



Smart city and local authorities  
**Leading the digital transformation**

August 2018

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**The French Development Agency is strongly committed to backing sustainable cities, and since 2015 has also become involved in supporting its partners through the digital transition. A new dimension of intervention in favour of the “smart city”, built primarily by multiple human energies making use of new technology tools, is therefore emerging in parallel to AFD’s transformation into a digital donor.**

For embracing digital solutions is one of the challenges facing emerging and developing cities. A catalyst for meeting the Sustainable Development Goals, digital tools offer powerful opportunities for urban development. The efficiency of urban services, the transparency of the local authorities, increased participation, the appeal of the territory, enhanced planning and risk prevention in towns, open data management, all these factors take us beyond the fantasy of an automated town focused on solutions to serve the public interest.

Devised in cooperation with IDDRI, AFD is offering this deliberately methodical, interactive and open smart city guide to local authorities who wish to start or gradually expand the digitalization of their projects or internal administrative organisation. The guide therefore aims to boost the (digital) capacities of local public stakeholders by offering them methods, suggestion boxes and experience feedback. The technical and local political teams will thereby have adequate material to **understand, act** (in four major urban domains they are responsible for) and **adapt** (internal transformation of local authorities) to mention the three major parts of the guide. They will be able to frame their goals, target some pilot actions, draw up monitoring indicators, enter into a *test-and-learn* approach and then scale up.

In addition to the paper version, it has been decided to make this guide available online through a website with a striking visual identity. The online guide will encourage the local authorities to provide feedback on their actual initiatives to be able to share them. And so this tool will be animated by you : it should enable the multiplication of exchanges between local authorities in Africa, the Mediterranean, Asia and Latin America. We hope you enjoy reading our part and that you will also enjoy doing your part !

**Anne Odic**, *Head of local government and urban development division at Agence française de développement.*

**The think-tank Institute for Sustainable Development and International Relations (IDDRI) has been working for more than ten years on the dynamics of the urban fabric. Iddri analyses the roles of public, private and non-profit stakeholders involved, in fields as varied as housing, provision of water and sanitation services, urban mobility and local finance, in cities of the North and South. Its research aims at deciphering the challenges and opportunities for sustainable urban development, and at providing recommendations to decision-makers for public action and good local governance.**

From this perspective, IDDRI has analysed the potential and impacts of digital technology in the urban fabric and management. This guide on digital tools in and for developing cities completes previous works on innovation and governance in the “real digital city”. Produced in collaboration with the French Development Agency, it combines examples, practical exercises and operational recommendations in a methodological approach.

Indeed, the realities and the effects of information and communication technologies, the uses made of digital technology by the stakeholders (elected representatives, citizens, private sector and academics), and data management turn out to be unexpected, ill-controlled or under-used. Far from the models and myths of the “smart city”, local public authorities and their partners are in a learning phase to assimilate new ways of doing, new partnership arrangements and new ways of exchanging.

Shall another smart city to be possible or even desirable, adapted to contexts, capacities and challenges of rapidly developing cities, IDDRI wishes to support this transition so that the digital sphere finds its way into local public action. This guide proposes a pragmatic and realistic approach to lay the foundations and boost the potential of these new tools, in order to make a concrete contribution to international sustainable urban development.

**Laure Criqui**, *senior specialist in international urban development.*

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# Test your knowledge about the smart city.

## QUIZ

Ten questions to test your knowledge and direct you according to your answers.

### 1 What does “smart city” mean to you?

1. A new buzzword only for rich countries which will soon pass
2. A local authority that uses digital technology as a tool for its sustainable and inclusive urban development strategy
3. An automated and data-controlled city, made of sensors and servers sold by digital firms

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cf. Introduction

### 2 For you, what are digital tools?

1. The devices used to dig and lay fibre optics
2. Connectivity infrastructure, sensors, servers and data storage centres
3. New services for users (local employees, inhabitants, non-profits, firms, etc.)

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cf. Introduction

### 3 You are launching a digital transition in your municipality and on your territory : how will you start?

1. By distributing smart phones and tablet computers to all municipal employees
2. By clarifying expectations, and performing a diagnosis of the digital maturity of the local authority and the territory
3. By contacting a specialised digital consulting firm to write a 10-year digital strategy for the territory

---

cf. Part A

### 4 What is digital inclusion?

1. Solutions dedicated to reduce inequalities in access to digital tools
2. A new algorithm for attracting even more people to the Internet
3. A goal that cannot be reached as long as literacy and basic education are not adequate

---

cf. Part A

### 5 What do you understand by the “uberisation” of urban services?

1. Diversification of the supply of services based on market mechanisms and digital platforms
2. Selling transport and telecommunication infrastructures to Uber
3. Transforming urban service providers in start-ups

---

cf. Part B1

### 6 Participatory digital mapping is used to :

1. Enrich the databases of GoogleMaps
2. Inventory and geolocalise urban facilities and actual urban practices with and for the population
3. Control all urban activities in real time *via* geographic information systems

---

cf. Part B2

### 7 What is a local digital ecosystem?

1. All the partners of the municipality engaged alongside it in the digital transition of the territory
2. A series of websites, applications, software and online forums dealing with the challenges facing the territory
3. The world of geeks, startupers and other innovators

---

cf. Part B3

### 8 What does civic tech mean?

1. The use of social networks by civic and political movements
2. A community of activists who are against internet advertising
3. The use of technology to strengthen democratic bonds between citizens and local government and improve the political system

---

cf. Part B4

### 9 What does e-administration mean for your municipality?

1. Buying computers, servers and software, choosing equipment that is not too expensive
2. Make savings and sub-contract a maximum number of tasks and administrative procedures to start-ups
3. Make use of digital tools (giving preference to free solutions) to improve the daily work of municipal employees and offer municipal services online

---

cf. Part C

### 10 What does “open data” mean?

1. Authorise everyone to produce their own databases freely
2. Allow all contributors to feed a single public database
3. Offer the public, to all without discrimination, digitised data that is accessible and can be freely (re)used

---

cf. Part C

## QUIZ

### Answers :

1	2	3	4	5	6	7	8	9	10
2	2 & 3	2	1	1	2	1	1 & 3	3	3

### Score :

**0 - 2** : The smart city and digital tools are new to you ! Don't worry, this guide is here to help you take your first steps.

**3 - 5** : You have an idea of what a smart city is, but you still have to gain a better grasp of the challenges and seize the opportunities and procedures for the digital transition of your territory and your institution.

**6 - 8** : You know the basics ! It is time to begin, thanks to the "key questions" and "practical exercises" in this guide to build your own way.

**9 - 10** : Digital technology holds few secrets for you, do not hesitate to inspire your colleagues by sharing your experience and the initiatives you have implemented !



# Introduction

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The purpose of this guide

Overview of the guide

The guide on the Internet



## The purpose of this guide

This practical guide, drawn up by AFD and IDDRI, is intended to assist local authorities in meeting the challenge of a digital transition with all city stakeholders : decision-makers, technical teams, inhabitants and users, operators, urban project implementers.

The content is based on the realities of cities in Africa, the Arab world, Asia and Latin America, but the methodological support has a universal reach.

**The questions this guide will endeavour to answer include :** how do you achieve the gradual digitalization of one or more sectors of local authority action ? How do you stimulate and facilitate innovation on the local territory ? How do you act with pragmatism and through a “test-and-learn” process ? How do you define the frameworks and regulate data access and openness in an approach that is in the public interest ? How do you build urban knowledge through digital tools that will help define the action of the municipality ? How do you start an internal process of digital transformation ? How do you boost the capacity of municipal staff in the digital sphere ?

### Digital transition : cities in the front line

Over the past few years, the swift propagation of digital technologies and services has caused economic and social upheavals. The digital sector encompasses an array of tools and solutions based on information and communication technologies (ICT) : connectivity infrastructure, management software, mobile telephone applications, geographic information systems (GIS), SMS, online forums, urban databases, etc. It entails the exponential production of data and the development of new stakeholders, uses and services.

Cities, in the North as in the South, are at the forefront of this digital transition. And the use of the phrase smart city is spreading. The image is attractive, but it often goes hand in hand with a “solution-oriented”, technical vision brought in and sold by the ICT operators and experts themselves. In addition, the majority of international best practices correspond to cities in the West or in the “major emerging countries”. This restricts the smart city to the optimisation of urban services (Singapore), city performance (Songdo in South Korea), or the integration of data symbolised by a sophisticated command and control centre (Rio de Janeiro has been experimenting this with IBM since 2010).

In reality, local authorities all over the world are still in the learning phase and facing a twin challenge :

- to support the dematerialised production and exploitation of urban data to improve city management,
- the effects of immediacy, responsiveness and transparency in exchanges among stakeholders in the administrative area.

## The smart city as a catalyst for the SDGs

This guide contends that actions related to the smart city must not be part of a rationale of “turn-key” digital services that are not anchored in the local territory and uses of these services. On the contrary, a city that is really smart initiates processes based on local uses and issues, analyses demand, seeks suitable – technical and organisational – digital solutions and provides a straightforward, accessible response.

**The users of digital tools may be the citizens, but not exclusively. Digital services can be designed for local administrations and firms, or can aim to facilitate the relations between these different communities of stakeholders. The generic term of user therefore designates the different target groups likely to use digital services depending on the context.**

The smart city thus has human and institutional dimensions which make it “the” condition of success for a city engaged in a sustainable digital transition. It combines the hardware of the digital infrastructure with the software of the “solutions” that can be simple and cheap, and match the immediate concerns of the local authorities and their citizens.

To summarise, the smart city is a catalyst, without being an end in itself, since the aim is to contribute to achieving the Sustainable Development Goals (SDGs).

The local authorities have a considerable responsibility for orienting the digital transition on their territory, regulating the generation and exploitation of data and creating synergies among the stakeholders. They must appropriate this new skill and encourage “good governance” of digital procedures, uses and tools.

## — Digital technology : an opportunity not to be missed

The digital sector is without a doubt full of potential opportunities for urban areas. It permits technology leapfrogging ; that is to say, skipping over certain stages in development and/or using tools tested by previously industrialised countries. Examples include mobile banking, mobile telephony, e-health and e-education. For cities undergoing development, the perspectives are also considerable : digitalized land registry map in the absence of a conventional land registry map, digital mapping by inhabitants of a neighbourhood outside of any census...

Digital tools also allow immediacy in the steering of urban action : they cross geographic and administrative borders, provide real time information and reduce response times. They allow new, more flexible and experimental project management methods and new business models.

**The uses of digital tools generated by the inhabitants and citizens also allow the authorities to gain a better understanding and recognition of informal activities, to make them an asset and not a constraint on development.**

## — The risk of local authorities falling behind on digital technologies

National and local public authorities must engage with digital services, or they run the risk of falling behind with respect to their citizens, and of being overwhelmed by the major corporations (in telephony and the Internet in particular) and other innovators.

In developing countries where a youthful, urban population is increasingly connected, the use of digital tools is growing exponentially, without intervention from the government. Major private platforms possess big data which it is lucrative to exploit.

There is therefore a risk of local authorities falling behind, which can be evidenced in the development of alternative digital services by third parties either disrupting the efficiency of or competing with the local public services. Another risk is that local authorities may have only limited or incomplete access to the data produced by the users and firms in “their” area, depriving them of essential material for urban planning and urban policies.

**It is not a problem per se that the major national or international firms generate large volumes of data. But they are not the guarantors of the public interest and local authorities must regulate the full availability and exploitation of all kinds of data.**

This guide encourages local authorities to define clear rules and initiate partnerships with the other stakeholders on their territory to (re)position themselves at the centre of local digital governance.

### The risks of digital technologies related to lack of municipal steering

- Economic risks : hegemony or monopoly of major platforms, privatisation of data, disappearance of jobs or job insecurity.
- Ecological risks : doubling of infrastructures (in the absence of sharing practises), excess energy consumption and carbon footprint of the ICT, lack of apprehension of the lifecycle of the infrastructure and connected objects.
- Social risks : inequalities of access and use, discrimination, addiction, lack of respect for private life.
- Political risks : control and surveillance threatening individual freedom, disconnection from social and democratic demands.

## The need to strengthen the capacities of the local authorities

The digital transition of a local authority requires strong political support and dedicated assistance, to facilitate the appropriation of the new tools by the users and to direct them properly towards sustainable and inclusive development of the local territory. Moving from the promise of the "smart city" to the reality of digital services in the city therefore requires capacity building for the local authorities to secure and supervise the change.

Properly managed and integrated into urban action, digital tools can achieve gains in efficiency, foster new cooperation and facilitate the co-construction of urban action. For local authorities, this means leading the change according to the following four operational objectives :

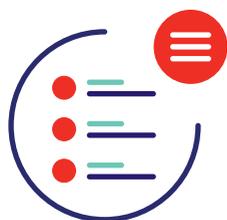
- digitalize the modes of action of the local authorities themselves and improve their interaction with the citizens ;
- design and implement new modes of communication and exchanges between stakeholders (public, private, civil society, etc.) ;
- gradually integrate ICT into the competencies of the local authorities to improve impact, efficiency and accountability ;
- regulate and manage governance of the digital sector through partnerships, legal frameworks and provisions on information management.

A small number of computers per capita, lack of access to digital tools, few or no digitalized information systems are not obstacles in themselves : any city, depending on its initial situation, can define goals in relation to its territory and needs. Nor is lack of local finance an obstacle : there are simple, accessible digital tools which can be easily introduced and have significant effects.

Special support for the local authorities and adequate appropriation time are mandatory for initiating the approach and removing potential resistance to change.

**The digital transition of a local authority requires strong political support and dedicated assistance, so that the tools can be designed on the basis of needs and expectations, and their appropriation by local authority staff and citizen users be facilitated. The switch from the promise of a “smart city” to the reality of local digital services therefore requires capacity building for the local authorities in order to materialise and guide the transformation.**





## Overview of the guide

This guide is designed to raise local authority awareness of the opportunities digital tools offer for their action, but also to emphasise their responsibilities.

It offers an operational perspective by proposing possible directions for action and examples of experience in the use of digital tools all over the world. The guide is not intended as a substitute for any technical assistance that a consulting firm could provide at the request of the local authority.

### Structure of the guide

The guide comprises three main parts :

- **Part A** proposes a methodological path for making digital technology a lever of sustainable change, and taking into account all the uses and stakeholders concerned by these new tools. The aim is to enable the local authorities to frame and define their general approach.
- **Part B** concerns the ways digital technology can be mobilised through four major municipal domains : management of urban services, territorial planning and management including the most vulnerable populations, local economic development and improvement of relations between administration and users.
- **Part C** covers the digitalization of the local authorities themselves and the resulting organisational adjustments. It highlights the fundamentals and components of a municipal digitalization to strengthen leadership and engage the departments in the digital transition. This part cuts across parts A and B.

In the annexes are a glossary explaining the main digital terms and additional online resources and references.



# The guide on the Internet

This guide is also available on the Internet at the following address :

<http://smartcity-guide.afd.fr/en>

The digital platform covers the different elements of the guide, in particular exercises and tools to go further.



KEY QUESTIONS



SUGGESTION BOX



PRACTICAL EXERCISE



TAKE THE TEST

The “**Initiatives**” part presents examples of the introduction of digital tools all over the world, classified by theme. It will be enriched gradually with contributions submitted online by local authorities who wish to share their experiences.



ALL THE INITIATIVES



SHARE YOUR EXPERIENCE

INITIATIVE

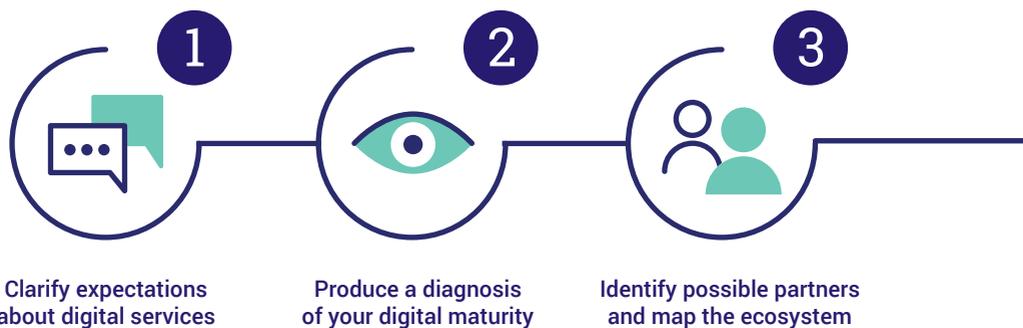
It also proposes downloads of “**work sheets**” to answer the key questions to be asked before embarking on the digitalization process.



Upload Worksheet

# UNDERSTAND

## The challenges of digital technology for local authorities



## GOAL

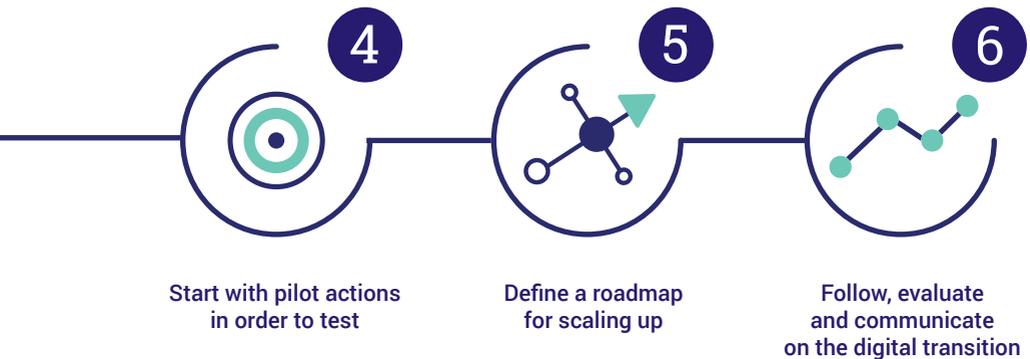
## Master the various steps for conducting digital projects and take up the lead of a local community of stakeholders.

The approach proposed here is a digital-oriented variation of the strategic territorial approaches : diagnosis, stakeholder mapping, defining of goals, methods of action and monitoring-evaluation. There are a few warnings and key questions to be asked before launching the introduction of digital services to optimise the chances of success.

The method can apply just as well to a single project for a sector to be digitalized (**Part B**) as to the internal digitalization strategy specific to the local authority (**Part C**).

### The basic principles of the method are :

- familiarisation with the potential, the tools and the culture of the digital ;
- identify the prerequisites and draw up a quick diagnosis of the penetration rate of the digital on the territory ;
- engage a collaborative approach to pool skills, data and resources ;
- define goals in accordance with the needs, demands and practices of the users ;
- consider that simple solutions can be decisive and implement pilot actions then scale up in the event of success ;
- favour a gradual process of improvement and testing, rather than the immediate implementation of heavy solutions that may not be very well-adapted.



STEP

1



## Clarify expectations about digital services

GOAL

Move beyond the fantasy of the “smart city” and identify the real opportunities and risks inherent in digital technologies for sustainable and inclusive development of your territory.

### Identify the real opportunities and take a stance

The first step is to clarify collective expectations in terms of sustainable urban development and adopt a political project that could be based on digital tools. A clear vision of the opportunities and limits of digital technologies is necessary.

This vision will allow the local authority, as guarantor of the public interest, to structure its action and the initiatives of third parties. Digital technology should be at the service of its political project.

#### Four models of “smart city”

Schematically, we can sketch four models of “smart city” influenced by ICT.

This typology is schematic. Nonetheless, it allows us to define scenarios that can be used to draw attention to the risks and limits of trends pushed to their extreme.

## TYPES OF CITY BASED ON DIGITAL TECHNOLOGY

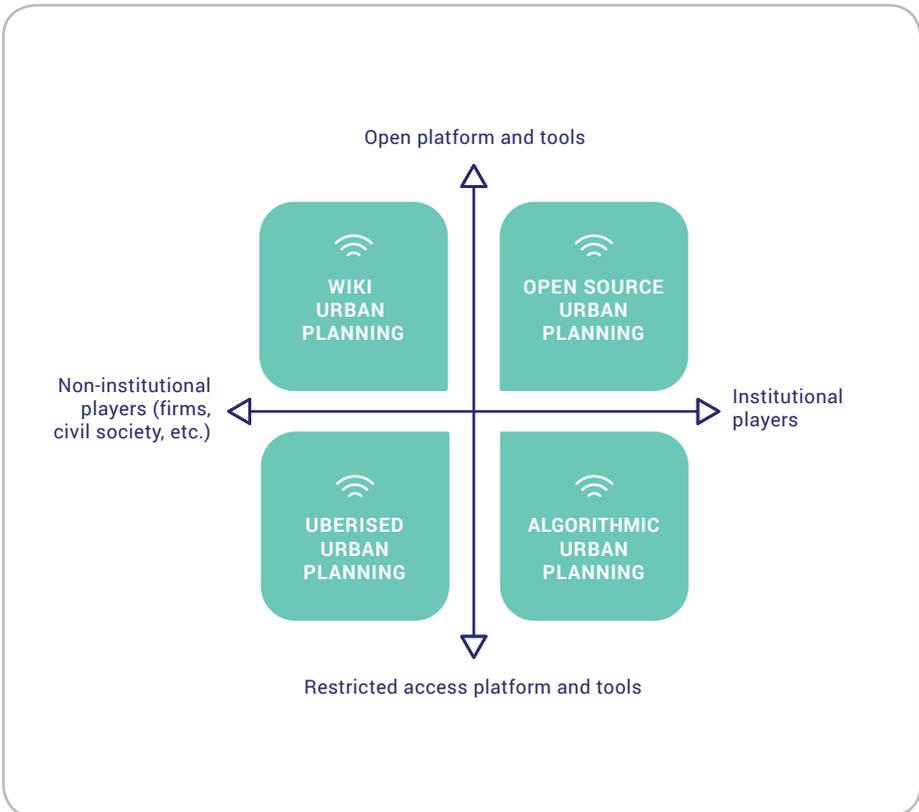
Type of smart city	Algorithmic city	Uberised city	Wiki-city	Open source city
Type of city planning	Expertise planning	Post-strategic planning	Communicational planning	Participatory planning
Dominant stakeholders	Private and/or public	Private	Citizen	Institutions and citizens
Urban planners	Engineer	Innovator	Volunteer, civic hacker	Digital mediator
Dominant values	Rationality	Market	Contributive democracy	Representative and participatory democracy
Objectives	Efficiency, sustainability, control	Innovation, disruption, profits	Sociability, alternative models of government and city	Participation, new legitimacy and capacity for action
Methods	Data mining and algorithms	Data mining and algorithms	Crowdsourcing and collective deliberation	Crowdsourcing, control or participation, collective deliberation
Systems	Closed command platform	Closed "cooperative" merchant platform	Open, co-built, "cooperative", non profit platform	Open, participatory, sometimes co-built, platform
Rationale and vision	Confidence in the technical expertise and data as closed resources	Extension of the domain of urban capitalism via new markets for services	Civil society seeking an alternative city <i>via</i> the social networks and cooperative exchanges	Renewal of planning practices and institutions and initiation of dialogue among all the stakeholders
Risks or limits	Domination and control of private stakeholders and depoliticisation of the solutions	Calls into question the legitimacy and capacity of action of the public sector	Bypasses or even calls into question the public stakeholders through the cooperative approach	Political and administrative supervision of processes ; lack of representativity of participation

## The “compass” of digital technology

Depending on the orientation chosen, the participation of non-institutional stakeholders and the degree of openness and access (internally or externally) to the data and digital tools will be more or less necessary. By taking position on the “compass” of digital technology, the local authority can start to identify the type of approach and the role to be adopted. Different alliances, tools, contractual arrangements will result.

The further to the left of the compass, the more the local authority should build and ensure its positioning vis-à-vis third party players. The lower the position, the more the local authority must defend its legitimacy and the accountability of the decisions in the public debate.

### DIGITAL URBAN PLANNING COMPASS



## KEY QUESTIONS

## Choose keywords that convey a digital vision



What must digital technology contribute to as a priority in my city ?

- **Local economic development?** : experimentation, innovation and creation of new services ; increasing competitiveness of firms ; improving the appeal and city image...
- **Social inclusion and local democracy?** : access for all to digital tools (public terminals and Wi-Fi) ; cooperative public services ; citizen participation and co-construction ; increased accountability and transparency...
- **The sustainability of my territory?** : planning and forecasts ; better knowledge of the territory ; constitution and analysis of databases ; preservation of natural resources, etc.
- **Modernisation of the local public action of my administration?** : efficiency of the management procedures ; reduction of administrative costs and time-frames ; relevance and legitimacy of the decisions by defining priorities in accordance with the needs of the population.

## From promises to actual uses

The way private stakeholders, formal or informal, the population and even the local authorities make use of ICT generates unexpected effects. These initiatives are often situated where public services are weak or absent ; they fill up the gaps and meet unsuspected needs. The local authorities can discover new niches for urban policies that previously were not in the scope.

**Part B** of the guide describes various actual and possible uses of digital technology in developing cities in four traditional urban functions, accompanied by examples : **management of urban services, planning for the most vulnerable, relations between administrations and users, and local economic development.**

We must therefore first of all return to basics : digital technology depends on information and communication technologies. It is not only a question of managing the city using data, but also of an ecosystem of stakeholders connected through digital devices. Of course, the effects of communication and information become intertwined : information serves as the foundation of new relations and the exchanges generate data.

