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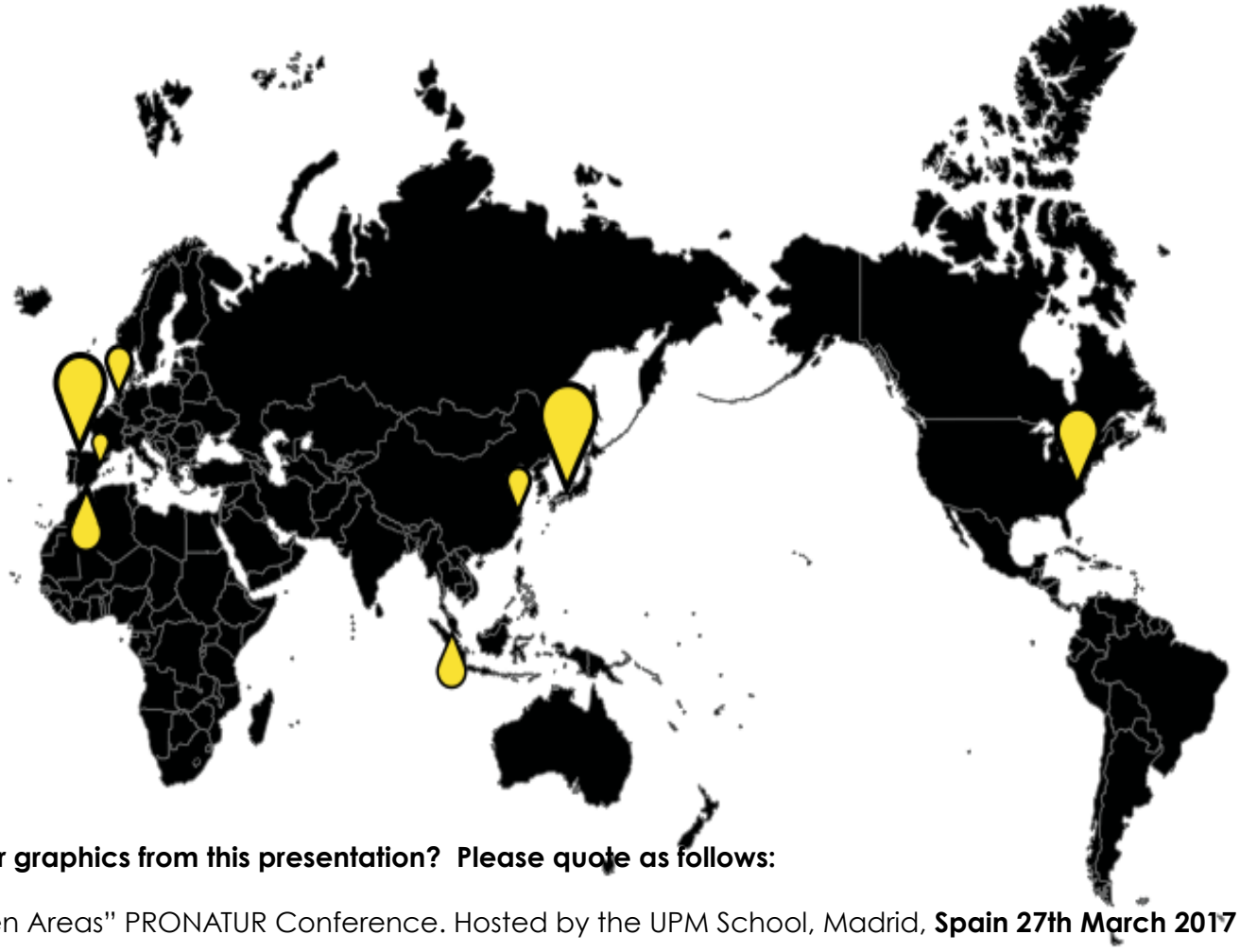

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Gil, O. 2017. "Green Areas" PRONATUR Conference. Hosted by the UPM School, Madrid, **Spain 27th March 2017**

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Scope

Definitions
Theory & framework
Hipothesys
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Theory **Definitions of smart cities under three traditions:**
1) human capital 2) technology and 3) digital literacy.
Normative question I: What are the skills that people and communities shall have to be digitally literate in the XXI century?

