise more advanced activities.

3. Virtual co-operation and teleworking

In Sweden, there are many different ongoing pilot projects, set-up of networks, etc. all building on information technology. For example, the Swedish Telecottages Association has developed a network which allows the existing 25 Telecottages, which are all SMEs themselves, to co-operate electronically, which increases the possibilities to reach a bigger national and international market. Each Telecottage also supports SMEs within its own area. An enlargement of the Association with new Telecottages is expected. The network and the different functions connected to it are continuously developed.

The DIG-project (DIGital infrastructure in rural areas) gives answers to questions such as "What are the implications of a functional application of information technology for the relative competitiveness and attraction of a rural region? What lessons can be drawn from a number of successful case studies?". The case studies cover teleworking schemes within a municipality, distance bridging business co-operation between two companies located more than 1 000 km from each other, network building and ways of using it. The results have just been reported to the Swedish Government.

Teleworking is important also for more densely populated areas. The number of teleworkers is comparably large in a narrow area and other solutions are needed compared to rural areas. It is necessary to be open to new ideas and solutions and to have a flexible way of working. A Neighbourhood Office in Nynashamn, close to Stockholm, was for example opened last June. It is a full scale pilot project which includes a lot of long distance commuters. Interesting results have already been achieved.

NUTEK itself is preparing an outsourcing of one unit responsible for handling National Transport Aid to Arjeplog, located almost 1 000 km away from the headquarters. ICT connections between Stockholm and Arjeplog are under development and in the future there will be electronic connections to support the co-operation. The new organisation will demand new ways of working, but also new ways of managing the office and the employees.

Equality between men and women is an important question in Sweden. In the regional support area, each municipality has a regional resource centre with a female business advisor to support women entrepreneurs and SMEs managed by women. The advisor, but also the female SMEs, are using the First Class system to communicate and co-operate electronically.

4. Strategic plans

Information technology is one of the key points for regional development in Sweden. Each County is supposed to work out a strategic plan for its region. In almost every plan, ICT and its significance for preserving or creating jobs, offering new ways and a wider choice of education through distance learning, etc. are prioritised.

5. NUTEK's role

NUTEK is responsible for several different areas, such as regional questions, technical R&D, business, energy and electricity markets. Within the regional area, NUTEK is responsible for co-ordinating work with regional development in Sweden. The working areas 'Regional questions' and 'Technical R&D' have fruitful co-operation concerning distance bridging activities and ICT for regional development. Moreover, NUTEK works very close by with the 24 County Administrative Boards. This includes taking the initiative for pilot projects, supporting and raising the awareness and enthusiasm in the regions, making regions more co-operative, etc. NUTEK is also a contact point for many European programmes and networks connected to ICT and regional development and since Sweden has joined the EU, NUTEK is also responsible for the co-ordination of the EU Structural Funds.

TELE-BASED EMPLOYMENT IN THE HIGHLANDS & ISLANDS OF SCOTLAND

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In Britain, as in the rest of the developed world, the present balance of population and economic activity between urban and rural areas is the result of 19th Century industrialisation. However, recent trends in technology, work practices and life-style preferences, are challenging that inherited pattern. Information and communication technology (ICT) is central to this new revolution.

The Highlands & Islands of Scotland is one of the most beautiful parts of Europe, but it is also one of the remotest, and has a fragile economic base which is disproportionately dependent on primary industries and tourism. Highlands & Islands Enterprise (HIE) is the longest established UK development agency, with responsibility for the economic and social development of the area.

In 1989, HIE co-invested with British Telecom (BT) in a major telecommunications initiative which brought full digital services to the area, at the very start of the UK ISDN installation programme. About 80 per cent of the population and businesses in the area now have ISDN access.

The efficiency of existing businesses in the area has been considerably enhanced through access to such sophisticated ICT-based business facilities as data transfer, E-mail, electronic data interchange, database access, mail order, video-conferencing, computer aided design, remote equipment monitoring, etc. These efficiency gains have undoubtedly preserved competitiveness and employment in many companies throughout the area. Public administration and social organisation have similarly benefited, enabling such initiatives as remote medical diagnosis, distance learning and training, access to public information services, etc. While some of these trends have strengthened the position of centrally located organisations, most have reinforced the ability of remote units (offices, schools, hospitals, etc.) to preserve viability.

Tangible new employment creation in the area has risen through ICT based remote business operations. Remote working is an important new force in rural employment, which takes several forms.

Home working has long been practised by authors, artists and other professional specialists. This group is expanding to include a range of talented people with life-style preferences for rural areas. Experiments with home working for less specialised occupations indicate both benefits and difficulties, and the potential is unproven at this stage.

Community teleservice centres, or telecottages, were pioneered in Scandinavia, and combine a mix of social and commercial objectives. The experience from the several schemes that have been established in the HIE area is that they require good leadership, access to a local market and sustained public support.

