

GEOGRAPHY OF THE INFORMATION SOCIETY: A NEW CULTURE OF HYBRID SPACES?

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1. Geography of Information and Communication

The technology of mobile telephony, wireless networks, and the use of computerized geographical systems are reshaping the relations between human populations and the places they live in, which has always been the unifying factor in the science of human geography.

Places reflect human communities' cultural practices in a completely different way from the idea of space conveyed by technological products in terms, for example, of an environment made up of the physical features of the reception areas that are required by some communication technologies. In other words, places have characteristics and they can evolve in a different way from what many of the current technological contents and approaches imply. There thus emerges a gap between the aims and the imagination of technology on the one hand, and human needs and structures on the other. At the same time, the new technologies offer great opportunities: they make it possible to contribute to the creation of new interactive maps for use in local planning, to combine technology and artistic expression in new ways, to develop and strengthen new forms of active citizenship through digital communities and networks for the transmission of information. These opportunities should not be lost, but enhanced and pursued.

There is still no definitive analysis of the impact of the pervasive growth of technology on planning urban space and on creating hybrid places where technological and social networks connect with inhabited spaces. How current trends in the impact of information and communication technology can be analysed and how information and communication can be designed to enrich the quality of life in places where people live are issues underlying the geography of Information Society.

The theoretical departure point is the work of the commission of the International Geography Union, 'Geography of Information Society' (Bakis 1997, Corey and Wilson 2000, Graham and Marvin 1996, Eveno 1997, Kellermann 1997, 2002, Wilson 2001). Previously, the relations between production and role of the local area in the Information Society had been widely discussed in the literature, starting from Gottmann, Bell and more recently Kellerman, 1985, 1987, 1993, 1997; Masuda, 1980; Castells and Hall 1994; Storper 1997; Camagni, 1991; Aydalot, 1986, Antonelli, 1986, Cooke 1988, Dosi et al., 1988; Maillat, Quevit and Senn, 1993, Lundvall B.A., 1992, Maillat and Lecocq 1992, Maskell et al. 1988, Todling 1995, Borlenghi 1990, Conti, 1997). The literature dubbed 'cybergeography' and 'communication geography', has firstly made it possible to conduct studies ranging from abstract visions of information flows to concrete impacts on the local area and to the identification, not of a city but of single technological components. Secondly, it has produced excellent results to disprove certain beliefs concerning the replacement of mobility with the introduction of ICT (Graham and Marvin, 1999), the dynamics of consumption, production and transmission of contents and the related localization needs on the part of suppliers (Zook, 2000, 2001; Kellerman, 2002), global and infraurban Internet mapping (Dodge and Kitchin, 2001).

The pioneering studies that dealt with the elaboration of indicators for the analysis and classification of places, according to an urban geography tradition, were carried out by Zook (2000 a, 2000b and recent works on the site <http://www.zooknic.com>). Zook mapped internet users and the related Internet domains by city, reaching a database of 2500 cities worldwide. In the early stages of the Internet the United States was predominant in number of sites and pages visited, but the surprising city record held by Korea compared to the traditional European cities, which show the digital progress of rising stars and urban areas. Zook also geo-codified the domains of non-US cities; Dodge and Shiode (2000) also showed that the spatial distribution of the production of internet content is decentralized only in Germany, demonstrating that digital advances follow the pre-existing organization of urban space. Recent thinking has started to show that the geographical model of the Internet changes over

time, due also to the specific local and national planning strategies for strengthening *unthethered cities* (Townsend, 2003).

Since the late 1990s and early 2000s, the Information Society has entered a new phase: information itself is the main product, the informatic media can blend together, information becomes culture and represents the raw material for local organizations and networks. (Bakis, Abler and Roche, 1993; Offner and Pumain, 1996). This fusion can lead to the organization and supply of services to the local area based both on a particular application for information, production (for instance in industrial areas, Micelli and di Maria, 2000, Rullani, 2000) and consumption, and for so-called public networks of data, services and communication (Halal, 1993; Kellerman, 1997).

