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Each year FutureEverything proposes, develops and responds to particular themes. These themes are provocations, designed to open up a space for debate and practice, made tangible through art and design projects. FutureEverything Publications seeks to contribute to an international dialogue around these themes.

Drew Hemment
Founder and CEO
FutureEverything

The left side of the page features an abstract background composed of several overlapping, semi-transparent geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes create a dynamic, layered effect.

Smart Citizens - Introduction

Drew Hemment and Anthony Townsend

We hope this publication can help to advance and add a new critical energy to the debate around the Smart City.

To date, there has been too much focus on the role of large technology companies and governments as the catalysts of technology-enabled progress. With this has come an emphasis on top-down solutions, and on centralised, proprietary systems. Efficiency, innovation and transparency are urgent priorities. But something is missing – the aspirations, anxieties and abilities of individuals, communities and small businesses as they struggle to survive, and thrive, in the face of daunting global challenges.

This publication builds on a strand of talks and workshops at the FutureEverything Summit in March 2013 which sought to bring together for the first time some of the key voices developing the emerging discourse around Smart Citizens.

Our goal is to shift the debate towards the central place of citizens, and of decentralised, open urban infrastructures, in Smart City design. But this isn't just about local innovation. It is also about global collaboration. Which is why we also set out to introduce new thinking about ways citizens in one city can share and recombine the best new ideas and technologies from elsewhere across the globe. Because the value of bringing citizens into the process is that only they can turn cookie-cutter corporate plans for the Smart City into designs that are truly bespoke.

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Here Come The Smart Citizens

Drew Hemment, Anthony Townsend

Some of the greatest impacts of network culture are at city scale. The opening up of public data sets and the roll out of a grid of high bandwidth connectivity can transform the public realm and the way we live and interact in urban areas. We are increasingly able to digitally search and interrogate the city. Social tools can be layered over the city, giving us real time access to information about the things and people that surround us, helping us to connect in new ways. Much of the data that relates to people's everyday lives - transport, housing, pollution - is held by city government and agencies.

The notion of the Smart Citizen is an important contribution to an urgent debate on the future of cities. An industry is growing up around a vision of the 'Smart City', predicted to be worth more than \$20 billion in annual market value by 2020.¹ But a growing number of voices now argue this vision is flawed and will not deliver the civic or economic benefits it claims.

At the heart of this argument is the claim that the 'Smart City' vision is shaped by providers of big technology, who are not attuned to bottom-up innovation, or the messy, disruptive ways that people use technology. It is a vision shaped around the need of the suppliers, and by the mindset of top-down masterplanning. More damningly still, the big technology companies are selling 'smart city in a box' solutions to cities, walled gardens that prevent scalable local business innovation. It is not surprising therefore that the technology is not selling, as the 'smarter' cities turn away.

The idea of the Smart Citizen has been proposed by thinkers such as Dan Hill - presenting a keynote

1. Pike Research Report, "Smart Cities" (2013): www.navigantresearch.com/research/smart-cities (accessed 01.08.2013)

2. Dan Hill, "On the smart city; Or, a 'manifesto' for smart citizens instead." : <http://www.cityofsound.com/blog/2013/02/on-the-smart-city-a-call-for-smart-citizens-instead.html> (accessed 01.08.2013)

3. Jane Jacobs. "The Death and Life of Great American Cities" (1961) Random House. New York.

address at the FutureEverything Summit in March 2013 - to shift the debate towards the most important dimension of cities, the people who live, work and create within them.²

On the one hand there is the view that Smart City design should allow for the disruptive ways in which people use technology. But there is also a stronger claim here, namely that citizens can, and should, play a leading role in conceiving, designing, building, maintaining our cities of the future.

This is a call for a fundamental shift in the way we think about our cities and about urban development, that goes beyond a plea for wider public consultation in the planning process. Alongside 'top-down' master-planning, we need to enable 'bottom-up' innovation and collaborative ways of developing systems out of many, loosely joined parts.

The notion of the Smart Citizen as a co-creator draws on a rich intellectual backdrop in both technology design and urban design. Digital culture has given rise to a collaborative code ethic, and there has been a trend towards applying thinking and methods from open source software development to other domains. These ideas resonate with a tradition in urban planning that as first articulated by Patrick Geddes at the turn of the 20th century, and was wielded by Jane Jacobs in the 1960s as she demanded that city planning institutions make space for the voice and views of citizens.³

In practice, actually engaging citizens in these processes is immensely challenging. Open datastores and integrated intelligence hubs as much as roads and buildings make up the cities being built today. Much can be done on the cheap, but there are critical, large-scale infrastructure

investments that are out of the reach of grassroots efforts. And there are limits to the extent we can build cities in the way we, for example, develop open source software. Open source movements only care about who participates, not those who don't. But cities can't afford to neglect those who lack the means to participate.

And so, the central challenge we address here is to flesh out the meaning of citizenship in a Smart City. What new kinds of roles and identities are emerging? What can, and should, be done by individuals and small groups to leverage new technology to address urban and global challenges and opportunities? What does all this mean for governance? Most importantly - and this is the challenge we issued to our contributors - how can we create opportunities to engage every citizen in the development and revitalisation of the Smart City?

Cities around the world are hitting the same impasse. No one has so far found a way to intelligently bring together the big technology platforms offered by global corporations, with local technology projects and the interests of citizens. We believe that a focus on the central place of citizens in smart city design can open up new possibilities for alignment and progress heretofore unseen.

Drew Hemment

Drew Hemment is an artist, curator and academic researcher. He is Founder and CEO of FutureEverything, and a Dundee Fellow, Reader at Duncan of Jordanstone College of Art and Design, University of Dundee.

Over 20 years, his work in digital culture and innovation has been covered by New York Times, BBC and NBC and recognised by awards from the arts, technology and business sectors, including Lever Prize 2010 (Winner) and Prix Ars Electronica 2008 (Honorary Mention). Projects include the emoto data visualisation of the London 2012 Olympics and Open Data Cities / DataGM, the Greater Manchester Datastore.

Drew is a member of the Manchester Innovation Group and the Editorial Board of the Leonardo journal of art, science and technology. In 1999, awarded a PhD at Lancaster University, in 2009 elected a Fellow of the Royal Society of the Arts (UK), and in 2010 an Eyebeam resident (USA).

Anthony Townsend

Anthony Townsend is an urban planner and forecaster whose work focuses on urbanisation, ubiquitous computing and technology-led innovation and economic development. He holds posts as Research Director at the Institute for the Future, an independent research organisation based in California's Silicon Valley, and Senior Research Fellow at New York University's Rudin Center for Transportation. Anthony was co-founder of NYCwireless, a pioneer in the community broadband movement.

Anthony's first book, [Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia](#) is published by W.W. Norton & Co in 2013.

The Tortoise Needs to Cross Many Chasms

Michael L. Joroff

Champions of the 'smart cities' movement promise the proverbial rose garden to cities, but more often than not deliver only a few stems—certainly not the advertised benefits to all aspects of civic and economic life. This has given rise to a lament of frustration. We find less reason to be disappointed when we shift our gaze away from those cities dubbed as “smart” and look generally at how digitally empowered technology has been inserted into every aspect of business, civic, institutional and government activity, with transformative if not disruptive effect. This is happening across economic groups in emerging as well as developed economies; driven top down and bottom up. What has been achieved touches on fundamental improvements of daily life (distribution of food and water) as well as the trivial (learning what a friend is doing at any one moment); has transformed business (from the bricks and mortar marketplace to the virtual market space); and changed manufacturing processes (from mass production to customised). And the delivery of many civic services have been improved (for energy distribution and traffic control.) But these many achievements are widely distributed, making it difficult to see their total impact.

There is still reason for disappointment because even the most beneficial of these and other accomplishments have not been adopted as broadly or as rapidly as anticipated. They are, instead, caught in what Geoffrey A. Moore describes as the perilous (and most often inevitable) chasm between the state of early innovation and widespread adoption.¹

1. Geoffrey A. Moore, “Crossing the Chasm: Marketing and Selling High-Tech Products to Mainstream Customers” (1999), Capstone

2. Evgeny Morozov, “To Save Everything, Click Here: Technology, Solutionism, and the Urge to Fix Problems that Don’t Exist (2013), Allen Lane

3. Amital Etzioni “Human Beings Are Not Very Easy To Change After All” (1972) *Saturday Review*, pp. 45-47. Reprinted in the *Congressional Record* (1972), pp. S10274-S10275; reprinted in *Annual Editions Readings in Social Problems* ‘74/’75 (Sluice Dock, Guilford, Ct.: The Dushkin Publishing Group Inc., 1974), pp. 203-206. Americas about the creation of 21st Century industry clusters and innovation districts.

A deeper sense of disappointment has been among those whom Evgeny Morozov describes as “technological optimists.” These, he notes, puzzle over technology’s failure to significantly impact major societal challenges such as income inequality, climate change and resource depletion.² The answer is that these challenges are ingrained in the political, economic and cultural context of society, over which technological prowess has limited influence. This stands in sharp contrast to the many areas of social interaction, commerce and production where technology has had enormous impact. For example, eCommerce is disruptive to the business models of many companies, but hardly challenges fundamental societal norms. Likewise, an app that allows pedestrians to engage the nearest taxicab may annoy cab fleet owners who lose a fare but is hardly equivalent to the core education, crime, or public health issues before a city.

Health care in the United States is a good case where technological optimists have been both pleased and disappointed. What medical technology hath wrought is truly amazing: robotic surgery; pinpoint delivery of medicines to specific genes; and the ability to virtually monitor a patient’s vital signs and remotely release medicine into her blood. Yes, the American health care system may be the most technology-enhanced on the planet; yet it is one of the least cost efficient and effective for lower income citizens in the developed world. Technology has barely grazed the central causes of the system’s malaise, which include political decisions, the power of financiers, and perverse incentives for hospitals and doctors. Change in these domains will come very slowly. Sociologist Amital Etzioni once observed that the pace of fundamental societal change ranges somewhere between “slow and crablike.”³ Technologically enabled data systems that make

transparent the procedures and outcomes of medical care do push change in the American health care system to tortoise speed.

We should not underestimate the benefits of technology that effectively manage traffic flows and energy loads; monitor and proactively react to changing levels in water basins, rivers and ocean fronts; and otherwise make our cities work better. And we should celebrate cities that provide the technology backbone that enables corporate and citizen made applications that improve education, public service delivery and allow people to form social communities of value to them. Here, we can bet on an increasingly rapid rate of development and adoption over the next decade. Technology enabled applications that make the consequences of public and private decisions transparent and help diverse groups find common cause will also grow rapidly, but the smart money about how these will influence the rate of change of fundamental societal issues will be on the tortoise.

Michael L. Joroff

Michael L. Joroff served for many years as Senior Lecturer and Director of the Laboratory of Architecture and Planning at the Massachusetts Institute of Technology. His research focuses on city-making for the future, and his practice helps cities to start playing out that future now. He advises cities in Asia, the Middle East, Europe and the Americas about the creation of 21st Century industry clusters and innovation districts.

Recuperating the Smart City

Adam Greenfield

Over the past half-decade or so, we have seen a premature consensus formed around the desirability of something called “the smart city.” Rather than referring to any general conception of the potential networked informatics have when deployed in the urban terrain, I think of “the smart city” as a specific rhetorical move within a much larger space of potential. To be precise, it’s almost exclusively a discourse about the instrumentation of the urban fabric and the quantification of municipal processes, specifically for ease and efficiency of management.

Very fortunately, however fervently some may labor to portray this as a natural or neutral stage in the evolution of human habitation, it is but one selection from a sheaf of available possibilities. There are others. The same ensemble of technologies that undergirds the smart city can be used in profoundly different ways, and turned to much more fruitful ends.

For example, that ensemble might be used to pose questions rather than deliver sterile “solutions.” Consider that the same infrastructure of data capture, visualisation and analysis that feeds something like IBM’s Rio de Janeiro Intelligent Operation Center¹ can be harnessed by citizens for their own use and edification - used by them to raise issues of equity in the distribution of municipal resources, and to open up other questions of power and access.

This end cannot be achieved without concerted and ongoing struggle, and it will surely be resisted by every institution whose otherwise unimpeded authority is opened to challenge in this way. In fact,

1. IBM’s Rio de Janeiro Intelligent Operation Center: <http://www-03.ibm.com/software/products/us/en/intelligent-operations-center/> (accessed 04.10.2013)

it is already clear that such institutions understand perfectly well what is at stake: after a technically-savvy citizen recently used its own release of data to determine that the Atherton (CA) Police Department was most likely conducting illegal racial profiling on drivers, for example, the city simply withdrew public access to that dataset. But if we are to embrace ubiquitous data collection and the other technics of computational oversight, we must do so under the condition that they be placed at the full disposal of an engaged citizenry, with the understanding that they will be used to provoke debate rather than forestalling it.

Ensuring open access to this data also happily frees it to serve the needs of the “autocatalytic city” the Rockefeller Foundation’s Benjamin de la Peña describes, a place where supply adaptive processes are founded on accurate, real-time local intelligence, citydwellers are empowered to respond appropriately to highly dynamic conditions, and emergent urban order is produced from the bottom up. Despite the fact that it is how hundreds of millions of human beings wrest livelihood from their environment, and has even been characterised as “the default mode of urban development,” this praxis of everyday survival goes almost entirely unrecognised in the contemporary smart-city literature. It should hardly (but apparently does) need to be said that we ought to devise technological frameworks that support this process of self-organisation rather than undermining it.

And this, in turn, would be a vital step toward a planet which is urban not only in name but in affect and outlook. The sociologist Saskia Sassen speaks of “urbanising technology,” by which I understand her to mean a conscious practice of design for the qualities city living reliably seems to generate in its adherents, wherever on Earth they are found and in whatever epoch of history we

encounter them. Rather than dedicating ourselves to enhancing the nominal intelligence of cities, then, perhaps we ought to invert the premise, and ask rather what kinds of technological intervention might support the emergence of intelligences, subjects and subjectivities we would recognise as distinctly urban:

- How might we leverage the potential of data-gathering, analysis and visualisation tools to improve a community's sense of the array of challenges, risks and opportunities facing it, and support it in the aim of autonomous self-governance?
- How might we use the armature of available networked technologies to further the prerogatives so notably absent from the smart-city paradigm, particularly those having to do with solidarity, mutuality and collective action?
- How might we inscribe a robust conception of the right to the city in all of the technological interventions proposed, including but not limited to those intended to enhance personal mobility, citizen engagement, and processes of (individual and collective) self-determination?
- And what alternative conceptions of technology in the urban everyday might support the open, tolerant, feisty, opinionated character we associate with big-city life - above all, that quality variously described as canniness, nous or savoir faire?

The "smart city" doesn't begin to speak to these questions, nor has it ever really pretended to. And yet these are the questions we most urgently need to answer if we're ever to find a resonant place for networked technology in the cities of the 21st Century. Only by doing so can we ensure that the conditions of life are not determined solely by

technological capacities - let alone the perceived needs of the vendors of technological products and services - but remain profoundly informed by the values and processes that have enabled cities to serve as vital engines of opportunity, platforms for personal reinvention and expressive creations in their own right for over seven millennia. We know that cities everywhere are always already smart, and that their intelligence resides in the people. Our task as designers is finding out how best to harness that intelligence.

Adam Greenfield

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What's so smart about the Smart Citizen?

Mark Shepard and Antonina Simeti

What happens when the Smart City turns out to be not that smart? Large-scale urban development projects such as *Masdar City* in the United Arab Emirates, Songdo, South Korea or *PlanIT Valley* in Portugal exemplify the push by global ICT companies in consort with real estate developers and government agencies to build cities from scratch outfitted with so-called smart urban infrastructure. In an age of Big Data, some suggest, we have the opportunity to connect, aggregate, analyse and integrate information about the urban environment in ways that enable us to better visualise, model and predict urban processes, simulate probable outcomes, and lead to more efficient and sustainable cities.¹ Often top-down and centralising, this approach promises to optimise the distribution of services and maximise energy efficiency, making cities more livable, sustainable and competitive.

