

Promises and realities of information technology uses in developing cities

Laure Criqui (IDDRI)

The deployment of information and communication technologies (ICTs) may open the door to a spontaneous optimism about the workings of urban management. But what is the reality of this? To what extent can resource-strapped local authorities facing massive, rapid and informal urbanisation turn ICTs to their advantage? There are still scant studies on the role of ICTs in the fabrication and steering of cities specific to the Global South.

This *Issue Brief* views digital devices not merely as a technology, but also as tools that are spawning new uses. Setting aside the ideal of the smart city, it approaches ICTs as operational tools that disrupt traditional urban functions (basic services management, economic development...) and the modalities of public action (planning, administration...). In Asia, Africa, Latin America, new actors are positioning themselves on niches where public action is either absent or failing, and new unexpected uses are emerging, albeit with a direct link to on-the-ground urban dynamics. The challenge is thus becoming less one of technical efficiency and more one of urban governance and local government's capacity to channel ICTs into making the digital transition a driver of sustainable urban development.

ICTs can be used to improve action in specific fields of application, help the governance processes of public action and drive economic growth. The urban and institutional conditions of developing cities will be what determines the feasibility, relevance and effectiveness of these new digital tools and their uses.

KEY MESSAGES

- Depending on the sectors of application, real uses of digital tools more or less correspond to the promises of the smart city. Their contribution to sustainable urban development for all depends on steering by public authorities to secure the public interest.
- Data production in developing cities is still sparse, politically sensitive, and supposes human and financial capacities for analysis, management and maintenance. Should this be lacking, their potential to inform decision-making will be limited.
- On the other hand, ICTs are driving the emergence of new players, but above all is enabling diverse stakeholders in cities to connect up at lesser cost through short circuits and on-demand services that bring greater social inclusiveness, even though they may be unregulated.
- The main ICT users are the private sector, civil society and central governments; local authorities are lagging behind in turning the digital transformation into an opportunity for sustainable urban development, and run the risk of finding themselves quickly overwhelmed.

This article has received financial support from the French government in the framework of the programme "Investissements d'avenir", managed by ANR (the French National Research Agency) under the reference ANR-10-LABX-01.

Institut du développement durable
et des relations internationales
27, rue Saint-Guillaume
75337 Paris cedex 07 France

1. DIGITAL TOOLS USES FOR URBAN FUNCTIONS

While the urban responsibilities of local authorities in the global North and South are similar, the promises of digital tools are inspired by cities in the North (Odendaal, 2003). Their diverse translations in developing cities reveal uses that are unexpected but no less supportive of sustainable urban development.

Urban services management

ICTs are supposed to lead to the optimised management of natural resources, infrastructures, commercial offers and the operational monitoring of service networks. In cities where these services are inadequate and where utility providers have constrained capacities, it is primarily in the area of alternative service offers that digital tools have been a game changer.

ITCs make it possible to **link up** unserved populations with small, private or informal operators *via* applications for on-demand services. They thus create new “**marketplaces**” outside the official channels, and help to increase the income of often precarious providers. In addition, these tools heighten the impact of communication on **changes in consumer behaviour**. For example, *Wecyclers* in Lagos (Nigeria) enables the residents of precarious neighbourhoods where waste collection is not ensured to call on recyclable waste collectors. To encourage residents to separate out this waste, they are offered redeemable points via their cell phones according to the amount of recyclable waste they supply.

More than simply optimising public services, ICTs make it easier to match a diversity of offers with previously hidden demands and thus helps to improve service coverage through third parties, on-demand services and hybrid offers. The question of public regulation to ensure compliance with standards, financial equity and social inclusion through these alternative offers is not in itself new. However, the issue has become all the more urgent given that these alternatives are proliferating through digital tools.

Diagnosis and spatial planning

ICTs are promoted as an enabler of “smart urban planning”, controlling and anticipating the functioning of the city. In fact, where planning is ineffective or plans are not implemented, digital tools offers new possibilities.

Firstly, the timing of urban action is shortened: from long-term forecasting, the availability and constant updating of data drive a more **incremental and responsive** action. Dar es Salaam (Tanzania)

and Kathmandu (Nepal) are now equipped with mapping and early warning systems for floods or earthquakes: combining satellite images and text messages, they ensure real-time coordination and immediate response to the needs of communities. What’s more, geographic information systems provide **localised and exhaustive knowledge** about the city and its needs. Still often omitted from official plans, precarious neighbourhoods are clearly present on these maps. Recognising them remains a political matter, but it is becoming difficult for the authorities to ignore them. The possibilities of citizen-led reporting and crowd-sourced mapping have extended the work of territorial diagnostics to third parties. The production of knowledge on the reality experienced in the city is easily appropriated and diffused thanks to ICTs. This of course requires enhancing the communities’ digital literacy, but offers a **more open medium** than conventional planning processes.