New company start-ups in ICT related business fields are developing at a most encouraging rate, with good diversity and geographic spread. These are an important new component in many rural economies.

The largest employment effects are experienced through the decision of major companies to locate office operations away from traditional urban centres. Business process re-engineering and electronic workflow management greatly facilitate this process, as does the accelerating trend to tele-mediated business transactions. Several major office operations have been successfully located in the Highlands & Islands, establishing a very promising trend.

There is growing evidence that, to a very considerable extent, the ICT revolution is removing the commercial disadvantage of remoteness. In the dynamic new business environment, rural areas offer companies access to a quality workforce which combines high productivity and service standards with flexibility and company loyalty. Cost structures are typically lower through competitive regional wage levels, lower property prices and access to regional development assistance packages. Quality of life is an important asset.

The 19th Century concept of the city is looking increasingly irrelevant to the needs of the 21st Century, for which rural areas may have considerable competitive advantages.

TELEWORKING AND THE REDISTRIBUTION OF EMPLOYMENT

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This presentation looks critically at the concept of teleworking and the ways in which teleworking may contribute to the geographical redistribution of employment. It focuses in particular on the difficulties of measuring changes in employment related to the use of new information infrastructures and evaluating their contribution to economic development in any given region and makes some tentative suggestions for future research.

1. Difficulties in the definition of teleworking

Discussions of teleworking and the relocation of employment tend to be dominated by popular stereotypes -- many of them deriving from the futurology of the early 1970s -- which, while often eliciting strongly polarised political reactions, bear only the haziest relationship to the empirical evidence.

The first of these stereotypes relates to the notion of the 'electronic cottage' popularised by Alvin Toffler. In this model, a wide range of white-collar jobs are supposed to become locationally independent as a result of the use of advanced information and communication technologies, leading to a growth in home-based working. This will lead to much greater freedom in the choice of residence for information workers, it is argued, and will result in general population movements away from industrialised urban areas and towards small towns and rural areas where the environment is pleasant and taxes low.

The second stereotype relates to the notion of the 'virtual enterprise'. In this model, work is supposed to become entirely delocalised, with globalisation making it possible to site almost any function in almost any location. It also becomes possible, it is argued, to fragment large organisations into many small components which are linked to each other on the one hand through telecommunications networks and electronic data interchange (EDI) and on the other by means of a variety of different kinds of strategic alliances, partnerships or contracts for the supply of labour, goods or services. Such organisations, it is held, have a number of competitive advantages. They can respond more quickly to market information, and can take advantage of local differences in such factors as labour costs, overhead costs, skill supply and time zones.

The word 'teleworking' has come to be used somewhat loosely to refer to these and other kinds of relocation and is used in this presentation for that reason, in the awareness that it is, nevertheless, a highly problematic term.

2. The problem of evidence

Unfortunately, we have very little hard empirical evidence that these trends are taking place on any scale. It is possible to cite cases which illustrate these trends; but equally possible to find successful companies which are still firmly rooted to a particular geographical location. While it is possible to measure some forms of home-based working, other forms are harder to quantify.

No firm conceptual framework has yet been developed within which to analyse and quantify these trends. The researcher has at least three intellectual disciplines to choose from, each with some important insights to offer.

Economics offers us the basic tools with which to assess economic development. However it has yet to develop reliable models which enable us to predict with any degree of accuracy which industries will tend to locate where. The tools of economics also present us with difficulties in measuring value added in relation to information-processing activities. In the case of a factory producing physical goods, for instance, it is relatively easy to measure inputs and outputs in order to assess what value has been added at a particular location. Such a process is much more difficult in relation to activities involving interactive communications between partners on multiple sites.

Organisational theory provides helpful insights into the dynamics of change, but fails to offer methods for quantification. By focusing on what happens within organisations it also tends to render invisible the relationships between organisations, which are particularly important for our purposes.

Probably the richest source of information on these changes comes from the work of geographers. This has provided a wealth of case-study information the analysis of which has produced a range of ex-post explanations of the locational behaviour of firms using advanced communications networks. It has also given us some interesting theoretical discussions of the process of globalisation. However so far geography too has failed to offer a framework which makes it possible to quantify and monitor trends and to develop predictive models.

3. Typologies of teleworking

Teleworking has been defined in widely differing ways and attempts to quantify its extent have therefore, unsurprisingly, come up with widely different estimations and predictions. A review of the empirical evidence suggests that it falls into two main categories:

1. individualised forms -- which may include:

- partially home-based teleworking for a single employer;
- fully home-based teleworking for a single employer;
- fully home-based working for multiple employers;
- various forms of multi-locational or mobile working.

2. collective forms - which may include:

- the suburbanisation of back-office functions;
- the relocation of back-office functions to sites in other regions or countries;

- the use of satellite offices or telecentres;
- the use of telecottages or business centres;
- the development of distributed team working (CSCW) within organisations;
- the development of EDI-supported collaborative work between organisations;
- the development of IT-supported networks of SMEs and individuals.

