

Citizen-Driven Innovation

A guidebook for city mayors and public administrators

Written in a collaboration between the World Bank
and the European Network of Living Labs



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//foreword

This guidebook aims to bring citizen-driven innovation to policy makers and change agents around the globe, by spreading good practice on open and participatory approaches as applied to digital service development in different nations, climates, cultures, and urban settings.

The effort is born of a Memorandum of Understanding for collaboration¹ between the World Bank and the European Network of Living Labs and their shared interest in applying new citizen centric methodologies for innovation.² These two organizations have pooled their resources to create this guidebook and share their broad set of experiences and know-how with city dwellers and policy makers, hoping to inspire its readers with successful case stories together with guidance on how to apply these approaches to their own contexts.

The following pages explore the concept of Smart Cities through a lens that promotes citizens as the driving force of urban innovation. Different models of Smart Cities are presented, showing how citizen-centric methods have been used to mobilize resources to respond to urban

innovation challenges in a variety of situations, objectives and governance structures. The Living Lab approach strengthens these processes as one of the leading methods for 'agile development' or the rapid prototyping of ideas, concepts, products, services and processes in a highly decentralized and user-centric manner. By adopting these approaches and promoting citizen-driven innovation, cities around the world are aiming to alleviate the demand for services, increase the quality of delivery, and promote local entrepreneurship. Citizen driven innovation, however, is best seen in action rather than on paper. This guidebook therefore mixes practical advice with concrete cases of experimentation between city administrators, citizens, and key stakeholders, as the best proof of the methodologies proposed.

The pages that follow speak to cities and citizens regardless of their geographical location.

While this guidebook is mainly targeted to city mayors and leaders, it may also be read by assistants, administrators, change makers and digital innovators in municipal administrations as well as in enterprises, universities and civil society organizations alike. The important point is that each player take the common perspective of seeing the whole picture and aiming to orchestrate all the resources a city is capable of mobilizing, with a shared goal of transforming it and its residents into at least one economically and socially prosperous corner of the Earth.

This guidebook is structured into seven main sections:

- 1 An introductory section describes the vision of a 'humanly smart' city, in order to give an idea of the kind of result that can be attained from opening up and applying citizen-driven innovation methods.
- 2 Chapter 1, 'Getting Started' helps Mayors launch co-design initiatives, exploring innovation processes founded on trust and verifying the benefits of opening up.
- 3 Chapter 2, 'Building a Strategy' identifies the key steps for building an innovation partnership and together defining a sustainable city vision and scenarios for getting there.
- 4 Chapter 3, 'Co-Designing Solutions' looks at the process of unpacking concrete problems, working creatively to address them, and following up on implementation.
- 5 Chapter 4, 'Ensuring Sustainability' describes key elements for long-term viability: evaluation and impact assessment, appropriate institutional structuring, and funding and policy support.
- 6 Chapter 5, 'Joining Forces' suggests ways to identify a unique role for participation in international networks and how to best learn from cooperation.
- 7 Finally, we provide a Starter Pack with some of the more commonly used tools and methods to support the kinds of activities described in this guidebook.

This is just the beginning of a journey,

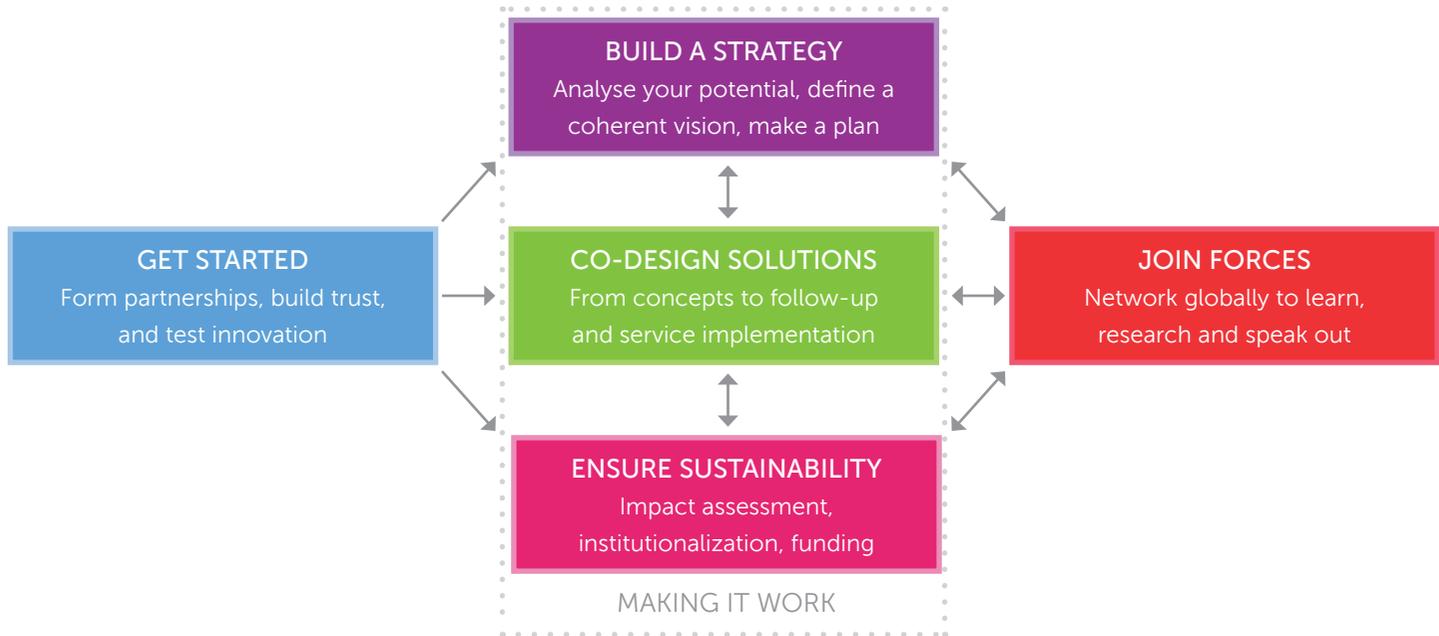
a collective journey with many paths but a common ambition, that of being able to address the challenges that cities across the globe face today. You the reader are encouraged to treat this document as an open resource and provide feedback to the authors, including your own experiences. This way a common portfolio of knowledge can be built up through a growing collection of information on the community of networks and organizations working with citizen-driven innovation and applying it in different city contexts.

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 #CitizenDrivenInnovation

//foreword



THE MAIN STEPS OF THIS GUIDEBOOK

Living Labs are “user-driven innovation environments where users and producers co-create innovation in a trusted, open ecosystem that enables business and societal innovation.”³

The European Network of Living Labs (ENoLL) was constituted through the Helsinki Manifesto of December 2006, under the Finnish EU Presidency, and legally established as an international, non-profit, independent association of Living Labs in 2010. Membership in ENoLL has grown from the original 16 Living Labs to 345⁴ members spanning six continents. ENoLL Living Labs cover a broad range of issues from rural development to health care.

The concept was originally developed as a way of more effectively carrying out research and development in ICT, bringing “users/consumers/citizens into the system of innovation, thereby leveraging on a larger mass of ideas, knowledge and experiences.”⁵ In essence, a Living Lab takes

research and development out of the laboratory and into the real world, engaging stakeholders, citizens, and end-users in the collaborative design of new services. The immediate benefits of the Living Lab approach derive from this new relationship created between people and technology: by allowing citizens to design and create their own solutions, the resulting services find faster and improved acceptance, with end users gaining a greater sense of empowerment and ownership.⁶

While originally applied in technical and industrial contexts, the Living Lab methodology has since grown and developed through a range of applications in different settings. Universities and educational institutions have adapted the method for

greater student engagement and increased relevance of curricula, linking student creativity with the surrounding community. Living Labs have also been taken up in rural community action groups, to engage citizens in the co-design of platforms and services and to further strengthen local collaboration for development. Finally, the Living Lab concept has been applied in urban and regional settings as a means to promote 'territorial innovation' to the overall benefit of enterprises and economic activities.⁷ It is in this context that Living Labs and related approaches have by now become policy tools through which local well-being can be enhanced through a constant and permanent process of multi-faceted

and citizen-driven innovation.

For further reference, a special section on the ENoLL website offers more in-depth material, allowing direct contact with the networks' members, all ready to share their experiences and insights and in turn learn from other innovation communities. In addition, ENoLL members often explore the Living Lab dynamics and methods from a research perspective, in parallel with the actual carrying out of Living Lab activities to address specific needs. Over the years a rich documentation of papers and publications has been developed, also available on the ENoLL website. //

//introduction

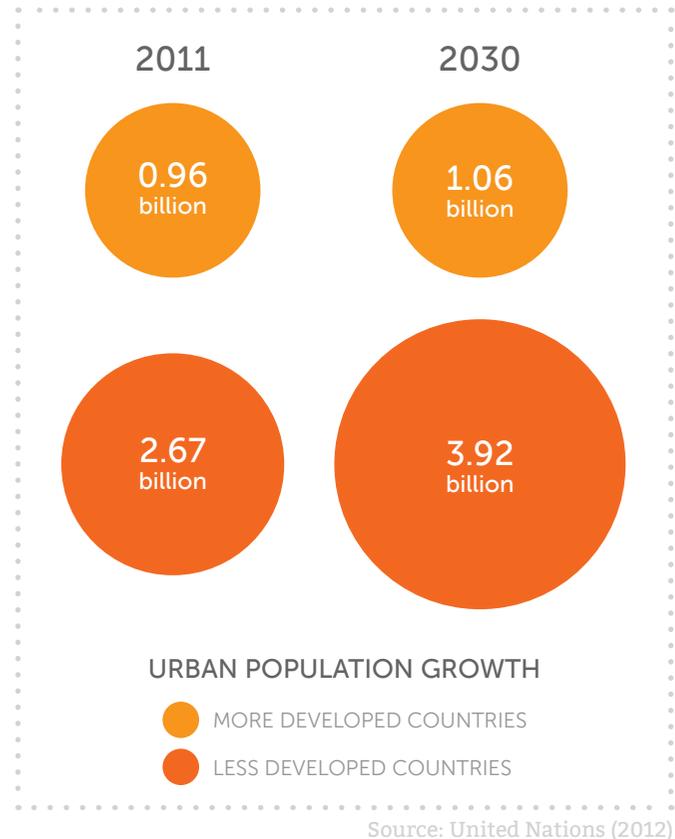
In 2009, for the first time in history, the earth's population of urban inhabitants overtook its rural population.

Between 2011 and 2050, world population is expected to increase by 2.3 billion, passing from 7.0 billion to 9.3 billion (United Nations, 2011). Population growth is also becoming largely an urban phenomenon with cities projected to gain 2.6 billion inhabitants, passing from 3.6 billion in 2011 to 6.3 billion 2050, concentrated in the developing world. Asia and Africa are expected to make up 80% of this urban growth,

with Asian urban residents projected to increase by 1.4 billion.⁸ Cities, although vibrant, exciting, and promising, face a series of challenges that require increasingly sophisticated tools and solutions, especially in a global atmosphere of increased scarcity. Indeed, it is becoming difficult for City administrations to provide even the most basic services to a good share of their populations.⁹

// THE CHALLENGE OF URBAN INNOVATION

If cities are where the problems are most acute, they also “offer a natural collaboration setting for solving societal challenges.”¹⁰ Urbanization allows for a marshalling of resources and a scaling up of services that is more difficult to accomplish in rural settings. The concentration of people creates a critical mass of diversity that in turn provides opportunities for innovation in new technologies, services and business models.¹¹ Cities are the first points of connection for foreign markets and external influences. Cities are also increasingly perceived as hubs of entrepreneurial and innovative activity.¹² The swifter spread of knowledge within dense city environments doesn’t only enable computer programs to enter the global economy, it also enables the diffusion of new ideas about equality and opportunities while giving voice to multiple actors.¹³ The challenge is how to further spur innovation in a cost effective and low risk manner, such that even the most resource constrained cities can invest in local prosperity and address core sustainability goals.



Box 1
INNOVATION

An **innovation** is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations.

Enhanced connectivity, inexpensive mobile phones, and the use of social media have radically altered citizens' behavior everywhere, and they also have the potential to deeply affect the development of municipal services. Some cities are already applying open innovation models originally developed for the business world, encouraging software developers outside of government to co-create tools and applications in collaboration with citizens and to tap into the knowledge generated in international networks. Indeed, city services can now draw on real time data collected from sensor webs or crowd-sourced from citizens, and customize content for different constituencies by language, location, and channel. This paradigm shift provides an opportunity for even the most resource-constrained municipal authorities to invest in the low-cost development of new services.

Such transformational solutions may have little to do with the way policy-makers and citizens normally think that problems can and should be solved; yet it is already possible to see the first signs of these changes happening. As this guidebook

shows, new models of citizen-driven innovation are in fact emerging to re-define city services and how they are structured and organized, increasing the quality of public service delivery while also contributing to address the global challenges.¹⁴

Shaped by approaches going under different names –social innovation, user-centered innovation, co-design, design thinking, etc. – these solutions all share a very broad view of innovation, no longer confined to new or improved products and services delivered to markets, but embracing non-technical and social aspects of innovation as well. Indeed, the main goal of a mayor may not be so much to increase the functional efficiency of specific services but more broadly to support and promote broad societal transformations that can promote a good life for citizens regardless of their income level, age or other demographic aspects.¹⁵

Box 2
OPEN INNOVATION

Henry Chesbrough [2003] states that “Open innovation is the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively. Open innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as they look to advance their technology.”



The urbanized outskirts of Dar Es Salaam, Tanzania.

Box 3
LIVING LABS FOR WICKED PROBLEMS

The concept of wicked problems was originally proposed by H.J. Rittel and M.M. Webber (1984) in the context of social planning. In solving a wicked problem, the solution of one aspect often reveals another, possibly more complex problem.

Many times there is no perfect solution for wicked problems, but there are many solutions that may “fit”. Here, approaches such as Living Labs seem specifically appropriate, allowing the exploration of situations where innovative solutions are hidden behind a complex web of stakeholders and possible solutions.

‘Wicked’ problems, such as the pollution of waterways, are often caused by complex links between the behaviors of individuals, organizations and institutions and increasingly shared by cities regardless of their geographical location. Rather than ‘technical fixes’ however, we need deep changes in the very structure and organization of our societies, starting from the patterns of our daily behavior and the way we live, work, and play. Such problems are beyond the sphere of influence of a city mayor, in that they derive from phenomena such as the unfettered competition of global markets, the demographic imbalances among countries, and the devastating effects of climate change. Nonetheless, as mentioned above, cities are well-placed to operate as laboratories for the experimentation and development of innovative technologies, services and business models with the active participation of

their citizens.

Just as there are no standard solutions to overcome the wicked problems all cities face today, there is no single best way to engage with citizens and spark off the co-design and innovation processes for a given city administration. There are, however, some common methods that have been defined over time, applying the citizen-driven innovation concept to different situations and generalizing those experiences to facilitate transfer and reciprocal learning. One of the objectives of this guidebook is in fact to extend the impact of these experiences, bringing the Living Lab approaches tested in European settings to address the urgent and severe problems in cities around the world.

Box 4
DEFINITIONS

Smart Cities: A Smart City is a city seeking to address public issues via ICT-based solutions on the basis of a multi-stakeholder, municipally based partnership.

Social innovations are “innovations that are both social in their ends and their means.”

User-centered innovation shapes designs to the user’s point of view.

Co-design goes further, by actively engaging all stakeholders on an equal footing in all phases of development.

Design thinking refers to structured processes that encourage creativity in problem solving.

// THE TRANSFORMATIVE ROLE OF TECHNOLOGY

Though following different paths and approaches in response to different contexts and needs, a common pattern can be seen in these emergent solutions: they all use Information and Communication Technologies (ICT) to do things and organize activities in a way that was previously not possible. The new paradigms in ICT – mobile communication, social media, Internet of Things and cloud computing – increasingly put the end user at the center of innovation processes, thus shifting the emphasis from technologies to people. This is the key feature of the Web 2.0 model, which explains the disruptive success of services such as Google, Wikipedia, and Facebook by the fact that they all rely on their users to create value. It is normal people and not 'experts' who generate content, give support and advice, define quality, and, to the degree that they are

Box 5 DEFINITIONS

Mobile communication entails services delivered to smartphones over the internet, with context-based services adapted to a user's profile and location.

Social media refers to on-line platforms based on communication driven by social ties (such as 'friends') defined by users.

Internet of Things refers to the interconnection of distributed networks of sensors and actuators capable of monitoring and controlling specific phenomena in real time.

Cloud computing is based on services that store and process information on the internet and deliver those services through a range of front-end devices.



Technology is not only promising unprecedented levels of efficiency, but it is also the key driver of new forms of participation.

“ Technology is not only promising unprecedented levels of efficiency, but it is also the key driver of new forms of participation. ”

empowered to do so, effectively co-create the service offer: the more users, the greater the value.

Technology is thus not only promising unprecedented levels of efficiency, but it is also the key driver of new forms of participation. The exponential growth of smartphones in recent years enables individuals to connect not only to almost any other individual in the world, but also to interactive services that process and analyze information on the move while customizing content to local and individual interests. The mobile phone has by now emerged as a nearly ubiquitous platform for which technology developers are designing a vast array of innovative applications and services, such that ‘app’ market places for web and mobile services (Android Market, Windows Store and Amazon Appstore) have become an integral part of the innovation infrastructure in many cities.

Similarly impressive has been the massive scale of adoption

of social media, enabling new forms of digital engagement as never seen before. Facebook surpassed one billion users worldwide in 2012,¹⁶ with over 80% now accessing via a mobile phone¹⁷ and over 800 million logging in on a daily basis.¹⁸ With the rapid emergence of its new modes of interaction – status updates, news sharing, event tracking, checking in, etc. – the social media revolution has changed the nature of communication from mass publishing to mass participation.

As governments take stock of these changes, new roles for ‘digital citizens’ are defined in a framework of open innovation. Cities encourage the ‘digital innovation community’ to listen to citizen needs and put new ideas into practice more rapidly and effectively than administration can achieve on their own. In a model dubbed Government 2.0,¹⁹ citizens, developers and city administrations form partnerships to deliver new and improved public services, enable transparency, and facilitate meaningful

performance management.

This collaboration is particularly evident in the area of Open Data, where public sector information is made openly available for developers to create innovative services. By considering information held by city administrations as a new kind of public good – and the service opportunities created of mutual benefit – new technical standards are being defined to facilitate the use and re-use of public data. This makes it easier for an

// WHAT KIND OF CITY?

Imagine then that you are the Mayor of a city somewhere in the world. Your city may be large or small, a rural town or a busy financial center, expanding or in decline; whatever your city is like, you have the right to aspire to a vision in which your citizens can live a dignified life and look to the future with optimism and trust in their government. Indeed, you may be asking: Are these new trends and technologies relevant to me and my people? If I engage with citizens and

application developed for one city to be adapted to another city and further lowers the entry barrier for innovative city services. Open Data is thus yet another example of how co-creation with citizens and local community members can reduce costs for service development while generating a wider diversity of solutions, ensuring that user needs and behaviors are accounted for in all aspects of design, before the launch of a service, product or policy.

