



**Smart networks, objects, buildings and
people:
Empowering the Internet for Smarter Cities**

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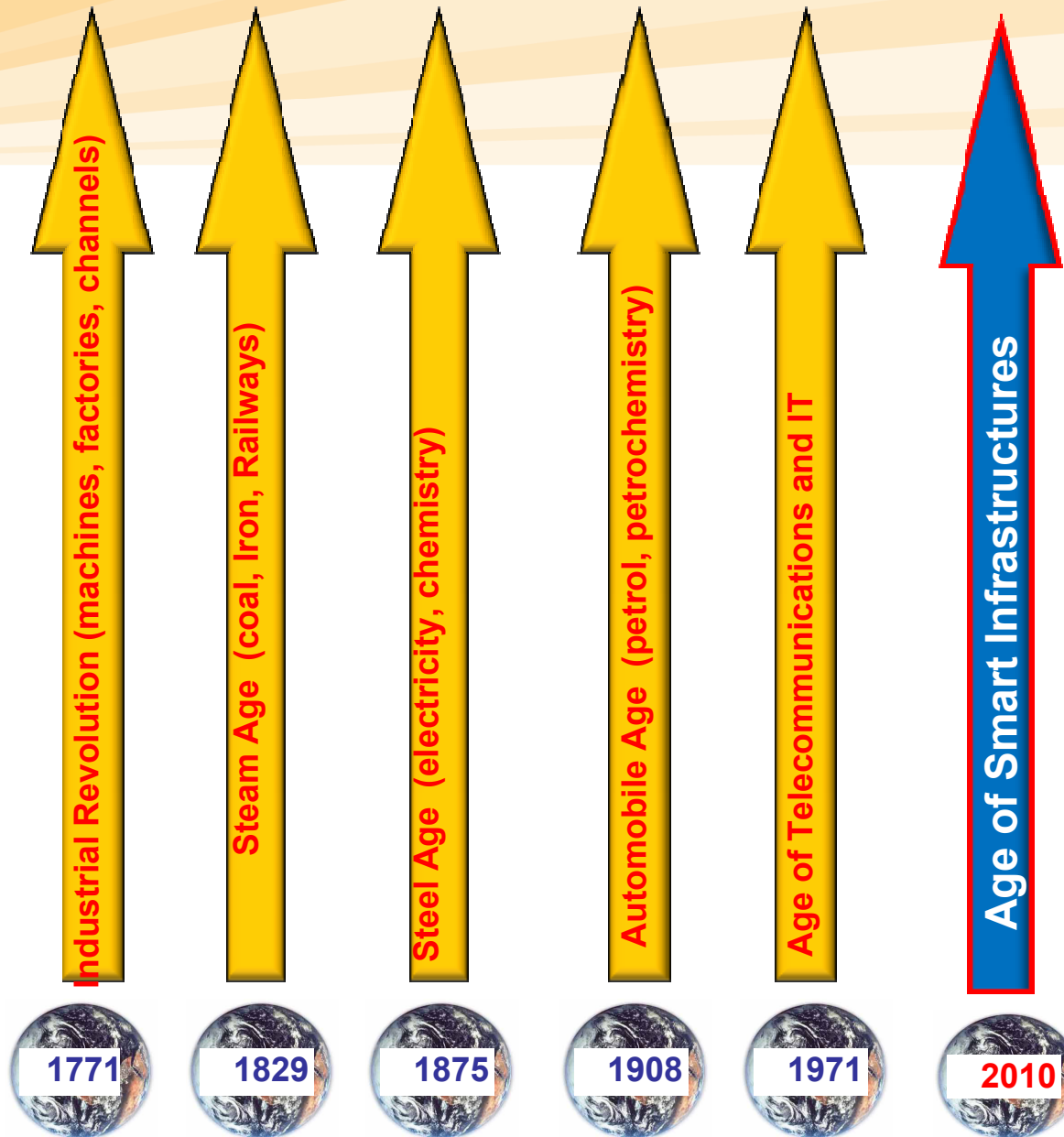
Some Archaeology of “Smart Cities” in EU Research Framework Programmes

- **Telematics for Urban and Rural Areas (FP4)**
 - 1995-1998
 - 2 Calls
 - 222 Proposals
 - 35 Projects [incl. 33 shared-cost]
 - Including TELE-INSULA (24 months)
 - 78 M€
- **Integrated Applications for Digital Sites (FP4)**
 - 1997-1998
 - 55 Proposals
 - 22 Projects [incl. 12 shared-cost]
 - 55 M€

IADS Success Stories

- **CALYPSO**
 - A unique card for payment, identification and ticketing (“Citizen Pass”)
- **CITIES**
 - A global cooperative digital platform supporting a host of telematics services
- **DISTINCT**
 - Smart card based services and multimedia information services for Transport, Elderly Persons and Disabled People
- **IMAGINE**
 - A European model for a “Digital Town” (building urban intranets)
- **INFOVILLE**
 - Increasing access of people to electronic services (Municipal/Regional services, Education & Training, Transport, Electronic Commerce)
- etc.

