Globalisation, Networking, Urbanisation: Reflections on the Spatial Dynamics of the Information Age

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Abstract

The network society is a global society because networks have no boundaries. Spatial transformation is a fundamental dimension of this new social structure. The global process of urbanisation that we are experiencing in the early 21st century is characterised by the formation of a new spatial architecture in our planet, made up of global networks connecting major metropolitan regions and their areas of influence. Since the networking form of territorial arrangements also extends to the intrametropolitan structure, our understanding of contemporary urbanisation should start with the study of these networking dynamics in both the territories that are included in the networks and in the localities excluded from the dominant logic of global spatial integration.

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In this article, I will summarise the main features and underlying causes of the spatial dynamics of the global network society on the basis of previous analyses and selected evidence (Castells, 1989, 1999, 2000, 2004; Castells *et al.*, 2006; Hall and Pain, 2006; Dear, 2005, 2006; Graham, 2005; Sassen, 2006; Lim, 1998; Broudehoux, 2004; Kwok, 2005; Lu, 2006; Hackworth, 2005; Wolch *et al.*, 2004; Halle, 2003; Graham and Simon, 2001; Abu-Lughod, 1999; Scott, 1998; Borja and Castells, 1997), in line with the studies presented in this Special Issue of *Urban Studies*.

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First of all, a stream of research conducted in the past two decades around the world, largely building on the old tradition of human ecology and following the path of the pioneering work by Harold Innis, has shown the close interaction between the technological transformation of society and the evolution of its spatial forms (Scott, 2001; Sanyal, 2003; Graham, 2005; Mattos *et al.*, 2004; Hawley, 1950, 1956; Innis, 1950, 1951). We know that technology is not the determinant factor of this evolution. Nonetheless, microelectronics-based information and communication technologies have been shown to facilitate the digital networks that support the diffusion of the new social structure, as the electrical grid and the electrical engine supported the expansion of the industrial society (Mitchell, 1999; Hughes, 1983). We also know that in the age of information and communication technologies, in sharp contrast with the predictions of futurologists, we are not witnessing the end of cities or the annihilation of distance. Instead, we are in the midst of the largest wave of urbanisation in human history. There is an increasing concentration of population and activities in urban areas and in major metropolitan areas. In 2008, we are expected to cross the 50 per cent threshold of urban population on the planet, which is 3.3 billion people, according to the United Nations Population Fund (2007), with over 1 billion living in squatter settlements, particularly in the metropolitan regions (Neuwirth, 2005). Projections from the same UNPF report estimate that the number of urban residents in 2030 will reach 5 billion, of whom 81 per cent are expected to live in developing countries, including one-third of slum dwellers. By 2030, the majority of the population on all continents, including Asia and Africa, will live in urban areas. South America is already 80 per cent urban and Europe and North America are approaching 80 per cent. Looking ahead, by simple extrapolation of current trends of population growth in urban areas, by mid-century it is likely that around three-quarters of the inhabitants of the planet will be urban dwellers. Yet the most important characteristic of this accelerated process of global urbanisation is that we are seeing the emergence of a new spatial form, which is given different names depending on diverse analytical perspectives. I call it the metropolitan region to indicate that it is metropolitan but it is not a metropolitan area, because usually there are several metropolitan areas included in this spatial unit. Peter Hall and Kathy Pain (2006) call these areas the polycentric megacity regions on the basis of their empirical study on recent metropolitanisation in western Europe. The polycentric metropolis, or the metropolitan region, arises from two intertwined processes: extended decentralisation from big cities to adjacent areas and interconnection of pre-existing towns whose territories become integrated by new communication capabilities. This model of urbanisation is at the same time old and new. In Hall's and Pain's words

> It is a new form, [including] anything between ten and fifteen cities and towns, physically separated but functionaly networked, clustered around one or more larger cities, spatially separate and drawing enormous economical strength from a new functional division of labour. These places exist, both as separate entities in which most residents work locally and most workers as local residents ... and as a functional region that is connected by networks of transport and communication processing flows of people, goods, services, and information (Hall and Pain, 2006, p. 3).