Box 6

DEFINING STANDARDS FOR OPEN DATA SERVICES

In the EU's CitySDK project, cities and developers worked together to define common technical standards for Open Data, through which applications can access information and services from any city that adopts the common interface. Standards were defined for tourism and transport data and also for citizen reporting of city issues.

local communities and promote open innovation leveraging Information and Communication Technologies (ICT) to their fullest potential, what difference will it make? How are the real (wicked) problems we are facing going to be addressed, and what will my city look like as a result?

Let's start with one of the leading approaches that applies ICT to urban settings: the Smart City model. This

concept is based on the city-wide deployment of sophisticated technology infrastructures capable of sensing what is happening in a city in fine detail: where cars are parked, which hospital beds are empty, what the water quality in the river is, etc. ICT networks bring all that information together into an integrated overview of city processes and critical issues, while interactive control systems allow to intervene directly (re-scheduling stop lights, re-directing ambulances, etc.) to fine-tune this city-as-machine, adapting it to specific needs and circumstances.²⁰

This Smart City vision is a very technology-driven approach to understanding the way a city works. Nonetheless, it is a useful model for two main reasons: a) many of the underlying technology systems are technically mature and can potentially bring real advantages to the management of city services, and b) the integrated vision at the base of the Smart City model, where the key is not so much the single networks but the

Box 7 SMART SANTANDER

One of the Smart City vision's earlier large-scale experiments is being carried out in the Spanish city of Santander, now an ENoLL Living Lab. 12,000 sensors have been deployed to monitor environmental parameters, parking space occupancy, traffic intensity, and parks and gardens irrigation. These sensors are all connected to a city monitoring and control network and allow the development of specific applications.



Systematic end user engagement in the testing of new product ideas supports the Taiwan Living Lab's service model.

PHOTO: TAIWAN LIVING LAB, INSTITUTE FOR INFORMATION INDUSTRY (<http://iii.org.tw>)

systemic impact of interconnecting them, draws our attention to the need for a fully cross-sector perspective.

A brief look at one of the main Smart City systems – infrastructures for the distribution of electrical energy called Smart Grids – illustrates how this interactive and integrated approach can lead to significant gains. The concept here is to replace the one-way distribution networks, designed to deliver electricity from centralized power plants to individual homes and businesses, with an interactive two-way system. This new approach not only allows individuals to generate electricity as well as consume it in a technically savvy way, through meters that allow locally produced energy to enter the grid for

distribution elsewhere, but also provides a detailed and real time awareness of where energy comes from and where it's going.

On the one hand, this opens the way for an increased adoption of renewable energy sources, whose unpredictable behavior (energy production is generally reliant on the presence of sun, wind, waves, etc.) makes it difficult to plan for. On the other, a widespread distribution of affordable sensors and actuators – some installations monitor and control every appliance in a home – helps individuals, families, and local groups and communities be aware of exactly how much energy they are consuming at any given moment and why. In most such

installations, people can remotely control appliances to save consumption or to program an appliance to turn on and off as energy becomes available. In this way, a key determinant for more sustainable energy usage – individual and collective behavior – is influenced by the availability of appropriate information together with the possibility to take action.

A fully developed Smart City schema applies a similar logic to all the functional elements of a city – transportation networks, waste management, air and water quality monitoring, etc. – to allow for an integrated control of city systems, especially when such systems are linked with the different departments of a city administration that are relevant for each service. In addition, combining information provided by sensor networks with applications running on citizens' smartphones allows to personalize city services according to both what's going on in the surrounding world as well as a user's specific position, profile, and patterns of behavior.

The futuristic Smart City vision has a strong appeal, particularly in its promise of being able to control an increasingly complex world. Problems often arise during implementation, however, and this suggests that technology alone is not enough.²¹ Sophisticated and complex infrastructures and systems can have very high costs, often making roll-out a lengthy process; even if and when things go well, important components may be outdated by the time they're fully operational. While such systems appear to work well on paper or even in pilot tests, the real world is inevitably more complex, with both human and system behaviors that are impossible to fully model and predict. Continuous adjustments and fixes can make the final price tag rise far beyond original expectations, with the additional risk of 'technology lock-in' forever tying a city to a given provider's proprietary standards. Finally, complex technology systems often introduce governance mechanisms that are external to – if not in conflict with – the structure and operations of a city.

Box 8 SMART CITY MALAGA

The Malaga Living Lab is specifically focused on Smart City infrastructures for energy, deploying state-of-the-art technologies in power generation, storage, demand management, efficient lighting, electric mobility and energy efficiency in office and residential buildings. These infrastructures are integrated with smart management technologies for energy supply and demand.

“ The only way to really bring people into the process is to start with people, not the technologies, from the initial moments of conceiving and designing a technological system or a service application. ”

administration; this mismatch between the technology system's implicit structure and the real workings of city life is what most often leads to problems.

In short, the human dimension is too often missing from Smart City models.²² For all the user-centered design processes, user profiling, and context awareness, when people are considered as 'end users' and not an integral part of the system itself, they end up doing things differently than the engineers expected. The only way to really bring people into the process is to start with people, not the technologies, from the initial moments of conceiving and designing a technological system or a service application. This is what brings us back to the Living Lab and similar approaches, which were originally conceived of as research methods. Indeed the starting point is to realize that by now technologies are no longer an end-product, but rather a platform allowing a continuous process of creation, development, and modification.²³

In a similar fashion, running a city is no longer only a question of efficient administration, but has essentially become a continuous co-design process, engaging with different stakeholders and exploring new solutions together. Previously, citizens were considered as passive objects of city services: they take the bus, dump the trash, send children to school, etc. The job of the Mayor and city administration was to provide those services at a sufficient level of quality to keep people happy. Not only is this scenario no longer possible, but each of these services – transportation, waste management, education, and so forth – is changing rapidly, in part due to the impact of new technologies. Perhaps one of their most important effects has however been that, as city budgets are cut and essential services reduced or even lacking entirely, citizens demonstrate the ability to organize alternative solutions themselves, from car-pooling to caring for the disabled, up to the organization of local currencies.

// EMBRACING CITIZEN-DRIVEN INNOVATION

Just as the Living Lab movement took off when the ICT industry realized that people were inventing ways to use mobile phones better than their design teams, city Mayors have begun to realize that the best solution is to capture this citizen creativity and work together.²⁴ Urban Living Labs were thus born as public spaces within which city governments can engage citizens and steer co-design processes in the most useful way towards the development of innovative city services. In this process, hitherto unknown and unexplored resources emerge on all sides: citizens (and equally public servants spread throughout the administration) become valuable sources of first-hand knowledge about a city's problems while city rules and procedures become potential spaces for experimentation. Through collaborative processes, service co-design results from a dialogue between citizen needs and administrative

constraints, leading to solutions that are generally far more effective and cost-efficient, well received by the public because they've been designed by the public.²⁵ Many such services also involve citizens in the actual service delivery process, such as monitoring air quality, further reinforcing a new alliance with city governments that goes far beyond the sense of political belonging driven by the electoral cycle.²⁶

By fully bringing the human dimension into the Smart City model, blending social and technological innovation, a new approach thus emerges for addressing city problems.²⁷ Even more, a new vision emerges for what a city is and how its institutions work. In the traditional mindset, the main role of city governments is to manage and administer public services. In this view, the redesign and re-engineering of

Box 9 'HUMAN' ENERGY SAVING

In one experiment, school children in Helsinki started a competition between classes to see who could produce the greatest energy savings. Using smart meters, they discovered that the highest consumption came from the school kitchen, so they re-negotiated the weekly menu with the cooks.

In another initiative in the Swedish city of Malmoe, a University design team helped apartment tenants build their own smart meters using the open source Arduino platform. This led to a strong sense of ownership, resulting in users actually monitoring their consumption and acting accordingly.

Box 10 ENVIRONMENTAL MONITORING IN NICE

The ICT Usage Lab worked with citizens and the local authority in Nice to make use of portable devices equipped with the appropriate sensors and GPS localization, putting environmental monitoring in the hands of 'citizen sensors'. As pedestrians and cyclists go about their daily activities, hundreds of signals are captured in real time, providing coverage of the urban environment that is far more dynamic and complete. Citizens, happy to take care of their own device, also co-designed apps and services that use the collected data..

existing services only happens as an exception: Smart City infrastructures are something to buy and install, citizen engagement is an episodic consultation process to be called upon only when necessary, and Urban Living Labs (if they are set up at all) carry out occasional experiments of service innovation that remain marginal to the city government's main mission. Now the paradigm shift lies in the recognition that research and co-design are no longer isolated moments, but they have become the norm. The seemingly unstoppable trends towards global warming and demographic change, among others, together with the accelerating pace of change of the technologies designed to address these issues, means that the space between solving one problem and the appearance of the next has disappeared.

Over the past few years, many city governments have made significant efforts to increase the role of functions such as innovation, environment, and social services, often setting up dedicated departments and special facilities.²⁸ Yet the issues

Box 11
BEYOND DEPARTMENTAL BOUNDARIES

To continue with the example of environmental monitoring in Nice, this new service was conceived of as an experiment in an EU-funded research project, but simply and immediately produced tangible results. The barriers of traditional administrative silos have difficulty resisting to such evidence: for how long can the Environment and Procurement departments ignore these outcomes?

community, it becomes ever more evident that the impasse in city administrations needs to be urgently overcome.

Cities that see the change coming can thus make the choice of openly embracing citizen-driven innovation rather than allowing the nature and structure of government to prevent it from happening. Indeed, the biggest commitment is not technical (though it does involve technology), nor financial (though it's not free), but rather the cultural and political change required to simply let it grow.²⁹ This in turn has two important effects:

- The essential role and purpose of government shifts from managing and administering to the orchestration of open innovation processes, requiring the collaboration of a broad range of stakeholders, especially those not normally engaged in political negotiation processes.
- In order to create the conditions for the fruitful engagement of stakeholders, the nature of political trust changes, from a commitment to fulfilling promises (delivering policy objects) to a commitment to openness, transparency, inclusiveness and shared

ownership (delivering policy processes).

Once you make the shift to trusting and engaging citizens and tapping into their boundless reservoir of ideas and creativity, many policies can be seen in a new light. Upraising digital skills among citizens is a valid way to defend your community against globalization, but if citizens are actively collaborating with the city administration it also increases their ability to contribute: the same goes for empowering public servants. When digital literacy becomes an important asset in your city and a goal shared by both the public administration and its citizens, addressing key issues such as security and privacy becomes a common concern rather than a battleground for lawyers.³⁰ As a strategic goal, the human Smart City vision is thus a political objective as well as a technical one; the opportunities and choices, the risks and dangers can and should be addressed at the political level as well. For mayors, the challenge is not so much to install the latest infrastructures or adopt the newest technologies, but to take the lead in guiding a new process where the public sphere re-gains its pre-eminent role in civic life, guaranteeing an open and transparent playing field in which citizen-driven innovation processes can unfold.

Box 12 E-SERVICES IN RURAL COMMUNITIES

The Siyakhula Living Lab in Eastern Cape, South Africa, brings together academia, industry, government, and the Dwesa community to address communication needs of remote rural communities through research, development, and training. An integrated e-services platform for marginalized areas – TeleWeaver – is currently under development, to increase the usefulness of the infrastructure (deployed in schools but open to the community at large) and to make it sustainable through the creation of revenue streams associated to each e-service.

Indeed, valuable and sustainable ICT applications are more likely to develop within an environment that encourages experimentation and collaboration between technologists, entrepreneurs and development practitioners everywhere. Often, stakeholders may combine their interests in joint projects. For example, in the African continent the recent flowering of local ICT development clusters – such as the iHub and NaiLab in Kenya, the Hive CoLab and AppLab in Uganda, Activspaces in Cameroon, BantaLabs in Senegal, Kinu in Tanzania and infoDev’s mLabs in Kenya and South Africa – is helping to create new spaces for collaboration, training, application, and content development, and for the pre-incubation of firms.³¹

There is a big benefit to this open approach: anyone can do it, whatever the baseline of infrastructures and capabilities and whatever the amount of money at hand. People and not things

are at the heart of citizen-driven innovation, and there are plenty of examples of important new services developed with the simplest of devices. Recent figures show an exponential growth of internet penetration and smartphone adoption,³² yet many life-saving services have also been devised using the simple SMS.³³ Creativity is such because it makes the best of what is available, so every city and every people will have their own mix of problems and opportunities and thus find their own path to innovation.

This means that the benefits of citizen-driven innovation are equally open to different forms and sizes of cities, cities within cities, or rural areas surrounding cities. Humanly smart services, when they rely more on people and creativity than they do on expensive infrastructures, are available to small towns, urban favelas, and rural villages the same way they are to the most advanced urban areas. This allows to apply the principles of

Box 13
SOCIAL MENTORING IN RURAL AREAS

European rural policy has successfully focused on building partnerships that link neighboring municipalities with a common development strategy. This has proven fertile ground for the introduction of collaboration technologies to build on their social capital and co-design new services. Such is the case of the Living Lab Consortium Fernando de los Ríos, which promotes innovation and business start-ups for health and well-being in rural Spanish communities.

Box 14
REGENERATION IN FUNDAO

As a small municipality in the central hills of Portugal, Fundao had difficulties keeping its young and talented and attracting investments, until it launched a Social Innovation strategy in 2011. A co-working space, Fablab and Social Business Incubator were set up, together with 'Casas Oficina' in the old center. Fundao has thus positioned itself as a shared service center, attracting national and international investments for 300 highly qualified jobs and hosting 40 start-ups and 10 innovative NGOs.

citizen-driven innovation for instance to dispersed networks of small to medium sized towns. Equally, those in big cities can extend their strategies to include broad metropolitan areas, involving peripheral towns with the shared goal of re-balancing territorial development by bringing the same opportunities to all.³⁴

For city mayors and administrators with increasingly heavy responsibilities, there is another important advantage: sharing the burden. As cities grow and become ever more attractive,

expectations on the ability of public administrations to deliver services also grow. At the heart of the so-called 'democratic deficit' is the fact that most city administrations have gone beyond the tipping point and are simply unable to deliver.³⁵ On the other hand, those who are capable of re-capturing the trust of their citizens discover that they don't have to do it all alone. By engaging citizens and stakeholders in co-designing and co-producing city services, everyone participates in sharing the burden, on the condition that the public sector in turn demonstrates the willingness and capability of collaborating

“ The vision of a human and equitable Smart City is both a common vision across the globe and a special vision for your city, its resources, and its people. ”

on an equal footing. It takes some learning however, as the people in a city administration are not used to opening up their processes and sharing responsibilities, nor are citizens used to contributing actively to what is normally considered the job of their city administration. Helping all concerned learn to engage and to manage these processes is in fact one of the key objectives of this guidebook.

The vision of a human and equitable Smart City is thus both

a common vision across the globe and a special vision for your city, its resources, and its people. It is not a vision to be defined at the start and then overshadowed by the details of implementation, but must be kept at the center of every activity through a constant process of verification and validation with all concerned. Indeed, when a city's vision is based on engagement and reciprocal trust, it expresses shared, collective goals of prosperity, well-being and sustainability. //

//getting started

Chapter 1

If you are attracted by this vision of a humanly smart city built on user-driven innovation, the natural question is: how and where do I start?

Getting started is in fact the hardest part – some of the difficulties have been mentioned above – but once you’ve gone through the first steps, you’re already there. It’s like riding a bicycle: you can only learn to ride a bike by trying and

maybe falling down a few times. But once you’ve managed to successfully ride the first few meters, that’s it: it becomes a part of you for the rest of your life.

In this chapter, we suggest five steps for getting your first results:

1. Look for the invisible potential in your city
2. Build trust among stakeholders
3. Test collaboration
4. Re-think the role of technology
5. Team up with champions

If you want to benefit from citizen-driven innovation, you have to take the first step. You need to realize you can no longer do it alone, broaden your political space, ask for help from the businesses and citizens in your community, and be ready to commit to co-designing new solutions together. At the beginning, you may feel shaky, but a sincere opening up by the public administration is usually answered with such an abundance of new and exciting ideas from citizens and partner organizations that you wonder why you waited so long.

// 1. LOOK FOR THE INVISIBLE

You can start by learning to see your city and its resources with new eyes. It is normal for city governments to engage with stakeholders in consultations at all levels of policy; what is perhaps less evident is that these exchanges are strongly framed in normative patterns of confrontational dialogue. Partly for this reason, those who appear to represent business owners, workers, charities and other groups of interest have often lost touch with the real dynamics of innovation as much

Box 15 DATA AS A RESOURCE

Information is a typical example of a hidden resource, and Open Data strategies and action plans make this information freely available as a platform and a resource for the development of new city services.

Like any innovation, however, the success of an Open Data strategy very much depends on people (especially your public servants) and their ability to think and act proactively.

as you, and they have difficulty in bringing new energies to the table. In addition, the available policy instruments tend to act more on the city's economic fabric and physical capital (buildings, roads, infrastructures, etc.) and less on the creative potential of the population.³⁶ Policy options are thus determined by money available and projects to spend it on, such that the current imperative of 'doing more with less' seems to create an impossible situation.

In order to see the invisible resources behind this wall of difficulties, reflect on how you might turn that policy imperative upside down, doing 'less with more'. 'Doing less' in the sense that with citizen-driven innovation you can step back from being the sole provider of services; by relinquishing some degree of control, you can shift to a role of orchestration of partnerships that co-produce services together. 'With more' in the sense that you can now work with both traditional and 'invisible' resources ignored until now because they cost too little and elude control.

Since individual and collective creativity are the motors of innovation, you need to look at how creative your people can be, what the conditions are to make them creative, and what makes your city attractive for other creative people to come and live there. In this way, you can already think of your city as having more resources than you thought, as you evaluate

Box 16 TECH HUBS IN AFRICA

In a recent project for the Botswana Innovation Hub, the World Bank's ICT group, together with the iHub in Kenya and BongoHive in Zambia, mapped tech hubs in Africa. A rapidly expanding innovation landscape emerged, with 90 hubs identified in over 28 countries and more than half of African economies with at least one. Guidelines on improving hub/lab sustainability were also produced.

the contribution of your cultural and symbolic resources (the richness of cultural heritage, the vibrancy of cultural activity, etc.) far beyond their immediate economic value.

On the other hand, public administrations are not normally meant to be creative at all, and innovative stakeholders have probably in the past had more negative experiences than you might like to think in trying to deal with them. Many active forces are therefore hidden from your eye on purpose, due to a barrier of mistrust. This can be true for the so-called 'digital innovation community' as well, made up of fiercely independent and often young programmers wary of public administrations by faith.³⁷ Other active citizen groups and movements may have suffered the delusion of engaging in fleeting moments of opening up that have led nowhere. So seeing your city's creative potential doesn't necessarily mean being able to work with it.

Box 17 BUILDING TRUST IN MILAN

The Quarto Oggiaro district on the outskirts of Milan has been plagued by drug use and organized crime. A city-led urban re-generation program is now working with the EU's MyNeighbourhood project to turn the area's prospects around.

The MyNeighbourhood platform rebuilds a sense of belonging and identity by allowing users to participate in community activities and contribute to solve local challenges by co-creating solutions with others.

In Quarto Oggiaro, adoption of this platform has had the effect of bringing together different civic groups and building reciprocal trust.



Collaborative workshops, like this one held in Concepción, Chile, can help stakeholders co-create a shared vision for innovation hubs.