While this approach perpetuates 20th Century strategies that gave birth to cities such as Chandigarh and Brasilia, the critiques of tabularasa urbanism do not need repeating here. We've long known urban life is not circumscribed by instrumental concerns for optimisation and efficiency. More problematic is how this approach promotes a technocratic view of the city and urban development, the corporatisation of civic governance, and the dependence on proprietary software, systems and services that leads to a form of municipal technological lock-in.² The market for Smart City technology is projected to reach \$20 billion by the year 2020.³ IBM established its Smarter Cities program to specifically target

1. See Hancke, de Carvalho e Silva, and Hancke Jr, "The role of advanced sensing in smart cities," *Sensors* 13, (2013) 393-425; Schaffers, Kominos, Pallot, Trousse, Nilsson, and Oliveira, "Smart Cities and the Future Internet: Towards Cooperation Frameworks for Open Innovation," In Domingue et al. (Eds) *Future Internet Assembly*, LNCS 6656, (2011) pp. 431-446; Batty, Axhausen, Giannotti, Pozdnoukhov, Bazzani, Wachowicz, Ouzounis, and Portugali, "Smart cities of the future." *European Physical Journal Special Topics* 214, (2012) 481-518.

2. Kitchin, Rob, "The Real-Time City? Big Data and Smart Urbanism," *Smart Urbanism Workshop*, Durham, UK (July 3, 2013). Available at SSRN: <http://ssrn.com/abstract=2289141> or <http://dx.doi.org/10.2139/ssrn.2289141>

3. Navigant Research, "Smart Cities," 1Q 2013, <http://www.navigantresearch.com/research/smartcities> (accessed 14.08. 2013)

municipal governments with an interest in centralising the control and management of data feeds from diverse city agencies within a single location. A Smart City in a Box (or a control room). Who wouldn't want that?

Contrasting the Smart City paradigm is one that places emphasis on the Smart Citizen rather than on smart technologies. Shifting the focus from technology and the city to the role citizens might play in shaping the urban environment, this bottom-up, distributed approach aims to directly connect people living in cities with information about their local environment, engage them in urban planning, policy and development processes, and solicit their participation in reporting conditions and taking action to affect positive change. Network technologies afford forms of organisation that make possible citizen-led initiatives capable of competing with the traditional planning mechanisms of municipal governments. By focusing on people - not technology - as the primary actors within the system, this approach aspires to foster new forms of participatory planning and governance, where social and cultural factors are emphasised over proprietary high-tech solutions with big price tags.

Focusing on Smart Citizens would appear to be a compelling alternative to the technocratic determinism of the Smart City model. The agility of bottom-up and distributed strategies enables affecting change rapidly at far lower costs than large-scale urban infrastructure projects. Yet challenges at the level of policy and regulation arise when one attempts to scale local solutions to larger urban systems, where interoperability between different systems and the development of open standards for sharing data between them become paramount. Things get murkier when we consider whom we are referring to as Smart Citizens. Does leveraging social media

and networked information systems really broaden participation, or merely provide another platform for proactive citizens already more likely to engage within the community? What barriers to entry - cultural appropriateness, technological fluency - are embedded in the design and implementation of these citizen - led initiatives? What are the incentives to opt-in? What new and unlikely citizens might be brought to the table, and how might they be engaged?

Finally, we have to ask what it means to call a city or its citizens “smart” in the first place.⁴ The term “smart” has been popularized by marketing executives of large technology companies, and it is hard to argue with their logic: who would want to live in a “dumb” city, or to be a “dumb” citizen? Embedded within the popular notion of the word “smart” is the idea that the optimisations and efficiencies these technologies promise will inevitably make for a better life. Maybe, maybe not, or at least: neither always nor everywhere, and rarely for everyone. As Bruce Sterling comments in a response to Dan Hill’s essay *On the smart city; Or, a ‘manifesto’ for smart citizens instead*⁵:

4. Haque, Usman, “What Is a City that It Would Be ‘Smart’?” Volume #34: City in a Box (2012) 140-142

5. Hill, Dan, “On the smart city: Or, a ‘manifesto’ for smart citizens instead,” City of Sound, (February 1, 2013) <http://www.cityofsound.com/blog/2013/02/on-the-smart-city-a-call-for-smart-citizens-instead.html> (last accessed August 14, 2013)

6. Sterling, Bruce, “Dan Hill, ‘Essay: On the smart city; Or, a ‘manifesto’ for smart citizens instead,” Beyond the Beyond, Wired (February 3, 2013) http://www.wired.com/beyond_the_beyond/2013/02/dan-hill-essay-on-the-smart-city-or-a-manifesto-for-smart-citizens-instead/ (last accessed August 14, 2013)

*“After reading this I feel that I understand myself better: I like *other people’s* cities. I like cities where I’m not an eager, engaged, canny urban participant, where I’m not “smart” and certainly not a “citizen,” and where the infrastructures and the policies are mysterious to me. Preferably, even the explanations should be in a language I can’t read. So I’m maximizing my “inefficiency.” I do it because it’s so enlivening and stimulating, and I can’t be the only one with that approach to urbanism. Presumably there’s some kind of class of us: flaneuring, deriving, situationist smart-city dropouts. A really “smart city” would probably build zones of some kind for us: the maximum-inefficiency anti-smart bohemia.”⁶*

Bruce Sterling

Unfortunately Sterling's call for a temporary autonomous zone⁷ for smart city dropouts ultimately leads to the Smart City ghetto. In the end, both the Smart City and the Smart Citizen result in the same rhetorical paralysis. Change seldom arises from purely top-down or bottom-up systems and processes, and pitching each paradigm in opposition to the other simply refies their shortcomings. The more successful integrations, exchanges, and entanglements between technology and urban life will most likely take shape though far more subtle and nuanced hybrids than these paradigmatic polemics promise.

7. Bey, Hakim, "T.A.Z. The Temporary Autonomous Zone, Ontological Anarchy, Poetic Terrorism," *Autonopedia* (1985)

Mark Shepard

Mark Shepard is an associate professor of architecture and media study at the University at Buffalo, The State University of New York, where he directs the Media Arts and Architecture Program (MAAP) and co-directs the Center for Architecture and Situated Technologies (CAST). His research investigates contemporary entanglements of technology and urban life. He is co-editor of the Situated Technologies Pamphlets Series and editor of Sentient City: ubiquitous computing, architecture and the future of urban space, published by MIT Press. His work has been presented at museums, galleries and festivals internationally, including the 2012 Venice International Architecture Biennial, the 2011 Prix Ars Electronica, Linz, Austria, and the 2009 International Architecture Biennial Rotterdam.

Antonina Simeti

Antonina Simeti is an urban planner with professional experience in program development, design strategy and public policy. She is committed to creative solutions that sustain the economic and environmental health of communities, and supports small-scale, place-based interventions that broaden community participation. Towards that end, she has worked with a range of stakeholders including institutional and business leadership, government, community organizers, designers and educators. Ms. Simeti is currently the Director of Planning and Implementation for the New York City Community Learning Schools Initiative where she works to transform New York City public school buildings into community service hubs. Ms. Simeti holds a Master's degree in City Planning from the Massachusetts Institute of Technology.

Networked Specifism: Beyond Critical Regionalism

Carlo Ratti, Matthew Claudel, Antoine Picon, Alex Haw

In 1961 the French philosopher Paul Ricoeur foresaw the virus: 'Everywhere throughout the world, one finds the same bad movie, the same slot machines, the same plastic or aluminum atrocities, the same twisting of language by propaganda.'¹ Globalization is synonymous with universalization: a diaspora of duplicate detritus; an inescapable extended family of the ever-bland and over-familiar. Architecture, too, has succumbed to the plague of parrotism, peppering its universe with multiples of the anonymous generic and the facsimile signature.

Thirty years ago, Kenneth Frampton's seminal essay on "Critical Regionalism"² - also opening with a lengthy quote from Ricoeur - offered a path out of the Modernist morass. It championed the genius loci of place as a key generator in shaping modern architecture, reconnecting design with cultural and natural forces. Its strategy was "to mediate the impact of universal civilization with elements derived indirectly from the peculiarities of a particular place," finding "inspiration in such things as the range and quality of the local light, or in a tectonic derived from a peculiar structural mode, or in the topography of a given site." It aspired to be both global and local.

Critical Regionalism had a noteworthy - if time - contextual - impact, providing a useful lens to engage and weave together many experiments of the late-20th Century and equipping a new generation with fresh inspiration. Yet its propulsive force quickly evaporated. Ultimately it was a victim of its own success; its local specificity diluted by the generic globalism of its most successful

1. Paul Ricoeur, "Universal Civilization and National Cultures" (1961), in *History and Truth*, pp. 276-7

2. Kenneth Frampton, "Towards a Critical Regionalism: Six Points for an Architecture of Resistance", in Hal Foster, *The Anti-Aesthetic: Essays on Postmodern Culture* (1983), pp. 21

3. Rem Koolhaas, "Bigness, or, The Problem of Large" (1994), in *S M L XL*, pp. 494-517

4. Christopher Kelty, *Two Bits: The Cultural Significance of Free Software* (2008) pp. 3

proponents, as they began building - that is, self-replicating - internationally. Critically Regionalist DNA began to unravel the moment it was reproduced, its earlier scrutiny of the minutiae of place brushed over by the starchitect's worldwide gaze, culminating in the Koolhaasian vision of an architecture whose "subtext is 'fuck context'".³

But context, in the digital age, is everything. URLs, IP locations, geo-location, ubiquitous remote sensing, and the emerging 'internet of things' all affirm the renewed centrality of place itself within the boundless gaping geographies of virtual and parallel worlds. The connective power of the web has led to the rise of extraordinary new ecologies and micro-niches that decades ago seemed impossible amidst the monocultures of an ever-homogenising public realm. What emerges from this revolutionary moment in time is a contemporary revision of Frampton's Critical Regionalism: a 'Networked Specifism' - where ideas and relationships, projects and cities all arise from intimate collaborations across ubiquitous distributed networks. New places of intimacy and exchange - places without the restrictions of physical space - are carved out of an aether.

Like Critical Regionalism, Networked Specifism favors presence over appearance, shunning the seductions of visuality in favor of the virtual, digital, intellectual and transcendental, and moving beyond Frampton's merely haptic, tactile connectivity. It eschews the serendipities of geological strata and quaint dapples of light in favor of human ideation and collaboration.

In recent years, complex scientific analysis has shown that networks of human interaction are locally grounded, centering on what Christopher Kelty, an anthropologist of technology, describes as a 'recursive public' - an open community that is both a result and a generator of networks.⁴

New fields like ‘theoretical ecology’ and ‘network analytics’ are emerging across disciplines to provide meta - analysis of the increasing cross - pollination within and between those disciplines themselves, addressing the fluid interface of the network and its constitution, propagation, and valorisation.

Both professional and amateur worlds have been radically disrupted by hyper - networking and cloud connectivity - whether as atomised networks of design professionals using synchronised digital tools to work together from across the globe or newly empowered citizens embarking on digitally - enabled participatory processes. Global cities that once seemed like they might become as sterile as the chain restaurants that filled them have suddenly rediscovered their power to speciate and provoke radical differentiation. Place is nourished by each tracked local footfall and each mote of mobile data, marrying ubiquitous systems with ultra-local feedback. Like the world’s most commonly used operating system, Linux, Networked Specifism is both local and global, human and mechanistic, anthropocentric and ecological, separated yet intertwined by its various actors and agents, all enmeshed in an unprecedented collaborative platform of vibrant exchange, coexistence and coproduction.

Carlo Ratti

An architect and engineer by training, Carlo Ratti practices in Italy and teaches at the MIT, where he directs the SENSEable City Lab. Ratti has co-authored over 200 publications and holds several patents. His work has been exhibited at the Venice Biennale and MoMA in New York. At the 2008 World Expo, his ‘Digital Water Pavilion’ was hailed by Time Magazine as one of the Best Inventions of the Year. He has been included in Blueprint Magazine’s 25 People who will Change the World of Design, Forbes Magazine’s People you need to know in 2011, and presented at TED 2011.

Matthew Claudel

Matthew Claudel studied Architecture at Yale University. He has presented at TEDx, designed and authored several books, completed architectural projects in Tokyo and St. Kitts, and designed several pieces of furniture. His work has been published in the Architectural Review, the Yale Graduate Retrospecta, Fritz Hansen, and featured in exhibitions at Yale. He was the recipient of the Sudler Prize—the Yale’s highest award for the creative and performing arts. He is currently working at MIT’s Senseable City Lab, focusing on design, writing, curation, and media in the contexts of architecture and urbanism.

Antoine Picon

Antoine Picon is the G. Ware Travelstead Professor of the History of Architecture and Technology at Harvard Graduate School of Design where he also co-chairs the doctoral programs. He has published numerous books and articles mostly dealing with the complementary histories of architecture and technology. Picon’s 2010 Digital Culture in Architecture proposes a comprehensive interpretation of the changes brought by the computer to the design professions. His most recent book Ornament: The Politics of Architecture and Subjectivity deals with the relation between digital culture and the “return” of ornament in architecture.

Alex Haw

Alex Haw is director of the award-winning UK art/architecture practice atmos. Their work spans the scales and senses, from furniture to masterplans, aimed at mind & body. They create meaningful, pleasurable, immersive environments and experiences, merging sculptural ergonomics, innovative fabrication technologies and digital mapping, exploring the connectivity of people to their place in the world. Haw graduated with a Fulbright from Princeton and a 1st from the Bartlett, and has taught Masters Studios at the Architectural Association, the Royal College of Art and TU Vienna. He runs Latitudinal Cuisine, writes widely and played the lead psycho in Chris Nolan’s 1st feature film, Following.

To Know Thy City, Know Thyself

Anthony Townsend

Since the dawn of modern urban planning in Britain at the end of the 19th Century, there has been a tension between place-making and city-making. And it is a critical tension we must understand if we are to expand the role of citizens in building better cities with information technology.

The 20th Century history of urban planning is replete with grand visions of vast, idealised cities. One of the most original thinkers was Patrick Geddes (1854-1932). Geddes' approach to city-making derived from the bottom-up, from individual actions. His writings and speeches argued that only full citizen participation in addressing urban problems would work. He believed that the mass urbanisation of the late 19th Century had disconnected people from their own history. In order to participate effectively, citizens had to learn the history of the city-region. To teach them, he built a civic immersion center, the *Outlook Tower* in Edinburgh, Scotland, where his massive survey of the surrounding metropolis was put on display.

Geddes advocated shifting the focus of intervention from grand civic works and idealised plans to small-scale place-making. He also showed us how to do it. Instead of clear-cutting slums, or scooting off to the countryside to establish "Garden Cities" like his contemporary Ebenezer Howard, Geddes employed a technique of "conservative surgery" buying up old tenements in central Edinburgh.

Geddes was showing people that if they gained understanding of the city as a complex system, the ways in which they might directly and locally contribute to its revitalisation would be clear.

There are hints that this process is happening in our own cities today. In the United States, a mounting body of evidence suggests that the better part of an entire generation of youth are saying no to automobiles and suburban sprawl in favor of smart phones and transit-based urban living. A compelling narrative about auto-dependency, environmental and individual health, and diversity and culture has firmly taken root. An understanding of the complex demands of the big picture is driving individual action, just as Geddes hoped.