The arrival of digital technology obliges local authorities to take position.

- ICT is shaking up the world of information and digital tools, opening up new opportunities for knowing, managing and anticipating the way the territory is changing in a much faster, more responsive way.
- Digital technology renders perceptible activities, urbanisation areas, categories of population, or even social movements, which previously had little visibility. This obliges the local authorities to define a position and a strategy for action.

## KEY QUESTIONS

### Define what you want to use digital technology for



#### Support the production and use of information, and especially data

- Producing, collecting, storing, processing, analysing and sharing data : which action(s) must the local authority take charge of ?
- Which types of data that are important for municipal development and public action should be given priority : statistics, council decisions, maps, civil registry ?
- For what purposes should the local authority use and exploit the data generated : knowledge, forecasting, controlling, programming ?
- For which users : the local authorities, third party public authorities, the private sector, citizens ?
- What are the limits to be anticipated : data storage capacity, data formats, ignorance of the problems for which there is no data ?

#### Facilitate communication and the exchanges between the stakeholders of the territory

- Which priorities : connect the stakeholders who are disconnected, foster the emergence of new stakeholders, encourage new ways of exchanging ?
- Which stakeholders : connected users, vulnerable populations, the private sector, informal sector, the NGOs ?
- To what ends : to raise awareness, consult, open new markets, tax, census ?
- In what form : information campaigns, forums, call centres, social networks, trade services ?
- With what limits : feed the practices that bypass local authorities ; develop a supply and demand system that excludes the most vulnerable ; dependency on intermediaries ?

## Become aware of the risks of digital technology

The question of exclusion or the digital divide is not only a question of access to the new technologies or network coverage, but takes in more broadly the issues of pricing, social acceptability, gender, age, appropriation and literacy.

Dedicated support systems are necessary :

- to reach the most vulnerable sections of the population or the excluded of the digital,
- to design systems suited to their needs and capacities.

While introducing municipal services on digital media, it is therefore important to maintain physical services, ensure the presence of facilitators to accompany the users, and design tools and interfaces accessible to all (including the illiterate).

Setting up partnerships, planning a training budget, or making equipment available are municipal actions that can easily bring together the conditions necessary for an inclusive digital transition. The NGOs, the universities or educational institutes, the stakeholders in the social and solidarity economy (SSE) or again the third places and incubators who democratise the use of digital technology can be relays and mediators.

The local authority, for its part, can take the responsibility of identifying the target populations, and the intermediaries who can work with them.

#### INITIATIVE



### Community Internet access points implemented by local authorities



#### JAMAICA

**In Jamaica, the creation of telecentres and libraries is one method used to facilitate access to e-government services, in particular in low-income neighbourhoods.**

A government programme to develop community Internet access points was implemented in Jamaica in 2011. The telecentres provide public access to ICT, especially for personal, social, economic and educational development. They encourage the creation of websites and virtual communities. They serve as meeting spaces for young people. They train or support the older generations who wish to remain in contact with expatriate members of their families.

A communication and awareness raising campaign promotes the idea that the execution of administrative operations in these access points is less expensive than travelling to the authorities. In addition, inhabitants can send questions to the telecentre by SMS, and the agents reply on the Internet and through local radio.

The implementation of this programme draws on the local authorities and non-profit organisations to whom they delegate the management of the access points. In parallel to the national ICT strategy, it is a question of giving everyone the chance to take advantage of the development of e-services.

#### Lessons learnt :

Financing and developing a local network of universal access points to digital tools constitutes a system for including all of the inhabitants.

## SUGGESTION BOX



## Set up digital mediation systems

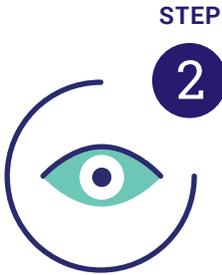
- **Improve the coverage in secondary infrastructure** and equipment : installation of digital booths, free access computers, Wi-Fi terminals in public places, stations, libraries or markets.
- **Organise or support training, workshops and educational campaigns** on the use of digital tools and the Internet with mediators in municipal spaces, schools, etc.
- **Design and define accessibility norms** for the online municipal services with easy, intuitive interfaces for users.
- **Diversify communication materials** combining the circulation of information on paper, telephones, online, and drawing on the media to reach as many people as possible.

## KEY QUESTIONS

## Design an inclusive digital system



- **Who** are the people excluded from digital technology or from the service to be developed : senior citizens, women, peripheral neighbourhoods, informal sector ?
- **Why** are they excluded, what are the obstacles they come up against : cost too high, literacy barrier, cultural practices, zone not covered ?
- **How** can they be included, what targeted system can be put in place to include them : digital literacy classes, digital mediation, communication campaigns, public facilities and access, simplified design ?
- **Which** partners can be involved : which intermediaries are the best placed to transmit the knowledge and know-how necessary for the appropriation of digital tools ?



## Produce a diagnosis of your digital maturity

### GOAL

Estimate the digital penetration rate on the local territory ; identify the possibilities offered by the national digital framework.

Territorial diagnoses are required to identify local assets and weaknesses and develop suitable and realistic solutions. A first quick inventory of a few key elements can be done easily and produce significant insight about local digital maturity.

### The importance of the national regulatory and institutional framework

It is rare that the telecommunications sector is governed directly by the local authorities and it is very often at national level that the regulatory frameworks are defined. A review of the political and institutional frameworks of the digital sector may provide indications on the possibilities for the local authorities to develop initiatives on their territory.

### KEY QUESTIONS

#### Know the national framework for digital technology



- What are the national and international programmes, competitions and calls for projects that can rally **specific funding** for digital innovation ?
- What are **the programmes for deployment of telecommunications infrastructure** on the territory, which would show the possibilities for extension or improvement of coverage ?
- Who are the telecommunications and data regulators ? What is the **regulatory framework**, the degree of openness and of competition in the sector ?
- What is the **distribution of skills and responsibilities** between the different levels of government, any regional or provincial agencies that can serve as relays ?
- What is the national framework on **data security and protection** ?

## The penetration rate of digital technologies and tools on the territory

The ICT penetration rate can be estimated from several types of information that give indications about the maturity of the local digital ecosystem :

- databases at national level, such as, for example, those of the International Telecommunication Union (ITU) ;
- estimations of the penetration rate in the cities based on this national data ;
- the trends across a number of years, to estimate the speed of penetration of digital technology on the territory and the potential growth of the user base.

### KEY QUESTIONS

#### Estimate ICT penetration rate on the local territory



- What is the **coverage of the electrical network and of the telecommunication networks** at national level ? This must allow the definition of connectivity at the level of a city, but also identify potential white zones where connections will be limited or difficult (on the periphery for example).
- What is the **rate of household ownership** of telephones, smartphones, tablets and computers ? How is this penetration rate distributed over the territory ?
- Who are the **local operators** of mobile phones and internet service providers, their partners, their equipment (capacity of the servers, data centres...) and their prices ? This must allow the identification of potential partners, service offers, the players seeking to develop their market, and also financial accessibility for the population.
- What are the **applications for local use** on the mobile application stores in the domains of transportation, catering, tourism or local media... ?
- What is **the accuracy and richness of the information on the online mapping systems** (OpenStreetMap or Google Map) ? They can serve as indicators of the vitality of a sector and of digital professionals on the territory concerned.
- What is the offer of **cybercafés and possible third places** (co working spaces, fab labs) ? This evaluation can give hints for identifying the stakeholders of the sector, or even potential financiers or business angels.

## INITIATIVE



## The national strategy of digital modernisation as a framework for the local authorities



UGANDA

[www.finance.go.ug/mofped/integrated-financial-management-system](http://www.finance.go.ug/mofped/integrated-financial-management-system)

**In 2006 the Ugandan central government launched a development process for the network of data transmission infrastructures within the scope of a vast plan for the digital modernisation of the whole territory.**

In 2011, 1,548 km of fibre optic cable was laid in the country. The government also regulated mobile phone technologies to secure this equipment, the development of which was considered a priority. In 2012, there were 850,200 mobile Internet users in Uganda compared to 84,558 users of fixed connections.

In addition, an Integrated Financial Management System (IFMS) was developed to harmonise the payment of tax at national level

and extend the tax base to all levels of the administration. In 2012, twenty-two ministries, twenty-five government agencies and eight local governments had adopted this system. Following this initiative, the dematerialised services were extended to include electronic payment of urban services (water invoices) and the renewal of administrative documents (passports, education and study grants, tourist visas, etc.).

In order to deploy this national strategy to all the administrations, the programme also promotes the introduction of municipal digital strategies.

### Lessons learnt :

The *impetus* from central level helps to structure a consistent national policy framework for the digital transition of the local authorities and their territory. Advocacy encouraged this *impetus*.

STEP

3



## Identify possible partners and map the ecosystem

GOAL

Enter into relation with the digital ecosystem, open up spaces for exchange and create partnerships to deal with common local challenges.

Digital technology is not a tool for the exclusive use of the public authorities : the private sector, academia, civil society and citizens make use of it spontaneously. On the one hand, the local authorities are not specialists in digital solutions ; on the other hand, the stakeholders of digital technology are not always fully aware of all the territorial issues at stake. It is therefore up to the former to tell the latter which subjects to deal with.

This means it is imperative to follow a rationale of partnership and openness from the very start. Cooperation between the innovators of digital technology and the users will ensure that the new digital services are appropriated and used.

### Private sector

The local authorities can avail themselves of private sector technical expertise, innovative ideas and funding capacities to develop viable initiatives. Different types of stakeholders can be identified.

- **The traditional private sector** (industries, banks, services, etc.) can be positioned as clients or funders : to improve operations or seize a market opportunity, they call upon the digital technology stakeholders to develop a solution, creating complementary services.

- **The traditional telecommunication sector** (infrastructure operators, Internet service suppliers, mobile network operators, etc.) possesses data that is potentially useful to the public authorities or innovators. They may wish to expand their range of services to consulting and strategy thanks to the data at their disposal.
- **The digital sector**, often small, young, dynamic enterprises who develop applications or services on niche markets. They are more oriented towards seeking finance and investments to develop their products and they possess technical skills.

## Civil society

Civil society makes use of digital technology as a tool of knowledge, to build capacity, for participation in decision making or even social protest.

- **The NGOs and CBOs** readily adopt ICT to increase the impact of their actions : communication campaigns, advocacy towards the media and the decision-makers. Their proximity positioning makes them preferential relays for raising the awareness of the population about the new tools. They can also position themselves as innovators, like the social and solidarity entrepreneurs who develop non-profit services to foster sustainable urban development.
- **The universities, research and education institutes** are particularly mobilised in the development of ICT and data management. Their capacity to generate knowledge and manage data makes them significant partners. Students – often well connected – are also possible relays for informing the population, carrying out user surveys, conducting awareness raising campaigns.
- **Citizens**, as inhabitants, entrepreneurs or customers, make use of digital technology to communicate and find information, express themselves and participate (civic tech). The users are also, passively or actively, generators of data (crowdsourcing, see schema 6). The digital services to be envisaged must therefore match their practices and uses.

### KEY QUESTIONS

#### Identify the stakeholders likely to become partners



#### Who are the local stakeholders most familiar with and keenest to use digital technology?

The idea is to list the stakeholders potentially concerned either by the digitalization of a specific project, or by the emergence of ICT and the associated ecosystem.

MAPPING OF THE STAKEHOLDERS INVOLVED,  
TO BE SPECIFIED DEPENDING ON THE LOCAL CONTEXT



KEY QUESTIONS

**Identify the dynamics of stakeholders and the external resources that can be rallied**



- What would each potential partner **gain** by developing digital tools : profit expectations, social cause or political interest, generation of new knowledge, enhanced efficiency or democracy ?
- What are the **resources** of each that could be rallied for projects with the local authority : financial, technical, human, data ?
- What are the possible **means of commitment and incentives to make them partners and conduct actions together** : visibility and marketing, complementary partnerships, targeting of pilot actions ?



STEP

4

## Start with pilot actions in order to test

GOAL

Start from an existing urban challenge, stimulate innovation and test new solutions.

Experimentation and apprenticeship must be a common theme. It is not a question of creating a digital revolution in your territory, but, on the contrary, of identifying the very concrete challenges and testing simple solutions before scaling up. The introduction of digital technology is a gradual transition that requires long-term management to match actual capacities and adapt to the needs of the territory.

### **Digital innovation : an approach through experimentation**

As for any innovative approach, it is advisable to remain realistic and advance gradually. It is more effective for a local authority to undertake changes that can be manageable and are reasonable, to experiment with pilot actions, to refine the solutions before generalising and switching to a larger scale. A number of successful initiatives have started on a circumscribed scope (geographic, thematic or instrumental), before being taken up and extended to a broader field.

This approach by test and learn or pilot projects is particularly suitable for developing cities which often have constraints in terms of resources : to allow work to start with limited means, then increase the amplitude of the action gradually as the results turn out to be satisfactory for the users, and so attractive for the city's partners.

To avoid investments that are too expensive or unsuitable, the identification of some particularly relevant technologies by municipal management is vital. Simple solutions, such as a page on the social networks, the listing of public facilities on OpenStreetMap, the introduction of a hotline for complaints, can already have a profound effect on the efficiency, impact, quality and perception of the services provided by a local authority.

The initial definition of the scope does not, however, remove the necessity of anticipating the change of scale or the reproducibility : the works should be done in a “flexible” manner and by iteration, taking possible future changes into consideration. The tools initially set up must be capable of integrating the increase in the volume of exchanges and data. Failing this, it will be difficult to handle broader topics, and it will be necessary to take up the process again from the beginning, losing out on the advantages of the apprenticeship.

## KEY QUESTIONS

### Define the scope of a pilot action



- **What is the area we want to act on? Start** from the city and drill down to a district, then a neighbourhood.
- **Which sectorial scope? Start** from an administration and drill down to a service, a procedure.
- **With what amplitude? Identify** a specific problem, sector niche, pilot project, an action integrated into a zone.
- **Using which lever or tool? Communication**, a service application, sensors, the dematerialisation of a procedure ?
- **By anticipating the switch to a larger scale** : what will be the capacities for processing, saving, updating and upgrading the tools ?

## INITIATIVE



## The information system of Cape Town : support to public decision-making



CAPE TOWN, SOUTH AFRICA

[citymaps.capetown.gov.za/EGISViewer/](http://citymaps.capetown.gov.za/EGISViewer/)

### A predictive model based on a GIS for planning the building of infrastructure, housing and services (water and sanitation).

At the beginning of the 1990s, Cape Town launched a mapping initiative of its territory to identify vulnerable areas and facilitate decision-making. This was inspired by the "Cost Surface Model" of Durban (South Africa) : this model can be used to predict the installation cost of basic services depending on the location of the residential projects, and so inform the decisions regarding the localisation of the development areas for affordable housing.

A geographic information system (GIS) was then produced on the entire municipal area with a particular focus on coastal zones vulnerable to risk. New applications were developed to enhance this tool and, for example, optimise tax collection. Lastly, the local authority created an interactive public map that allows citizens to find the data relative to their neighbourhoods on the Internet and participate in formalising the administrative limits of the municipality.

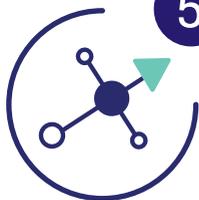
In the long term, it is a question of improving the efficiency of decision-making in urban development.

### Lessons learnt

- A clear political vision on the part of the local authority enabled the GIS to be set up in stages.
- The peer-learning mechanism allowed the municipality to have at their disposal an initial already tested tool, that it subsequently enhanced with the complementary tools adapted to its needs.

STEP

5



## Define a roadmap for scaling up

GOAL

Formalise a roadmap for scaling up, taking account of available (human and organisational) resources.

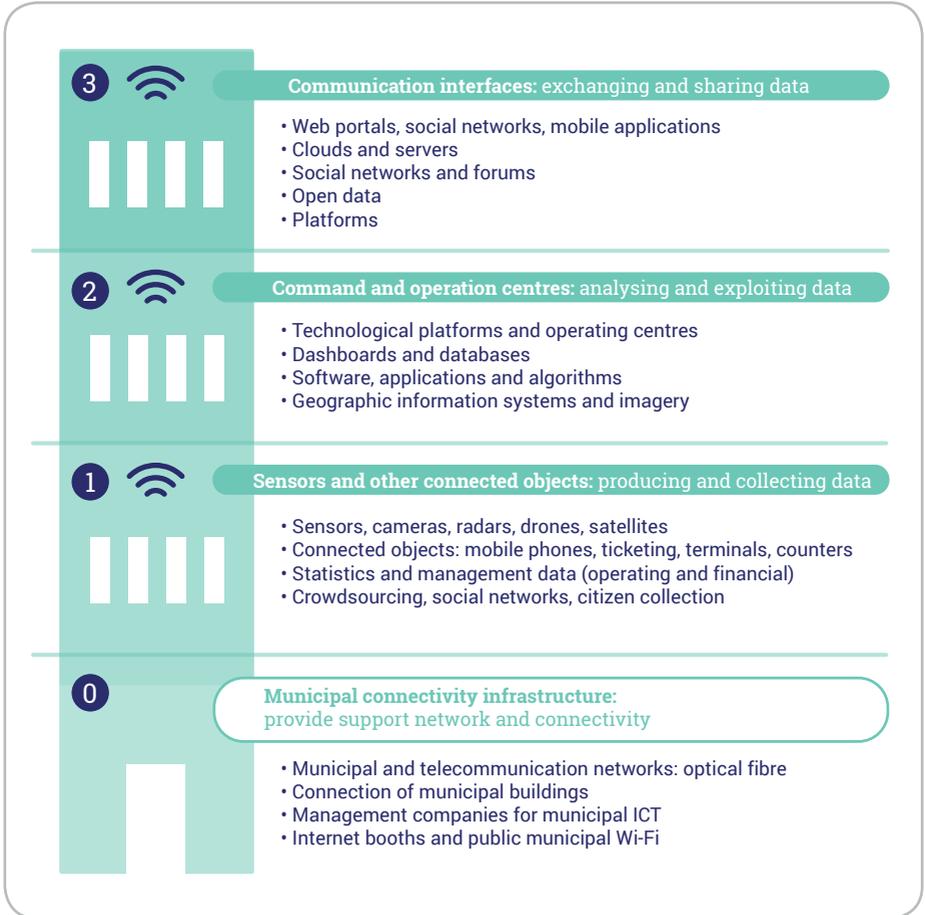
Digital technology is not the core activity of the local authorities, even though they have legitimacy for defining political and territorial orientations. The production of the new digital services may be more efficient if performed by specialists. However, it is up to the local authority to make strategic choices in the light of their needs and internal resources and on the basis of pilot actions (previous step) to endeavour to change the scale by generalising or duplicating the actions tested.

We are dealing here with the way the local authority can affirm its digital leadership, by defining the norms and priorities that will guide and encourage the digital initiatives carried by the stakeholders in the local digital ecosystem. The action of building digital capacity specific to the local authority is dealt with in **part C**.

### Make choices in the “layers” of the smart city

Digital tools and solutions are far from uniform : from perfected drones to a page on a social network, the reasons to have recourse to them, the modes of use and the impacts vary. The choice of a digital solution therefore depends on the use we wish to make of it : it is important to establish a quick panorama of the types of infrastructure and tools that exist (**schema next page**) before selecting them depending on the level of digital maturity of the territory, the type of approach and expected results, and the financial investment capacities and management by the local authority.

## THE “LAYERS” OF THE DIGITAL CITY



Inspired by the Inter-American Development Bank, 2016, and the World Bank, 2016.

### KEY QUESTIONS

**Identify the most suitable tools depending on the capacities and the objectives set**



**From the schema, choose one or more affordable digital tools that the local authority can encourage (commission) or develop directly.**

## Assume responsibility through clear actions and rules

The local authority has a role in supervising digital initiatives to make them sustainable, effective and inclusive. It is a question of first of all creating the conditions favourable for the generation of new tools at the service of the projects and policies carried by the local authority and propitious to securing a form of construction of municipal action that is more open and more partner-based.

Most of the innovations in the developing cities are currently emerging from the private sector or civil society. It seems in the first instance **more strategic that the local authority positions itself as the promoter of digital innovation (intervening in the priorities and orientations year after year), facilitator of alliances and guarantor of the public interest by indicating to the third party stakeholders the challenges encountered to find digital solutions.**

### Organise and guide the initiatives

- **Run an ecosystem and foster synergies** : the opportunities offered by digital technology sometimes turn up unexpectedly, with domino effects in other sectors (for example, the digital mapping of vulnerable neighbourhoods contributes to better urban planning, anticipating natural disasters, developing forms of citizen participation, easier tax collection, etc.). It is up to the local authorities to anticipate the external and cross effects, and to transform them into opportunities around a jointly defined development goal.
- **Anticipate how to scale up** : very often the isolated solutions developed in a fragmented manner can make it difficult to integrate the data generated. In order to avoid redundancy of human, technical and financial efforts, right from the beginning it is important to define a common, consistent framework which is flexible enough to be able to gradually incorporate new developments. To do so, it is necessary to prepare the recovery of raw data and source files according to predefined standards.
- **Define and adopt norms and standards** : the use of free software and the introduction of open data avoids dead ends when the information generated by digital technology cannot be shared or used for other purposes. In parallel, the adoption of a municipal charter defining the principles of the use of digital technology for sustainable local urban development may incite and guide initiatives that are otherwise autonomous.

## INITIATIVE



## Urban Lab of “Paris and Co” : how a city guides and stimulates innovation on its own territory



PARIS, FRANCE

[urbanlab.parisandco.paris/](http://urbanlab.parisandco.paris/)

### Thematic experimentation programmes to guide and stimulate the prototyping of solutions by young entrepreneurs.

Paris&Co is the economic development and innovation agency of the city of Paris. It specialises in the themes of attractiveness and innovation to create jobs and economic value. Urban Lab is the urban experimentation laboratory of this agency. Its mission is to organise and accompany innovative solution experimentation projects on Parisian territory, and in this way help entrepreneurs test their prototypes and services in a real situation.

Paris&Co proposes a micro-donation and technical support to the entrepreneur for testing in real conditions, evaluating and then deploying.

Launched in partnership with the city of Paris once a year, programmes explore a theme by selecting a dozen experiments for each edition. The city chose to experiment thematically smart urban furniture (2010-11), improved air quality (2017-2018), convenience retail (2015-2016). An evaluation, outsourced and performed by evaluation specialists, offers global teaching on the levers of success and obstacles to innovation on this theme.

Based on more than ten experimentation programmes launched in partnership with the City of Paris since its creation in 2010, Urban Lab maintains preferential relations with the operational departments of the city, and with the offices of the deputy mayors.

### Lessons learnt :

- A city commits to innovation by defining one theme each year and financing and supporting the winners selected from calls for projects.
- An ad hoc structure is financed by the city and some committed companies of the territory.

## Initiate and co-fund different collective action practices

- **Hackathons** : these episodic events bring together, over a short period, volunteer computer developers who programme solutions from the databases made available to them. To do this, the community of developers must be sufficiently active for collective emulation to produce results.
- **Open innovation** : a more long term approach, a process of opening reflection on a problem to outside partners to find a new solution. The issue is to encourage private enterprises, universities, start-ups and NGOs to cooperate, in an atmosphere of trust, around a collectively-defined problem.
- **Call for innovative projects** : the local authorities can open a call for projects if they have adequate funding capacity to support the initiatives selected. These calls for projects may concern a specific issue or be open in order to incite original proposals. Reciprocally, an authority may respond to calls for ICT-based projects, at national or international level, to take advantage of funds, mentoring and technical support.
- **Public procurement** : within the calls for tender with private service providers to develop services, the local authorities can promote innovation *via* specific clauses in public contracts. They may concern, for example, the digitization of project documents, the definition of a standard format and the opening of the data generated, transparent communication online and on the social networks...
- **Intrapreneurship, internal change and innovation** : digital innovation is not necessarily external to the public sector. An administration or a public body may initiate their own approach to the digitalization of procedures, data, or even the promotion of innovation internally (**Part C**). This makes it possible to remain in control of the process, but must not exclude the third party stakeholders concerned by the development of a product from the reflection and the implementation.
- **Dedicated digital structure** : this may be a municipal department, an agency, a joint venture or a public enterprise. Such a structure will have the mission of running the local ecosystem, but also of rallying investors, defining the sustainable development goals to be pursued, identifying the problems and challenges of the territory, managing the databases and ensuring their public sharing, and lastly developing access to digital technology (see **Part C** which expands on this).
- **Labels or prizes** for rewarding any particularly innovative initiatives from time to time. The organisation of salons or forums can help to run and promote the local ecosystem. Forming alliances with partners can increase visibility and reduce costs.

The specific support mechanisms for start-ups and other third places favourable to digital innovation are presented in **part B** in the domain of **local economic development**.

## INITIATIVE



## Hackathon Hack Jozi Challenge

JOHANNESBURG, SOUTH AFRICA

[hackjozichallenge.co.za](http://hackjozichallenge.co.za)



### An annual competition for start-up entrepreneurs located in Johannesburg.

In South Africa, the development of ICT is seen as a lever for improving productivity and green growth in an urban environment. In 2014, Johannesburg council launched a hackathon to elicit innovative ideas in digital formats to resolve the challenges of the city.