Empirically **What makes a city smart?**

Normative question II: Differences in the definition of smart in cities are important → **translated into differences on which stakeholders are allowed to innovate locally, we founded**

More on definitions: www.slideshare.net/olga.gil/smart-cities-euraconference2013/6

Definition: What makes a city smart?

Smart places

- Combine the best of physical and virtual worlds. Physical spaces retain relevance (Deaking, Al Waer 2011)
- Presence of a creative class (Andrea Caragliu et al 2011, Richard Florida 2002, 2005)
- The "three layers": Physical space, with aglomeration of people, innovative clusters 2) institutional innovation mechanisms and policies for technology transfer 3) collaborative spaces (Komninos 2009)

Model and the variables

Testing eight variables

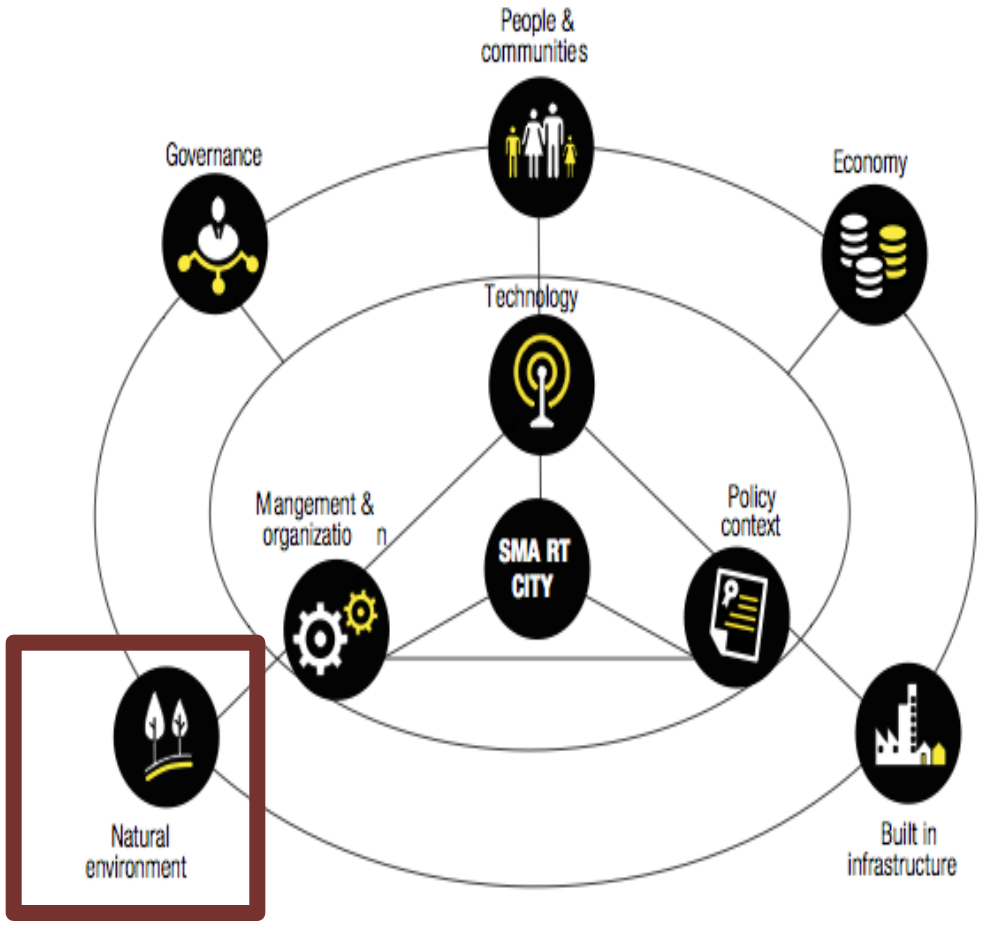


Figure 1: Smart cities initiatives framework: A visualization developed from the model by Chourabi et al. (2012) and our empirical research

Unwraping the variables in the study: See Annexes

Hypothesis Factors to advance smart plans are key to differentiate models of urban governance

Comparative perspective includes Asian, American and European cases

Why? Choice of cases driven by an interest to learn from innovation practices in different world institutional settings and the errors in each local setting

