ICT and urban design, a paradigm challenge

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0 OUTLINE

Dealing with ICT, a design studio has been created, dedicated to the "Network City". There is no direct link between ICT and spatial structure. And the spatial impacts of the new technology still involve high levels of uncertainty. That is where design comes in as it can demonstrate and visualize **what could be**. The future urban agglomeration is one of the test-beds. The approach is one of design-oriented research aiming at **possible futures**. This approach might be referred to as "research by design", but certainly also involves "design by research". It is, not unlike many aspects of ICT, not a simple matter of either/or.

1 ICT AND URBAN DESIGN, A PARADIGM CHALLENGE

"Why have cities not, long since, been identified, understood and treated as problems of organized complexity? If the people concerned with the life sciences were able to identify their problems of organized complexity, why have people professionally concerned with cities not identified the kind of problems they had?"(Jacobs, 1961: 434). Almost 40 years later the question is even more challenging and urgent: because of ICT.

According to Mitchell (1995), a citizen has a choice between actual physical buildings and the corresponding virtual ones. The recombinant architecture implies mutations of traditional buildings (shown in box 1) The latter, to some extent, continue to exist, offering alternatives to virtual "buildings".

bookstores → bitstores
stacks (in libraries) → servers
galleries → virtual museums
theaters → entertainment infrastructure
schoolhouses → virtual campuses
hospitals → telemedicine
prisons → electronic supervision
banking chambers → ATMs (automated teller machines)
trading floors (stock exchange) → electronic trading systems
department stores → electronic shopping malls
work (in offices) → telwork
at home → @ home

Box 1.

Seen as a transport technology, ICT, generally speaking, introduces **choice** for households and business firms. Not unlike the rail, road and air network (in especial the road network when it comes to urban form) it increases the action space, that is the reach of jobs and facilities accessible to users (Dijst, 1995). Accessibility by road also has been a key factor in the evolution of multinodal urban structures: from interaction between two urban systems, exchange of persons, goods and information, via interference (a partial change in the functional structure), to the development of a new joint urban system leading to the creation of new functions (Jacobs, 2000). A shift from automobile travel to electronic communication is a shift to a higher speed. And a higher speed, in turn, means a higher reach.

What are the implications of applying this kind of reasoning to spatial concepts?

From the Dutch history of spatial concepts, for example, two main themes can be distilled: concentration **or** deconcentration (dispersal), multifunctionality (mixed land use) **or** monofunctionality.

The compact city, the dominant concept in recent years, is an example of concentration combined with monofunctionality.

With ICT, however, the either/or thinking of the past is better replaced by multiple-option thinking. At least, that is part of the paradigm challenge.

Only multiple-option thinking - say, concentrating **and** deconcentrating, multifunctionality **and** monofunctionality - can cope with the challenge of organizing complexity.

A spatial concept reflects a planning actor's view of a desirable spatial structure (and the interventions necessary to implement it). In the Netherlands there are national, regional and local planning actors who act increasingly with private partners. And there are households and companies with their own view of what is spatially desirable. Yet planning actors and decision-makers on the national level try to impose top down uniform blueprints of spatial structure such as the compact city. This is hardly a good practice of organized complexity. A new approach, embracing the principle of subsidiarity, could stimulate multi-option thinking bottom up; also taking the form of online planning.

2 NETWORKS AS CENTRAL CONCEPT

Dupuy (1991) distinguishes three, interacting levels of network operators that (re)organize urban space as shown by figure 1.

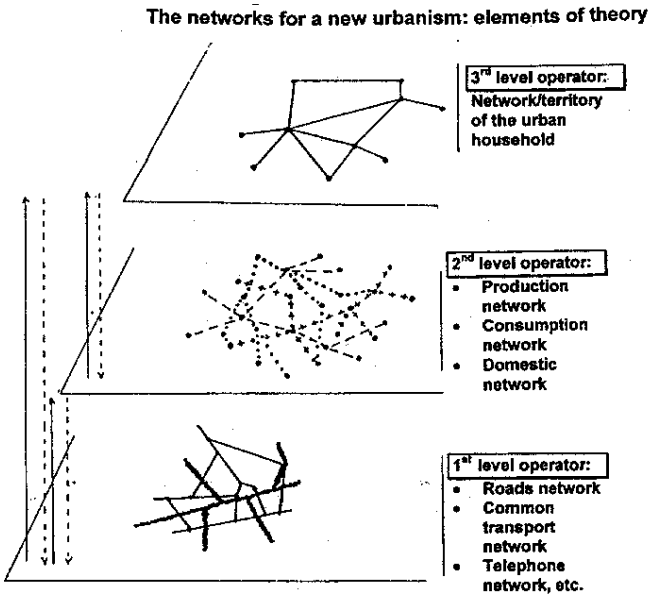


Figure 1.

Level one involves the suppliers of technical networks. They are specialized and organized in sectors.