But just as we may be winning the rhetorical battle over the planning failures of the industrial city, a new paradigm for city-building is taking over. Information technology is the primary enabler of our schemes for smart cities. So simply responding to the consequences of past decisions is not enough. We need to understand the implications of the choices we are making now about the shape of the future city.

It is difficult to see the consequences of decisions about smart technology. The stuff of the smart city is literally invisible and usually illegible to the layperson. It is hidden and privately-held. It is unimaginably complex, and its impacts are often subtle, indirect and dynamic. But just as we needed to understand the dynamics of sprawl to understand our own role in mitigating it, we need to understand the unintended consequences of digitalisation to avert similar mistakes.

In Geddes' day, the urban world was being reshaped to a great degree by disruptive technologies - steam power, electricity, telephones and telegraphs - were large-scale and highly centralised. And so, giving the individual the knowledge and tools to assess and respond to big external forces made sense.

The urban revolution we are experiencing today is playing out in the opposite direction. Today, it is the rewiring of how we interact with each other, not the imposition of command-and-control systems from above, that is driving change. If Geddes were alive today, I wonder if he would advise us, instead of looking at the city to understand the city, we start by knowing ourselves - because the nature of the urban individual, and their role in urban dynamics is changing because of technology.

Think about it this way. For Geddes, full civic participation in city building was merely a duty, its goal to incrementally repair the city. The challenge was so hard, it wouldn't be met without every last person pitching in. Today, grassroots efforts to reshape cities are actually trying to change the ways things work at a local level, amongst people, to create new (healthier, greener) systems. They are about change and reform, not just aggregation. Our duty as citizens is not to understand the lay of the land, but the process by which new kinds of interactions at the small scale add up to emergent large-scale phenomena of revitalisation.

But where is our Outlook Tower?

I believe it lives in our pockets. Take out your smart phone and look at it. These devices are both a new lens on the dynamic life of the city around us, and the remote controls we can use to activate the world at a distance.

So as you peer into that phone of yours, consider spending some introspective moments thinking about your own behavior and how it impacts the world that you are ignoring around you. Devote yourself to a meditative reflection on the city, the systems of systems around you, the observations you and your devices make, and the responses it provokes. For, by understanding the invisible fields of awareness and action that emanate from our

own bodies and minds, and how the city responds, we might grasp a greater understanding of the larger whole, and our ability to tend it for the betterment of all.

Anthony Townsend

Anthony Townsend is an urban planner and forecaster whose work focuses on urbanization, ubiquitous computing and technology-led innovation and economic development. He holds posts as Research Director at the Institute for the Future, an independent research organization based in California's Silicon Valley, and Senior Research Fellow at New York University's Rudin Center for Transportation. Anthony was co-founder of NYCwireless, a pioneer in the community broadband movement. His first book, Smart Cities: Big Data, Civic Hackers, and the Quest for a New Utopia is published by W.W. Norton & Co.

The City with 20 Million Brains

with apologies and in homage to Italo Calvino

Benjamin de la Peña

Cities & Memory

Old, but not as ancient as other cities, Sophia counts her years in centuries not millennia. She squats, a city 20 million strong, astride a river that empties into a deep bay. Sophia was an outpost for various empires, conquered, re-conquered and conquered again, a holdfast to guard the straits and control the interior. Few warships visit her now, the armadas were replaced by merchant marine ships loyal to no standard, only waiting their turn to feed or disgorge on her docks.

The city kept outgrowing the series of walls built by her conquerors: the first wall for the fort; the second for the palace; the third to protect the cathedrals; the fifth to shelter the bazaars and the brahmin mansions. She jumped past the invisible borders inked on the maps, ate up the fields to bridge the river in nine places; her skirts sprawling into the landscape, first to pull her neighbours into her orbit, then to swallow them whole. The older women still say they are from Thelxinoë, Aoedē, Arche, and Meletē but to the young and to the traders and sailors it is all Sophia now.

Her streets are unruly, like the matted hair of a mongrel; a million vendors collide with ten thousand carts and rickshaws; trotros and motodubs by the hundred thousands weave and jostle with autobuses and carriages to cross her bridges. She has few markers to guide the stranger, her landscape disorients; skyscraper overlooks slum, marble columns strive to raise mansions above

the crowded shacks where few of the brahmin dare but where the waste pickers and the head porters and the mercenaries find their beds. The Bean Counters do not visit the slums, they have no count of the shacks or the stores or the children; they fear the branching streets will trap them like the offal of some rotting leviathan. The vendors and the rickshaw pullers know their way through the bifurcations and recursions and will ferry you from the Bridge of Angels to the Bridge of Soldiers without once entering the outer walls, scurrying through secret lanes that are in no city maps.

Cities & Desire

There are grand, sunlit pavilions that use fountains to cool the rich wives as they buy silk from other lands, but these are outnumbered by souks and street corners where Sophia's poor buy and sell everything under the sun. Anything can be had and anything can be haggled. Money is Sophia's lifeblood - a shekel, a lira, a peso - it doesn't matter, it is all legal enough tender here. Every space is space to seek out a living if the constables are paid or are not looking or are paid not to look. The unpaved lanes flow with the money that holds up the skyscrapers.

The viziers and grand viziers in their towers have frowned on it all. "A city so big, so powerful should be grand! It should be orderly," they all say. "It must read well on a map and communicate our intentions in green and concrete and glass."

More than once they have roused themselves enough to get the Bean Counters and the Planners to redraw the city with straight lines and wide boulevards. In their visions, there are no souks and lanes and rickshaws, only towers and sunlit pavilions; the walls are washed white and the bridges flow freely in a city of parks and manicured hedges.

Cities & Wisdom

The Bean Counters and Builders have tried to make Sophia more legible, more efficient but the slums and souks have thwarted them at every turn, the way they thwarted the forgotten emperors. The generals could never have enough muskets to kettle the millions outside the walls; their power is tenuous at best within the belly of the city.

To tame the Sophia, the viziers have turned to shiny boxes bought from men in dark suits, boxes that breathe and whisper in secret algorithms, equations that promise order, feeding on data from one-eyed mechanical spiders that will crawl the matted city. The spiders measure what they can measure, discard what they cannot. Counting tire and pavement, discarding the aroma of the noodle shops and the bakeries that call passers by to stop for dinner before they head home to their shacks.

They are fragile. Half-blind they stumble on the cracked concrete, they sink in mud and are run over by the trotros; they are stepped on by the pullers who are too busy ferrying strangers. The spiders cannot find the secret lanes and return only with mono-dimensional images of the walls and towers.

The boxes and their spiders cannot capture the 20 million stories that each day, conquer and reconquer Sophia.

Benjamin de la Peña

Benjamin de la Peña is the John S. and James L. Knight Foundation's Director for Community and National Strategy. His work focuses on informing and engaging communities to foster opportunity and better economic integration in U.S. cities. Until recently, he was Associate Director for Urban Development for The Rockefeller Foundation where he worked on issues related to urban dynamics, informal settlements, transportation, information technology, urban science and urban policy. Benjamin conceptualized and led the Informal City Dialogues -a scenario and innovation exercise in Accra, Bangkok, Chennai, Lima, Metro Manila and Nairobi. He also led the Rockefeller Foundation's exploration on the emerging dynamics between Cities, Information and Inclusion. Benjamin is a native of the Philippines and has a Master's in Urban Planning from the Harvard Graduate School of Design and a B.A. in Communications (Journalism) from the University of the Philippines.

“You have the presence of someone” The Ubiquity of Smart

Nancy Odendaal

In 2008 I interviewed a small group of immigrant informal traders (vendors) that had just lived through a tragic spate of xenophobic violence in South African cities. I wanted to know how mobile phones enabled their livelihoods and lifestyles. An attractive young woman with shadows in her gaze described how important text messaging was when staying in touch with friends: “...you have the presence of someone”. Her friend next to her claimed that losing her phone was like losing a limb, especially when it enabled information on what urban sites to avoid during this crisis; cell phones enabled safety.

Walk through any African city and you'll see phone services for sale on makeshift tables and trolleys that could easily be shifted to convenient market spaces and bus terminals. Passers-by can do their weekly fruit and vegetable shopping, purchase airtime and make a quick call if need be. African urbanism has an uncanny tendency to be mobile, fleeting and opportunistic. That observation extends to most marginalised spaces in cities worldwide: the need to connect and communicate on the move. Billboards advertising cell phone services sell the idea of ubiquity: whether on Kenya's highlands or on Accra's busy streets; you are always connected.

The Smart City is dominated by cell phone access. Private individuals use flexible payment options provided through private service providers to access mobile telephony and the Internet without onerous contractual obligations (not possible if you

do not have informal employment). Community services are enabled through less formal to highly informal provision through phone shops and kiosks. New spaces have evolved, as phone shops become meeting places and sidewalk fixtures. Other services and goods accompany these services. In many cases, they have become nodal meeting points.

The flexibility afforded by mobile telephony enables technology appropriation that translates into new 'spatialities'. It starts with the body. The line between the corporeal and public is blurred; a private conversation links the individual to another space while he sits on a small stool in the middle of a physical place designated in front of a shopping center. It extends to community - albeit transient community - as pedestrians go about their business, stopping to make a phone call at a table with an umbrella located on a paved space and then extending the chat to an interchange with the vendor and fellow callers. The space can become private again as booths in shops allow for separation from the bustle of city life. Throughout this experience the ubiquitous availability of mobile telephony and an extended array of services is advertised; the smart city is never far away physically, or from our consciousness.

Bottom up innovation, necessitated by marginal livelihoods, is not immediately obvious but can become revolutionary. *MPesa*¹ in Kenya started as a simple money transfer system intended to reach those excluded by the banking sector. It now enables inter-country remittances and support of remote rural relatives. *Ushahidi*² means 'testimony' in Swahili. What started as an online means to map post-election violence in Kenya in 2008, is now considered a model of collaborative journalism.

1. MPesa: www.safaricom.co.ke (accessed 04.10.2013)

2. Ushahidi: www.ushahidi.com (accessed 04.10.2013)

The smart city is fluid. It reaches beyond city limits. Physical place is important however. Urban space is saturated with reminders of the digital age and has in recent years been the manifestation of digital mobilisation around social justice. How then do we turn such ubiquity into urban opportunity? I argue that digital space needs to be part of a continuum of urban space that stretches from the physical to the virtual. Maintaining the dichotomy of real and virtual spaces is not helpful. This has design implications. Newly defined land uses and uses of open space require urban design that is mindful of expanded livelihoods, that accommodates flexibility and acknowledges the fleetingness of exchange. Public space is required to be multifunctional, connected and augmented, enabling co-presence through use of smart phones. Understanding the spatial manifestations of marginal livelihoods is important. They provide us with clues on the entry points for technology appropriation in urban space.

An engagement with culture, with the signifiers of 21st Century urbanism requires contextually appropriate responses that articulate globally. It starts with how people use space and what the constraints are to an augmented urban experience. It may be as simple as digitally interactive maps measuring commuter traffic for vendors, or business advice centers for small-scale street entrepreneurs located in containers. It could be as obvious as free Wi-Fi that enables free VOIP calls for migrants, information on trading prices for informal vendors. Or seemingly mundane physical interventions of providing seating for those impromptu phone calls, open space that allow for trade, for spontaneous interaction. Smart technologies provide opportunities for decentralised city services on site. Planners and urban designers need to expand their definitions of what public space by engaging the smart city through a situated urbanism. Recent history shows us that the fine line between virtual mobilisation and physical protest

can quickly blur when the city does not work for the masses. 'Having the presence of someone...' virtually, is not enough. The smart city should augment and enhance, because it will never replace the 'real' city.

Nancy Odendaal

Nancy Odendaal teaches urban planning in the School of Architecture, Planning and Geomatics at the University of Cape Town, South Africa. Prior to that she coordinated the Association of African Planning Schools (AAPS), a network of 51 university departments that teach urban planning degrees across Africa, while based at the African Centre for Cities. Her research focuses mainly on the interface between technology, infrastructure and urbanity in cities of the Global South. She is concerned also with the related issue of the relevance of planning education in the context of informal urbanisation and community mobilisation. Nancy is a chartered member of the Royal Town Planning Institute and represents AAPS on the governing council of the Global Planning Education Association Network (GPEAN).

Including Informality in the Smart Citizen Conversation

Lea Rekow

In my work - concentrated in the area of informal settlements (favelas or slums) in Rio de Janeiro - how to conceive of smart citizens has little to nothing to do with technological innovation. Rather, it resides in how to use social inclusion to create more productive, environmentally responsible land use in dense urban areas under extreme stress. If we consider that one in five people currently live in slum conditions, and that by 2050 this figure is expected to rise to one in three, we can see how including informal settlements in the smart citizen conversation is a critical issue to look at.¹

The truth is, inside the favelas, physically interacting with one another remains the most common way to communicate. Digital infrastructure is at its infancy inside informal communities, with SMS the predominant technology used. Yet for the smart citizen movement to gain legitimacy as one that benefits all citizens, it must take into account how technology can be used inclusively across all sectors of society, including informal communities. This kind of paradigm shift means cultivating new approaches, concepts, and organisational strategies that strive to recognise and address any range of social needs. Part of this shift requires that ethics and inequality be brought to the forefront of conversations.

Often people who live in informal communities are marginalised through a lack of literacy, skills, and identification. Many slums do not have formal addresses, a basic requirement necessary to gain access to employment, public utilities, bank accounts, loans, and basic health and education services. As we start looking more closely at the concept of

1. For more statistics on slum populations, see http://www.who.int/gho/urban_health/en/ and http://www.unhabitat.org/en/inp/Upload/1051050_Part%20two%205.pdf

2. For example, the merger of corporate technology and mobile phone access in Africa now enables people to use of regular mobile phones to gain access to the International banking system through the use of text messaging to transfer money. In parts of South America (as recently seen in the World Cup protests in Brazil), SMS, social networking, micro-blogging, and ninja media has emerged as powerful activist tools. And in parts of the Middle East

and northern Africa, as evidenced in the Arab Spring uprisings, basic text messaging helped network enough political resistance to result in political revolution.

For more on how mobile devices are used worldwide, see <http://www.newmediatrendwatch.com/world-overview/98-mobile-devices?showall=1>

3. Map Kibera: <http://www.mapkibera.org/> (accessed 04.10.2013)

4. "Teenagers are Mapping Brazil's slums with Bikes": <http://www.fastcompany.com/3017247/fast-feed/teenagers-are-mapping-brazils-slums-with-kites> (accessed 04.10.2013)

5. CDI, "What in the World are you Doing?": <http://vimeo.com/58425734> (accessed 04.10.2013)

inclusive cities, we need to start asking how together we can create less exploitative employment conditions, access basic education and healthcare, food, water security, affordable and reliable transportation, and safe and desirable public space. We can approach some of these problems through top-down / bottom-up integration. Other problems can be addressed without reliance on formal policy - through informal partnerships, and by thinking about how people can become better equipped to build voice and solve problems.