Rather than serving mainly to control and define a city’s future, digital tools are more useful for dealing with what already exists, as it takes on board urban development patterns that elude urban planning and adapts the public response to this. In cities undergoing rapid and informal growth, there is the potential for a massive paradigm shift with respect to modes of action other than traditional planning methods.

Improving public administration

The promises and realities of e-administration seem more aligned, including and perhaps even more particularly for resource-strapped authorities. Certainly, ICT-driven improvements in municipal functioning show gains in efficiency, transparency and accountability.

Uganda and the Philippines have thus cut **internal spending on local management** by coordinating actions on-line, dematerialising administrative procedures and formalities, introducing e-payment systems, reducing paper consumption, etc. The upshot is that the possibility of **fraud and corruption** is lessened and transparency enhanced. This accountability goes hand in hand with more effective control, a reduced error rate, an on-line complaints platform and e-payment of taxes. By building trust, these mechanisms have helped the municipalities to improve their tax collection rates

To be effective, however, e-administration needs to be **accessible** to all, and reduce the time and distance for interaction with local administrations (Internet kiosks in Fes [Morocco], acceptance of mobile money). The multiplicity of media adapted to the practices and capacities of vulnerable populations is a decisive factor in achieving this.

The synergies for municipal governance are promising but so far have not barely been taken on board by local authorities. Most often the programmes are state-led initiatives: as they disrupt professional practices, and sometimes vested interests, their application demands a real willingness along with political and financial support.

Strengthening partnerships and participation

Using data to steer cities supposes ad-hoc configurations of actors; e-governance can be built around the production and use of data. In such cases, the limited capacities of the authorities in developing cities leave considerable room for the intervention of third parties.

On the one hand, **open data** not only enable citizens to follow public action but also encourage innovation and application development by start-ups. On the other hand, authorities with little latitude for managing big data are seeing other ways of producing and using urban data. In this situation, **crowdsourcing** initiatives – such as participatory mapping of precarious neighbourhoods – can lead to the emergence of needs, demands and ideas to inform urban action.

If e-governance is to be inclusive, having recourse to **intermediaries** (universities for data analysis, NGOs for data production) guarantees that a diversified public will be mobilised and buy in, and that the e-skills of all stakeholders will be enhanced. Apart from Brazil, which is prone to citizen participation, initiatives are often still limited to a one-way exchange of information rather than encouraging a real dialogue or the co-production of public action.

Local economic development

Lastly, the digital sector is an attractive, productive and competitive sector that creates economic activity, jobs and revenue, while also reducing transaction costs. Yet making it into an engine for local economic growth requires public-sector support, which in developing cities is still very limited.

Incubators or hackathons offer stimulating, open and collaborative work spaces. Initiatives are mushrooming in Africa, but these “**third-places**” are often small or fledgling and lack support. The coordination of the digital sector with **traditional private-sector businesses** also requires enabling schemes such as the open innovation promoted by NUMA Casablanca (Morocco), if start-ups are to bring real solutions to the challenges of the private sector and benefit from coaching and financing.

Moreover, third-party's ICT uses in developing cities generally have a strong **social and environmental mission**: actions are anchored at local level, respond to the needs of local communities and seek to contribute to local development. Their commitment to creating local jobs, promoting short supply circuits or furthering digital education is promising.

Local authorities still need to mobilise: be it state-led initiatives (e.g. platform for local tourist sites in China) or private initiatives (e.g. hotel-booking sites in Africa leveraging a weak regulatory framework), the economic opportunities offered by the sector are still off the local authorities' radar screen and overlooked in their policies.

However, the potential of these sector-oriented uses is not risk-free: following the specific logics of market-driven supply and demand, the risks involved threaten the equity, accessibility and universality of services for all, fail to guarantee data security and protection, and are not immune to political manipulation, which means that the authorities crucially need to take a position vis-à-vis the sector.

2. IMPACTS OF DIGITAL TOOLS ON LOCAL ACTION

In both the global North and South, the digital sector's actors are becoming part of the urban fabric, whatever the public policy in place.¹ These dynamics are especially disruptive in the Global South as they are operating on a fertile ground characterised by public weaknesses and informal urban development (Odendaal, 2003). This is certainly an additional challenge for already fragile local authorities, but one that it is not impossible to turn into an opportunity.