On **level two** we find functional networks of common-interest users centering on consumption, production, distribution and personal contacts. To each of these networks specific location factors apply.

It is at **level three** that the operators of functional networks make actual, selective use of technical networks for their special purposes. The resulting networks represent virtual cities. Virtual means being functionally but not formally of its kind. These virtual cities tend to clash with how planning actors usually view a desirable spatial structure.

The three-layered has been successfully applied to the Internet three times on the European and national levels (Drewe 1999 a, b; 2000 a).

In each case, **level one** corresponds to the Internet infrastructure. The ISP transit backbone has been chosen as it is closest to the users. On **level two**, the "Internet industry" is analyzed, that is the commercial domain as it leads over other domains. And, finally, **level three** refers to actual traffic on or performance of the Internet.

With suppliers of technical networks at level one, networks are urban-technology based. All kind of technical networks are involved: water, sewer, energy, transport, conventional telecommunication and ICT. The behavior of the different operators is in itself an important research topic what with the policies of privatization and liberalization and the issue of social exclusion or universal service.

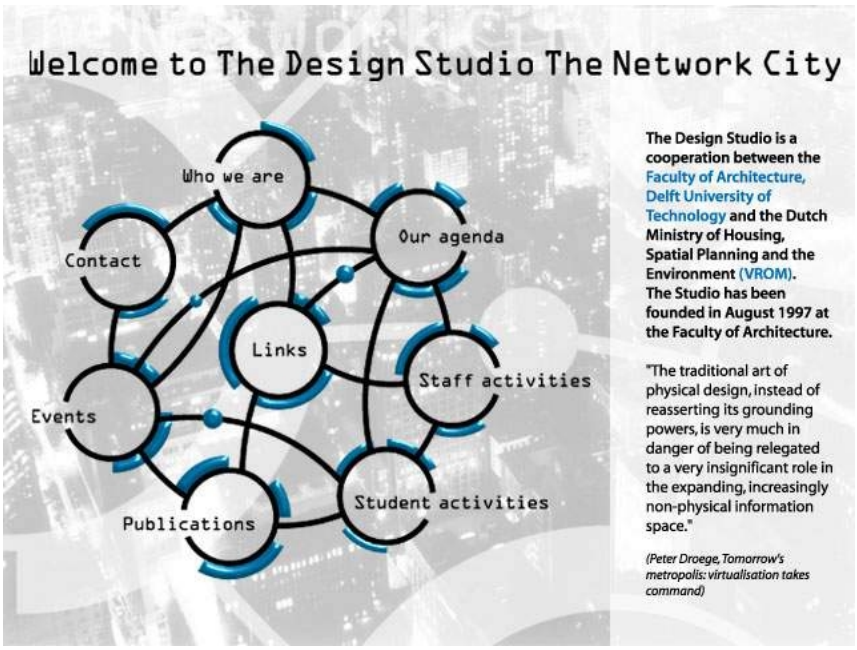
In order to illustrate how important urban technology is for urbanism or spatial planning, let us single out the road network and the private car (because it has never been property conceptualized spatially). Mainstream urbanism has rather been dominated by zonal thinkers like Le Corbusier as opposed to network thinkers such as Cerda, Wright or Rouge (Dupuy, 1991). Creating monofunctional zones for dwellings, work and facilities (recreation) naturally induces traffic between those zones. The rise of the automobile and the accompanying expansion of the road network have produced a "mobility problem" that is still unsolved today.

More generally speaking, the Athens Charter of 1933 that served as a blueprint for post-war urbanism is based on two false premises:

"(a) It is desirable to concentrate functions into giant packages; (b) The geometry within each package is homogeneous. Nevertheless, a city contains so many complex human functions that it is impossible to isolate them, let alone concentrate them, so that imposing a simplistic geometry on urban form inhibits the human activities that generate living cities" (Salingaros, 2000: 15).

3 THE 'NETWORK CITY', A DESIGN STUDIO

The Network City design studio is another example of the search for new concepts. It is a cooperation between the Ministry of VROM and the Faculty of Architecture at Delft University of Technology (http://www.networkcity.nl). The studio involves staff members, PhD students, students in their final year and representatives of VROM's central directorate.



The studio approach is one of design-oriented research aiming at possible futures – as design can demonstrate or visualize what could be. Possible futures relate to the long term. In order to bridge the gap between a distant future and today's practice, a number of location specific test-beds has been chosen: among them "the future urban agglomeration".

Conventionally, urban agglomerations (in the Netherlands) are approached as a hierarchy of areas, looking from the inside out:

- the (historic) city center (as the "pedestrian city"),
- pre-war inner-city neighborhoods,
- post-war residential suburbs (or housing estates),
- recent expansion areas (including the VINEX locations),
- the outer periphery (villages and the nearly countryside).

