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The cities digital transformation and the urban planning vision

Lucas Girard

In the study "The Total Environment Programming: Planetary Communication Infrastructures", a research developed within the graduate program of the Faculty of Architecture and Urbanism of the University of São Paulo (FAU-USP), the interrelations and tensions between space, information and communication technologies (ICT) were subjected to investigation. The goal was to identify elements to understand the influences of technology on urban space organization and vice-versa: how does natural and human geographies influence ICT's distribution and development?

Admitting that the knowledge of the historical process of formation of these infrastructures provides a comprehensive view of the current scenario of this technology, maps, iconography and a bibliographical survey were initially collected, allowing the assembly of a framework of the current types of ICT infrastructures. These elements were the theoretical basis of a research on forms of territorialization of interconnected systems which constitutes the overarching global architecture of ICT networks. The global connectivity map outlined through various maps available at online sites and platforms reveals latent issues. The most immediate is that the global connectivity architecture – built during the last 6 decades, does not fully provides fast broadband to several regions of the world, such as some African countries and parts of Brazil. In addition, one may infer that the current provision of ICT infrastructure corresponds to historical patterns of sociospatial inequalities: regions with higher income per capita are better served by providers and operators. Also, the great density of submarine cables serving the United States, Europe and Southeast Asia denotes not only the economic predominance of these sites but also the political and conceptual inadequacy of assuming the internet as a decentralized system: the maps of connectivity indicate what the French geographer Boris Beaude called "a hyper-distribution of power structures". In fact, some countries and conglomerates concentrate high "infrastructural power", which allows them to capillarize their military and commercial operations over vast geographical distances.

> Studies on the spatial and socio-environmental impacts of urban digital media can reveal new variables and subsidize innovative policies of reprogramming Brazilian cities.

These inferences gain more relevance as the growth in the use of electronic devices in all spheres of social life demands a strong expansion of connectivity infrastructures in urban agglomerations. Electronics, big data, new online services and digital platforms are now critical elements for the continuity of the digital revolution, as the inclusion of large layers of the global population to the digital platforms of corporate and governmental operations is inevitable.

At the current stage of the global reconfiguration of industrial and cultural logistics in a hyper-distributed network of producers, suppliers, consumers and distributors, it is a sine qua non condition to build a vast and homogeneous computing environment. In this context, cities would be digital-urban platforms that allow the conversion of the informational byproduct of electronically mediated social dynamics – data – into value.

Today in Brazil there is a great movement towards the creation of parameters for new public investments in systems of sensing and monitoring of urban space. Smart Cities are one of the priority focuses of the National Internet of Things

Plan to be fully disclosed by BNDES (National Bank of Economic and Social Development) in September 2017. The leading role of the urban agenda within the technology sector is in line with the global UN sustainability agenda and also with the Industry 4.0 demands. However, infrastructure construction is a slow process. Providing the urban environment with a densely capillary connectivity structure challenges the current status of ICT networks in metropolises such as São Paulo.

Considering the 5G technology scenario, which will make intensive use of small cell networks applied in buildings, traffic lights, street lights, newsstands and bus stops, some questions are inevitable: Will the current infrastructure support the demand for connectivity? How will the network expand at the required speed? Given the fragmentation of public data on the mapping of underground cables and aerial wiring; given the overload of electric energy poles and the lack of agile processes for project approval, how to overcome the concrete reality of chaotic urbanization and bureaucratic city administration and bring together public and private actors around an integrated urban-digital agenda?

Except for specific experiences, from an urbanistic and historical point of view, it can be stated that in Brazil the field of telecommunications planning does not participate in the public instruments of production and organization of urban space. In São Paulo, the implementation of telecommunication infrastructure networks is not legally included in the Strategic Master Plan – a requirement of the Statute of Cities, the law that regulates urban policies in Brazil at the federal level. The National Plan for Connectivity of the Ministry of Science, Technology, Innovation and Communications (MCTIC) also makes no mention of urban or spatial policies. This condition, inherited from the pre-mobile connectivity era, is the face of the disjunction between the expectations of expansion of the digital economy and the spatial consequences of this expansion in Brazilian cities. This lack of interaction is due in part to the lack of prospective, exploratory studies on the inter-influences between urban-social development and new technologies. Although the biggest and most comprehensive impacts of ICTs on the urban environment are on the forms of time use, non-negligible spatial effects on space use demand attention.

The cases of Uber, Cabify and 99 services illustrate the presented problem. Although the arrival of these companies promotes a new mentality regarding mobility, do they actually promote a reduction in the number of cars circulating in big cities? After all, for citizens to stop using their private vehicles, other citizens will get a car to service them. In addition, due to the logic of density, labor supply and per capita income and also the perimeter of activity of some of these companies - such as Cabify -, we can infer that most of the races in São Paulo are carried out in the expanded downtown area, a factor that might induce greater displacement of drivers from the outskirts to this region. Also considering that the use-sharing of the road space is transformed by the entrance of these new services, is there an effective improvement of the metropolitan transit in general? And, finally, there's the "Uber effect", which is the increased vacancy of parking lots in the cities served. This is one clear consequence of the direct effect of a remote application - run on a mobile terminal connected to the global connectivity infrastructure - on the use and value of urban space.

In the current context, the creation of integrated urban-digital municipal agenda is urgent. Structured as a dynamic platform, it should ensure support for public management of complex urban and social systems. But they must go beyond that. Studies on the spatial and socio-environmental impacts of urban digital media - that is, on the inseparability between the behavioral effects and the spatiotemporal effects produced by the greater dissemination of digital systems in the metropolitan social life - can reveal new variables and subsidize innovative policies of reprogramming Brazilian cities.

This field of study is in the process of formation and, through it, passes the future of urban life.

Lucas Girard *is an urban planner and architect, has a master's degree from FAU-USP, coordinator of the Future Urban Scenarios (FAU-USP), and researcher at CEST-USP.*

Coordinator: Edison Spina

This article is a result from the author's ascertainment and analysis, without compulsorily reflecting CEST's opinion.