These can be classified using the following matrix:

- functionally separate;
- distributed/interactive;
- teleworking;
- team working;
- inter-firm e.g. telecottages or e.g. data-sharing networks of data entry subcontractors;
- small firms or
- 'virtual enterprises';
- intra-firm e.g. remote back-offices or e.g. multi-site teams
- call centres.

4. Assessing the economic impact

The impacts of these developments are not unitary. Some involve relatively high-skilled, high value-added work which could be regarded unequivocally as making a positive contribution to the economic development of the area in which it is located, since it is likely to be associated with a raising of local income levels, technology transfer and a positive multiplier effect in the local economy. This is particularly likely to be the case when they take place in locally-owned autonomous organisations. Others may best be understood within a context of Taylorisation and involve low-skilled, low-paid work which may well be transient in its locational attachment. In such cases, local control may be minimal and most economic benefits accrue to the regions where head offices are based, rather than those where the work is carried out. There may also be differential impacts resulting from the specific gender or ethnic composition of the workforce, whether the work is full-time or part-time, or whether it is located in urban, suburban or rural areas.

In order to assess the impact on any given region it will be necessary to carry out several procedures:

1. The development of a methodology for quantifying the extent of teleworking in each of the above categories. This will in turn involve the identification of relevant indicators, which might include:

- inter-regional and international trade in information-processing services;
- investment in and use of telecommunications networks;
- use of software designed for computer-supported team working;
- skills and occupational structure of workforce;
- numbers of and industrial classification of locally-owned SMEs;
- presence of TNCs involved in information-processing activities.

2. The development of a methodology for assessing the contribution made by these developments to local economic development and the extent to which they have become locationally 'rooted'. This will also involve the identification of appropriate indicators, which might include:

   - numbers of jobs and structure of workforce;
   - capital investment;
   - investment in training;
   - wage levels and per capita income levels;
   - value added;
   - qualification levels;
   - numbers and size of locally-owned enterprises;
   - quality of infrastructure;
   - quality of environment.

This is an ambitious project, which will only be achieved within an inter-disciplinary framework. However in order to develop information infrastructures and territorial development it is urgently required.

TELECOMMUNICATIONS TECHNOLOGY AND DEVELOPMENT POLICY FOR THE LESS-FAVOURED REGIONS IN GREECE

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The less-favoured regions of Greece are, according to generally accepted criteria, the mountainous, semi-mountainous and island regions of its extremely ragged terrain.

Since the first rehabilitation attempts in the postwar, the less-favoured regions of Greece have been considered as the "problematic" c ounterpart of the more developed S-shaped axis of the east littoral areas of the mainland, along which are located the largest urban-industrial agglomerations, the largest ports and airports, the main road and rail arteries, the highest market potential of the country.

There are major drawbacks impeding the development of the less-favoured regions -- being responsible for high costs of construction and up-keeping of infrastructure, provision of services, exploitation of natural and human resources and for the generally low standards of living in those regions.

The drawbacks are:

- extreme geographical diversification, rocky soil, rough climate (cold and humid in the mountainous areas, windy in the islands);
- dispersed population, not enough to support a school, a health centre, an administrative service, a market place or any other facility at convenient distance;
- prevalence of very small settlements, thinly scattered over the most inaccessible locations (a pattern inherited from the times of the Ottoman occupation and the piratic invasion);
- low per capita income, far below the country's average;
- critically disturbed demographic, economic, and social structure, and lack of development momentum.

On the other hand, there are major assets which encourage Greeks to value highly the less-favoured regions and want to maintain, restore and revitalise them.

The assets are:

- rich and mostly undisturbed historic endowment representing all areas of Greek civilisation;

- important natural reserves;
- indisputable beauty of the natural and man-made landscape;
- still unexploited resources;
- native place of most of the Greeks now living in the large urban agglomerations in the country and in numerous other countries of the world.

The objectives of regional policies for the less-favoured regions have been socio-cultural rather than economic, protective rather than development oriented. More concrete policy objectives refer to improvements in transportation links and to the establishment of proper infrastructure for the supply of goods and services to the people and the small economic activity in these areas. The implementation of this policy has been advanced by the allocation of high per capita expenditures in the less-favoured regions compared to the more developed areas, because of the high costs of construction, upkeeping and functioning of the technical and service infrastructure and its fragmentation in numerous small works scattered over the territory. What is more disturbing is the fact that most of the infrastructure (especially schools and health facilities) built after the second world war under the above policies has never been staffed and equipped properly, or has been deserted with the massive emigration from those areas.

It was realised from an earlier stage in the development policy process (beginning of the 70s) that the extension and better use of telecommunications in the less-favoured regions can contribute to making policies less expensive and more efficient and effective, because they can substitute a considerable part of the necessary infrastructure and movement of people in these regions. In the beginning, it was the telephone network in mind, more recently modern technologies are promoted, namely tele-education, tele-health and tele-administration service provision, information diffusion and consultation to business, tele-marketing, etc.