PHOTO: DIANA DEL OLMO / WORLD BANK

// 2. BUILD TRUST

The next important step is in fact to build (or re-build) trust between your city administration and all of your potential partners in a citizen-driven innovation strategy. It helps to first make a quick census of which groups and contacts might be the most interesting to work with. You will certainly need to connect with at least some digital innovators, and to do

this you will probably need support in scanning the web to look for groups and initiatives that are already active in your city. You should also look for some of the less vocal citizen groups, for instance by exploring a specific issue in a specific neighborhood, getting behind the newspaper headlines to see who is really doing what, since truly active citizen and

//case story

CITY LABORATORY IN MEXICO CITY



Description

The Laboratorio para la Ciudad (Laboratory for the City) is Mexico City's new experimental office for civic innovation and urban creativity, the first city government department of its kind in Latin America. The Lab is a space for rethinking, re-imagining, and reinventing the way citizens and government can work together towards a more open, more livable and more imaginative city.



Context

Since its foundation in 2013, the Lab is constantly seeking new proposals and provocations around the problems and opportunities of the city through collaborative efforts, both within government and through civil society. Mexico City is thus the creative testing ground, the space that inspires and provokes, that shapes views and roles, bursting with potential.



Challenges

Although a small office compared to most government departments, and tiny compared to the sheer size and complexity of Mexico City, the Laboratorio keeps ambitions high by relying on small-scale interventions, prototypes, soft infrastructure and social capital. The Lab's civic innovation experiments seek to improve government services and make government more open, more responsive, and more receptive to citizen participation and feedback. For this, a focused, intimate perspective can be a good way to address and shed light on complex and serious issues such as social innovation, sustainability, economic development, infrastructure, participation, public space, common good, etc. When experiments prove successful at the micro-scale, they can be adopted by the city at a larger scale either at the policy level or as citizen driven initiatives. At the same time, joint action and narratives are able to push strategic conversations across the silos of different ministries.



Actions

In all the Laboratorio's activities, government is seen as an attractor of talent, a space of opportunity, and a motor for innovation and civic entrepreneurship.

Urban creativity projects, on the other hand, offer opportunities to rethink city spaces and potential ways to inspire interaction. The main experiments to date include:

CódigoCDMX (Code for Mexico City);

HackCDMX, Mexico City's first Data Festival;

Open Government Program; DataLab (Laboratorio de Datos), the government online data platform;

Proposal City, a channel to share citizens' ideas for the city;

Maker City (Ciudad de Hacedores), encouraging Mexico City's makers;

Urban Artifact, an urban observation tool.



Results

In a year and a half of activity, more than 40 events have been held, ranging from conferences to workshops, creating spaces for dialogue. In HackCDMX 500 participants produced 52 web and smartphone apps using public datasets in less than 45 hours. With CódigoCDMX, six civic hackers worked during nine months, each with a specific city ministry, to develop an app that would offer a solution to citizens' everyday problems. One API created by our fellows was accessed more than 4 million times in less than 5 months.



Impacts

Overall, the Laboratorio's Open Government strategy is swiftly gaining ground. Laboratorio para la Ciudad has created the foundations for citizen-driven innovation projects to become part of city life, and offer new tools in urban spaces. These foundations will eventually allow projects to grow on their own and invite other people to profit from available data to rethink the city.



Scaling Up

With 'open government' as one of its main goals, all the Laboratorio's work and data are open to anyone; participation in the constellation of labs around the world allows to constantly share experiences and learn, in a tight relationship with other cities such as Buenos Aires.

innovation communities tend to coalesce around concrete problems to be solved.

Before reaching out to these new stakeholders, try to see the situation from their perspective: Do they want to interact with the city government? Are they being offered the support they really need? How can they be convinced that their commitment is not just being used for political visibility? Keep in mind that a) you need them as much as if not more than they need you and b) they may not be interested in what you think you have to offer them (power, money, or fame). What they are definitely looking for is a different type of practice and behavior from a public administration, one that is open to being engaged with – open to listen and open to change – and not necessarily one that has all the answers. What kind of signals can you send out to communicate that this is indeed the case?

A good starting point is to think in terms of reciprocity: you'll need to trust them as much as they trust you. Do you want to organize an event to get to know new actors? Show your

Box 18 ROLES IN COLLABORATIVE GROUPS

Actors play different roles but in most communities of practice you will find examples of the following: Leaders provide guidance and management, aligning with the strategic goals; Sponsors nurture relationships between actors and the community; Facilitators help the leaders to energize the community, Coordinators maintain, plan and tidy up the practical work within the community; and subject-matter Experts share their deep knowledge of the theme or topic.

Box 19 CO-CREATING AN INNOVATION HUB IN GRAN CONCEPCIÓN

In order to imagine, discover, and define a city-wide innovation hub in Concepción, Chile, the World Bank ICT Group and the Government of Chile invited 30 individuals to a three-day workshop based on co-creation techniques. In this process, the team articulated a shared vision of the future hub - from its linkages with community stakeholders to potential business plans - and identified concrete actions for making it a reality. The workshop was driven by the participants, guided by world-class facilitators and speakers sharing their experiences of operating hubs as orchestrators of effective user-driven, collaborative innovation ecosystems in their respective cities.

respect for them by using a participatory form of engagement: BarCamp, Open Space, and similar methods as discussed in the Starter Pack; you may be surprised at how effective they can be. Show you are really listening by asking to be listened to in turn; be open and honest about the kinds of problems the public administration is facing (not just “we don’t have the money”) in relation to the issues raised by your new stakeholders. Identify what can be done to better meet their needs by thinking creatively yourself.

Think also about roles and responsibilities as well as the expected contributions from different actors in your innovation partnerships. These mini-communities have their own social structures that require cultivation in order to change and grow - and sometimes even to finish the job on time. It is important

to agree on a clear definition of roles, as confusion about who does what is a common source of tension and conflict, often leading to misunderstandings and unsuccessful outcomes. These problems can derive from a lack of communication –

// 3. TEST COLLABORATION

After opening up to build trust, the only way to really test it is to work together to address a concrete problem, and for this it's important to define the issue to work on. Forget for a moment the problems you think should be addressed and try to get your stakeholders to identify something that will have meaning for them. Focus on something that is concretely possible to achieve with existing resources, in the short term. What kinds of problems can be identified that are best tackled through new forms of collaboration, especially by making use of simple technologies that are already in place?

For your first initiatives the purpose is not so much to actually solve the problem, as it is to see how the problem can be explored in new ways, with new ideas generated by processes that give value to the contributions of each and every participant. As you identify problems and possible projects

people who think they're saying the same thing when they aren't – a lack of clarity in expectations on what is to be done, or a redundancy of competencies in an over-crowded team.³⁸

together, make sure you also identify the conflicts and barriers that you yourself can do something about, namely those raised by the nature and operational structure of your public administration.

The best way to build trust is in fact to show that you are ready to act, opening up the city government and making even uncomfortable procedural changes where necessary to facilitate a solution. Indeed, the main goal of these first co-design experiments is to demonstrate reciprocally that a new way of collaborating is possible, that this can be done without big investments, and that concrete benefits can be demonstrated in the short term. Once you have carried out a micro-project full cycle, everyone will be sure that all parties can be trusted to do their part.

//case story

CITIZEN INNOVATION IN CORNELLA



Description

Citilab167³⁹ is a center for social and digital innovation in Cornellá de Llobregat, Barcelona. It is a mix between a training and research center and an incubator for business and social initiatives. It sees itself as a center for civic innovation, using the Internet as a way of innovating in a more collaborative manner, integrating citizens in the core process.



Context

The Citilab vision starts with the community networks of the 1990s, including Cornellanet and BCNet in Barcelona as well as similar efforts in Cleveland, Ottawa, and Amsterdam. Citilab takes the next step of shifting the emphasis from universal access to innovation, considering Citilab as a center for community and individual innovation literacy.

The governance model is based on a non-profit foundation: the first time in Spain for an innovation foundation set up by a municipality. The President is the Mayor of Cornellá, while Board Members include representatives from local companies as well as multinationals, the Catalunya Region, the University, and local civic leaders.



Challenges

The main challenge of Citilab has been to introduce an innovation culture in the normal life of citizens, not an easy task. The basic approach of Citilab is learning to innovate: "What do you want to do?" is the question Citilab asks every newcomer. Their experience then takes shape through a personal and team-driven project, as a dynamic work-in-progress learning path. In this model, a key role is played by the "local innovation agent". This actor brings together academic contributions, knowledge of new technologies, and a special insight to help extract innovation requirements from citizens. Public authorities and companies provide resources but also ask questions: they are equally invited to participate in discovering their own needs and setting up their own projects in their own organizations.



Actions

The first step for creating Citilab was to find a place, which the City identified in a restored textile factory. This was ideal for its symbolic value: if in the '90s the factory was the center of civic life, now it is the laboratory: in fact, people identify Citilab with the building.

With the physical and digital infrastructures in place, the organization of activities started in November 2007, launching projects with two social groups: SeniorLab (helping the elderly to develop their own innovations using IT) and Edutec (helping kids open up to computational thinking: Scratch, Arduino, etc.). Over time, the model has been extended to other social groups, such as the Social Media Lab: Musiclab with local musicians, Sportic, with young football teams and GameAcademy with dropouts ("turning your hobby into your profession") or the LaborLab, a laboratory for inventing new forms of work using ICT: "Don't look for a job, invent your own project."



Results

Step by step Citilab is introducing innovation to City Hall and also to local companies. Citilab currently has 7,000 registered users (they are issued a card like public libraries), which is over 6% of the population of Cornellá. The Citilab foundation works with an annual budget of 1.2 Million Euros (50% local government and 50% projects and services) and employs 25 professionals.



Impacts

The first and most significant impact derives from the concept that any citizen can develop their own innovation project; it doesn't matter who you are, you have a place and you can learn to innovate. A broader impact of Citilab has been the application of this methodology for citizen engagement. The Citilab experience has been instrumental for introducing the citizen-driven innovation methodology in the City of Barcelona, that in 2012 launched the Barcelona Laboratori project, exploring how an entire city can become a city lab.



Scaling Up

Over the years, Citilab has strengthened and extended its laboratory model, cited as best practice in the EU's Guide to Social Innovation. SeniorLab is now collaborating with other cities through EU Grundvig funding, while the Edutec is extending its scope to mobile applications, working with primary and secondary schools. The Spanish government is extending the Citilab concept in a program with Medialab Prado of Laboratorios Ciudadanos, with a stronger element of social innovation. Finally, Citilab participates in international exchange not only through ENoLL but also coordinating the CYTED research project, with a network of citizen laboratories in Brazil and elsewhere in Latin America.

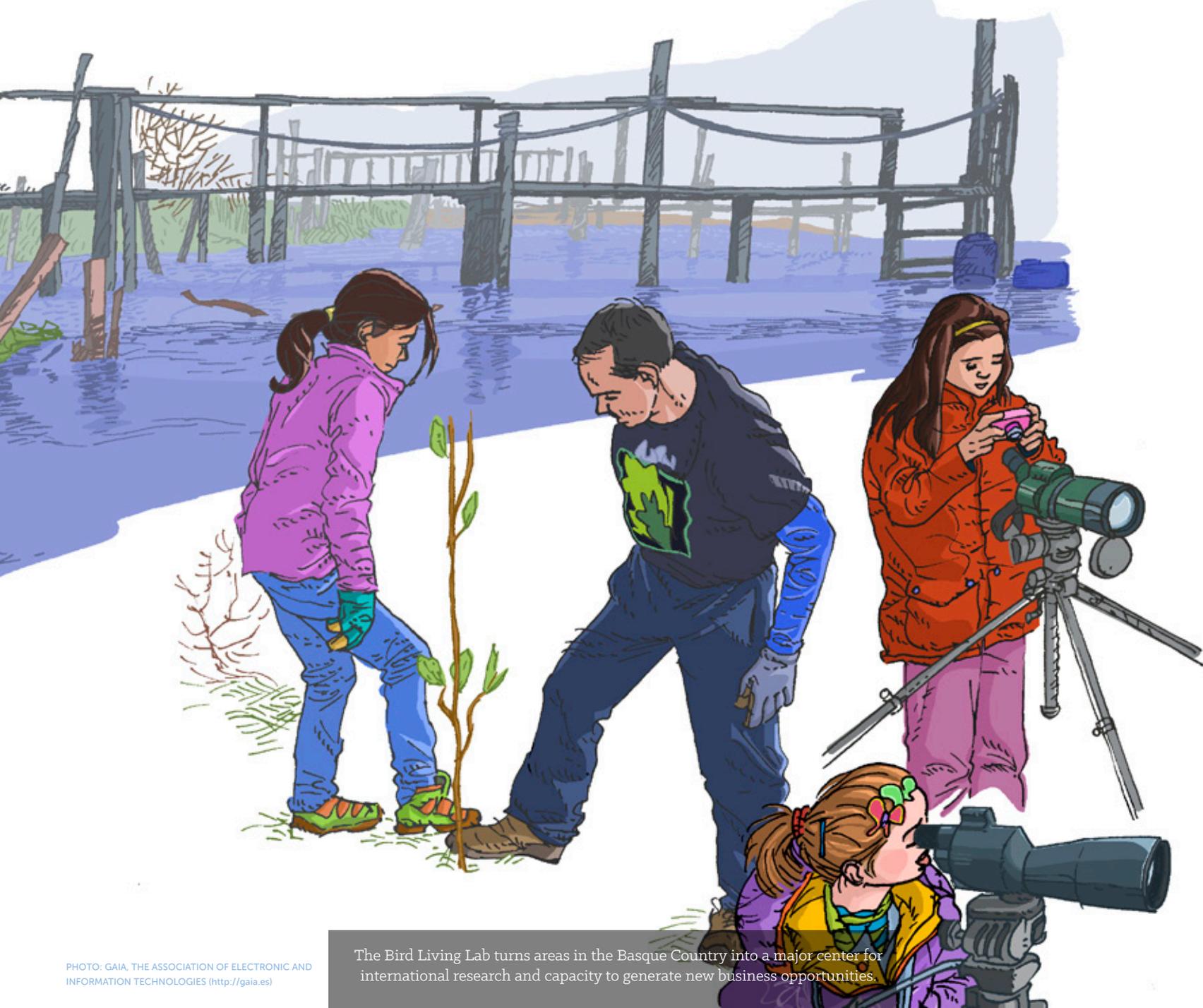


PHOTO: GAIA, THE ASSOCIATION OF ELECTRONIC AND INFORMATION TECHNOLOGIES (<http://gaia.es>)

The Bird Living Lab turns areas in the Basque Country into a major center for international research and capacity to generate new business opportunities.

// 4. RE-THINK TECHNOLOGY

As you get involved in co-design methods, you will probably discover a few things about technology that are useful to reflect upon for a moment. We are all used to thinking of ICT as tools that exist because they are useful, in that they make processes more efficient and reliable. It used to be that in order to design an ICT application, a specific functional purpose was defined (e.g. accounting, transport networks, etc.) and the solution was developed and delivered. More recently, however, technologies have evolved to do a lot of things that are not directly 'useful': play games, chat with friends, and organize events. These new technologies mix and blend with the 'useful' ones – you can simulate city planning, chat about government policy or organize a business meeting – so it becomes impossible to identify where efficiency ends and enjoyment begins; this ultimately leads to an inseparable integration between the technology systems and human social interaction.

There are some important consequences of these new developments. First, as technology systems interconnect and gain complexity, there can no longer be experts with a total control of any given system. Some may have an expert's grasp of network protocols, while some may have a better understanding of how to get re-tweeted, but the integrated world of ICT has become too complex and too pervasive for a total comprehension of all its aspects. The corollary of this is that, from the very moment someone knows how to make a phone call or send an SMS, they can be considered as an expert of ICT from at least one perspective. This means that the only way to really influence technology processes is to get all these types of expertise together, ranging from the specialists to common people.

Second, despite appearances, it is no longer possible to 'buy' an isolated ICT system; in truth, we at best add more

Box 20 APPS4DUMMIES

The Apps4Dummies interactive workshop format is designed around the EU Citadel... on the Move project platform, which allows non-expert users to convert and publish Open Data. City officials who bring an Excel file filled according to a standard template are paired with local software developers to explore the platform together and generate an app that visualizes the converted dataset. This allows civil servants from different offices to build alliances with the local development community and actively participate in the Open Data process.

Box 21 SERVICE FEEDBACK VIA SMS

Citizens receiving health care in the Nasarawa province of Nigeria can provide feedback on services received using SMS. The MyVoice system in fact sends interview questions by voice and allows for simple Yes or No answers via keypad or more complex answer via SMS. The anonymized results are then collated and reports made available to supervisors and funders through an online dashboard.

//case story

TERRITORIAL SPECIALIZATION IN THE BASQUE COUNTRY



Description

The Urdaiba Bird Center complex (UBC) is a technical and research hub located in the heart of the Urdaiba Biosphere Reserve, a particularly important point along major bird migratory paths. The Center takes advantage of this unique setting for the collaborative design and testing of ICT solutions related to bird ringing and tracking, as well as hybridization projects that apply the results to other fields. The 'cluster+' collaborative model for this leading edge multidisciplinary research was formally launched as Bird Living Lab⁴⁰ in spring 2011.



Context

Due to its special environmental features, the Biosphere Reserve is an area with significant limits on the options for defining a development strategy. The Bird Living Lab turns these constraints into strengths, by making the area a major center for international research as well as the capacity to generate new business opportunities.

This has been made possible by the collaboration of key stakeholders in a process of 'entrepreneurial discovery'.⁴¹

The public administration (Biscay Provincial Council and the Basque Government) providing institutional and financial support.

The business fabric (through the GAIA Cluster+ model) guaranteeing positive externalities for companies with technology transfer and business development.

The innovation system (Aranzadi) guiding research in biological and environmental sciences and managing the Center.

The communities of users (mainly of a scientific and technological nature), linking the Center to European and international thematic networks.



Challenges

In the ever more globalised context, regions and territories need to identify their specific contribution to global innovation systems in order to maintain a path of sustainable development.

The Bird Living Lab is on the one hand nearly impossible to replicate, yet on the other constitutes a model for discovering a territory's specific potential for creating wealth and employment based on the positive interaction of the economic, social, and environmental dimensions.



Actions

All aspects of the Bird Living Lab model link the focused specialization of its core research with broader global systems:

In economic terms, the technical and research solutions applied to monitoring Urdaiba's unique biodiversity, create externalities in fields such as logistics, security, aerospace, etc.

In social terms, the Center not only attracts international talent, but also generates new activities based on tourism, education and environmental education and training.

In environmental terms, the Center is contributing to ensure the maintenance of the natural character, landscape, ecology and biodiversity of the Urdaiba Reserve.



Results

Results include devices for bird ringing and tracking that combine technological and ICT solutions in the field of biology, also applicable to other activities where traceability and monitoring are key, such as security, defense, logistics and transport, aerospace, tourism, and health. Furthermore, given that bird migration patterns are indicators of climate change, they also support the analysis of environmental risk.



Impacts

The Center, with its multiple possible uses, also carries out related activities that maintain a strong connection between the technological R&D and both the surrounding territory and global networks. This has led to linking its frontline research in the fields of ecology, climate change and biodiversity to training and education, the development of hybrid technologies and innovation initiatives, and scientific tourism.