Basic technologies are now the hands of many of those living in less affluent societies, but are used in ways that are dramatically different to how technologies are accessed, consumed, and thought about in the North.² Technology is currently being used within informal sectors in several ways. Kibera, Africa's largest slum, was GPS mapped in 2009 by local youth.³ This is also happening in other slums.⁴ The "citizen - as - sensor" approach (enabled through the use of mobile apps, SMS-messaging systems and smart phones) is used by the private and public sectors as a means to gather data about informal communities. Companies like LaborVoices gather intelligence, for example, on migrant garment workers, through basic mobile phone usage through an IVR platform. The goal is to provide information about working conditions to workers, and in doing so gather corporate intelligence about the workforce. In another example of how technology is used in slum communities, the Center for Digital Inclusion (CDI) is a NGO that brings technology literacy to residents in poor areas by providing facilities and teaching software basics, online research techniques, and digital video. There are over 700 CDI affiliations in a dozen countries that service almost one and a half million people living in slum areas. Through CDI in Brazil, a group of youth edited video of a rat infestation at a local garbage site and presented it to the Prefeitura. The garbage was removed as a result.⁵ In an educational computer literacy initiative, India's for-profit company, NIIT, sells computer kiosks

to the government to install in schools. The project - *Hole in the Wall* - began in 1999 when a scientist literally knocked a hole in his office wall and installed a computer facing to the other side (into a slum) for kids to play with. Within minutes a group of children had gathered and intuitively figured out how to use it. A pilot project was subsequently funded by the World Bank and more than twenty kiosks were installed over the next five years. The program left no doubt that kids left alone could figure out how to use computers. There are now 500 kiosks installed in some of India's poorest areas. There are many locally-based technology initiatives that work in similar ways.⁶ Additionally, countries like Rwanda that are now crisscrossed with fiber optics are investing heavily in educating their youth in IT. So as technology begins to integrate more into poor communities, we can expect to see more initiatives that bring improvement and opportunity to people's lives. These intersections between bottom-up citizen action, top-down, and local organisational structures, open source architecture, and motivated individuals, show how the challenges of living in a 21st Century slum are currently being tackled.

How the implementation of technologies can impact on concerns involving human and environmental security (for example, public health, food security, water security); and how these problems are entwined with socio-economic and societal structures (for example, economic, corporate, political, civil) is central to how informal citizens and the poor are attached to their environment, and how they can best advance their own solutions to their specific problems. This challenges planners, designers, cultural workers, policymakers, technologists and citizens alike to examine not only the urban environment itself, but the economies that drive urban practices, and the cultures and cultural issues through which they interlace. This is where new forms of organisational structures and approaches that link top-down with the bottom-up initiatives can be most effective. This is where my

6. For example, see <http://rede.metareciclagem.org/> (accessed 04.10.2013)

7. Green My Favela: <http://greenmyfavela.org> (accessed 04.10.2013)

professional focus lies. *Green My Favela*⁷ (GMF) is an informal project that helps problem-solve some of the favela's critical needs by remediating severely degraded urban space. We work creatively with favela residents, community leaders, NGOs, schools, the public sector of Rio, and a range of international partners to build gardens, work on garbage problems, improve water security, promote economic opportunity, and brainstorm about how to implement affordable, renewable energy technologies. Our partnerships help create productive public space where previously there was none.

Whatever their shape, quotidian practices that help foster local solutions and galvanise civil mobilisation may be looked at as the tools of micro-political systems. If these small elements are well conceived and organised, micro levels of information and exchange can impact on informal society by affecting the relationship between macro-political-economic phenomena and micro-social behavior. These energetic forms of social organising become mediators between the macro and the individual to ultimately form landscapes of collective desires — landscapes that are characterised through the politics of self-positioning, regardless of the form of technology used.

Lea Rekow

Lea Rekow is a transdisciplinary researcher/practitioner, curator, and social organizer. Lea was previously Executive Director of the Center for Contemporary Arts in Santa Fe, and founder of Gigantic ArtSpace in New York City. Lea is an advisor to viralnet.net, an associate of Lalutta Media Collective, a member of New York Women in Film and Television, and a member of the Australian Institute of Geographers. She has produced numerous social and environmental impact projects, including projects about the civil war in Burma, the coal and uranium industries on Navajo Nation, and land use issues relating to the military-industrial complex in Utah. Lea founded, and is currently director of, Green My Favela, a land use reclamation project located in the urban favelas of Rio de Janeiro, Brazil.

Critical Design: A Mirror of the Human Condition in the Smart City

Michael Smyth

Cities have always raised particular issues for technologists and researchers. But today, more so than ever, a transformation is taking place in how our cities work. Cities are being laced with sensors, in the form of personal devices and technology embedded in the environment, imbuing physical space with real-time behavioural data. A digital landscape overlays our physical world and is expanding to offer ever-rich experiences. In the cities of the future, computing isn't just with us; it surrounds us, and it uses the context of our environment to enable us in more natural, yet powerful ways.

Technology designers have learnt to put human needs at the centre of their process and if this user-centric approach seems to be so successful, why is the citizen in danger of being ignored when it comes to designing technology for cities? Rather than casting the human at the centre of this vision, today's citizens appear to be given the role of consumers or simply as nodes in the vast network that comprises the city. What is clear is that the urban fabric itself is becoming increasingly reflexive and responsive, and this in turn has numerous implications for the design and experience of cities. The aspiration to be 'smart' is an over-riding desire of many of the world's cities. How this might be achieved is a more complex issue. Currently, this challenge is being addressed from two main perspectives: a top-down systemic approach; and a bottom-up emergent approach. The systemic approach is reflected in large urban development projects addressing infrastructure

issues such as transport, pollution, sustainability and security; they reflect 'big thinking' at an urban level. A counterpoint to the top-down strategy is the bottom-up, human-centred, grassroots approach that is characterised by emergent forms of community intelligence demonstrated by newly connected urban dwellers. Inspired by the open-source movement, individuals, self-organising groups and whole communities are beginning to aggregate the layers of data that increasingly permeate the urban environment in order to create a new generation of products and services. Each of these groups has the potential to inform how we might lead our lives in the future city.

Efficiency alone does not make a city smart. It is the individuals who inhabit cities that have made them smart in the past and, in that respect, the future will not be different. If this premise is accepted, then it raises the question of how and where to look critically at the urban environment so as to eschew the familiar diatribes of the 'smart city' on the one hand, and to avoid the tag of 'apps for hipsters' on the other. How do we seek out those indicators and signs that just might provide insight into our shared urban futures? A possible place to begin is at the marginal zones of the city, the space between and beyond buildings where the seams of data ebb and flow with time and place. While the experience of data might only be fleeting and transient, citizens seek to understand the urban environment through situated interaction.

One approach is to decode the buildings and spaces through observation of the movements and behaviours of citizens. In a similar manner to the way that ethnography has been appropriated by design researchers, this approach has the potential to uncover meaning; it does not identify problems or solutions. An alternative would be to engage citizens directly. But what would be the nature of this dialogue and when and with whom would it take place?

Design plays a central part in our lives. It holds a mirror up to the human condition but it also points ahead to how things could be. It is shaped by the events of today while all the time presenting alternatives to what might be our shared futures. Through doing this, it offers the possibility of making us more critical of our destiny prompting us to question whose futures these really are and what form they might take. Critical Design offers an approach to the study of potential paradigms of interaction in the urban environment. It positions design as a catalyst or provocation for thought rather than the presentation of complete solutions. Here it is a means of opening dialogues. The method centres on the design of tangible future scenarios that humanise the future and reveal needs, values and priorities. For example, the approach has been applied to explore energy production *New Mumbai*,¹ patterns of habitation *Single Town*² and consumption *Corner Convenience*.³ These scenarios scaffold dialogue and aim to encourage us to question our assumptions and preconceptions and thereby open up new possibilities that are grounded in humanity.

While Critical Design has the potential to be forward looking in a way that is not possible by restricting research to observations of current practices, it also places the burden of translation of the subsequent dialogue on the designer. This should not be a surprise, as it is after all the role of the designer to point ahead to the future. But this possible bottleneck of interpretation could limit the potential of the approach to offer new insights that will ultimately mature into design facts. It will be through this necessary step of interpretation that we will better understand our own condition and so gain the necessary insight to inform the emergent objects and environments that will characterise the near and more distant future.

1. Tobias Revell, "New Mumbai": <http://www.tobiasrevell.com/New-Mumbai> (accessed 04.10.2013)

2. KesselsKramer & Droog, "Singletown": <http://studio.droog.com/studio/all/s1ngletown/> (accessed 04.10.2013)

3. Near Future Laboratory, "Corner Convenience" (2012), <http://nearfuturelaboratory.com/2012/03/04/corner-convenience-near-future-design-fiction/> (accessed 04.10.2013)

Michael Smyth

Michael Smyth is the Coordinator of the UrbanIXD project that is funded under the EU FP7 programme and is part of the FET Open initiative. He has worked in the fields of Human Computer Interaction and Interaction Design since 1987 and during that period has published over 60 academic papers in refereed journals, books and conferences. In addition he has had interactive installations exhibited at both UK and international conferences and arts & design festivals. He is co-editor of the book entitled *Digital Blur: creative practice at the boundaries of architecture, design and art*, Libri Publishing.

Smart Cities of the Future?

Manu Fernandez

Back in 2008, when the Smart City movement was taking its first steps, Robert G. Hollands asked for 'the real smart city to stand up'.¹ Since then, there has been an intense and ongoing debate around this subject, as well as a number of projects self-proclaiming their 'smartness'. Great steps have been taken in some leading cities to explore how we turn digital innovation into public service improvements. But we still face the same question: how do we get citizens involved as active agents of this digital urban revolution?

Let us first consider how cities are described in presentations and commercial brochures. Often, the same common perspective is used - the view from above. When an urban system is viewed in this way, only infrastructures and urban form are visible - these renders do not depict people (and the complexity of social interactions) - Smart Cities, therefore, become a matter of managing infrastructures, designing cities from scratch and building an illusory feeling that everything can be under control. A city seems to be just a layout of streets, whilst what happens there remains hidden. This focus is sensible, useful and feasible, but only for certain urban issues concerning infrastructure and utility. In a networked society, citizens demand to play a more active and meaningful role.

Scale and perspective determine what you see and how you see it. From the street level, the intersection of urban life and technology raises issues, fields of knowledge, possibilities and consequences. All of this seems to be irrelevant in the smart city visions dominating the current landscape. They are unable to address meaning in terms of citizenship, politics, conflict, public

1. Robert G. Hollands. "Will the real smart city please stand up?"(2008), City Vol. 12, Iss. 3

2. It is likely you have heard about this project of building a new city from scratch to test new urban technologies, but no people will be living there. CITE, Centre for Innovation Testing and Evaluation is conceived as an urban laboratory to simulate scenarios and collect test data in an environment of zero interaction with users Its envisaged facilities are conceived as a testbed for companies and researchers of new technological solutions to be deployed in cities. This is a good example of how not to understand urban innovation and how citizens can be perceived even as

an annoyance that has to be erased from the equation.

3. Medialab Prado: <http://medialab-prado.es/?lang=en> (accessed 04.10.2013)

4. Code for America: <http://www.codeforamerica.org/> (accessed 04.10.2013)

5. Urban Mechanics: <http://www.newurbanmechanics.org/> (accessed 04.10.2013)

6. Air Quality Egg: <http://airqualityegg.com/> (accessed 04.10.2013)

7. Guifi.net: <http://guifi.net/> (accessed 04.10.2013)

space, etc, - permanent elements of collective life that remain beyond technological sophistication. Pursuing a future of cities² based on the aspiration to predict a whole city will, at some point, need to confront the unexpected - the thing that makes life amazing and is part of the real cities we are living in today.

The best thing about digital technologies and their intersection with urban life is that great movements are already happening and there is no need to wait for others (companies or governments) to build new solutions. It is hard to see them from those top-down visions, as they evolve on a distributed basis. It is hard to see them because they are emerging thanks largely to the gathering of activists, technologists and people concerned with the problems of daily life; sometimes out of the spotlight of the current spectacularisation of smart cities. It is happening in places like Medialab Prado in Madrid, a collective innovation laboratory.³ It takes the form of people coding for social good in platforms such as Code for America,⁴ hackathons and other kind of collective action processes that are boosted by digital technologies. It emerges in collaborative processes between local government departments and citizens to improve public services to deliver beta version innovation.⁵

The smart city becomes real when people can deal with open technologies to build their own public infrastructure for environmental monitoring⁶ or share a community network of wireless connections.⁷ The smart city promises make sense only when citizens become makers and crowdsource manufacturing for the needs of their neighbourhood. Hundreds of cities are making public data open; making it possible for developers, civic hackers and activists to reuse it and thus, broaden public information with new transparency tools. The smart city becomes an arena for smart citizens when we understand

the ways people are engaging using available, locally provided, digital tools. Smart cities are what happens in the intersection of urbanism and art exploration through digital media facades⁸ and other kind of critical thinking interventions in public space⁹ in which citizens engage, build, organise, create and share a common platform - our cities. All these examples illustrate what the renders can not: a growing number of people working in real places, with real problems, to build real solutions, with the technologies we have in our hands. The transformative power of this opportunity is still in its infancy. The way we engage citizens in the development of smart cities starts by acknowledging what is already going on. There is too much focus on yet-to-come promises based on infrastructures and solutions, oriented to solve only government efficiency needs.

However, the rules have changed in the digital era: thanks to open technologies, people can make real things together. But to do so in our cities, community engagement and strong physical connections are still relevant and the mix of digital knowledge and activism is needed more than ever, as is evidenced in the aforementioned examples. The good thing is that this is already happening, just not in the way mainstream visions predict.

8. Connecting
Cities: <http://www.connectingcities.net/> (accessed 04.10.2013)

9. Urban
Prototyping: <http://urbanprototyping.org/> (accessed 04.10.2013)vv

Manu Fernandez

Manu Fernandez is an urban strategist, founder of Human Scale City urban agency (www.humanscalecity.org) and author of Ciudades a Escala Humana blog (www.ciudadesaescalahumana.org). As a researcher and urban policy consultant for the last ten years, he has always been involved in projects relating to local sustainability and urban economies. He is currently focused on three areas: adaptive urbanism strategies to activate vacant sites, the intersection of digital and social perspectives of bottom-up smart cities and, the link of social creativity and local economic development. Manu holds a master's degree in sustainability management and is a graduate in Laws and Economics.

India in 2025

Aditya Dev Sood, Namrata Mehta

In India, ancestral homes in city centers are being torn down to give way to multi-storey apartments, the outskirts of existing cities are being fitted out with gated communities of all shapes and sizes, large tracts of agricultural fields are being bought over to build entirely new cities and the villages that once owned these fields are sprouting single room tenements by the hundreds. All this because it is commonly estimated that 750 million Indians will migrate from rural to urban India by 2025.

While existing cities struggle to cope with such large-scale migration, the new cities, such as those along the Delhi Mumbai Industrial Corridor (DMIC), are being built to harness the power of technology to create sustainable ways of accessing water, energy, education, health, transport as well as safety and security. But, if recent models of development, such as those represented by the 'millennium city' of Gurgaon are to offer any indication of the challenge of building new cities, urban India will have to demand for the adoption of decentralised, systemic and inclusive forms of city governance.

The following illustration presents to you two visions of India in 2025. Each illustrates future scenarios of city dwellers interacting with infrastructure and utilities. We predict that the nuanced differences in how people choose to contribute to their city, as well as society at large, can go a long way in shaping the character of urban India as either Eutrophic or Dystrophic. Perhaps the biggest leapfrog new Indian cities can make is not in fact in the use of technology for sustainable infrastructure, but in its use to bridge the gaps in social inequality.

