

The Topoi of e-space

Global cities and global value chains

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Electronic space is easily read as a purely technological event and in that sense as self-contained and neutral. But this is a partial account. In this brief essay I will argue that what is left out of this technological reading is that electronic space is embedded in the larger dynamics organizing society. Whether in the geography of its infrastructure or the structuration of cyberspace, it is inscribed and to some extent shaped by power, concentration, contestation, as well as openness and decentralization. Thus it is by now well known that the particular features of the Internet are in part a function of the early computer hacker culture which designed software that strengthened the openness and decentralization of the Net and which sought to make it universally available. It is also clear that in the last two years, when business discovered the Net, we are seeing attempts to commercialise it through the development of software that can capitalize on the net properties and through the extension of copyrights - in other words, the opposite of the early hacker culture.

In this regard, it seems to me that we need to re-theorize electronic space and uncouple it analytically from the properties of the Internet which have shaped our thinking about electronic space. We tend to think of this space as one that is characterized by distributed power, by the absence of hierarchy. The Internet is probably the best known and most

noted. Its particular attributes have engendered the notion of distributed power: decentralization, openness, possibility of expansion, no hierarchy, no centre, no conditions for authoritarian or monopoly control.

Yet the networks are also making possible other forms of power. The financial markets, operating largely through private electronic networks, are a good instance of an alternative form of power. The three properties of electronic networks: speed, simultaneity and interconnectivity have produced strikingly different outcomes in this case from those of the Internet. These properties have made possible orders of magnitude and concentration far surpassing anything we had ever seen in financial markets. The consequence has been that the global capital market now has the power to discipline national governments, as became evident with the Mexico 'crisis' of December 1994. We are seeing the formation of new power structures in electronic space, perhaps most clearly in the private networks of finance but also in other cases.

The concern in this brief essay is to elaborate the proposition that electronic space is embedded and to do so through an examination of what I think of as cyber-segmentations. The focus here is particularly on economic electronic space, and the digitalisation of a growing component of the economy. This focus provides a particular set of analytic pathways to the broader notion that electronic space is embedded. These are pathways grounded in realms of practice rather than in ideas about electronic space. It is the beginning of a research inquiry and presents only elements of a new theorization. Whether this analysis is pertinent, or can be used for other types of electronic space and realms of practice is a question I cannot answer and probably is a question for research.

There is another side to this story which I will only touch on briefly which has to do with the fact that the ascendance of digitalisation and virtualisation is also, in turn, inscribing lived experience and the mental categories through which we experience and understand, as well as engendering new mentalities till now largely confined to particular subcultures. Here I examine three ways in which the embedded-ness of electronic space can be captured:

>>> There is no fully virtualised enterprise nor fully digitalized industry. Leading economic sectors that are highly digitalized require strategic sites with vast concentrations of infrastructure, the requisite labour resources, talent, buildings. This holds for finance but also for the multimedia industries which use digital production processes and produce digitalized products.

>>> The sharpening inequalities in the distribution of the infrastructure for electronic space, whether private computer networks or the Net, in the conditions for access to electronic space, and, within electronic space, in the conditions for access to high-powered segments and features, are all contributing to new geographies of centrality both on the ground and in electronic space.

>>> Commercialisation of public networks and hierarchical concentrations of power in private networks are producing what I think of as cyber-segmentations-instantiations of dynamics of inequality and of power.

After an examination of these three subjects the final section incorporates these issues in a larger discussion about space and power.

1. The Topoi of E-space: Global Cities and Global Value Chains

The vast new economic topography that is being implemented through electronic space is one moment, one fragment, of an even vaster economic chain that is in good part embedded in non-electronic spaces. There is no fully virtualised firm and no fully digitalized industry. Even the most advanced information industries, such as finance, are installed only partly in electronic space. And so are industries that produce digital products, such as software designers. The growing digitalisation of economic activities has not eliminated the need for major international business and financial centres and all the material resources they concentrate, from state of the art telematics infrastructure to brain talent.