It is a capacity-building programme to support the creation of jobs and entrepreneurial

development, particularly of small businesses. The ten winning participants are selected following a competition during which they have access to mentoring, technical support and networking. The first prize is 1 million rand (almost 70,000 euros) ; the following two are 350,000 rand each.

This initiative grew in partnership with the University of Witwatersrand (Wits), the Joburg Centre for Software Engineering (JCSE) and Seed Academy business school.

### Lessons learnt :

- By creating the opportunity of a hackathon event and emulation by seed funding, the city of Johannesburg helped revitalise the local ecosystem of start-ups.

### KEY QUESTIONS

#### Define your role depending on resources



An inventory of the technical, human and financial resources available that could be rallied for the local authority gives an idea of the types of actions and funding they could commit for scaling up.

- **Availability of data** : how can data be made accessible to the local authority, how can third party stakeholders be given access to data to develop new services ? How can some data be made open ?
- **Innovation agenda** : how to target, depending on resources, actions supporting digital innovation ? Towards which co-funders should we turn ?
- Is there a **municipal team** or a small in-house group familiar with or interested in digital innovation ?
- Is it possible to release **funds** to finance open innovation events and subsidise start-ups for developing a prototype ?
- Are there any possibilities of **funding** to undertake investments in local infrastructure (Wi-Fi terminals, for example, GIS, servers to host production) ?



STEP

6

## Follow, evaluate and communicate on the digital transition

GOAL

Define monitoring indicators, draw lessons from pilot actions and communicate.

The use of digital technology must be monitored and modified gradually as the development unfolds and the services are used. This monitoring must allow the continuous adjustment of digital solutions depending on uses and user feedback, from citizens, entrepreneurs, civil servants and developers.

### Monitoring, capitalisation and evaluation

To facilitate the evaluation, and be able to draw significant lessons, it is sufficient to follow one or two good indicators instead of wishing to measure everything in parallel. These indicators must be objectively measurable and based on reliable, stable data. They must allow the identification of the factor that enabled an improvement in the situation.

For each project, the local authority must therefore undertake precise monitoring of the desired impact and steer the digital initiatives depending on the results obtained.

An evaluation committee could be set up for the purpose. Composed of a limited number of persons, it must, however, represent all the sectors and users concerned and ensure the expression of the points of view of all the stakeholders. This committee must intervene according to a relatively tight, sustained schedule to assess the progress gradually.

The production of data is also a means of evaluating public policy and development projects : progress on the localisation of SDGs draws for example on data produced and disaggregated at local level, and can be used to highlight the progress of the cities towards sustainable development.

Throughout the monitoring of digital initiatives, it is important to be cautious about the risks, limits and conditions of success. Several conditions must be met to ensure the success of a digital tool.

- **Accompany human change and in terms of practices** : a new digital tool will not change behaviour and uses, but by promoting new behaviour and uses, the digital tool finds its full expression.
- Make sure, therefore, that the **tool is a response to a local urban need or challenge** : it is important to keep in mind the needs and uses for which the tool was designed, and continuously check that it fulfils its purpose.
- **Share information** : agree to open data, share code, be a part of an open process which is the foundation of a sustainable global innovation partnership approach.

Remain cautious about the “non-digital” : neighbourhoods, categories of citizens, of services may remain outside the digital spectrum for lack of access, or quite simply because the problem is not amenable to a digital solution. It is not because there is no data available that there is no problem !

### KEY QUESTIONS

#### Choose one indicator that is significant, measurable and adjustable



What are the indicators to be considered ?

- **In terms of economic efficiency** : revenue generation (increase of tax base, heightened recovery), gains in efficiency and costs avoided (savings of paper, energy) ?
- **In terms of technical optimisation and management** : reduction in corruption, reduction in losses or errors, prevention and attenuation of the impacts of a crisis (losses and damages avoided) ?
- **In terms of social inclusion** : increase the number of users, develop new services, enhanced transparency and confidence, user satisfaction ?
- **In terms of environmental sustainability** : reduction in the consumption of natural resources, reduction of pollution, improved public health ?

## Communication, transparency and accountability

Digital technology is also a tool for transparency, facilitation of exchanges, and reduction of asymmetries of information. Setting up a system for the circulation of information, sharing open data and making public the information relative to the way local government works in the city, means enabling dialogue between departments within a local authority and with the local partners. Digital tools also feed a form of accountability of the local authority vis-à-vis the users. The local authority must be able to report on the results of the introduction of digital technology in its actions to justify the investments made, incite users to make use of the system and attract new partners. Regular consultations are also a decisive means of evaluating the level of user satisfaction to adjust the functionality of the tool and better respond to needs and demands.

The dematerialisation of exchanges creates new spaces for virtual exchanges. But the conventional communication channels (face-to-face mechanisms, traditional media) must not be neglected, or there is a risk of not attracting new users, some of whom are not yet equipped with digital technology.

### KEY QUESTIONS

#### Define the first communication actions



- **How to disseminate information and raise users' awareness** : communication campaigns, presence on social networks, websites ?
- **How to provide information feedback and gather opinions** : call centres, surveys and on-line questionnaires, a system for managing complaints and claims, urban problem reporting tools ?
- **How to share, inform and create spaces for dialogue** : online forums, participatory digital mechanisms, making available of open data ?



# ACT

## Digital technology in four urban sectors



**Manage urban services**



**Plan for the most vulnerable**

## GOAL

The aim of this part is to guide local authorities who wish to integrate digital technology into their concrete projects.

The support method comprises knowledge milestones, toolboxes, practical exercises and feedback from experience on the ground.

The examples of initiatives and solutions presented here have been taken from representative case studies. We have given precedence to frugal, simple, accessible solutions that create opportunities.

The online platform offers a worksheet for each of the domains, which takes up the practical exercises so that the reader of the guide can have an initial working document with the first responses by the local authority's team.



**Stimulate local economic development**



**Improve relations between local authorities and citizens**

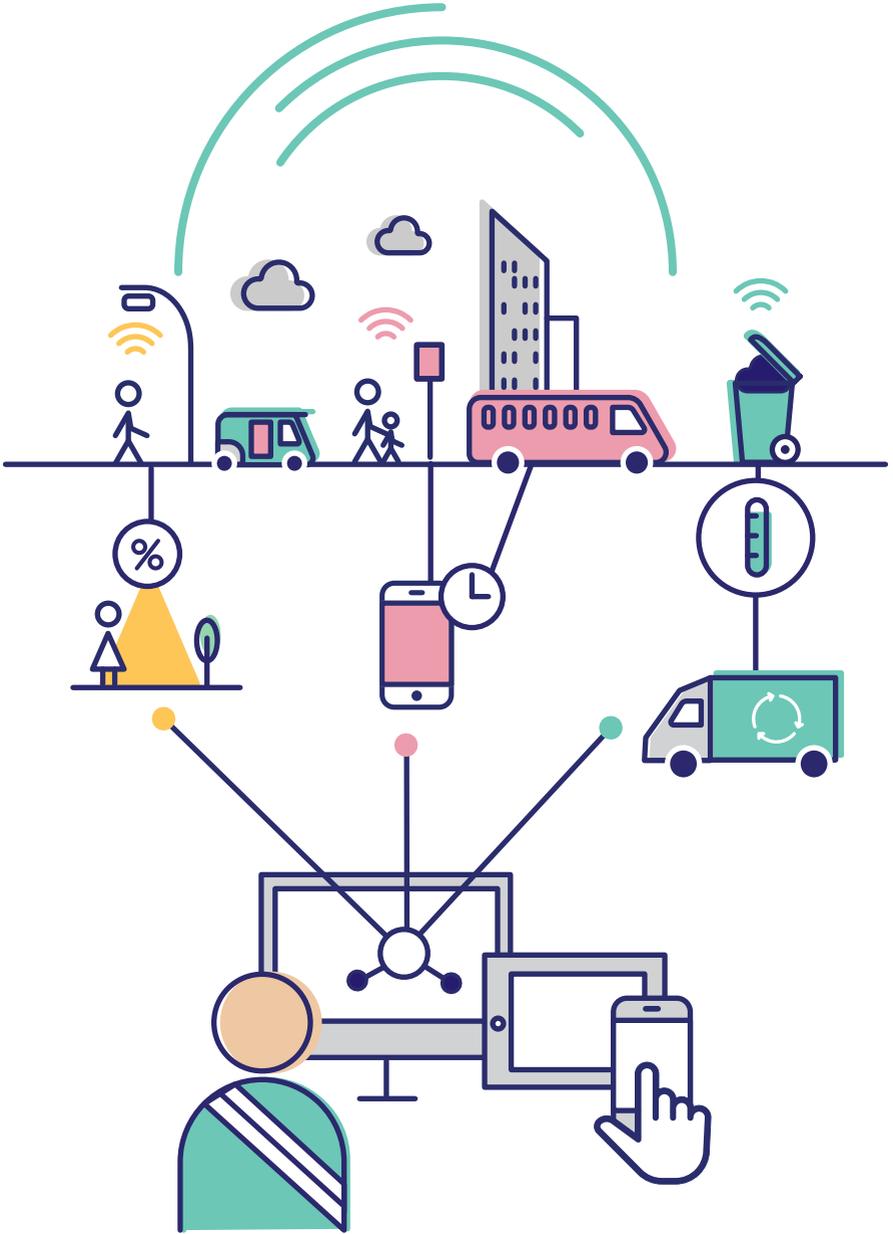


## Manage urban services

The challenge is to assist local authorities in making digital technology an opportunity for improving the efficiency and quality of services.

One of the first challenges for the local authorities in the developing cities is to provide basic services to the population. They can exercise their competence directly or by delegating to private operators. How can ICT contribute to improving user access to services and efficiency ?

**NB : The guide focuses particularly on the management of solid waste and urban mobility.**



## STEP

1



## Clarify expectations to improve the supply of services

## GOAL

Integrate digital tools for improving, extending and integrating existing services, whether in the official utility network or private or alternative offers.

In the context of developing cities where urban services are partially insufficient or faulty, the arrival of ICT offers several possibilities for the local authorities.

- **Gravitate towards a rationale of collaborative public services driven by the local authority**, with a multiplicity of stakeholders monitored thanks to ICT. The local authorities, their private or public delegates, can use digital technology to better control their network, but also for a better knowledge of third party supply. Inventory, mapping, alignment of price offers, monitoring system, can be more easily harmonised thanks to digital tools.
- **Encourage the “uberisation” of the services with caution** : ICT facilitates the matching of a totally privatised supply and demand according to pure market rules without intermediary or regulation (development of services on demand *via* telephone, mobile payment). Digital technology can feed advanced commoditization of urban services, with the multiplication of offers of private services, whether formal or not, which escape the control of the public authorities and follow the market laws by responding to the demands of the solvent population. The risk is that the service providers focus on the profitable segments of the market, leaving aside the population or zones that are less interesting financially, without the local authorities being able to ensure equality or even guarantee a certain standard of quality and security of supply.
- **Encourage the development of proximity community services** that complete the public service offer. From a more social perspective, NGOs and citizens can make use of ICT to improve the existing provision of informal services : by making it easier to provide on demand services, including in the most vulnerable neighbourhoods, by allowing the informal providers to make their actions more visible, by offering them possibilities of monitoring their activities, or by turning towards the offer of start-ups or stakeholders in the social economy who embrace digital technology to provide services to those who are excluded.

The local authority may be led to give precedence to certain orientations :

- **Boost the existing official provider** of the service considered thanks to digital tools : improve technical performance, reorganisation of commercial offer, efficiency of internal management, etc. ;
- Use digital technology to **facilitate recognition and collaboration with other service providers** : identification and contractualisation of the informal sector, development of more flexible, or even on demand services, harmonisation of tariffs.

For mature networks with good coverage of the city, the authorities can encourage the utility provider to monitor comprehensive dashboards on service management. These indicators can provide a global image of the data on the network, how it operates, its weaknesses or insufficiencies. In the case of networks with partial coverage, **full mapping (technical, commercial, management characteristics) of alternative offers would be the equivalent**. More complex, because it has to incorporate a variety of stakeholders and data, this mapping can, in the long term, facilitate their integration into a coherent system on the territory

#### PRACTICAL EXERCISE

### Make perfectly clear the expectations of digital technology for each urban service



#### Choose an orientation representing one of the main goals of the introduction of digital technology from among the following proposals

- Digital technology contributes to improving the supply of urban services for better inclusion and sustainability.
- Digital technology can facilitate and accompany the development of new private services.
- Digital technology can be used to list the existing alternative service providers and have them cooperate.

#### Identify the population groups with little or poor service and make sure they benefit from the digitalization of the service

- Who are the social groups or neighbourhoods with no access to the service concerned ? To what extent can digital technology accentuate this exclusion ?
- Who are the informal service providers who could lose their business when the digital systems are introduced ?

## STEP

2



## Produce a diagnosis of digital tools for the targeted urban service

## GOAL

Produce an initial diagnosis of the uses of digital technology by all the service providers, whether or not related to the local authority.

Efficiency is an important factor for the providers of public services in the digital transformation of infrastructure and commercial offers. The introduction of digital services will then go hand in hand with the organisational reforms related, in particular, to the automation of certain tasks, and therefore to restructuring in terms of business lines and human resources.

For the small private or informal providers, digital technology can be a means to expand their market, facilitate contact with users, ensure better monitoring of their offer and of their invoicing, etc. They also, once equipped, have an incentive to use these tools.

The degree of ICT penetration in these service offers varies depending on the investment capacities of the providers and the potential returns on investment they can expect.

Several elements must be taken into account.

- The uses of digital technology by the municipal provider : clientele services, ticketing, payment of taxes, internal administrative and commercial management, fleet and equipment monitoring ; communication.
- The uses by alternative providers : on demand services, mobile payment, commercial advertising, and clientele relations.
- Existing tools and the data that can be generated : applications for service requests, proportion of online payment, dematerialised clientele services, service management data, geo-tracking of journeys, consumption monitoring, customer databases, etc.

**PRACTICAL EXERCISE****Produce a quick self-diagnosis of digital maturity****Produce a quick diagnosis of the possibilities and limits afforded by the regulatory framework of the sector**

- What are the national and international programmes, competitions and calls for projects that can rally specific funding for digital innovation and/or the modernisation of the public service considered ?
- What place is acknowledged and/or granted to alternative or informal service provision within the sectoral framework of the urban service concerned ?
- What is the distribution of skills and responsibilities between the State (if it is a stakeholder), the local authority and the provider ?

**Produce a quick diagnosis of the digital maturity of the urban service targeted**

- What is the level of computer equipment of the urban service providers (computers, software, sensors, etc.) ?
- For what uses do the providers have recourse to digital solutions (clientele services, flow monitoring, ticketing and invoicing, internal management, on demand service, etc.) ?
- What is the providers' online presence (websites, social networks, applications, etc.) ?
- What data of potential interest is collected by the providers ? Is it centralised and processed ?
- What part of the service is listed and geolocalised (on Google Maps or OpenStreetMap) ? Is this data updated ?
- What digital services are offered to users, and what is the rate of use of these digital solutions compared to physical exchanges ?
- Are there any start-ups who develop digital solutions for the service concerned ?

## STEP

3



## Identify possible partners to use ICT in service provision

## GOAL

Many stakeholders with digital skills can be rallied by the local authority to improve service provision.

The traditional private sector and the stakeholders of the social and solidarity economy are particularly active in the digital optimisation of urban services. The public authorities can benefit from their technical expertise to guide their digitalization. Start-ups provide innovative solutions, in particular for extending the services to neighbourhoods not served. The small private or informal providers help to compensate for the inadequacy of the public services by proposing proximity services, that meet the needs of the inhabitants directly.

### INTERESTS AND CAPACITIES FOR DIGITAL TECHNOLOGY OF THE LOCAL STAKEHOLDERS IN URBAN SERVICES

Local authority	<ul style="list-style-type: none"> <li>Goal of expansion of the scope of the service</li> <li>Guarantor of fair prices</li> <li>Guarantor of the respect for the environment</li> <li>Capacity to integrate the information on the different service offers</li> </ul>
Traditional private firms	<ul style="list-style-type: none"> <li>Interest in extending the scope of intervention</li> <li>Goal of financial profitability</li> <li>Possess technical and financial data on the existing service</li> </ul>
Small private or informal providers	<ul style="list-style-type: none"> <li>Good knowledge of user demand</li> <li>Positioned in the intersections of the public service</li> <li>Interest in structuring the commercial offering to increase profitability</li> </ul>
Start-up	<ul style="list-style-type: none"> <li>Capacity to develop services on demand, innovative offers</li> <li>Good responsiveness to meet supply and demand</li> <li>Treatment of centralised data platforms</li> <li>Can work as much with the formal as informal private sectors</li> </ul>

NGO	Knowledge of the demand not serviced and of informal supply Capacity to bring out social demand Capacity to adapt to field constraints
Population	Interest in procuring consumption monitoring Wish to have payment facilities Beneficiary of clientele monitoring, management of the complaints and claims

### PRACTICAL EXERCISE

## Mapping the stakeholders' ecosystem



**List the stakeholders potentially concerned by the digitalization of a concrete project (see schema, page 32)**

- Local authorities (municipalities)
- Traditional private firms
- Telecommunication sector
- Digital start-ups
- Small entrepreneurs and providers (including informal)
- Stakeholders of the social and solidarity economy
- NGOs
- Community-based organisations
- Citizens
- Universities and educational institutes

**Identify the stakeholders likely to become interesting partners for the local authority**

- Which local stakeholders are turning or will turn most easily towards digital technology ?
- What would they gain by developing digital tools : profit expectations, social cause or political reason, generation of new knowledge, enhanced efficiency or democracy ?
- What are the resources of each of these stakeholders that could be rallied for projects with the local authority : financial, technical, human, data ?
- What are the possible means of commitment to make them partners and conduct actions together : visibility and marketing, complementary partnerships, targeting of pilot actions ?

STEP

4



## Start with pilot actions on a limited segment

GOAL

Design quick actions initiating the digitalization of the urban service and its management. .

The concept of “smart city” conveys the idea of quick optimisation of urban services on several levels, under the assumption of a single, centralised provider. Several points of application of this optimisation are possible :

- **Management of natural resources** : planning the availability of resources, meteorological changes, peaks in consumption, reduction of transmission losses and wastage, adjustment of flows to demand, monitoring of quality, attenuation of air and ground pollution, reduction of energy needs.
- **Technical management** of infrastructure : monitoring of the status and state of repair of the equipment, identification of leaks and fragilities, localisation of the cuts, identification of sensitive points, remote surveillance, and reduction of maintenance costs.
- **Commercial management** : smart meters, computerised ticketing, complaints and claims services, payment facilities, on demand or pay-as-you-go services, expansion of customer base, reduction in overdues, change in user behaviour.
- **Operational management** : data collection, budgetary management, remote commercial management, circuits for collection and navigation of the teams, inter-operator coordination, automation leading to a reduction of the possibilities of corruption and fraud, services supervision.

But ICT does not automatically solve all the difficulties of the local authorities in serving the entire territory, because this model assumes not only that there is already a universal and effective network of services, but also that the public sector has the capacity to monitor these digital arrangements. **In developing cities, these two conditions are often far from being met.**

In contexts where a large part of the services supply is informal, digital technology nonetheless has the potential to improve service provision through a number of advantages.

- The optimisation of the **complementarity of service providers** by better communication : listing and mapping of informal providers, identification of the intersections between scopes of intervention or low coverage areas, price integration, knowledge of flows, etc.
- The possibility of **reaching populations that previously had no service** : service supply adapted to their needs by door-to-door or on demand services, mobile payment, change of behaviour by online communication campaigns, dematerialised complaint management system...

### PRACTICAL EXERCISE

## Identify quick, easy pilot actions to test the approach



### List pilot actions that are simple and fast to meet demand and uses

#### Support the production and use of data information

- Target a test action the municipality will take in charge either for production, collection, storage, processing, analysis or sharing
- Target a type of data to be digitalized to improve the targeted service
- Target the goal assigned to each test action : knowledge, forecast, control, and programming ?
- Identify the users of each test action : internally, third party public authorities, private sector, population ?
- Anticipate obstacles to each test action : storage capacity of an exponential quantity of data, harmonisation of data formats, etc.

#### Improve communication and exchanges between the stakeholders of the targeted service

- Which stakeholders are the main beneficiaries of each test action : connected users, vulnerable population, the private sector, informal sector, NGOs ?
- Which priorities should be given to each test action : connect stakeholders who are not in contact, foster the emergence of new stakeholders, encourage new ways of exchanging ?
- What is the aim given to each test action : raise awareness, consult, open new markets, tax, inventory ?
- In what format should the communication be targeted for each test action : information campaigns, forums, call centres, social networks, merchant services ?

### Define the experimental scope of the actions

- On each test action, which part of the territory is targeted ?
- On what user perimeter for each test action ?
- With what amplitude ? Identify a specific problem, sector niche, pilot project, an action integrated into a zone.
- Using a digital tool : a service application, sensors, the dematerialisation of a procedure ?

## SUGGESTION BOX



## Digital tools for managing solid waste

- Geolocalisation of recycling, resale, or waste collection points.
- Sensors of filling rate of skips, collection points, landfill sites.
- GPS on trucks to optimise collection circuits depending on traffic.
- Pre-collection services on demand, door-to-door *via* SMS or application.
- Mobile or automatic payment of fees or collection service.
- Pricing by weight at collection time *via* connected scales.
- Sorting at source encouraged by communication campaigns and collection points.
- Systems to alert to hazardous waste dumping, full skips.

## INITIATIVE



### WeCyclers : selective precollection of waste

LAGOS, NIGERIA

[wecyclers.com](http://wecyclers.com)


#### An innovative recycling service for the people in underprivileged neighbourhoods in Lagos.

WeCyclers is a Nigerian enterprise founded in 2012 which offers a plastic recycling service adapted to the needs of the people living in underprivileged neighbourhoods in Lagos. The enterprise promotes sorting and recycling at source and covers an area not served by the municipal refuse collectors.

The collection is done door-to-door by three-wheel scooter, which makes it possible to enter the narrow streets of these neighbourhoods not covered by municipal collection. The collectors are equipped with connected scales and an application, on the basis of

which the families earn a certain number of points. They are then offered domestic appliances depending on the volume of waste collected.

Thanks to this SME, in partnership with the Lagos Waste Management Authority which delegates management of the service to the private sector, many young people have been offered their first formal job.

Digital tools play the role of intermediary between the company and the households and provide immediate access to objective, transparent data that act as an incentive to sorting, while at the same time facilitating contacts for the service.

#### Lessons learnt :

- Digital technology can help extend the solid waste pre-collection service to areas not covered by the municipality.
- The stakeholders of the social and solidarity economy can be supported by the municipal authorities to converge towards joint improvement of the urban service.

## SUGGESTION BOX



## Digital tools in urban mobility systems

- GPS mapping and data collection from artisanal transportation lines and stops.
- Real time information on telephone about passing and/or stopping times.
- Integrated ticketing on card or telephone with mobile (pre)payment.
- Geolocalisation of the ticket sale stations or kiosks.
- Traffic speed limit compliance control.
- Applications for monitoring traffic, accidents and car parks.
- Applications encouraging intermodal integration of journeys.
- Development of shared (car pooling) or on demand services.
- Computer monitoring of the state of the fleets and maintenance deadlines.
- User returns, online votes and opinions on service and driving quality.

## INITIATIVE



### Accra Mobile : innovative mapping of artisanal transportation



ACCRA, GHANA

[Data.afd.fr/accramobility/](http://Data.afd.fr/accramobility/)

#### A mapping service for obtaining information on informal transportation lines and the service level.

In Accra, 70% of daily commuting is by informal minibus (tro tro). The aim of the project was to acquire knowledge quickly and inexpensively about the tro tro services covering the groups of operators, roads, service level and information on the routes covered. The project was implemented using a Smartphone application and onboard surveyors collecting real time geo-data.

The secondary goal is to develop methodology that can be supported for upscaling and duplicating this type of project in other cities.

The project was launched by AFD in partnership with the Department of Transport (DoTs)

and Concordia University, based on a hackathon organised in 2016 mobilising Accra mobility data.

Phase 1 identified more than 300 tro tro lines, phase 2 provided detailed qualification of the service level of the 60 main lines and phase 3 formalised a protocol for the automatic data acquisition and exploitation, authorising operators to perform updates.

The mapping, developed with Transitec (French consulting firm specialising in mobility issues) and Jungle Bus (a start-up that has worked on collaborative mapping of Accra), makes use of OpenStreetMap. The website provides access to the Accra Tro Tro map and the service level of the lines.

#### Lessons learnt :

- An open innovation approach led to a collaborative mapping prototype of artisanal transport based on a new generation of data provided by the surveyors' smartphones.
- Improving knowledge of the artisanal supply makes it possible to improve the efficiency of the mobility system on the scale of the whole city.

STEP

5



## Define a roadmap to facilitate the matching of service supply and demand

GOAL

While the main challenge for urban services is to facilitate the matching between social demand and supply from providers, it is also important to define a policy regarding data from the service.

