Korea Telecom and its role in Smart City development

- For SSC Workshop ITU-TRAI -
Contents

1 Introduction to KT
2 Smart City Development in Korea
3 KT’s effort in sustainable smart city development
4 Major References
5 Direction of development
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to KT</td>
</tr>
<tr>
<td>2</td>
<td>Smart City Development in Korea</td>
</tr>
<tr>
<td>3</td>
<td>KT’s effort in sustainable smart city development</td>
</tr>
<tr>
<td>4</td>
<td>Major References</td>
</tr>
<tr>
<td>5</td>
<td>Direction of development</td>
</tr>
</tbody>
</table>
Company Overview

Korea Telecom

Established: December 10, 1981
Revenue: USD 17.4 B (2014)
Stock Listing: Korea, New York, London
No. of employees: 23,800 (2014)

KT Group

- Consolidated Revenue: USD 21.4B (2014)
- Consolidated Assets: USD 30.7B (2014)
- Number of Subsidiaries: 56

ICT Subsidiaries

- kt ds (IT/SI)
- kt telecap (Security)
- kt ens (NI, IDC)
- NEXR (Big Data)
- CENTIOS (Smart Space)

[The Full List of Subsidiaries]
Global Awards and Recognitions

1. MWC Outstanding Overall Mobile Technology (Feb. 2014)
2. DJSI Industry Super Sector Leader (2010 ~ 2014)
4. WBA WiFi Industry Awards (Nov. 2012, 2013)
5. GSMA joyn Innovation Challenge 2012 (Feb. 2013)
## Contents

1. Introduction to KT
2. **Smart City Development in Korea**
3. KT’s effort in smart city development
4. Major References
5. Direction of development
01 Background: Urbanization in Korea

The concentration of population in the Seoul Metropolitan area brought the need for developing phase 1 and phase 2 new towns.

Concentration of population and industries in Seoul (more than 20% of the total)

Development of 5 new cities around Seoul vicinity

Development of self-sustaining new towns
The problems generated by rapid urbanization threaten the quality of life.

**Factors Impacting Life Quality**

- High Population Density
- High Crime Rate
- Environmental pollution
- Waste Management
- Traffic congestion
03 Background: Social & Technical Trends

Global trends affecting society and personnel lives can be observed beyond physical boundaries by virtue of ICT.

Emerging Trends

- Mobility
- New Business Model
- Economic Vitality
- Innovating to Zero
- Smart & Green
- Connectivity
- Health & Wellness
- Future Infrastructure
- Social Trend

ICT as a Facilitator

Source: City as a customer: Identifying Growth Opportunities in Cities of Tomorrow by Frost & Sullivan, April 2013
04  Smart City development in Korea

KT proposed Smart City concept to the Korean government as a new model of city development

- **R&D for Smart City Model Development**
  - Develop Technology, Operation Model of Smart City
  - Test-bed for IT and Construction Convergence

- **Government organizations facilitate Smart City Development**
  - MOCT and MIC sign a MOU on Smart City implementation
  - Define roles of related government agencies

- **Applying Smart City concept for Dongtan City**
  - LH(Land and Housing Corp.) leads city development
  - Successful initial implementation leads to development of other smart cities

* Ministry of Construction & Transportation
** Ministry of Information and Communication
Major Stakeholders in Smart City Development

**Central Government**
- Supports the industry through establishing Smart City law
- Standardization of relevant technologies

**Public Land Developers**
- Plan and develop selected land based on Smart City Concept
- Fund Smart City Projects

**City Municipalities**
- Smart City assets are transferred to Municipality
- Operation and maintenance
- Prepare Local regulations

**Private Companies**
- Lead Plan/Design/Implementation of Smart City projects
Regulations regarding Smart City

U-City Law

Background

- Smart Cities are consisted of various services; whereas multiple government organizations are related

- The Korea Government with the support of major Smart City developers have developed the U-City Law which regulates and gives guidance to U-City implementation

Types

- U-City Law
- U-City Decree
- U-City Guideline

Major Contents

- Smart City Comprehensive Planning
- Permits and license
- Technology development
- Management & Operation
- Privacy
- Smart City Steering Committee
<table>
<thead>
<tr>
<th></th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to KT</td>
</tr>
<tr>
<td>2</td>
<td>Smart City Development in Korea</td>
</tr>
<tr>
<td>3</td>
<td><strong>KT’s effort in sustainable smart city development</strong></td>
</tr>
<tr>
<td>4</td>
<td>Major Reference</td>
</tr>
<tr>
<td>5</td>
<td>Direction of development</td>
</tr>
</tbody>
</table>
Values for KT Smart City

Sustainability will realize four areas of benefits that should be resolved through an experienced service provider:

**Energy Savings**
- Utilize alternative energy resources
- Seamless connection between IT and physical services

**Reliable Infrastructure**
- 24/7 uninterrupted smart services
- High speed reliable network service

**Efficient Operation**
- Less man managed service features
- Centralized operation and management

**Quality of Living**
- Enhance life quality through information and devices
- Safety of residents and visitors, operators & management
- Safety in and around common areas, residence
Efficient Operation through Integrated Operation

KT’s Integrated Operation Platform can integrate smart services, monitor and control all the services through the City Operation Center.
The 3MP is an IoT based city platform that offers productivity, cost efficiency, and timely entry into new markets.