THE POLICY IMPLICATIONS OF ICTs FOR RURAL DEVELOPMENT

Jeremy Millard, Tele Denmark Consult

1. Rural areas as distinct territorial types with a distinct development agenda

Although all areas and regions are unique, a large number of localities share similar attributes of relative remoteness from main urban and core areas, low population density, higher than average primary sector activity and employment, lower service levels and more difficult access to infrastructural facilities, including ICTs. These are the common characteristics of rural areas which have arisen largely because of the mainly centralising forces of first the industrial society and later the service society, and which now present both problems and opportunities for socio-economic development in the emerging information society.

2. Re-assessing the comparative advantages of rural areas

The processes of change in rural areas which have been underway since 1945 (including the flight from agriculture and from rural to urban areas) have been strengthened and given new twists as a result of a series of global developments, including the de-regulation of markets and institutions, the globalisation of trade and investment and dramatic technological innovations. Although individual rural areas are reacting differently because of their unique characteristics and locations, there remain many common problems and opportunities.

Of prime importance is the way in which the comparative advantage of rural areas is now changing from the earlier emphasis on economic activities based upon the location of raw materials, on agricultural potential, on industrial complexes such as processing and manufacturing facilities, on transportation infrastructures and, overriding all these, on geographical proximity to important economic centres or to large markets with high levels of population. Although many of these factors can still be important, even if sometimes this is only because of historical inertia, the emphasis now is decisively shifting to a new set of factors and resources:

- human capital: qualifications, skills, flexibility, attitudes, etc.;
- levels of local services: including both public and private services;
- environment: attractive man-made and physical surroundings providing high amenity values;

- quality of life: a whole range of factors including many of the above, plus social and cultural facilities, a sense of community, well functioning social and cultural networks, and a lack of congestion, pollution and crime, etc.;

- dynamic and creative economic networks: based upon innovative communities of firms supported by the public sector;

- ICT infrastructures: supporting the local economic networks and knitting them into wider systems;

- pro-active local authorities and development agencies in promoting the above factors, depending upon the specific comparative advantages an area has, with an emphasis on creating partnerships with the private sector and other actors both locally and with outside interests, and in attracting inward investment.

ICTs can dramatically improve the accessibility and interaction of rural areas so that they are no longer dependent upon distance and location. But this does not mean that distance and location are no longer important. It rather shifts the focus of attention onto other factors, like those above, which although largely dependent upon human agency cannot easily be moved around as they are often painstakingly built up as a result of long-term strategic choices, typically using ICTs as a key set of tools. So, far from negating the importance of distance and location, ICTs are contributing to the re-assessment of other characteristics of areas and re-emphasising the freedom of action, as well as vulnerability, of a whole range of actors, including those in rural areas.

In this context rural areas are much better placed than they have previously been as they can provide lower wage costs, a clean and attractive environment, high amenity values, cheaper land and less congestion than their urban counterparts. But drawbacks remain with deficiencies in infrastructure (transport, communications, ICTs, etc.), disadvantages in the low level of social services (for example, health and education), and a less dynamic local economic and social life as compared to most urban areas. Overall, however, rural areas are now relatively better placed than previously and great potential exists for exploiting these new advantages to the benefit of rural inhabitants.

3. The role of ICTs

New ICTs have obvious implications for the socio-economic development of rural areas, for example by:

- reducing potential isolation and peripheralisation;

- improving access to a rural area's goods and services by regions elsewhere (i.e. increasing market size), and improving a rural area's own accessibility to larger markets thereby reducing the cost of factor inputs leading to lower prices and greater efficiency;

- enabling the substitution of ICTs for transport and reducing the negative externalities associated with pollution and congestion;

- increasing factor productivity (e.g. of capital and labour);

- reducing transaction and co-ordination costs between firms and with other types of organisations by increasing the speed of communications and giving fast and convenient access to information;

- enabling greater flexibility in the organisation of work, including a decentralisation of activities to geographically separate sites, for example by using teleworking where individuals work for some or all of the time at home or in local offices;

- reducing the time and expense of commuting by decentralising work, as well as reducing the traffic congestion and pollution associated with commuting;

- providing strong support for attracting new enterprises to a particular area, especially those which are service or information based;

- encouraging positive network externalities which can be considerable and typically are not captured in market prices;

- improving the productivity of the public sector by increasing the quality, range and outreach of services provided.

However, in spite of the fact that ICTs have taken on a new importance in recent years, they are not a panacea for development problems and need to be fully incorporated into the detailed development plans of specific areas if their potential is to be realised. In the case of rural areas particularly, there is also considerable danger that, in the absence of policies and frameworks designed to foster decentralisation, ICTs will lead to a further round of centralisation as core areas are able to access and exploit the resources of weaker areas without giving anything in return.