Data collected “in real time” thanks to digital technology concerns every aspect of the city.

- **Environmental situation** : estimation of pollution, changes in behaviour towards more sober consumption modes, relation to modes of supply that also consume less energy, traffic flows, etc.
- **Economic situation** : willingness and capacity to pay (study of prices and collection rate), business plans and revenue forecasts of suppliers.
- **Social situation** : localisation of residential areas, population flows, knowledge of the needs of the most vulnerable, daily uses and practices.

Mobilising this data can provide a particularly up-to-date and detailed image of the practices of the inhabitants, and elements for decision making in other urban action sectors : densification possibilities, need for public spaces, etc. Providing visibility of informal supply could constitute a mine of information and digital technology can really facilitate the task of the local authorities.

## SUGGESTION BOX



## Some digital tools for managing essential services

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### Data production

- Sensors on equipment : bus fleets, filling of skips, ticketing, etc.
- Connected objects : GPS to follow and optimise routes, Bluetooth printers, etc.
- Real time data collection using smartphones.

### Exploitation of the data

- GIS and mapping tools.
- Dashboard of network status and operation.
- Comparison of commercial offers.
- Universal open formats.
- Monitoring of consumption and uses.

### Sharing and restitution

- Applications for pricing and SMS services.
- Systems for ordering on demand services.
- Cloud platforms and websites giving information on the services.
- Transport applications : route calculation, vehicle booking.
- Web platforms for publishing transport maps.
- Development of flexible offers and offers optimised on demand.

## PRACTICAL EXERCISE

### Define the methods of action in the medium and long term to digitalize an urban service



Once the pilot actions have been tested (**step 4**), how do you scale up and expand the dynamics of transition ?

#### Choose affordable digital tools the municipality can encourage or develop (see schema 4, page 37)

##### Communication interfaces (exchanging and sharing data)

- Web portals, social networks, mobile applications
- Clouds and servers
- Social networks and forums
- Open Data
- Platforms

##### Control and operating centres (data analysis and exploitation)

- Technology platforms and operations centres
- Dashboards and databases
- Software, applications, algorithms
- Geographic information systems and imagery

##### Sensors and other connected objects (data production and collection)

- Sensors, cameras, radar, drones, satellites
- Connected objects : mobile phones, ticketing, terminals, counters
- Statistics and management data (operational and financial)
- Crowdsourcing, social networks, citizen collection

##### Municipal connectivity infrastructure (support network and connectivity)

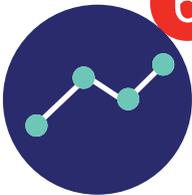
- Municipal telecommunication networks : fibre optics
- Connection of municipal buildings
- Firms for managing municipal ICT
- Public municipal internet terminals and Wi-Fi

#### Define positioning depending on technical, human and financial resources

- Data availability : how can data be made accessible to the municipality, how can third party stakeholders be given access to data to develop new services ? How can some data be made open ?
- Innovation agenda : how to target, depending on resources, actions supporting digital innovation ? Towards which co-funders should we turn ?
- Presence of a municipal team or small in-house group, familiar with and interested in digital innovation ?
- Possibilities of releasing municipal funds to finance open innovation partnership events and subsidise start-ups for developing a prototype ?
- Possibilities of municipal financing to undertake investments in local infrastructure (Wi-Fi terminals, for example, GIS, servers to host production) ?

STEP

6



## Evaluate improvement of the targeted service and user experience

GOAL

Evaluation must be based on the monitoring of relevant indicators and take into account the possible risks of introducing digital technology into the management of basic services.

Depending on the goal chosen and the data available, the local authority needs a performance improvement indicator. This must be all of the following :

- useful for the service providers, so that they can adjust their offer ;
- representative of the change introduced by digital technology ;
- and sufficiently eloquent to attract the attention of the media and/or general public.

The choice of indicator is therefore not neutral because it reflects the priorities pursued by the authority for sustainable urban development and enables the identification of the side effects expected in terms of savings in management cost, public health, access to jobs, etc.

## SUGGESTION BOX



### Examples of possible performance indicators for essential services

- Energy savings and reduction in the consumption of vehicle fuel on optimised routes.
- Increased revenue *via* growth in invoice collection rate using mobile payments.
- Multiplication of applications (increase in the number of users) which facilitates the development of on demand services.
- Number of lines, stops, collection points mapped and geolocalised.
- Rate of use of a forum and queries on an online customer service.

The arrival of digital technology in the management of basic services does, however, present some risks :

- **for municipal providers**, the introduction of digital technology must not obscure the fact that technical solutions are not a substitute for good management ! The systems put in place can provide information about service operation, but do not predetermine strategic decisions in terms of investment and maintenance. The use of commercial tools and online clientele services must also be achieved gradually to avoid excluding the most vulnerable users, poorly served with services and often less connected to digital technology ;
- **for small providers** (artisanal or informal), while digital technology can effectively promote their supply of services and contributions towards certain users, it does not constitute a solution to their job insecurity and/or poor working conditions. The recognition and accompaniment of these small entrepreneurs can be improved thanks to digital technology, but should be backed with parallel methods of contractualisation, certification and training relative to their core business.

Lastly, digital tools can be mobilised for the implementation of communication campaigns on responsible uses, hygiene practices, changes in behaviour and saving resources. Through awareness raising campaigns on the social networks or in video format, the local authority can reach young people, who will be the consumers of the services of tomorrow, and thereby elicit more responsible behaviour in the long term.

## PRACTICAL EXERCISE

## Evaluate and communicate on digital change in urban services



### Choose at least one indicator that is significant, measurable and adjustable

The difference digital technology makes to the quality of service provided can be measured by an increase in the revenue generated by the service provision, by an improvement in the performance of service supply, by an increase in user satisfaction and by the shared benefits for the urban environment.

What existing data can be used to define the initial situation, and what data can be used to measure how it changes in terms of :

- economic efficiency : income generation, gains in efficiency and avoided expenses ?
- technical optimisation and management : reduced corruption, reduced losses or errors, prevention and attenuation of crisis impacts (losses and damage avoided, etc.) ?
- social utility : increase the number of users, develop new services, enhance transparency and confidence, user satisfaction, etc.
- environmental sustainability : reduction in natural resource consumption, pollution, improved public health, etc.

### Define the first communication actions

- Disseminate information and raise user awareness : communication campaigns, presence on social networks, websites
- Feedback and information gathering : call centres, online surveys and questionnaires, claim and complaint management system, urban problem reporting tools.
- Share to inform about decisions and create spaces for virtual dialogue : online forums, participatory mechanisms, making available of open data.



## Plan for the most vulnerable

The challenge for local authorities is to place digital technology at the service of urban planning that includes the most vulnerable population groups.

Urban planning, rehabilitation of precarious neighbourhoods and risk and disaster management constitute major challenges for local authorities.

In the cities of the South, the official housing supply is not adequate to meet the needs of the population, who settle in informal neighbourhoods, often in high risk areas. This insecure, even dangerous urbanisation is a particular challenge for local authorities and reveals the lack of knowledge and deficiencies of traditional planning tools.

**What solutions can digital technology provide as part of the big challenge to plan and manage the territory from an inclusive and sustainable perspective ?**



## STEP

1



## Clarify expectations about digitalization of urban and spatial planning

## GOAL

Digital technology can be used to build a better knowledge of the city to help with local decision-making and improve risk and disaster management

The limits of urban and spatial planning, in particular for the most precarious neighbourhoods, originate from a lack of information and urban data on these territories. Digital technology can help improve the development of the territory through several tools.

- **Predictive models of how the city changes** crossing satellite imagery, weather forecasts and topography studies. On this basis, the municipality can model contingencies, predict natural disasters and their impact, locate at risk infrastructure and equipment, sketch population relocation scenarios.
- **Participatory or community mapping exercises**, often conducted with backing from NGOs, universities or donors. In this way, inhabitants of precarious neighbourhoods can generate digital maps, or even geographic information systems on residential areas neglected by urban planning. These maps can take account of representations and actual uses, as well as report on emergencies or needs expressed by the inhabitants.
- **The coverage of fundamental management and planning data.** The land and property registry can be revisited by simple digital tools to help the city to better investigate the requests made, design functional zoning, prohibit urban development on certain sites, inventory the plots that are under-used and can be re-purposed, etc.

ICT can be an opportunity to **fundamentally renew urban and spatial and planning tools**, from more precise and up-to-date information on urban functioning, including on the more informal or excluded fringes. Digital technology can be used to assemble data on physical, social, economic, land ownership, environmental, etc. aspects ; cross-reference it with public intervention capacities, and study the effects of an intervention on the whole territory. It is a real opportunity for building a knowledge database to guide the decisions-making.

Generating new knowledge on the city using digital technology seems an inevitable trend, and this data is made visible by dynamics that are informal or outside the public sphere. For local authorities, the challenge is to use this information for urban inclusion actions instead of ignoring it.

### PRACTICAL EXERCISE

## Clarify expectations about digital technology to facilitate urban and spatial planning



### Choose a reason from among the following for having local urban planning informed by ICT

- Improve predictability of climate and environmental events and their impacts ?
- Ensure integration and consideration of the informal neighbourhoods in local development policies ?
- Better inform about public decisions and thereby revitalise planning practices ?

### Identify “informal” zones and agree to acknowledge them through mapping

- Which population groups and neighbourhoods are hardly or not at all taken into account in planning ?
- About which zones is information lacking ?
- What are the limits of emergency responses in the event of a disaster ? Which zones are not reachable by these emergency responses ?
- What are the urban challenges, informality or natural disaster, that cannot be digitalized, and how can they nonetheless be included in the decisions ?

STEP

2



## Perform a self-diagnosis of available and usable data for planning and crisis and disaster management

GOAL

The local authority must start by identifying existing data and the different stakeholders who possess it, and assessing quality and reliability.

Knowledge generation through digital technologies for urban and spatial planning relies on past or present urban plans and technical studies commissioned by the municipalities. To review the state of existing knowledge, the following should be examined and compared :

- **available data**, digitalized or likely to be, within the scope of urban planning (maps, sectoral statistic databases relative to taxation, land registry, services, etc.) ;
- **data generated autonomously by civil society**, in particular in the informal, precarious or at risk neighbourhoods, which enrich official information with expertise of use *via* participatory or community mapping exercises.

The prime rationale is to collect information through digital tools such as smartphones, GIS and online platforms. Particular attention should therefore be given to the mapping media (Google Maps or OpenStreetMap), data formats, the possibilities of crowdsourcing, the possibilities of cooperation with mobile operators or social networks platforms (Facebook's Safety check for instance).

Another challenge, given the rapid pace of urbanisation in many developing cities and the need for a rapid response to natural disaster, is the extent to which the data and maps are up to date. Information that is too old will not be of much use for triggering decisions. On the contrary, maps produced on the basis of the daily experiences of the population can serve as a medium for dialogue and coordination of sectorial actions.

### PRACTICAL EXERCISE

## Produce a quick diagnosis of digital maturity of the tools for urban planning and local risk and disaster management



### Examine the possibilities and limits offered by the data regulatory framework

- What are the national and international programmes, competitions and calls for projects that can rally specific funding for urban and participatory mapping ?
- What is the responsibility of the local authorities on data and maps ?
- How does the administrative scope of the authority correspond to urban sprawl ? What are the existing means of coordination for covering the territory ?
- What is the national framework on data security and protection ?

### Establish a technical diagnosis on existing data and maps and their quality

- List the statistic databases available, geolocalised or not.
- Evaluate the digital status of the municipal land map and associated registry.
- Identify the mapping initiatives and stakeholders who possess field data (NGOs, universities, other municipal services such as civil defence, for example).
- Estimate the quality, relevance, extent of updating and compatibility of this data, and identify the gaps to be filled.
- Define the media (background map), formats, main software used locally and inexpensive.

## STEP

3



## Identify the partners and ecosystem capable of producing urban data

## GOAL

The role of the local authority is to bring together all stakeholders around the urban data for better urban planning and programming of public investments.

There are numerous possibilities inherent to digital tools for gaining more detailed knowledge on the territory. Municipalities can thereby organise and develop their own urban data collection to improve, for example, management of the land registry map and knowledge of urban vulnerabilities. In a complementary manner, civil society stakeholders (inhabitants, NGOs and universities) also mobilise digital tools to “put on the map” the vulnerable neighbourhoods and urban challenges they face. This process can be part of a rationale of social protest or of capacity building to combat urban eviction.

### LOCAL URBAN DEVELOPMENT STAKEHOLDERS' INTERESTS IN AND CAPACITY FOR DIGITAL TECHNOLOGY

Local authority	<ul style="list-style-type: none"> <li>Possesses statistics databases</li> <li>Wishes to follow urban expansion and find out the potential for urban densification</li> <li>Lack of detailed knowledge on urban development on the periphery</li> <li>Wants to improve emergency response capacity</li> </ul>
Traditional private firms	<ul style="list-style-type: none"> <li>Can take advantage of knowledge to extend their markets</li> <li>Interest in better knowledge of possible business areas</li> </ul>
Start-up	<ul style="list-style-type: none"> <li>Can integrate and exploit the data</li> <li>Work collaboratively and participatively</li> <li>Are capable of updating and working responsively</li> </ul>

Universities	Can integrate, put into form and exploit data Possess databases
NGO	Play the role of intermediary between population and authorities Train the population on producing data
Population	Wish to have an objective medium for balanced dialogue with public authorities Contribute <i>via</i> crowdsourcing to generating knowledge

### PRACTICAL EXERCISE

## Mapping the ecosystem of the stakeholders on this domain



**List the stakeholders potentially concerned or implicated by the digitalization of maps and data (see schema, page 32)**

- Local authorities (municipalities)
- Traditional private firms
- Telecommunication sector
- Digital start-ups
- Universities and research centres
- NGOs
- Community organisations
- Citizens

### Identify stakeholders likely to be interested in digital mapping tools

- What is the degree of usage of digital technology of each of the stakeholders listed ?
- What would they gain by geolocalising their data ?
- What are they lacking to be able to share their data more ?
- What are the partnerships and collaborative relations they are already engaged in ?

STEP

4



## Start with pilot actions to test simple solutions

GOAL

Focus efforts on one planning issue or vulnerable area for which the data will make the difference.

Increased generation of knowledge thanks to digital technology must enable better orientation of the local authorities' decisions. Regarding developing cities, the work of diagnosis and mapping rapidly growing urban areas often remains incomplete or non-existent. The response of the local authorities can therefore only be partial, but digital tools gradually provide a mass of up-to-date sector information.

When it is a question of making urban planning decisions specific to improving the living conditions of the most vulnerable, the stakes for the local authority are double :

- **in a "normal" situation, use existing data** and data generated by the inhabitants to be able to design responses adapted to the uses and conditions of urban development, which favour population inclusion ;
- **in emergencies, coordinate public action** on a poorly known territory, in particular in critical situations of natural disaster where the population is in danger.

In both cases, digital technology allows knowledge production to be opened to the population, beneficiaries of the investments to be made. The local authority can make use of cheap technologies (GPS, SMS, online mapping systems) to help with decision-making and information-sharing through social networks. Decisions are more legitimate because they are based on the data generated by civil society and inhabitants.

There is a risk of being “overwhelmed” by the quantity of data and information produced rapidly and massively by mobilising citizens. It is therefore necessary to carry out prior work upstream :

- design a geographic information system that can gradually enrich the database and combine them depending on the needs of the moment ;
- identify the vulnerability of public facilities at risk, evacuation centres and access routes for emergency services ;
- fit alarm systems that can be activated by SMS.

### PRACTICAL EXERCISE

## Identify quick, easy pilot actions to test the digitalization of urban planning and local risk management tools



### Identify a priority urban planning challenge that can be tackled with a digital solution

In a “normal” situation, the creation of data, statistics and maps aims to enable :

- easy land ownership regularisation of precarious neighbourhoods ?
- identification of the lack of public facilities to be provided ?
- identification and forecast of urban sprawl ?
- anticipation of the impacts of disasters on the population, on the infrastructure ?

In a crisis situation, digital tools must facilitate communication between ::

- emergency, civil defence and health services ?
- population and authorities to inform them ? To provide first aid ?
- NGOs and public authorities to coordinate ?

### Define an experimental scope for testing the solution

- Which zones suffering from a deficit in development are a priority ?
- Which pilot zone can I test to digitalize my zoning plan and land registry map ?
- Which public facilities are the most vulnerable in the event of a disaster ?
- Which are the longest urban development procedures or emergency response procedures ?

## SUGGESTION BOX



### Digital technology for disaster risk reduction (DRR)

- Mapping of exposure areas on the basis of weather and seismic data ...
- Cross referencing of maps of risk exposure and residential areas, including precarious settlements.
- geolocalisation of public reception facilities for emergencies.
- Crisis communication strategies *via* social networks.
- Modelling of vulnerability of major public infrastructures.
- Models of optimisation of routes for emergency vehicles.
- Crisis simulation tools to anticipate responses.
- Drones for contacting inaccessible areas.
- Real time coordination of emergency services, integrated protocols and command centres.
- System of alarm and localisation of persons in danger by SMS.
- Online risk information and awareness-raising campaigns.

## SUGGESTION BOX



### Digital technology for upgrading precarious neighbourhoods

- Satellite imagery for examining the retrospective evolution of urban sprawl.
- Identification of land occupation, street encroachments, vacant plots.
- Estimation of the density of human settlements thanks to drones.
- Up-to-date mapping of the state of buildings, roads, facilities.
- Population census and inventory of needs *via* online forms and/or tablet computers.
- Elaboration and update of land registry map, automated addressing campaign.
- Drawing up of a multisector GIS, superimposing data from different sectors.
- Identification of available areas for extension or relocation.
- Data collection on uses and social needs *via* crowdsourcing and SMS
- Estimation of the distances and obstacles between population and basic equipment.
- Tools for alerting of difficulties on the roads for quicker responses.
- Census of social demands *via* blogs and pages on social networks.

## INITIATIVE



## Participatory mapping of precarious neighbourhoods



DAR ES SALAAM, TANZANIA

[explore.ramanitanzania.org](https://explore.ramanitanzania.org)

### Maps to prevent risks and a citizen reporting system.

Dar es Salaam is particularly vulnerable to flooding and 70% of the population lives in informal neighbourhoods. To reduce the vulnerability to risks of these insecure residential areas and improve preparation for risk management, the municipality instigated the mapping of Tandale, one of the largest precarious neighbourhoods, in 2013.

Inspired by the initiative MapKibera (Kenya), students in urban planning and inhabitants were trained and engaged to take an inventory of the existing facilities on OpenStreetMap, from an approach of awareness raising to solidarity and capacity building.

Free open source software (GeoFabrik and Tilemill) were then used to publish the maps on the Internet. Drones identified the areas most likely to be affected by flooding. This work produced maps of risk exposure and evacuation routes, also enabling the identification of the areas where flooding could cause epidemics.

In 2017, the collected, processed and published data covered 1.3 million people and fed online tools (OpenStreetMap and InaSAFE –QGIS module) which can be used by communities, without prior knowledge of programming. The funding served to create the maps, but also to set up the resources necessary for a citizen reporting exercise (identification of epidemic centre, etc.). A platform similar to Ushahidi (use of SMS or voice calls to list information) was introduced.

### Lessons learnt :

- The municipality engaged local human resources for data collection.
- Collaborative mapping with the inhabitants was done on free software and made available in open access.

## INITIATIVE

## Open Cities Project : risk mapping

KATMANDOU, NÉPAL

[www.opencitiesproject.org/cities/kathmandu](http://www.opencitiesproject.org/cities/kathmandu)

**A map of infrastructure and equipment, a mobile problem alert application and an interactive mapping system to inform the public of the projects in the neighbourhoods.**

In 2012, Kathmandu benefited from a partnership between the central government and the Global Facility for Disaster Reduction and Recovery managed by the World Bank, to improve prevention and preparation for seismic risks. The project promotes the use of open data for urban resilience. It can be used to digitize the built environment, the road network and other critical facilities, and establish their vulnerabilities to a contingency to be able to subsequently organise the necessary interventions.

Students and inhabitants have been enrolled to create a map of the valley on OpenStreetMap. The data was collected by setting up crowdsourcing mechanisms and training a local community of volunteers : the first year, more than 2,300 people took part in the training workshops.

Different mechanisms were implemented :

- mapping of infrastructure and facilities (hospitals, schools, evacuation routes) ;
- mobile application allowing citizens to notify and map urban malfunctions (holes in the road, illegal dumping of waste, etc.) ;
- interactive mapping system to inform the public of programmes and projects in the neighbourhoods.

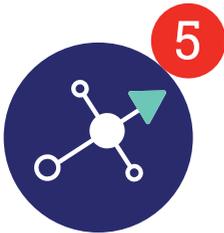
During the 2015 earthquake, the team centralised information *via* an online platform (Quake) to list the needs of affected people and coordinate first aid and humanitarian actions among civil society organisations, volunteer and civil defence groups. Ushahidi (for sending information or SMS by application or the geolocalisation of voice calls) was also mobilised to locate the victims.

A local NGO, Kathmandu Living Labs, was supported to carry out management and maintenance of the system and ensure the training of contributors in the long term.

### Lessons learnt :

- Free technical tools were used to map the baseline situation and help to improve disaster risk reduction.
- Stakeholders' coordination facilitated by ICT. The experiment can be reproduced by municipalities which can conduct this type of collaborative project.

## ÉTAPE



## Define a roadmap to ensure public responsibility for urban planning data

## GOAL

The local authority must enhance its capacity to produce reliable and systematic urban data for spatial planning

Even if the data comes from civil society, deciding which zones to be mapped, choosing the items to be represented, adding this data to the official databases is the local authority's responsibility.

This work on the territory requires coordination and collaboration with data producers, as well as a capacity for integration and processing to build centralised platforms. To ensure total coverage of the territory, data protection and security, and the use of the data in an emergency, the local authority must position itself as guarantor of the public interest. The gradual enriching, maintenance and continuous updating of the data also requires the municipality to take charge of or delegate it to a trusted third party with close monitoring.

The gradual constitution of a municipal team dedicated to data management seems necessary for the maps and risk management plans to take account of the most recent changes in the territory. In the longer term, the introduction of services of this type within the municipalities can be a first stage for building a solid information and knowledge database of the territory, prior to the integration of other information.

## SUGGESTION BOX



## Some digital tools at the service of urban and spatial planning

### Data source

- Recording and inventory of services, built environment and population
- Crowdsourcing *via* mobile applications, SMS services or call centres
- Drones, data and satellite imagery
- Sensors, rain gauges, weather radars
- Platforms
- Very high resolution (VHR) satellite imagery

### Data exploitation

- Use of GIS
- Mapping of contingencies, evacuation routes and critical infrastructure
- Geolocalisation : alerts, persons in danger, needs
- 3D Imaging
- Use of the European Space Agency's Copernicus, Google Earth or OpenStreetMap
- Crisis simulations

### Sharing and restitution

- Use of interactive, open maps
- Production of weather models
- Notification of problems that affect the community
- Development of platforms and database availability *via* API
- Recording of municipal administrative limits
- Crowdsourcing *via* mobile applications, SMS services or call centres
- Internet Platforms for coordination of stakeholder intervention
- Automated and/or manual alert services, by SMS

The methods of governance, coordination and steering of digital technology and innovation depend on the local political-administrative context (Part A, Step 5), rather than being specific to this particular action sector. The key questions and the possibilities of intervention methods therefore remain the same.

## PRACTICAL EXERCISE

## Define a medium to long-term roadmap for digitalizing urban planning tools



### Choose accessible digital actions the municipality can implement in its roadmap (see schema, page 37)

- A shared platform for existing urban data, which may be scattered and not all digitalized ?
- Format Harmonisation and geolocalisation of data ?
- Data collection on the informal areas of the city, not included in the plans or land registry maps ?

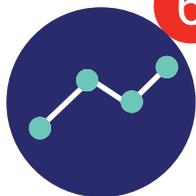
### Define the positioning of the local authority for digital-based planning

- What are the local authority's and concerned service providers' resources (technical, human, financial) which can be engaged to manage the digital system ?
- How and by whom can this digital system be proposed, designed, implemented ?
- How can the data generated be used and shared beyond the sector of the urban service ?



## STEP

6



## Assess, learn and enrich the data for territorial knowledge, and communicate on possible contributions

## GOAL

A continuous evaluation, apprenticeship and communication process should be set up to follow the elaboration of urban database.

Mapping enjoys strong spin-off dynamics, with free software (OpenStreetMap), learning communities and data collection tools (Ushahidi for example), the investment in and appropriation of which can be supported by international donors and cooperation agencies.

While drawing up a GIS may seem complex at first sight, there are support structures that allow gradual skills enhancement of the different departments within the local authority : IT service in charge of the databases, people in charge of the land registry map and civil defence, etc.

Using digital technology to make planning decisions favourable to the most vulnerable neighbourhoods is a first stage in adopting a broader approach of collaborative production of spatial knowledge. Ensure collection and mapping system monitoring by digital tools, means engaging in the digitalizing of spatial knowledge.