More recently, geography literature has revealed the relations existing between Information production, consumption and transmission, and the relative content and specific areas of the Internet (Kellerman, 2002). This includes the seemingly paradoxical creation of opportunities and constraints due to physical geographical barriers for the creation and use of digital environments (Wilson, 2003). Detailed case studies and theoretical developments also account for the local economic organization deriving from the new technologies (for instance, the most recent works of Arai-Sugizaki, 2003, Lorentzon, 2003a e b, Hashimoto, 2003).

The main results of geographic research show that in transmission space, places are becoming more and more important, with one main difference compared to the pre-Internet era: it is becoming less and less easy to interpret places as separate, independent entities. Interconnection is the outstanding feature of current geography. On the one hand, traditional rules about urban size and ranking persist in the interpretation of urban space, while on the other, individual mobility and the mobility of the individual piece of information have radically changed: the basic geographical differences between different types of information have not changed but everything moves at an astonishing speed compared to the past. An example of the validity in some respects, of the rank-size rule, comes from the regressive analysis in Kolko (1999) of the density of commercial domains registered in American towns. This shows that these domains are directly proportional to population size and inversely proportional to the town's degree of isolation in terms of average distances; the brilliant pioneering work of Zook (1999) also shows that the domains registered within a single nation reflect the hierarchies of urban systems.

The importance of place in the process of localization is just as important as it was in the past: traditional urban centres or main infrastructural nodes had the advantage in attracting new business, developing the specific positive or negative features of the place. The City-Network system, which fuels the new economy and feels its impact, reproduces itself due to two seemingly contradictory dynamics: the tendency to centralize and the tendency to decentralize functions into local areas; ICT gives more localization freedom, it attenuates but does not eliminate the influence of local features and the advantages of proximity (Graham e Marvin, 1996, 1999).

Digital networks are still highly concentrated and distributed more unevenly than the main infrastructural networks in towns, due, in part, to the privatization and deregulation of the telecommunications sector. In contrast to the prevailing argument, however, it has been observed that a small group of cities on the Internet currently control the development of communications, playing the role of important 'hubs' and surprisingly enough, global cities are importing new technologies created elsewhere (Townsend, 2003). Analysing the social geography of the Internet, Warf (2001) shows that as far as the USA is concerned, access to the Internet correlates to power and income category, and this is also repeated in cyberspace. According to Graham and Marvin (1996), the inequalities that emerge in traditional and in digital spaces reinforce each other. Moreover, the interrelation of knowledge production and information production and the production of both coincide spatially. Initial scientific work on digital networks, ICT infrastructures and regional planning was carried out by the geographers Corey and Wilson, 2003, Townsend in his doctoral thesis (2003), and by Mitchell in his in-depth analysis of the future, a true precursor of urban changes. Town planners and urban designers have so far remained essentially indifferent to the issue of digital networks and urban environments (Townsend, 2003). Bill Mitchell (1995) supplied an early systematization; contributions to the scientific and practical elaboration necessarily have to come from a variety of fields such as geography, computer science, and urban sociology.

From the point of view of conceptually representing geographical space, Graham (1998) conceptualizes the dynamics between cyber spaces and places from three basic angles: 'substitution and transcendence', 'co-evolution', 'recombination', in that geographical studies perceive cyberspace as a sort of added 'layer' that interferes with traditional geographical spaces, in a way often leading to joint reinforcement (Batty, 1993). For Batty (2001), the idea of a 'small world' is exemplified in a network of clusters and nodes which are deeply rooted in the local area and densely connected, but which are able to connect rapidly over long distances and to interact with other places due also to their local density. The result is an increased density of local contacts and actions and of global connection.