In the absence of commercial incentives to extend ICT infrastructures in rural areas because of the inherent weakness of markets for applications and services (both in terms of sophistication and quantity), there seem to be two main policy scenarios; i.e. either a demand-pull approach or a supply-push approach. The former typically involves policies to maximise the use of existing ICTs on the basis of a bottom-up, user-led, step-by-step gradual approach; a lot can be done with what is already available if users are made more aware of the possibilities and opportunities. On the other hand, the latter approach relies on the kick-start which large scale technology and other inward investment can give to a rural area on the basis of a more top-down, supply-push attempt to upgrade facilities, normally to advanced levels. For example, this has happened in the Highlands and Islands of Scotland where British Telecom and regional authorities have collaborated with some success to invest in high-speed telecommunications networks for the benefit of the socio-economic development of the area.

Both approaches have a potential role, and some mixture of the two is probably desirable. The first approach is most suitable in situations where it is clear that existing possibilities are not being exploited, especially where the aim is, for example, to assist existing companies or encourage the establishment of new companies in situ in the area based upon local skills or opportunities. The second approach is probably more suitable as part of wider regional or national investment programmes, particularly in situations where the intention is to attract companies from outside the area to establish activities within it, or to encourage urban-based companies to access labour living in the area, for example by teleworking schemes. Most of the evidence shows that this approach tends to be the most successful. Recent research into a large number of rural development projects throughout Western Europe showed that the use of ICTs had greatest impacts when clearly focused on specific economic activities and users and when sponsored by exogenous public-sector finance aimed at promoting the business sector.

4. The need for an integrated rural development strategy

Although there are distinct policy roles for national and international authorities, it is the rural development agencies, in co-operation with these where necessary, as well as with ICT suppliers, which have the main role in exploiting the beneficial potential of ICTs for their areas. They must concentrate upon providing an environment and incentives to create the right local conditions for activities which could otherwise be made foot-loose by ICTs or other technical and economic developments. This can be done by creating favourable local infrastructures, capacities and conditions for local development that cannot be easily moved, including:

- education and training, including technical, managerial and organisational skills (i.e. boosting the skills and qualifications of the labour force and improving the organisation and competitiveness of firms);

- networking and partnership (i.e. supporting the institutional capacity of the area through co-operation between the private and public sectors);

- private and public sector services (i.e. improving the quality, range and outreach of services);

- collaboration with local universities and technical institutes, other centres of skill and knowledge, etc.;

- attractive man-made environments promoting quality of life which build upon the amenity values provided by the natural environment.

STRATEGIC SCENARIOS FOR LOCAL AUTHORITIES

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What could be the role of local authorities facing the increasing development of teleservices within cities? How could they shape current policies? How could they monitor teleservice development and in this respect, what could be the most adapted measures to be set up by local authorities?

As a matter of fact, the irreversible penetration of teleservices within cities, in particular metropolises, raises profound issues for local authorities concerned with all aspects of urban management (land planning, transport, housing, education, social services, fight against social fragmentation, etc.): how could local authorities manage urban transformation stemming from the teleservice development (activities leaving city centres, relocation of activities out of cities or abroad, development of tele-activities like tele-banking, tele-shopping, tele-medicine, etc.)? Will they have to develop "do-nothing" or, at the opposite, interventionist policies, or incitement policies or others?

This issue, which seems to be crucial for the European city of tomorrow, is one of the focuses of the European C.A.P.A. Cities project ("Consolidated Actions of Public Authorities for European Cities in the 'New Information Society'") launched by the European Commission (DGXIII), co-ordinated by URBA 2000 (France) and bringing together four countries (France, Germany, Italy and the United Kingdom) and both experts and national associations of cities. The objectives of the project are threefold:

- to sensitise local authorities to the development of teleservice and its implications for population, territories and activities (risks and opportunities);
- to identify the impacts of this development;
- to develop strategic scenarios for and with local authorities.

The main conclusions of C.A.P.A. Cities studies in 15 European cities (among others, Berlin, Naples, Rome, Lille, Edinburgh) underlined the following points:

- the increasing and determining role of information closely tied with economic activities, which amplify economic trends and worsen urban fragmentation;
- the teleservice development is an irreversible process which in turn depends on world-wide economic development;

- urban territories are challenged by the teleservice development and immaterial production which can be developed anywhere in the world ("dilution of territories");

- a lack of co-ordination within cities (between key-players), between cities and between cities and other local authorities;

- a lack of awareness of what could be the risks and opportunities of teleservice development for cities.

These points reveal key questions as stakes for cities and public bodies, in particular:

- how could key players and policies for teleservice development within cities be co-ordinated ?

- how could cities orientate teleservice development, especially with regard to deregulation?

- how could cities use their market power to negotiate with service providers and telematics operators?