Scaling Up

The UBC and the Basque Country in turn form part of a global value chain regarding the possible applications of ICTs for monitoring birds which involve Innovation Centers of Excellence giving rise to technological hybridization projects with a strong commercialization potential.

or less powerful new sub-systems to the complex mesh of technology already out there. The value of what is added is in part proportional to the scope and sophistication of the new sub-system, but there is a new element that increasingly contributes to defining its value, which is the impact of its inter-connection with the pre-existing systems. In this logic, it is possible to obtain an ICT system by not paying a penny for a new technology but rather re-designing the way people and organizations interact using existing technologies (like putting a message in a bottle). If we take this anthropological definition of technology fully on board, then it becomes impossible not only to conceive of ICT without people but equally to imagine any new city initiative without an ICT component. Finally, as ICT gains value as a function of its openness and interconnectedness with systems of human organization, it assumes an increasingly political dimension. Associated with these new trends are new norms of how knowledge and information are shared, how value is created, and how power is defined and used, as discussed in the introductory section of

this guidebook. The new values of openness and collaboration that can enable citizen-driven innovation to happen in your city in fact mirror the open and interconnected nature of the new technological systems.

The more you build new partnerships to generate ideas and address problems, the more you will realize that these features of the new technologies – their inclusiveness, their interconnectedness, and their political impact – become part of the shared understanding among your stakeholders, as a common ethos emerges. ICTs play a central role in citizen-driven innovation, not so much for the power of what they do (which is sometimes astonishing) but mainly for the way they enable people to creatively work together according to open principles. If you are able to capture this new political dimension and use it to the benefit of your city and citizens, then you can reasonably consider yourself to have become an expert in ICT.

// 5. SPOT THE CHAMPIONS

As you begin to experiment with citizen-driven innovation, you will probably notice that others with a strong leadership role already work in this way, although they may not have done so until now with the city government. These ‘champions’ share this understanding of the new dimension of ICT, with an ethos of practice based on reciprocal trust that is the foundation of co-design. Some may be actual experts in the different methods and techniques of citizen engagement such as participatory co-design or design thinking, while others may simply be natural leaders who instinctively choose to work in an open and transparent way. They may be artists, business owners, volunteer care givers, software programrs, or civil servants, but they will demonstrate their interest by committing

their ideas and expertise to common endeavors, recognizing the value of the expertise of others, and opening up to your efforts to engage.

These people will be the most valuable resource for your new policies as you move forward to build on the first exciting experiences of engagement and co-creation, so make sure you show your commitment and trust to them. They won’t necessarily need a formal recognition or position, but they will require a continued commitment from you to listen and act; if you ask them what they need, they will usually tell you: often it may be simply “let us do what we’re already doing.” Whatever their profiles and specific competences, this group will form the starting core of your city’s innovation partnership. //

CHECKLIST FOR GETTING STARTED

Have you...

- Reflected on where the most creative people in your city are, where they meet, and what they do?
- Identified at least one open event of your local digital community to attend this month?
- Drawn up a short list of specific city issues you can use to test new forms of collaboration?
- Compared the apps on your smartphone’s home screen to those of others?
- Invited at least two new people from the civic and digital communities to lunch?

//building a strategy

Chapter 2

If you have applied our suggestions from the previous chapter, you will have seen that citizen-driven innovation is easier than it looks and probably more powerful than you thought.

To follow our previous metaphor, you will have learned to ride a bicycle. Among your citizens, you will probably have raised expectations and generated enthusiasm, but this initial magic is a fragile thing; transforming such energy into the daily practice

of how your city works requires careful leadership. Above all, every step needs to maintain the principles of openness and collaboration, since you will need the support of all involved to judge together when and how to move forward.

In this chapter, we suggest the key steps to define a citizen-driven innovation strategy:

1. Set the rules
2. Define a vision
3. Generate ideas
4. Define scenarios
5. Make a plan

By going beyond the first initiatives to build a solid, permanent partnership for citizen driven innovation, you will need to work on several dimensions in parallel, which we will explore in this and the following chapters. This includes:

- A coherent strategy and vision for your city
- Co-designed solutions to real problems
- A solid framework for long-term sustainability
- Networking and knowledge exchange with other cities and communities.

The first step however is to give coherence to the episodic

// 1. SET THE RULES

We have repeatedly underlined the importance of working in an open and transparent manner, ensuring mutual respect. As your core team of external and internal innovators gains different experiences, you will generally find that it is useful to translate some of these principles into an operational framework. You don't at first need to establish a department or any formalized

moments of creative collaboration you have guided so far. In your initial 'light and quick' test projects you selected problems mostly for their ability to engage stakeholders and initiate the practice of co-design; eventually you need to move towards a strategy that addresses the real problems of your city in a systematic way. This requires that you co-design a broad framework for your citizen-driven strategy together with your core innovation partnership, so that individual projects fit into a broader picture and work together towards the common vision.

structure, but you do have to agree on the common, minimum rules that each stakeholder should follow, expecting others to do the same. This way, new players who join your collaborative processes can get a clear idea of the values you share and immediately see if they are coherent with their expectations. These rules should primarily ensure openness, transparency,

inclusiveness, and shared ownership, but they can also define general principles for dealing with privacy, intellectual property rights, and other such matters.

What is most important is that these rules are taken seriously, using the partnership's own governance structure to monitor compliance. A good test is to ask an external third party to evaluate your governance principles: do they seem sincere, do they engender trust, do they encourage engagement and empowerment? Another test is to ask those who you are representing or working on behalf of: do they guarantee

// 2. DEFINE A VISION

Once you've established the rules of the game, it's a good idea to work together to define a shared vision for your humanly smart city, a vision that is specifically adapted to your city's needs, resources, and aspirations as described at the outset of this guidebook. This will not be a permanent or rigid definition, but rather a work in progress that changes and grows throughout your innovation processes, reflecting at any

transparency, do they provide for accountability and allow 'outsiders' to intervene when necessary?

Finally, while it is important to set down the rules it is equally important to make provisions for modifying and updating them on the basis of your experience in working together. Try not to focus too much on predicting and preventing possible future problems; put the emphasis rather on establishing a shared identity for your group, with reciprocal trust as the best antidote for creating problems and open and transparent mechanisms for addressing problems if and when they arise.

given moment the main points of consensus on where you want to go in the long term. Normally, a vision is encapsulated in a written statement where every word counts; that can be a useful exercise especially for the outside world, but what is important is to base that vision on a deep analysis of your city's potential and your options for action.

Box 22 VISION-BUILDING IN LEBANON

The World Bank ICT Group and the Government of Lebanon held a two-day workshop to define a vision for the country's mobile internet ecosystem. Representatives of the 'quadruple helix' (government, enterprises, academia, and civil society) came together to articulate a shared strategy, including the creation of a coordinator hub to feed on new linkages between stakeholders. The vision-building process was supported by international thought leaders sharing experiences in value creation for urban innovation ecosystems.

Box 23
TRACKING IDEAS

The Pisa Living Lab (Leaning Lab) has developed a software platform that tracks the evolution of ideas during an on-line collaborative design process, allowing the identification of authorship in a fair manner. This in turn makes it possible to establish clear rules for Intellectual Property Rights (IPR) within an open co-design partnership.

Box 24
EUROPE'S 'ICAPITAL' 2014

The City of Barcelona was awarded the European Capital of Innovation ("iCapital") prize for its vision of "Barcelona as a city of people". This policy, launched by the City Council in 2011, is based on "introducing the use of new technologies to foster economic growth and the welfare of its citizens". Barcelona Laboratori, the city's Living Lab, has helped to achieve this goal.

A well-known method of analysis is called the SWOT, which maps Strengths, Weaknesses, Opportunities and Threats in a four-sector diagram. You or others will probably have already carried out a SWOT analysis for your territory, but this time it will be different, since you will be doing it as a collective, participatory exercise. In this context, you should be able to identify new Strengths, for instance in terms of your cultural heritage or the local potential for creativity. Weaknesses may include marginalization from flows of globalization, countered by the Opportunities of the internet and citizen empowerment. Finally, the Threats may be seen to come locally, i.e. with an exodus of your youngest and brightest, or externally, i.e. with the impacts of global financial crises.

This analysis should then be coupled with an exploration of the

potential of citizen-driven innovation in relation to your city's prospects. The first participatory initiatives you have carried out will enrich your thinking with new tools, new stakeholders, and new approaches as your main Strengths. The Weaknesses could lie in the lack of a culture of cooperation or internal difficulties in the public administration. The Opportunities can mainly be found in the creative use of technologies, especially in the 'frugal' paradigm that allows for a more inclusive approach. Finally, the Threats may for instance lie in dynamics that can undermine the trust you have built up or external pressures to return to 'the old ways' of policy-making. These considerations will help you to balance the analysis of your city's context with the potential of citizen-driven innovation, in order to define a long-term vision that is both desirable and feasible.

//case story

IMPROVING LIVING CONDITIONS IN VITORIA



Description

The Habitat Living Lab⁴² is a social network ecosystem for Research & Development as well as Education. It has the purpose of developing and implementing environmental friendly technologies in collaboration with low-income communities, so as to improve the conditions of urban and rural housing in the Brazilian State of Espírito Santo.



Context

In Vitória, a city with over 300.000 people, approximately 31 thousand live in a poor area named Território do Bem. It was in this context that the NGO Associação Ateliê de Idéias was created in 2003, to generate ideas to address the lack of supply of basic human needs of housing, clean water, treatment and disposal of waste etc. The first initiative was to set up a community bank controlled by local residents, Banco Bem. This was followed by the constitution of the Fórum Bem Maior, where community leaders meet to discuss and propose solutions to their problems and demands, giving shape to a strategic plan for specific projects. Initiatives in residential construction using clean technologies such as soil-cement bricks and low cost water heating solar panels led to an agreement between the NGO and the Laboratory of Construction Materials at the Federal University of Espírito Santo, the core of the Living Lab partnership. Today, the Living Lab is coordinated by the Federal University and its partnership includes universities and research centers, the Vitória Municipality, several donor foundations, and the Portuguese energy institute.



Challenges

The Habitat Living Lab addresses challenges typical of such a bottom-up community building approach. The endemic lack of focus and tendency to act individually is overcome through information sharing, joint decisions, and engagement in active participation and collaboration.



Actions

The Habitat Living Lab is a web of actors linked by projects, divided into four types:

Development projects in the community territory (the Bank, residential construction program, etc.)

Co-design of ICT applications supporting the community initiatives

Research on construction materials and processes, renewable energy sources, solid waste disposal and ICT tools for collaboration and communication.

Dissemination of activities and results.

These projects are all carried out in a tight cooperation between residents of the Bem area and post-graduate University students from different disciplines whose engagement in the Habitats Living Lab is a formal part of their curricular activities.



Results

Since the beginning of this program more than 10,000 people in a situation of social and economic vulnerability have been helped and a total of 800 university credits awarded for work with businesses, products, and housing.

As an example of direct results, the community-led Banco Bem granted loans to 135 families over a five year period. At the broader level, the engagement of the local community in the user forums empowers citizens to define the actions to be taken in the neighborhood, with a direct impact on their prospects for the future.



Impacts

Keeping the community at the center of technology development, achieved through a mixture of environmental education and community engagement, ensures that the co-designed solutions respect local culture, rely on low-cost technologies, and promote sustainable development. The benefits for the universities involved is to steer their research in a multi-disciplinary approach to the housing issue. The innovations in architectural design and environmentally friendly and low cost construction materials have a potential impact that goes far beyond the regional boundaries.



Scaling Up

Although the Habitat Living Lab was initiated in the Bem district of Victória, it has spread to address issues common to low-income communities in both urban and rural settings throughout the State of Espírito Santo. Through the international network of ENoLL, collaborations are also being explored for specific research in areas such as solar energy.

// 3. GENERATE IDEAS

With a shared ethos of practice and a vision of what you want and think you can achieve, the next step is to explore your options. Here you are not taking decisions but opening up possibilities: sharing, learning, and discovering. Discovery should be an important step in defining your strategy but also a permanent feature of your innovation policy, so think of the processes you follow and the tools and methods you learn to use as investments for the future.

In the previous chapter, you've begun to see the importance of defining problems to address as a means of exploring new possibilities. Keep working around concrete issues and for each, ask your innovation partners what emerging technologies are coming to market, what research is being done, and what are the current trends. Together, explore the new and different

perspectives that can be brought to bear on the problem, and what new stakeholders can be brought to the table to enrich your understanding of it and the possible approaches that can be taken. When you treat issues in the abstract, i.e. 'transportation', you often lose the connection with other factors (for instance, store opening hours). When instead you start with concrete issues on the ground, the transversal dimension emerges – i.e. elementary school schedules > mothers driving to drop off their children > local air quality > health of children – and just as one problem leads to another one solution can lead to another in a systemic fashion. While this approach can make it difficult to identify definitive solutions, it is an excellent way to breed the conditions for generating ideas. Indeed, creativity prospers on this inter-connected complexity.

“ Focused idea generation is an important part of citizen-
driven innovation, in that it both addresses concrete
issues and introduces new ways of tackling them ”

Focused idea generation is thus an important part of citizen-driven innovation, in that it both addresses concrete issues and introduces new ways of addressing them. The Starter Pack at the end of this guidebook identifies specific methods such as Hackathons, Innovation Camps or Startup Weekends. These are more focused than the open forums of a BarCamp, though they generally respect similar principles: every participant is empowered to express ideas, group decisions identify the best concepts to carry forward, participants develop them in interdisciplinary groups, and so forth. In fact, the structured and

sometimes rigid formats of these methods are quite different from the consultation processes that governments normally use to engage with stakeholders. These activities thus have the double function of generating ideas and signaling that new approaches are being experimented, the administration is daring to open up and take risks, and commonly agreed procedures are being respected.

//case story

CREATIVE POTENTIALS IN BRISTOL



Description

Knowle West Media Center (KWMC)⁴³ works with the community to develop the creative, educational and social potential of people within the surrounding area. KWMC's mission is "To achieve cultural, social and economic regeneration by involving the community in media arts activity, education and action". It specializes in exploring innovative ways of engaging citizens and communities (often excluded from decision making and research) in the co-design and the testing of ideas, products and technologies, including quality film, design and media work.



Context

KWMC was formed in 2002 emerging as a charity with experience of working in a community of 20,000 people affected by unemployment and skills, health and education issues. KWest Research is Bristol City's Living Lab based at the charity and company limited by guarantee, Knowle West Media Center. Housed in the largest straw bale building in the South West, KWMC works 'locally' engaging citizens but has extensive networks with a wide range of sectors that it draws on for its projects.



Challenges

Bristol will be European Green Capital in 2015 and KWMC has worked closely with Bristol City Council and Future Cities Directorate, on the smart and green cities agenda for over ten years. The challenge is to work with citizens to co-design and explore Smart Green City innovations, addressing social justice and inequality that is evident in many developed cities in Europe.



Actions

KWMC has a wide portfolio of projects that engage citizens in exploring new technology. Media artists are brought in to create data visualization, documentation and engagement strategies. A comprehensive youth program teaches skills in media, coding and, 'making', together with an ongoing program of digital inclusion workshops. These projects are also carried out in partnership with the Universities of Bristol and Bath and businesses including Toshiba, IBM and Bristol Media. Currently under development is a Makerlab for Bristol that will teach skills and create new businesses.



Results

Specific examples of projects include:

3Ehouses a smart metering project exploring behavior change

IES Cities an open data project encouraging citizens to be super-prosumers and designers of future services.

Girls Making History a wearable technology project for young people.

Data Toolkit an open data initiative supporting arts organizations to work with young people on data projects



Impacts

The KWest Research approach reinforces the recognition that Cities need informed, creative and active citizens to successfully design a sustainable (and fairer) future. This has led to an increasingly close collaboration with Bristol City Council on a wide range of Smart Cities initiatives including a new Open Data platform and projects for Bristol2015.⁴⁴



Scaling Up

Sharing knowledge regionally and internationally is an integral part of fostering a better understanding of 'local' communities: to connect communities implies recognizing the importance of differences, similarities and synergies. Working with large companies and cities across Europe allows to share expertise and bring new insights relating to technology that can only be gathered by working in depth in communities. This practice of working locally and networking internationally is further supported by being part of the European Network of Living Labs.

// 4. DEFINE SCENARIOS

The vision building and discovery exercises described above provide a solid platform on which to return to a more sector-oriented approach, focusing on specific areas of shared interest and concern such as health care, education, or poverty. For each area, the objective here is to build a long-term, desirable scenario that describes in some detail what your city could and should look like. In doing so, think far enough ahead to get beyond the details of current debates – at least 15 years into the future – but not so far that you lose contact with the reality of the issues to face up to, in the name of a too-easy consensus; often it's useful to think in terms of the next generation, about 20 years forward.

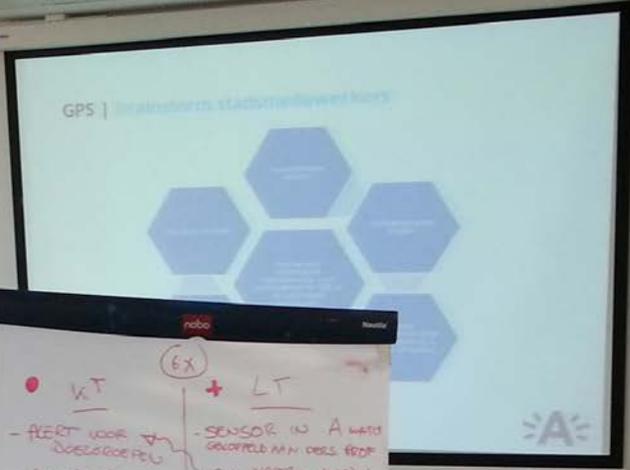
Make sure that participation goes beyond the usual set of stakeholders; for instance to discuss food distribution you might want to engage with hotel and restaurant owners, software engineers, school cafeteria managers, environmentalists, and social volunteers as much as farmers, supermarkets, and nutritionists. Each of these stakeholders may have a different approach to the issue, with different problems

but also with different ideas and potential contributions to service co-production, and it is useful to learn to see the issues from the standpoints of others.

It is thus best to develop your scenarios as multiple narratives based on different stakeholder experiences unfolding in parallel, both for the present situation and for future scenarios that can be attained using the citizen-driven approach. From there, you can identify the different kinds of transactions between actors and the reciprocal benefits gained from different value chains: some methods such as the Rainforest Canvas⁴⁵ help you to map the key components of these city ecosystems within which individual activities, businesses, and public services unfold. You can then explore the impacts and sustainability issues according to the specific service or business models for the different actors taken individually. Your scenario thus not only describes the possible workings of desirable city systems but the basic elements of sustainability. Finally, you should go back to your vision statement and see how this more detailed work feeds back into it.

Box 25 BROADENING PARTNERSHIPS

espaitec, the Science and Technology Park of Castellon (ES), created a Living Lab in 2010 to better engage with stakeholders in the surrounding community, including the Castellon City Council. Today, espaitec is leading the international association of Technology Parks in the move towards Living Lab partnerships for an "Areas of Innovation" scenario.



