Smart Cities of Korea
Trends
Development of Smart City

1993: Amsterdam Digital City
2004: Korea, started u-City
2006: Europe, Living Lab started
2008: Global companies like IBM, CISCO, Smart City Strategies
2011: Barcelona, Smart City World Congress
2012: China, announced a plan to build 320 smart cities
2014: India, 100 Smart Cities
2016: US, Pres. Obama Smart City R&D Plan
2018: Korea, National Pilot Smart City
2017: Dubai, Test of Urban Robotics like a flying taxi
2019: Google, Sidewalk Master Plan
Approaches to Smart Cities

Holistic Approach

City as a Product

City as a Platform

Smart City 1.0

Fragmented Approach

Smart City 2.0

Smart City 3.0

Smart City 4.0

Smart City x.0
Smart cities are ...


Solutions

Urban Problems

Smart Economy

Regional Development

Creating New Society
Smart City development model

Architecture and platforms are key to the advancement of Smart City

**Infrastructural**
- Modern physical infrastructure
- Tech friendly city

**Smart System**
- Separated system
- Smart devices like smart card, street lights

**Vertical Interoperability**
- Link or integration of Smart services in a domain or along the same value chain
- Service hub for each domain
- Smart energy, smart traffic, etc.

**Horizontal Interoperability**
- Removal of silos between related domains like safety-related domains, welfare-related domains, etc.
- Architecture & platforms bridge domains and enable new convergence services
- A totally new service from existing ones
- Institutional innovation is needed

**City as a Platform**
- A city works as a platform
- Well-designed architecture (rules and structure) in place
- Interoperability of data, systems and services across the city
- City substantially enables the use of smart technologies such as robot and AR

**National Strategy**
- holistic
- architecture & platform-driven

**City strategy**
- fragmented
- technology-driven

**Present**
Smart City Winter
Figure 1. The Changing Seasons of AI and HCI.
Funding climate and public perception with three HCI high points.
u-City had a good start and produced best cases in the early 2000s
u-City lost momentum and Korea fell into smart city winter

Number of Greenfield u-City in Korea
What’s wrong with u-City?

City as a Product
- Separation of build and operation
- Lack of continuous innovations
- Reliance on developer for investment

Fragmented Approach
- Focus on service without common platform
- Missing the power of architecture and platform

Hwasung-Dongtan, the first greenfield u-city in 2008
Retry
The Korean government adopted the 4th Industrial Revolution as a new development strategy in 2017. Smart City was regarded as an integral part of the 4IR.
New Smart City Strategy of Korea in 2018

1. Technology-driven ➡ Human-oriented Smart city
2. Urban development ➡ City as an engine for innovation-based growth
3. Investment in infrastructure ➡ Value for citizen from service
4. One-size-fits-all service ➡ Customized city
5. One-off development ➡ Sustainable city as a platform
6. Supplier and public led ➡ Customer and private led open city
7. Fragmented policy and projects ➡ Converged and linked city
## Approaches to Types of Cities

<table>
<thead>
<tr>
<th>Type</th>
<th>Direction</th>
<th>Key policy</th>
</tr>
</thead>
<tbody>
<tr>
<td>New city</td>
<td>Apply new technologies and establish new infrastructures</td>
<td>National pilot cities</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regulation-free regions</td>
</tr>
<tr>
<td>Growing city</td>
<td>Develop services promptly by using mature technologies</td>
<td>Data hub</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Specialized services zones</td>
</tr>
<tr>
<td>Shrinking city</td>
<td>Apply smart solutions under the government’s leadership</td>
<td>Regenerate a city based on smart city strategies</td>
</tr>
</tbody>
</table>

- Growing city: Develop services promptly by using mature technologies. Key policy: Data hub, Specialized services zones.
- Shrinking city: Apply smart solutions under the government’s leadership. Key policy: Regenerate a city based on smart city strategies.
Law & Plan

Special Act

- Act on u-City Constructions & etc.
  - enacted world first smart city act in March 2008
  - approached smart city as a product

- Act on Smart City Creation & etc.
  - revised in July 2018
  - approached smart city as a platform

Comprehensive Planning

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>established Nov. 2009</td>
<td>Sep. 2013</td>
<td>Jun 2019</td>
</tr>
<tr>
<td>Focused on</td>
<td>construction &amp;</td>
<td>Focus on service &amp;</td>
<td>Focus on innovation</td>
</tr>
<tr>
<td></td>
<td>vertical data</td>
<td>horizontal data</td>
<td>&amp; platform</td>
</tr>
<tr>
<td></td>
<td>integration</td>
<td>integration</td>
<td></td>
</tr>
</tbody>
</table>
• **At a National Level**
  - Special Committee on Smart City
    Nov. 2017
  - Government Committee on Smart City

• **At a City Level**
  - 84 Cities have smart city projects
    (as of Jun 2019)
  - No. of cities with dedicated SC squad

\[
10^{('14)} \rightarrow 34^{('18)} \rightarrow 46^{('19)}
\]
Korea’s New Smart City Strategy

New City

Growing City

Shrinking City

Smart City Challenge ('19~)
- City-specific Service Dev. ('18-'20)
- Data Hub

City Regeneration

Busan EDC

National Pilot Smart City

Sejong 5-1 Zone

Transform

Reform
Busan Pilot Smart City
Digitalization → Digital Transformation

Smart City → Smart Transformation
Overview of Busan National Pilot Smart City

Pilot Smart City is ...

Model House
- Future City Concept
- Basic City Platform

Development Lab
- Common Services for all Cities
- Living Lab

Test bed
- Real Environment Test bed
- Open Innovation
Busan aims to be the world first Augmented City

Digital (Data, AI) + AR/VR + Robotics → Augmented City
Digital Platform

1. City Computing (Super-Computer)
2. Intelligent Communication
3. City-wide Cyber Security
4. Data Hub

Augmented Reality Platform

1. Dynamic Digital Twin
2. Precision Location
3. Data with Geo-context

Robot Platform

1. Robot Management at the City Level
2. City Design for Robot Use
3. Robot Risk Management
Lessons
The Power of Architecture & Platforms

**Without A&P**
- Investment-driven development
- Silos of Services & Infrastructures
- Short term effects

**With A&P**
- Innovation-driven
- Democratization of technology
- Connected city and sharing of Infra
- Long term effects
The Role of Governments

Services in City

Services by City

Smart City Base

Institutions, Technology, Architecture & Platforms

private
government

Local Government

National Government

Private
The Role of Governments

Top-down

- Active role of national government
- Architecture of smart city platform
- Interoperability between cities

Bottom-up

- Promotion of citizen engagement
- Private investment and service development
- Testbed for creative ideas
One of big contributions by The World Bank and the Korean government is to develop guidelines together for cities and policymakers around the world.
Thank you

Hwang, Jong-Sung, Ph.D.
Master Planner of Busan National Pilot Smart City of Korea
Lead Researcher at National Information Society Agency
js.goodworld@gmail.com