In order to answer these questions, the C.A.P.A. Cities consortium has developed key scenarios as policies hypotheses to be submitted and analysed by local authorities through seminars, surveys. and workshops (held in September 1995). These strategic scenarios represent six typical policies:

- **a do-nothing policy**: local authorities do not intervene in the teleservice development and this development depends on the market regulation;

- **a non-co-ordinated policy** which is indeed the most common in many European cities nowadays;

- **a focused policy**: local authorities decide to develop certain types of teleservices (i.e. public teleservices);

- **a co-ordinated policy** aimed at defining agreements between local authorities and a public/private structure investing in urban telematics networks being able to federate the whole services within the city;

- **an incitement policy** based on specific mechanisms like financial supports, cash grants, fiscal exemptions, etc.;

- **an interventionist policy** based on massive investments of local authorities and on the opportunity for a city to be service provider.

New tools tied with scenarios were also presented to local authorities, such as sensibilisation and training of population and firms to the teleservice development, RDT policies, fiscal and financial measures (leasing, venture-capital, etc.).

Each scenario influences local authorities' policies, territorial development and city management. Several conclusions can be outlined from the analyses carried out up to now:

- Many European cities consider the **do-nothing and interventionist scenarios** unrealistic and inapplicable; the first one is limited by the need to solve the increasing exclusion of parts of the population and of territories; the second one is not feasible because of financial constraints.

- According to the cities involved in the project, the best-adapted policies are represented by **a mix of the focused scenario** (because of priorities) **and of the co-ordinated scenario**. Cities emphasise the need for co-ordination between public and private key players within cities, between cities, with other local authorities, with national governments and with the European Union.

- Many cities do not have a clear idea of what kind of opportunities could be offered by deregulation. They do not acknowledge possibilities from current national laws. They do not know in detail the policies of the European Union, of the telematic operators, and of the respective national governments. However, cities would like to be considered as key players in the European political process for the development of new services.

- Many cities would like to develop federative telematic networks in co-operation with private companies (i.e. ATM networks) and to offer the opportunity to attract new services (tele-medicine, tele-training, tele-shopping, urban services, etc.) from service providers.

A reference in this case could be to the innovative policies developed by European cities like Antwerp or Stockholm, but adapted to the legal, political and economic context of each city. This is probably one of the most interesting ways to be exploited.

ASSESSING THE TERRITORIAL IMPACT OF THE INTERNATIONAL DEPLOYMENT OF INFORMATION INFRASTRUCTURE

Gérard Pogorel, Head, Department of Economics and Management, Ecole Nationale Supérieure des Télécommunications, Paris

The influence of cross-border information infrastructures on territorial development is dynamically determined by the information content of activities, existing or potential, with strong linkages to other economic factors (labour, capital, natural resources). The impact assessment has to deal with the following factors :

- Level of communication and computer usage, actual and planned. Importance of internal information networks, and connections to related activities.

- Incentives to the diversification of activities and locations, market structures, linkages to international manufacturing or service provision processes, with special mention of joint-ventures, strategic alliances, formal or informal networks.

- Possible qualitative effects on working habits and procedures.

Impacts can be differentiated among activities:

- Trend effects are to be observed in territorial activities where the relative weight of the information factor, as compared to other factors, is low. The information infrastructure appears here to be only ancillary to a relatively stable industrial capital equipment, and an industry-specific know-how. Activities of this kind might become progressively harder to identify nowadays. For activities with a long-standing tradition of territorial deployment, however, such as automobile, chemical industries and engineering, the information infrastructure seems to fit into the existing structure of firms and territories. No structural change is implied, but deployment of information infrastructure would facilitate the existing evolutionary trend.

- In-depth effects can be expected in activities where the day-to-day operation consists mostly in information processing. Monopolistic positions exist, which are based on fundamental (amount of specific information) or built-up (regulatory) obstacles to competition. The technical possibility of easy and copious flows of information gives rise to structural pressures to territorial change, including at the international level. These pressures appear to be particularly strong in transports (both domestic and international), and high level manufacturing activities (electronics are a good example).

- Deep changeovers are underway for regions, areas and firms whose business is the production, processing and communication of information itself, and generally speaking information-rich activities. Not only are the structures of the firms jeopardised, but the changes extend themselves to market structures, and manufacturing locations. New regions enter information activities. Each country and area tries hard to find the appropriate combinations to compete effectively. The definition and building of cross-border and cross-regional networks is at the heart of a particularly active game, with complex technical, commercial, and strategic bearings. Actual and potential information infrastructure users and providers compete in a particularly complex setting, where policy, marketing and technology are closely intertwined.

This game can be described as territorially affecting conduits and contents. Conduit providers, under competitive conditions which are building up, thrive to decrease prices and costs. They compete to attract content activities. Their heavy investments in infrastructures has to be matched with sophisticated terminal equipment. A fierce competition arises at two levels: firstly between global information marketplace incumbents, secondly between countries and regions aiming at territorial development and attaching and attracting global players.