6X

KT + LT

- FEET WOOD → DOORLOEP
- MEETPUNTEN → RESULTEN DOORLOEP
- EFFECT BELEID TOEGANG
- GEBOUDE BELEID KRIJGEN TOEGANG
- CANTON'S CAPTION GOED GEBOUDE TOEGANG
- CONCEPT UP TO OTHER DATA RAADPLEEGEN
- SENSOR IN A WOOD GEBOUDE MAN DOES FEET
- OORAN ALBERT → MELDING
- ECOTAX OF BASIS VAN LUCHTKWALITEIT
- LICHTZUNNENDE WEGEN
- DATA GEBOUDE OM TE WEGEN OF BELEID
- WILLEN KUNNEN PROBERE LICHT VOLEI

A co-creation session to develop an interactive platform for monitoring air pollution takes place at iMinds in Belgium, a research institution and incubator designed to help innovate products and services.

//case story

CO-DESIGNING SCENARIOS IN COLOMBIA



Description

The World Bank, using funds of the Korean Trust Fund, implemented a project in the three Colombian cities of Barranquilla, Cali and Manizales, which aimed at building workable scenarios for the development of tailored technology solutions to solve urban challenges, as well as the creation of an enabling environment for Smart Cities. In particular, the objectives of the project were: (i) to modernize the e-government back-office to support a Smart City model, (ii) to develop smart applications in Colombian cities using ICT tools to increase the efficiency and effectiveness of municipal public service delivery, (iii) to create a smart applications exchange and initiate a Smart Cities network of practitioners, and (iv) to build consensus at the national level to define action lines for a national Smart Cities Strategy in Colombia.



Context

Colombia is Latin America's third largest economy and one of its champions of e-government and connectivity, with internet connections tripling to 6.2 million over the last two and a half years. The government's Plan Vive Digital sets ambitious objectives for ICT infrastructure, services, applications and contents, and adoption and use. This project is thus part of an effort to ground these investments in the effective uptake of innovation in local administrations.



Challenges

The main challenges for the promotion of an open innovation environment for Smart Cities are linked to the need to overcome cultural barriers within each of the Municipalities. Public servants are in fact used to thinking of innovation as something that happens either externally (in a private company and then sold to the public sector) or top-down (pushed by policy makers). The identification and promotion of Change Makers within the administration was achieved by engagement in co-design and scenario-building activities.



Actions

A series of co-design activities were carried out, all with the purpose of engaging public servants, exploring new ways to address problems, and opening minds to innovation. The main initiatives carried out included:

Smart government road map: analyzing existing IT infrastructures to define path towards Smart City scenarios.

Co-design technology solutions: mixing civil society organizations, local universities, software developer communities, public officials, and sector specialists to co-design solutions to urban challenges.

Crowdsourcing solutions to urban challenges: a Hackathon carried out simultaneously in the three cities to build local innovation communities.

Urban Innovation Lab: providing a sustainable institutional structure for citizen-driven innovation.

Access to International Networks: through initiatives such as the World Bank's CitySense event in Barcelona.



Results

Among the more emblematic outcomes is Co-crea Colombia, the networked hackathon. More than 200 entrepreneurs and university students participated and proposed 45 ICT solutions to overcome their city's development challenges. The nine finalist teams went through a 2-month mentoring, and the winning team traveled to London to visit the UK's innovation ecosystem and strengthen its entrepreneurial skills. For designing the Urban Innovation Lab, experts from the European Network of Living Labs were brought in to discuss best practices with Colombian city and national government officials in a customized training course "City as a Laboratory. Training Program on Open Innovation in Cities". The city managers thus were able to exchange first-hand the results and benefits of the program with others.



Impacts

The greatest impacts involved a change of mindsets by (i) raising awareness among mayors and city leaders on how ICTs can shape scenarios for delivering better services to citizens; (ii) building capacity among city officials in leveraging existing ICTs to improve the quality of life in their city; and (iii) showing the benefits of engaging with the local ecosystem (i.e. academia, private sector, civil society).



Scaling Up

Thanks to this project, upstream activities have been triggered and ongoing discussions with the Colombian ICT Ministry are taking place to scale up this support to cities nationwide. In addition, at the end of 2013, the ICT Ministry launched a National Smart Cities Strategy for Colombia⁴⁶ aimed at improving citizens' quality of life by harnessing ICTs.

// 5. MAKE A PLAN

By piecing together the different scenarios you have developed in the framework of the broad vision you defined at the outset of your process, you and your partnership can get an overall view of how your strategy can best be operationalized. It is unlikely that you will have the human or financial resources to do everything, so you will have to select priorities to focus on. A first criterion for selection is systemic impact: which actions are likely to have more transversal effects, bringing benefits to the greatest number of stakeholders?

An equally important criterion, however, is short-term feasibility. Ironically, long-term scenarios are often the best way to help you see what needs to be done tomorrow. In fact, they help build consensus on problems that do have a solution and that can be addressed by working together, being creative, and maximising the opportunities offered by new technologies and your local strengths. You can start by identifying the main barriers present in the detailed scenarios you have defined, especially those that are common to more than one issue or

area. From there, ask which of those barriers depend most on a lack of openness, collaboration, innovation? Which are most subject to a paradigm shift if new technologies are brought to bear? Which possible solutions have the greatest 'acupunctural' potential, in the sense that they could trigger innovation dynamics in other areas for other problems?

Once you have a set of such problems defined and developed, you are ready to get to work. On the basis of the resources and reciprocal availability of all of your stakeholders, you can draw up a short to medium term plan that identifies specific projects, roles and goals for each, and how they contribute to the broader vision. //

CHECKLIST FOR BUILDING A STRATEGY

Have you...



Compared the principles and rules of different collaborative and fair trade groups on the web?



Reviewed a 'traditional' SWOT analysis for your city, transforming weaknesses into strengths?



Scanned the web for results of idea generation events (try GovJams) relevant to your city?



Written future narratives from the standpoint of an entrepreneur, a bus driver, and a mother?



Made sure that different types of groups have all expressed their goals, objectives, and contributions to your action plan?

//co-designing solutions

Chapter 3

In order to carry out the agreed plan, the individual projects that have been defined need to each be carried out following the same principles of citizen-driven innovation that have underpinned the broader strategy-defining process.

The difference here is that the goal is to arrive at the definition of new public services that are actually implemented and that make a real difference to your city. This does not mean that the time has come to thank your participatory innovation

partnership and revert to traditional administrative processes. On the contrary, only if you adopt new ways that guarantee openness and participation throughout will the final service have an effective uptake and impact.

In this chapter, we discuss the operational steps to co-design a new city service:

1. Unpack the problem
2. Co-design service concepts
3. Follow up on creativity
4. Pace development
5. Go official

// 1. UNPACK THE PROBLEM

For each of the projects in your work plan, you first need to clearly define the participating stakeholders and reinforce their commitment, so that each of you knows whom to count on to accompany you throughout the co-design process. That established, the next step is to explore the problem you are addressing, with particular attention to ways you can transform problems into opportunities. How can the big problems be broken down into manageable but real issues that can make a measureable step forwards? As you develop the dynamics surrounding the problem, the following questions arise: who is involved, what internal organizational issues are part of the problem, how much does it have to do with interfacing, sharing knowledge, or communicating with others? Look to see not only the main processes involved, but also the views of others who may be more indirectly affected by this problem. Then look to see how systemic benefits could occur by successfully addressing the problem: How might benefits to one actor lead to processes benefitting others? Who has to gain, what, and

how much? As you develop this line of thinking, you may begin to see that addressing this problem could begin to spark off positive effects in other areas.

Next, work on identifying the resources – both material and immaterial – that can be brought to bear on the problem. In so doing, you will probably find that there are initiatives or programs or departments already set up or funded, framed in traditional ways of action, that could instead be steered in the direction of contributing to solve the problem in the framework of citizen-driven innovation. You may have a budget line assigned or even a contract awarded, with a clear indication of what to do but not how to do it. Check to see if these initiatives could be brought together and implemented in a co-creative framework. In the previous chapter, you will also have identified other actors potentially interested and with a potential benefit from addressing the problem: do they also have resources – employees, equipment, meeting rooms – that could be pooled together? This exercise has two important impacts: first, by

//case story

FOCUS ON LIGHTING IN AGUEDA



Description

The Lighting Living Lab (LLL)⁴⁷ is located in Agueda, a rural city of 50,000 inhabitants where some 70% of the Portuguese lighting industry is based. In a tight collaboration with the city government, which also constitutes the main testing environment, it addresses Smart Lighting and Eco-friendly Lighting, including ICT based services for monitoring and control, and gives birth to new services, systems, products and business opportunities.



Context

The LLL originated in a city-driven initiative to network innovative companies in the region and improve their competitive potential. The project also identified regional problems and needs such as high energy consumption and costs, and the city decided to test the proposed state of the art lighting systems on one of its main streets. The benefits became immediately apparent, so the program was extended in a systematic manner to the whole city context, engaging citizens and the community together with the industrial association to explore the social and behaviour implications of the new technologies and co-design new solutions. The LLL maintains the same formal structure of association as created in the original project.



Challenges

The main challenge is to engage both the industry and the community in co-designing the paradigm shift from lighting seen as a mere utility (supporting human activity with sufficient illumination) to lighting seen as a public service, enhancing the sense of well-being in urban environments and contributing to define the appearance of buildings and spaces.



Actions

Following the first installation, which primarily demonstrated the benefits of adopting LED technology in one of the earlier large-scale installations, other aspects of public lighting and energy have been addressed in an incremental fashion. This first step was to integrate remote monitoring and management, through a wireless network and software capable of sensing the status of individual lights and intervening according to specific criteria. This was followed by the installation of photovoltaic panels to produce the energy for the lighting but also for the City Hall, schools, and other public structures. Each of these steps has constituted the opportunity for innovation processes using the collaboration between the City administration, the industrial association, and local citizens and businesses to identify concrete needs and co-design new and effective solutions.



Results

As an example, one of the many pilot projects carried out in LLL has led to an annual savings of over 7,000kW of energy, with a savings of 3,2 tons of CO2 emissions. The results for the local industry are evident in a range of new products, services and applications that have resulted from the collaboration.



Impacts

The pilot projects in the City of Agueda lead to costs savings and reduced environmental impact as well as increased service quality to citizens. The visibility and results of the installations also have an important cultural impact on citizens in terms of environmental awareness. More broadly, this Living Lab builds on the specific industrial vocation of the territory and the engagement of its citizens to promote a broad yet focused concept of innovation, as an exemplary case of the paradigm shift required to meet the challenges of public services in general. In this way, a small rural city has rejuvenated its industrial potential and positioned itself at the forefront of territorial innovation.



Scaling Up

The lessons learned from the Agueda experience are providing a valuable contribution to the design of Portuguese regional innovation strategies, as evidence of the benefits of the Living Lab approach based on specific local innovation potentials. Through the ENoLL network, similar initiatives for citizen engagement in urban illumination programs have also occurred, for instance in the Italian Trento Province for the town of Campodenno.⁴⁸

looking at existing resources, programs and departments with a new eye you will see that feasibility is within closer reach than you originally thought; second, by pooling resources among public and private actors for a shared purpose, you are contributing to re-building a civic culture of the common good.

Now that you have identified stakeholders to engage and resources that can be brought to bear, focus in again on the problem definition to see how you can bring technology

// 2. CO-DESIGN SERVICE CONCEPTS

To move towards more formally constructed co-design procedures, you should define the key actors to lead and own the process (it doesn't necessarily have to be the city government), and the timeframe for the design phase. You then need to select one or more methods, for instance open, on-line 'challenges' where you define a problem and allow self-forming groups to propose several service concepts or structured, intensive, face-to-face co-design formats such as a

into the picture in simple (or complex) ways, for instance by opening up relevant datasets, co-designing apps, engaging citizen groups using crowdsourcing tools, etc. to co-design some micro-scenarios for new services. For each of these, who needs to be doing what, and what innovative roles can be played by using the technologies at hand? Having defined these aspects, it is likely that you will together reach the definition of one or more co-design processes that can be initiated, knowing the who, the what, and the why.

weekend jam or hackathon. Whatever your method, you need to be sure before you start that you are ready to follow up with the necessary commitments: the resources need to be real, innovative administrative procedures required to support the new ideas will have to be carried out, and results and benefits will need to be measured.

One of the most important steps you can probably take is to make the data held in your administration publicly

Box 26 SHARED DIGITAL SERVICES

The Haaga-Helia Living Lab designs new mobile and cloud-based solutions, by getting small organizations, companies and citizens to work together. The new advanced technologies and cloud-based platforms make it possible to create shared digital services in a more cost effective way.

“ One of the most important steps you can probably take is to make the data held in your administration publicly available according to the Open Data paradigm. ”

available, according to the Open Data paradigm. Most public administrations severely underestimate the hidden potential of the information they capture, generate, and manage, allowing the politics of information-as-power to hinder steps towards transparency. As the technology platforms for publishing and accessing Open Data become more widespread and easy to use, and as the evidence of innovative services spreads, it is clear that a city's Open Data policy is an increasingly important enabler of citizen-driven innovation and one of the key commitments your administration should be making.⁴⁹

All of these commitments need to be clearly stated from the outset, as they are the necessary pre-conditions for the effective engagement needed to make citizen-driven co-

design work. Once you have made your commitments from the public side, you have a right to expect similar commitments from the private side – for instance from the business community – if that has been identified as key for the success of the innovation path. As you move towards the actual process or event, it is equally important that you take additional steps to ensure open governance and fairness, listening to and supporting the participation of the weaker actors with motivation and empowerment to avoid that the co-design and co-decision process is not high-jacked by the stronger players. Remember, only by ensuring open and fair participation will the full creative potential of your territory emerge to address the problem at hand.

//case story

SERVICE MONITORING IN MAPUTO



Description

The MOPA Service Monitoring System is designed to engage citizens in helping the city administration monitor the quality of service delivery, especially when contracted to third parties. In the case of Maputo, an experimental platform is being tested in the area of solid waste management.



Context

Maputo is Mozambique's capital and largest city, with a population of over 1.2 million inhabitants. The City of Maputo faces challenges providing adequate public services, especially in its low-income peri-urban neighborhoods.



Challenges

The Maputo Municipal Council (CMM) has worked to expand and improve solid waste management (SWM) services with the support of the World Bank and several bilateral donors. Quality and coverage, however, continue to lag behind expectations; in part due to CMM's difficulty in monitoring service delivery by contracted SWM firms.



Actions

Through a 2014 Innovation Grant, the World Bank developed the beta-version of Ntxuva,⁵⁰ a software platform that provides visualizations and statistics from citizen-provided information about urban services. The platform is designed to collect information from citizens via SMS, mobile app, and Web Portal; a voice interface in local languages is foreseen to enhance access by less educated, poorer populations.



Results

Ntxuva will be piloted in early 2015. Reports tailored to stakeholder needs and preferences will be provided to municipal service managers and governing officials, to firms providing SWM services, and to citizens and civil society organizations. Scale-up and roll-out are planned for 2015-16.



Impacts

To overcome entry barriers for often marginalized and under-served peri-urban populations, Ntxuva will manage information from both designated citizen-monitors and spontaneous crowd-sourced reports. The project also promotes engagement among the local software development/innovation community including firms, universities, and independent hackers/programmers.



Scaling Up

All service related information is publicly available through an Open Data API compliant with Open311 - a widely known standard for citizen reporting used in more than 60 US and European cities. Ntxuva is based on existent Open Source solutions (Mark-a-Spot, a Drupal distribution for Open311 as well as VoIP Drupal for SMS integration) and its source code is publicly available via Github.

// 3. FOLLOW UP ON CREATIVITY

Whether you have chosen to organize a one-weekend event or hold a three-month crowdsourcing challenge (or both), the process you have initiated does not stop there: follow-up is key to ensuring that the full benefits are actually reaped. Indeed, the purpose of these co-design formats is to give focus and visibility to the process, but what happens afterward is as important as the preparation of what happens before. A valid service idea or functional sketch of an app gives participants the awareness that solutions can indeed be found, but there is still a long path to transform a good idea into an effective city service. Above all, by committing your city and its administration to innovate and support citizen-driven co-design processes, you have accumulated a significant capital of trust. If you cannot keep your promises following the most co-creative phase of the process, the broken expectations will

be extremely difficult to recover.

The key to effective follow-up is to guarantee real political and organizational commitment to the co-design process you have initiated. Give visibility and support to the process, the results, and the champions of the process on the city web site, through press conferences and other institutional communication. Be ready to reply flexibly to possible needs for relatively small amounts of short-term funding required for instance to build a prototype to test. Provide public spaces or meeting and working facilities for the co-design groups to follow up on their work. Alert the relevant city departments of the possible need to open up data or define procedures for new service concepts and organize the required interaction.

Box 27 THE ESPOO STORY

The City of Espoo (FI) uses a broad participatory process to define the Espoo Story – history, present and future i.e. the strategy in a nutshell – formally adopted by the City Council. The challenges identified are addressed in all city activities across services and implemented in development projects in collaboration within the city but also with citizens, companies and other partner organizations.



Co-designing services and solutions is often a hands-on, creative and collaborative process, such as this innovation hub co-creation exercise held in Beirut, Lebanon.

//case story

INNOVATING CITY HALL IN AMSTERDAM



Description

The City of Amsterdam launched a new Chief Technology Office in 2014, as a transversal, internal city department that fosters and accelerates innovation both within and outside of city hall. To achieve this end, the CTO office maintains a rich network outside of the city administration with innovation agencies and start up accelerators, as well as universities and industry leaders.



Context

The City of Amsterdam, with its population of over 800,000 inhabitants, strives to be one of the leading innovation hubs in Europe. The establishment of the CTO office is thus in line with a long-standing policy of design-based innovation for sustainable lifestyles. The CTO Office is governed by the city's Chief Technology Officer, Ger Baron, and is empowered to operate across city sectors and divisions, reporting directly to the General Secretary. The CTO Office collaborates with the CSO (Chief Scientific Officer) and CIO (Chief Innovation Officer) to provide a coherent framework for city wide innovation schemes, jointly advising the different clusters dealing with e.g. social and economic matters within the city administration.



Challenges

The main trigger for establishing the CTO office is the need for transformation within the city hall. This is in part related to budget cuts but more importantly it aims to revalidate and rejuvenate urban services as well as launch new services that reflect both the needs of citizens and those of the city hall. This challenge is addressed through an approach called 'interfacing', through which the city opens up to citizens, asking them to contribute to the design of a 'future-proof' city. This happens through crowdsourcing campaigns⁵¹ and offline meetings⁵² but also by interactive policy workshops such as the THINK Bike Lab.



Actions

Open Innovation, social innovation, interactive policy making and ICT driven innovation are the CTO office's main actions. The starting workplan aims to address the following key themes:

Mobility: to stimulate multi modular traffic (there's congestion also for bikers!),

Balanced city development: how to spread tourism and de-stress busy areas

Sustainability (circular economy): how to expand the use of electric cars

Government as 'lead user' of enabling technologies

Innovative procurement

In addition, the CTO office is currently supporting the launch of a large scale Tech Start Up Hub.



Results

The main expected result, beyond the contribution to the city's overall innovation policy, is an increase in 'innovation literacy' among civil servants. This will allow the city hall to adopt a more agile approach to implementing innovation, using service design and rapid prototyping methods, and enable the administration to better address complex urban problems.



Impacts

The CTO Office has the necessary operational freedom to support innovation actions within the city hall. This does not mean that it operates in isolation; to the contrary, it plays the role of active initiator of a City Innovator's Network, where Open Data and innovation minded colleagues can meet up and share knowledge.