Nonetheless, telematics and globalisation have emerged as fundamental forces reshaping the organization of economic space. This reshaping ranges from the spatial virtualisation of a growing number of economic activities to the reconfiguration of the geography of the built environment for economic activity. Whether in electronic space or in the geography of the built environment, this reshaping involves organizational and structural changes. Telematics maximizes the potential for geographic dispersal and globalisation entails an economic logic that maximizes the attraction/profitability of such dispersal.

One outcome of these transformations has been captured in images of geographic dispersal at the global scale and the neutralization of place and distance through telematics in a growing number of economic activities. Yet it is precisely the combination of the spatial dispersal of numerous economic activities and telematic global integration which has contributed to a strategic role for major cities in the current phase of the world economy. [3] Beyond their sometimes long history as centres for world trade and banking, these cities now function as command points in the organization of the world economy; as key locations and marketplaces for the leading industries of this period (finance and specialized services for firms); and as sites for the production of innovations in those industries. The continued and often growing concentration and specialization of financial and corporate service functions in major cities in highly developed countries is, in good part, a strategic development. It is precisely because of the territorial dispersal facilitated by telecommunication advances that agglomeration of centralizing activities has expanded immensely. This is not a mere continuation of old patterns of agglomeration but one could posit, a new logic for agglomeration. A majority of firms and economic activities do not inhabit these major centres.

Centrality remains a key property of the economic system but the spatial correlates of centrality have been profoundly altered by the new technologies and by globalisation. This engenders a whole new problematic around the definition of what constitutes centrality today in an economic system where

- > a share of transactions occur through technologies that neutralize distance and place, and do so on a global scale;

- > centrality has historically been embodied in certain types of built environment and urban form. Economic globalisation and the new information technologies have not only reconfigured centrality and its spatial correlates, they have also created new spaces for centrality.

As a political economist interested in the spatial organization of the economy and in the spatial correlates of economic power, it seems to me that a focus on place and infra-

structure in the new global information economy creates a conceptual and practical opening for questions about the embedded-ness of electronic space. It allows us to elaborate that point where the materiality of place/infrastructure intersects with those technologies and organizational forms that neutralize place and materiality. And it entails an elaboration of electronic space, the fact that this space is not simply about transmission capacities but also a space where new structures for economic activity and for economic power are being constituted.

2. A New Geography of Centrality

We are seeing a spatialisation of inequality, which is evident, both in the geography of the communications infrastructure and in the emergent geographies in electronic space itself. Global cities are hyper-concentrations of infrastructure and the attendant resources while vast areas in less developed regions are poorly served. But also within global cities we see a geography of centrality and one of marginality. For instance, New York City has the largest concentration of fibre optic cable served buildings in the world; but they are mostly in the centre of the city, while Harlem, the black ghetto, has only one such building. And South Central Los Angeles, the site of the 1993 uprisings, has none.

There are many instantiations of this new unequal geography of access. Infrastructure requires enormous amounts of money. For example, it is estimated that it will cost US\$ 120 billion for the next ten years just to bring the Central and East European countries communication networks up to date. The European Union will spend US\$ 25 billion a year to develop a broadband telecommunications infrastructure. The levels of technical development to be achieved by different regions and countries, and indeed, whole continents, depend on the public and private resources available and on the logic guiding the development. This is evident even with very basic technologies such as telephone and fax: in very rich countries there are 50 telephone lines per person; in poor countries, fewer than ten. In the US there are 4.5 million fax machines and in Japan, 4.3 million, but only 90,000 in Brazil, 30,000 in each Turkey and Portugal, and 40,000 in Greece.

And then there are the finer points. The worldwide deployment of integrated services digital networks (ISDN) depends on interoperability and on a technology base. Both of these conditions severely restrict where it will actually be available. For example, even in Europe where there is a common communications policy calling for harmonization, ISDN deployment varies greatly: in France it has reached 100%; in Greece it is virtually nonexistent. Another instance, the establishment of the General European Network which provides 8 channels of two megabits per second each, does so only among nodes in Frankfurt, Paris, London, Madrid, and Rome - a select geography. The availability of leased two Mbps circuits in Europe is highly uneven - from 40,000 circuits in Great Britain to 17 in Ireland (as of the early 1990s).