In the work we are developing from 2013 we have already covered eight cases

Shanghai, cities in Japan, Iskandar, New York, Amsterdam, and three cities in Spain Málaga, Santander and Tarragona

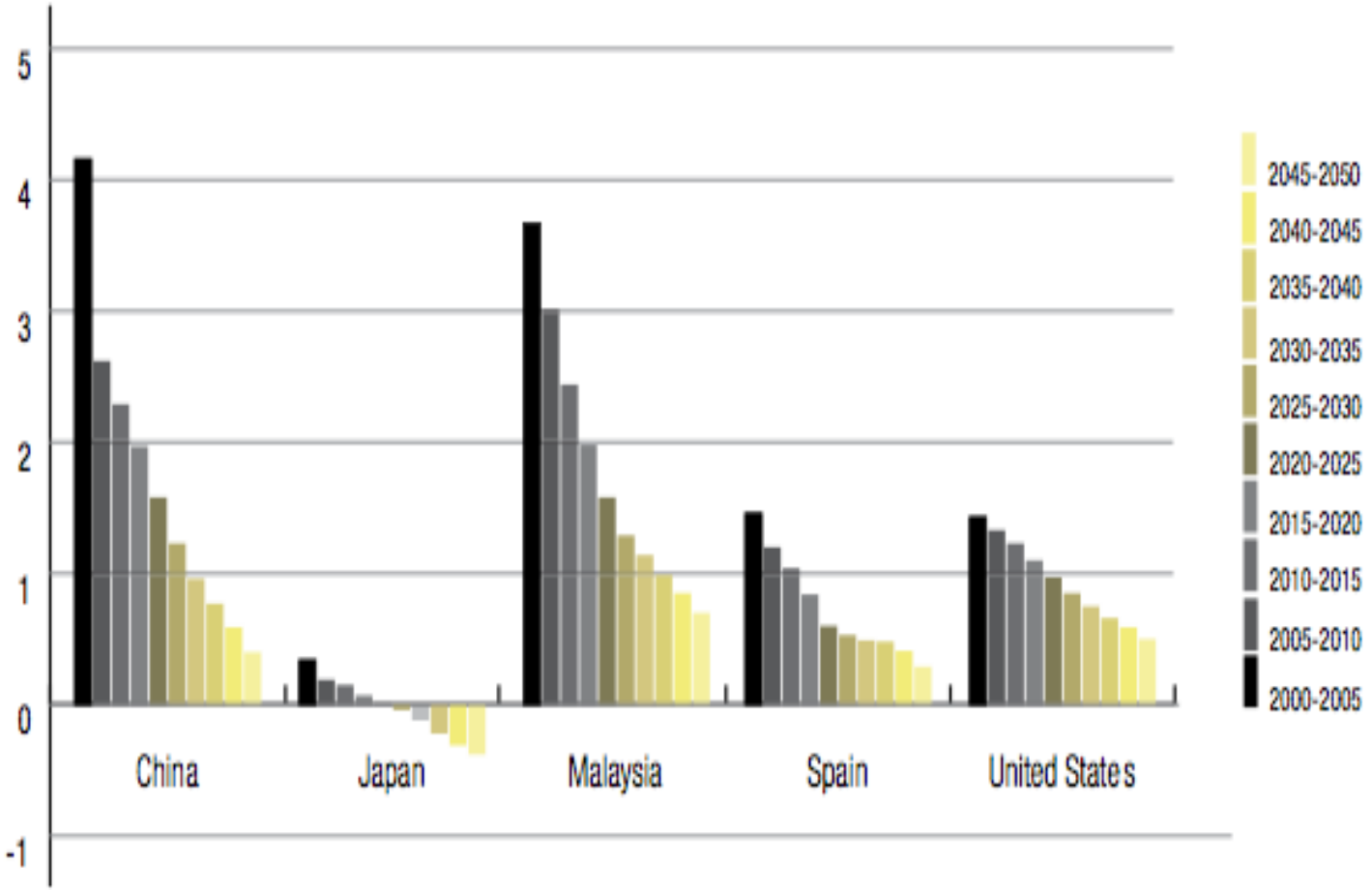
Hypothesis and cases

Hypothesis: Factors to advance smart plans are key to differentiate models of urban governance

Choice of cases: Driven by interest (China, Japan, Iskandar (Malaysia), New York, Tarragona (Spain).