Scaling Up

The CTO office has just been launched in 2014 with a starting staff of 5 employees, planned to expand to 17 (on a project basis) by end 2015. In addition, it has a hot desking office to share knowledge and open up to both city servants as well as the outside world. External and internal staff can thus join the CTO office's project workgroups as needed.

// 4. PACE DEVELOPMENT

As the service concept develops, define together intermediate results that can constitute appropriate moments for dissemination, evaluation, and sharing developments with a broader audience, maximizing the value of the process as you go along. Make sure you recognize and award creativity and clarify ownership issues in due time; here you have to be careful of balancing young developers' rights with the collective interest, making sure the ethical principles of openness and fairness originally agreed upon are met.

Even on the basis of an intermediate result such as a working prototype, it is possible to imagine business and service models. This includes exploring revenue streams and market roles for the different actors both public and private and the governance issues that might arise, perhaps with a need to re-define the rules of the game or identify new players to engage.

// 5. GO OFFICIAL

As your project evolves, you will be able to look into the future and plan future steps with greater clarity. It is important to set agreed objectives and milestones so that you can have checkpoints where together you can assess progress with

Your concept idea can in fact be a good opportunity to attract the attention of a telecoms service provider or a local utility, expanding the partnership and the resource base on which to work. Exploring these issues will in turn help you to identify how to handle issues of ownership and exploitation rights, by thinking about the long-term sustainability of the new service.

In parallel, it is likely that full scale implementation will also require changes in structures and procedures internal to the administration related to data management, process accountability, etc. Here you need to broaden your co-design partnership to include the relevant departments and work together to explore new approaches. Your administration may not be used to it, but the contamination with citizen-driven partnerships can lead to positive long-term effects sparking off innovation processes of their own.

respect to the original objective and carry out any necessary changes of direction or partnership. It is important to have a view of when to expect different levels of maturity, so that people can focus their expectations and have a better

understanding of the role and value of intermediate results.

At some point, especially as regards the internal administration procedures, you need to 'go official' and make the adoption of the new city service a formal part of the city protocol. This will probably require specific acts of the Mayor's office or the City Council, but it is also a good opportunity to give full public visibility not only to the new service but also to the citizen-driven process that has designed and developed it. It is also an appropriate moment to relate this achievement with the broader vision and strategy for citizen-driven innovation.

Of course going official doesn't at all mean that you've finished; it is only an important milestone in service development.

Adequate planning, if it is sufficiently open and flexible, allows you to pace the next steps of the co-design process over the longer term, maintaining the multi-stakeholder partnership and consolidating the capital of trust and engagement. These aspects will be fundamental to guarantee the long-term sustainability of the new city service, since citizen-driven innovation needs to become not just an episode of co-design but an integral part of a new way of running your city. //

CHECKLIST FOR CO-DESIGNING SOLUTIONS

Have you...



Discovered at least one already funded initiative that can gain a new direction through co-design?



Opened up at least five datasets from different departments to support the co-design process?



Held a press conference with your innovation partnership to show results and commit to follow up?



Identified the appropriate administrative departments to involve in service implementation?



Issued the necessary directives to incorporate the new service in the city's standard procedures?

//ensuring sustainability

Chapter 4

While the sustainability of individual projects and city services is an integral part of a sound co-design process as illustrated above, it is equally important to think of the broader sustainability of your citizen-driven innovation partnership.

This will not only ensure the long-term success of individual projects and continuity over time of the benefits of engagement, but it also provides the foundation to make innovation a widely shared practice throughout your city. In order to attain this, you need to think about sustainability from

different points of view, in particular from the institutional, social, and economic standpoints, listen to those who consider each aspect to be most relevant, and work together to build a viable strategy.

In this chapter, we discuss three key issues for ensuring the sustainability of your citizen-driven innovation partnership:

1. Demonstrate impact
2. Structure appropriately
3. Ensure financial and policy support

// 1. DEMONSTRATE IMPACT

One of the most overlooked aspects of sustainability is the ability to demonstrate in measurable terms the success of your method and its results, both externally to the outside world as well as internally, to yourself and your innovation partnership. The previous phases we have discussed are all characterized by iterative processes, which continuously require validation of previous outcomes, reflection on possible impacts, re-definition or re-focus of objectives, and sometimes a broadening of objectives and partnerships. All of these aspects require some sort of evaluation or structured understanding of the co-design processes and the results produced, together with an assessment of their ultimate impact on the city systems you are trying to change.

Impact assessment can be a tricky issue because it is easy to underestimate its complexity, reducing it to a set of simplified indicators – jobs created, money saved – through which to measure success. Though these goals are important, different evaluation stances also need to be taken into account. The

most common one is that of a funding or monitoring body mainly interested in proving that money has been spent on the right projects (ex-post result evaluation). There are however also those directly involved in a project's execution who will want to know if their work is progressing well and if improvements can be made along the way (process evaluation). Finally, there are other stakeholders with a direct interest in the positive outcome of an initiative: businesses, citizens, and associations (impact assessment). These different perspectives, typical for any program evaluation, become all the more important when adopting a participatory co-design approach with greater stakeholder engagement and a greater emphasis on policy processes.

A robust multi-stakeholder evaluation strategy starts from the identification of the different actors directly or indirectly affected by the project and, for each, examines what specific goals they have, criteria of success for progress towards those goals, and visible or measureable changes that can be

Box 28

MEASURING INNOVATION

The European Union has devised an Innovation Union Scoreboard (IUS) for measuring innovation in European regions. The Basque Country in collaboration with Innobasque and Sinnergiak Social Innovation, has in addition proposed RESINDEX, which complements the IUS with indicators more closely related to citizen-driven innovation.

//case story

COMMUNITY MAPPING IN TANDALE



Description

The World Bank funded a successful community mapping initiative in Tandale in August-September 2011, on the basis of a similar initiative in Nairobi's Kibera slum. Community mapping aims to empower inhabitants of informal settlements to gain a sense of place and citizenship and express their problems using maps and story-telling platforms. The process relies on using location based mobile services together with a community mapping technology such as OpenStreetMap, and thus involves community engagement and training.



Context

Tandale is an informal settlement on the outskirts of Dar Es Salaam, covering an area of 90 hectares with a population of 71,250. Due to difficulties such as access, only three or four of the main roads crossing the settlement appear on official maps; this naturally has a significant impact not only on the delivery of city services, but also on the identity of the people living there. The community mapping initiative, designed to address this issue, was funded by the Bank but carried out in partnership with GroundTruth (the NGO creators of Map Kibera), Twaweza (a local NGO for citizen advocacy), and the local Ardhi University's urban planning department.



Challenges

The main challenges in such an initiative are related to the typical issues of working in such a disadvantaged context: insufficient equipment (from printers to meeting facilities) and technological illiteracy in the population. In addition, partnership building needs not only to bring together the necessary resources but also connect with the local community; for this, particular attention was paid to a 'buddy' system to pair the University students – seen as 'outsiders' – with grassroots community leaders.



Actions

The community mapping process started with a training program involving 25 students and 18 community members. Groups were then formed to cover different areas, and a first site reconnaissance carried out, followed by the phase of actual data collection, tracing paths and signaling important landmarks, with the final phase editing and uploading the data. The mapping process was paralleled by a more 'human' mapping of the area, with story-telling, blogging, photos and videos.



Results

As a result of this effort, the Tandale community now has a detailed map. The map shows paths and significant buildings, and includes information such as the location of sanitary facilities, public water points, health care services, and places of worship, but also hair dressing salons, coffee shops, musical libraries, and various shops and kiosks.



Impacts

The project also includes a community blog, through which citizens build on the mapping experience to identify issues, propose, and discuss solutions. The aim is to allow the recognized authority and other development stakeholders to engage more actively with the community, for instance by potentially integrating feedback into the World Bank's Dar Es Salaam Metropolitan Development Project.



Scaling Up

The community mapping project in Tandale is an example of a new approach to development problem-solving that taps the promise of ubiquitous and cheap technology, open source tools, social networks, and the wisdom of local and global experts and innovators. The project's training curriculum, available on-line, can be used for future iterations and extension to other districts of Dar Es Salaam and beyond. More broadly, the OpenStreet-Map community overall is gaining in scale and scope in both developed and developing countries, allowing for future development and extension of community mapping methodologies.

considered as evidence of that progress. For instance, for a project addressing public transportation, a business association might have as a goal the ability of employees to get to work on time, while a citizens' group may prioritize the comfort of seating; both would be interested in the cost of the ticket. A multi-stakeholder evaluation strategy takes these and other criteria into account and highlights the degree to which different goals are being met within the framework of the overall project objectives.

For innovation processes, evaluation not only looks at final outcomes, but starts with an ex-ante or context analysis of the existing situation. This helps define baseline indicators, or the starting values of the things the project intends to improve. It also aims to identify the dynamics of the systems that constitute the landscape within which the project intends

to act. As the project progresses through the different phases outlined in previous chapters, process evaluation comes into play. This monitors the interaction between stakeholders and the nature and quality of co-creation processes that occur, and generally helps promote learning among stakeholders by throwing light on certain dynamics they may not have been aware of. It also helps support self-governance of innovation processes as they progress, by highlighting potentials for conflict and opportunities for resolution. In addition, process evaluation's observational stance is often able to identify emergent or unexpected elements of creativity that the stakeholders directly involved might overlook. By mixing the different ex-ante, process, and outcome approaches, a well-structured evaluation strategy can be fundamental in assessing the potential impact of a specific project.

// 2. STRUCTURE APPROPRIATELY

You may have noticed that in the previous sections we continually stressed the importance of open partnerships, stakeholder engagement, and the role of champions. These ingredients initially flourish in an open and unstructured environment, based on loose connections between pre-existing organizations that are usually capable of managing the first activities on behalf of the broader partnership. At some point however, the need usually emerges to give that specific partnership its own institutional structure. Understanding when is the right moment to take this step and the nature of the structure to provide – its level of autonomy, governance structure, openness, etc. – is critical to the success of your citizen-driven innovation strategy.

We cannot tell you exactly the right moment to act or the right structure to adopt, but we can highlight some of the issues to be taken into consideration when the question arises. Be aware of the special nature of more or less spontaneous, 'self-organized' partnerships that can have very fragile dynamics. As a city Mayor or administrator, you are used requiring some kind of institutional form in order to be able to act on any initiative. All too often, however, creative networks can collapse as

they move towards a legal structure which inevitably leads to drawing boundaries, distinguishing the financial resources of potential associates, and so forth.

We therefore suggest you adopt a gradual approach towards institutionalization. A first step can be to create an open partnership that may require no legal form at all, using instead a simple multi-stakeholder Memorandum of Understanding. Signatories can jointly commit to collaboration with the aim of co-designing innovative city services, adhering to a set of ethical principles such as the rules you defined in the early stages of your partnership building process. Individual projects requiring the management of financial resources can be carried out with specific agreements among the contracting parties.

Box 29 THE ART OF THE MOU

Several European projects, notably the CentraLab project and its Budapest Manifesto, have specifically addressed different ways of designing Memoranda of Understanding for Living Lab innovation partnerships, based on the exploration and experimentation of different governance models.

//case story

CITY INNOVATION AGENCY IN HELSINKI



Description

Forum Virium Helsinki (FVH)⁵⁴ is an innovation unit within the Helsinki City organization playing a key role in implementing Helsinki's Smart and Open City strategy. The mission of FVH is defined as follows: "FVH is an innovator and an initiator of new kind of cooperation between companies, public sector organizations and citizens. The aim is to create internationally competitive services that are based on the real needs of users."



Context

In early 2006, Forum Virium Helsinki (FVH) was established by ten ICT companies to boost innovation and digital business development through public-private-collaboration. The concept was then taken up by the City of Helsinki, where it was seen as a novel approach to develop more user-driven (and cost-effective) services for the citizens.⁵⁵

Forum Virium Helsinki Ltd is a subsidiary (limited company) owned by the City of Helsinki. FVH's official partners are its five anchor companies, five other partner companies and six public sector partners, including the Ministry of Transport and Communications, the Innovation Funding Agency for Tekes and VTT Technical Research Center.



Challenges

There is a strong need today for cities to find new efficient ways to support technology management, innovations, and novel sources for growth through open innovation mechanisms, especially in the interface of public, private and citizen collaboration. By going beyond the realm of a city's own experts and traditional partners, the goal is to harness the innovative capabilities of the entire urban community. More specifically, cities are looking at the Smart City concept as a source of new solutions, advancing the open engagement of citizens and the broader city community, pioneering open data and transparency of city governance, and promoting agile service development.



Actions

The main form of Forum Virium's operations is concrete development projects, carried out within five program areas: Smart City, Innovative Public Procurement, New Forms of Media, Wellbeing, and Innovation Communities. These themes are cross-cutting, and a cross-sectorial approach is actively promoted in order to find new innovative solutions.



Results

FVH has evolved to 31 personnel end 2013 (17 in 2010). Some key results of FVH include: pioneering the Open Data movement in Finland, bringing new tools to manage technological change, changing the way citizens interact with the city, changing the way the city cooperates with developers, contributing to Helsinki's international reputation as a Smart City, disseminating new knowledge into the Finnish innovation ecosystem, and strengthening Helsinki's international networks' use of funding opportunities.



Impacts

FVH has attained the most important impacts with projects that have had strong commitment from all the key participants. For instance, Helsinki Region Infoshare (HRI), a joint initiative by four cities in the Helsinki Metropolitan Area, already lists more than 1,000 open datasets covering a range of topics. In another example, the CitySDK project's APIs have been used to develop apps for tourism, mobility, and participation across 8 European cities.



Scaling Up

Sharing new insights and transfer of knowledge is a key value proposition of FVH. Scaling up is also boosted by fostering strong synergies among individual projects both locally and nationally (i.e. with the new joint 6AIKA strategy for Finland's six largest cities) and internationally, through networks such as ENoLL.

As partners consolidate their collaborative practices and goals through a series of successful projects, the need to give a permanent and financially sustainable structure to the partnership will emerge, if at all, with the agreement of those

// 3. ENSURE FINANCIAL AND POLICY SUPPORT

Perhaps one of the most obvious aspects of sustainability is getting political support and funding for your projects and initiatives. You may think that as the Mayor that's the easy part, since in theory you yourself are one of the key decision-makers in this regard. Although that is in many respects true, there is the danger of falling back into the traditional way of doing things, with the city government 'buying' and owning policy

involved. At that point, the legal structure simply gives a more permanent form to principles already validated, roles and commitments already tested, and common goals defined through the sum of initiatives already undertaken.

initiatives rather than orchestrating a broad, citizen-driven partnership with shared ownership of objectives, processes and results. We do suggest setting aside a small and flexible fund for organizing events or otherwise 'seeding' projects and partnerships, but unless significant infrastructure projects are involved, we advise against the traditional approach of pre-defined calls for tender for specific initiatives until they clearly

Box 30
INNOVATING POLICY INSTRUMENTS

The Apulia Region in Italy has experimented the promotion of Living Labs through a multi-stage funding program. First a catalogue of innovation needs in the area was developed, followed by a catalogue of innovation partners. Only then was a call opened for Living Lab initiatives that addressed one or more needs in the catalogue through co-design methods.

result from a co-design process.

Citizen-driven innovation projects should ideally draw on a range of funding sources, of which city funding can play a part though it should not dominate the partnership's governance. A good principle here is 'alignment' or building a project's objectives in coherence with other on-going initiatives such as a university research project, a citizen initiative, a new business service, or even a city-funded regeneration plan. Where that is insufficient, innovative ways for the public sector to fund innovation – ranging from Hackathon prizes to Pre-commercial Procurement – can be explored for specific projects. For the private sector, an increasing number of

crowd-funding platforms are also available, although they tend to focus more on business cases than public services. In any event, it is a good idea to consider different kinds of contributions – money, volunteer work, equipment and facilities, etc. – with equal respect. This kind of multi-sourced arrangement is often referred to as a PPPP: Public Private People Partnership.⁵⁶

Financial institutions, venture capital funds, and similar bodies can also be considered as partners in your local innovation alliance. In a short-term view, they may wish to participate in innovation processes as a way of identifying emergent ideas or business prospects for early stage financial support. In a

//case story

SME INNOVATION SERVICES IN FLANDERS



Description

iMinds-iLab.o⁵⁷ is a networked service provided to SMEs throughout the Flanders Region in Belgium, supporting the development of innovative products and services using Living Lab methodologies and tools.

iLab.o's on-line platform provides a Living Lab toolbox with the following modules: Panel & Community Management (for selected lead users), Living Lab User Research Toolkit, Prototyping and Testing Support, and 360° Business Model Innovation. Finally, iLab.o helps local SMEs establish network relationships with other Living Labs through direct links with ENoLL.



Context

iMinds is a research organization connecting five universities across the Flanders Region as a platform for demand-driven applied research, including pre-seeding and incubating new businesses.

The iLab.o initiative was born of a mixture between an early interest in the Living Lab approach and a specific case, iCity, that exemplified the need for the services offered. The Flemish government decided in 2009 to incorporate iCity with one of the iMinds universities to create iLab.o, as a merge between the operational services of a Living Lab and the academic know-how in business research. The governance structure of iMinds-iLab.o is thus as a non-profit organization with framework agreements with each of the five universities.



Challenges

One of the biggest challenges for cities and regions aiming to promote the economic competitiveness of their territories is to balance the need to take a neutral stance in the public interest with that of promoting successful SMEs, which inevitably involves selecting some actors over others. Especially in the case of Smart City products and services, the city itself is a potential client, thus raising issues of possible conflicts of interest. The iMinds-iLab.o service takes that burden off the cities' back, maintaining the appropriate balance by engaging cities in co-design processes while ensuring the development of sustainable businesses.



Actions

iMinds-iLab.o acts as an open incubator for the regional SME innovation ecosystem. While its main activities are structured according to the methodology of the Living Lab toolbox, an important feature is the reciprocal contamination between the concrete business development needs of the SMEs and the broader research activities on Living Lab methodologies.



Results

There are 200 researchers directly on the iMinds payroll, 18 of whom specifically dedicated to iLab.o. The 20 million Euros annual regional funding to iMinds is complemented by participation in national and EU projects, to a total of € 47Mln in 2013. The iLab.o service was launched in 2009, and the number of SME projects supported reached 20 by 2013.



Impacts

As iMinds acts in the public interest, its projects need to offer a value proposition to both the community and the SMEs, while keeping the Living Lab dimension alive. A comprehensive evaluation methodology is an integral part of iMinds-iLab.o activities, focusing on the innovation trajectories of the companies using the service.



Scaling Up

Scaling up of the iMinds-iLab.o service model occurs at two levels: the institutional level of the service and the individual SMEs participating. At the institutional level, discussions are currently under way with the Haag-Helia University, with six campuses throughout Finland also coordinating a Finnish network of Living Labs. Both settings thus share similar vocations and territorial configurations. At the SME level, iMinds promotes the development of cross-border Living Lab ecosystems by working to harmonize the operational aspects of the Living Lab methodology across geographical and cultural differences.

broader perspective, it is in their long-term interest to support the innovation capacity of the territory where they operate, since economic vitality in general contributes to the soundness of their investments and operations. Finally, initiatives with a strong civic or social innovation element can be considered as part of a Corporate Social Responsibility policy (CSR). Financial institutions tend to require clear objectives, timeframes, and indicators of returns on investments, so this approach makes a sound and broad-reaching evaluation strategy all the more important.