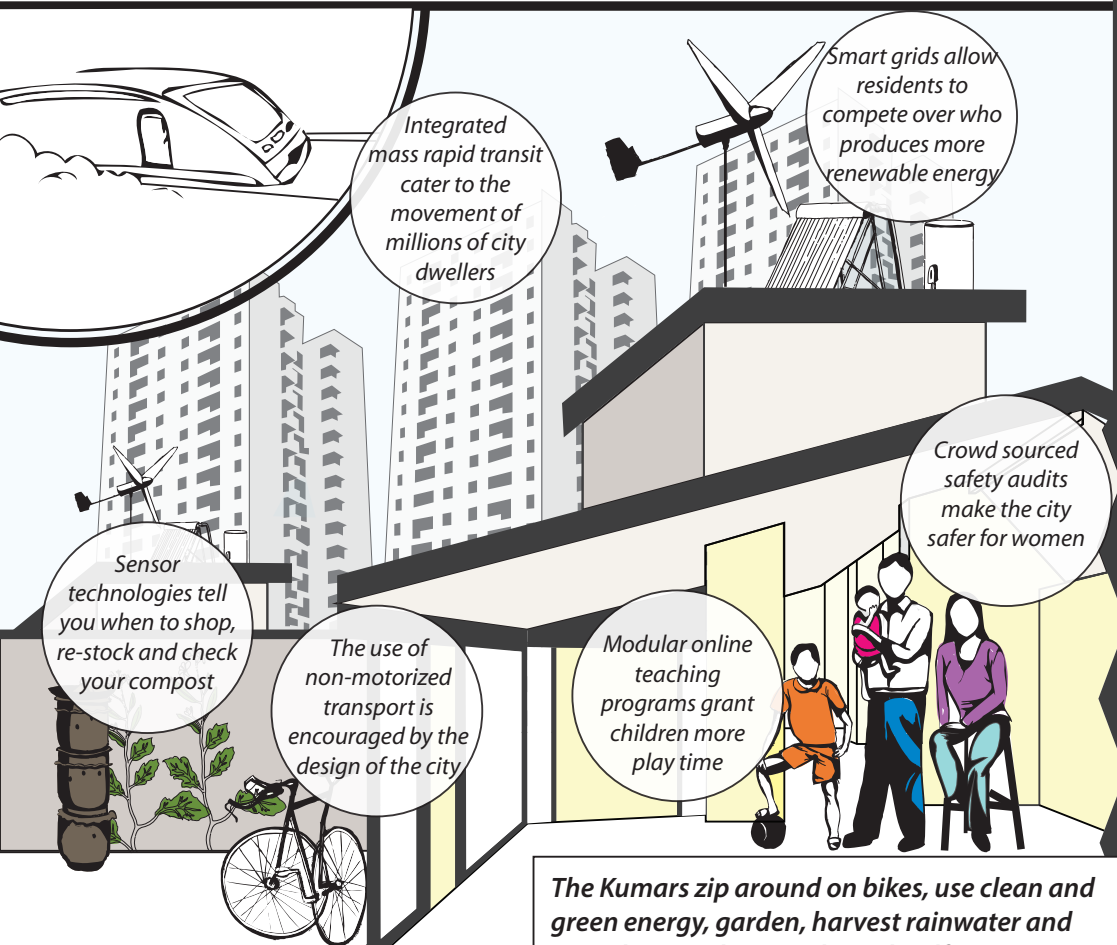
Aditya Dev Sood

Aditya Dev Sood is the Founder and CEO of the Center for Knowledge Societies (CKS), an innovation-consulting firm offering a compelling vision of the central role of design and innovation for emerging economies such as India. He is the chairman of the Adianta School for Leadership and Innovation, and the Bihar Innovation Lab. Dr. Sood is a Fulbright scholar with two doctorates from the University of Chicago and a wide range of disciplinary competencies, gained through a long and diverse education, including Architecture, Art History, Critical Theory, Comparative Literature, Sanskrit Philology, Philosophy of Language, Cultural Anthropology, Social Theory and Political Economy.

Namrata Mehta

Namrata Mehta is Director Innovation at the Center for Knowledge Societies (CKS), where she works closely on technology and infrastructure projects related to mobility, ranging from telecommunication technologies, portable diagnostic devices and transport solutions. Prior to CKS, Namrata developed games as a policy research tool for the agricultural and urban infrastructure sector. In her other life, she is a media artist, creating tools to engage with people about the experiences of everyday urban Indian life. She has an undergraduate degree in Sociology from Delhi University, and a postgraduate diploma in Experimental Media Arts, from Srishti School of Art, Design and Technology.

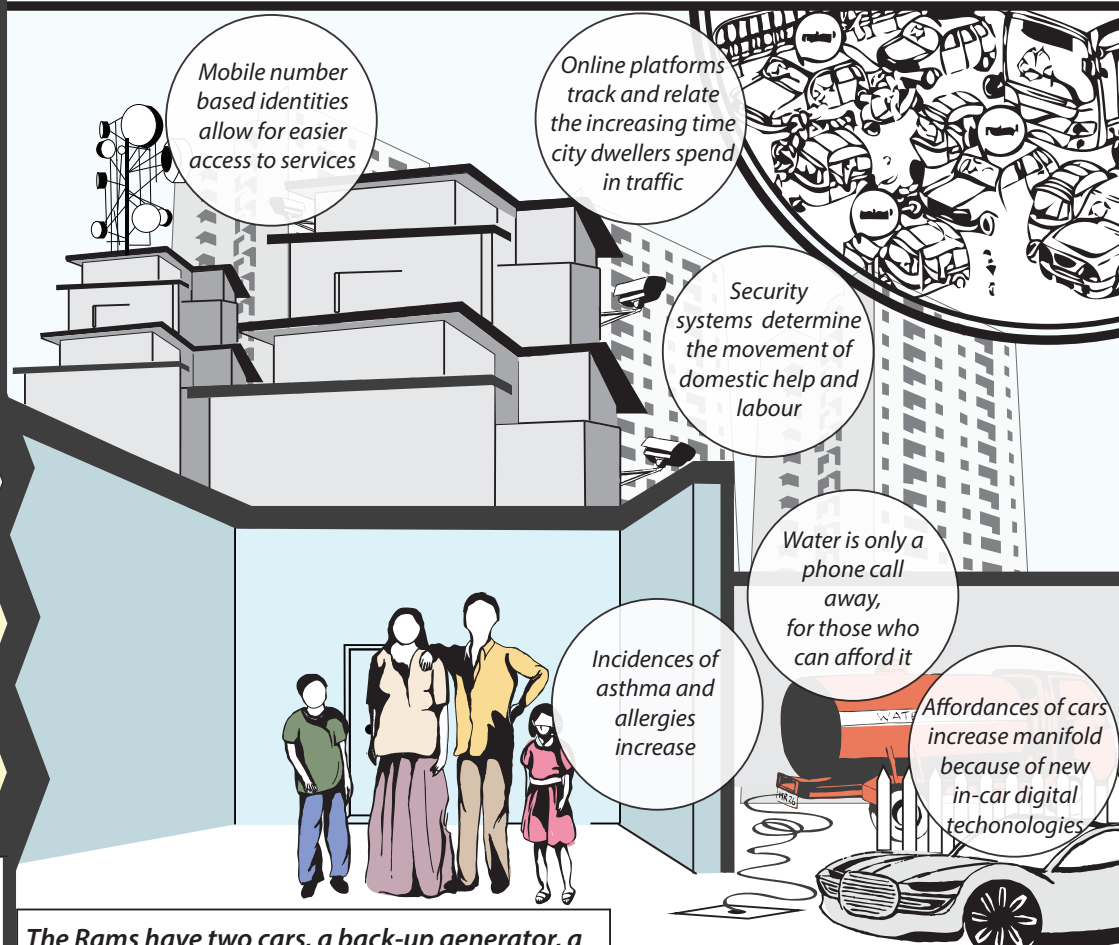
2025 Eutrophia



The Kumars zip around on bikes, use clean and green energy, garden, harvest rainwater and contribute to their residential welfare association.

The choices we make are often made for us years ago because of the degree to which our cities are planned -- or else allowed to rise and sprawl without attention to the systems that shape our everyday life. Governance and systems thinking will make all the difference to how Indians will live in the future.

Dystrophia 2025



The Rams have two cars, a back-up generator, a battery inverter and a dry bore-well. They enjoy watching TV, going to restaurants, and oxygen therapy.

*the state in which an environment has high acidic content supporting little life.

*the state in which an environment is rich in nutrients, supporting dense populations.

Design Rules for Smarter Cities

Frank Kresin

Cities are the dominant and most successful organisations of human endeavour. This intense form of cohabitation has developed over thousands of years, attracting an increasingly larger part of the human population. While they have vibrantly developed in terms of size, density and quality of life, technology has sped up, leading to problems and possibilities that we still have to fully apprehend.

To many contemporary government officials, there is no more silver-lined allure than the mantra of the “Smart City”. Smart Cities are essentially networks of sensors strewn across the city, connected to computers managing vast flows of data, optimising urban flows like mobility, waste, crime and money. They promise to make governance more efficient, and turn cities into safer, cleaner and more enjoyable places. This technocratic rhetoric, that stresses efficiency and control over serendipity and dialogue, might well do more harm than good, since it takes humans out of the loop and turns them into passive rather than active agents.

Citizens, on the other hand, have become smarter than ever; appropriating new technology at an incredible pace. In just over a decade, they have embraced mobile phones and social media, repair cafés and maker spaces, crowd funding and crowd sourcing. The power individuals have to influence others, even on a large distance, is unprecedented in history. While citizens became self-directed, funded and employed, governments often still regard them as customers, or even nuisances in the way of progress.

However, the power balance has changed and it is clear that citizens need their governments and governments need the intelligence and the cooperation of their citizens to function well. This demands a change in how cities are governed. Cities need to (re-)design and implement procedures, services and (technological) systems in ways that acknowledge the new role citizens take. No longer should they be designed top-down, and then poured over citizens without them having an active role in their conception, development and delivery.

Experience in participatory platform design suggests that to guide the design process certain principles are needed. City officials should implement them whenever they devise a new policy, rule or project:

- Your citizens know more than you. Don't coerce or just pretend to listen, but engage in a dialogue about what should be done, and how. Employ violently neutral facilitators that will take power out of the equation.
- Don't separate the design and development process: they are one. Prototypes will make design issues tangible and understandable to the people that participate. Prototype early and fast, engage the stakeholders, iterate quickly and be prepared to start all over.
- Embrace self-organisation and civic initiative, but help to make the results sustainable and scalable. Bureaucracies can never muster the passion and energy that citizens have to start new ventures, but do play an important role in further implementation and scaling. Where possible, become a launching customer.

- Know what you are talking about in the face of technology. If you procure a platform, product or service, have people that built them in the procurement team in leading positions. Never rely on consultants that will sell you more consultancy, not solutions.
- Have binding decisions made at the lowest level possible and actively preach self-governance. No good system was ever built by committee, and no committee ever improved a decision that was made by the people who have to use it.
- Favour loosely coupled, smaller systems over monoliths and mastodons, and use peer-defined standards to glue together the parts. Small systems tend to fail sometimes; large systems fail for sure. Furthermore it enables small, local companies to do the work: they work twice as hard for half the money.
- To raise and deserve trust, build systems based on data reciprocity and transparency. People want to know as much of the system as the system knows about them. Be open of what it captures and who has access, and let the people be in control of their data.
- Reuse existing parts and design your additions for reuse, adding to the public domain and thereby strengthening its capacity to act and learn. Open content, open source and open data will be beneficial to all and “make all bugs shallow”.

The successful application of some of these design rules to governance can, for example, be seen in participatory budgeting, collaborative urban planning and distributed energy production initiatives. Hard evidence is as yet limited. However, experience

indicates that systems, thus designed, will add to the complex city dynamic instead of stifling it. They will help to re-establish agency and trust between the ones who live, work, and raise their children in these cities, and the ones that are assigned to govern and manage them.

Any help on furthering these proposed design rules is highly appreciated – please get in contact. Smart Citizens abound; now it takes Smarter Cities to grasp their potential and build the systems that the 21st Century needs.

Frank Kresin

Frank Kresin is Research Director for Waag Society, institute for Arts, Science and Technology, based in Amsterdam. His background is in Artificial Intelligence and film making, and his interest is in developing technology for societal goals. He was involved at the start of many innovation programmes, amongst them Apps for Europe, City SDK, CineGrid Amsterdam and Code 4 Europe. Frank has spoken, written and lectured on Open Innovation, Open Data & Open Design, Users-as-Designers, Living Labs and Fablabs. He is a regular moderator at the PICNIC Festival, as well as at design and innovation workshops in the Netherlands and abroad.

Smart Citizens need Smart Government

Léan Doody

People want to get involved in shaping their cities. Often the most visible display of people's passion for their immediate environment is a display of NIMBYism or (Not In My Back Yard.) In many cities the only time people get to have any say in their physical environment is when they are presented with a big construction project on their doorstep. A more positive development has been the rise of the citizen hacker. New types of people have become involved and engaged in cities through the open data movement, building new civic services: from transport apps to city dashboards. Citizen hacking is still very much a niche activity requiring specialised skills but it shows that there are new ways in for citizens to have increased agency over their cities.

Innovative applications of city data are often created independently of the state, but they also show the central role of city and national government in making change possible. Government and its agencies have an essential role to play as providers of data, but I would argue that their role goes further. Citizen led innovation will most likely run up against government regulation at some point, particularly where it impacts the physical city. Responsible regulation remains a core function of the state. These are essential roles of government as both democratic representatives of citizens - and key players in an ecosystem of actors effecting change in cities.

Successful change requires an ecosystem approach: collaboration between multiple actors in the city. A recent report we wrote for the

Technology Strategy Board analysing the Future City activity in 29 cities in the UK bears this out. Proposed deployments of smart technologies to address various city issues (e.g. congestion, social care, air quality) all involved various degrees of cooperation between the city, other city agencies, industry, academia and citizens. City government has a key role as influencer and convener of key actors, including citizens, although many cities are perhaps not fully aware of this power.

City government draws this power from its role as democratic representative of the citizens. The role of politics is to manage conflict and balance rights of competing interests. However cities have been slow to engage in the Smart City debate. Technology vendors have driven a Smart City narrative of technology driven optimisation of city operations which prioritises efficiency. While this is important to cities and citizens (most people prefer clean streets to dirty ones, like the buses to run on time and want to be able to easily find parking spots), it ignores other narratives which also important such as economic and social equity. The city leadership, as canvassers of citizen votes, understands this more keenly.

But city government has for the most part not yet effectively harnessed technology to deliver change with its citizens. There is a lack of skills and knowledge of ICT and its potential at the top of most city organisations, so they fear vendor lock-in while also depending on industry for information. Some cities are effectively exploring what smart technologies can do for them and their citizens: Chicago and Boston in the US have both built new types of city organisations that work with citizens and other interests to enable new services and new businesses.

For Smart Citizens to reach their potential to shape their cities, we need city government to change.

This may involve new types of organisation, with a top-down remit, but with bottom-up capabilities and representation as in Chicago. Cities will need to broker relationships, between different actors, but also between citizens-matching need with capability. Cities will need to develop the in-house skills and expertise to work out what needs to be supplied by Big Technology and what can be provided locally. At national level, the UK government made a decision to skill up at central level and the resulting organisation, Government Digital Services, has developed new ways of procuring solutions that avoid dependence on the big systems integrators. City operations may need to become more responsive - or manage expectations: if I report a problem with the street light outside my house, I want it fixed, and to know when it will happen. Cities will need to develop new ways of working with citizens on plans for change as platforms like Spacehive, a crowdfunding site for civic projects become more viable for organising and fundraising for change in public space.

If government is to change, citizens will also have to change how they engage with government and what they expect from government. Smart Citizens need smart government.

Léan Doody

Léan leads the smart cities consulting team at Arup, an independent multi-disciplinary consultancy, advising cities, government, industry and developers on smart city strategy and organisation. She started her career working for a number of Dublin start-ups. After 8 years in software product management she completed an MSc in urban design and policy at the LSE Cities Programme. She then joined Arup in 2002 hoping to apply her software background to urban developments. Current work includes strategy and research for London, Bristol, Edinburgh and Christchurch, New Zealand. She is a member of the BSI advisory board on Smart Cities and a member of the advisory board for Urban1xD.

Open Data and Beyond: How Government Can Support a Smarter Society

Paul Maltby

With the help of technology citizens have the potential to be more informed, connected and engaged with the world around them than ever before. But to realise these possibilities we need to advance the meaning of 'smart' beyond purely connected infrastructure and capture how the citizen can be at the heart of the decisions and services affecting their lives.