- To learn from innovation practices in different world institutional settings
- Different innovation rates (R&D in China + 17 %, USA 5,2 %, Europe 3,8 %)
- Attempt to tackle differences and similarities in both OCDE and non OCDE countries
- Interested in variations in the universe of cases

Urban Annual Growth Rate % shows converging trend



Urban annual growth rate (%). 2000-2015. Source: United Nations Statistics. Data from 2010 onwards are projections.

World Context: Smart cities and green spaces (mostly lacking) in the world agenda

An interest in **China** in city development far from the growth model (Lin 2002)

OCDE and European Union link the concept of sustainable environment, competition and cohesion with smart cities (2005)

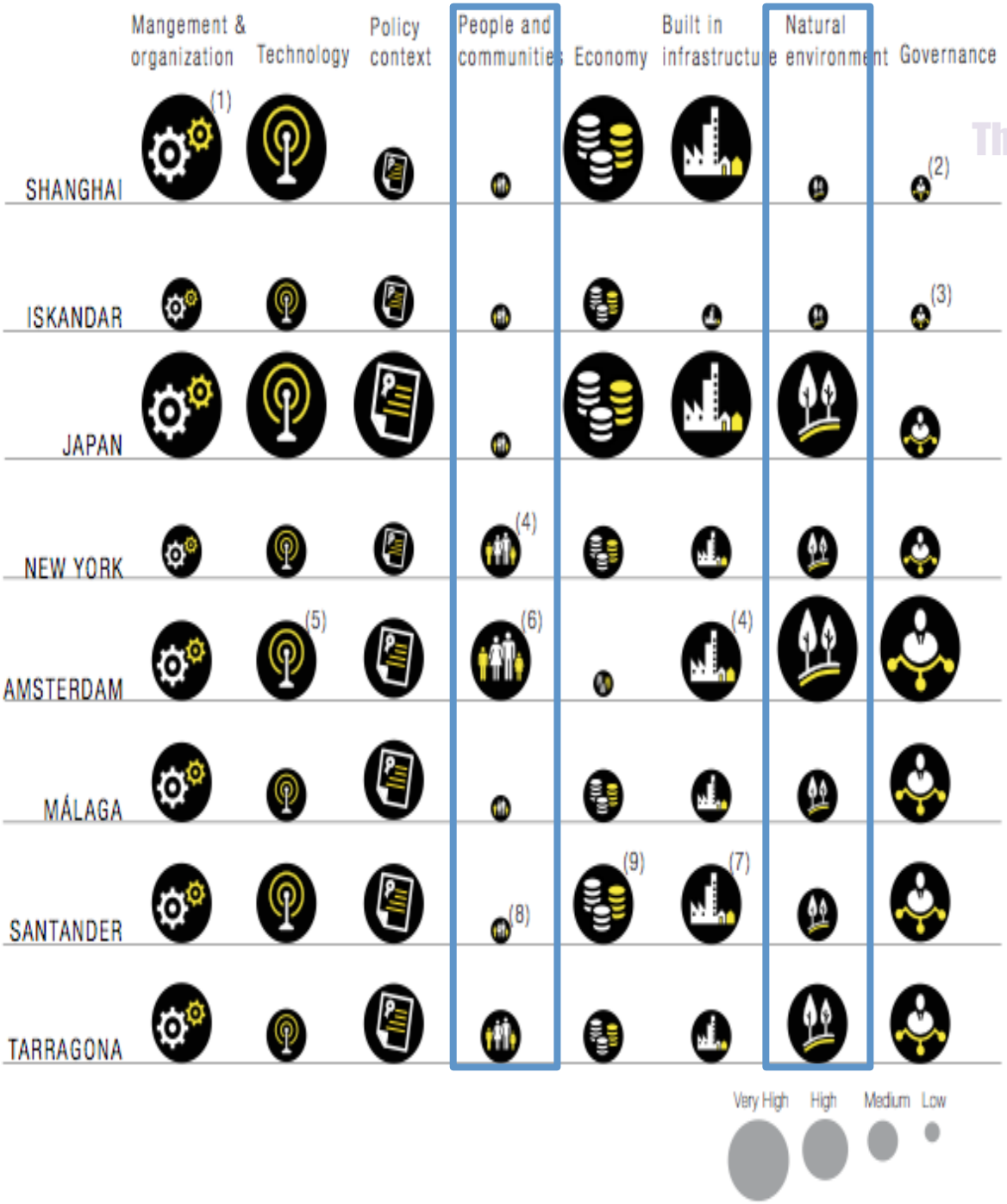
City initiatives: Amsterdam, Southamton, Edimburgh, Malta, Philadelphia, Seattle, Quebec, Mexico city…