## SUGGESTION BOX



### Examples of performance indicators for digital planning

- Number of neighbourhoods mapped participatively and quantity of information listed.
- Increase in the number of contributors on OpenStreetMap.
- Enriching of the database of at-risk infrastructure.
- Number of subscribers to a feed, page, or alarm network.
- New partnerships with urban operators for the geolocalisation of public facilities.

This process of familiarisation and learning also takes place among civil society stakeholders. The participatory mapping exercises reinforce the knowledge of the population, as well as their capacity to interact with the local authority, on the basis of objective information that structures social demand. The presence of NGOs enables the transformation of the data produced by the inhabitants into tools that can be used by the local authorities and, reciprocally, serve as relays towards the population.

**Putting precarious neighbourhoods “on the map”, taking an inventory of vulnerable facilities and infrastructure is a first step towards acknowledging certain lacks in public action. For these tools to be really useful to the authorities, they must also be convinced that this “informal city” contributes to the overall running of the city.**

To make such a system sustainable requires the implementation of a communication strategy for data production to inform public decision-making ; for citizens to be informed about monitoring mechanisms, trusting of public data management and able to update the data.

### PRACTICAL EXERCISE

## Evaluate and communicate on digital change in the domain of local planning and risk management tools



### Choose one indicator that is significant, measurable and adjustable

How can data-based planning improve public action ?

- By reducing human and material losses in the event of a natural disaster ?
- By accelerating emergency response procedures, or the regularisation of precarious neighbourhoods ?
- By enhancing territorial databases ?
- By increasing data availability for third party stakeholders ?

### Communicate and reassure about the uses that will be made of data and maps

- What fears may the vulnerable population have about a census ?
- What fears may the institutional stakeholders have about sharing their data ?
- What is the guarantee framework the local authority must make public ?
- What are the types and degrees of access to be granted to various planning data ?



## Stimule local economic development

The challenge for local authorities is to encourage the local entrepreneurial ecosystem to embrace digital technology.

Digital tools can serve to improve commercial offers deployed on the municipal territory (develop tourism, manage urban markets, modernise logistics equipment), and thereby contribute to economic attractiveness. But digital technology is also a sector of activity in itself, whose firms of all sizes deserve to be accompanied. Local authorities are responsible for encouraging innovation and, when they can, proposing a service offering to firms.



STEP

1



## Clarify expectations : digital technology as an economic sector or at the service of economic activities ?

GOAL

Digital technology's capacity to generate income and jobs depends on the role played by local authorities in stimulating this new economic sector.

Digital services can contribute to traditional economic development by increasing the productivity of enterprises, improving infrastructure operation, favouring innovation, and improving the attractiveness of the city (tourism or heritage protection). The main advantage is that it can support almost all the local economic sectors.

While it spreads within existing firms, digital technology also generates flexible and innovative types of companies, increased tax revenue and local job opportunities – particularly for young people. Commitment is required from local authorities to foster the emergence of this dynamic economic fabric and guarantee its anchorage in the territory, for it to become a real driving force behind local development.

## Several models for the development of the digital environment

Digital technology is a particularly dynamic business sector, which mobilises a diversity of stakeholders with a variety of capacities for influence, investment and impact.

### • The “turnkey” offers of the major groups

Developed by major companies (through research & development departments), technical solutions are devised in the interests of these companies to increase their revenue. Certain solutions can be expensive for cities and not suited to local context.

For them to have a real grip on local reality and be suited to the users, strong guidance on the part of the local public authorities is necessary to supervise a form of order which is in the public interest and accessible.

### • The start-up model

Over the past few years it has imposed itself as a new urban business model : small, dynamic, responsive to demand for innovation but with still uncertain economic benefits in numerous cities. The challenge for these new structures is to be able to find available space to create their prototype, but also premises for scaling up, that is to say meeting firms and financial bodies that could either buy them, or fund them to develop an activity that goes beyond the pilot phase to generate income and jobs.

This change of scale depends, certainly, on the growth capacity of these firms, but also on external variables on which the municipality can intervene : stability of institutional framework, access to financial resources, availability of innovation support, identification of customers and promising markets. Local authorities can also encourage (or even co-fund) development of incubators (to develop prototypes) or accelerators (places that create contact between start-ups and “corporate clients” to lead to industrialisation).

### • Supporting digital innovation

The third way is the introduction of local strategies to create favourable conditions for digital urban innovation. In close relation to a national policy framework, these policies can be implemented by the local authorities to allow a mature ecosystem to emerge on the territory.

To do so, it is necessary to assemble the human, financial and technical resources necessary for the development of innovative SMEs. Skills can be mobilised for example *via* partnerships with universities or the creation of innovation centres bringing stakeholders together on a chosen territory.

Organising meetings with banks and local investors for new enterprises can also facilitate scaling up and the identification of commercial markets.

## INITIATIVE



## The City of Le Havre co-finances the Digital City

LE HAVRE, FRANCE



[www.codah.fr/actualite/em-normandie-et-la-cite-numerique-arriveront-en-2019](http://www.codah.fr/actualite/em-normandie-et-la-cite-numerique-arriveront-en-2019)

### A building dedicated to the digital economy co-financed by local public stakeholders.

The operation consists in the construction, at the heart of the maritime and port campus of Le Havre in France, of a building to allow the emergence of an ecosystem favourable to the development of innovation, entrepreneurship and the digital economy. The digital City contributes material and intangible means for the development of the diversity of the digital stakeholders : dedicated, outfitted spaces, a digital canteen (coworking spaces reserved for web and digital technology professionals), a training structure that favours new digital skills, a fab lab and an accommodation offer tailored to the development of the firms :

- An incubator for project leaders/business founders ;
- A business/start-up incubator (hosting/personalised support/services) ;
- A business hotel for developing companies.

The local authority of the Le Havre agglomeration (CODAH) is owner of the execution of the Digital Cité project and co-finances the building for 9.53 million euros out of a total budget of 24 million euros. Benefits and return on investment comprise rents collected and new jobs generated.

### Lessons learnt :

- Local authorities can co-finance a place to host the digital economy.
- When they do not possess the financial resources, it is to their advantage to drive real estate dynamics to create places (incubators or accelerators) and take part in governance and promotion.

## PRACTICAL EXERCISE

## Explicit expectations of digital technology for local economic development



### Choose an orientation that represents local economic opportunities for digital technology

You are expecting digital technology to be...

- An economic development sector in itself which requires support in particular for start-ups that will create jobs and generate innovation.
- A supply of services to increase performance, appeal and profitability of the existing economic sectors.
- A means of inciting the appearance of new markets and innovative services not yet identified, in liaison with other development domains (urban service applications, technology innovations).

### Identify the risks of exclusion and mechanisms targeted to attenuate it

- What economic activities and business lines could be threatened by the introduction of digital technology ?
- Which groups of clientele could lack access to the new digital markets ? For what reasons (price, accessibility, type of services proposed) ?
- Who might the start-ups be in competition with ?
- How can we encourage the traditional economy stakeholders to follow and collaborate with the new digital technology economic stakeholders ?
- How can we support the traditional economy stakeholders in their own digitalization ?

STEP

2



## Produce a diagnosis : know your local digital ecosystem

GOAL

The diagnosis must incorporate the dynamics of the formal and informal local economic fabric, the universities, research laboratories and national and international stakeholders in the sector.

In terms of support for the digital economy, local authority mobilisation remains weak, even non-existent. A good starting point would be to take an inventory of the existing baseline :

- **formal or informal organizations or start-ups** which often network to exchange experiences, share work spaces, compete in contests or forums that promote initiatives ;
- **major national or international companies** in the sector which, *via* calls for projects, can elicit demonstrations of interest from start-ups and small firms (artisanal or not) in the launch phase and the search for technical, commercial or financial backing ;
- **universities and educational institutes** are organizations which train the sector's future human resources. Knowing the training paths, skills, professional opportunities and markets the students position themselves on will allow a sketch of the local digital economic fabric.

This analysis of the digital ecosystem must address the financial and commercial constraints of the different stakeholders, to begin to identify the points that block their development, which the local authority could act on.

To grow their business, digital stakeholders also need access to data, on the basis of which they can develop applications and incite new uses. Thus, if the municipality makes existing territorial data available, this can also be a means of furthering creativity (cf. **Part C, pillar 3**).

## PRACTICAL EXERCISE

## Quick diagnosis of digital maturity of major local economic development actors



### Perform a quick diagnosis of possibilities for supporting start-ups

- What are the national and international programmes, competitions and calls for projects that can rally specific funding for digital innovation ?
- What are the programmes, competitions and calls for projects that can rally funding for the social and solidarity economy ?
- What is the regulatory framework for the creation of small companies (aids and procedures) ? On which aspects can the local authority facilitate procedures ?
- Are there, in neighbouring cities and countries, dynamic ecosystems that can serve as a source of inspiration, or even coaches for local start-ups ?

### Produce a quick diagnosis of the digital maturity of the urban service targeted

- Are there any start-ups on the territory ? Third places ? Dynamic *cybercafés* ?
- Are innovative organizations listed as formal companies, NGOs, individual entrepreneurs ?
- Are there any local financiers and investors (business angels) that can be engaged ?
- What are the local applications in mobile application stores in the domains of transportation, catering, tourism or local media... ?
- How accurate and rich is the information available on OpenStreetMap ?
- Which universities and training courses offer curricula in computing, development, innovation and digital technology ? Where do young graduates with digital skills work ?

## STEP

3



## Identify potentially interested local partners

## GOAL

Identify the local economic stakeholders involved in digital technology to build partnerships.

Traditional firms can be mobilised through partnerships to ask digital start-ups to develop new innovative services. They represent a market not to be neglected, for which local authorities can facilitate relations.

Civil society (universities, associations, NGOs, etc.) can also be associated with these initiatives by proposing a dialogue with the local population and contributing to the human capital of the ecosystem.

### INTERESTS AND CAPACITIES OF THE LOCAL ECONOMIC STAKEHOLDERS TOWARDS JOB CREATION AND INNOVATION

Local authority	Generation of local revenue Increase of the employment area Appeal of investors
Traditional private firms	Public-private partnerships to create incubators Increase their competitiveness <i>via</i> innovation
Start-up	Need for spaces and support for their innovation
Universities	Search for openings for young graduates
NGOs	Promotion of social innovation in partnership with the start-ups Guarantee pursuit of sustainable development goals
Population	Interest for jobs in an attractive sector Commitment of young technicians and graduates in entrepreneurship projects

In the domain of local economic development, ecosystem mapping is broadly in line with the prior work of territorial diagnosis regarding digital penetration rate *via* the stakeholders (Part A, Step 3).

### PRACTICAL EXERCISE

## Mapping stakeholders' ecosystem



**List the local stakeholders potentially concerned by digital innovation**  
(see schema, page 32)

- Local authorities (municipalities)
- Traditional private firms
- Telecommunication sector
- Digital start-ups
- Small entrepreneurs and operators (including informal)
- Stakeholders in social and solidarity economy
- NGOs
- Community organisations
- Citizens
- Universities and educational institutes

**Identify stakeholders likely to become interesting partners for joint actions**

- How do traditional local firms aware of digital technology work : extent of equipment ownership, capacity to use software, prior uses, data availability ?
- What would they gain by developing digital tools : profit expectations, social or political reason, generation of new knowledge, new, enhanced efficiency or democracy ?
- What joint actions could be invented to make partners of certain economic stakeholders ?

## ÉTAPE

4



## Start with pilot actions to support the digitalization of the local economy

## GOAL

Local authorities, with the help of start-ups, can launch pilot actions to test new digital public-oriented services

The digital sector can contribute to local economic development in two ways that are not mutually exclusive :

- by developing **innovative merchant services** for the population, provided by start-ups responding to demand on an unexplored market ;
- by developing digital solutions that contribute to **enhanced performance of the traditional private sector** which then positions itself as a client and buyer of solutions.

The promotion of these innovations is achieved through a strategy of supporting the development of a competitive market favourable to local entrepreneurship and urban development. Local authorities in developing cities often have limited capacities to provide basic services or for example to map informal neighbourhoods. Entrepreneurs, on the other hand, may find opportunities there, develop more efficient intervention methods, or even reveal a latent demand on the part of the population. The development of these services is not necessarily in competition with public action.

For these new services to be complementary or even add value for inclusive and sustainable development, the local authority must position itself as a **catalyst and regulator of the initiatives**. For example, it could submit urban problems to these small enterprises, leaving them free to innovate, make use of their skills to develop digital solutions for administrative problems, support informal stakeholders in structuring their commercial digital offers, and encourage the creation of

economic partnerships between traditional private stakeholders and start-ups around the search for innovation...

The emergence and development of a dynamic local ecosystem are subject to certain conditions :

- **open, collaborative environments** where start-ups meet traditional companies, universities, etc. Incubators, hackathons, fab labs, intrapreneurship, open innovation contests, and now federations of labs, are so many spaces that create synergies and favour innovation. It also relies on making available data, the processing of which will lead to new applications ; the more open and available the data, the richer the innovation may be ;
- **engaging the universities** in training digital professionals, support for the new enterprises in their commercial management as well as digital services offer to **traditional private firms** should ensure sustainable dynamics for innovation and the creation of start-ups ;
- **social and environmental vocation** is an item that distinguishes developing cities from western cities. The new enterprises see market opportunities here and compensate for the inadequacies of public services at lesser cost thanks to ICT. This trend not only makes it possible to contribute globally to urban development, but also indicates the sectors and activities with a high potential for leapfrogging.

#### SUGGESTION BOX



### Support firms in the digital sphere

- Define critical urban problems to submit and share with innovative firms
- Make available from time to time shared, equipped and connected premises
- Grant aids and facilitate procedures for company creation in the digital sphere
- Allocate subsidies to digital training programmes
- Organise competitions and prizes for digital innovation, accredit promising start-ups
- Facilitate exchanges between traditional private sector and start-ups *via* trade fairs and forums
- Grant targeted aids for innovation with a social and environmental vocation and local impact
- Put in place partnerships with universities for data processing
- Accompany informal service operators to develop digital services

## PRACTICAL EXERCISE

### Identify quick, easy pilot actions to stimulate digital innovation in local economic development



#### List pilot actions that are simple and fast to meet the needs of companies

In the traditional economic sector, what are the priorities for accelerating the use made of digital technology ?

- The generation, sharing and opening of data to offer the possibility of developing new, related services ?
- Communication strategies and online marketing to increase appeal ?
- The building of interfaces and platforms to facilitate exchanges and relations with customers/users ?
- Building partnerships or support for innovation *via* innovative third party enterprises ?

For start-ups, what are their priority needs in terms of :

- equipment ;
- data ;
- coaching ;
- funding.

#### Define the experimental scope of the actions

- What type of stakeholders do we wish to provide with initial support ?
- On which key urban development issues are we awaiting the introduction of new digital services ?
- What are the possibilities for creating niche markets, derogations, spaces to facilitate experimentation with new business models ?

## INITIATIVE



## CIPMEN : The incubator for start-ups

NIAMEY, NIGER

[www.cipmen.org](http://www.cipmen.org)



### A set of personalised services to support start-ups backed by the city of Niamey.

The SME incubator in Niger (CIPMEN) is part of the AfricInnov programme, partially supported by AFD. It was set up in 2013 to improve the chances of growth and the survival rate of Nigerien SMEs in ICT, renewable energies and the environment. This is a non-profit public-private partnership between the public authorities in Niger and several major private corporations (Orange CSR, Total, Veolia, CTIC Dakar, etc.).

The aims are to help start-ups access funding and national and international markets, limit administrative and tax red tape and train young talents, in particular in digital technology.

CIPMEN offers start-ups several personalised services, including :

- use of premises adapted and equipped for SMEs (coworking spaces) ;
- professional, commercial, administrative and technical consultation ;
- facilitation of access to funding ;
- integration into a network of entrepreneurs, academics, suppliers, clients and the business world in general ;
- company accounting management and tax exemptions.

### Lessons learnt :

- Organising open innovation events allows the local authority to identify innovative stakeholders on its territory.
- The municipal public sector can guide supportive structures to the private sector on themes that are in the public interest (ICT, renewable energies, environment, etc.).

## SUGGESTION BOX



## Work with start-ups to develop digital tourism services

- Geolocalise tourism offers (accommodation and catering) on online mapping systems
- Create an interactive map with places of interest to create a tourism itinerary
- Publish up-to-date practical information online (times, access, prices, etc.)
- Publish an up-to-date schedule of local cultural and sports events online
- Install flash codes on historical and heritage buildings that link to tourist information
- Opt for audio guide applications at the tourist sites for interactive visits
- Set up an e-ticket service for online management of visitor flows
- Install Internet terminals with free access and/or Wi-Fi in tourist places
- Create forums for sharing experiences and visitor comments

## INITIATIVE



## Mekong Innovative Start-up Tourism

CAMBODIA, LAOS, MYANMAR, THAILAND AND VIET NAM

[mist.asia](http://mist.asia)



### A programme devoted to supporting start-ups specialising in the tourist sector in the Mekong basin.

This initiative is developed by the Greater Mekong Sub Region (GMS) economic cooperation programme, grouping together six States via its tourism coordination bureau. It follows on from the revision of the tourist strategy of the GMS of 2010-2015 with a first edition in 2017.

This is a contest that selects the twelve best start-ups for a bootcamp organised in partnership with the Mekong Business Initiative (Australian government, Asian Development Bank) and regional start-up incubators.

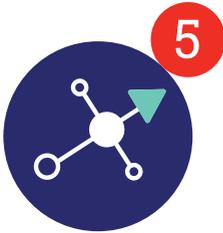
A second competition is organised after this training with five awards (from 7,000 to 10,000 USD) distributed to the start-ups judged as the top performers.

The winner of the first prize was the Myanmar start-up "GoP", offering an online platform listing local stakeholders proposing tourist circuits and local guides. The site can be used to make bookings and to have access to instant information for planning a trip to Myanmar without wasting time. It has not been translated into English. This initiative gives access to the market for local stakeholders, firms and guides.

### Lessons learnt :

- This initiative is jointly run by several border States around a common challenge and can be replicated on the scale of the neighbouring local authorities.
- In a region experiencing strong growth in tourist numbers, digital innovation constitutes one of the levers of local economic development and can vitalise an entire regional ecosystem.

## STEP



## Define a roadmap to boost local economic development

## GOAL

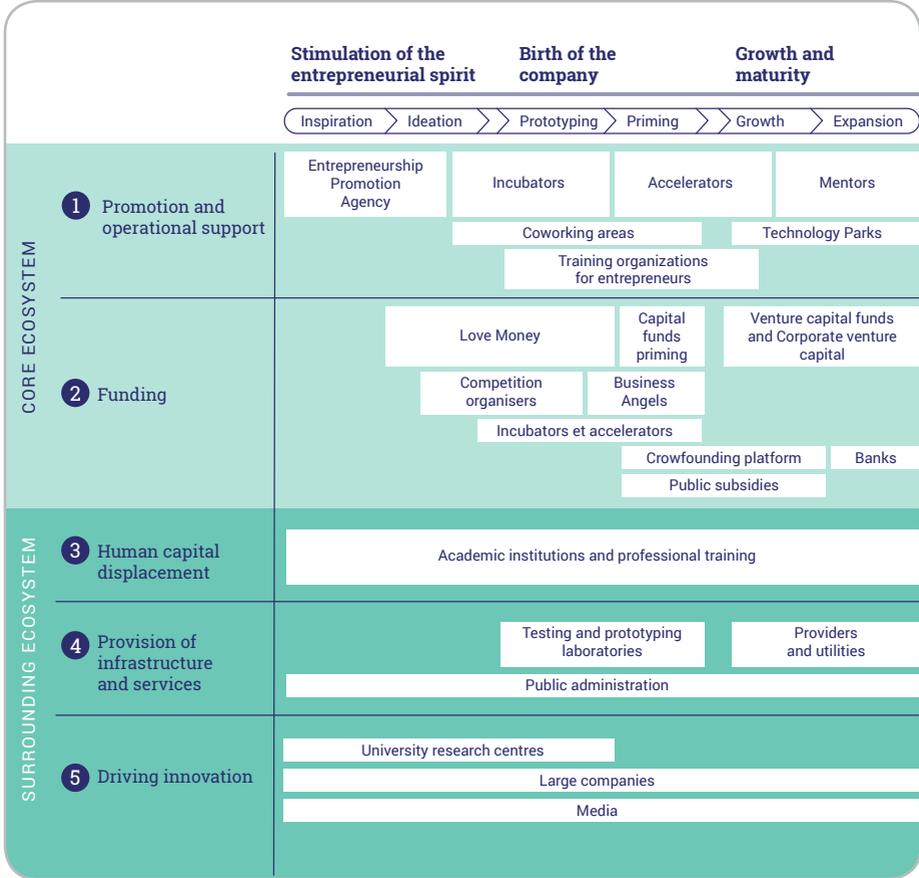
It is in the interests of local authorities to position themselves above all as facilitators, mediators and promoters of third party dynamics.

Among the more sustainable actions, and in order to scale up, the offer of work spaces dedicated to digital innovation is a key issue. In a context of often limited financial resources, they can start to encourage the emergence of third places (coworking) or the creation of innovative activity centres (potentially in connection with training organizations) run by third party stakeholders (local companies and banks) involved in digital technology. Furthermore, a municipality simply making available premises that are equipped and connected, in the form of cooperative work spaces, can also be an easy, inexpensive first stage towards facilitating working conditions, meetings, collective emulation and therefore the structuring of the local digital ecosystem.

Lastly, local authorities with more financial resources could help to fund certain buildings dedicated to innovation (incubators or accelerators) and/or the associated offer of services to start-ups.

Intermittent events can also allow local authorities to engage their ecosystem on specific questions or problems. Often organised in the form of innovation contests (hackathon for example), these schemes allow a local authority, possibly in partnership with traditional private firms, to select the innovations they wish to support and the methods of providing support. It may be a question of a preliminary stage prior to the integration of an incubator, the presenting of a prize so that the company can expand, or support in the form of bootcamps, training or mentoring over the innovation development period.

**LOCAL ECONOMIC INNOVATION SCHEMES IN FAVOUR OF THE DIGITAL ECONOMY**



Inspired by Roland Berger, 2017.

## PRACTICAL EXERCISE

## Define a roadmap for encouraging the use of digital tools in local economic development



### List the main constraints on the development of start-ups

- Human resources : are skills lacking in development, innovative methodologies, user design, commercial product design ?
- Technical resources : is there adequate computer ownership, work spaces and connectivity ? Is there enough data available ?
- Financial resources : do entrepreneurs have trouble contacting banks and investors, making their products attractive and credible to financial backers ?
- Administrative resources and managers : are procedures too long, complex and restrictive or unsuitable for digital innovation ?

### Define interventions favourable to innovation (see schema, page 102)

If the aim is to foster the emergence of start-ups, should priority be given to :

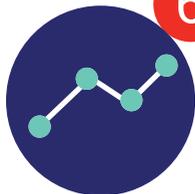
- offering premises and conditions for working and collaboration ;
- facilitating procedures for setting up a business ;
- making sure valuable data is available ;
- calls for projects accompanied with subsidies or seed capital ?

If the aim is to boost an existing ecosystem and make openings sustainable, should emphasis be placed on :

- bringing traditional and innovative economic sectors into contact to develop collaborative solutions via open innovation, forums and trade fairs ;
- training and employment of skilled young people by creating universities/start-up centres ;
- organising competitions around public data to make it more visible and open up markets ?

## STEP

6



## Evaluate learning and follow the digitalization of the local economy

## GOAL

Once the pilot digital services have been tested, enterprise-local authority partnerships can be designed to scale them up.

Monitoring the innovations produced by start-ups is a source of information for local authorities about the services that were lacking on the territory, which satisfy a demand and for which users would be willing to pay : for example, tourism applications, contract management, creating contact between service providers and underprivileged populations, commercial information.

It then becomes possible to design partnerships between these enterprises and the local authority to develop solutions on a larger scale, by the municipality itself (within the scope of its own calls for tender) or by the existing traditional firms on the local territory.

## SUGGESTION BOX



### Examples of performance indicators in the digital economy

- Number of local applications registered in the application stores.
- Funds mobilised for organising start-up competitions.
- Frequentation of Museum and tourist spot websites.
- Increase in online ticket sales and tourist visits.
- Number of participants at a local digital economy trade fair or forum.
- Registration of guides, hotels and restaurants on a local tourism platform.
- Increased traffic at tourist sites.

The opening of the local authority's data and information is a condition for the development of new applications and a dynamic digital ecosystem. Failing this, the risk is that innovators turn towards traditional private sector stakeholders, or crowdsourced data (generated by the population) to develop their services, thereby bypassing and marginalising the public authorities. Access to information must therefore be as transparent as possible.

A municipal service specialised in data management is a condition for success to ensure the innovations proposed are relevant to the local authority, and also to guarantee the security and protection of the information made available (Part C, Pillar 3).

### PRACTICAL EXERCISE

## Evaluate the support given to digital innovation and communicate



**Choose an indicator that is significant, manageable and adjustable to measure the economic benefits related to the digital sector**

- The number of jobs in the sector ?
- The companies founded ?
- The financial flows allocated ?
- The development of new services and local applications ?