The transport and digital communication infrastructures, including wireless communication systems, are the nervous system of the polycentric metropolis (Rutherford, 2004). I would also add that in most cases, with some exceptions (for example, Toronto and Jakarta), there is no institutional unity in these metropolitan regions, leading to political

unaccountability and chaotic planning for these mega human settlements.

The metropolitan region is not just a spatial form of unprecedented size in terms of concentration of population and activities. It is a new form because it includes in the same spatial unit urbanised areas and agricultural land, open space and highly dense residential areas: there are multiple cities in a discontinuous countryside. It is a multi-centred metropolis that does not correspond to the traditional separation between central cities and their suburbs. There are nuclei of different sizes and functional importance distributed along a vast expanse of territory following transport lines. Sometimes, as in the European metropolitan areas, but also in California or New York/New Jersey, these centres are pre-existing cities incorporated in the metropolitan region by fast railway and motorway transport networks, supplemented with advanced telecommunication networks and computer networks. Sometimes the central city is still the urban core, like in London, Paris and Barcelona. Often, however, there are not clearly dominant urban centres. For instance, the largest city in the San Francisco Bay Area is not San Francisco but San Jose. Yet, San Francisco remains the key location for advanced services, while the main economics basis of the region (Silicon Valley) is neither in San Francisco nor San Jose, but in between. In other instances, like in Atlanta and in Shanghai, the new centres (North Atlanta, Pudong) are induced by the fast growth of the metropolitan region to host business, services and population that gravitate towards the dynamism of these metropolitan magnets. In all cases, the metropolitan region is constituted by a multicentred structure (with different hierarchies between the centres), a decentralisation of activities, residence and services with mixed land uses, and an undefined boundary of functionality that extends the territory of this nameless city to wherever its networks go. In this early 21st century the metropolitan regions are a universal urban form. In the US in 2005, the Urban Land Institute identified 10 megalopolitan areas housing 68 per cent of the American population (cited by Hall and Pain, 2006). Yet, the largest metropolitan areas in the world are in Asia. The largest one is a loosely connected region that extends from Hong Kong to Guangzhou, incorporating the manufacturing villages of the Pearl River delta, the booming city of Shenzhen, on the Hong Kong border, and the adjacent areas of Zhuhai and Macau, each one with a distinctive economy and polity, fully interdependent with the other components of this south China metropolitan region, with a population of approximately 50 million people. This pre-figures the megapolitan future of China. During my conversations in Beijing in November 2005, planning officials of the State Council reported their plans to organise China's metropolitan growth by 2020 into 10 major metropolitan regions with 50 million dwellers each. In fact, the south China region has already reached that size and Greater Shanghai in 2007 was home to over 30 million people. These metropolitan regions will constitute the heart of the new, increasingly globalised China, the manufacturing centre of the world in the 21st century. These 'cities' are no longer cities, not only conceptually but institutionally or culturally. In fact, they do not even have a name. In the place where I live now, Los Angeles, the only people who call it Los Angeles are either visitors or the minority of people inhabiting the city of Los Angeles (about 3.5 million), in contrast to the rest of the inhabitants of a southern California metropolis of about 20 million that stretches from Santa Barbara to San Diego and Tijuana across the border, in a pattern of continuously urbanised landscape along the coast, and extends for about 100 miles inland (Wolch *et al.*, 2004). Faced with this troubling namelessness, the southern California media have created a name for this integrated television market, which is used

at the beginning of evening news broadcasts: "Your local news. From the Southland". The Southland (south of where?) is this undefined metropolitan region where 20 million people work, live, commute and communicate by using a network of freeways, media coverage, cable networks and wireline and wireless telecommunication networks, while retrenching in the polity of a fragmented territory's localities and identifying their diverse cultures in terms of ethnicity, age and self-defined social networks. Thus, the Southland lacks a definition of institutional, cultural or geographical boundaries, but has a strong functional and economic unity.