Government has a role to play in this. To be smart, citizens must be connected, and on one level this does mean investment in infrastructure. The UK City Deals initiative provides £100 million of investment in super-fast broadband to guarantee rapid online communication in much of urban Britain. With almost 10,000 datasets available on data.gov.uk,¹ and many more on local portals such as the London Datastore,² the UK has also led the drive for releasing government data in usable formats - a raw material for citizen-led innovation in communities. We are still in the early days of innovation, but the applications built using open data continually inspire and astound me, with apps providing everything from real-time transport updates to local health-care information, crime statistics, property prices, and information about schools. A planning application notice pinned to a bus shelter can now be found on a smart phone. When packing for a trip abroad, your tablet can give you foreign travel warnings as they are released.

But despite these positive stories, there remain further, as yet unfulfilled possibilities.

1. data.gov.uk:
<http://data.gov.uk/> (accessed 04.10.2013)

2. London Datastore:
<http://data.london.gov.uk/> (accessed 04.10.2013)

3. The G8 Open Data Charter: <https://www.gov.uk/government/publications/open-data-charter/g8-open-data-charter-and-technical-annex> (accessed 04.10.2013)

4. National Information Infrastructure: <http://data.gov.uk/blog/the-national-information-infrastructure-where-are-we> (accessed 04.10.2013)

5. Open Data Cities and DataGM: <http://futureeverything.org/ongoing-projects/open-data-cities-datagm/> (accessed 04.10.2013)

6. School of Data: <http://schoolofdata.org/> (accessed 04.10.2013)

7. Open Knowledge Foundation: <http://okfn.org/> (accessed 04.10.2013)

8. Open Data Institute: <http://www.theodi.org/> (accessed 04.10.2013)

9. Nesta: http://www.nesta.org.uk/areas_of_work (accessed 04.10.2013)

10. Mozilla: <http://www.mozilla.org/en-US/> (accessed 04.10.2013)

11. 'Make things do stuff': <http://makethingsdostuff.co.uk/> (accessed 04.10.2013)

12. codeclub.org.uk: www.codeclub.org.uk (accessed 04.10.2013)

The UK is leading the world in opening up its data, but there is still more to come. *The G8 Open Data Charter* launched under the UK Presidency earlier this year³ set a new standard of open data by default, and the UK will make this a reality through launching a *National Information Infrastructure*,⁴ an inventory to enable the public to see what data government departments hold and when it will be released if it hasn't been already.

We also need to extend our reach. Data is power, but only if it is being accessed and used. I suspect that many of those who most fully appreciate the possibilities of open government data are those with coding expertise or specialist policy interests. But smart citizenship is too powerful an idea to leave to a select few, and I am a strong supporter of those who are reaching out to new potential users. Alongside the work of FutureEverything⁵ we have the School of Data⁶ from the Open Knowledge Foundation,⁷ new training courses run by the Open Data Institute,⁸ and pioneering work by Nesta to open up the possibilities of open data for campaigning charities.⁹ Alongside this there is a new push to reclaim the UK's lead as a home for coding skills. We have computer science returning to schools, organisations like Mozilla¹⁰ and the Nominet Trust's backing programmes like *'Make things do stuff'*¹¹ to bring digital creativity to a new generation of young people, and the likes of codeclub.org.uk¹² and codingforkids.org¹³ spreading the skills to allow data to be manipulated in innovative ways.

The UK has just concluded its year as lead co-chair of the Open Government Partnership (OGP). Two years into its life, the OGP¹⁴ is demonstrating what can be achieved when governments and civil society groups work together and challenge one another across national boundaries. As we focus on the benefits we expect open data will bring to economic growth and to the reform of public

services in the UK, it is worth reflecting on how this links in with calls from civil society for more power to be put in the hands of citizens through a global push for more open government. Ultimately it is these smarter societies, not just smarter cities, that a steadily increasing number of countries are banking on to deliver both modern, participative democracies and the best chance for future economic prosperity.

13. [codingforkids.org:](http://codingforkids.org/wiki/Main_Page)
http://codingforkids.org/wiki/Main_Page (accessed 04.10.2013)

14. Open Government Partnership:
<http://www.opengovpartnership.org/> (accessed 04.10.2013)

Paul Maltby

Paul is Director of the Government Innovation Group and of the Open Data and Transparency Team in the Cabinet Office, which works to release government data that can be freely accessed by citizens and businesses to help drive the next generation of data-led economic growth, strengthen government accountability and improve public services. Prior to this Paul was seconded to Leicestershire County Council where he worked on schools reform and a programme for commissioning services across different local public bodies. He has been Director of Strategy in the Home Office and began his time in government in the Prime Minister's Strategy Unit.

Internal Activists – Catalysts For Smartness All Around

Katja Schechtner

Within the discussion about Smart Cities and Smart Citizens I have found that one group never makes it into the spotlight: the people working within the institutions that plan, fund, operate and manage cities.

In this essay I will argue that tech-savvy employees within those institutions, who are advocating for a change from within, are a key factor in shaping the current debate about the relationship between Smart Citizens and Smart Cities. Those “internal activists” are acting as translators, catalysts and lobbyists for adopting new forms of and new tools for the interaction between the citizen and her government.

As Smart City concepts ultimately advocate for the integration of a relatively new range of technologies into the urban fabric, they are - by their very nature as information and communication technologies - challenging the established modes of interaction between the people.

Looking at some examples from developing countries in Asia and multi-lateral development organisations, I will briefly sketch which qualities internal activists deem crucial for successfully persuading their employers to open up towards citizens.

New technologies to collect, document, analyse and visualise information about the built space, its use and its management enable citizens to challenge their governments based on a new quality of evidence. Governments, sometimes

1. SPRING: <http://www.spring.gov.sg/Pages/homepage.aspx> (accessed 04.10.2013)

2. Pulse Lab: <http://www.unglobalpulse.org/pulse-lab/jakarta> (accessed 04.10.2013)

3. Next Drop: <http://nextdrop.org/> (accessed 04.10.2013)

4. CAI Asia, Walkability App <https://play.google.com/store/apps/details?id=com.dzo.walkability> (accessed 04.10.2013)

5. I Paid a Bribe: ipaidabribe.com (accessed 04.10.2013)

6. Apps For Asia: <http://www.appsforasia.com> (accessed 04.10.2013)

providing via open government tools the very data that is used to hold them accountable, find it difficult to adjust to this new form of interaction with their citizens. However individuals within a variety of institutions have begun to act as spearheads advocating for new ways to link those (smart) citizens with their (smart) city. Often they are successful by harnessing new technologies and new design approaches to create structures, which are familiar to their organisations. The design innovation unit in *SPRING* Singapore¹ and the *Pulse Lab* in Jakarta, Indonesia² are examples of this approach. Other initiatives develop accountability tools bottom-up, but with funding and knowledge support from employees within the same organisations that are targeted. Tools and services to inform marginalised groups about the availability of much needed utilities (e.g. water availability: *Next Drop*),³ to collect evidence about the neglect of basic infrastructure (*CAI Asia*, *Walkability App*)⁴ or the abuse of power⁵ have been developed within this cooperative settings.

Mike Linfield, former Lead Urban Specialist at the Asian Development Bank, describes how, drawing from his broad formal education, his practical experience and day to day exposure to the requests of the urban poor in the fast growing urban centers in Asia, he was able to persuade his organisation to refocus from the needs of the rural poor towards the struggle of the urban population. Communication and cooperation with other players, either institutional, or NGOs or from the private sector, resulted in funding urban interventions and creating programs like *Apps for Asia*,⁶ which actively engage citizens in interacting with their governments by creating and using new tech-tools.

Asked to name the qualities that he considers key for successful internal activists, Mike Linfield sums up the answers of many of his peers in multilateral, governmental or municipal administrations:

“First you have to have some credibility within the organisation and some idea about the politics of it without getting involved in it. Then, secondly, expertise and interest beyond the organisation to be able to understand what the external issues that need to be addressed are, and third, the skills to go with it. I have degrees in architecture and planning and a PhD in economics. In some sense I span the urban and the finance side. And I am credible because I can talk those languages to a point. And the final thing is just sheer, bloody minded persistence.”

Mike Linfield.⁷

However sometimes the “sheer bloody minded persistent” internal activists, still need to team up with equally determined “smart” citizens from outside the organisation to convince it to accept new technologies as crucial for better services. Patrick Meier, who in 2010 in response to the Haiti disaster developed an ad-hoc crisis map, with a group of nerdy volunteers, which proved to be the superior to anything the UN or other humanitarian organisations were able to provide, recounts how challenged in their status as experts the people working within those institutions felt.⁸ However, he describes how, almost a year after the incident one

7. Mike Linfield, “in conversation with Alexandra Vogl and Katja Schechtner” (2013), Manila

8. Patrick Meier, in conversation with Dietmar Offenhuber and Katja Schechtner in “Accountability Technologies – Tools for Asking Hard Questions” (2013), Ambra V

9. *ibid*

senior UN official came around: ‘Before the panel we talked, and he basically said - “Listen, you are clearly not going to go away, so we have decided to take a constructive engagement approach. Let’s find out how we can work together.” Shortly after that conversation, the UN and OHA got in touch with us.’⁹

This collaboration, which was first supported only by a few UN employees, turned out to be mutually beneficial. Highly experienced humanitarian specialists learned how smart technologies could actually help them to better serve the needs of people, who were struck by disaster, and the Standby Volunteer Task Force benefited from this recognition and was able to offer their help to other institutions.

These examples just highlight a so far neglected part of the Smart City and Smart Citizen debate: how experts within a city’s institutions team up with tech savvy “amateurs united” in order to develop the smart tools and services that will shape urban future life beyond corporate smart city visions.

Katja Schechtner

Katja Schechtner holds a dual appointment with the Asian Development Bank and the MIT Media Lab to create new strategies for large-scale urban mobility and transport technology investments and to lead research projects to integrate qualitative parameters into quantitative urban analysis tools. She has a background in transport, urban studies, management and technology assessment and currently focuses on understanding the potentials of coupling urban infrastructure sectors for more efficient urban investment and operation strategies. Katja’s work is stimulated by her international work experience in Asia, Africa, North America and Europe, she has published two books and numerous articles, as well as exhibited her work at international venues, most lately at the Venice Biennale 2012, where it received a special commendation. Bridging the gap between finance, research and the arts, she also serves as a curator for Mobility and Technology Exhibitions at the Technical Museum and the Museum of Applied Arts, and the ars electronica in Austria. Therefore she travels extensively — and loves it.

Implementing Civic Innovations: A Political Challenge

Mayra Madriz

This is a call for civic hackers, data activists, Gov 2.0 enthusiasts and all those inspired to use the power of technology to promote the public good. It is not enough to come up with better solutions. If we want to succeed at effecting change we must build political coalitions outside our ranks and take an active stand on behalf of change.

We all agree that government can and should be more transparent, efficient, and responsive. Society at large would benefit from infusing government with the best qualities of the startup world: leaner and flexible processes, greater transparency, increased accountability, responsiveness to the needs of the customer/citizen and evidence-based decision making. Our vision of open government is also one of universal and meaningful civic engagement. We are inspired by the decentralised collaboration models and Web 2.0, which demonstrated that people want a voice and will provide valuable input if the barriers to participation are lowered.

In spite of our desire to impact government, many civic technologists continue to work outside the political sphere, underscoring an unconscious belief that government operates as a fair meritocracy where products are adopted on the basis of their intrinsic value.

Self-reliance and independence is a cornerstone of the hacker ethos. We believe that we are responsible for our own destiny. We like to get our hands dirty and develop our own solutions, even if the world is not ready for them. We would rather

fail and own our mistakes, than wait for permission to act. This independent spirit fuels creativity and entrepreneurship, but places a hamper on our ability to have influence on the public domain.

1. Living Labs Global Award: <http://www.llga.org/> (accessed 04.10.2013)

Some of the activities that have galvanised our community are 'civic hackathons' and 'innovation challenges.' These events, in which coders volunteer their time to develop applications are a terrific education and engagement tool, but it is difficult for the concepts developed during a hackathon or to scale. There are some exceptions to the rule: *Living Labs Global Award* (LLGA)¹ provides an effective framework for city governments to crowdsource solutions to key problems. Unfortunately initiatives like LLGA are scarce. Few civic innovation projects that come out from hackathons have succeeded in outlining a formal path from innovation to adoption.

Yes, three coders and a designer can work in a basement for 36 hours and develop an app with the potential of revolutionising public transportation... but having it adopted by government is a completely different story.

We learned this the hard way. Two years have passed since our friends developed the *Smart Muni App* which uses Global Positioning System technology to monitor problems and delays along the system in real time. The technology would substitute the current system that relies on four-channel radio and paper clipboards. The app received the support of the many candidates during the mayoral campaign, but the cash-strapped transportation authority failed to adopt it arguing it lacked the funds to invest on the iPads and run the pilot program. In spite of its value, the application was caught in a bureaucratic limbo.

A key reason why innovative ideas get stuck in bureaucracy is the incentive structure under which government officials operate. Experimentation always carries some risk of failure and public officials, whose actions are under public scrutiny, have much to lose if they support an idea that fails. This creates an incentive for people in government to maintain the status quo.

In addition to risk aversion, there are also embedded interests, hidden agendas, and procedural barriers that block innovation and change in government. Across the world we find evidence that the bureaucratic clasp on innovation can be exacerbated by divisive politics. For instance, since 2010 local authorities have blocked the installation of smart traffic lights in certain districts of Caracas because they were spearheaded by a politician in the opposition party. This is not an isolated case, in numerous cases the national government has banned innovative transportation and social programs to prevent the opposition from taking credit for the improvements.

Given the barriers to change in government, we are bound to failure if we attempt to change it from the outside. Even private startups whose service innovations threaten established interests have to navigate political challenges. Two of the most successful companies in the share economy: *Airbnb* (room rental)² and *Lyft* (peer-to-peer ridesharing)³ are fighting legal battles at city hall to defend their right to operate.

We are at a point that our technological capabilities have exceeded our ability to implement them. What keeps us from living in a transparent and effective democracy is political will. We must look outside the tech community and partner with groups who share our interest in a transparent, effective and inclusive government. Non-profit organisations, including *Code for America*⁴ and *US Ignite*⁵ are paving the

5. US Ignite:
<http://us-ignite.org/> (accessed 04.10.2013)

2. Airbnb: <https://www.airbnb.co.uk/> (accessed 04.10.2013)

3. Lyft: <http://www.lyft.me/> (accessed 04.10.2013)

4. Code for America: <http://www.codeforamerica.org/> (accessed 04.10.2013)

way by convening technologists, with government, academia and business partners, but there is still much work to do in expanding this reach.

Those who are in the position to open our cities to more innovation, need political cover. We need to stand by them and give them the courage to challenge the established interests. Our movement needs to evangelise and build alliances, using broad citizen power to remove the barriers that are keeping us from an open and innovative civic sphere.

Mayra Madriz

Mayra is an urban strategist with a background in participatory design, psychology and anthropology. She is an active player in the San Francisco innovation community and regularly collaborates with organisations that promote experimentation in the public realm. Her current work sits at the intersection of placemaking and design research. She has worked as a sustainability consultant at the global firm Arup. In this position she conducted research and crafted policies that addressed the socio-cultural impact of high-profile planning projects in the US and Latin America. Mayra holds a Masters Degree in Community and Regional Planning and a Masters Degree in Latin American Studies.

The Power of Civic Imagination

Jake Dunagan

To envision how smart citizens might engage in civic life in unexpected and powerful ways in the future, we need to look beyond corporatised “smart” solutions and seek out those who bring a more narrative-driven, even absurdist, sensibility to urban experimentation.