**Determine how to motivate traditional firms, attract and mobilise new entrepreneurs**

- Via prizes, labels or competitions to promote them ?
- Via forums, work spaces and meetings ?
- Via digital platforms listing services on the territory ?



## Improve relations between local authorities and citizens

The challenge for local authorities is to use digital technology to stimulate citizen participation, facilitate exchanges with the population and increase political accountability.

Digital tools, named civic tech in this domain, can be a vector of good local governance for cities. “E-governance” and “e-government” are particularly good illustrations of the opportunity digital solutions offer in facilitating exchanges between local authority and users through the dematerialisation of procedures and of citizen participation, the shortening of processing times and increased transparency.

This domain of action shall be completed by **part C** which guides local authorities through their internal transformation by digital tools.



STEP



## Clarify the political expectations of the local authority and commit to accountability

GOAL

Embracing digital technology to improve exchanges between local authority and citizens is a strategic political commitment.

Civil society is prompt to embrace digital tools to convey social demands : this is called civic tech. If they fail to acknowledge these new spaces for open dialogue, the local authorities run the risk of finding themselves faced with protest and claims facilitated by social networks.

Engaging in the digital sphere means entering into a virtuous circle of better service quality, transparency and accountability, greater confidence and greater willingness to pay on the part of the users. The capacities for public action are thus enhanced.

Digital technology can lead to change according to three dimensions :

- **E-administration** : optimisation of administrative functioning *via* dematerialisation of in-house procedures, digitalization of processing and monitoring procedures ;
- **E-government** : opening of the information to the public *via* a web platform ;
- **E-governance** : citizen participation in public decisions facilitated and increased by digital tools.

Although independent, e-administration and e-governance approaches are quickly found to be related in practice. It is therefore important to design user services keeping in mind the management dimension internal to the local authority, which will be modified by this (cf. **Part C, Section 2**).

In order to bring the stakeholders onboard, and be able to show results rapidly, it is important to focus on problems of friction between local authority and citizens. Entering into a coproduction approach with citizens and inhabitants, facilitated by ICT, must enable trust to be boosted in return.

#### PRACTICAL EXERCISE

### Clarify expectations of digital technology to improve relations with users



#### Choose a reason for undertaking the use of digital technologies in the relations with the citizens

- Enhanced legitimacy of decisions made, founded on citizen opinion ?
- Accountability of politicians vis-à-vis tax collection and budget allocations ?
- A possibility for the citizen and social movements to express themselves and cooperate on public actions ?
- A reduction in corruption and increased transparency ?
- Facilitation of administrative procedures (time saved for public agents and users) ?

#### Identify the risks of exclusion and the targeted mechanisms to attenuate it

- Which people have most difficulty entering into contact with government services ?
- Are the obstacles related to distance, cost or the time frames for the procedures ?
- Do they have easier access to dematerialised/online tools ?
- Which digital service design ensures that everyone understands and has faith ?
- Which stakeholders are already working on digital literacy ?

STEP

2



## Perform a diagnosis of e-governance maturity and use of civic tech

GOAL

For digital technology to facilitate relations with citizens, the local authority and the population must be equipped and connected.

The local authority must first of all verify the digital penetration rate within its own departments. Equipment diagnosis may involve :

- listing of regulatory and administrative documents which have been or can be scanned and published online ;
- identification of procedures and complex steps for users which could be simplified thanks to digital technology, such as civil registry, tax payment, recording of permits and commercial licences ...
- identification of systems that could benefit from user contributions for decision-making or preparing budgets, depending on the needs expressed by the population.

**Internal consultation** with municipal agents may bring out points of friction or difficulties experienced in relations with users. This stage allows agents to be associated with developing solutions.

**Communication tools** should not be neglected in this domain : the way the local authority informs, raises awareness and consults the population can be greatly facilitated and extended thanks to digital technology, in particular *via* new communication online means and social networks.

**PRACTICAL EXERCISE****Perform a quick diagnosis of possibilities and progress of digital technology in the relations between local authority and citizens****Produce a quick technical diagnosis of local authority maturity on this domain**

- What is the rate of household ownership of telephones, smartphones, tablets and computers ? How is this penetration rate distributed over the territory ?
- What municipal spaces already offer the general public Wi-Fi access ?
- Which procedures and data are already dematerialised or available online ?
- Which documents and statistics have already been scanned ?
- Which teams or public agents are most familiar with digital technology and oriented towards innovation ?

**Produce a quick diagnosis of possibilities and limits offered by the national regulatory framework on e-governance**

- What are the national and international programmes, competitions and calls for projects that can help to fund improvement actions ?
- What are the national programmes for dematerialisation of procedures ?
- What are the possibilities for setting up participatory processes ?
- What are the regulations on personal data and online administrative files ?
- Are there any legal methods for paying taxes by mobile or online ?

## STEP

3



## Identify possible partners and map local civic tech initiatives

## GOAL

Local authorities must play the role of initiator and guarantor of improved relations with citizens.

To develop suitable solutions for local uses, local authorities are the relevant stakeholders for coordinating supply and taking part in defining needs. But citizens, the direct targets of the systems introduced, also have a role to play concerning the dematerialisation of procedures, participation in budget or tax decisions.

### POTENTIAL INTEREST OF THE STAKEHOLDERS FOR E-GOVERNANCE

Local authority	Reduction of internal costs and increased revenue Creation of new positions and specialised services Boosting of skills of public agents Increased transparency, confidence and user satisfaction
State and other public institutions	Facilitation of internal communications Coordination of intra-governmental exchanges Regulations promoting data openness Transparency generating confidence
Traditional private firms	Transparency and efficiency of public procurement Facilitation of procedures for registration, statements, paying taxes
Start-up	Methodologies for conducting change Development of applications and integrated services

<b>Universities</b>	Knowledge of what is at stake for public services Trusted third party in the political arena Accompaniment of participatory schemes
<b>NGOs</b>	Knowledge of citizens' difficulties Support for population to master tools Accompaniment of participatory schemes
<b>Civil society organisations</b>	Promotion of a social or political cause Increase of membership/activists base Exchange of ideas or resources between organisations Relay communications to the media
<b>Population</b>	Need for information and awareness raising Confidence in tax collection Payment facilities

### PRACTICAL EXERCISE

## Mapping stakeholders' ecosystem



### List stakeholders potentially concerned by e-governance (see schema, page 32)

- Local authorities (municipalities)
- Traditional private firms
- Telecommunication sector
- Digital start-ups
- Small entrepreneurs and operators (including informal)
- Stakeholders of the social and solidarity economy
- NGOs
- Community organisations
- Citizens
- Media
- Universities and educational institutes

### Identify stakeholders particularly likely to be interested in e-governance

- Who in civil society develops civic tech ? What are possible meeting points with public authorities ?
- Who among the public agents of the local authority have the keenest need to change modes of relation with the population ?
- Among the citizens, which people will be most willing to be beta-testers of municipal digital systems ?

## STEP

4



## Start with pilot actions to initiate a virtuous circle with citizens

## GOAL

E-governance allows increased population participation in decision-making, monitoring of administrative procedures and the payment of taxes.

A virtuous circle can be initiated between better quality administrative services, accountability and confidence, and willingness to pay for these services along three lines.

- **The introduction of a communication and consultation strategy** that is regular and transparent, interactive, enabling bilateral exchanges. This is not only a question of providing information on a website, but also of being able, *via* online spaces for discussion and dialogue, to gather users' opinions and needs to orient decisions. This communication cannot just be a showcase : if the local authority is not able to respond to citizens' expressions, it runs the risk of creating frustration. Taking feedback from citizens into consideration is also a means of increasing relevance and legitimacy of decisions made.
- **The dematerialisation of the procedures** that render fluid and facilitate access to the administrative services, while contributing to reducing distances and delays and increasing transparency in treatment and follow up of dossiers and payments. This simplifies procedures for users and municipal agents.
- **The collection of taxes** thanks to digital tools. Mobile payment is a first means of removing technical and administrative obstacles to receiving payments. But more globally, ICT contributes to reducing suspicions of embezzlement, corruption or malfeasance thanks to the automation of tasks. Monitoring systems that are neutral and objective instil confidence and defuse possible complaints.

For these solutions to operate, the local authority must be responsible for awareness raising among citizens, their free, representative participation, and the accessibility of the services.

Becoming an "online" local authority assumes in-house work is conducted to digitalize its internal organization (**Part C, pillar 2**). Clarifying this willingness and capacity to provide services to match the aroused expectations must be included in the balance when priority goals are defined.

**PRACTICAL EXERCISE****Identify quick, easy pilot actions to introduce digital technology in the relations between local authority and users****Define pilot e-governance actions to be implemented to respond to social demand**

- Online communication to the general public of motions voted after each council meeting ?
- Transparency and online publication of major items in local budgets each year ?
- Targeted online survey of the population's satisfaction and needs ?
- Test online participation of citizens in the annual budget ?
- Online collection and management of a tax or duty as a test ?
- Dematerialisation of a targeted administrative procedure ?

**Define a friction point for developing an experimental solution**

- On a procedure that is particularly expensive for users ?
- On a procedure that is particularly ineffective for local authority ?
- In each case, think about what can be dematerialised, automated or digitalized simply for citizens ?

**SUGGESTION BOX****Digital technology for facilitated exchanges with citizens**

- Introduction of a website, social network pages, web portal.
- Dematerialisation of administrative procedures and procedures : civil registry, permits, etc.
- Creation of online libraries and archives of regulatory documents.
- Votes and questionnaires online for citizen consultation.
- Creation of tools for citizens to notify urban malfunctions.
- Installation of interactive terminals, Wi-Fi and public digital spaces.
- Forums or email systems for exchanging among politicians, administrative staff and users.
- Mediation and digital education systems to facilitate appropriation.

## INITIATIVE



## Digital contributions to a participatory budget



BELO HORIZONTE, BRAZIL

[www.pbh.gov.br/seminariointernacionalop/downloads/AnaLuiza.pdf](http://www.pbh.gov.br/seminariointernacionalop/downloads/AnaLuiza.pdf)

### Online citizen consultation for drafting municipal budget.

Participatory budget initiatives started in Brazil in the 1990s. The city of Belo Horizonte tested a participatory e-budget to increase and diversify participation.

The online voting platform created in 2006 by the municipality provides information on the scheme and on the projects ; videos and images allow the citizen to query the municipal authorities and offer possibilities of discussions (online forum).

A communication campaign mobilised the municipality and civil society stakeholders (associations) who disseminated the information by traditional means (flyers, posters, television, radio), but also via an online campaign (social networks, mailing-list, etc.). Public Internet voting points were set up all over the city.

In 2006, the e-budget gathered seven times more participation than the traditional system (almost 10% of voters). Among the 500,000 votes, slightly over a third registered online. ICT enabled the cost of participation to be reduced, in particular voters' travel costs.

The municipality opted for an iterative approach for the second edition in 2008 : the voting systems were extended to include telephone voting (10% of total votes) and a chat was integrated into the platform. Furthermore, the municipality oriented projects preselected around a single goal : improving traffic, with virtual media (maps, images) and a higher budget (22.2 million US dollars on average per project). A team was dedicated to improving the system and contact with the inhabitants.

### Lessons learnt :

- Involving the population in the drafting of a municipal budget using digital tools ensures better transparency of the action of the city and reaches a wider public.
- Digital systems are complementary to conventional participation systems and it is not possible to leave out the "traditional" communication campaign.

## SUGGESTION BOX



## Digital technology for increasing municipal revenue

- Creation of digital tax payer profiles with monitoring of payment statements.
- Public terminals for paying taxes, invoices, licence fees and duties.
- Applications for online or mobile payment of taxes and duties.
- Applications for recording, monitoring and payment of fines.
- Payment reminders and confirmations by SMS or email.
- Portable connected printers for issuing receipts on site.
- Tablet computers or connected terminals for collecting taxes on site.
- Interfaces for information on local budget expenditure.
- Complaints and claims services online and via SMS.

## INITIATIVE



## E-Citie for tax collection and payment

KAMPALA, UGANDA

[ecitie2.kcca.go.ug/portal/](http://ecitie2.kcca.go.ug/portal/)



### A unified information management system that enables online registration, tax returns and payment of taxes, duties and rates.

The Kampala Capital City Authority (KCCA) launched the E-Citie programme in 2014 to improve efficiency of tax collection, increase the weight of local taxation in the operating income and thereby limit dependence on transfers from central government.

Several types of payment system have been introduced : windows, points of sale, banks, mobile phones or computers.

The system was first tested in the transport sector (road user taxes and taxi operation fees) and will be adapted to other revenue flows (hotel taxes, commercial licences, real estate taxes). It enabled the identification and centralisation of the tax payers base in a municipal register, which facilitates monitoring and improves the collection of taxes and refunds (SMS reminders of deadlines, confirmation of payments).

Between 2011 and 2016, the KCCA experienced a 266% increase in its tax receipts. Total revenue collected through mobile payment reached 12.8% of revenue collected.

### Lessons learnt :

- Using simple digital tools for tax collection represents a very profitable investment for local authorities.
- Tax collection was introduced in stages, in the first instance limiting the use of digital tools to a specific domain.

## STEP

5



## Define a roadmap for becoming an “online” city

## GOAL

The local authority should scale up the first pilot actions and make use of civic tech.

Civic tech brings together digital offers that use technology to boost the democratic bond between citizens and government. Although many are developed on a national scale (to address members of Parliament for example), these tools can be used and adapted at local level. They include citizens involved on a personal level, NGOs, the media, start-ups and foundations who focus efforts on the development of citizen networks, community commitment and the sharing of data.

## SUGGESTION BOX



### Civic tech solutions for engaging citizens

- FixMyStreet : tool for notifying problems observed in the street (holes, flooding, etc.).
- Bouge Ma Ville : tool for submitting a request for information or pointing out a problem.
- Fluicity : platform for exchanges between elected representatives and the population on ongoing projects.
- CityZenMap : mapping application for citizen participation in development projects.
- Democracy Os : consultation service platform for inhabitants.
- Cap Collectif : platform for building participatory applications.
- Unlimited Cities : collaborative urban planning tool.
- CitySDK : kit for developing, harmonising and sharing API.

Methods of governance, coordination and steering of digital technology and innovation depend on the local political-administrative context (Part A, Step 5), rather than being specific to this particular action sector. The key questions and possibilities of intervention methods therefore remain the same.

#### SUGGESTION BOX



### Some digital tools for facilitating exchanges

#### Data production

- Conversion of paper files to digital format, storage in databases and computer archives
- Collection of taxes and dematerialised receipts
- Sensors and connected objects (cameras, etc.)
- Crowdsourced data

#### Data analysis and processing

- Computerisation of manual operations (production of reports, record of salaries, etc.)
- Inventory of office equipment and document search equipment
- Record of tax payers in an online municipal register
- Centralisation of data on a municipal server
- Geolocalisation of tax payers
- Creation of integrated operations and control centres

#### Communication and exchanges

- Sharing of hard disks, printers and scanners
- Libraries and electronic archives
- Internet platforms open to citizens
- Deadline reminders by SMS
- Applications for notifying irregularities, recording infringements
- Conversion of data into re-usable formats
- Digitalization of legislative documents

## PRACTICAL EXERCISE

### Define the action methods for improving relations between local authority and users



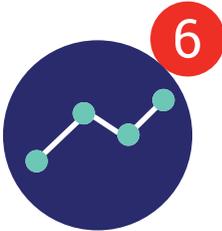
#### Define your vision as a local authority

- What commitments should be made in terms of digitalized services for the population ?
- How can civic tech start-ups be relied on and cooperated with ?
- Which data and information should be shared ?
- What are the actions to be conducted for the most vulnerable members of the population so that they can take part in the process ?

#### Choose a digital action that the municipality can support on a larger scale after completing a test phase (previous step)

- Gradual dematerialisation of tax and administrative procedures ?
- Systematic online collection and management of taxes and duties ?
- Systematic transparency of major investment decisions ?
- Convergence and coordination of tools for experience feedback, opinions, claims and notifications from citizens ?
- Integration of opinions from forums, media and digital platforms for citizen control in decision-making ?

STEP



## Assess the improvement in citizen perception of local authorities and communicate on the digital transition

GOAL

Convince the population of the relevance of the approach is condition of success for massive and sustainable use of new digital tools.

All the systems implemented by local authorities must be the subject of a **communication campaign** to make sure they are appropriated by the users. Introducing training and awareness raising sessions is essential to make the tools sustainable. These initiatives often provoke resistance or even incomprehension, so time is required to boost staff and citizens' skills.

An issue related to the introduction of these e-governance systems is that of **transparency and accountability**. This must be considered a real asset, and not a risk by the authorities : the acceptance and use of digital systems in fact goes hand in hand with increased user satisfaction on the new services offered. Communicating on the impacts (internal economies, gains in efficiency, reduced errors and deadlines, adaptation to all population categories) provides arguments the local authority must render accessible and comprehensible.

Incorporating digital technology into municipal management can be an opportunity to develop an open platform for publishing data on public management (Part C). The opening of public data is part of local public action transparency and increased trust of inhabitants towards local elected representatives

## SUGGESTION BOX



### Examples of e-governance performance indicators

- Increase in online tax collection rate.
- Rate of population participation in participatory systems and digital consultations.
- Number of contributions to public debate online on social networks.
- Rate of recourse to online administrative procedures.
- Frequentation and use of free access terminals or computers in administrations.
- Number of creations or recording of individual online accounts.
- Increase in frequentation rate and follows of the city hall's web pages and social networks.

## PRACTICAL EXERCISE

### Evaluate and communicate on the change in relations between local authority and users



#### Choose an indicator that shows targets have been met

- Users' perception of the quality of local administration ?
- Increased tax revenue ?
- Enhanced citizen contribution to public decision-making ?
- A reduction in the time it takes to complete administrative procedures ?

#### Implement a communication strategy

- Disseminate information and raise user awareness : communication campaigns, active presence on social networks, websites, etc.
- Feedback information and gather opinions : call centres, surveys and online questionnaires, a complaints and claims management system, urban problem reporting tools.
- Provide information about decisions and create spaces for virtual dialogue : online forums, participatory mechanisms, making open data available.



# ADAPT

## Transforming local authority organisation with digital technology

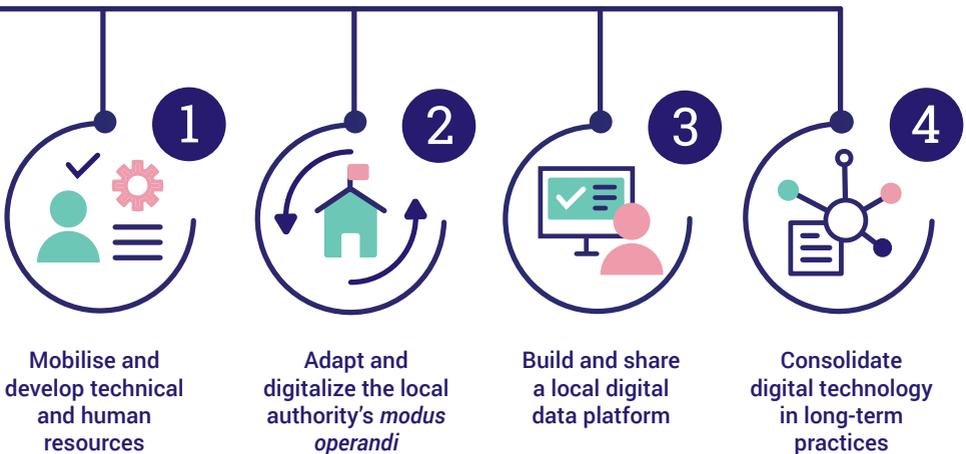


## GOAL

Local authorities have a crucial role to play in harnessing the potential of digital tools as part of their internal transformation.

Digital technology potentially constitutes a powerful lever for local authorities to drive internal organisational change, improve efficiency of activities, transparency of certain processes and accountability for the actions of municipal departments. How to structure a digital transformation approach within the municipal departments? How can the administrative staff be brought on-board and encouraged to commit? Where to begin?

**This task is divided here into four pillars, each of which is a lever to help structure the approach.**



## PILLAR



## Mobilise and enhance technical and human resources

## GOAL

Change management induced by integrating ICT into administrative departments requires strong political backing : the digital transformation will take place over the long-term and involve a dedicated team working closely with all the administrative services.

The constraints of human, technical, financial and administrative resources the authorities in developing cities may have to face are far from an obstacle to the use of ICT. The introduction of digital technology can even be an opportunity for leapfrogging and moving forward by giving preference to free or inexpensive tools and solutions.

### Evaluate the uptake of computer equipment and digital tools used daily by municipal staff

In preparation, a few elements of diagnosis are necessary to assess the initial situation (digital maturity), and digital development potential (cf. next box).

## KEY QUESTIONS

## Diagnosis of municipal digital maturity



- What access is there to telephone and Internet connections ? What is the uptake rate of telephones, computers and printers, software installed and licences bought, tools for management, backup and archiving online in the municipal departments ?
- Are there any public information and communication portals (websites, social network pages, etc.) and how frequently are they updated ?
- What is the state of existing data and statistics : format, update, possibility of standardisation and interoperability between departments, storage solutions ?
- Is there a computer department, where is it positioned on the organizational chart ? What are the teams' skills and degree of mastery of digital technology, personally and professionally ?
- Who could be the person or department, sufficiently cross-disciplinary, legitimate and innovative to carry the digital project internally ? Who could be external allies (universities, entrepreneurs, incubators) for sharing this digital innovation culture and method ?

## Develop the digital skills of the city's staff

The collaborative approach is unavoidable to be able to successfully introduce digital technology in the departments and the way the local authority works. There are three decisive success factors.

- **The process must be supported by a decision-maker (leader) and a technical manager**, who will be both driving force and king pin of the local digital transformation. They should interact with legitimacy and conviction towards all the stakeholders : other elected representatives, local public officers (users), consultants supporting the transformation, technician-developers. Their knowledge of digital methods and especially their experience in launching major projects and stimulating and coordinating other agents' initiatives should enable the departments to go beyond their confines.
- **The use of technical skills** to support digital transformation. This can be expressed as internal recruitment of new skills sets : developers (computer experts and programmers) specialising in data management and analysis. This can also involve consulting firms who help to design strategies (on the data managed by the city, the uptake of digital tools, etc.) and solutions.
- **Training**, to help local administrative staff own the stakes, take charge of the new tools and become stakeholders and initiators of the digital transformation.

The local authority can choose different change management methods, depending on its human, financial and technical capacities : back the project internally or call on consultants or specialised firms, while maintaining strong political guidance. Universities and educational institutes can also be particularly interesting partners for rallying the necessary skills.

The first step for engaging administrative staff is to assess whether the teams are familiar with digital tools : mastery of basic software, knowledge of uses and potential of the Internet and social networks. Beyond this, it is important to know whether they are interested in appropriating new tools and working methods to define which types of support and training will be required.

Digital tools may alter ways of working profoundly, for two reasons.

- **The “entry cost” for the civil servants** : familiarising themselves with new tools, becoming used to exchanging on online forums and collaborative applications, agreeing to change working habits is neither instantaneous nor easy. In the first instance, an information, awareness-raising and training approach shall be necessary to make sure the staff are ready to invest time and effort in these new methods and persuade them to do so.

- **Alteration of jobs** induced by the new digital tools : automation of certain procedures, dematerialisation of archives and exchanges, greater speed and responsiveness change the rationale behind the work. Gains in efficiency that may be expected can also be perceived as threats in certain business lines. The underlying rationale and the benefits the staff can derive must be clearly explained. The transformation process must not only be transparent, it must also address the concerns and problems facing the agents in the field, who will be the users of the new digital solutions.

The promises and opportunities of digital technology will be fulfilled if local authorities, and their personnel, engage in **a perspective of innovation and experimenting** with new solutions on a daily basis. This pre-supposes a change in the local authority's *modus operandi* towards more flexibility and attention to the proposals coming directly from staff/users, and acceptance of readjustments along the way, when a tool does not work properly.

Building an inter-departmental team which has conviction is therefore decisive for a successful digital transformation. The manager would do well to rely on digital “focal points” in each department to serve as a relay for the internal transformation.

## INITIATIVE



## Digitalization of the local authorities of intermediate cities



### PHILIPPINES

[workspace.unpan.org/sites/Internet/Documents/UNPAN035000.pdf](https://workspace.unpan.org/sites/Internet/Documents/UNPAN035000.pdf)

#### Programmes for the gradual modernisation of procedures and the boosting of average-sized cities local authorities' digital skills.

The Philippines set up a national programme to modernise procedures within the administrations at the beginning of the 2000s. This programme was gradually extended to local authorities.

The municipalities of Caloocan, Muntinlupa, Antipolo and Tagaytay, for example, implemented strategies to modernise procedures within their administrations within the scope of the Government Information Systems Plan (GISP) approved and adopted as a framework for all the computerisation efforts of key services and operations.

None of these municipalities had Internet access for all their departments in 2010, and Caloocan had no Internet access at all. The municipal authorities nonetheless devoted

resources to introducing this programme, for example at Tagaytay and Muntinlupa, where a job position was created specially. This measure was to be implemented by Caloocan and Antipolo.