Space is not simply about transmission capacities.

The growing economic value and hence potential profitability of communications are creating enormous pressures towards deregulation and privatisation. The fact that the top players need state of the art communication systems further creates pressure for immense amounts of capital and high-level expertise. This has meant that pub-

lic telecoms all over the world are finding themselves between the pressures to privatise coming from the private sector and the insufficiency of public funds to develop state of the art systems -- systems which may well largely benefit top players. Even in countries such as France and Germany, with long held preferences for state control, we are now seeing partial privatisation.

Similar developments are taking place in countries as diverse as Japan, Australia, New Zealand, Singapore, Indonesia and Malaysia. The notion, particularly in less developed countries, is that privatisation will help them gain access to the foreign capital and expertise they need to develop their national infrastructure. Thus Mexico, Argentina, Venezuela, India and even China are considering such initiatives.

Deregulation and privatisation are facilitating the formation of megafirms and global alliances. Further, new technological developments are facilitating convergence between telecommunications, computers and TV leading to the formation of a mega multimedia sector. Globalisation is a key feature of the new multimedia sector. And all developments signal that this will only grow. These global players and the state of the art infrastructure and technologies they will have access to, can only increase the distance between the technological have and have-nots among firms and among consumers.

Finally, once in cyberspace users will also encounter an unequal geography of access. Those who can pay for it will have fast speed servicing, and those who can't will increasingly find themselves in very slow lanes. For instance, Time Warner ran a pilot project in a medium sized community in the U.S. to find out whether customers would be willing to pay rather high fees for fast services; they found that customers would, that is, those who could pay. The next section examines some of these issues.

3. Emergent Cyber-segmentations

One way of beginning to conceptualise the possibility of forms of structuration in electronic space is to specify emerging forms of segmentation. There are at least three distinct forms of cyber-segmentation we can see today. One of these is the commercialising of access, a familiar subject. A second is the emergence of intermediaries to sort, choose, evaluate information for paying customers. A third, and the one I want to focus on in some detail, is the formation of privatised firewalled corporate networks on the Web.

Regarding commercialisation of access, what matters for me here are not the current forms assumed by paid services, but what lies ahead. Current commercial forms of access are undergoing change. Microsoft, after being an Internet laggard is now offering free Internet access and browser programs. And AT&T, the world's largest telephone company,

Once in cyber-space, users will also encounter an unequal geography of access.

has just announced it will offer free access to the Internet to its customers. All this free access offered by giants in the industry is tactical. There is right now an enormous battle among the major players to gain strategic advantages in what remains a fairly unknown, under-specified market. Microsoft's strategy in the past has been to set the standard, which it did for operating systems. The issue today, it seems, is once again to set standards, and to do this by providing the software for free in order

eventually to control access and browsing standards and thus be able to charge.

We cannot underestimate the extent of the search for ways to control, privatise, commercialise. Three major global alliances have been formed that aim at delivering a whole range of services to clients. While the mechanisms for commercialisation may not be available now, there is enormous effort to invent the appropriate billing systems. It is worth remembering that in the U.S. the telephone system started in the late 1800s as a decentralized, multiple-owner network of networks: there were farmers telephone networks, mutual aid societies telephone networks, etc. This went on for decades. But then in 1934 the Communications Act was passed defining the communication systems as a 'natural monopoly situation' and granting AT&T the monopoly. AT&T is up to 60% a billing company: it has invented and implemented billing systems. And much effort today is likely to be addressing the question of a billing system for access to and use of what is now public electronic space.