Sustainability is however not only a question of finding money,

and project funding is not the only way the public sector can support innovation. Many local authorities are looking at ways to provide support to innovators such as information sharing and matchmaking services or even funds to support patent protection. An equally important approach is to provide public spaces – often in restored public buildings – where innovators can meet, interact, and work, with access to the necessary services and equipment. These can range from business incubators to the newer models for creativity and innovation such as Co-Working spaces or FabLabs.⁵⁸ There is also an important role for regulatory policies, whose impact can be

strongly inhibiting as much as a potentially powerful enabler; while many important regulations are beyond the remit of city governments, creatively working with the rules at the city level can also lead to important results. In the end, sustainability

essentially means the survival of your innovation partnership, and for that to happen each stakeholder needs to continue to find a good reason for playing their role in citizen-driven innovation. //

CHECKLIST FOR ENSURING SUSTAINABILITY

Have you...



Made sure that each stakeholder agrees that the selected indicators reflect their goals and objectives?



Identified moments in your plan in which to reflect on process and review the next steps?



Kept an eye on the continued engagement of all participants as you discuss legal structures?



Published on your website a presentation of the different ways stakeholders contribute resources?



Explored how under-used municipal properties can house innovation activities?

//joining forces

Chapter 5

Until now, we have discussed citizen-driven innovation only in terms of what you and your partnership might do in your own city.

The examples we have given along the way begin to show the benefits of connecting with other cities and other practitioners by entering into collaboration networks. Indeed, this guidebook draws on the collective knowledge and experience of both the World Bank and ENoLL, both of which build and network local innovation networks. Networking is not something you should

necessarily think about at the end of your process; on the contrary, it is useful to listen and learn from others before you even get started. Now that we have walked you through the journey towards citizen-driven innovation, you probably have a better understanding of what to expect from participating in an innovation network and what you can gain.

In this chapter, we discuss four aspects of joining up with other cities engaged in citizen-driven innovation:

1. Define your role
2. Listen and learn
3. Research
4. Speak out

A first step is to reflect on how an innovation network works: how it brings and adds value. We often think of networks as similar to the old telephone system, where more or less equal devices are all connected together on a peer to peer basis. Innovation networks are quite different, in that the links between different points or nodes can be more or less intense, and the more distinctive a node is, the greater the value that is brought into the network. As we discussed at the outset of

// 1. DEFINE YOUR ROLE

It is therefore important to reflect early on about your city's own value proposition to itself and to others: what particular forms of innovation are you drawing on and working with?

this guide, any city can actively participate in an innovation network, be it large or small, central or remote, rich or poor, since each city's contribution is unique. It is the differences that drive interaction, it is interaction that makes a network alive, and (in the innovation community at least) it is the vivacity of a network (more than the number or size or power of its members) that determines its influence.

The same special mix of creative capital that you have used all along to drive your own path towards innovation is key to what you have to offer to network partners. Try to re-read the SWOT

//case story

LEARNING TO CONNECT IN POZNAN



Description

The Poznan Living Lab⁵⁹ focuses on three strategic areas: Smart City, healthcare, and education. It is run by the Poznan Super-computing and Networking Center and its broad partnership includes the member companies of the Wielkopolska ICT cluster, research institutes, NGOs, and the Poznan City Hall. Sixteen user communities come together in relation to different ICT technologies and/or different fields of application, with operations carried out entirely with own resources, namely without EU or public funding.



Context

The Poznan Living Lab grew to its current configuration and approach following a path of discovery of the effectiveness of user engagement. The original cluster was set up in 2008 with the goal of launching knowledge driven projects, but was unable to reconcile the visions and expectations of the different stakeholders. In 2010, the association opened up to non-ICT partners closer to the innovation demand: schools for educational projects, hospitals and care organizations for medical projects, and Poznan City Hall for citizen related projects. Operational and regulatory obstacles continued however to hinder progress. The next step was to launch the ZOO coworking space, which began to work when the focus shifted from technologies to application areas such as finance, healthcare, public spaces, and open data. The final element which finally sparked off collaboration and innovation is the organization of hackathons where NGOs define real problems to be solved by the developer teams.

Due to the lack of direct funding for operational aspects, the Living Lab itself has no need for a dedicated governance structure. Different activities are supported by the participating parties.



Challenges

The main challenges faced have not been in the technical nor financial domains but in the legal and operational details for collaboration. Institutional innovation is thus a key element for fully implementing the user-driven approach. The limitations to property rights is another barrier for engaging SMEs, although a clear Open Source policy at the outset can clarify possible misunderstandings.



Actions

The main actions undertaken today by the Poznan Living Lab include:

The ZOO co-working space as a place of co-design involving non ICT communities

Mobilizator: the 2-day hackathon matching NGOs' innovation needs to developer teams

D.challenge: an 8-week interdisciplinary user-driven course bringing together students from different universities and different backgrounds

Poznan Open Source Competence Center: incubation of new companies mainly based on transportation data.



Results

The NGOs who have participated have gained professional support from programs as well as access to city officials and potential sponsors. Conversely, the companies of the Wielkopolska ICT Cluster gained real challenges to work on.



Impacts

The gradual shift of orientation towards an end user driven definition of technology processes has had a strong effect on the technology partners, used to thinking in technology-driven terms. Citizens' awareness of the transformational power of user-driven research has increased participation and engagement, while the business and research communities have increased their commitment to multi-disciplinary research and gained a greater connection to the city in actively addressing its problems.

The effectiveness of the Living Lab's activities have convinced the City government to extend the implementation of the products and services developed. In particular, by seeing real users interact with the technologies, a strong program for opening up city data was finally set in place.



Scaling Up

The Poznan Living Lab is playing a leading role in promoting Living Labs throughout Poland and in other formerly Eastern European nations, using ENoLL as a platform for international networking.

analysis you carried out while defining your vision in the light of the strengths, weaknesses, opportunities, and threats of other cities; this way you can easily see what you have in common and what distinguishes your strategy as unique.

Some cities may have different priorities as concerns food security, climate change, income equality, or other issues, while others may share your own priorities and actually be engaging in similar innovation approaches and initiatives. Compare the resources you and others are drawing on to feed innovation, together with the different levels of ambition for addressing different problems. You should be able to identify one or two cities with whom to begin exploring knowledge exchange processes. You might have also signed up to one or more open innovation, smart city or similar networks or associations, but

we suggest that even then you pinpoint one or two partners to team up with as an entry point for broader engagement.

To start off collaboration, you need others to know who you are, which means you need to present your city and its citizen-driven innovation strategy and initiatives effectively. Look at others' presentations, their structure, and the media they use: brochures, websites, social media, and video in different mixes. It is important that you learn to see your city and projects through the eyes of others, telling your story in a way that captures their imagination and highlights the key points of possible collaboration. From there you can make your first contacts and perhaps organize site visits for the members of your innovation partnership.

Box 31 TRANS-REGIONAL SERVICES

The Taiwan Living Lab designs service blueprints and executes various field experiments with end users to evaluate market acceptance of innovative technology services. This service model has proven effective at the trans-regional level, and offices have been opened up in Taichung, Taiwan and Nanjing, China.

// 2. LISTEN AND LEARN

Of course you learn most not by telling your story but by listening to others: how different cities assess their problems and potentials and what they are doing. Listening is important, since it allows you to step into the on-going dynamics of other initiatives and from there diagnose your own projects

and strategies. You will probably see good practices you may want to take home with you, but in parallel, you should not underestimate the complexities of transferring experiences. For any positive initiative you see, you will need to understand the context it arose out of, identify those aspects that you think

Box 32

THE ART OF KNOWLEDGE EXCHANGE

Knowledge exchange, or peer-to-peer learning, is a powerful way to share, replicate, and scale up what works in innovation. Development practitioners want to learn from the practical experience of others who have gone through, or are going through, similar challenges. They want to be connected to each other and have ready access to practical knowledge and solutions. When done right, knowledge exchange can build the capacity, confidence, and conviction of individuals and groups to act.

//case story

A GLOBAL WATER HACKATHON



Description

In October 2011 the World Bank organized a global Water Hackathon,⁶⁰ a marathon competition of brainstorming and computer programming. This event gathered over 500 local software developers and technical communities in 10 cities around the world to work simultaneously in building prototype solutions to water sector challenges. Water Hackathon was designed with four objectives: (i) creation of a network of atypical partners to find solutions to water-related challenges, (ii) preparation of a list of challenges facing the water sector, (iii) development of new applications designed to address challenges, and (iv) adoption of applications and code developed in Bank projects.



Context

Today more people in the world have access to a mobile phone than to a toilet. The lack of safe drinking water and adequate sanitation is the world's single largest cause of illnesses, responsible for two million deaths a year. Water is also the primary medium through which climate change will impact people, economies, and ecosystems. Digital technologies and tools offer new platforms for outreach, transparency and participation that can help to achieve water security.



Challenges

Removing barriers for collaboration between water professionals and local technologists was considered essential. Event preparation was preceded by an iterative consultation, definition and refinement of development challenges in the water sector judged amenable to technology solutions. Challenges were then reframed in a way that allowed computer programs to understand and address them directly. An iterative process approach brought existing and nascent innovations to the surface and strengthened the ties between innovators and the water community.



Actions

The World Bank Water Hackathon adopted a process inspired by the Random Hacks of Kindness (RHoK) model.⁶¹ to the requirements of the water community, using its own brand. Incentives were designed to leverage appropriate applications specific to the community and prioritizing: (i) locally identified problems; (ii) deep subject matter expert involvement throughout the process; (iii) local community building by leveraging existing networks and recognized local champions; (iv) targeting incentives towards technical entrepreneurs; (v) positioning of problem statement owners as clients with a degree of follow-up commitment; and (vi) investment in post-event measures, such as naming of water ambassadors.



Results

More than 60 prototype solutions were built in response to the 113 water sector challenges defined. More than 500 software designers were mobilized in 10 technology communities world-wide from Nairobi to London to Lima to Bangalore. Winning teams were rewarded with business incubation support and offered further opportunities to engage with their water counterparts. In some cases, this led to financing of new start-ups and the recruitment of local developers to various advisory positions in governments.



Impacts

Through partnership with tech organizations, universities and community leaders, the World Bank was able to draw global attention to development water problems.⁶² The openness of the approach attracted considerable attention from within the water community and also from print and online media, including blogs and social networks, which traditionally do not feature water content. "This was the new Egypt at work," said one participant in Cairo. This approach also required a change in mindset for the World Bank, calling for greater openness, experimentation and tolerance of failure.



Scaling Up

Hackathons are inherently local events, but the global network allowed collaboration across sectors and time zones. Partnership with a local tech community is critical, as they are best equipped to host a hackathon that is fun and open, while global networks help raise the profile of the hackathon to a broader audience. The World Bank has since organized a global Sanitation Hackathon (2013) as well as supporting other more local events in the context of several projects.

are most relevant, and see what kind of adaptations might be required in order to bring similar benefits to your city.

For the transfer of good practice, there are many variables to take into consideration, ranging from cultural differences to different technology baselines, different legal and regulatory

// 3. RESEARCH

As you develop your citizen-driven innovation strategy (even as you read this guidebook), you will realize that an integral part of the method is to reflect on the process in order to understand and improve it, in parallel with its experimentation in concrete practice. All Living Labs have to some degree a research component that examines their processes and methods to continuously improve results. Research is by tradition an international and collaborative process, meaning that just as you are focusing on using innovation processes to solve city problems, other Living Labs – especially those with a strong University guide – may be focusing on research related to some of your unanswered questions.

environments, and so on. In the end, to guarantee an effective exchange it is best to engage your whole partnership, promoting exchanges between peers and exploring the various aspects of adaptation from the different stakeholder perspectives.

Research on citizen-driven innovation can thus be a strong driver for your possible participation in international networks. You can link up your local universities and encourage them to address issues on citizen-driven innovation in collaboration with ENoLL Universities, or alternatively you can collaborate as a pilot setting for research carried out elsewhere that is exploring the issues and methods you are using. Either way, framing your innovation strategy in a research perspective can only be beneficial to your ability to improve your processes.

Box 33 LEARNING BY DOING

Laurea Living Lab is hosted by an R&D oriented University of Applied Sciences in the Helsinki metropolitan area and focuses on service innovation. Through its several locations and its innovation process based on Learning by Developing, it acts both as a host organization and as an innovation service provider focusing on welfare, knowledge intensive business services and social responsibility. This mixture makes Laurea a leading University for research on Living Lab methodologies; evidence of this is the recent special issue of the Interdisciplinary Studies Journal on Smart Cities.



The first edition of CitiSense, a conference that explores humanly smart cities through technology-enabled citizen participation, took place in Barcelona in 2013.

//case story

A CITY-UNIVERSITY PARTNERSHIP IN COVENTRY



Description

City Lab Coventry⁶⁷ aims to build strong communities by mobilizing the collaborations, assets and expertise of the University and the city to help revitalize urban neighborhoods and research issues that support city planning and development as well as the work of the third sector.

City Lab Coventry includes: access to citizens, vehicles, buildings, roads and IT infrastructure within the city; a serious games studio/app lab, from prototypes through commercialization; business support, working with SMEs, start-up businesses and corporate organizations; and Living Lab trials in priority thematic areas: low carbon vehicles, low impact buildings, digital media and assisted living.



Context

Urban Universities are a huge asset for their home cities, as catalysts for social mobility, investors in infrastructure and providers of extensive employment opportunities. Historically Coventry University has had a strong relation with the City of Coventry, though over recent years the campus became disconnected from the wider city. City Lab Coventry allows to re-establish that link, by sharing and opening up research with citizens, thus leveraging the huge capability and resources of the community.

City Lab Coventry is a joint venture between Coventry City Council and Coventry University. The two organizations own 90% of the land in the City Center and use this space as a City test bed and Living Lab.



Challenges

The ultimate aim of City Lab Coventry is to address the challenges facing Coventry through the lens of its people and communities, who have low recorded levels of pride in their city, aspiration, chronic skills shortages, and stagnant social mobility. The complex, entrenched, and interconnected opportunities and challenges in Coventry are too often addressed in a short-term or fragmented way. City Lab Coventry was set up to address this by delivering a series of comprehensive and interconnected interventions.



Actions

Working upon that platform, the City Lab Coventry activities are characterized by different roles between the City, citizens, and the University:

Opening up University research: for instance by using wireless sensor monitoring in researchers homes to help a social housing company understand how to implement the passive house concept.

Citizens engaged in University research: for instance by advertising for people to sign up and trial low carbon vehicles.

Citizens driving University research: for example the AroundMe™ informal care platform that helps people live independently, or the engagement of citizens to enrich and develop content for tourist information, apps and services.

Letting citizens lead: for example supporting a campaign against church closures by co-designing virtual tours and encouraging people to visit them.



Results

All of the initiatives of the City Lab Coventry are able to engage the city's population in research and service co-design. As an example, the recent social relations initiative has calculated that through a range of programs (e.g. 40 over 40, "get creative") up to 20% of the Coventry population or 60,000 people will be engaged over a three-year period.



Impacts

Each project in some way redefines the relationship between the City and the University, highlighting needs and ambitions for both and encouraging both to take responsibility for mobilizing assets. The scale and size of impact varies between projects, but it is important to establish the evidence and highlight individual success stories.



Scaling Up

Different innovation programs have been extended across the UK and the apps developed are widely used. International scaling up mainly occurs through partnerships developed starting from membership in ENoLL.

// 4. SPEAK OUT

Once you have established working relationships with one or more cities and experimented knowledge exchange and reciprocal learning, you are ready to define a broader networking strategy as a permanent framework for your city's activities. Sign up to platforms and associations that are coherent with your innovation approach and objectives and those of your local partnership. Select those where you may choose to adopt a pro-active approach, bringing in your communication products and actively participating in meetings and conferences. As you do so, it's important to ensure that

Box 34 CITISENSE

In the context of the Smart City Expo World Conference 2013 in Barcelona, the World Bank and partners hosted the first CitiSense event. Participation from around the world saw more than 240 attendants, including public officials and city and municipal leaders from about 90 developing and developed cities together with over 50 speakers, urban and energy specialists, and technologists. Participants exchanged experiences and were introduced to innovative projects designed to enhance public service delivery through technology-enabled collaboration with citizens.

your local partnership is behind you when you tour the world to promote your strategy and its initiatives. They should also be encouraged to join the same or similar networks, perhaps more oriented towards their specific needs, ie business alliances, environmental networks, technology user groups, etc. as a means of promoting 'network literacy' throughout your local innovation community.

Finally, strong participation in global networks is in the end a political commitment, an arena where you need to promote the actions and approaches that you and your local partnership

feel are the right way to go. Remember, at the base of your decision to embrace citizen-driven innovation is the desire to fully address some of the terribly urgent problems facing our planet. Your network commitments and engagements are the best way to scale up the knowledge and experience base you build to meet your city's needs. After all, it is at the global level

that the problems your city faces are generated and where the courage and commitment of change makers across the globe will be required if we are to hope to reach global solutions. //

CHECKLIST FOR JOINING FORCES

Have you...



Looked at videos and presentations of other cities' innovation strategies?



Made a list of what makes your city and its approach special according to different stakeholders?



Brought together your city's University departments that deal with different aspects of innovation?



Listed the international network opportunities for your innovation partnership?



Identified at least one up-coming public occasion in which to promote citizen-driven innovation?

//starter pack

The basic idea of this guidebook is to inspire you to begin addressing your city's problems and issues through citizen-driven innovation. In this section, we have gathered a first collection of concepts, tools, and methods to help you get started with your first experiments.

This is by no means a complete collection, but it should help familiarize you with the basic elements of the Living Lab approach. Once you've started, you'll probably want to learn more, connect with one or more of the many Living Labs active

in methodological research on innovation, and contribute your own insights to the growing portfolio of experiences in the on-line resources that support this guidebook.

The Starter Pack we have assembled consists of a series of different elements:

- Essential technology paradigms for the Smart City model: [Internet of Things](#), [cloud computing](#), and [open data](#).
- Three families of methodologies for citizen engagement: [idea generation](#), [co-design](#), and [service design](#).
- Two types of policy initiative: [facilities](#) based on the Innovation hub model and approaches and [policy instruments](#) for demand-driven innovation.

Each section is illustrated with cases, mainly from the projects and experiences of ENoLL Living Labs, with links to specific examples.



Description

Technology paradigms are based on an interrelated set of technologies that together define radically new scenarios of usage. Among the key technology paradigms underpinning the Smart City model are: Internet of Things (IoT), based on massively pervasive sensor networks that allow for a real-time awareness of urban phenomena, and Cloud Computing, based on the storage and elaboration of information in an internet-based service, so that access occurs through any connected device.



Use

Reaching an understanding of technology paradigms helps a city administration govern innovation processes, empowering a Mayor to participate actively in defining Smart City strategies together with the engineers and ICT providers who have a greater mastery of the functional and technical details. What is important is to grasp the broad vision and its political implications, understanding above all how citizen engagement can be ensured for implementation.



Typologies

The impact of the Living Lab approach can best be illustrated in terms of the two paradigms identified here. The Internet of Things concept is greatly enhanced if we consider 'citizens as sensors' by integrating what people see and hear in addition to taking advantage of diffused sensor networks. Cloud computing offers significant savings and convenience but also raises issues related to privacy and security; recent events underline how greater involvement of local governments, citizens, and businesses is essential.