“Politics is the one sport where the amateur is better for the nation than the professional.”

Lawrence Lessig.¹

If Lawrence Lessig is right, then Jerry Paffendorf may be the best amateur politician in America. Paffendorf is busy building a civic movement of makers and dreamers in Detroit, highlighted in the three examples below. By combining crowdsourced ownership, hyper-local politics, popular culture, collective mapping, open data, art, narrative, sharing, vision, and fun, these projects elicit addictive emotions in participants. It is this emotional response that drives deep levels of engagement and commitment, and one that is instructive for envisioning the future of citizenship.

Loveland

Described as an “experimental mixed-reality novelty micro real estate laboratory,”² Loveland launched in 2010. Through the novelty of selling 1 square inch “plots” of land in a 50,000 square inch “neighbourhood” in Detroit, Loveland generates a quasi-imaginary, but connected, community - changing the conversation around blight, gentrification, or government mismanagement. My employers, the Institute for the Future, feeling the

1. Lawrence Lessig, “Testimony to U.S Judiciary Subcommittee Hearing SH-216”

2. Loveland: <http://inchnet.com/> (accessed 04.10.2013)

3. <http://techcrunch.com/2011/02/11/detroit-robocop-statue/> (accessed 04.10.2013)

4. <http://www.kickstarter.com/projects/imaginationstation/detroit-needs-a-statue-of-robocop> (accessed 04.10.2013)

5. <http://www.detroitnews.com/article/20130814/METRO01/308140036> (accessed 04.10.2013)

love, purchased 500 square inches of Loveland, and christened the appropriately named Inchstitute for the Future.

Robocop

A rather random tweet from @MT in Massachusetts was sent to Detroit Mayor’s Dave Bing on Feb 7, 2011:

“Philadelphia has a statue of Rocky & Robocop would kick Rocky’s butt. He’s a GREAT ambassador for Detroit.”³

Mayor Bing coolly dismissed the suggestion on Twitter, but Paffendorf and others seized this spontaneous opportunity by launching a “Detroit Needs a Statue of Robocop” Kickstarter campaign. It hit its \$50,000 mark without breaking a cyborg sweat.⁴ One line sums up their mission, “We live in a new world, and sometimes it takes funny things to show us all that.” Now, as the unelected emergency manager sizes up Detroit’s art collection for sale,⁵ a small group of wacky futurists and artists (and 2,714 micro-funders) are busy erecting a statue of Robocop. Citizen engagement can be built on these “funny things.”

Why Don’t We Own This?

“Why Don’t we Own This?” (WDWOT) engages an army of volunteers to co-create an interactive map of available real estate, tax information, history, regulations, and other key data. WDWOT’s success relies on the “smart” foundation of crowdsourcing, open public data, and platform design, but it is also built on other more intangible resources - credibility and inspiration. Jerry’s short but significant history of authentic, creative, and absurd projects based in Detroit have won him a deep connection with

large numbers of people in Detroit. WDWOT is fine example of practical crowdsourced civic mapping, but it couldn't have happened without the inches of Loveland or the strange attraction of Robocop.

A Proposal: Civic Imagination Day

“Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution.”

Albert Einstein⁶

Jerry Paffendorf's Detroit engagements help us re-imagine civic engagement for the future. If we are to involve every citizen in the creation of the smart city, we need platforms for both civic innovation and civic imagination.

The number of eligible voters in the U.S. for the 2012 elections was 221, 925, 820. The average wait time to vote in 2012 was 13 minutes.⁷ In recent years, just over half of eligible voters actually vote. From an individual perspective, this makes rational sense: you have a greater chance of being elected President than having your vote decide a national election.

So I'd to propose that shift the relatively meaningless civic effort of voting to something more creative, more fun, and potentially more socially significant. In this plan, 1% of the population will be randomly sampled, assuring a representative national pool - roughly 2.21 million people (using 2012 numbers). The other 219 million Americans would be tasked with participating in some act of civic imagination for at least 13 minutes on Election Day, now a national holiday. This

6. Albert Einstein, (1931). “Cosmic Religion: With Other Opinions and Aphorisms.” P. 97

7. This is a national average, and, of course, elides the great disparity in waiting times, especially disparities driven by race and class. That issue is of high importance, but beyond the purposes of this exercise. See “Waiting to Vote in 2012,” Charles Stewart III, Massachusetts Institute of Technology Political Science Department. Working Paper No. 2013-6.

could take highly idiosyncratic and unpredictable forms. You could call a national hotline and voice your vision of a better America. You could organise a civic flash mob at city hall. You could write a new national anthem, sing it, and put it on YouTube. What would you do with your 13 minutes?

219,706,562 million people spending a total of 2,856,185,306 minutes (47,603,088 hours) expressing and sharing a civic act. The elections would go on, and a winner would be determined, but what a different day that would be.

Conclusion

We need Smart Citizens, but we also need absurd, playful, angry, emotional, intellectual, poetic, and kinetic citizens. If we want “every citizen” to contribute, we must create compelling engagement opportunities. Making the absurd, the fun, the visionary, or the poetic part of “official” civic life may sound paradoxical, but if done properly, we could see our communities and our lives improve in measurable and immeasurable ways.

Jake Dunagan

Jake's professional career has been centered on the concept of social invention and the practice of building better, more future-oriented social systems. He has examined how institutions, organizations, and societies are adapting to the Neurocentric Age, a time of unprecedented powers to view and modify the mind. Recently, he has helped create political systems, design tools and new structures of citizen participation via the Governance Futures Lab at the Institute for the Future. He has led research in comprehensive cognitive design, judicial foresight, kid's technologies, neuroscience and the ocean, alternative energy futures, tactical media, and the future of work. Jake also designs artifacts, visual media, interactive experiences, and guerilla public engagement projects that inject alternative visions of the future into the mental ecology of the present.

Connecting Cities and Its Citizens Through Artistic Urban Media Scenarios

Susa Pop

Media façades and urban screens are a newly widespread phenomenon. They are increasingly replacing traditional advertising infrastructures in urban environments, and are used at big events like World Expos and in European Capitals of Culture. The rapid growth of an digital outdoor advertising market points to both the globalisation and gentrification of our cities.

The potential of media façades and urban screens can be reconsidered in the light of the critical debate around Smart Cities and Smart Citizens. In such a reframing, they can be viewed as platforms and membranes between the physical and the digital worlds. They can provide new interfaces for human interaction and trigger new forms of participation, engagement and bottom-to-top activism.

In this contribution to the Smart Cities publication are introduced a number of urban screen art projects presented within the *Media Façades Festival 2010*.¹ These were informed by a research project *Connecting Cities*,² investigating networked infrastructure of urban media façades on which artistic and socio-cultural content can circulate between our cities. Through the use of new technologies, the goal is to interconnect the local urban media façades and enable a direct trans-cultural exchange between local scenes and communities.

An inspiration for this programme was *Blinkenlights*, one of the first projects to transform a building into an interactive media façade. Conceived by Chaos

3. Blinkenlights:
<http://blinkenlights.net/>
(accessed 04.10.2013)

4. SMSlingshot:
www.vrurban.org/smslingshot.html
(accessed 04.10.2013)

1. Media Façades
Festival 2010: www.mediafacades.eu (accessed
04.10.2013)

2. Connecting
Cities: www.connectingcities.net (accessed
04.10.2013)

5. City Sleep Light:
www.antoineschmitt.com (accessed
04.10.2013)

Computer Club in 2001, it invited the public to send them a love letter, which was then displayed in real-time on the former 'Haus des Lehrers' at Berlin Alexanderplatz. In the debate about the increasing commercialisation and digitisation of our cities, Blinkenlights is still an iconic showcase. It visualises how citizens can be empowered and how a media façade can be transformed into an agora for direct communication.³

The opening performance of the Media Façades Festival 2010 was called *Reclaim the Screens!* It was a pilot project that created a live-exchange between seven European cities through the medium of urban screens. For the festival, VR Urban - a collective of artists and computer scientists - developed a project entitled *SMSlingshot*.⁴ It consisted of a wooden slingshot that could be used by audiences in Berlin and Liverpool. The public could start a dialogue beyond their physical borders by typing in messages and catapulting them onto a screen, situated in the opposing city. It gave huge visibility to its authors - the citizens - and generated a sense of togetherness through the act of passing the device from one visitor to the next. With this activist gesture, *Reclaim the Screens!* pays homage to the homonymous London based collective.

Making data visible and transferring it into 'visualisation zones' is an important aspect in the debate around the socio-cultural potential of media façades. Antoine Schmitt, with his artwork *City Sleep Light* visualises the city's sleeping rhythm. It is generated using public data— such as traffic flows, energy use and financial flows— that is transformed into an organic, pulsating light that is projected back into the urban space. The resulting effect means that the city literally "pulsates".⁵

With *City Light Orchestra*, Schmitt goes a step further and turns City Sleep Light into a collective

experience that reminds us of do-it-together and crowd-sourcing practices. Everyone can join the visual symphony by connecting their personal screen(s) to the city's sleeping rhythm and installing it on the windows at home, the office or in the street. With each device glowing in its own light shade and pulsating in the same rhythm, citizens get the chance to create their own media façade cityscape. By indefinitely recomposing itself, City Light Orchestra becomes an open visual symphony for the windows of the city. It creates an individual and at the same time collective city experience, in which anyone can participate at any time. In this way, City Light Orchestra and City Sleep Light show the enormous potential of media façades and urban screens as visualisation zones for collaborative data processing.⁶

6. City Light Orchestra:
www.antoineschmitt.com (accessed 04.10.2013)

Another project that should be mentioned in this context is *Regreen the World*. This is an artistic campaign that generates a positive ecological impact. People can donate \$5 for planting a tree via sending a text message. Then they can watch their virtual forest grow, as an interactive 'treeometer' displays their contributions in real-time. The screening is not only visually interesting for those that have donated but it also visualises a collective consciousness of action; inviting others to take part. Initiated by the Green World Campaign, Regreen the World was shown on 10 large screens at Times Square as part of the Earth Day New York, 2011.⁷

Regreen the World
<http://greenworld.org/>
(accessed 04.10.2013)

The projects introduced above are only a small sample of the many creative projects which open urban infrastructure up for novel forms of citizen intervention.

Susa Pop

Susa Pop is an urban media curator and producer based in Berlin. In 2003 she founded Public Art Lab (PAL) as a network of experts from the fields of urban planning, new media arts and IT. Susa Pop is interested in creative community building through networking art projects that catalyse communication processes in the public space. Since 2008 Susa Pop reflects on the increasing presence of commercially used digital screens in public spaces while investigating their communicative function and networked possibilities in the urban environment. In this context she initiated the Media Facades Festivals 2008 and 2010, the Innovation Forum 2011 and the Connecting Cities Network 2012-16 and gives lectures at FH Potsdam, European Media Science and Computer Science at HTW in Berlin. The publication 'Urban Media Cultures' which she co-edited (publisher: avertedion, 2012) provides numerous examples from the areas of urban media development, technology and marketing.

Open Data: From ‘Platform’ to ‘Program’

Martijn de Waal

A few months ago, Dutch designer Mark van der Net launched OSCity.nl, a highly interesting example of what can be done with open data.¹ At first, it looks like a mapping tool. The interface shows a – beautifully designed – map of The Netherlands, colour coded according to whatever open data set the user selects, varying from geographical height to the location of empty office buildings. As such it is an example of a broader current in which artists, citizens, NGO’s and business actors have built online tools to visualise all kinds of data, varying from open government data to collaboratively produced data sets focused on issues like environmental pollution.²

What makes OSCity interesting is that it allows users to intuitively map various datasets in combination with each other in so called ‘map stories’. For instance, a map of empty office space can be combined with maps of urban growth and decline, the average renting price per square meter of office space, as well as a map that displays the prices of houses for sale. The intersection of those maps shows you where empty office spaces are offered at or below half the price of regular houses and apartments. The result is thus not just an aesthetically pleasing state of affairs, but an action map. Policy makers, developers and citizens can use the insights produced by the map to find empty offices that are worthwhile to turn into houses.

There are two important lessons we can learn from this project. First, it shows the importance of programs like OSCity to make open data platforms operationable for various actors. Over the last

1. OSCity.nl: <http://oscity.nl/> (accessed 04.10.2013)

2. Examples can be found a.o. in Offenhuber, Dietmar and Katja Schechtner eds. “Urban Data as Public Space”(2012), Vienna: SpringerWienNewYork

3. Sharon Dawes and Natalie Helbig “Information Strategies for Open Government: Challenges and Prospects for Deriving Public Value from Government Transparency”. (2010). Electronic Government: Lecture Notes in Computer Science, M.A. Wimmer et al. (Eds.): EGOV LNCS 6228. 50–60.

4. Martijn De Waal, “The City as Interface” (2013), Rotterdam: NAI010 Publisher.

5. Jo Bates, “This is what modern deregulation looks like”: Co-optation and contestation in the shaping of the UK’s Open Government Data Initiative.’ (2012) *The Journal of Community Informatics* 8.2

few years governments and other organisations have started to open up their datasets, often accompanied with high expectations of citizen empowerment and greater transparency of governments. However, case studies have shown that opening up data and building an open platform is only a first step. Dawes and Helbig have shown that various stakeholders have various needs in terms of standards and protocols, whereas both citizens and government officials need the relevant skills to be able to understand and operate upon the data.³ ‘Vast amounts of useful information is contained in government data systems’, they write, ‘but the systems themselves are seldom designed for use beyond the collecting agency’s own needs.’ In other words: what is needed to deliver on the expectations of Open Data, is not only a platform – a publicly available database - but also what I have called ‘programs’ – online tools with intuitive interfaces that make this data intelligible and actionable in concert with the needs of the public.⁴

There is a second issue that OSCity raises. As Jo Bates has pointed out, the main question is: who exactly is empowered through programs like this? Will ‘programs’ that make data operationable work for citizens?⁵ Or will their procedures, standards and access be organised to benefit corporate interests? These do not have to be necessarily contradicting, but if the goal is to empower citizens, it is important to engage them as stakeholders in the design of these programs.

This is a very important issue as many local governments have started to discuss the implementation of so called Smart City technologies with major technology companies, as it is these companies that have a lot of know-how and experience with the collection of real-time data. But which data will be collected in what ways? And to whom will it be made available? With what standards and under what conditions?

In the discussions on smart cities, the city is usually framed as a set of infrastructure to be managed as efficiently as possible. 'The city as a service',⁶ this approach is sometimes called, a vision in which urbanites are mainly addressed as consumers. Yet a city is more than just infrastructure, and urbanites are not only consumers but also citizens.

What if these citizens would like to make use of the datasets collected by smart city technologies? For instance, data assembled about traffic could be used commercially to operate roads more efficiently or help paying individual drivers avoid congestion. But what if citizens would like to combine datasets of traffic in an OSCity type of program with data about school locations, to make a point about dangerous routes to school for their children? Will citizens be allowed access to these datasets? Will the data be formatted in such a way that they can use it as such? Or will these data remain in the domain of the companies and institutions that collect them?

If we will decide on the latter, we will end up with Smart Cities – efficiently managed technopoles. Only if we opt for the former will we can begin to empower Smart Citizens that are able to contribute to the ever ongoing process of city-making.

6. Jong-Sung Hwang, "U-city: The next paradigm of urban development" M. Foth, ed., "Handbook of Research on Urban Informatics": The Practice and Promise of the Real-Time City (2009) Hershey, PA: IGI Global

Martijn de Waal

Martijn de Waal is the author of The City as Interface. How New Media are changing the City, published by NAI010 publishers in the autumn of 2013. He is also a co-founder of The Mobile City, a research group on the role of digital media in urban culture. He works as an assistant professor in the department of media studies at the University of Amsterdam.