In addition, the municipalities rallied technical assistance to improve the skills of their departments : Caloocan and Muntinlupa have a dedicated department, Management Information Systems ; which acts as preferential contact ; Antipolo preferred to consult its software vendor, Amellar Corporation ; Tagaytay enlisted the services of private technicians.

At Muntinlupa, emphasis was placed on e-governance, improving the website as a priority. The three other cities preferred to set themselves the goal of improving e-government by developing specific administrative applications on the Internet, requiring user identification.

#### Lessons learnt :

- The intermediate sized Philippines municipalities took charge of their digital transformation starting from a very low level of maturity.
- The implementation of a national policy framework allowed the municipalities to develop coherent procedures, as well as peer-learning.

## INITIATIVE



## “E-Fes” : dematerialisation of the civil registry

FES, MOROCCO

[www.fes.ma](http://www.fes.ma)



### Online services for civil registry procedures that simplify service delivery and improve municipal management performance.

The Moroccan context is favourable to the modernisation of the authorities, promoted by the monarchy and by the higher echelons of State. The municipality of Fes has been a pilot city in processes for dematerialising administrative procedures.

Back in 2004, the registry office was modernised : an ICT technician was put in charge of setting up an online portal dedicated to digitalizing civil registry procedures (birth certificates, marriage, divorce, death certificates, etc.). The purpose of this joint initiative of the municipality and Al Akhaway University was to create online services to simplify

service delivery and issuing of administrative documents for inhabitants. As a complement, interactive digital terminals were installed in the administrations.

In addition to improving dialogue between local authorities and citizens, the platform enabled the development of municipal management performance indicators. The reduction in service waiting time, error rate and repetitive tasks are so many indications of the growing competence and efficacy of the civil servants at the registrar’s office. Municipal services are now subject to citizen evaluation. At the end of 2017, an application called “e-Moukataâ” was tested to allow citizens to access the administrative services and legalise their documents from a distance.

### Lessons learnt :

- The partnership of Fes municipality with its university involved quality human and technical resources to manage and continuously evaluate the process.
- Introducing municipal management performance indicators made it possible to measure improvements in skills and efficiency of the local civil servants.

## PILLAR



## Adapt and digitalize local authority organization

## GOAL

Gradually modernise local public action following an iterative procedure : start with a pilot project, test and refine it, before replicating or extending it.

ICT can generate efficient tools for local management (administrative or operational) which may be inexpensive. The diagnosis performed at the outset must identify priority needs, existing capacities (human, technical and administrative), and lastly, easily accessible tracks for improvement.

### Organise local administrative services for the transformation

Depending on the maturity of the digital sector on the territory and the local governance frameworks, a local authority may endow itself with a team dedicated to innovation and digital technology. Relying solely on the city's IT department is a practice that has not proven successful, but the digital team should work closely with this department.

Several options for positioning the digital transformation in the organisational chart are possible :

- confer innovation and digital transformation on the **general services department** or the general secretariat of the local authority : this solution has the advantage of ensuring political support for the process and guaranteeing leadership over the other departments. But a hierarchic approach to the change should be avoided as it disconnects the decision-making sphere from the realities of the staff at work ;
- create an **innovation or digital department** : the advantage is to procure a clearly identified department. However, this division must find its place in the organisation and ensure its interaction with the other departments to achieve a cross-disciplinary approach ;

- attach digital technology to the **economic development department** : private sector stakeholders, traditional or digital, will thereby be automatically involved, and the link assured between public authority and private sector. The internal transformation project could, however, be less well guided in this configuration.

Whatever the option chosen, **the digital transformation must not remain in the hands of a single local government department**. Political steering must also be conceived far upstream, to ensure each initiative is driven and validated by the elected representatives, in consistency with local policy as a whole. Similarly, the facilitation of the change process (informing and gathering contributions from staff) is necessary to elicit the uptake by everyone of the digital transformation project.

## Dematerialise local administrative procedures

The dematerialisation of administrative procedures is one of the promising aspects of digital solutions for public action, from e-administration to e-government. This is the internal facet of e-governance (**Part B, 4<sup>th</sup> domain**), which can improve the way local government works.

The dematerialisation of procedures leads to gains in efficiency for the local authority which can take several forms.

- **Increased revenue** : extension of the tax base in informal neighbourhoods that are now inventoried thanks to digital technology ; improved rate of tax and invoice collection thanks to online follow-up, etc.
- **Cost reduction** : savings in paper, fuel, online archiving, etc.
- **Avoided expenses** : reduction in loss and error rates and processing times, reduction in human cost through the optimising of tasks, reduced corruption, etc.

The overall aim is to improve administrative file processing time and quality. Whether for registry procedures, the monitoring of public calls for tender, paying taxes, automatic licence registration, the challenge is to gain in speed, reduce errors and be more transparent. This implies a change in the habits and procedures of the departments, hence the importance of supporting the public officers in this approach, right from the start and throughout the process. Defining simple impact and monitoring indicators could serve as an incentive to gain acceptance.

## SUGGESTION BOX



### Driving internal organisational change

- Organise a creative day-long "sprint" that engages staff who volunteer to work as a "start-up" and submit digital solutions to be tested within the municipality.
- Devote a small budget to having service providers develop services (applications, software) to test solutions that improve daily work practices.
- Organise themed work groups (human resources, administrative procedures, land ownership, housing, planning, etc.) to arrange in a hierarchy the transformation actions to be undertaken.
- Put in place a shared internal server to open municipal or local data to personnel.
- Promote the use of digital applications for internal exchanges, meetings (collaborative platform, internal chat software, forum for sharing business line information, etc.).
- Promote the use of digital applications for project management tools and budget programming.
- Encourage people to join social networks and online groups, and define common digital communication rules for officers.
- Symbolically reward the departments who improved in performance or efficiency thanks to the use of ICT.
- Invite entrepreneurs, start-ups or universities to present their innovative methods and the possibilities afforded by digitalization.

## SUGGESTION BOX



### Prerequisites and first steps of administrative dematerialisation

- Installation of the same software on the computers in the different departments.
- Conversion of paper files to digital format, storage in databases and computer archives, electronic document management, backups on the cloud (internally or on remote servers).
- Use of the same institutional email system to communicate.
- Computerisation of manual operations (entering reports, file saving, etc.)
- Use of an intranet, social networks or collaborative applications for internal or external communications.
- Sharing of a server and peripheral devices (printers and scanners).
- Use of barcodes for office equipment inventory.
- Dematerialised payment of salaries.
- Dematerialised public procurement contracts for the municipality.

## INITIATIVE



## Mi Muni en Casa : online municipal services



CARTAGO, COSTA RICA

[municartago.maps.arcgis.com/home/index.html](http://municartago.maps.arcgis.com/home/index.html)

[www.mimuniencasa.com/municipalidadcartago/login.aspx](http://www.mimuniencasa.com/municipalidadcartago/login.aspx)

### An integral digital agenda combining a GIS for the administrative services and citizen dialogue platforms.

The city of Cartago implemented a digital strategy combining a GIS and an online municipal services interface. This municipal "integral digital agenda" combines two dimensions :

- the production and centralisation of data in a GIS for the municipal services : update of land registry maps, ownership databases, commercial licences, building permit, land rights, etc. ;
- the creation of platforms and interfaces for dialogue with citizens : mobile applications, web interfaces, software available online ([www.mimuniencasa.com/municipalidad-cartago/login.aspx](http://www.mimuniencasa.com/municipalidad-cartago/login.aspx)).

One of the first activities was the automation of the parking fine collection process in 2014.

A mobile application and management software were combined to centralise tickets on the site. A team dedicated to continuous system updating was created in the municipality's ICT department. The GIS was gradually completed with additional functionality for paying utility bills, real estate services, commercial leases, patents, etc.

The benefits are just as evident for users as for the municipality : time and money saved thanks to the online procedures and transactions ; increased transparency *via* online account monitoring and the issuing of digital receipts ; better detection of fraud and data manipulation in property declarations ; better knowledge of tax payers and monitoring of bad payers.

The return on investment was swift. The whole GIS programme helped increase the municipal budget by 315% between 2006 and 2015.

### Lessons learnt :

- The introduction of a multi-task GIS integrating the administrative data of several departments can be used to generate revenue for the municipality.
- The municipality of Cartago set up a team dedicated to the digital transition to monitor the implementation of the local digital agenda.

## PILLAR



## Build and share a local digital data platform

## GOAL

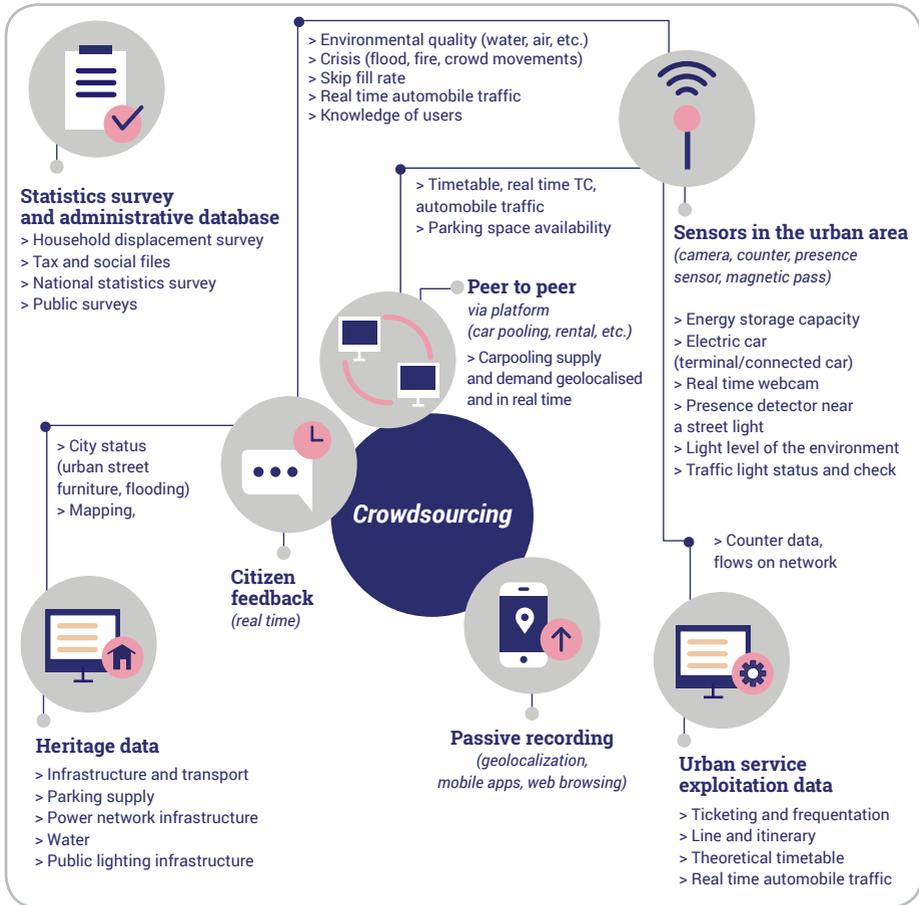
The arrival of ICT in the city multiplies the capacities to generate and store data useful to local authorities. It is up to them to engage in a policy of open data.

Local authorities also have the responsibility of contributing to the production of local data that is pertinent and open. According to OpenData France (association founded in 2013 to assemble and support French local authorities actively engaged in opening public data), emphasis should be placed especially on the following data :

- public decision-making (deliberation, attribution of subsidies to associations, public orders, etc.) ;
- civil registry (unless managed at national level) ;
- social services (childcare and schools, sports and culture, etc.) ;
- facilities (description, time table, event and frequentation) ;
- urban services : (transportation, waste, environment) ;
- planning (roads, networks, urban planning, geographic information) ;
- local events (fêtes, markets, etc.).

**In the case of developing cities, for which local authorities often lack data, recourse to crowdsourcing is an inexpensive solution for collecting additional information connected to reality.**

## URBAN DATA PRODUCTION MEANS



From Saujot and Érad, 2015.

Local authorities' databases must gradually become the central nodes of the entire digital architecture. Whether third party applications, dematerialisation of internal procedures or the sharing of data with the private innovation sector, data structuring, harmonisation and standardisation will be decisive. If a local authority aims to steer governance and uses on the basis of their territorial data, it would do well to build or consolidate its own digitised databases and define the methods for opening internally and externally.

This process should improve communication, and therefore coordination, between the authorities and the population, but also between administrations, including the higher levels of government. Exchanges with other local authorities in the country can also allow the adoption of similar procedures to be able to exchange data according to uniform formats.

## Opening the data

The data available on a territory can be either closed (paying), shared (with a limited number of users and subject to conditions), or open data. Digital data is increasingly considered common property. Opening data means offering everyone, without discrimination, data that is accessible (financially and technically) and usable (without restriction for developing new usages). Open data must be high quality and representative.

Making raw data available can enable the development of new services through the intermediary of firms who re-use them to develop digital solutions or to improve their supply of an urban service in the local territory.

**Each local authority must make a clear choice between the digital data to be shared internally among the departments and those to be made accessible externally. This is how they will design their open data strategy.**

It is therefore necessary to list, organise and “clean” the existing territorial data before sharing, that is to say building an information system that is clear, consistent, harmonious and organised. The data can be quantitative, but also qualitative in the form of videos, reports, surveys, etc. The data produced according to different sources will take different formats (in terms of time interval, geographic scale, reliability, etc.). Their cross-referencing therefore assumes a work of standardisation to reduce integration costs and avoid being held captive by a technological solution.

The databases must also be updated as often as possible, or even, if possible, geo-referenced. They must also be protected and secured. Management, in the end, comprises the integration of scattered data into a single base and cross-referencing the information. This interoperability of data that was previously scattered and incompatible, offers the possibility of a systemic vision of the city and its components, and of highlighting the black spots or creating synergies.

In the long term, opening the data supposes the creation of a team dedicated to the task within local authorities. This team shall then be responsible for the quality and integrity of the data within its remit.

**Data management will become a competence in its own right among those devolved to local authorities and municipalities must prepare for this. There are open digital tools, in particular software platforms that do not require a licence or local server, but a subscription to products that are ready to use and available online.**

## SUGGESTION BOX



## Choose and prioritize urban data to be gradually opened

- Geographic and cartographic data, urban planning documents (plans, regulations).
- Minutes of municipal council meetings and regulations.
- Data from user services (public facilities, hours of opening).
- Public procurement documents (calls for tender, results).
- Budgetary and financial data (sector, investment and operating budgets).
- City statistics, social and economic data.
- Granting of subsidies (attribution criteria, selected projects).
- State of urban and social services.

## INITIATIVE



## A working group for opening public data

MONTEVIDEO, URUGUAY



[www.montevideo.gub.uy/institucional/montevideo-abierto/datos-abiertos](http://www.montevideo.gub.uy/institucional/montevideo-abierto/datos-abiertos)

### A process for standardising geographic data and free access publishing.

In Uruguay, from the 1990s, municipal civil servants took the initiative of sharing, public topographic and cartography data free of charge. In order to formalise this process, an open data work group was launched within the municipality of Montevideo in 2010. In parallel, a national law was voted to promote the adoption of free software and open standards in the public sector.

This process relied on sets of geographic and transport data in the available formats having already been published on the Internet in open access. The conversion and standardisation of public data into open format required specific human resources.

This initiative responds to demand from the private sector identified by the municipality to support the development of applications, in particular for tourism (transport, tourist guides, mapping of recyclable bins for example).

### Lessons learnt :

- A working group constituted within the municipality prepared the process and tested an initial, free publication of some data.
- In a favourable regulatory framework, the publication of public data in open formats allows the private sector to develop applications that meet the inhabitants' needs.

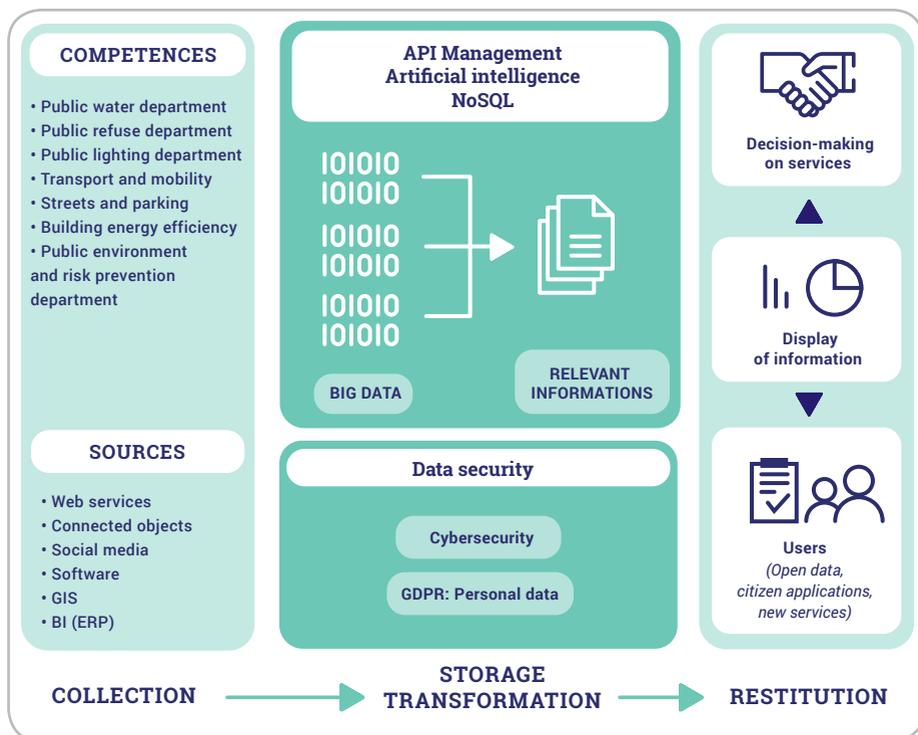
## Sharing data *via* Application Programming Interfaces

The opening of data is to make files available for the general public. They must be secured. Some of them must also be updated regularly, others in real time : it is on this basis that specialised applications can develop, such as, for example, an application with information on public transport schedules.

To be able to make this data available safely and the information remain stable, comprehensible, usable and consistent, it must offer application programming interfaces. They allow third parties to query the databases, then process them to develop applications. In that perspective, the authorities become the information supply platforms from which the start-ups develop value-added services.

Developing APIs (Application Programming Interface) pre-supposes confirmed technical skills, dedicated, and specialised teams for design and maintenance. The extra financial and human cost assumes a certain digital maturity on the local authority's part.

### URBAN DATA PLATFORM



According to OpenData France, it is up to the local territorial authorities to organise and publish the data for their area. They could do so on either :

- their own website ;
- a dedicated data publishing site (portal), developed in-house or hosted by a specialist in the domain (OpendataSoft , MGDIS, ESRI, InfoPro, etc.) ;
- a shared publishing site managed by a public stakeholder of a higher level (region or State) ;
- theme portals or collective to a territory. The authority's data could cohabit with other data from public or private sources.

## INITIATIVE



### An open data policy

RENNES, FRANCE



[data.rennesmetropole.fr/page/home/](http://data.rennesmetropole.fr/page/home/) et <http://www.handimap.org/rennes>

#### **A platform for publishing public data and incentives to promote them through digital solutions that meet the inhabitants' needs.**

Since 2010, Rennes Métropole and the municipality of Rennes have been using a web platform to publish their public data. More than two hundred data sets are available there, from local government departments of the Rennes municipality and Rennes Métropole and public or private partners of the territory (Kéolis, Citédia, TransMusicales, Les Champs Libres, etc.).

The contents of the platform include :

- real time data from the self-service bicycle hire system ;
- practical and geolocalised information concerning more than 2,000 local public and parapublic bodies ;
- all data from bus and metro network in real time thanks to collaborative work with the public transport delegatee (state of the facilities, flashcode waiting time application, location of stations) ;
- city budget ;

- perimeters of urban redevelopment areas (ZAC) ;
- localisation of polling stations.

Each data set is associated with display tools to facilitate comprehension : a 3D model belonging to Rennes Métropole was developed to allow simple representation of the territorial public databases (moves, noise management, heat island, creation of light and shade, etc.). This model is accessible on the website and made available to citizens.

In order to stimulate data use for local economic development, Rennes Métropole instigated a competition with a prize of 50,000 euros in 2010 and 2011 for developing digital services that meet the population's needs. Forty-three mobile applications and websites were created ; the winner Handimap, for example, is a web application for calculating itineraries for people with reduced mobility. The public authorities encourage here the development of digital services for the most vulnerable population groups.

#### **Lessons learnt :**

- Rennes Métropole and the municipality made data available to contribute to the development of innovative systems for the benefit of the population.
- In public procurement contracts, Rennes Métropole opted to retain ownership of the data it ordered from its service providers.

## PILLAR



## Consolidate digital technology in the staff's long term practices

## GOAL

The digital sector is particularly dynamic and changing rapidly in technology and uses. It must go hand in hand with the evolution in local government administration's missions.

Once the movement towards local authority digitalisation has been launched and consolidated, it can be monitored and integrated into the local procedures more broadly, through the :

- design of a local digital strategic plan that capitalises on the first pilot actions ;
- introduction of a process for continuous skills boosting of the municipal staff.

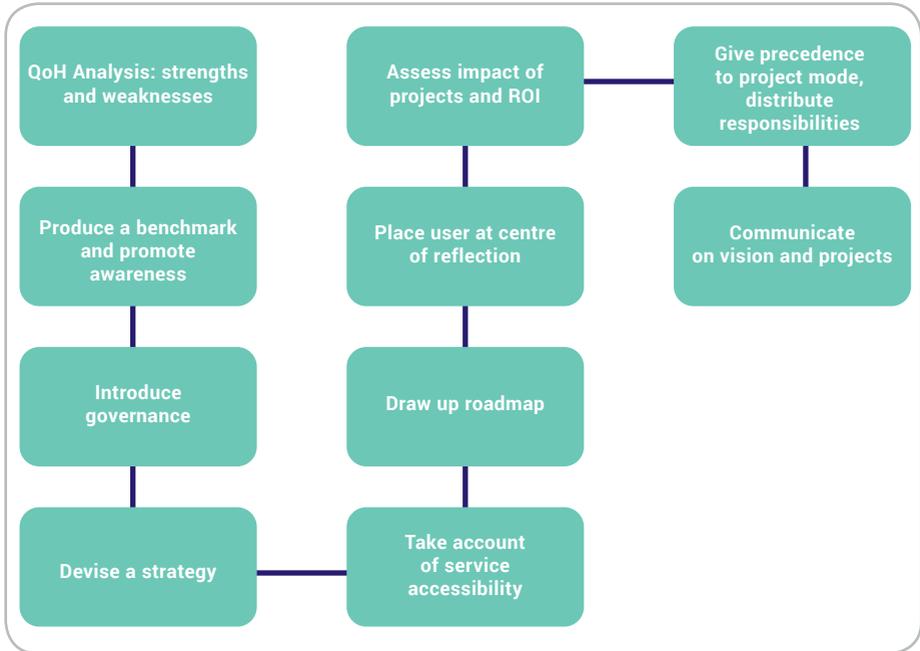
### Design a local digital plan

Once several pilot projects have been tested and evaluated, it becomes possible to derive lessons from them and prepare the design of a local digital plan.

According to feedback from experiences, this approach is more a result of than a preparation for the introduction of digital technology on a territory. It aims to spread the pilot projects on the scale of the territory following the same methodological stages as for a sector project.

It may be useful to have recourse to **smart city project management support** : service providers, specialists in the domain (consulting firms) can contribute to clearly defining the strategic project, establishing a more in-depth diagnosis of the digital maturity of territory and local authority, to master the technical and regulatory environment, discover reserves of opportunities and optimise local public action thanks to digital tools.

## SMART CITY TECHNICAL ASSISTANCE



Inspired by Assou, 2017.

Technical support can take several complementary forms to contribute an outsider's view :

- support to local decision-makers to properly understand the opportunities inherent to the digital transition ;
- legal support for managing the information and data produced by the territory ;
- advice for managing and organising the municipality faced with the digital challenge ;
- organisation of training sessions dedicated to staff and managers on the tools tested within the local authority ;
- drafting of proposals for data management modes.

## INITIATIVE



## Collaborative design of a municipal digital strategy



PARIS, FRANCE

### A digital strategy to create a participatory framework around the smart city.

In 2015 the city of Paris, along with a committee of public and private partners, implemented a digital strategy called “Smart, sustainable Paris, outlook for 2020 and beyond”. The aim is to enrich and evolve gradually with contributions from the different stakeholders. [www.paris.fr/services-et-infos-pratiques/innovation-et-recherche/ville-intelligente-et-durable](http://www.paris.fr/services-et-infos-pratiques/innovation-et-recherche/ville-intelligente-et-durable)

Digital systems, co-construction workshops, online groups of users, experts and public officers are set up to encourage citizen participation :

- Paris Idea ([idee.paris.fr](http://idee.paris.fr)) is a forum for contact between project leaders and partners ;
- *Je m’engage pour Paris* ([jemengage.paris.fr](http://jemengage.paris.fr)) lists the missions in the public interest according to geographic, thematic and tempo-

ral criteria and facilitates meetings between volunteers and associations and collectives ;

- The interactive map Carticipé ([carticipé.net/](http://carticipé.net/)) allows people to propose and vote for projects on a map of the city available online.