Business initiatives: IBM, Siemens, Oracle

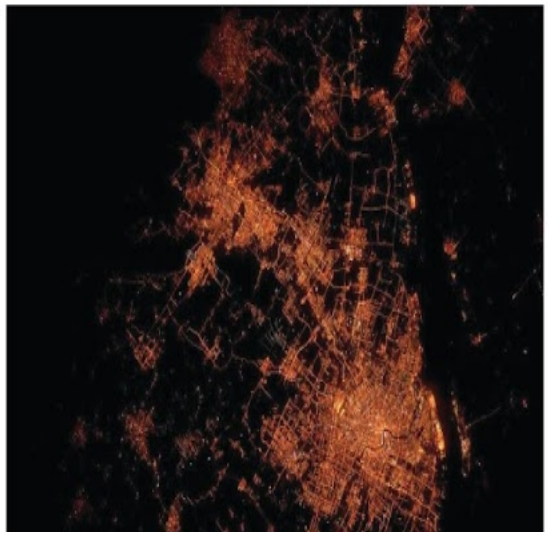
European Union research and policy projects: Intelcities, INTERREG

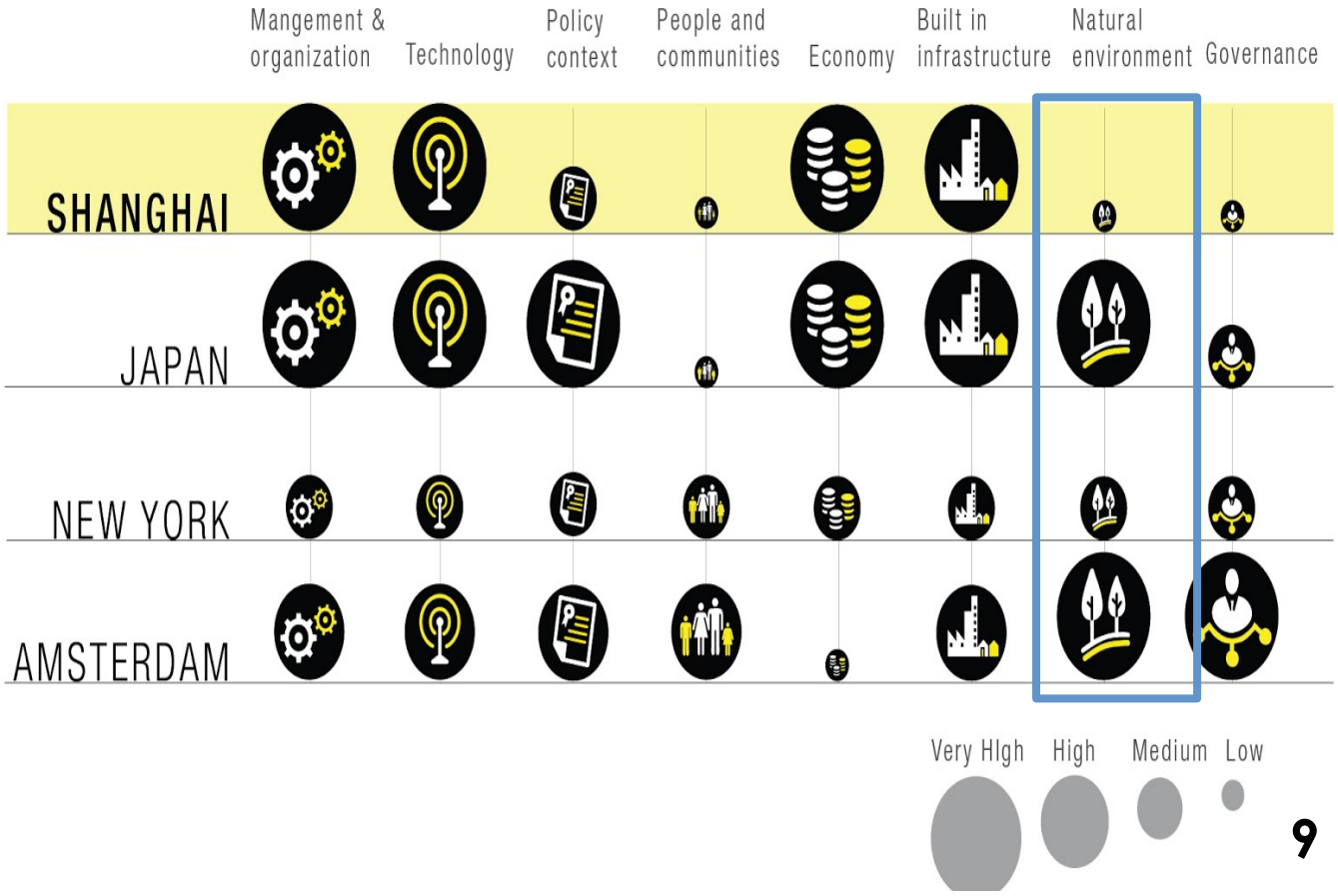
Results

Global Picture



The Case of Shanghai





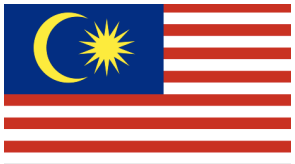
4. Cases for analysis: China

People and communities

- Incorporated through the political party
- Liu and Peng (2013) suggest the importance of talented persons, professionals, education and training, they suggest to build a high-end talent platform with university and scientific institutes, cooperation with colleges, local industries, vocational training schools…

Natural environment

- Focus on the smart grid to transport energy to coastal cities in the east



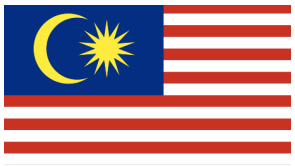
4. Cases for analysis: Iskandar

Policy context

- Iskandar Regional Development Authority (IRDA) established by a Federal Act of Parliament (2007) "provide a livable and sustainable conurbation."
- Iskandar is placed as a development area where a main focus is attracting international capital ($30 bn plan expecting 1/3 from abroad)

People and communities

- Addressed from the point of view of education and top-down.
- Ellis Rubinstein, president of New York Academy of Sciences appointed to work on Iskandar university campus area with the mandate to make it a reference and to accommodate necessities of fast rising populations.
- Support from the cultural industry brings Pinewood Studios to Iskandar and Legoland has placed a theme park



4. Cases for analysis: Iskandar

Not found strategies of master planning for design codes, rooted participatory democracy or electronic media as tool to extent the democratic debate.

Introduction of carbon credits –However, policies to reduce C02 have not been contemplated in Iskandar or Malaysia.