Graham and Marvin (1996) see cyberspace as basically metropolitan, having developed from the traditional city but perpetually reshaping, rather than annulling, the local area. So what is the geographical value of web spaces? How does and how can interaction between traditional and virtual spaces occur? How great is the geographical diversity of web spaces and how far does globalization affect the regional diversity of the web? Bonora (1991 e 2001) suggests that ICT introduces opportunities but also new limits due to the decision to decentralize and develop infrastructures, and underlines the uniqueness of the Italian situation which, with the great age of its urban structure and heritage, calls for specific ICT solutions. In a time of the dismantling of welfare systems, the possibility of providing the declining population in rural areas with services (tele-medicine, distance learning) should not be underestimated.

The previous ideas can be examined in greater detail, with reference above all to the ground-breaking work of Aharon Kellerman (2002):

- *information and technology*: face to face contact and 'cross-fertilisations' are vital in the creative stages, hence the importance of locating Research and Development activity in specific regions that have a geographical environment with certain features. Technology enables research centres to get onto the Net, thus allowing greater distribution of high-tech centres. The famous case of Silicon Valley (Lee, Miller, Hancock and Rowen, 2000) shows that in the creative process taking place between individuals, a fundamental role is played by the habitat, or by the setting which in the geographical sense also involves quality of life. Recent research by R. Florida (2002) underlines the importance of having a geographical environment with certain characteristics for the attraction of 'talents', individuals capable of triggering off the creative processes.
- *Production of technology*: the Internet developed from the pre-existing localization of knowledge, technology and artistic capacity and allowed the previous media to converge. This underlined the importance of cities that already had a considerable comparative advantage. There are some similarities between the central features of the world of finance and those of Internet production: the advantage of the 'pioneers', the first cities that invested in the sector; the global spread of consumers; the concentration of high-level know-how; the geographical spread of Internet-related industry, but the geographical concentration of the main centres of innovation, production and advanced-site-management; however, there is no significant association between web site content and the traditional specializations of the cities, as there is in the financial sector.
- *Digital contents*: the relation between geography and Internet content is complex. On the one hand, the supposed freedom of location for information systems follows the dictates of geography; on the other, Web contents are extremely varied and are not influenced by being located in a regional area, not necessarily reflecting the place of production of the information. From another point of view, the most commonly used contents like finance and commerce depend on the features of the locality for their operations, both in terms of infrastructures for telecommunications and distribution and in terms of face to face contact. Contents and traffic may be ubiquitous but human knowledge is 'spatialized'. Economic activities on the Web and in general in ICT systems do not require spaces, for instance for warehousing, but do require localization concepts and spaces for headquarters, distribution centres, and for server farms (Hashimoto, 2002, 2003).

Paradiso (2003 a and b) and Paradiso and D'Aponte (2003) deal with the introduction and development of approaches and ways of planning both digital environments and the

interconnection of traditional and digital environments as a tool with which regional planning can improve the quality of life and increase the participation of citizens in decision-making. An operative tool in the process of planning for the development of communication and information is the framework for the comparative evaluation of sites (also with Einemann, Paradiso, 2004 for further advances from the point of view of making comparisons at an international scale); the proposed hybrid environment involves a geographical model of digital city outlined first in more abstract terms (Paradiso e D'Aponte, 2003) and in terms of prototypical development (Paradiso, 2003).

- *Transmission of Information and Communication*: transmission space has not only produced a gap between geographical areas, but also dualism within urban areas, in that it is organized according to the rules of the urban hierarchy as regards information and activity content. Digital networks have developed within existing urban geographies without significantly affecting them, and within a system lacking in local planning and further weakened by deregulation. In the USA there has been a 10, 20, 30-fold duplication of infrastructure networks (Townsend, 2003). An example of excellence in providing access to the Information Society for citizens and places is found in Sweden, which currently holds the world record. Recent research in Italy, entitled "Digital Citizens" (Censis, 2003), has shown that Basilicata is the leader in terms of Internet access per head of population: no doubt thanks to the concentrated effort of the Regional authorities to provide their citizens with infrastructures.
- *Consumption of Information and Communication*: it is interesting to notice the variety of approaches to adopting technology products from geographical areas. The popularity of broadband in Korea differs from that in Japan; northern Europe has adopted new technology rapidly and to a high overall degree; in the US there is a great difference in levels of Internet use between cities on the Pacific and the Atlantic coast.