Citizen Engagement in Smart Cities

Catherine Mulligan

In our quest for efficiency have we forgotten a key question – what do citizens want? Have we forgotten to ask them? Do citizens wish to have a balance between technology and the ability to be anonymous in a big city, are they willing to have a slightly less ‘connected’ journey to experience serendipity in their lives once in a while? Do they want perfectly constructed lives, or are they happy for spaces to be left between technologies to allow the profoundly human elements of life to emerge, the messy ones, the events we never planned, the friends we never thought we’d make, the spouses we might never have met...

It seems that while ‘Smart Cities’ are a hot topic within academic and business circles, few cities have truly embraced the vision. Despite the promises of ever increasing efficiency, streamlined urban planning, better transport and cheaper public services, many have yet to even implement basic Smart City technology. Our research in *Sustainable Society Network+* at Imperial College, London¹ shows that Smart Cities are not really understood outside of specialist circles. Conceptually, they are difficult to understand and technically they are complex and costly to implement. Every day citizens, from teenagers through to retirees often see these technologies as irrelevant to their lives. Focusing solely on technology with cities creates new forms of digital divide and overlooks the fact that despite technology, political and economic inequalities will persist. Many smart city visions take a technology deterministic view, overlooking that often a non-technical solution would be a better option.

1. Sustainable Society Network+: <http://www3.imperial.ac.uk/digital-economy-lab/partnernetworks/sustainable-society-network> (accessed 04.10.2013)

2. London’s Open Institute: <http://www.oi-london.org.uk/> (accessed 04.10.2013)

Without engaging citizens about the role of technology in their cities and its impact on the way in which they will travel, live, eat, play and study, the Smart City vision will fail. If cities truly want to gain the benefits of technologies in society, then they need to start a discussion with their citizens about how this technology might impact their lives. Citizens have the right to know where technology will be applied in their cities and asked what they think the correct balance is? A Smart City, therefore, starts with Smart Citizens who are asked their opinions and engaged in the process of deciding how they are used.

Engagement starts with education and public debate. In the same manner as the Victorians decided that every person needed to learn how to read and write, we must decide that every citizen needs to understand the basics of privacy, technology and interpretation of data. Schools and universities will play an important role, but new public institutes can also further the debate around the role that technology can, and should, play. *London’s Open Institute*² is one example, which is providing a unique space for citizens come together and discuss, learn and understand not just the role of the new technologies but also how they impact different parts of society - from open economics, open politics to open corporates.

This is just one example of how to engage citizens. Initiatives such as these, however, where citizens can come together and debate both future technology and what the correct frameworks for its use are, are increasing in necessity. When a technology touches on so many facets of our society, the ethics of its use must be debated and commonly agreed upon. The recent privacy scandals are a perfect example of the necessity for this debate - what are citizens willing to give up in terms of privacy or cyber security for the ease of use or fun applications? There are no correct

answers to these questions; these are issues that must be discussed amongst as many citizens as possible. A key part of any such initiative has to be that it is not housed in an elite academic institution - knowledge and discussion about technologies needs to be made as available as is possible to as wide a range of skills and interest levels as is possible. Smart City technologies should not be viewed as a discussion belonging to people with advanced degrees in engineering, science or mathematics, but rather as technologies that are now sufficiently accessible to the average everyday person on the street. As things like Raspberry Pi, Arduino and 3D printing continue to develop, these technologies are available to a broad range of citizens. The education and engagement of these citizens must be provided so that they can become the Smart Citizens needed to decide how to implement these concepts in their everyday lives. Properly managed, such technologies can help citizens create resilient environments, local economies and communities. Poorly managed, these technologies can cause damage and unexpected consequences to our social, economic and natural structures.

To engage citizens in a debate about 'Smart Cities' therefore we must go beyond the role of technology in our world and how it can be used to achieve greater efficiency. We need a fundamental discussion about how we wish our common future to be shaped and organised – what constructs and social norms we wish to accept and how technology can enable them, rather than implement the technology and ask citizens to adapt their social norms to technology developed by large corporations. A robust debate between corporates, citizens, NGOs, academics, city leaders and technologists is required to push the smart city debate forward and fulfill its promise of a balance between environment, economy and the citizenry.

Catherine Mulligan

Catherine Mulligan is a Research Fellow in the Innovation and Entrepreneurship group at Imperial College Business School, where she leads several grants in the Digital Economy, including Sustainable Society Network+. Her research interests focus on the role digital technologies can play in the creation of an economically, socially and environmentally sustainable society. During 2013, she led the Urban Prototyping festival in London which investigated how citizens can learn and engage with digital technologies in the 'Smart' City era.

Smart Citizens Make Smart Cities

Dan Hill

At the 2010 Shanghai Expo, a recurring centrepiece of many corporate “smart city” pavilions was the “urban control centre”. Even in Shanghai, this control room or dashboard metaphor seemed hopelessly inappropriate for cities, even if focused on the “urban systems” that a city government might ostensibly run.

The citizens themselves were invisible, for one thing. The motif of the control centre betrayed a technocratic view that the city is something we might manage efficiently, if only we had enough data.

That centralised approach to city-making and city-running could simply be the latest incarnation of the same sensibility that brought us the suffocating, oil-dependent latticework of suburbs, malls and flyovers of the mid-20th century city, one of the more unhelpful cul-de-sacs in human history. The drive to efficiency led us in that direction too, but infrastructure companies, whether cars and highways or screens and routers, actually look to simply increase traffic on their infrastructure, almost instinctively.

*“Technology is the answer.
But what is the question?”*

Cedric Price

Fortunately, the Smart City appears to be without a client, presently, as few if any smart cities actually exist despite the millions spent on marketing the idea over the last decade. Cities just do not buy that kind of product in that kind of way.

It’s not that cities shouldn’t manage the infrastructure using these new tools: it’s just that there is more to cities than this. We don’t make cities in order to make buildings and infrastructure. We make cities in order to come together, to create commerce, culture, conviviality, and the very notion of living in cities itself. Buildings, vehicles and infrastructure are mere enablers, not drivers. They are a side-effect, a by-product, of people and culture. The city is its people. This is not efficient, but it is good.

So instead of the Smart City, perhaps we should be more preoccupied with Smart Citizens. As it happens, engaged and active citizens are all around us, using social media and related technologies to organise and act, rapidly and effectively.

We saw this activity throughout Occupy Everywhere, the Arab Spring, the Madrid manifestations and the UK riots, as well as the numerous subsequent urban protests. And running along parallel tracks, we see similar patterns underpinning the explosion in urban crowdsourcing and crowdfunding platforms over the last few years.

Both are predicated on the idea that citizens want to engage in their city; that implicitly, citizens are best-placed to notice, suggest, aggregate and drive a certain kind of urban intervention.

Yet crowdfunding and social media has a political edge, consciously or not. Crowdfunding could become a substitution for municipal taxation.

Equally, there is nothing intrinsically democratic or publicly accountable about social media. Crowdsourcing systems, by their very nature, will rarely enable a systemic change. They create a tapestry of one-offs and events, but will rarely generate city-wide services or infrastructure.

Given the cultural power code can now exert, we have to ask whether one can adopt the dynamics of a system without also inheriting its underlying ideologies? Can we bind the energy and dynamics of social media - those active citizens - to active government too? Government exists - partly at least - to take such disruptive innovations and productively absorb them into a resilient system that smoothes social inequalities and generates broader access.

What if municipal government was directly and boldly prototyping new versions of itself, using these new technologies? It might be that a sense of public good, of civic responsibility, can be found within a re-calibrated approach to municipal government, dovetailing active citizens with active governments.

One inspiration is Hans Monderman's "shared space" traffic system, which removes most if not all signage from intersections, instead relying on engaged human interaction, individuals working instinctively within a wider "civic" framework. The system is safer than traditional intersections, wherein we effectively outsource decision-making to traffic lights. It relies on smart, engaged, aware and active citizens, rather than the passive systems that smart city visions are often predicated upon.

If we take that metaphor into the design of new civic platforms, activism might become something more akin to plain old urban activity, in which many if not all citizens are more deeply woven into the fabric of their city's decision-making.

As well as a new urban hardware and software, it's in this interface between engaged citizens and engaged government that its real promise may lie - introducing genuine efficacy and verve into the way the public sector works, reducing the cost of government massively whilst increasing its positive impact, rebuilding a meaningful civic interface with citizens.

With Cedric Price still in mind, we have to ask some questions, focused on understanding the difference between drivers and enablers, the value in unpredictability and inefficiency, the relationship between personal and civic responsibility, what meaningful activity from citizens and government might look like, and the city as public good. Are these part of the Smart City vision?

For these are all part of what makes a city work, what makes a good city, and what will make a genuinely resilient city. Asking such questions might be a smart thing to do.

A Manifesto for Smart Citizens¹

Frank Kresin

We, citizens of all cities, take the fate of the places we live in into our own hands. We care about the buildings and the parks, the shops, the schools, the roads and the trees. But above all, we care about the quality of the life we live in our cities. Quality that arises from the casual interactions, uncalled for encounters, the craze and the booze and the loves we lost and found. We know that our lives are interconnected, and what we do here will impact the outcomes over there. While we can never predict the eventual effect of our actions, we take full responsibility to make this world a better place.

Therefore, we refuse to be consumers, client and informants only, and reclaim agency towards the processes, algorithms and systems that shape our world. We need to know how decisions are made, we need to have the information that is at hand; we need to have direct access to the people in power, and be involved in the crafting of laws and procedures that we grapple with every day.

Fortunately, we hold all the means in our hands. We have appropriated the tools to connect at the touch of a button, organise ourselves, make our voices heard. We know how to measure ourselves and our environment, to visualise and analyse the data, to come to conclusions and take action. We have continuous access to the best of learning in the world, to powerful phones and laptops and software, and to home-grown labs that help us make the things that others won't. Furthermore we were inspired by such diverse examples as the 1% club, *Avaaz*, *Kickstarter*, *Couchsurfing*, *Change by Us*, and many, many more.

1. An unauthorised companion to Dan Hill's seminal essay *On the smart city*; Or, a 'manifesto' for smart citizens instead: <http://www.cityofsound.com/blog/2013/02/on-the-smart-city-a-call-for-smart-citizens-instead.html> (accessed 04.10.2013)

We are ready. But, as yet, our government is not. It was shaped in the 18th Century, but increasingly struggles with 21st Century problems it cannot solve. It lost touch with its citizens and is less and less equipped to provide the services and security it pledged to offer. While it tries to build 'Smart Cities' that reinforce or strengthen the status quo - that was responsible for the problems in the first place - it loses sight of the most valuable resource it can tap into: the Smart Citizen.

Smart Citizens:

- Take responsibility for the place they live, work and love in;
- Value access over ownership, contribution over power;
- Ask forgiveness, not permission;
- Know where they can get the tools, knowledge and support they need;
- Value empathy, dialogue and trust;
- Appropriate technology, rather than accept it as is;
- Help the people that struggle with smart stuff;
- Ask questions, then more questions, before they come up with answers;
- Actively take part in design efforts to come up with better solutions;
- Work agile, prototype early, test quickly and know when to start over;
- Will not stop in the face of huge barriers;
- Unremittingly share their knowledge and their learning, because this is where true value comes from.

All over the world, smart citizens take action. We self-organise, form cooperations, share resources and take back full responsibility for the care of our children and elderly. We pop up restaurants, harvest renewable energy, maintain urban gardens, build temporary structures and nurture compassion and trust. We kick-start the products and services we care about, repair and upcycle, or learn how to manufacture things ourselves. We have even coined new currencies in response to events that recently shook our comfortable world, but were never solved by the powers that be.

Until now, we have mostly worked next to governments, sometimes against them, but hardly ever with them. As a result, many of the initiatives so far have been one-offs, inspiring but not game changing. We have put lots of energy into small-scale interventions that briefly flared and then returned to business as usual. Just imagine what will happen if our energy, passion and knowledge are teamed up by governments that know how to implement and scale up. Governments that take full responsibility for participating in the open dialogue that is needed to radically rethink the systems that were built decades ago.

To get ourselves ready for the 21st Century, we have to redefine what “government” actually means. We ARE our government. Without us, there is nobody there. As it takes a village to raise a child, it takes people to craft a society. We know it can be done; it was done before. And with the help of new technologies it is easier than ever. So we actively set out to build truly smart cities, with smart citizens at their helms, and together become the change that we want to see.

Frank Kresin

Frank Kresin is Research Director for Waag Society, institute for Arts, Science and Technology, based in Amsterdam. His background is in Artificial Intelligence and film making, and his interest is in developing technology for societal goals. He was involved at the start of many innovation programmes, amongst them Apps for Europe, City SDK, CineGrid Amsterdam and Code 4 Europe. Frank has spoken, written and lectured on Open Innovation, Open Data & Open Design, Users-as-Designers, Living Labs and Fablabs. He is a regular moderator at the PICNIC Festival, as well as at design and innovation workshops in the Netherlands and abroad.

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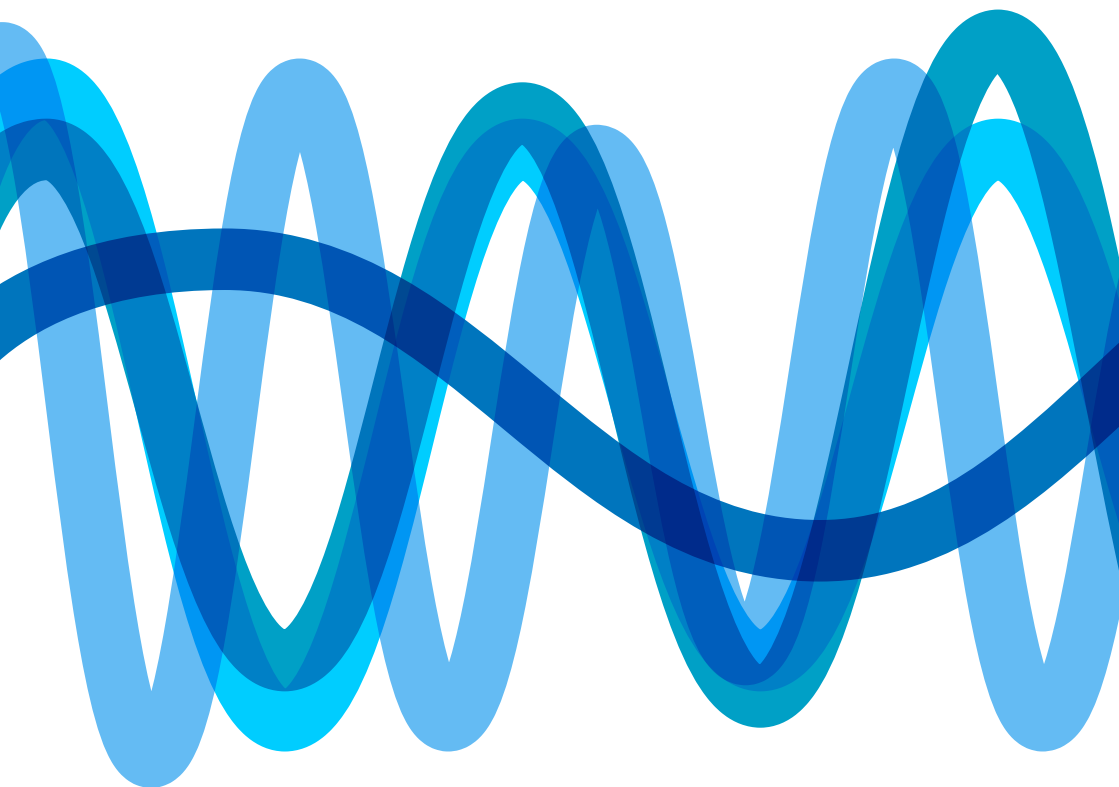
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