Technological Revolutions



Each Revolution transforms the economy and leads to growth, development and new innovation forms

Each Revolution reshapes the opportunity space, and our ways of working and living

At the beginning of a new Age

- **Mature industries are close to technology exhaustion, their innovation drive is weak**
- **Old economies stagnate, new technologies are incipient**
- **Need to select the new engines of growth**
- **Moving from *laissez-faire* to the active comeback of the state**
- **Shifting from supply-push to demand-pull in investment and innovation**
- **Moving from individual focus to collective interests**
- **Old industries and markets are rejuvenated**
- **Making the best out of our technological potential**

Today's Drivers and Opportunities

- **Rising costs of energy, transport, health**
- **Huge inefficiencies in energy and transport and health related processes**
- **Growing environmental threats**
- **Growing security threats**
- **Untapped potential of ICT as smart infrastructure enablers**
- **Energy distribution and management**
- **Transport, mobility, architecture, urban planning**
- **Production, waste disposal, recycling**
- **Health, well being, third age**
- **Sports, leisure, culture**

What is a “Smart City”?

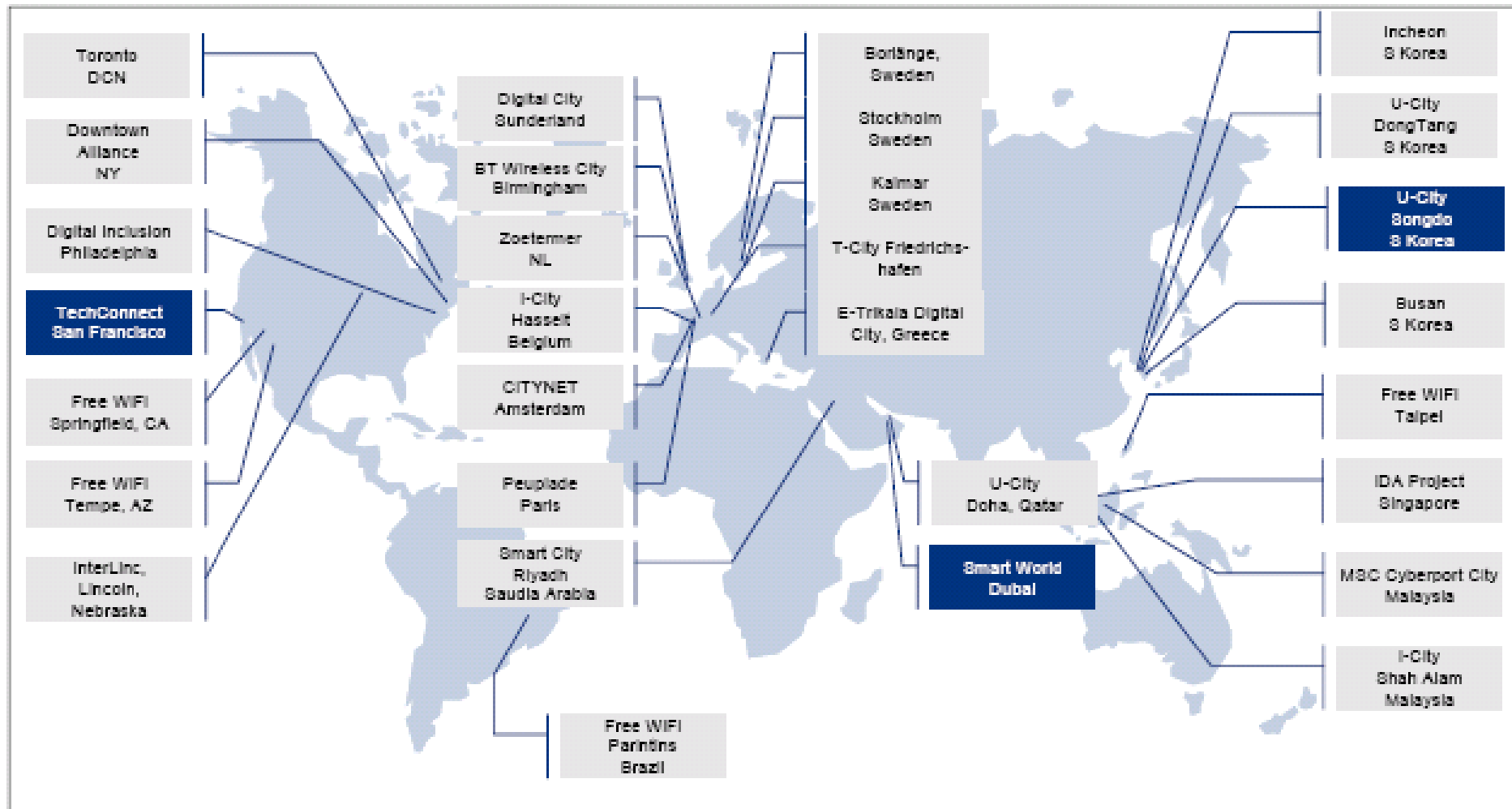
- **Instrumented**
 - Smart meters, distribution networks
 - Building management systems
 - Infrastructure sensors
 - Traffic and transit sensors
 - Public safety systems
- **Interconnected**
 - Networked environments – fibre, wireless, buildings, open spaces
 - Networked sensors, sensor platforms, concentrators
 - Enterprise Service Bus (ESB) – a platform to realise a service-oriented enterprise architecture
- **Intelligent**
 - Lots of data – how to get value from it?
 - Real-time analysis of sensor data streams
 - “Enterprise-view” visibility of the city in action
 - Behavioural modelling of physical, natural and people systems,...