In Europe, Peter Hall and Kathy Pain (2006) have identified the dynamics of the polycentric metropolis in the eight major regions of Europe they studied. What they found is the persistence of urban centrality at the core of the region, in spite of the articulation between various urban centres. In other words: there is a hierarchical specialisation of functions between different urban centres. The overall spatial structure is polycentric and hierarchical at the same time. Yet there is no sprawl. In fact, the traditional residential suburban sprawl observed by American urban studies in the 1960s and 1970s is no longer the predominant pattern in American metropolitan areas. The residential settlement process has extended to exurbia, while many suburbs have become dense areas, sometimes dominated by high-rise buildings, and economic activities have decentralised along transport lines, so that there is a mix of activities in the outlying areas, together with the diversification of urban centrality functions. The notion of residential suburban sprawl as a predominant urban form is outdated. Nowadays, we observe a distributed centrality and a multifunctional spatial decentralisation process. The key features are the diffusion and networking of population and activities in the metropolitan region, together with the growth of different centres interconnected according to a hierarchy

of specialised functions. Why so? What are the reasons for the formation of these metropolitan regions?

Peter Hall and Kathy Pain propose a major hypothesis which is one of the keys to unlocking this mystery, but not the only one. In the knowledge economy, advanced services are the dynamo of urban growth, wealth and power. Advanced services are globally organised. So the globalisation of advanced services is at the source of concentration in some areas of the world that are the pivotal nodes of the networked management capacity in our society. These advanced services act as a driver of urban centrality, because they are concentrated in old or new centres of our major cities. These high-level service centres are located in places that are well connected in terms of transport and telecommunication and possess a strong basis in terms of knowledge generation and professional labour.

This is clearly a major reason for the phenomenon of metropolitan concentration, but there are others. I will start with the proposition that the key spatial feature of the network society is the networked connection between the local and the global. The global architecture of global networks connects places selectively, according to their relative value for the network. The research presented in this Special Issue, particularly the studies by Peter Taylor and his collaborators, Denise Pumain, Céline Rozenblat and others, demonstrates the importance of the global networking logic for the concentration of activities and population in the metropolitan regions. This is not only to say that these metropolitan regions are connected globally, but that the global networks, and the value that they process, need to operate from nodes in the network. It is not the financial centres in London, Tokyo and New York that have produced a global financial market made of telecommunicated computer networks and information systems. It is the global financial market that has restructured and

strengthened the places, old and new, from where global capital flows are managed. They are not global cities, but global networks that structure and change specific areas of some cities through their connections. After all, much of New York (for example, Queens), Tokyo (for example, Kunitachi) or London (be it Hampstead or Brixton) is very local, except for their immigrant populations. The global functions of some areas of some cities are determined by their connection to the global networks of value making, financial transactions, managerial functions or otherwise. And from these nodal landing places, through the operation of advanced services, expands the economic and infrastructural foundation of the metropolitan region. So the changing dynamics of networks, and of each specific network, explain the connection to certain places, rather than the places explaining the evolution of the networks. The points of connection in this global architecture of networks are the points that attract wealth, power, culture, innovation and people, innovative or not, to these places.

For these places to become nodes of the global networks, they need to rely on a multidimensional infrastructure of connectivity: multimodal transport on air, land and sea; telecommunication networks; computer networks; advanced information systems; and the whole infrastructure of ancillary services (from accounting and security to hotels and entertainment) required for the functioning of the node (Kiyoshi *et al*.ter, 2006). Every one of these infrastructures needs to be served by highly skilled personnel, whose needs have to be catered to by service workers. These are the ingredients for the growth of the metropolitan region. Knowlege sites and communication networks are the spatial attractors for the information economy as the sites of natural resources and the networks of power distribution determined the geography of the industrial economy. And this is valid for London, Mumbai, São Paulo or Johannesburg. Every country has its major node(s) that connect(s) the country to strategic global networks. These nodes underlie the formation of metropolitan regions that determine the local/global spatial structure of each country through their internal, multilayered networking. Outside the landing places of networked value creation lay the spaces of exclusion, or 'landscapes of despair' (Dear and Wolch), either intrametropolitan or rural.