Data to support decision-making

The architecture of the digital city has as its key components: connected devices such as sensors, cameras, and satellites, which generate data; data centres that integrate, operate and maintain data in order to treat and analyse them; and communication interfaces to share the information (Bouskela *et al.*, 2016). For each of these steps, it is necessary to regulate authorisations, incentives and institutions (Edwards *et al.*, 2016)

In developing cities, the amount of data produced is smaller but more diffuse. The data come less often from statistics databases or the indicators of urban services than from dedicated sensors, as well as citizen input and passive recording of

1. www.iddri.org/Projets/Audacities-Gouverner-et-Innover-dans-la-Ville-Numerique-Reelle

mobile data. This means that data producers are no longer the public authorities but a myriad of public, private and informal actors that are fabricating the cities through their use of ICTs.

This means that efforts towards interoperability, centralisation and harmonisation are required. Digital tools modify the type of knowledge by inputting co-produced, localised and constantly updated information. This provides a dynamic and exhaustive image of the city, an added-value for contexts where the urban fabric is largely informal and has often been overlooked by decision-makers. Data-sharing then plays a role in the public sector's internal coordination, but also in exchanging with third parties, enhancing transparency, and broadening the diversity of uses. The way in which data are consulted, analysed and shared depends on political choices related to the form and function of the city, which go beyond technological arrangements alone.

New actors (and interactions) to make the city

In addition to data—and before all—ICTs offer platforms for communication and exchange that connect markets, the otherwise unmatched supply and demand, and link up and coordinate actors, while also reducing transaction costs (Relhan *et al.*, 2012). Yet, new uses in developing cities are structured less around and by the authorities than by the gaps where authorities are struggling to meet the needs of local communities.

The emergence of digital sector actors disturbs the arrangements between the public sector, private sector and civil society. ICTs allow direct, immediate and dematerialised relationships: a simple text message allows people to pay taxes, call a service provider, signal their whereabouts during a natural disaster or lodge a complaint. Other intermediaries such as universities, NGOs or incubators that defend an open and collaborative vision of digital tools are also positioning themselves and seeking to use ICTs for the local common good. They support marketplaces where the offerings of small service providers match the latent demands of marginal populations, and even help the latter to use ICTs as a neutral and objective tool to relay their social demands.

New forms of exchange are being created as information asymmetries are being reduced and barriers to the digital world being lifted thanks to ICTs, spawning other urban practices. However, in cities where the authorities are often overwhelmed by urbanisation, this dynamic may in fact weaken the role of the public authorities even further, while at the same time innovating in

the direction of a certain urban inclusiveness. By imposing a multi-stakeholder approach, ICTs thus blur the lines between official urban actions and alternatives for the common good, and is halfway between posing a heightened risk of ungovernability and creating leapfrogging opportunities.

The stakes for the urban vision

To make a city “smarter” through digital tools, there are some organisational prerequisites: a champion to carry the vision, a dedicated department, and the training of professionals (Bouskela *et al.*, 2016). But these elements are already limited in developing cities, including for the traditional urban functions. The importance of political—and financial—investment in favour of digital tools is thus all the more crucial.

Finally, the eruption of digital tools relates to a transition process. Developing cities are far from totally digitalised, and the absence of data does not point to the absence of problems: alongside the potential described in this Brief, the risk of leaving behind the most vulnerable and often the least connected populations should not be overlooked. Thus, access to ICTs, the use of data or the development of alternative services are becoming organisational and political stakes. This means that local authorities' digital capacities need to be reinforced in order to embed ICTs into existing institutional and administrative frameworks and to minimise the risk of “dropout”; also local authorities need support to empower them to understand, exploit and channel the opportunities offered by digital tools towards inclusive urban development. ■

This *Issue Brief* is the result of the first phase of a study conducted with the French Development Agency (AFD) on the stakes of digital tools in developing cities; it will be followed by an analysis and recommendations on what role is most appropriate for local authorities and donors.

REFERENCES

- Bouskela, M., Casseb, M., Bassi, S., De Luca, C., & Facchina, M. (2016). *The road toward smart cities. Migrating from traditional city management to smart city*. Washington DC: IADB.
- Edwards, B., Greene, S., & Kingsley, G.T. (2016). *A political economy framework for the urban data revolution*. Washington DC: The Urban Institute.
- Odendaal, N. (2003). ICT and local governance: understanding the difference between cities in developed and emerging economies. *Computers, Environment and Urban Systems*, 27(6), 585–607.
- Relhan, G., Ionkova, K., & Huque, R. (2012). *Good urban governance through ICT: Issues, innovation, and strategies* (Working paper No. 71512). Washington DC: World Bank.