

Ruggiero, Luca

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Luca Ruggiero(*lruggier@unict.it*), Unità di Geografia Economico-Politica,
Dipartimento di Sociologia, Facoltà di Scienze Politiche - Università di Catania,
Catania, Italy

Development and innovation of technological networks in some peripheral urban areas.

The society that emerged out of the crisis of the fordist model of production and organisation of space is increasingly dominated by development, innovation and diffusion of urban technological networks (telecommunications, transport, energy, etc.). There are nowadays, working at different geographical scales, an amount of projects to increase the number of networks and connect a larger number of people and organisations. This is based on the notion that the emergence of an internationally-integrated and increasingly urbanised Network Society would allow better connection between the local and the global level and vice versa, giving those marginal areas the opportunity to take part to the main development dynamics. The rise of the network society is also often associated with a regeneration of the local administrations, in ways that would make them more efficient and clear, improving territorial government and citizens quality of life. Besides, the development of the 'digital city' seems to be connected with the emergence of new professional careers and a virtual space interacting community that would help to better meet the needs of local society and increase the level of participation to territorial government decision making. On the opposite side some authors argue that the contemporary conditions of development and innovation of infrastructure networks world-wide are particularly favourable to 'secessionary tendencies' and lead to the deliberate creation of premium networks that selectively tend to connect together only the most favoured users and places. In the present paper I will analyse these contradictory tendencies attributed to the development and innovation of infrastructure networks operating within and between cities. I will concentrate mainly on the experience of some, considered, marginal urban realities of the Mediterranean area.

1. Introduction. Technological innovation and the city

A rapid development and diffusion of new technological innovations is taking place in contemporary advanced industrial cities. This is profoundly affecting old ideas and assumptions about the development, planning and management of modern cities.

When we talk about innovations that are transforming several aspects and functions of contemporary cities we refer mainly, according to nearly all commentators, to the technological shift that occurred in the field of telecommunications infrastructures and services and that has considerably increased their significance and capability of transcending spatial barriers. Telecommunications are, thus, rapidly changing becoming digital and based on microelectronics. The word telematics has also been coined to refer to services and infrastructures which link computer and digital media equipment over telecommunications links.

The increasing application of telematics to nearly all contemporary cities functions has required new conceptions of contemporary cities. Not only they should be considered for being physical agglomeration of buildings, intersection of material traditional transportation networks and the main centres of economic, social and cultural life, but also as electronic hubs for telecommunication and telematics networks (Graham, 1996).

The city has always been the place devoted to communications, where its different components, the social, the productive and the institutional have found the ideal conditions for the activation of profitable and stable relation systems. The city is also the place of encounters, of socialisation, where people can meet each others and activate spontaneous and informal processes of knowledge transfer. During the last years, however, cities had to face the challenge and consider the opportunity connected with the progressive introduction and diffusion of new communication technologies. These are increasingly able to modify spatial interactions establishing fast and low-cost connections even between people, organisations and enterprises that are located far away from each other. Spatial restrictions that used to represent a strong barrier to long-distance interaction and communication, thanks to innovation in the field of telecommunications, are tending to disappear.

Because of the strong impact this process has on urban traditional functions, it represents a key element in the evolution process of cities. Some cities, thanks to their capacities and potential, are experimenting some changes, to a certain extent as part of

a spontaneous evolution process and to another as part of the adoption of specific policies, able to drive and accelerate the rhythm of transformation. However, the possibility to exploit such new instruments, with the strong impact they have on relational and communicative processes, have not left those who govern and participate in shaping the future of other cities indifferent and uninterested.

My aim would be that of analysing the specific features of the development and innovation of technological networks in a peripheral Mediaterranean urban reality such as Catania.