Public transit system rather than more roads to improve easier movement.

4. Cases for analysis: Japan

Based on four on-going location experiments (2010-2014 in four city wide corridors)

"social infrastructures, involving electricity -energy-, water, buildings, transportation, communications, administrative services and other elements, are "indispensable factors for ensuring that the lifestyles of the people and businesses can be supported."

Includes evaluation of the projects as part of the process towards smart goals: sub-projects carried within the selected cities are later supervised by the Community Energy Management System (CEMS), in charge of verification and evaluation.

4. Cases for analysis: Japan

People and communities

Experiments include residents as active parts (mentioning ***residents*** especifically):

> *"Smart cities are not something that should be tackled by just governments and corporations and presented to residents. The general public must also be actively involved in sharing their own ideas and helping to formulate the cities by throwing their own wisdom into the pot. "*

4.5. Natural environment

- Natural environment as key driver. The origin of the smart city projects in Japan is the aftermath of the Great East Japan Earthquake on March 11, 2011, and the subsequent nuclear power plant accident.
- Facing urbanization is an enormous issue for Japan, with agricultural land being converted into urbanized areas at the same pace as the rapid growth of developing nations.

4. Cases for analysis: NY

University Project on smart cities. Dr. Steven E. Koonin, former under secretary for science in the Department of Energy in the Obama administration heads the research agenda in New York University's Center for Urban Science and Progress on smart cities.