The creation of an independent structure dedicated to the smart city makes it possible to drive the approach in a cross-sectional manner. Composed of half a dozen staff and reporting to the “Smart and sustainable city” mission’s general secretariat, it enables project monitoring and driving, management of responses to national and European calls for projects, and organisation of new ways of working with the partners. This cross-wise structure brings together all the “innovation” contacts of the divisions, or six persons, each in charge of a theme (data, participation, mobility, architecture, energy, digital solutions and planting).

### Lessons learnt :

- Digital strategy management was embodied in the creation of a dedicated service within the municipality.
- The strategy was fuelled by the results of several coordination mechanisms with the inhabitants using digital tools.

## KEY QUESTIONS

## Building a local digital strategy



- Is the territory sufficiently mature : is there an adequate critical mass of start-ups ; is the ecosystem already properly structured ; is the level of population computer ownership and connectivity high enough ?
- Are digital skills present : are there bodies for development training ; coaches or mentors capable of providing support to entrepreneurs ; willingness on the part of public employees to make their practices evolve ?
- Are their sufficient financial means : is there a manifest interest on the part of investors ; the possibility of obtaining and distributing subsidies *via* calls for projects ?
- Is the regulatory framework stable : what is the regulatory framework for telephone service providers ; the legislation on open data ; what leeway do local authorities have for defining their rules ?
- Is there a clear vision of digital technology on the territory : is there a proper understanding of the concrete opportunities by sector ; the risks, the control measures to be put in place ?
- Are the territory's problem issues amenable to digital solutions : have the urban problems been clearly identified and listed ; is there any data on these problems which can be shared and submitted to the innovators to propose solutions ?

## Offer public servants continuous training in these new skills

The local officers must be both capable and convinced of the potential of ICT to improve their working conditions and methods. **The training of employees in the use of digital tools** is a pre-requisite that can be facilitated today *via* online tools, such as MOOCs, awareness-raising games and forums for exchanging practices. Raising the awareness of the elected representatives themselves can make a useful contribution to this general mobilisation, making them able, on the one hand, to collectively define the digital strategy and, on the other, to make sure, each in their own domain of responsibility, that it is deployed appropriately by the local government teams.

The use of digital technology for training, or e-learning, can apply to the ICT sector itself but more broadly to all domains of urban and local action. This may also be an indirect way of promoting awareness of digital technology : online training on drawing up the land registry map, crisis management or tourist strategies, can serve to highlight the potential of digital technology, to familiarise project leaders with digital tools.

Local authorities will do well to take advantage of the availability of open, free tools and software, as well as forums and online training. The dematerialisation of exchanges facilitates learning methods for the new digital tools. All these tools and digital contents allow local authorities to identify what already exists, what can be done, and the methods used by other cities to implement their digital projects. Internally and externally, online training can accelerate the boosting of local digital skills remotely and inexpensively.

## Peer learning : intercity dialogue

Still rare are those local authorities who undertake such a process alone, and it is often with incentives or support from the State, donors or foundations that the initiatives emerge. The appeal of "open government" or "open data" can stimulate exchanges between peers and offer opportunities that incite local authorities to engage in such a process.

Lastly, digital technology is also a tool that allows **exchanges of experience and the sharing of best practices**. The constitution of networks of cities for the appropriation of digital technology, their challenges and conditions, can benefit from ICT to boost these exchanges. The novelty of digital technology makes the sector particularly dynamic and at the same time unstable : experience feedback is therefore still relatively fresh. Peer exchanges are the most reliable source and the most responsive means at the present time for learning what is being done, what works or doesn't work and what can be done simply in a very concrete manner.

### INITIATIVE

#### TechTown, a European network on the issue of job creation



[urbact.eu/techtown](http://urbact.eu/techtown)

#### Intermediate cities network to create jobs thanks to digital technology.

The European URBACT programme allows eleven cities in proximity to major "hubs" to learn on the general theme of job creation. The work takes place on two scales.

- transnational meetings and activities on specific themes : how to define the digital ecosystem, how to attract and retain talent, how to support start-ups, how to fund connected spaces and premises, how to digitise the traditional industries ;
- local activities in each city from a local URBACT support group combining all the stakeholders around the local authority. Each

group has the aim of drawing up a local digital agenda on the selected theme.

To take the example of a city in the programme, Clermont-Ferrand in France, as requested by the local authority, the network made it possible to work on supporting the sound and light sector with the stakeholders :

- execution of a sector inventory from February to June 2017 ;
- co-definition of a shared vision for the future of the sector (participatory workshop on 27 June 2017) ;
- identification of actions to be co-managed by stakeholders (June 2017 to May 2018).

#### Lessons learnt :

- Peer dialogue (city to city) is a powerful vehicle for learning.
- The cities forming a network must make sure they all want to learn from each other and must find donors to fund their local and transnational activities.

## INITIATIVE



## Decentralized cooperation and participatory planning

GUEDIAWAYE, SENEGAL



[pastel.diplomatie.gouv.fr/cncdext/dyn/public/atlas/detailProjet.html?criteres.prjId=2844](http://pastel.diplomatie.gouv.fr/cncdext/dyn/public/atlas/detailProjet.html?criteres.prjId=2844)

### Taking advantage of the experience of a city in the North to introduce digital services and spaces for citizen dialogue in a municipality in the South.

Guediawaye is one of four municipalities that compose the agglomeration of Dakar. The different municipal teams launched participatory planning experiments, in particular around projects to encourage the use of digital technology (municipal websites, e-learning, micro-credits, etc.). To provide consistency in the overall development of digital technology in the city, a decentralized cooperation project emerged in 2008 involving the municipality, the agglomeration community of Castres-Mazamet and the University of Toulouse (France).

The French municipality placed its experience and know-how at the service of Guediawaye for the development of a digital plat-

form recognised as one of the major vectors of local development (economic, teaching and research).

Between 2007 and 2010, a first phase enabled the introduction of a pilot GIS for more efficient management of municipal services and the circulation of mapping for the use of decision-makers and civil society. A collaborative portal was also developed to exchange and pool initiatives of the different categories of stakeholders, make available up-to-date information matching citizens' needs, and teach them to use the tools (use perceived as unavoidable).

Two other phases were implemented over the 2010-2015 period : one for institutional capacity-building and appropriation of the tools by local stakeholders, the other, funded by AFD, for examining the possibilities of regional spin-offs.

### Lessons learnt :

- The decentralized cooperation mechanisms enabled the development of peer-to-peer learning and capacity-building of stakeholders by adapting a French solution to the needs of a Senegalese city.









# Annexes

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Glossary

Webography

Bibliography

# Glossary

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## To find your way around digital vocabulary.

**Accelerator** : A form of incubator : a structure whose purpose is to accelerate the development of firms by providing specific training and mentoring services in an intensive programme, often shorter than an incubator. It is aimed rather at firms already created and promising in the fundraising phase.

**Algorithm** : In the digital sector, a process or set of rules to be followed in data calculations or other problem-solving operations. As the memory and calculation capacity of computers is limited, their efficiency is optimised.

**API** : Application programming interface which allows software to provide services or data to another programme simply. For example, the geocoding API proposed on the data.gouv.fr website is used to convert a postal address into geographic coordinates.

**Big data** : Literally large amounts of data or mega data. The production of data in the digital world has changed scale in terms of 3 "V"s : volume, velocity (speed of real time production) and variety (multiple sources and types of data). This new paradigm imposes a change of computer tools, at the level of data capture, storage, searches, sharing, analysis and display. Big data can produce information that is often original for marketing, research, optimising business processes, sports, etc.

**Bootcamps** : Inspired by American military training camps and sometimes called "start-up weekends", these are intensive coaching and learning sessions of a few days among peers, to boost entrepreneurship projects.

**Business angels** : Providential investors : private individuals possessing successful entrepreneurial experience who invest in a young company. Their support is financial, but also includes coaching based on experience, networking and skills development. The business angel provides special support to the young firm in the design and execution of its idea.

**Chat** : Internet Relay Chat or IRC : communication protocol for texting or instant messaging online. It enables a conversation between a group of people connected on the Internet. It can be used to follow channels and discussion threads, but also to transfer files. The messages are displayed in real time.

**Civic tech** : The use of technology to strengthen democratic bonds between citizens and government and improve the political system. This encompasses any technology allowing an increase in the power of citizens on political life, or making the government more accessible, efficient and effective.

**Cloud** : Cloud computing consists in exploiting the calculation power or storage capacity of remote servers. Through the intermediary of a network, generally the Internet, the information is saved, archived or processed online directly. The servers can be delocalised, and are rented on demand or as a package deal. This process avoids having to store data locally.

**Corporate Venture Capital** : Activity which consists in funding start-ups *via* the equity of a third party. The venture capital investor provides capital to young firms.

**Coworking** : Type of organisation of work comprising two notions : a shared work space and a network of workers (community) encouraging exchanges and opening. Co working spaces are considered third places.

**Crowdsourcing** : Consists in the use of information, creativity, expertise or intelligence of a large number of people through the intermediary of a platform. From an economic approach, it may be a question of distributing a large number of tasks for the lowest cost. From a collaborative, social or altruistic approach, it is a question of making use of the specialist or volunteer networks of the general public to collect or process information.

**Data centre** : A physical site on which the equipment constituting information systems (central computer, servers, storage bays, network and telecommunication equipment, etc.) is assembled. It can be internal or external to a firm, run with the support of service providers or not. Beyond the computer equipment, it comprises elements for controlling the environment (air conditioning, fire prevention system, etc.), emergency, redundant power supply and physical safety mechanisms.

**Data mining** : Notion that covers the prospecting and exploration of raw data and the resultant extraction of knowledge. Automatic or semi-automatic methods, combining statistics, artificial intelligence and IT, are applied to databases in large quantities. The algorithms based on pre-defined criteria serve to identify and build models, structures or patterns in the raw data, and thereby extract new knowledge.

**SSE** : Social and solidarity economy

**Fab labs** : Abbreviation of "Fabrication laboratory" : place open to the public where all sorts of tools are made available, in particular machine-tools driven by computer (3D printers, laser cutting, etc.), for the design and production of objects. In the form of a company or cooperative, these premises assemble communities of computer experts, designers and artists.

**Hackathon** : Contraction of "hacker" and "marathon". Event organised over a short period where developers, designers and entrepreneurs meet around a pre-defined problem to produce, as a team, proposals for digital solutions. These are called "datathon" when the exercise focuses on databases.

**Incubators** : Support structure for business creation projects. Provide know-how, a network and logistics during the first stages of the life of the company. Incubators address companies that are very young or in the course of being incorporated.

Incubators stand out by the services they propose, whether or not they are profitable or by the type of projects they target.

Since the mid 2000s, "second generation incubators" have appeared known as accelerators, offering aid for the creation of a firm in exchange for shares in the new company.

**Intrapreneurship** : Neologism used in management, contraction of “intra” and “entrepreneurship”. It aims to allow major companies to create internal structures to innovate, to compensate for institutional inertia. It covers either a mechanism by which individuals create a new integrated organisation combining with a major company, or an approach that allows the creation of a special team of employees within the organisation by granting them autonomy and special responsibilities.

**Love money** : Refers to the capital provided by your entourage which is intended for the participatory or community funding of a project. This is the mechanism used in the tontine or crowd-funding.

**Mentoring** : Mentoring is a relation of transmission, transfer of assets, know-how and life skills between an experienced, qualified person and an other who wishes to increase their skills. It can be done informally or as part of an organised programme, and is usually long-term and a priori not remunerated. Coaching is slightly different : it is more a question of helping someone to find their own answers in a personal approach. The coach does not necessarily need to be a project expert.

**MOOC** : Massive Open Online Course.

**Massive** : addresses a very large number of potential participants, since it is intended for the general public.

**Open** : accessible to all and free (only the issuing of certificates is paid for).

**Online** : accessible online, *via* an Internet connection.

**Course** : it is a course – and not training – in the academic sense of the word.

**BCO** : Basic Community Organisation.

**SDG** : Sustainable development goals : also called global goals, these seventeen goals are a world appeal launched by the United Nations to act to eradicate poverty, protect the planet and strive for all humans to be able to live in peace and prosperity (<http://www.undp.org/content/undp/fr/home/sustainable-development-goals.html>).

**Open access** : The making available online of digital content which may itself be free or under an intellectual property regime, but open access. In theory, open access can include access to data to allow data mining.

**Open data** : Freely accessible and re-usable raw data. The practical philosophy of open data recommends free availability of a maximum amount of public data for everyone, without restriction of copyright, patents or other control mechanisms. To guarantee reuse, open data requires the information to be made available in a structured, documented way that can be easily interpreted by a machine.

The movement of opening data concerns, in the first instance, the data collected or produced by a State, a territorial assembly or a para-public body during its public service activities.

**Open innovation** : Designates, in the domains of research and development, modes of innovation founded on sharing and collaboration (between stakeholders) with stakeholders external to the organisation.

**Open source** : Applies to software whose licence respects the criteria precisely established by the Open Source Initiative (<https://opensource.org/>), that is to say the possibilities of free redistribution, access to source code and the creation of derivative works.

**Pay-as-you-go** : Payment for the service or on demand, which replaces the principle of a subscription by buying credit depending on consumption.

**Peer-learning** : Learning between peers, in this instance between local authorities.

**Prototype** : "A prototype is an original model constructed to include all the technical characteristics and performances of the new product" (OECD), on a small scale or in a pilot phase to be tested. Used in the initial phase of a project, it must make it possible to prove the pertinence and utility of a product or service before it is rolled out.

**GIS** : Geographic information system : system designed to gather, store, process, analyse, manage and display all types of spatial and geographic data.

**Start-up** : A young firm with a high potential for growth. These firms develop an idea, a product, an economic model or an innovative and ambitious technology they propose to deploy very quickly on a very large scale. They are not necessarily technology firms.

**Test-and-learn** : Iterative project management method. Consists in advancing step by step, putting in place projects underlying the global project, and measuring their impact gradually in order to continuously assess their relevance. Rapid experience feedback can correct the weak points and determine the actions to be conducted to optimise the project. The project is deployed on a large scale once all the stages and tests have been successfully completed.

**Third places** : Correspond to social environments other than home and work. These are physical spaces where individuals can meet, come together and exchange informally in response to the needs of a community present. Third places all have their own personality, depending on their location and the community that is present there. Coworking spaces are considered specific third places.

# Webography

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## **AFD, consultation numérique**

([consultation-numerique.afd.fr/pages/la-strategie-numerique](http://consultation-numerique.afd.fr/pages/la-strategie-numerique))

The consultation of the French Development Agency on the strategic challenges of digital technology for development.

## **Africa4Tech** ([africa4tech.org](http://africa4tech.org))

Network and international platform of innovators and facilitators for developing innovative solutions in Africa.

## **City Keys** ([www.citykeys-project.eu](http://www.citykeys-project.eu))

European project for defining key indicators and data collection procedures for monitoring smart solutions.

## **Digital africa** ([digital-africa.tech/fr/](http://digital-africa.tech/fr/))

AFD, BPIFrance and FrenchTech start-up competition website in 2016, network of partners.

## **Digital principles** ([digitalprinciples.org](http://digitalprinciples.org))

Guides and principles of good practices for the use of digital technology for development.

## **Digital transport for Africa** ([digitaltransport4africa.org](http://digitaltransport4africa.org))

AFD's open data platform and online collaborative and open resource centre on urban transport.

## **Open Cities Project** ([www.opencitiesproject.org](http://www.opencitiesproject.org))

Initiative for public participation and open data in Southern Asia, based on OpenStreetMap.

## **Open Contracting Partnership** ([www.open-contracting.org](http://www.open-contracting.org))

Community promoting and developing tools for public procurement contracts favouring open data.

## **Open Data France**

([www.opendatafrance.net/wp-content/uploads/2016/05/Clause-OpenData.odt](http://www.opendatafrance.net/wp-content/uploads/2016/05/Clause-OpenData.odt))

Examples of clauses to be included in public procurement for data opening and sharing.

## **Open Data Institute** ([theodi.org](http://theodi.org))

Platform for information, case studies and guides to open data.

## **Open Data Toolkit** ([opendatatoolkit.worldbank.org/fr/index.html](http://opendatatoolkit.worldbank.org/fr/index.html))

World Bank website to support decision-makers on the basics and implementation of open data.

## **Open Data for Resilience Initiative** ([opendri.org](http://opendri.org))

Guides and online classes for open and participatory mapping.

## **Open Government Partnership** ([www.opengovpartnership.org/theme/subnational](http://www.opengovpartnership.org/theme/subnational))

Platform of digital solutions for democracy, with an axis of work on the infranational level.

## **Open Knowledge Foundation** ([okfn.org](http://okfn.org))

Tools and methods for opening and managing open data.

# Bibliography

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Only works available online are mentioned here.

AdP - Villes en développement (2015), *Les villes du Sud à l'heure du numérique (Bulletin n° 98)*.

Paris : association AdP. [www.ville-developpement.org/bulletins-villes-en-developpement/bulletin-nd98-fevrier-2015-les-villes-du-sud-a-lheure-du-numerique](http://www.ville-developpement.org/bulletins-villes-en-developpement/bulletin-nd98-fevrier-2015-les-villes-du-sud-a-lheure-du-numerique)

Albarède, M., de Feraudy T., Marcou T., Saujot M. (2018), *Audacités : innover et gouverner dans la ville numérique réelle*. Paris : FING & Iddri.

[www.iddri.org/fr/publications-et-evenements/rapport/innover-et-gouverner-dans-la-ville-numerique-reelle](http://www.iddri.org/fr/publications-et-evenements/rapport/innover-et-gouverner-dans-la-ville-numerique-reelle)

AMGVF & Vivapolis (2015), *Villes intelligentes : les expériences françaises*. Paris : Association des maires de grandes villes de France et Vivapolis.

[franceurbaine.org/sites/default/files/travaux/lesvillesintelligentes\\_experiencesfrancaises\\_f\\_15nov.pdf](http://franceurbaine.org/sites/default/files/travaux/lesvillesintelligentes_experiencesfrancaises_f_15nov.pdf)

Assou, D. (2017), *Devenir une smart city. Mise en œuvre opérationnelle* (experts' file). Voiron : Territorial éditions. [issuu.com/infopro/docs/devenir-une-smart-city-mise-en-oeuvre](http://issuu.com/infopro/docs/devenir-une-smart-city-mise-en-oeuvre)

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.

[publications.iadb.org/bitstream/handle/11319/7743/The-Road-towards-Smart-Cities-Migrating-from-Traditional-City-Management-to-the-Smart-City.pdf](http://publications.iadb.org/bitstream/handle/11319/7743/The-Road-towards-Smart-Cities-Migrating-from-Traditional-City-Management-to-the-Smart-City.pdf)

Brimont, L. (2017), *Le crowdfunding, un nouvel outil des politiques territoriales de développement durable* (Issue brief No. 03/17). Paris : Iddri. [www.iddri.org/fr/publications-et-evenements/decryptage/le-crowdfunding-un-nouvel-outil-des-politiques-territoriales](http://www.iddri.org/fr/publications-et-evenements/decryptage/le-crowdfunding-un-nouvel-outil-des-politiques-territoriales)

Caisse des dépôts. (2016), *Smart city versus stupid village ?* Paris : Caisse des Dépôts.

[www.caissedesdepots.fr/fileadmin/newsletter/expertise/n4/Guide\\_SmartCities-StupidVillages.pdf](http://www.caissedesdepots.fr/fileadmin/newsletter/expertise/n4/Guide_SmartCities-StupidVillages.pdf)

Criqui, L. (2017), *Promesses et réalités des usages du numérique dans les villes en développement* (Issue brief No. 06/17). Paris : Iddri. [www.iddri.org/fr/publications-et-evenements/decryptage/promesses-et-realites-des-usages-du-numerique-dans-les-villes](http://www.iddri.org/fr/publications-et-evenements/decryptage/promesses-et-realites-des-usages-du-numerique-dans-les-villes)

Fing, Transitions<sup>2</sup> (2017) Kit *AgirLocal : Le numérique au service des démarches*

*environnementales de nos territoires, V2*. Paris : Fondation Internet Nouvelle Génération <http://fing.org/?Kit-AgirLocal-version-2>

FNAU (2017), *Villes des intelligences, territoires numériques* (dossier n° 41). Paris : Fédération nationale des agences d'urbanisme.

[www.fnau.org/wp-content/uploads/2017/06/fnau-41-villes-numeriques-def-bd1.pdf](http://www.fnau.org/wp-content/uploads/2017/06/fnau-41-villes-numeriques-def-bd1.pdf)

Institut d'aménagement et d'urbanisme – Ile de France. (2017), *De la smart city à la région intelligente* (Les Cahiers n° 17). Paris : Institut d'aménagement et d'urbanisme – Ile de France.

[www.iau-idf.fr/savoir-faire/nos-travaux/edition/de-la-smart-city-a-la-region-intelligente.html](http://www.iau-idf.fr/savoir-faire/nos-travaux/edition/de-la-smart-city-a-la-region-intelligente.html)

International Telecommunication Union (2016), *Shaping smarter and more sustainable cities. Striving for sustainable development goals* (ITU-T's Technical report). Geneva : International

Telecommunication Union. [www.itu.int/pub/T-TUT-SMARTCITY-2016-1](http://www.itu.int/pub/T-TUT-SMARTCITY-2016-1)

Nguyen, C., Bleus, H., & Van Bockhaven, J. (2017), *Le guide pratique de la Smart City*. Liège : Smart City Institute. [guidesmartcity.be/guide-cover](http://guidesmartcity.be/guide-cover)

Parme Lawyers & Tactis (2017), *Construire son smart territoire*. Paris : Fédération des industriels des réseaux d'initiative publique.  
[infranum.fr/wp-content/uploads/2018/06/Guide-SmartCity2018-INFRANUM-WEB-pages-v3.1.pdf](http://infranum.fr/wp-content/uploads/2018/06/Guide-SmartCity2018-INFRANUM-WEB-pages-v3.1.pdf)

Saujot, M., & de Feraudy, T. (2016a), *Crowdsourcing : un mode d'emploi pour les villes* (Policy brief No. 09/16). Paris : Iddri. [www.iddri.org/index.php/fr/publications-et-evenements/propositions/crowdsourcing-un-mode-demploi-pour-les-villes](http://www.iddri.org/index.php/fr/publications-et-evenements/propositions/crowdsourcing-un-mode-demploi-pour-les-villes)

Saujot, M., & de Feraudy, T. (2016b), *Le « crowdsourcing urbain » pour transformer la fabrique de la ville ?* (Issue brief No. 06/16). Paris : Iddri. [www.iddri.org/fr/publications-et-evenements/decryptage/le-crowdsourcing-urbain-pour-transformer-la-fabrique-de-la](http://www.iddri.org/fr/publications-et-evenements/decryptage/le-crowdsourcing-urbain-pour-transformer-la-fabrique-de-la)

Saujot, M., & Erard, T. (2015), *Les innovations de la ville intelligente au secours de la ville durable ? Décryptage à partir des enjeux de données* (Working paper No. 02/15). Paris : Iddri.  
[www.iddri.org/fr/publications-et-evenements/working-papers/les-innovations-de-la-ville-intelligente-au-secours-de-la](http://www.iddri.org/fr/publications-et-evenements/working-papers/les-innovations-de-la-ville-intelligente-au-secours-de-la)

Tactis (2016), *Appropriation et déploiement de la Smart City dans les villes, agglomérations et territoires français*. Paris : Observatoire Smart City.  
[www.tactis.fr/content/uploads/2017/02/tactis-observatoire-smart-city-smart-territoire-france-2016.pdf](http://www.tactis.fr/content/uploads/2017/02/tactis-observatoire-smart-city-smart-territoire-france-2016.pdf)

United Cities and Local Governments (2017), *Smart cities study : International study on the situation of ICT, innovation and Knowledge in cities*. Bilbao : United Cities and Local Governments.  
[issuu.com/uclgclgu/docs/smart\\_cities\\_2017\\_en](http://issuu.com/uclgclgu/docs/smart_cities_2017_en)

World Bank (2016), *World Development Report 2016 : Digital Dividends*. The World Bank.  
[www.worldbank.org/en/publication/wdr2016](http://www.worldbank.org/en/publication/wdr2016)

World Bank, & Humanitarian OpenStreetMap. (2014), *Open data for resilience initiative : Planning an open cities mapping project*. Washington DC : World Bank.  
[gfdrr.org/sites/gfdrr/files/publication/Planning-an-Open-Cities-Mapping-Project\\_0.pdf](http://gfdrr.org/sites/gfdrr/files/publication/Planning-an-Open-Cities-Mapping-Project_0.pdf)

**Smart Cities** ([pages.devex.com/smart-cities.html](http://pages.devex.com/smart-cities.html))

Dossier on the potential and solutions of digital technology for international urban development.

**Smart City Expo World Congress** ([www.smartcityexpo.com/en/home](http://www.smartcityexpo.com/en/home))

Website of the Smart City World Congress, with programmes, speakers and exhibitors.

**Uraia** ([www.uraia.org/fr/](http://www.uraia.org/fr/))

Exchange platform on digital tools for local public management.

**Wego** ([we-gov.org](http://we-gov.org))

Network of exchanges and ICT tools for e-government.