Why do these global networks linked through nodes need to land in some specific metropolitan regions? Why is the processing of their highly abstract operations unable to free itself from spatial constraints? Here, we can use traditional models of explanation (Castells, 1989; Sassen, 1991). What is important in the location of advanced services is the micro network of the high-level decision-making process, based on face-to-face relationships, linked to a macro network of decision implementation, which is based on electronic communication networks. In other words, meeting face-to-face to do financial deals or political deals is still indispensable, particularly where there is a need for absolute discretion in the case of decisions that provide a competitive edge. In the locational decisions of the managerial functions of business corporations, the intangible factor is still about having access to the micro networks located in certain selective places, in what I named 'milieus' (Castells, 1989). They can be financial milieus (for example, New York, London, Tokyo; Sassen, 1991) but also technological, like in Silicon Valley (Saxenian, 1994) or other centres of technological innovation in the world (Castells and Hall, 1994), or media-related, as in Los Angeles and New York (Abrahamson, 2004). The key innovation and decision-making processes occur during face-to-face contact, and they still require a shared space.

What is fundamentally new is that these nodes interact globally, instantly or in chosen times throughout the planet. So the network

of decision implementation is a global macro electronic network. Meanwhile, the network of decision-making and generation of initiatives, ideas and innovation is a micro network operated by face-to-face communication concentrated in certain places. This spatial architecture simultaneously explains the concentration of some metropolitan places and the diffusion in terms of networks: the space of places and the space of flows. Once this mechanism is identified, everything else can be explained: concentration of ancillary services, infrastructure in communication that develops in one site and not in others, attraction of talent, satisfactory living conditions for the creators of value, etc.

Communication infrastructures are decisive components of the process of mega metropolitanisation, but they are not the origin of the process. Infrastructure of communication develops because there is something to communicate. It is this functional need that calls for the development of infrastructures. The value-making locales offer greater opportunities and better services, and this offer attracts talented and innovative professionals. And because there is money, there is a thriving market and there are better cultural amenities, educational facilities and health services, and therefore jobs which are still the main source of urban growth. Since job opportunities are globally appealing, these metropolitan regions also become the hubs for immigration. They develop as multi-ethnic places and establish global connections not only at the level of functional and economic interactions, but also at the level of interpersonal relations—the networks and people, conceptualised as 'transnationalism from below' by Michael Smith and Luis Guarnizo (1998).

At the source of the process of metropolitanisation, there is the ability to concentrate production of services, finance, technology, markets and people. And this creates economies of scale, as in previous forms of urbanisation, as well as economies of synergy which are the most important nowadays. Spatial economies of synergy mean that being in a place where there is potential interaction with valuable partners creates the possibility of adding value as a result of the innovation generated by this interaction. Economies of scale can be transformed by information and communication technologies in their spatial logic. Electronic networks allow for the formation of global assembly lines. Software production can be spatially distributed and co-ordinated by communication networks. On the other hand, economies of synergy still require the spatial concentration of interpersonal interaction because communication operates on a much broader bandwidth than digital communication at a distance. This is why scientific research is still concentrated in campuses around the world at the same time that these campuses cannot operate without being networked with the world wide web of science.