The approach defined at NYU "from sensors to sociologists, and science with a social dimension"

A second smart project is developed from the **city hall, focusing on smart data.**

- For the local government technology goes hand in hand with the use of data to guide operations. In 2010, the city set up a team of data scientists for special projects in the Mayor's office. The city government has committed to giving the N.Y.U. center access to all its public data.
- Digital strategy focused on access to technology, open government, engagement and industry in New York City.
- Local government CIO Rachel Haot: "**open government** is important for the local government because if the data and the internal structure and priorities aren't completely open "we're not going to be able to enable increased [open] services, "we need to be constantly gathering feedback from the public, informing and serving. And **access is the foundation** because everyone needs access to these technologies." (Howard 2011).

4. Cases for analysis: NY

People and communities

Experiments with data driven approaches in governance include: citizensourcing smarter government, aimed at creating platforms for citizens to collaborate around information to improve outcomes, participatory budgeting and "broader future as a data platform."

New York City government data repository, the NYC DataMine. And moves toward making more useful public data available (geocoding, performance and regulatory data. Recently, online 311 service request map…)

The local government working to grow the community of civic entrepreneurs and developers fostering a Big Apps program and an contests known as NYC Big Apps

Natural environment

Joint programms with the university regarding water consumption, electricity, computer simulations and climate models for weather prediction.

Cases for analysis: Tarragona

Management, organization

- A Foundation has been set up to follow up the smart city plan.
- The smart city projects presented in April 2013 are influenced by Richard Florida´s concepts of thriving cities: based on talent, technology and tolerance. It also brings in the ideas of entrepreneurial spirit and collaborative organizations. The values underlying the projects are consensus and intelligence "that would be defined by universities, firms, public administration, and citizenship." Values are aimed at citizen´s welfare, wellbeing, and social cohesion.
- Plans under the umbrella of a Foundation, include the participation the public university and firms in the energy, water, health, mobility, digital contents and tourism industries.
- The Tarragona smart city project is designed with the **policy context** of the Mediterranean Sports Games in mind. The games will be held in 2017: Mediterranean region as and space with emerging opportunities, linked to the development of the northern Africa region and the importance of the sea port, the fourth in importance in Spain.

4. Cases for analysis: Tarragona

People and community are addressed in Tarragona

- Favoring the creation of a market for open innovation in software, with the partnership of Innoget, a project based on advertising as a business model.
- Educative project "smart phones for smart people" to teach how to use smart phones in the civic centers in order to target the digital divide
- Plans to install Video Wii games in nine civic centers to engage citizens on physical exercise and community entertainment.

Cases for analysis: Tarragona

Built infrastructure and natural environment

- Thermal isolation pilot in school with BASF technology Termabead to measure the resulting energy savings.
- Environmental impact of public transportation, to be carried out by the Chemical and Tech Center of Catalonia, funded by Repsol.
- Pilot on the use of biofuels produced by seaweed, a research project application from Repsol laboratories.
- Smart metering for water in neighborhoods and public swimming pools, with AGBAR, EMATSA and AQUALOGY –expecting the results of a competitive project from the European Union on telemetry.
- New asphalt installed in zones of intensive use by heavy industrial vehicles. The properties allow capturing contaminated diesel particles, better water absorption, and fissure self repair.
- Water quality control of beaches in Tarragona accessible through mobile phone and tablets apps.

Analysis and Findings

Interesting similarities and differences among cases:

Absence of the green city dimension in most of the projects except Amsterdam, Japanese cities, China

Multi faceted sides of the smart concept locally, shaped by national and/or local governments.

What smarts entails is very different and open to policy conceptualization --**in some cases, open to society engagement, specially in Amsterdam**.

5. Analysis and Findings

People and Communities frameworks to develop smart cities and policies involving citizens.

3. Prototype and test of the prototype. The living lab approach, testing it with actual citizens and consumers in a real world environment allows for more insights
   - Gathering citizen feedback entails that citizens, using the prototype, provide feedback about their experience using the service, and their feedback should be taken into account for next iterations of the proposed solution. This feedback should then be used to improve the service.
   - repeat the last three steps in order to improve the proposed solution based on feedback received from potential users- It allows for improvements based on actual usage by citizens.