The approach towards gaining control is through strategic partnerships. Growth strategies and global alliances are not only geared to provide computer services and telephone calls, but also data transmission, video conferencing, home shopping, television, news, entertainment. Mergers and acquisitions have risen sharply in the global IT industries, as companies are seeking the size and technology to compete in global markets. In 1995 these transactions reached record numbers, with 2,913 deals, that is a 57% increase over the 1,861 recorded in 1994. The total value of these deals was US\$ 134 billion, which is a 47% increase over the US\$ 90.5 billion in 1994. Deregulation is a key step towards the expansion in service coverage and the formation of global alliances. But experts are forecasting that after a period of sharp global competition, a few major global players will monopolize the business. AT&T already has the nation-wide infrastructure and a billing system in place to provide and charge for services.

Intranets: Towards Firewalled Citadels on the Web?

Perhaps one of the most significant new developments is the use of the Web and firewalls by firms to set up their own internal computer networks. Rather than using costly computer systems that need expert staffing and employee training, firms can use the Web to do what those systems do at almost no cost and with little need for expert staffing. Firms save enormous amounts of money by using the Web for their own internal corporate purposes.

Is this a private appropriation of a public good? It seems to me there are definite elements of this here, especially in view of the millions of dollars firms can save. Are the firewalled intranets the citadels of electronic space? The formation of private intranets on the Web is probably one of the more disturbing instances of cyber-segmentation. I would like to give some details about it here since it is a very recent development but one that is growing very rapidly.

About a year ago business discovered that the WWW is a great medium to communicate with customers, partners, investors. Now they are using the WWW to set up internal networks, surrounded by firewalls. Beyond very elementary uses such as information about new developments, directories that can be updated easily, these intranets create access to a firm's various databases, and make these easy to use for everyone in the firm, no

matter what computer systems, software or time zone they are in. Firms can avoid complicated, costly and time consuming retrieval procedures which have often meant that these databases were de facto of little use in decision-making. Lotus Notes, the leading provider of internal computer network technology has far more complexity than is often necessary; and it is expensive and requires expert staffing.

Private intranets use the infrastructure and standards of the Internet and WWW. This is cheap and astoundingly efficient compared to other forms of internal communication systems. Because Web browsers run on any type of computer, the same electronic information can be viewed by any employee. Intranets using the Web can pull all the computers, software and databases of a corporation into a single system that enables employees to find information wherever it is in the system. Computer and software makers have been promising this for a while but have not yet delivered it. Now firms have found that the Web can do it for them.

This all has had sharp effects in changing the software industry. At first software makers focused on Web browsers and other programs aimed at making the Web a consumer medium. Now it's increasingly aimed at building intranets for firms using the Web. Thus the firewalled sites on the Web is only going to continue to expand at growing speed.

Conclusion: Space and Power

Electronic space has emerged not simply as a means for transmitting information, but as a major new theatre for capital accumulation and the operations of global capital. This is one way of saying that electronic space is embedded in the larger dynamics organizing society, particularly the economy.

There is no doubt that the Internet is a space of distributed power that limits the possibilities of authoritarian and monopoly control. But it is becoming evident over the last two years that it is also a space for contestation and segmentation. Further, when it comes to the broader subject of the power of the networks, most computer networks are private. That leaves a lot of network power that may not necessarily have the properties/attributes of the Internet. Indeed, much of this is concentrated power and reproduces hierarchy rather than distributed power.

The Internet and private computer networks have co-existed for many years. But there is something different today, and that drives my concern with the need to re-theorize the Net and the need to address the larger issue of electronic space rather than just the Net, or public electronic space. The three subjects discussed above can be read as an empirical specification of major new conditions: the growing digitalisation and globalisation of leading economic sectors has further contributed to the hyper-concentration of resources, infrastructure and central functions, with global cities as one strategic site in the new global economic order; the growing economic importance of electronic space which has furthered global alliances and massive concentrations of capital and corporate power, and contributed to new forms of segmentation in electronic space. These have made electronic space one of the sites for the operations of global capital and the formation of new power structures.

What these developments have meant is that suddenly the two major actors in elec-

tronic space - the corporate sector and civil society - which until recently had little to do with one another in electronic space, are running into each other. Then as today, corporate actors largely operate in private computer networks. But two years ago business had not yet discovered the Internet in any significant fashion, the World Wide Web - the multimedia portion of the Net with all its potentials for commercialization - had not yet been invented, and the digitalization of the entertainment industry and of business services had not exploded on the scene.

