Kees Donker
Challenges, vision and solutions: an integrated perspective for a smarter city

Leuven, June 1st
Let’s build a Smarter Planet
Infusion of Intelligence into the Way the World Actually Works

Our world is becoming
INSTUMENTED
+
INTERCONNECTED
+

Virtually all things, processes and ways of working are becoming
INTELLIGENT
objects

...and connected?
It’s time to take advantage of….

- Smart objects
- The connectedness of everything
- Supercomputing for everyone
- Information put to work
- Collaboration & co-creation
- The marketplace for expertise
- The virtual corporation
There are for the moment no technical boundaries

While the number of transistors per square inch on integrated circuits doubles roughly every 18 months (Moore’s Law)...

...more storage can be purchased each year for the same price.

Semiconductor Industry Assoc.; Seagate (as reported by IBM Institute for Business Value: The Specialized Enterprise); Pricewatch
The city is a microcosm of the major challenges and opportunities facing the planet today—intensified and accelerated. Here, all man-made systems come together and interact with one another.
Smarter energy and utilities: An opportunity to manage supply and demand

By providing real-time information about the flow of energy, an intelligent utility system helps citizens and utilities make smarter, more responsible choices about the way they buy, sell and manage utility services.

SMART GRID
Monitor the health and stability of the grid at all times, identifying an outage or issue as soon as it happens and dispatching crews to address it immediately. Enable customers to monitor energy prices and their own energy use in real time.

BUILDING EFFICIENCY ASSESSMENTS
Reduce energy consumption and CO₂ emissions, and save water usage, using sensors to monitor everything from motion and temperature to humidity, precipitation, occupancy and light.

WATER MANAGEMENT
Use the right tools to optimize consumption, monitor quality and model past and future water basin behaviors.

ENERGY PORTAL
Store and quickly access energy consumption data, customer data, device monitoring and sensor data at all times—empowering the consumer.
**Smarter healthcare:** An opportunity to achieve better quality and outcomes, increase value and improve accountability and sustainability

A smarter healthcare system forges partnerships and makes better use of data in order to deliver excellent care, predict and prevent disease and empower people to make smarter choices.

**HEALTH INFORMATION EXCHANGES**
Enable patients, consumers, health practitioners and insurers to securely share clinical information across organizational boundaries, enabling safer, more timely, efficient and effective patient-centered care.

**CONSUMER PORTALS**
Encourage consumers to assume responsibility for health and chronic disease management through transparency of healthcare costs, quality of care and prescription drug costs, empowering them to make wiser health and financial decisions.

**DISEASE SURVEILLANCE**
Prevent and manage threats to the health of a community by capturing, sharing and modeling data to spot trends and identify causes, detect disease outbreaks early, efficiently manage cases and take action as needed to protect the public.
Smarter public safety: An opportunity to turn data into insight to protect citizens and communities

A smarter city uses advanced technologies and community-based approaches to anticipate and prevent—not just respond to—crimes and emergencies.

**CRIME DATA AGGREGATION**
Put decades worth of crime information at the fingertips of law enforcement officers at all times.

**EMERGENCY MANAGEMENT INTEGRATION**
Connect police, fire departments, ambulance services and other first responders so all are instantly alerted when an emergency takes places.

**SMART SURVEILLANCE SYSTEMS**
Use digital cameras to continuously monitor urban areas and automatically alert authorities when a suspicious event occurs or when a license planet, vehicle or other entity is recognized.
Smarter government services: An opportunity to infuse intelligence into needed services, stimulate economies and save taxpayer time and money

Increased information sharing and collaboration drives smarter decision-making.

**CITIZEN-CENTERED DESIGN**
Shift towards a citizen-centered business model to improve services, experiences and outcomes while lowering costs.

**INTEGRATED DELIVERY OF SERVICES**
Connect people to needed programs with speed and accuracy. Enable cities to predict potential issues so preventative measures can be taken.