It is essential to keep in mind the complementarity of factors which combine with the deployment of the information infrastructure (not forgetting education and training) in influencing the territorial development.

NEW FORMS OF PRODUCTION, EMPLOYMENT AND LAND USE

by Anita Bensaid Rozenholc,
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"Globalisation of the economy", "internationalisation of markets", "the global village" -- are just some of the terms being used to describe the "information society" that we are entering.

Without doubt, the development of this information society can facilitate job creation and lessen the tyranny of geographical constraints, yet it also contains the seeds of territorial job destruction and desertification.

1. The dematerialisation of the economy

The development of the information society entails an ever-increasing dematerialisation of production processes. Immaterial functions based on the use of computers, audiovisual equipment and telecommunications networks are playing an ever more strategic and important role in the production of traditional goods and services; it is therefore perfectly logical that such functions should play a key role in the provision of new services.

The unique features of immaterial activities justify the contention that the 21st century will be that of a new industrial revolution. The new services being supplied are both ephemeral and mobile, and can be delivered over telecommunications networks.

- They enhance the value of know-how and skill by opening up a worldwide market for non-material products.
- They are creating a new international division of labour by widening areas of competition.
- They transcend physical boundaries and thus enhance the interdependence of territorial economies.
- Lastly, they are conducive to a new mode of production: teleworking.

These intrinsic characteristics of immaterial activities are fuelling the spatial decentralisation of production processes, with activities located wherever production costs, for equal quality, are lowest, and whenever there is easy access to telecommunications networks. Obviously, the competition is never-ending: new suppliers in the market come and go, and activities are relocated from one region to another. Such movement could be seen as a factor in territorial development in that it offers locations an opportunity to make themselves particularly attractive, to host activities and to create jobs.

In this context, the role of the chief executive is gradually becoming that of a co-ordinater of segments of production located at different cities around the globe.

2. Transforming production processes

Immaterial activities have other effects on production processes: they make some functions superfluous, transform others and, in addition, provide a basis for new services and new products.

This makes it absolutely essential to reskill jobs, redeploy workers and train people for new kinds of work if unemployment is to be fought effectively and jobs created and sustained. It is therefore crucial to rapidly anticipate and prepare for new ways of doing things, since change is never-ending and the competition international.

By their strategic role in production processes, immaterial activities induce a knock-on effect leading to the creation of traditional jobs, including low-skilled employment. The additional sales made possible by larger geographical markets or areas of production foster job creation in sectors that, without the new systems, could not generate new jobs and that, in time, might even cease to exist.

As a result of these developments:

- New modes of production will become widespread as networking develops.
- For many employees, the boundaries between working hours, family life and leisure time will gradually be eroded.
- Access to knowledge and skills may become more democratic, for the greater enrichment of territories.

But these changes, this rapid transformation, can also widen social divides and increase the number of people who are jobless or excluded from society.

The era of the "tele-economy" is beginning; while it may falter at first, it is certain to develop. The task at hand is to discover how it works and to ensure that it will constitute an opportunity for employment and territorial development.

USE OF ICTs & INFORMATION INFRASTRUCTURES AND EFFECTS ON REGIONAL EMPLOYMENT

The Miyagi Case, Akihiro Sawa, Deputy-Director General, Department of Commerce, Industry and Labour, Miyagi Prefectural Government, Japan

1. The current situation in the Miyagi Prefecture

Information infrastructures have been constructed in the Miyagi prefecture in order to provide regional firms with easy access to ICTs and related services. However, there are only a few firms capable of making advanced use of ICTs due to a lack of expertise in ICTs and conservative business spirit among CEOs of regional firms.

The information industry has grown in the prefecture over the past ten years, but not so much as the national average because of a lack of advanced users in the area.

In a word, we have many potential resources, but have not fully tapped them.

2. Influence of use of information infrastructures on regional employment

There are three positive effects on regional employment and economic performance and two negative ones in the Miyagi prefecture. The positive effects are:

- advanced information infrastructures improve the attractiveness of the region for inward investments by large businesses in the core area;
- aggressive entrepreneurs set up or grow new businesses by taking advantage of advanced information infrastructures and services;
- advanced information infrastructures' users stimulate the information industry which would in turn expand regional employment.

On the negative side:

- since existing regional factories have begun to outsource beyond the boundaries of the prefecture, regional SMEs suppliers are facing serious problems;
- as electronic commerce technologies are developed, some of the sale branch offices of Tokyo-based large businesses located in the prefecture might be shut down.

3. Policy options

The effects of advanced information infrastructures on regional employment are at most mixed. At the moment, the first negative effect mentioned above has begun to work before the positive effects reveal themselves.

Policy makers in the Miyagi prefecture are now trying to work out policy measures which will enable regional firms, and especially SMEs, to catch up with and benefit from the progress in ICTs and advanced information infrastructures and services.