2. A peripheral Mediterranean urban reality: Catania

Catania is a Sicilian middle-sized city without an industrial past and characterised by low development rates. The city suffers from heavy economic, social and environmental problems. First of all, a very high unemployment level, almost 27% of the workforce, nearly 60% of which is made of young people under 25 in search of their first occupation (Zinna, Ruggiero e Grasso, 2003). According to the last ISTAT survey, the number of people occupied in the various economic sectors, compared with those of 1991, have decreased of different percentage points, with a few exceptions regarding hotels and restoration, transports and communications, advanced service sector and public sector. The way the system of enterprises is structured is also very weak. This, thus, shows a clear dominance of the construction sector (more than 7% of the total) and of the small manufacturing units with a traditional artisan base. A poor diversification of the service sector, mainly based on commercial distribution, can also be observed. Besides, economic growth has slowed down in all productive compartments, mainly in those technologically mature, in that of construction and of commercial distribution that represents one of the leading activity of the city economy.

Weaknesses are not only to be traced in the heavy unemployment rates, but also in the unprecedented growth of the urban area from a demographic point of view and most of all from that of a progressive “cementation” of the city and of the surrounding districts. Catania is, in fact, a city that has gone through an uncontrolled process of expansion and that “ has almost made a myth out of the process of physical and quantitative growth, as if it was an indicator that could prove the economic growth of

the city” (Recupero, 1996; p.28). This context is exasperated by a lack of infrastructures and very high transport costs for people and goods, not to consider occasional water and electricity emergencies.

The troubles are not only limited to the economic side, but also extended to the social. Problems of urban and social degradation, thus, coexist with difficulties connected with a diffused and deep-rooted in the territory criminality. To all this it must be added a low level of life quality, depending firstly on the absence of an adequate service supply and secondly on per capita income level that is almost 40% lower than the national average.

2.1 The formation of the high-tech area

All these economic, social and environmental problems interweave and overlap with each other representing simultaneously causes and effects of the city development delay. In this not really promising context, however, the formation, not without limits, of a high technology pole (computer systems, telecommunication and bio-technologies) should be mentioned.

At the foot of Mount Etna a “ high tech” area has developed, defined by the international press “Etna Valley” (Betts, 2000) and resulting from the collaboration between some high technological industries (first ST Microelectronics and Nokia) and the University with material and immaterial infrastructures, knowledge and research centres. The recently established technology pole can also count on a highly educated and skilled workforce at relatively low costs. The very high unemployment rate among young people, in fact, gives them the chance to carry on with their education path and form a highly intellectually prepared workforce at costs lower than those any other European region can offer.

The main features that have been identified within this technological district, are:

- a) presence of a pioneer company, as production centre of high tech know how (ST Microelectronics is one of the leading companies in the microelectronic field with over 2,500 employees, 78% of whom possess a degree, above all in engineering, and with the new plant, one of the most innovative on a world level, that employed in 2003 more than 1,500 employees);

- b) links between high tech enterprises, the University of Catania and the local government;
- c) availability of low cost, abundant human resources, above all engineers coming from the local university;
- d) availability of national and regional incentives, (the new employees are exempted from social welfare contributions for six years);
- e) effects of attraction and concentration (spin in), towards a growing number of international and local companies, achieved by ST Microelectronics (22 international companies are directly or indirectly tied to the ST production, some are located inside the client's plant, some others are independent, as Nokia, which has created a research and development centre in telecommunications in Catania; Antech-satellite communications; Aid; Chi Mei; Cities on line; IBM ; Media On Line; Telespazio; Olin; Openline; Sat; Wirenet, etc...) (Schillaci e Altri, 2000).
- f) development of local high-tech companies that do not operate in the microelectronic field, but benefit from the trust generated by the general spread of know how.

As I already mentioned the formation of this technological area is not without limits. Among the principal ties that have been recognised it can be mentioned that the local companies are still too few and above all of small dimension and with few employees; the information flux prevalently follows hierarchical channels, from the big to the small companies and very rarely in the opposite direction, lacking the typical transversal ones of the evolved networks; the level of the advanced services is still very modest; the enterprises and the networks able to expand the process towards the external (spin off) direction are rare; the catalyzer poles around which the development must expand are still too few; there is a poor presence of risk capitals; relation networks are still prevalently subjective and there is a poor presence of institutional ones.