As a contrast, it is possible to design the future agglomeration also from the outside looking in. Each type of area must be able to function according to its own potential, integrating (mixing) different functions as much as possible. The future urban agglomeration can be conceived of as a network of complementary, synergetic locations, a network that is not hierarchically ordered. Complementarity constitutes a certain coherence which makes that the whole is more than the sum of its parts. But coherence or cohesion also requires both old and new means of communication: private cars, however, reducing, automobile dependence; (individual) collective transport; seamless multimodal mobility; and, of course ICT connectivity. This is indeed a challenging design task; how to organize complexity. Postmodern architects, considering urbanism as " a bastion to the denial of reality" will disagree with this approach to urban agglomerations. They find concepts such as identity, complementarity or coherence suspect as the entire notion of urbanism:

"Urbanism or the building of settlements has not only become impossible, but no longer needed or, even worse, undesirable, complicating things. Urbanism ceases to exist" (Kolhaas, 1998).

An illustrative example of a networked city is the concept of an "integrated metropolis" developed by Roberts et al (1999).

According to Roberts et al the shape of cities is moving towards a polycentric or multi-centered form which functions as a whole. Attention is focused on transport interchange (nodal connections between the networks), the high street and the sub-center.

Urban designers, traditionally, have focused on the square and on site-based problems. The integrated metropolis offers the opportunity of extending the traditional concept of the public realm. It is rather turning into a place of connections between modes of transport, between public and private. Rather than replacing the physical by the virtual or digital, the extended concept of public realm comprises both traditional physical interactions (exchanges of goods, face-to-face social interactions) and virtual interactions (the exchange of information) (MacCormac, 1996).

In designing the integrated metropolis, one does not have to start from scratch, however. There are quite a few "classics" that offer sources of inspiration (Drewe 2000b).

What needs to be done is to develop rules or codes for electronic or digital connectivity: "In order to define a coherent, working urban fabric, the pattern language of electronic connection (which is only now being developed) must tie in seamlessly to the language for physical connections. Already some authors misleadingly declare that the city is made redundant by electronic connectivity. Such opinions ignore new observed patterns which correlate electronic nodes to physical nodes in the pedestrian urban fabric" (Salingaros, 2000, 8).

To illustrate what the network at the "Network City" design studio is about, here are some topics that relate to the future urban agglomeration, that is the relation between ICT and urban form:

- how to design a new residential area, talking into account ICT and hence in contrast to a VINEX location
- can the New Urbanism approach from the United States inspire the design of a new residential area in the Netherlands, including a code for ICT; once again, in contrast with a VINEX location
- and, vice versa, can the Dutch approach to urbanism make a contribution to planning a location in the United States including ICT and elements of new urbanism

- how to plan emergent Edge Cities in the Netherlands, compared to the US experience and what role can the urbanist play in this
- how can the national planning concept of "network cities" be applied to a corridor of two cities outside the Randstad and what would the planning and decision-making process be like
- how to plan and design "the future urban agglomeration" in the periphery of the Netherlands as an ICT-based network urban nodes
- how can the urbanism of networks be changed into sustainable network urbanism: in designing interfaces between ecological and urban infrastructures
- how to design a mixed residential-work environment interfacing with new wet grassland, using "light urbanism" and ICT
- how to combine ICT (a neighborhood telecenter) with sustainable construction to revitalize a waterfront area
- design aspects of ICT applications in an existing neighborhood: catering to the needs of the elderly (Caso, 1999)
- can ICT be used to help with the revitalization of a deprived neighborhood in a Dutch city empowering its residents
- the same question only this time applied to cities in Latin America
- design of personal travel services as part of a larger project on sustainable multimodal mobility including, among others, a design theory for intermodal transfer points in multimodal passenger transport networks.

4 WHERE DO WE GO FROM HERE?

The work carried out so far in the design studio as well as a number of emergent (mainly Anglo-Saxon) concepts lead to the same conclusion: the need of an integrated planning of land use and urban technology networks, in particular transport and ICT. Siembab (1999) – for example – pleads for "a bricks and bits strategy for livable communities" including land use, transportation and ICT. He illustrates this idea with a demonstration project in **Los Angeles** ("Blue Line Tele Village"). Graham and Marvin (1998) list three areas in which urban ICT initiatives are already occurring:

- integrated transport and IT strategies (urban and regional teleworking initiatives, new communication corridors, road information informatics),
- city-level new media and IT strategies,
- information districts and urban televillages,

There is a wide range of possibilities as, for example, demonstrated by the Global Bangemann Challenge with more than 600 submissions covering 11 themes and 18 winners (Drewe 2000b)

Of course, there is still a lot of work ahead. An integrated planning of land use and urban technology networks (including ICT) needs to be developed. And urban ICT initiatives are to be stimulated. In particular those that tackle the "digital divide" in cities (Drewe, 2000b).

If ICT is not taken seriously and dealt with in a professional manner, Kolhaas after all may be proven right in calling urbanism "a bastion to the denial of reality". Or is Dorothy Parker right when she wrote way back "you can't teach an old dogma new tricks".

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