Table 1. The current status of SMEs use of ICTs in the Miyagi prefecture

	Miyagi average	National
PC units per firm	2.2 units	4.0 units
Use of LAN	8.2 %	25.0 %
Use of VAN	11.8 %	23.4%
Regard use of ICTs as		
- effective	75.7 %	93.5 %
- ineffective	24.3 %	6.4 %
Reasons of being ineffective		
- lack of operating staff	50.0 %	23.1 %
- software problems	33.3 %	10.3 %

Source: A survey by the Miyagi Prefectural Government

TELECOM-INFRASTRUCTURE AND TECHNOLOGIES FOR ESTABLISHING GOOD LIVING CONDITIONS IN DIFFERENT PARTS OF SWEDEN

The Government's role in this process
Myrna Smitt, Division for Regional Development Policy, Ministry of Labour, Stockholm, Sweden

Sustainable development for growth and employment is the main objective of regional development policy. The possibilities for this vary widely with geography. Sweden has densely populated areas close to the national and European markets as well as sparsely populated areas far from all markets other than local.

The Government's role in the field of using new information -- and communication -- (IC) technologies and infrastructure is threefold. As a **regulator**, it sets the legal framework for regional and IC development; as a **relocator**, it stimulates companies to locate jobs in specific areas; and as a **facilitator**, it supports pilot projects in fields where new pathways must be proofed.

1. The regulator

1.1 The deregulation of the Swedish telecom market

In preparing and planning the deregulation of the Swedish telecom market in July 1993, the Swedish Government had many reasons to evaluate and examine the implications of both regional and IC development.

Eventually, the state owner defined a set of strong conditions for deregulating the telecom market. These are pointed out in the Telecommunications Act which contains provisions also concerning the accessibilty to, and the quality and cost of the network.

To supervise the enforcement of the law, the National Post and Telecom Agency was established. This authority is also responsible for licensing operators.

However, after the deregulation, the old monopoly company, nowadays named TELIA, is still dominating the market. TELIA has the responsibility for supplying a network and is obliged to let other companies use it (public service).

1.2 The risks of deregulation

A deregulated environment often brings about the risk of non-competition in the less profitable segments of the market. From a regional development standpoint, this means a negative development of access and rising costs for "small" ICT-users in peripheral areas of Sweden. With no possibility of cross-subsidisation the emerging problems are mainly of a political nature.

An additional risk is represented by the fact that most of the jobs which are relocated are low-skilled jobs which do not contribute to upgrade the long-term competitive position of the areas where they are located.

These trends are closely monitored and analysed by the regional development authority, the Swedish Board for Industrial and Technical development (NUTEK). Its first survey was published one year ago and a second one, required by the Ministry of Transport and Communication, was finished few weeks ago.

2. The relocator

2.1 The Government policies

Regional development initiatives are undertaken by the Government by means of financial support, guidelines, and so on. In particular, stimulating small scale application for SMEs and rural enterprises has been an important part of the Government's action in using IT for regional development objectives.

The Government has also supported the location of call centres and branches of big companies in peripheral areas. One thousand jobs per year have been created during the last part of the 1980s (five thousand jobs up to now). These programmes are now under evaluation.

The national regional development boards, NUTEK, the National Board of Rural development and the County Administration Boards have stimulated ICT use in a very broad range of domains: education, SMEs, decentralisation of public services -- to mention but a few.

The Government is now launching studies on the effects of ICT development on the organisation of work. These issues are also handled in a special committee investigating the laws which regulate the labour market.

The fact that the Swedish Ministers of Labour and of Cultural Affairs work at a distance is an example of practical action.

2.2 The structural fund programmes

In the programmes for the structural funds, ICTs are extensively used in all objective areas in Sweden. So far the objective 6 programme has been adopted and there is a consequent use of ICTs in these areas, following the European Commission's White Paper on Growth, Competitiveness and Employment.

3. The facilitator

3.1 The IT Commission

The questions of ICT are very high ranked in the Swedish Government. The position of the Government is that use of ICT -- and consequently of the related infrastructure -- should be intensified.

Even if Sweden is far ahead of many other countries in the world as far as "PC-density" and mobile phones are concerned, there are important margins for improving the efficiency of the whole use of ICT system. A lot is expected from the education system, both in school, public administration, and in the new forms of tele-learning, in making Sweden more efficient and competitive in using the opportunities offered by ICTs. Changes are also needed in the legislation to adapt to the new circumstances.

Special efforts are made to raise the awareness of young people -- for example, through the establishment of a junior counselling IT committee.

3.2 Financial support

Over the past two years, Sweden has allocated a fairly big funding (750 millions Skr) for ICT-related projects, especially in the field of education, but also for regional development.

3.3 The very moment

Governments initiatives coupled with current attitudes concerning quality of life, the environment, life-long learning issues, and equality of men and women, provide policy-makers with a positive climate for supporting the use of ICTs in regional development policies.

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