This, despite the above mentioned limits, is often quoted as a case where high information technology combines with telecommunications to create a networked reality that has been recognised as an unique occasion to improve the future of part of a lagging region as Sicily. This, according to the myth of "technological changes as world transforming (and, of course, world improving)" (Graham, 1997; p. 21), has been seen as a node capable of interacting with some of the big technological innovation

networks, with important effects on the entire territorial system (Frankel, 2001). Therefore, this “new economy”, where the fundamental resources are information and knowledge and the instruments to create it, with its technology discontinuity and thanks to the advantages of network interactions, has been seen as a new system that goes beyond the limits and rigidities of traditional enterprises, allowing the growth of different types of enterprises and innovation in the organisation of production in order to offer new development opportunities for peripheral areas (Cacace,1999).

2.2 Other examples of the use of new technologies in the city of Catania

This last one is not the only example where new technologies and the economy related to it has been seen as means to improve the situation of a peripheral area.

Apart from this example, the city of Catania strongly believes in the possibilities offered by new technologies to solve its socio-economic, environmental problems. For this reason it has given way to a series of projects that involve innovation in the field of technology, such as development and innovation of telematic networks, construction of an integrated Geographical Information Systems (GIS) and creation of new web sites. These instruments, with their increased level of efficiency and information, are expected to create a virtual complementarity between the different levels of territorial government at the different geographical scales, from the smaller to the bigger and vice versa. They, according to another project, will be also used to manage virtual desks that would help to open up a dialogue with private citizens and enterprises in order to improve delivery of information and services. The development of network interactions is, thus, aimed at bringing about a renovation and innovation of the public administration, in such a manner that it would make it more efficient and transparent, improving the territorial government and the well-being of citizens.

It can also be mentioned the creation of a scientific and technological park¹ with the aim of creating new high-technology enterprises. In addition, two projects, both in the field of innovation of telecommunications networks, are on the agenda. One should provide the entire metropolitan area of Catania with a cabled network and the other,

¹ Funded jointly by the Ministry of University and Research and through a European Regional Development Fund.

named “Nautilus”, should establish Catania as a hub of an optic fibre network that will cable the Mediterranean and Middle east area.²

The success of these projects is expected to extend and strengthen the functional urban relations within the local territorial context considered as a local, metropolitan and sub-regional network system. However, some of them are also expected to strengthen the competitiveness of the urban system giving Catania the possibility and the opportunity to interact with the other Euro-Mediterranean economic, cultural, communication, tourism, etc. networks hubs and to have, as the most dynamic and developed urban systems, an intermediate role between the local and the global level.

4. The creation of a digital city as a promotional tool

The establishment of Catania as a digital city, i. e. a virtual interacting community, thus, if on one side seems to be a powerful instrument that would help to better meet the needs of the local society, on the other seems to work as a promotion tool for the city that would help to position it as a site for investment and competition for multinational service and manufacturing corporations. In fact, according to a recent Rur-Assoinform-Censis (2000) report to establish themselves as digital cities gives urban areas a significant competitive advantage and is also a decisive element to assess the importance of a city and its rank within global and regional networks. An essential element in the evaluation process of the city becomes, then, the number and the development of interactions and interactivities that the electronic system establishes with the physical city and with its community. As Graham (1997; p. 26) also states “telematics have become a natural policy focus as policy makers everywhere have struggled to reinvigorate city economies, physically regenerate urban areas, market urban spaces as global site for investment, address social polarisation, and restructure public services to address funding crises”.

The city of Catania aims, thus, at using telematics for different objectives. The creation of a digital city might be seen as a promotion tool to achieve a position within

² The Nautilus project started as a joint-venture between Telecom Italia and the Israeli telecommunication company Globescom that should invest something like 500,000 € for the realisation of the project.

global and regional networks, a civic network to boost endogenous development that tries to reconnect the economic, social and cultural fragments and also a means to develop innovative programmes through which public services are delivered via telecommunications. Such overoptimistic view and the excessive faith in the changes that can be brought about by the telematic revolution, for Catania, can be also interpreted as a spasmodic desire to “abandon” a peripheral geographical position that has so much conditioned its role within the main development dynamics. New technological networks have been, in fact, too easily identified by some local actors as an opportunity to overcome territorial barriers that limit the possibilities of interaction and exchange and allow to better exploit resources of the local context in a world where, thanks to technological innovation, “geography, propinquity and spatial dynamics either cease to matter at all or are likely to be of much reduced significance” (Graham, 1997; p.22). This has appeared to be more real for a city like Catania that suffers from considering its location and territorial structures more a limit, than an opportunity.