**BUSINESS AND CITIZEN SERVICES**
Interconnect dynamically with citizens, communities and businesses to spark growth, innovation and progress.

**GOVERNMENT ACCOUNTABILITY**
Results-driven agencies manage, monitor, analyze and report on key initiatives, with measurable outcomes.
Smarter transportation: An opportunity to improve the transit experience, reduce congestion and encourage a modal shift among users

Cities can infuse intelligence into their entire transportation system, improving drivers’ commutes, giving better information to city planners, increasing public transportation usage and the productivity of businesses, and raising citizens’ quality of life.

ROAD USER CHARGING
Employ a dynamic toll system based on the flow of vehicles into and out of a city to reduce traffic.

ELECTRONIC FARE MANAGEMENT
Enable rail, bus and road customers to purchase fares via SMS or online and have the fare collected automatically.

TRANSPORTATION INFORMATION MANAGEMENT
Gain real-time traffic prediction and intelligent route planning capabilities.
**Smarter cities roadmap:** Starting with your goals and a long-term strategy, select high-value projects that can be managed carefully to produce visible results.

1. Develop your city’s long-term strategy
2. Prioritize a few high-value projects
3. Integrate across your systems
4. Optimize your services and operations
5. Discover new opportunities for growth and optimization
High-Resolution Flow Modeling for New York City

Rainfall Estimates

Flood Prediction

Impact Estimates

Central Park
The CSA System: integrating several ‘stovepipes’

City Situational Awareness
(CSA system)

- Energy
- Sewage
- Drinking water
- Surface water
- Traffic
- Police
- Fire department
- Medical

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HOW TO set priorities to police and fire department? (energy, traffic, water plazas)
Case study: Flood Control 2015

• 20M euro program (2008 – 2012) in the Netherlands, open to launching customers

• Focused on:
  – New monitoring techniques
  – Real-time prediction methods
  – Decision support systems
  – Serious Gaming

• Joint initiative of:
  – Industry: Fugro, Arcadis, HKV, Haskoning, IBM
  – Knowledge institutes: Deltares, TNO, ITC, IJkdijk
## Selected smarter cities projects with authorities Snapshot

<table>
<thead>
<tr>
<th>Project</th>
<th>Phase</th>
<th>Description</th>
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<tbody>
<tr>
<td><strong>1. City Command Center</strong></td>
<td>Pilot phase</td>
<td>Demonstrator giving dashboard views</td>
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<tr>
<td></td>
<td>Project</td>
<td>Manage projects and City Services</td>
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<tr>
<td><strong>2. Smarter Cities Assessment Tool</strong></td>
<td>Pilot phase</td>
<td>City of Mons</td>
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<tr>
<td></td>
<td>Project</td>
<td>Assess 6 cities &amp; recommend areas for improvement and propose implementation actions</td>
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<tr>
<td><strong>3. Smart Building</strong></td>
<td>Pilot phase</td>
<td>3 public buildings (schools)</td>
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<tr>
<td></td>
<td>Project</td>
<td>1000 schools</td>
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<td><strong>4. Smart Mobility</strong></td>
<td>Pilot phase</td>
<td>Smarter Taxi</td>
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<tr>
<td></td>
<td>Pilot 2</td>
<td>Smarter Parking</td>
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<tr>
<td></td>
<td>Project</td>
<td>extension of pilots to several cities</td>
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<tr>
<td><strong>5. Smart Information</strong></td>
<td>Pilot phase</td>
<td>8 information kiosks in the city of Mons</td>
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<tr>
<td></td>
<td>Project</td>
<td>extension to 50 kiosks in Mons and several other cities</td>
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<td><strong>6. Cloud Computing</strong></td>
<td>Pilot phase</td>
<td>Infrastructure to support pilots</td>
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<tr>
<td></td>
<td>Project</td>
<td>Cloud services to BNL customers</td>
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