Status of Smart Cities in Korea

- Smart City Testbeds based on IoT Platform -

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STRATEGY OF MSIP FOR BUILDING THE INTERNET OF THINGS (2014 ~)

Master Plan of MSIP (Ministry of Science, ICT and Future Planning) for Building the Internet of Things (IoT), May 2014
Strategy 1. Increase Collaboration Among Players in the Ecosystem

- Collaboration among the government (ministries and local governments), big companies, network operators, service providers, and SMEs
  - To develop open service platforms
  - To encourage new IoT products and services
**Strategy 2. Promote Open Innovation**

- **Closed Ecosystem → Open Ecosystem**

<table>
<thead>
<tr>
<th>Category</th>
<th>As-Is</th>
<th>To-Be</th>
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<tbody>
<tr>
<td><strong>Method</strong></td>
<td>Closed Innovation</td>
<td>Open Innovation</td>
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<tr>
<td><strong>Concept</strong></td>
<td><img src="image1" alt="Closed Ecosystem Diagram" /></td>
<td><img src="image2" alt="Open Ecosystem Diagram" /></td>
</tr>
<tr>
<td><strong>Stages</strong></td>
<td>Government: Government selects pilot services to be led by the government (decision-making on requirements, functions, methods, etc.) → Secure budget and order projects</td>
<td>Government: Government provides an open platform environment for service development and provision (under collaboration with global/large businesses and communication service providers)</td>
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<td>Private sector: Private sector obtains order for each project (SI provider – small and medium-sized subcontractor) → Develop/ construct according to the requirements of government pilot projects</td>
<td>Private sector: Private sector transforms ideas into services and provides them (supporting service development of small and medium-sized venture companies)</td>
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<td>Government: Each government institution builds and uses systems separately</td>
<td>Government: Government purchases and uses private-sector services</td>
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<td><strong>Features</strong></td>
<td>There is a lack of interoperability between each system as well as redundant system development</td>
<td>Interoperability is improved and data can be connected and used</td>
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<td>There is a burden of expenses for development, construction, and operation</td>
<td>Realization of economies of scale and scope can minimize the cost burden</td>
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<td>It is difficult to respond to environmental changes</td>
<td>Flexible responses are ensured when there are environmental changes</td>
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Strategy 3. Develop Customized Strategies for large/big company, SMEs, and Startups

- For Global and Large companies
  - Strengthen alliances and open partnerships

- For SMEs
  - Provide the open platform and test-beds to reduce development costs and enable time-to-market
  - Support collaborations among businesses of different areas such as software, sensors, and devices

- For startups
  - Establish an ecosystem to realize their ideas into products and business models
R&D ROADMAP FOR THE IOT TECHNOLOGIES
K(Korea)-ICT Strategic Industries

- Software
- **Internet of Things**
- Cloud
- Security
- 5G
- UHD
- Smart Device
- Digital Contents
- Big Data
- Artificial Intelligence
R&D Map of IoT Platforms

Common Platform (2012-2015)
e.g., Mobius Platform

e.g., FIESTA and WISE-IoT

Intelligent Platform (2017-2020)
Intelligent Platform (2017-2020)

IoT High Level Architecture (cited from IoT R&D Roadmap of MISP and AIOTI WG03)
SMART CITY TEST-BEDS
Start from the Open IoT Platform

- Build Open Platform
- Demonstrate Promising Services
- Support Service Facilitation

- City services that solve problems and facilitate private sector participation
- Transport
- Safety
- Energy
- Environment
- Healthcare that links demand and supply
- Pilot Management
- Infants’ Behavioral Disorder Management

Support SMEs and venture companies’ demonstration and commercialization

Smart City/ Healthcare Demonstration Support Center → Provision of environment (Open Lab, technical support, etc.) for development

Korea Electronics Technology Institute
Busan – Smart City Platform

- Coordinator: SK Telecom
- Open Smart City Platform
  - Based on oneM2M Standard
- Services, Applications and Devices
  - Proposed and deployed by SMEs
### Testing prospective city services (26 services)

#### COMMUNITY SAFETY
- Smart streetlights
- Relief services for the socially disadvantaged
- Smart Maritime safety service (utilizing drones)
- Smart subway ventilation management system
- Secure location management service based on smart LED streetlights
- Development of smart marine leisure services deploying IoT-based weather data collection devices

#### TRAFFIC IMPROVEMENT
- Smart crosswalks
- Smart safety service for subway/LRT platforms
- Trial of Smart City disaster prevention system
- Smart traffic safety service in school zones
- Smart City platform-based safety advisory service for wet road conditions
- Developing & testing ‘soft’ smart ship service platform for passenger safety & convenience, using wireless integrated IoT sensor technology

#### URBAN LIVING
- Proximity beacons for small business location-based marketing services
- Smart parking
- Pedestrian-responsive smart directional information signage service
- Testing of situation-aware Smart Home service
- Social care services utilizing IoT smart mirrors
- CCTV video analytics for traffic data collection & alternative route info
- Enhanced image-based smart parking service
- Visitor access control and monitoring system

#### ENERGY CONSERVATION
- Smart building energy conservation
- Smart store energy management
- Development of urban energy-self-sufficient smart farm service, linked with Smart City platform

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**2015: 15 Services**

- **Smart parking**
- **Reinforcing education services through happiness and environmental technology for outdoor using facilities**, providing rayime information of healthiest park in using intensity

**2016: 11 Services**

- **Smart marine leisure services**, deploying IoT-based weather data collection devices
Goyang – Smart City Platform

- Coordinator: LG U+
- Open Smart City Platform
  - Based on oneM2M Standard
  - Sharing the Busan Smart City Platform
- Services, Applications and Devices
  - Proposed and deployed by SMEs
Goyang – Smart City Services (for 2016)

- Proposed services
  - Smart Eco City services
  - Air Quality Management
  - Open Public Data
  - Smart Street Light
  - Smart Parking

<Smart ECO City service>

<Air Quality Management>
Daegu – Smart City Platform

- Coordinator: Daegu TechnoPark
- Daily Healthcare Platform
  - Based on oneM2M and ISO/IEEE 11073 Standards
- Objectives
  - To improve life quality of people
  - To support business incubation
### Daegu – Smart City Services (for 2016)

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Description</th>
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<tr>
<td><strong>Fitness App connected to fitness centers</strong></td>
<td>Help trainers to better aid their trainees</td>
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<tr>
<td></td>
<td>• A trainer could design personal workout plan for users</td>
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<td></td>
<td>• A trainer could monitor daily workout status of users</td>
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<td><strong>Chronic Disease Mgmt.</strong></td>
<td>Extend trial scope to include small and medium sized hospitals</td>
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<td>• Collect biometric indices of different patient conditions with diet history and share the data with hospitals</td>
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<td><strong>Pregnant Woman &amp; Maternity Care</strong></td>
<td>Help mothers to better balance exercise and diet</td>
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<tr>
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<td>• Help mothers to better adjust their workout and diet in order to change metabolism during the pregnancy</td>
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<td><strong>Gene Analysis based HC</strong></td>
<td>Provide generic healthcare advice based on one’s gene analysis</td>
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<td>• Take gene analysis for various genetic markers and provide generic healthcare advices accordingly</td>
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<td><strong>Fatigue Recovery</strong></td>
<td>Develop a fatigue recovery service for critical operators</td>
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<td>• Improve 1st year services to better meet user’s expectations</td>
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Lessons learned

• Can provide a common service platform for smart city based on oneM2M standards
• Need training program for the developers
• Need city information model or city domain ontology to support interworking between smart cities in information level
THANK YOU

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