5. Technological benefits for a peripheral urban area

This idea of coming out of a peripheral position through the use of telematics is also very much supported at different levels.

InvestiaCatania, for instance, an agency that has been created to facilitate the setting up processes of new business investments in Catania, strongly supports this idea. This aims at promoting the opportunities offered by the new communication technologies among local enterprises and encourages the creation of networks among them³

Also, different authors (Rullani et al., 1999; Golfetto, 1996) see telematics as an opportunity especially for “small cities”. They argue that even small cities are getting involved in the recent changes of labour division that require cities to develop and attract new services connected with finance, tourism and culture and to shift from manufacture to services. Despite “new technologies, that allow enterprises a centralised control of territorial dispersed activities, might give evidence of a reinforcement of the

³ <http://www.investiacatania.it>

big cities over the small” (Rullani et al., 1999; p.21) – central and directive activities tend to concentrate in major cities (Sassen, 1994) – they maintain the contrary. They insist that the technological innovation processes and the transformation of urban interactions towards reticular systems will become an instrument “through which even smaller dimension cities, and thus the most disadvantaged, could find a way to strengthen their position and make the most of their local resources”. This could happen “through the creation of complementary and synergistic networks, specialisation in certain economic sectors” and of course with “the support of IT that will allow even smaller cities to compensate problems connected to their small dimension and will let them acquire significant consideration within the demand for location of business investments, effectively contrasting higher-rank city competition” (Golfetto, 1996; p.108).

Finally, European Union bodies have shown a clear interest in the development and in the level of penetration of the new information and communication technologies within the member states. The European Commission, in particular, is about to set up a specific structural fund that will consist of a considerable amount of Euros to develop optic fibre in the marginal areas of the EU, that include Sicily, with the aim of strengthening their position within the EU (Scrofani, 2003).

6. Problems and contradictions connected to the use of new technologies

Not all opinions tend to converge on this optimistic views that see the improvement of the peripheral position of an urban area through the development and innovation of technological networks in a simple cause-and-effect way. There is a number of authors (Sassen, 2002; Graham, 1997; 2000; Offner, 2000) that maintain that technological networks obey the traditional rationale of agglomeration economies. They continue arguing that, despite the enormous resources they require, both private and governmental, they are able to restructure space in other forms, but do not have the power to redefine urban hierarchies. For instance, they do not bring about either “deterritorialization” (Offner, 2000; p.170), or “neutralization of geography” (Sassen, 2002; p.14) but, on the contrary, a strengthening of the role of the big cities. Overoptimistic technological forecasts, as Graham (1997; p.21) argues, are often aimed

at “attracting media attention or generating sales and glamour for technological equipment. Hugely powerful interests in the burgeoning communications, computing and media industries are obviously set to benefit from portraying current technological changes as world transforming (and of course, world improving) in some simple, cause-and-effect way”.

New technologies also put delicate questions regarding the role of the public administrations.

According to Rodotà (2004) we are in front of an increasing propensity to delegate technology the solution of problems of which political, economic, and social motivation should be analysed. The use of technology in the public realm can, thus, excessively free local authorities from analysing reality. For instance, a video-surveillance system in a unsafe district can relieve of the duty to investigate the causes of the danger.

Moreover, as a result of the spreading of new technologies, it has been noted (Graham, 2000; Offner, 2000) that standardised, mainly public infrastructure monopolies are receding. This, on one side, is reducing the political institutions’ domination and on the other is accentuating the creation of “premium networks” that tend to customise to the needs of powerful users and spaces, whilst bypassing less powerful users and spaces.

Conclusions

These are just some of the troubles that might be linked to a much too liberal and confident approach to technology within cities. It is true that the response to globalisation, for an urban area, cannot consist of neglecting innovation and interaction with other areas, but local administrations should pay extreme attention to the definition of their attitude towards new technologies. The main risks are oversimplification and underestimation of specific questions connected to the introduction of new technologies.

A strong policy approach is, thus, necessary at the urban level to monitor and influence the development of technological networks towards socially equitable, economically efficient and environmentally sustainable urban areas.

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