Issues

As with the Smart City model itself, technology driven visions can provide a useful guiding framework but only by fully embedding new technologies in the practice and operations of a city, its institutions, and its people, can we say that the innovation process is effective. Technology infrastructures are the foundation of the Smart City vision but social and societal innovation are the real transformative factors; the main issue for city Mayors is to ensure the coherence between the two.



Implementation

The Living Lab approach suggests implementation processes that, to the degree possible, proceed in an iterative fashion according to discrete and transparent steps, allowing for engagement and co-design to occur along the way.



Cases

An energy saving project in Malmö works with local residents to build their own electricity sensors, thus attaining a sense of ownership and greater impact.⁶⁴

Cloud computing platforms aim not only to allow for remote access to data and services, but they also provide basic underlying features and functionalities that make Smart City services easier to develop. In the EU's EPIC project, a Living Lab approach used for the co-design of an app for re-locating in a city⁶⁵ helped define such security and privacy features in conjunction with specific pilot services.

Finally, the FI-WARE⁶⁶ platform for the Future Internet offers a cloud-based infrastructure for Smart City services such as IoT, Open Data, and Big Data (making sense of massive amounts of information) applications.



Impact

Citizen-driven innovation processes are essential to help city governments master technology paradigms, understanding how they can really bring benefits to a city and its people. This changes the way citizens interact not only with new technologies but also with their city: whether they annotate bus stops, share touristic routes or report potholes.

Technology paradigm



Internet of Things / Cloud Computing



Description

The main premise of Open Data – that information should be freely available to all – is not new, though the term has recently taken on specific meaning with the publication of public sector information on the internet. Open Data is related to principles of participation and transparency as much as it is to the technologies, which in fact can range from making available files for download to real-time web services structured to be directly accessed by mobile applications.



Use

One of the central tenets of the Open Data philosophy is that governments hold a wealth of valuable information but third parties such as software houses are better at transforming that information into value adding services. Governments are thus encouraged to publish whatever data they have in a 'raw' format (ie numbers rather than graphs), allowing unexpected and creative uses to be made of it and creating important business opportunities for local enterprises.



Typologies

Open Data is generally classified using five stars for levels of usefulness.⁶⁷ The first three levels refer to types of file available to download; at the lowest level are documents only a human can understand (text or a pdf); next come structured 'machine-readable' formats (i.e. an Excel file) followed by the same in a non-proprietary (i.e. non-Microsoft) standard, usually CSV (tables of data with columns separated by commas). Four stars implies the jump to uniquely identified resources that are directly accessible 24 hours a day. The highest level is reserved for LOD (Linked Open Data), which provides links between sources of data to facilitate associations and searches in a 'web of data' scenario.



Issues

While Open Data is a fast-growing phenomenon, there are several open issues:

Adoption by public administrations of clear guidelines on data quality, privacy and security so that staff know how and what to publish.

Harmonization of standards for how to structure different kinds of data (semantics) in order to allow systems to aggregate information sources.

Cost and availability of reliable infrastructures to host Open Data files and services, especially for smaller and remote communities.

The gap between the process of opening and publishing data and the development of applications by external actors.

The gap between the general philosophy and benefits of Open Data and the level of technical expertise required to define and implement a strategy.



Implementation

Definition and deployment of an Open Data strategy needs to focus on engagement of both the developer communities and the local citizen and business communities. The first group helps define guidelines for the publication of Open Data and the organization of development contests and events (Hackathons) to make published data useful. The second group helps clarify the ultimate use of government data and therefore define strategies and priorities. Finally, it is essential to engage key actors across the public administration to enact a diffused Open Data policy.



Cases

The CitySDK initiative⁶⁸ has defined unified Application Programming Interfaces (APIs) towards their data services, making it easier for developers to transfer an app developed from one city to another for a more attractive investment opportunity. The CitySDK experience shows how the interface needs to structure the data flow in tight collaboration from the city side.

The Citadel platform⁶⁹ allows any small city or even citizens and businesses to convert and publish their own Open Data at practically no cost, with an App Generator Tool that allows for an immediate visualization of different datasets.



Impact

Direct engagement in Living Lab processes for Open Data allows city officials to manage the constant technological change in the areas of new available technologies, devices, applications and use cases. The Open Data paradigm is likely to spread rapidly in the coming years, to eventually become an integral part of public service provision in a range of aspects.

Technology paradigm



Open Data



Description

Idea generation methods are useful for the initial phases when it is necessary to explore concrete possibilities through lateral thinking: typical formats include BarCamps,⁷⁰ Hackathons,⁷¹ and other more business-oriented methods. These processes base their effectiveness on placing a multi-disciplinary group in a focused and supported co-design environment for a defined number of hours, with the goal of producing and communicating concrete results. Often there is also a competitive element, with juries and prizes.



Use

One of the purposes of idea generation methods is to deliver tangible results in a very short time. In addition, the intense multi-disciplinary experience is in itself a useful way to promote 'innovation literacy' and build a local innovation community. For city governments, such events offer a good first step for opening up to citizen engagement.



Typologies

Idea generation methods can be applied in a range of situations: where there is already a need for innovation identified with the desire to look for new approaches; to seize on a given 'innovation opportunity' such as the launching of a new Open Data strategy; or from a totally open starting point, with proposals freely brought in by participants.



Issues

Many idea generation techniques are part of a global network that gives excellent visibility and often technical support, but at the cost of having to follow a very strict format. In addition, these formats often convey cultural models that may not be appropriate, such as a highly competitive approach where instead the goal is to build a collaborative innovation community.



Implementation

The setting should ideally be in a stimulating and creative environment with open Wi-Fi coverage. It is necessary to have both a plenary room plus properly equipped working spaces for each team of 5-10. For the staff, clearly defined roles are required such as project coordinator, technical manager, team coaches or mentors, and experts in specific areas. The key to success, however, is getting the right mix of participants, balancing teams with people who have experience in the problem domain (including civil servants), ICT experts and programmers, creative professions such as design and communication, those with experience in business planning, and so forth.



Cases

Many ENoLL Living Labs experiment variations on different idea generation methods. The Ghent Hackathon⁷² builds mobile applications using Open Data published by the municipal government. It was initiated by the city together with the Urban Living Lab innovation ecosystem, with the goal of civic engagement for public and economic value creation.

The Startup Weekend of SUST Living Lab Tunisia⁷³ instead follows a global 48-hour format (sponsored by Google) with the specific goal of generating business start-ups.

Finally, Haaga-Helia University has developed its own formula – the InnoCamp⁷⁴ – focusing solutions towards expressed needs of a commissioning entity. This has been successfully applied for instance in the development of mobile service concepts for the tourism industry.



Impact

The impact of idea generation methods often goes beyond the two or three days of the event. Statistics from the international Startup Weekend network show that roughly 80% of participants plan a longer term collaboration with their groups, and over a third of the startups generated are still active after three months. The main factors to attain impact are: a clear and tested structure for the event, engagement of local stakeholders, and adequate preparation previous to the event and follow-up afterwards.

Methodology



Idea Generation



Description

Co-design methods are those that engage all stakeholders – city government, ICT developers and providers, and local citizens and businesses – on an equal footing in some stage of the development of a new product or service. Co-design goes beyond so-called ‘user-centered design’ and similar approaches to define processes where citizens and end users take an active role in design processes.



Use

The principles of co-design are at the heart of citizen-driven innovation, as this guidebook has intended to show throughout, so co-design can and should be a part of every Smart City initiative. Evidence across the Living Lab movement demonstrates how co-design leads to reductions in both cost and time for the implementation of services, since the end users themselves have contributed to defining them.



Typologies

Co-design approaches can rely on face-to-face interaction or use appropriately structured internet based services, which offer the possibility to engage a global audience and network with other communities in a more open format. On-line co-design environments are often structured through ‘Challenges’, a way of defining innovation needs and then inviting a community of innovators to create new solutions to meet that need. The approach can also vary according to the setting, i.e. industry-led product design, community-led initiatives, etc. For instance, the Electronic Town Meeting⁷⁵ as carried out by the eToscana Living Lab⁷⁶ specifically supports policy co-design.



Issues

The main issue for co-design is that it is easier said than done; lip-service is often paid to user engagement when in fact a top-down or technology-driven approach is actually defining the process. It is thus important to ensure that co-design extends as far as possible to all of the steps in the decision making process, from agenda-setting onwards.



Implementation

For the early adoption or implementation of a given co-design method, it is a good idea to ask an expert familiar with the technique, drawn for instance from any partnering ENoLL Living Lab, to assist in animating the process. You will then be able to gradually build a local team of co-design support staff.



Cases

Many ENoLL Living Labs have been active in the experimentation of structured co-design methodologies. The FormIT model,⁷⁷ developed at the CDT Botnia Living Lab, is one of the earlier formalizations of the Living Lab approach; its on-line toolbox includes a broad range of useful tools and techniques.

The CKIR at Helsinki's Aalto University⁷⁸ and the iMinds-iLab.o⁷⁹ support service are good examples of the 'lead user' method, where the people engaged in co-design are selected from a pool of users according to specific criteria.

Service Design approaches also use specific co-design tools that aim to capture the end user's viewpoint. Methods developed in the Guarantee⁸⁰ and VEP⁸¹ projects include: Affinity diagrams (clustering interview responses), Persona development (narratives for fictional profiles), Scenario building (innovation concepts for own goals), and Blueprinting (symbolic representation of service actors and activities).

The MyNeighbourhood⁸² service introduces competitive 'gamification' techniques to stimulate user engagement. Oulu instead uses an on-line 'One Stop Shop'⁸³ for the co-design of remote city services.



Impact

Co-design methods should be selected according to the affinity of the setting and the availability of professional support. The main factor to achieve impact is political commitment.

Methodology



Co-Design



Description

Service Design applies citizen-driven innovation throughout the lifecycle of developing a new ICT based product or service, from initial concept through to service or business deployment. Service Design makes use of idea generation and co-design methods as discussed above, but frames them in a purposive context with a clear innovation goal. Throughout, a holistic perspective aims to ensure that all aspects of a service are taken into account from the end user's point of view, using for instance ethnographic and journalistic techniques and representing concepts through scenarios, 'user journeys' etc.



Use

Service Design works best when the general domain and its innovation needs are known, a multi-stakeholder partnership is in place, and there is a clear goal to reach a sustainable ICT based service. Typical areas include e-government, social services, and health care, but Service Design methodologies can be applied to any Smart City domain.



Typologies

Service Design originates as a method for developing competitive ICT based services for the private sector. Here, the process is industry-driven and considers the end-user as 'customer', while the structure and conditions for service sustainability are those of the service delivery setting. A second typology, more relevant to the Smart City context, is applied to public services, where a third-party such as a University or research center mediates between the public dimension of the service itself and the business interests of those who will need to ensure the sustainability of service provision.



Issues

In order for Service Design to be effective, it is necessary to maintain the appropriate balance between the public interest and the need for business sustainability. This in turn requires that, where city services are involved, the administration is capable of playing an active and informed role, including the management of the 'ripple' effects propagating institutional innovation beyond the boundaries of the service in question.



Implementation

Service Design can be a relatively lengthy process and requires a clear strategic focus and strong political commitment. It is thus recommended for a relatively mature partnership, under external guidance as can be provided by one of the ENoLL Living Labs specialized in this area.



Cases

Laurea University of Helsinki⁸⁴ applies Service Design methods with a specific focus on health care, working together with local, regional and national authorities in a holistic approach. In the Finnish nationally funded Guarantee project, the approach combined more traditional desk studies and interview surveys with methods to develop service concepts from the user perspective.

Living Labs Taiwan⁸⁵ applies a method called Service Experience Engineering with over 50 research teams and enterprises, drawing on a user community of 3,000 households and a state of the art ICT infrastructure.

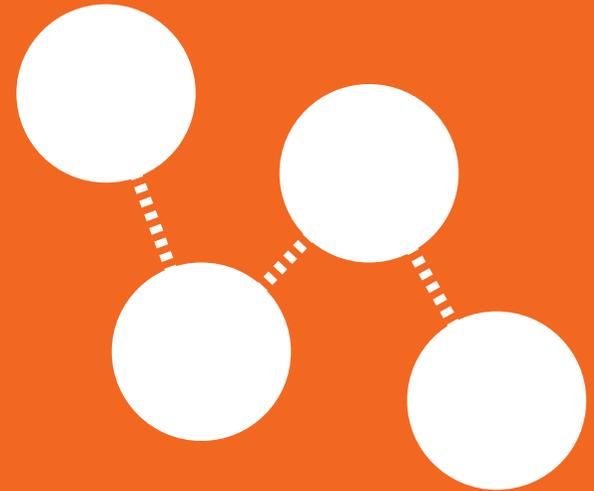
The Virtual European Parliament (VEP) project, led by CDT Luleå⁸⁶, applied the Service Design approach for the development of an ICT service whose objective is to build a better link between citizens and the European Parliament. VEP developed a Service Design method defined by ten 'I's: Identify (user roles and characteristics), Interact, Iterate, Involve, Influence, Inspire, Illuminate, Integrate, and Implement.



Impact

Service Design requires long-term commitment of all parties but in return delivers the most effective and long-term benefits.

Methodology



Service Design



Description

Innovation hubs are public spaces for innovation, generally with a strong interdisciplinary atmosphere and a mixture between offering a stimulating place for professional work activities, promoting the emergence of new and innovative businesses, and exploring innovative societal organizations for work itself (the so-called FabLab⁸⁷ model). Common features include: the symbolic value of the physical space, openness to the participation of any interested party, and the promotion of new businesses and/or business partnerships.



Use

Innovation hubs are a powerful tool for promoting citizen engagement and entrepreneurial creativity in a way that offers strong visibility as part of the urban fabric, allowing a city to position itself as 'open to innovation'. It is however essential to ensure long-term sustainability in order for the innovations generated therein to have a future or for the initiative itself to have lasting impact.



Typologies

Innovation hubs can be conceived of as multidisciplinary environments for highly competitive professionals, SME support centers specifically focused on innovation, or as more open initiatives with a social function. City governments can play different roles: private or NGO-sustained hubs often ask the city to find an appropriate space, university incubators will generally include the city in their governing board, while public innovation hubs can be directly set up and managed by the city itself.



Issues

The model adopted for a given innovation hub needs to be clearly identified and shared by all participants, since ambiguity can lead to misunderstandings, for example between participants looking for a creative office space and those interested in exploring new forms of collaboration. As a consequence, it is important to define an appropriate governance structure, capable of handling all issues ranging from who buys the coffee to assignment of intellectual property rights.



Implementation

A successful innovation hub is generally formed around an individual or group 'champion' who will define the strategic and ethical direction of the initiative as well as guarantee leadership. It can be useful to look at international networks (ImpactHub,⁸⁸ FabLab,⁸⁹ etc.) as potential organizational models. From there, the appropriate place needs to be identified and properly equipped, following the model adopted: this can mean anything from Wi-Fi and printers to sofas and sculptures to specific equipment such as laser cutters and 3D printers.



Cases

Citilab Cornellá,⁹⁰ ZOO co-working space⁹¹ in Poznan, and the Living Lab Cova da Beira⁹² in Fundao, mentioned elsewhere in the guidebook, are all good examples of citizen-oriented innovation hubs.

In addition, the Waag Society,⁹³ part of the Amsterdam Living Lab, carries out a range of research, education and service activities mixing art, science and technology in a 15th Century city gate house.

Numa,⁹⁴ a trend-setting space in central Paris, promotes collaboration of startups and project developers by providing the conditions for development and growth. The 'Numa Experiment' association brings together entrepreneurs, academics, administrations, small and large companies, associations, and communities. Nearly 1,000 events per year covering a broad range of topics – culture, art, health, ecology, economy, fashion, education – attract over 80,000 participants with different backgrounds and skills on an annual basis.



Impact

Taken together, innovation hubs not only foster citizen-driven innovation, often addressing issues related to City services, but they also allow for the open experimentation of new models of work, collaboration, and value adding.

Facilities



Innovation Hubs



Description

Ensuring support for innovation is a difficult task, since innovation is by definition difficult to plan for and even more difficult to predict. Public policy instead requires neutrality, certainty, and predictability. Experimentation with new policy and funding mechanisms includes new approaches towards policy making processes on the one hand, and new funding procedures and instruments on the other.



Use

Innovation policy traditionally supports the 'supply' side by funding research and development in areas deemed to yield scientific advances and market results. Demand-driven innovation policies, where the processes are driven by the end beneficiaries rather than researchers, instead aim to ensure greater relevance and better and faster uptake. In addition, they generally integrate technical and non-technical or social innovation and thus promote citizen engagement and creative thinking about alternative ways to provide services and address problems.



Typologies

Demand-driven innovation policies are being experimented at nearly all different levels of the policy making process:

The European Commission is defining regional innovation strategies for 2014-2020 (Smart Specialisation)⁹⁵ based on broad engagement, integration of social innovation, and 'entrepreneurial discovery' to identify hidden potentials.

At the operational level, alternatives to the traditional call for tenders include conditionalities such as the inclusion of end users as well as multi-step calls that identify innovation demand before funding projects.

Business promotion includes loan guarantees, local support to Venture Capital, and leveraging crowdfunding platforms.

Finally, Pre-Commercial Procurement⁹⁶ is a multi-step process through which the public sector transforms its own procurement needs into innovation processes.



Issues

Several issues arise with demand-driven innovation policy, first of which the need to address conflicts of interest through transparency rather than regulations. In addition, citizen-driven innovation is often represented by spontaneous networks that are difficult to fund. Finally, new procedures encounter the resistance of public officials wary of administrative innovations.



Implementation

Policy innovations are best introduced through pilot testing, or the experimentation of new approaches on a small scale and with broad engagement of stakeholders before integrating into practice. Pilot testing helps identify potential pitfalls and define the appropriate procedures and roles.



Cases

271 regional governments across Europe are currently defining their Smart Specialisation strategies with different degrees and types of policy innovation. Notable examples include the Usimaa-Helsinki Region (Finland),⁹⁷ applying a vision of the region as an innovation ecosystem; the Basque Country (Spain)⁹⁸ integrating social and territorial innovation; and the Apulia Region (Italy)⁹⁹ adopting innovative procedures to fund Living Labs. These strategies also include different innovations in policy instruments.

Pre-Commercial Procurement is being promoted by the European Commission since 2009¹⁰⁰ and is by now adopted in many R&D projects as well as regional innovation programs.



Impact

Pre-Commercial Procurement offers the clearest indications of the impact of demand-driven policies: significant savings for the public sector, improved chances for commercialization of funded products and services, and improved growth and competitiveness of participating firms.

Policies



Demand-Driven Innovation

//endnotes

1. On July 10, 2012, a Memorandum of Understanding was signed by Jose Luis Irigoyen, World Bank Director for Transport, Water, and Information and Communication Technologies, and Álvaro Oliveira, representing the ENoLL President, Jarmo Eskelinen. The agreement aims to pool global expertise in the area of ICT to help improve public services, increase civic participation, advance public administrative capacity, and drive green growth, furthering the shared goal of finding new approaches to improving the public services that affect the everyday lives of millions of people in developing countries.
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19. Government 2.0 is the use of technology—especially the collaborative technologies at the heart of Web 2.0—to better solve collective problems at a city, state, national, and international level.
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