4. To drive the process, **an innovation team needs to be established.** Examples of similar frameworks: at the national level, the government innovation labs Nesta in the United Kingdom; At local level, urban living labs such as Forum Virium in Helsinki.
   - http://www.ideo.com/
   - http://www.nesta.org.uk/
   - http://www.forumvirium.fi/en

"smartness as a vision to respond to local governance challenges"

Generally: Significant role that local governments play in cities

Shanghai: Giant developing infrastructure and global influence

Malaysia: Getting a place in the geo-regional area

Japan and Amsterdam: Facing energy constraints with innovation

New York: Innovation for civic engagement

Spain: Opportunities for economic reactivation?

Concluding remarks

- **Limited scope for people and communities**

- **Innovation framed whithin the scope of prefered stakeholders**

- **Evaluation is key**, and we find few cities doing it. Shanghai and cities in Japan do it

Analysis and Findings

People and Communities frameworks to develop smart cities and policies involving citizens.

These innovative frameworks (Nesta, Forumvirium…) are institutions that have ingrained the values of participation. They share a culture of :

- rapid prototyping
- and fail safe environments where the testing and prototyping of new ideas is allowed: "in fact, it is failure during the early stages of prototyping what allows for a better outcome, in collaboration with early adopters that provide useful and meaningful feedback" (2013).

These kind of teams are well prepared to be constantly looking for citizen service delivery gaps and propose solutions that are co-designed with citizens through feedback in iterative processes.

Other factors for further research for people and communities include digital divides, education, participation and partnership, information and community gatekeepers, communication, quality of life and accessibility.

Natural environment

- Concerns present in all the cases explored.
- Japan did set up the smart pilots in the aftermath of the nuclear accidents.
- China faces severe environmental concerns. Malaysia is also aware in Iskandar.
- New York has suffered severe impact of climate change in november 2012.
- Tarragona is also concerned.

We find this field as one posing the biggest challenges at a global level. Would local policies be enough to tackle this challenge?

No homogeneous path towards a smart goal.

Goals defined in smart plans and factors mentioned above play a critical role

Thank you for your attention and discussion

謝謝

Powerpoint will be available for download at:
Slideshare Olga Gil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Variables in the study

Managerial and organizational challenges and strategies

Source: Gil-García and Pardo in Chourabi et al. (2012:2291)

Challenges	Strategies
• Project size • Manager's attitudes and Behavior • Users or organizational diversity • Lack of alignment of organizational goals and project • Multiple or conflicting goals • Resistance to change • Turf and conflicts	• Project team skills and expertise • Well-skilled and respected IT leader (technical and social skills) • Clear and realistic goals • Identification of relevant stakeholders • End-user involvement • Planning • Clear milestones and measurable deliverables • Good communication • Previous business process improvement • Adequate training • Adequate and innovative funding • Current or best practices

Variables in the study

Technological challenges

Source. Ebrahim and Irani (2005)

Dimension	Challenges
IT skills	• IT training programs • Lack employees with integration skills and culture
Organizational	• Lack of cross-sectoral cooperation • Lack of inter-departmental coordination • Unclear vision of IT management • Politics • Culture issues

Variables in the study

Governance: Chourabi et al. (2012:2292)

Factors
• Collaboration
• Leadership and champion
• Participation and partnership
• Communication
• Data-exchange
• Service and application integration
• Accountability
• Transparency

Factors of people and communities: Chourabi et al. (2012:2293)

Factor
• Digital divide(s)
• Information and community gatekeepers
• Participation and partnership
• Communication
• Education
• Quality of life
• Accessibility

Variables in the study

Factors of built-in infrastructure: Chourabi et al. (2012:2294)

Dimension	Challenges
IT infrastructure	• Lack of integration across government systems • Existing internal systems have restrictions regarding their integrating capabilities • Lack of knowledge regarding interoperability • Availability and compatibility of software, systems and applications
Security and privacy	• Threats from hackers and intruders • Threats from viruses, worms and Trojans • Privacy of personal data • High cost of security applications and solutions • accessibility
Operational cost	• High cost of IT professionals and consultancies • High cost of IT • Cost of installation, operation and maintenance of information systems • Cost of training