SMART CITIES FROM A SYSTEMS PERSPECTIVE

How to move from separate issues to an integrated vision and actionable, scalable and measurable projects that connect

For Who?
Local governments, developers, industry, and others involved with “place”
- that understand that various Smart City ideas hold promise to greatly improve operations, efficiency, citizen well-being and safety
- that need to hone their vision and guiding principles so they work in today’s Smart City context
- that want to scale up and integrate isolated pilots, technologies and concepts with measurable costs and results.
As well as UNC students and faculty, invited to join the morning program.

Why?
Smart Cities are hot. But what are they and what is really behind the concept? Individual tech and IT firms may have brilliant ideas, but how do we know that these will work in your community, without impeding other important issues and initiatives? How do we embed accountability? How do we work from a wide systems perspective that includes all important themes, structures and stakeholders?
Outcome

• Update on state-of-the-art smart city developments in North Carolina, the United States and globally.
• Understanding why Smart City solutions can’t be addressed or implemented in isolation and the framework to be more systems-oriented.
• A practical model to apply a systems approach to making your city smart(er).
• Networking with leaders and systems thinkers in the integrated Smart City field.

Program

Big picture: why an integrated, systems approach for smart cities

State of the art: what’s the status of smart cities in the U.S. and Europe

Voices from the field: challenges, barriers to implementation, solutions (panel discussion)

Workshop Session 1: Experience applying a practical model - practicing with systemic bottom-up and top-down approaches

Workshop Session 2: Plenary Discussion, results, and next steps. Closing remarks.

Speakers

Welcome by Prof. Gary Marchionini, Dean of the School of Information and Library Science, UNC.

Keynote: Mr. Russ Vanos, SVP Strategy and Development Itron. Keynote speaker

International Expert: Drs. Ing. Cor Rademaker, MBA, Visiting Scholar Smart Cities UNC; CEO Strateq, Netherlands

Panel Discussion

• Trevor Clements, Director Water, Tetratech
• Dwayne Campbell, CIO, City of Fayetteville, NC.
• Dr. Arcot Rajasekar, professor, Information Sciences, UNC
• Maurice Ferrell, Asst. Director for the Center of Public Technology, UNC School of Government
• Jonathan Estes, CEO Smart Game Systems, Inc.

Panel and Workshop Facilitator
Michiel Doorn, Strateq USA
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Presentation summary

EXPERIENCE SMART CITY, Europe

Drs. Ing. Cor Rademaker, MBA,
Visiting scholar smart cities UNC,
CEO Strateq
Power to the cities - some quotes

“More than half of the world’s population lives in cities, a figure expected to rise to 70 per cent by 2050”

“It might seem as though the science of cities should aspire to an integrated theory... this is a mirage”

From Manchester to Barcelona: Europe’s smartest cities put citizens first

The Guardian
HOW DO WE CREATE A SMART CITY?
by connecting:

TOP DOWN

Mayors | City Councilors | Municipal Departments

TACTICAL URBANISM

Developers
Entrepreneurs
Business Improvement Districts

Advocacy Organizations
Artists
Planning + Design Firms

BOTTOM UP

Citizen Activists | Community Groups | Neighborhood Organizations
European Smart City Topics

1. **PRACTICAL MODELS**
   - EU SC model (*also used in afternoon workshop*)
   - Focus points model

2. **STANDARDS**

3. **EUROPEAN SUPPORTING INITIATIVES**
EU SMART CITY MODEL

A smart city is a city that creates long-lasting successful socio-economic development making use of state of the art (internet) technology in order to make a smarter use of social and environmental resources profiling the cities competitiveness.

The smart city concept essentially means efficiency. Based on the intelligent management and integrated IT, and active citizen participation.

Smart cities are identified and ranked along six main axes or dimensions:

- smart economy
- smart mobility
- smart environment
- smart people
- smart living
- smart governance
FOCUS POINTS MODEL

Sustainable Urban Mobility

Citizen Focus: how we include citizens into the process as an integral actor for transformation

Policy & Regulation: creating the enabling environment to accelerate improvement

Integrated Planning: how we work across sector and administrative boundaries; and manage temporal goals

Sustainable Districts & Built Environment

Knowledge Sharing: how we accelerate the quality sharing of experience to build capacity to innovate and deliver

Metrics & Indicators: enabling cities to demonstrate performance gains in a comparable manner

Open Data: understand how to exploit the growing pools of data; making it accessible – yet respecting privacy

Standards: providing the framework for consistency commonality and repeatability, without stifling innovation

Integrated Infrastructure & Processes

Business Models, Procurement & Funding: integrating local solutions in an EU and global market

UNC EXPERIENCE SMART CITY EUROPE
SMART CITIES THROUGH STANDARDIZATION

- BSI PAS 181 Smart city framework. Guide to establishing strategies for smart cities and communities,
- ISO 37120, clearly defined city performance indicators and a standard approach for measuring each,
- BREEAM for developments (http://www.breeam.com)
- LEED for neighborhoods (http://www.usgbc.org/LEED/)
EUROPEAN SUPPORTING INITIATIVES

The European Innovation Partnership on Smart Cities and Communities (EIP-SCC)

Aim:
• To contribute to the EU’s 20/20/20 climate action goals
• Connecting cities, industry and citizens to improve urban life through more sustainable integrated solutions.

How:
• Strategic partnerships between industry and European cities.