The impacts of Information and Communication technology on local behaviours can be summed up in the following way. Space-time compression, the main spatial impact of the new technology, does not imply reducing space to a body of points, but it means new digital territories such as 'tele-cities' which overlay and interact with real local systems. Consequently although the main objective of research in local planning - the space-time management of human relations - changes in content, it does not disappear (TAN group, 2001).

The possible fusion between different technologies of information, production and distribution may lead to a unified service space, which may be public, for information, consumption and production (Kellerman, 1997).

Development prospects for the Information Society reflect the contrast in socio-economic market regulation mechanisms and in the attachment of business to localized contexts. Geography studies show that the Net can be interpreted on two interconnected levels (Kellerman, 2002):

- a) the configuration of situation and reproduction modes of the local contexts of physical reality;
- b) the configuration of the situation and reproduction modes of geocyberspatial contexts;
- c) A third level can be added:
- d) the interconnection of the two levels of space, effected by keeping in mind the following activities: identification of Internet geometry, designing of Internet Geography, criteria for localization decisions (Paradiso 2003a).

The geometry of the Internet is identified on the basis of the origin/destination of traffic between physical places, on the choice and definition of the physical process of localization and development of communication (similar to what happened with the introduction of innovative technology for the distribution of electricity, and radio and telephone communications); this geometry ends up being translated into the physical geography of the Internet, of which mapping is currently underway worldwide (Dodge 1998, 1999, Dodge and Kitchin 2001, Zook, 2001, 2002).

Designing the Geography of the Internet implies: designing local structures characterized by geographical accessibility (access platforms), strategic localization and concentration

(regional hubs at a global level and then down the scale, with central localities which attract ICT management and development activity, such as the cities of New York, Singapore, and Hong Kong), diffusion and interaction (points in the region to act as 'gates' or Internet access points, such as interactive kiosks, or to channel on-line services to the region, such as call centres), local consolidation and growth (regional portals, e-government of on-line cities, citizens' networks, e-markets oriented to the e-selling of local products).

The criteria for decisions on localization of Internet access points, management modes and the creation of Internet contents that promote quality of life and economic development (digitalization of urban-rural welfare services), localization of places (virtual industrial areas, natural parks or theme parks) appear to be strategic factors for a sustainable Information Society.

What becomes crucial is the planning of the interconnection of real and virtual spaces, in particular by applying localization strategies to design places which can bring benefits, thanks to Internet content and support applications and technology. These benefits include the emergence from isolation, and upgrading, salvage and development (for example, localizing access units and family and business service contents in abandoned areas, or in rural villages which have been converted to the new economy – so-called electronic villages).

From the point of view of regional planning for the development of Information Society applications, the methodology proposed consists of designing hybrid spaces, of which an excellent example is the 'Digital City'.

ICT exerts its influence on 'real' spaces through networks and places of digital interaction and information and, at the same time, real spaces not only underlie physical and immaterial interaction but also the formation of the life experience of the local population. Consequently, interconnection, which still remains to be satisfactorily studied and designed, leads to the hybridization of behaviours and the creation of new digital areas that are however tied to traditional areas, which they expand.

In view of the transformations underway, we are therefore aware of the need to reorganize the the scientific mode of analysis, observation and proposition, which appear to be too reductive if oriented exclusively to the quality of ICT services. They also need to be oriented to the area's mode of reproduction in digital spaces and to the opportunity to use web spaces for local planning purposes: the subject of the city has always been a crucial focus of geographical thinking! This need suggests analytical methodologies in the geographical approach to assessing virtual spaces. The theoretical and methodological framework needs to be reshaped in order to interpret forms, functions, the characteristics of local identity, the impacts of the dynamics of interconnection of traditional and digital spaces, convergence with and divergence from the usual behaviour and existing models of local organization.