In the age of information, and innovation, cities remain more than ever the sites of generation of value and the material basis of power, cultural production and social selection (Hall, 1998). Quality of life has nothing to do with it. Quality of life is an entirely subjective notion. Green Silicon Valley suburbs are boring places to live in from the point of view of a hard-core New Yorker or an unreconstructed Parisian. Yet that is where the most advanced technological innovation happens and where every wave of major technological innovation in the past 50 years has occurred. Silicon Valley engineers do not often go to San Francisco's bars. They barely have time to go to their suburban bars in Silicon Valley. Why are they there then? Because of the quality of life? Because of night life? No, because they are excited by their work, they are fascinated by their own creativity and they cherish the possibility of being close to other creators. Cities become trendy only when they have the power and money to launch the trends.

Now, the most strategically important observation for an analysis in terms of spatial networks is that these global networks do not have the same geography, and they usually do not share the same nodes. The network of innovation in information and communication technology—i.e. Silicon Valley—is not the same as the network of finance, except for the network of venture capital usually originated from inside the high-technology industry. Political agencies, nationally and internationally, build their own spatial sites and networks of power. The global network of scientific research does not overlap with the networks of technological innovation. That is why so many are surprised by the failures of projects aimed at developing new Silicon Valleys around a new university. Artistic creativity also has its own network, which shifts constantly, depending on fields of art and movements of fashion. The global criminal economy (accounting for 5 per cent of global GDP) is built on its own specific networks with nodes that do not generally coincide with those of finance or technological innovation. The management of drugs traffic features places such as Medellin, Bogota, Mexico, Miami, Bangkok, Kabul and Amsterdam, most of them secondary nodes for other major networks.

Therefore, there is a multilayering of global networks in the key strategic activities that structure and deconstruct the planet. When these multilayered networks overlap in some node, when there is a node that belongs to different networks, two major consequences follow. First, economies of synergy between these different networks take place in that node—i.e. between financial markets and media businesses, or between academic research and technology development and innovation, or between politics and media. In addition, because these multilayered networks land on particular places, and many networks share a node in such places, these localities become mega nodes: they become switching nodes for the entire global system, connecting various networks. London and New York are typical cases of this multiple nodal advantage. Boston does not reach the same level because, even if it is probably the dominant node in academic research and an important node in technological innovation (particularly in biotechnology), it is only a secondary node in financial networks and is subsidiary to other nodes in a number of important dimensions of wealth and power. This is also another reason why in China there is a clear differentiation between Beijing and Shanghai in terms of the nodes and the distinct role they play in the global architecture: Beijing specialises in the political, financial, scientific and technological; while Shanghai specialises in financial networks and global trade.

These mega nodes are not global cities. They are simply the urban dimension of multilayered global networks, which is a different matter. In other words, to understand the dynamics and meaning of the node, we must start with the analysis of each network and their interaction as facilitated by their spatial convergence. However, each mega node becomes an attractor of capital, labour and innovation. This is where the contradictions arise. A mega node attracts resources and accumulates opportunities to increase wealth and power. At the same time, because it rarely has institutional existence or the political capacity of autonomous decision-making as a metropolitan region, it can hardly implement redistributive policies on behalf of the needs of the local. In the absence of active social demands and social movements, the mega node imposes the logic of the global over the local. The net result of this process is the co-existence of metropolitan dynamism with metropolitan marginality, expressed in the dramatic growth of squatter settlements around the world and in the persistence of urban squalour in the *banlieus* of Paris and in the inner cities of America. There is an increasing contradiction between the space

of flows and the space of places. These mega nodes concentrate more and more wealth, power and innovation in the planet. At the same time, few people in the world (actually 13 per cent according to the World Values Survey) identify with the global, cosmopolitan culture that populates the global networks and is worshipped by the mega nodes' élites. In contrast, 47 per cent of people feel a strong regional or local identity. Thus global networks integrate certain dimensions of human life and exclude other dimensions regardless of what the intentions of the actors are. The contradictory relationship between meaning and power is manifested by a growing disassociation between the space of flows and the space of places. There are places in the space of flows and flows in the space of places but the meaning is defined in place terms, while the functionality, the wealth and the power are defined in terms of flows. And this is the most fundamental contradiction emerging in our globalised, urbanised, networked world.

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