Source: IBM at Global Forum 2009, Bucharest, RO

Why Smart Cities Now?

- **Technological factors**
 - Pervasive digital networks, cheap sensors,...
 - Over 4 bn mobile cellular subscribers in the world (60% penetration)
 - Location-based services and social networking
 - Global Networked Enterprises
- **Economic factors**
 - The top 100 urban agglomerations account for 25% of worldwide GDP
 - Developed world has underinvested in its cities; developing world needs new urban infrastructure
 - Rise of “new” cities: Masdar City, Songdo, GIFT, KAEC, etc.
 - Financial and economic crisis is spurring government stimulus
- **Social / Demographic factors**
 - 50% of the world population lives in a city
 - 2010-2050: Urban population will almost double
 - 18 countries in the world with contracting populations (in 2050: 44)
 - Rapid urbanisation creates high stresses in Asia
- **Environmental factors**
 - Cities occupy 2% of the world’s geography but account for 75% of the world’s greenhouse gas emissions → drive for cities to cut carbon emissions and increase the energy received from renewable sources
 - 1.2 billion cars on the road by 2015 (1 car / 6 people)

Smart Cities Around the World



Source: DETECON Consulting



<http://giftgujarat.in/>



<http://www.masdarcity.ae/en/index.aspx>



<http://www.kingabdullahcity.com/en/CityInProgress/CityPhases.html>



<http://www.songdo.com/>

The Challenge

- *“By 2050, city dwellers are expected to make up 70 percent of the Earth's total population, spiking from approximately 3.3 billion people today to a breathtaking 6.4 billion. That gives us only 40 years to prepare our cities and our planet for an inflow of new inhabitants.”*

IBM, <http://www.ibm.com/ibm/smartercities/us/en/>

- *“Why not use the urbanisation focus and combine that with the digital focus, meaning bring IT and an IT backed backbone into the new buildings, and make them smart buildings that can be more energy-efficient and be very technology-driven buildings?”*