2. Hybrid places: the example of the Digital City

In order to introduce and understand information technologies in present and future cities, Corey (2001, 1998) Corey and Wilson (1997) provide a comparative study of Malaysia, Singapore and the Unites States and a general model for the examination of the digital city. This model identifies three facets of information technology: technical possibilities, economic feasibility, social acceptability. The authors particularly stress the sociopolitical element of ICT, which is crucial in planning for ICT development both from the point of view of regional agreements and from that of practical implementation, including access and spatial distribution.

According to Kellerman (2002), the special importance of interconnection and joint development of real and virtual space can be seen in the dominant method of the geography of information, which sums up the real, the virtual, and the middle course between the two, reflecting geography's role in production, consumption, distribution, knowledge, and metaphorical experience. In particular, the various correlations between real spaces and virtual spaces can be expressed in terms of the interdependence of their operations, the joint development of both spaces, the double construction and elimination of places and activities in both spaces (Kellerman, 2002, p. 37). From the point of view of terminology, the ideas in Levy (1997) are particularly stimulating: he maintains that virtualization implies de-regionalization and the questioning of reality. The complement of the term 'the real' is 'the

possible' since everything is real, including cyber-experience. Digitalization is a reinforcement of reality: it follows that it would be preferable to use the terms 'traditional' rather than 'real' and 'digital' rather than 'virtual' in stressing the traditional spaces in cyberspace.

At the initial general stage, we can suppose that the planning of a digital city is based on the following points, many of which are highly geographical: creating infrastructure for the Internet in view of the geographical features; mapping and computerizing public Administration services and functions and related areas; creating information centres for data elaboration; creating interest and training on the potential of the new technologies; implementing policies of promotion and planning that start from the characteristics and needs of specific places; creating city hubs in disadvantaged areas or areas of transit to give added value to plans for urban renewal.

The concept suggested in Paradiso and D'Aponte, 2003, is that of the 'geo-advanced' digital city, i.e. a space mediated by the geographical settings considering certain spheres of interaction:

- the spatial experience of the place in terms of accessibility, mobility, traffic, localized resources (categories of accessibility, basic contents);
- dynamics of business spaces (category of transactivity, safety tests and digital signature);
- dynamics of civic and public spaces (category of sociopolitical relations and interactivity);
- dynamics of geographically advanced representation in terms of auto-organization of place, self-reflexive planning of the urban future, planning proposals and related initiatives (category of geographically advanced contents, distinguishing feature of the geoadvanced digital city).

The scientific and practical frontier of Regional Planning for the Development of Communication and Information concerns how to understand, visualize and redesign the purpose and format (Townsend, 2003) and the contents (Paradiso, 2003) of digital networks to improve local conditions and growth.

The users' growing demand leads to a greater non-commercial sector, namely of individuals who need to connect up wherever they are and to use new types of public spaces like cafes, public parks and pubs which offer free Internet access and where the separation of spaces according to a specific function is breaking down. Studies on the effects of privatization have also shown that the phenomenon of access is above all urban and in particular that there is not only a digital divide between rural and urban areas but also within neighbourhoods of the same urban area. The research and Planning frontier is linked to the study of the transformation of territorial behaviour deriving from the new man/computer interaction. This is connected to 'ubiquitous computing' or to contexts in which a number of people interact, to 'smart' contexts involving the development of sensors, to the use of GIS and GPS, GPRS (Global Positioning System and Global Positioning Radio System respectively). In any case, the shift from non-portable technologies dependent on hands and keyboard, to 'invisible' technologies (such as liquid crystal LCD billboards) which can be activated without an individual request, will reshape both the urban landscape and the way people live in places and the same meshing body-city. A deeper geographical cultural approach to these issues is to be enhanced.

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