The European Technology for Electricity Network of the Future

• European forum for the crystallization of policy and technology research and development pathways for the smart grids sector, as well as the link between EU-level related initiatives

http://www.smart-cities.eu/
GROWSMARTER PROGRAM: TRANSFORMING CITIES FOR A SMART, SUSTAINABLE EUROPE

http://www.grow-smarter.eu/home/

- 12 Smart Solutions
  Together with 20+ Industry
- 3 Lighthouse Cities
  Stockholm, Cologne and Barcelona
- Targets and Evaluation
  Economic, Social, Environmental
- Knowledge Replication
  5 follower cities, Graz, Cork, Suceava, Valetta, Porto
2015 European Top 10 Main Cities Examples

- Smart Cities
- Barcelona
- Smart City Wien
- Smart Grids
- Smarter Cities Challenge Copenhagen
- Smart City Berlin
- GeNOVA
- Amsterdam

EXPERIENCE SMART CITY EUROPE
COPENHAGEN

- the lowest carbon footprints/capita in the world (less than two tons/capita).
- most ambitious carbon reduction plan of any major city in the world. They aspire to achieve carbon neutrality by 2025.

Approx. 40% of all commutes are conducted by bicycle

Using data
- as a tool to reduce energy consumption
- as a platform to develop new solutions to help change behavior related to energy consumption.

\[ \textit{i.e. real-time info on issues of air contamination and traffic congestion for cyclers} \]

- Creating an integrated end-to-end energy model
In recent years, Amsterdam has stepped up its pace to be a leading smart city.

Amsterdam Smart City is a public private partnership focused on using the city as an urban laboratory for the use of open data, new mobility solutions and ultimately improved quality of life for all residents and visitors.

**Supporting 43 different smart projects in the city**

Smart city Amsterdam is based on 5 themes:
- Living
- Working
- Transport
- Public facilities
- Open data

Three focus areas
INNOVATIVE FLOOD-PROOFING: Sponge-zone

Bentemplein Water Square - also water retention basin. First of its kind in the world, according to C40

Circular gates to close of harbor from storm surges
ROTTERDAM

DUTCH WINDWHEEL
WINDENERGY, BIOGAS, WATERRECYCLING
Housing, Offices, Sightseeing, Bars/Restaurants
Endesa is working on upgrading its power supply system in Barcelona where it will roll out a cutting-edge smart grid offering greater savings and more efficient and sustainable management. This will prepare the city for the energy model of the future, based on values which afford economic and social progress. Total investment in this new SmartCity project is estimated to be over 100 million Euro.

- Electric vehicle
- Renewable energy and the smart storage (microgrids)
- New public lighting systems
Summary:

CITIZENS first, as an integral actor for transformation

Integrated top down/bottom up approaches: citizens needs as driver for innovation

- Through National and EU models and programs creating coherent development
- Including Industry, Cities, Research
- Citizens as the main stakeholder: for, with and by.
- Setting Models, Standards and City Indicators
- Exchanges best practices and upscaling between cities

EU and USA cooperation coming soon!
Voices from the field: challenges, barriers to implementation, solutions
What are the main challenges to making a city smarter?

Single purpose entities and departments, especially administrative ones. E.g. we need program-based budgeting, we need to reward employees differently.

We have prescriptive, single issue regulations that can’t deal with multiple objectives, inhibit innovation, and create a regulator vs regulated mentality.

Information, integration, address trust, privacy and quality vs quality. It should translate down and lead to participation and action. Visualize outcomes.

How can we break down the silos?

We need principles that everybody can get behind. Purpose driven decisions.

What’s in it for me (WIIFM). Speak from the perspective of the citizens/customers/employees. Tie project outcome to *their* job results.
Panel: Impressions 2

How can we move from project to program management?

If you automate a mess, you get an automated mess.

Start with process improvement. Introduce a project management system, including data handling.

Engaging citizens

Ask them. Organize “café conversations.

Key is short-term feedback + action, or you will lose them forever.

Help people see personal implications over the long term.

In a Smart City there is a substantial information flow in both directions.
WORKSHOP IMPRESSION 1

Using the EU Smart Cities Model

These 6 characteristics are also perspectives to look at the city!

Model was used from a Top down and a Bottom up perspective.
We chose downtown mid-size city.
WORKSHOP IMPRESSION 1.

Downtown mid-size city

Each group of three looks at downtown America from a different perspective

Participants from:
- City of Greensboro,
- Town of Chapel Hill,
- City of Raleigh,
- City of Fayetteville,
- UNC
- EPA’s, Sustainable and Healthy Communities Research Program
Working with the EU SC model - Findings

- Develop critical mass,
- e.g. day-time AND night-time activities
- Not just young. bring seniors downtown
- Need amenities, e.g. theater
- Grocery store (Start with coop)
- Educate people about benefits of Local

- Look at impacts
- WIIFM (Free rides?)

**Smart Economy**

- Engage the community
- Create cultural, educational and physical (green) space
- Policies that encourage all other perspectives (integrated planning)
- be ware of gentrification (affordable housing)
- Accessible council (wo)men

**Smart Mobility**

- Begin with end goal in mind
- Create a vision, through a participatory process
- Self assessment, monitoring
- Gaps, Opportunities, Barriers
- Track stability of growth
- Standardize public engagement

**Smart Governance**

- Educate!
- Focus on retention
- Diversity through creativity
- Civic participation
  - partnerships
  - link with mobility
  - get feedback

**Smart Environment**

- Track market signals
- Provide information
- Regulatory instruments
- Manage Local vs State dynamics
- Link with public transit
- Sustainable management
WORKSHOP IMPRESSION 2

GAIA - climate change and adaptation serious game with SGS

For more information: www.smartgamesystems.com