Padmasree Warrior, CTO of Cisco Systems

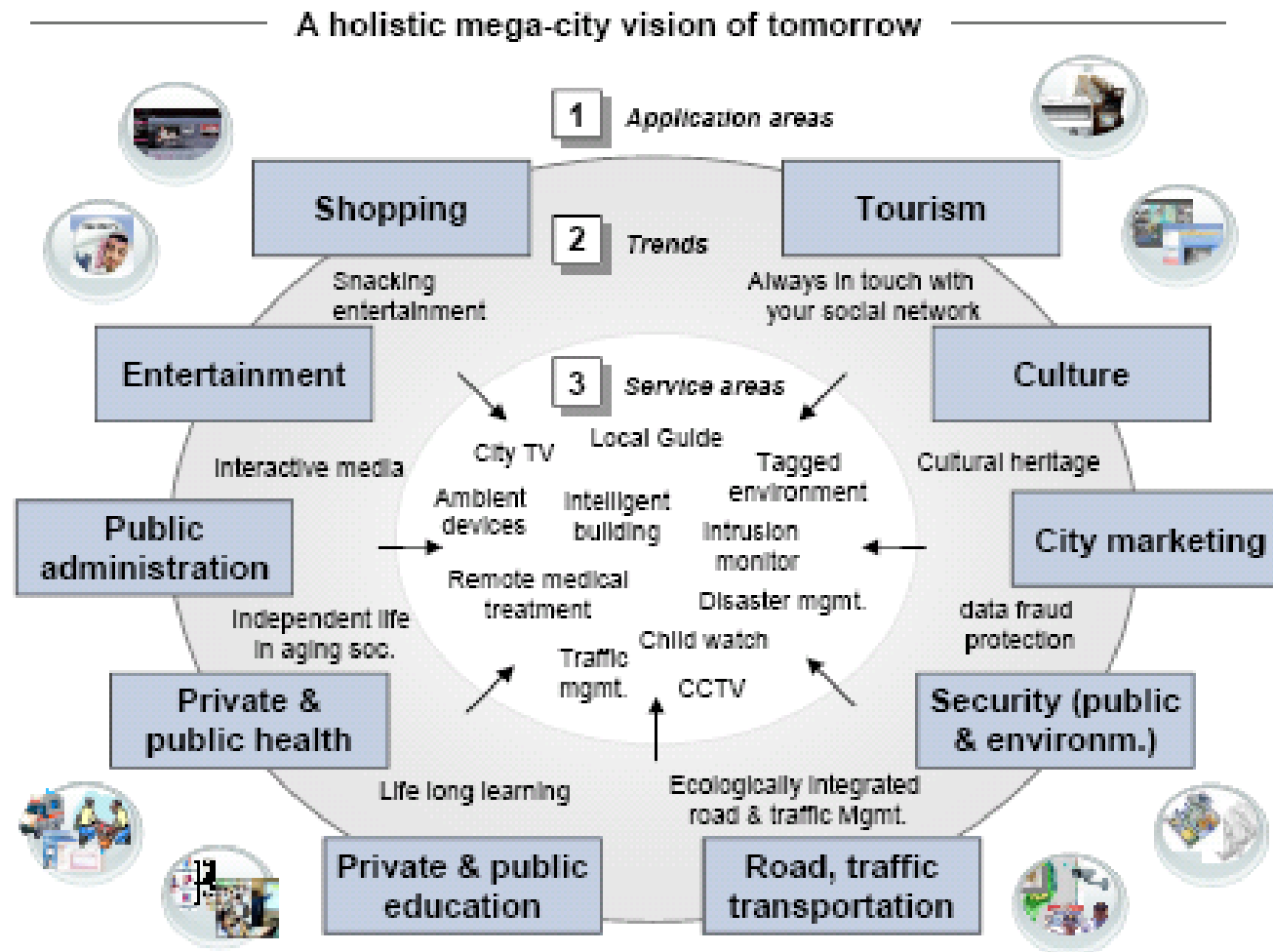
Smart City: A System of Systems

- **Infrastructure**
 - Transportation, utilities, communications, water management, energy, etc.
 - Improving quality, efficiency and sustainability
- **Business**
 - Smart government attracting and retaining companies and starting new ventures
 - Planning, product and services regulations, openness to foreign trade and investment, taxation, ease of starting new businesses...
 - Creating jobs and wealth
- **Human Capital**
 - Basic human services: education, healthcare, public safety...
 - Social, community and cultural services
 - Attracting and retaining talented people

The Applications of the Internet of Things

- **Things on the move**
 - Retail, logistics, pharmaceutical, food,...
- **Ubiquitous intelligent devices**
 - Smart clothes, smart books, intelligent buildings, intelligent cars,...
- **Ambient and assisted living**
 - Health, intelligent home, transportation,...

Smart Cities and Smart Services



Source: DETECON Consulting

Tokyo Ubiquitous Technology Project

- 1200 RFID chips embedded around Tokyo's Ginza shopping district, 270 infrared spotlights, 16 Wi-Fi stations on lampposts, flower beds, stores, and underground subway tunnels
- The technology can be used to help guide the elderly, the blind and the handicapped through city streets



*“A glimpse into the future, when chips on objects and places will become widespread so government offices and private businesses will use them to zip information to passers-by”
(Prof Ken Sakamura)*

China's first municipal Internet of Things

- Longyan municipal government of Fujian province
- Framework cooperation agreement with Tsinghua Tongfang
- Focus on digital urban management, “waterless harbour”, public emergency
- Up to CNY 3.2 billion will be invested, and 10,000 cell towers and 20,000 access points will be built in the province



More information

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R&D:

- http://cordis.europa.eu/fp7/ict/enet/home_en.html

Policy:

- http://ec.europa.eu/information_society/policy/rfid/index_en.htm

Thank you!