This is also the context within which we need to read the recent and sharp trends towards deregulation and privatisation which have made it possible for the telecommunications industry to operate globally and in a growing number of economic sectors. It has profoundly altered the role of government in the industry, and, as a consequence has further raised the importance of civil society as a site where a multiplicity of public interests can, wittingly or not, resist the overwhelming influence of the new corporate global actors. Civil society, from individuals to NGOs, has engaged in a very energetic use of cyberspace from the bottom up.

To the extent that national communication systems are increasingly integrated into global networks, national governments will have less control. Further, national governments will feel sharp pressure to help firms become incorporated into the global network, to avoid the risk of being excluded from the increasingly electronically operated global economic system. If foreign capital is necessary to develop the infrastructure in developing countries, the goals of these investors may well rule and shape the design of that infrastructure. This is of course reminiscent of the development of railroads in colonial empires, which were clearly geared towards facilitating imperial trade rather than the territorial integration of the colony. Such dependence on foreign investors is also likely to minimize concerns with public applications, from public access to uses in education and health.

There are today few institutions, at the national or global level, that can deal with these various issues. It is in the private sector where this capacity lies, and then only among the major players. We are at risk of being ruled by the MNCs, accountable only to the global market. Most governmental, non-profit and supranational organizations are not ready to enter the digital age. The political system even in the most highly developed countries is operating in a pre-digital era.

The overwhelming influence that global firms and markets have gained in the last two years in the production, shaping and use of electronic space along with the shrinking role of governments, has created a political vacuum. But it does not have to.

Because the ascendance of digitalization is a new source of major transformations in society, we need to develop it as one of the driving forces of sustainable and equitable development in the world. It should be a key issue in political debates about society, particularly equity and development. We should not let business and the market shape 'development' and dominate the policy debate. The good side of the new technology, from participation to telemedicine, is not necessarily going to come out of market dynamics.

Further, even in the sites of concentrated power, these technologies can be destabilizing. The properties of electronic networks have created elements of a crisis of control within the institutions of the financial industry itself. There are a number of instances that

illustrate this: the stock market crash of 1987 brought on by program trading and the collapse of Barings Bank brought on by a young trader who managed to mobilize enormous amounts of capital in several markets over a period of six weeks. Electronic networks have produced conditions that cannot always be controlled by those who meant to profit the most from these new electronic capacities. Existing regulatory mechanisms cannot always cope with the properties of electronic markets. Precisely because they are deeply embedded in telematics, advanced information industries also shed light on questions of control in the global economy that not only go beyond the state but also beyond the notions of non-state centered systems of coordination prevalent in the literature on governance.

Finally, the Net as a space of distributed power can thrive even against growing commercialization. But we may have to reinvent its representation as impervious to such commercialization and as universally accessible. It may continue to be a space for *de facto* (i.e. not necessarily self-conscious) democratic practices. But it will be so partly as a form of resistance against overarching powers of the economy and of hierarchical power, rather than the space of unlimited freedom which is part of its representation today. It seems to me that there are enough changes in the last two years to suggest that the representation of the Internet needs to be subjected to critical examination. Perhaps the images we need to bring into this representation increasingly need to deal with contestation and resistance, rather than simply the romance of freedom and interconnectivity. Further, one of the very important features of the Internet is that civil society has been an energetic user; but this also means that the full range of social forces will use it, from environmentalists to fundamentalists such as the Christian Coalition in the U.S. It becomes a democratic space for many opposing views and drives, and for a range of criminal uses - often referred to as the 'blacknet'.

This is a particular moment in the history of electronic space, one when powerful corporate actors and high performance networks are strengthening the role of private electronic space and altering the structure of public electronic space. But it is also a moment when we are seeing the emergence of a fairly broadbased - though as yet a demographic minority - civil society in electronic space. This sets the stage for contestation.