- **Implementation Cost Reduction**
- **Easy addition of smart services**
- **User customization based on widget**
Integrated monitoring benefits

3MP’s integrated monitoring and control of operation flow enables quick resolution of city issues.

### As-Is

**Fragmented Operation**

- **Situation Breakout**
  - Citizen
  - Water mgmt admin
  - CCTV mgmt admin
- **Accept Situation**
  - Weak Communication
  - Each Responsible department
- **Propagate Situation**
  - IOC Administrator
- **Send Orders**
  - Mobile VMS
  - Responsible Service department
- **Act upon Situation**
  - Each Responsible officer
- **Confirm Situation termination**
  - Weak Communication

### To-Be

**Organic and Seamless Operation**

- **Situation Breakout**
  - Citizen
  - Sensor
  - Water level gauge
  - devices
- **Accept Situation**
  - IOC Administrator
- **Propagate Situation**
  - Strong Communication
- **Send Orders**
  - Mobile VMS
  - Responsible Service department
- **Act upon Situation**
  - Responsible Service officer
- **Confirm Situation termination**
  - IOC Administrator
## Energy Savings

KT has participated and played an important role in government-led initiatives for energy savings.

### Government led Initiatives

<table>
<thead>
<tr>
<th>Participation Area</th>
<th>Smart Market Place Implementation</th>
<th>Micro Energy Grid ('13~)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major roles of <strong>kt</strong></td>
<td>Implementation of Integrated Operation system</td>
<td>System Integration and Interconnection</td>
</tr>
<tr>
<td></td>
<td>Implementation of Smart Grid Management Infra (AMI, EMS, ESS)</td>
<td>System implementation for Analysis of Energy data</td>
</tr>
<tr>
<td></td>
<td>BEMS Implementation &amp; commercialization</td>
<td>Implementation of DR service platform</td>
</tr>
<tr>
<td></td>
<td>Implementation of charging infra. for electric vehicles</td>
<td></td>
</tr>
</tbody>
</table>

**Smart Grid Pilot ('09~)**

- System Integration and Interconnection
- System implementation for Analysis of Energy data
- Implementation of DR service platform

**Micro Energy Grid ('13~)**

- System Integration and Interconnection
06 Energy Savings case – for Campus

Handong University in Korea

- **Overview:** Implementation of energy monitoring and saving solutions at campus level
- **Site:** Handong University in Korea, 2013
- **Implementation Description:**
  M2M Integrated Monitoring solution, Vehicle monitoring, EMS, CCTV, BIS, CSMS

Dashboard for monitoring

- **Internet**
- **Smart classroom**
- **A/C monitoring**
- **Energy monitoring**
- **CSMS**
- **BIS monitoring**
- **CCTV monitoring**
- **Vehicle monitoring**
Energy Savings case – for Building

BC Card Future Center Building

- **Site**: BC card Future center, Seoul, 2012
- **Implementation Description**: Energy management platform, Legacy BAS/FMS interface, Environment-based control (CO2, external air temp), Analytic advanced BEMS
- **Energy Analysis Overview**
  - Period: January 1, 2013 ~ June 30, 2014 (18 months)
  - Base year: 2011.1~2012.12 (2year)
  - Improvement: 14.2% (1 year average) reduction against base year
Reliable Infrastructure – Facility management

Smart City is implemented to efficiently manage and operate city infrastructure for decrease of maintenance cost and increase usability.

- **Values**
  - Increased usability of infrastructure
  - Decrease of maintenance cost
  - Increase of user satisfaction

- **Site**: Dongtan Smart City, Paju Smart City etc.
- Sensor based urban facility management
- CCTV monitoring
- 3D monitoring of underground water/gas pipelines
- Road monitoring
- Network Management
Quality of Living – Increased access to information

Data collected through sensors and wireless devices will be used as information for public access.

- e-government portal
  - Government information open to public with easy access
  - Tax payment, Application for public document etc.

- Transit Information system
  - Real-time Bus/train Arrival Time
  - Route information
  - Transfer information
  - Vicinity Area Map
  - Information collected through Wi-Fi, GPS & Sensors

- Public API Sharing
  - Public Data API opened to be used for extensive development by the general
  - Brings various options and better service for users
Contents

1. Introduction to KT
2. Smart City Development in Korea
3. KT’s effort in sustainable smart city development
4. Major References
5. Direction of development
Dongtan Smart City
Dongtan, the first Smart City in-operation

**General Information**

- 40km South from Seoul
- 9.04km² (2,169 acre)
- 120,692 population
- 39,827 households
- Project Period: May 2006 ~ Sept. 2008
- Budget: 50.8 M USD

**Major Features**

- Residential that disperses population from Seoul
- Implementation of Green City concept with greenway connection throughout the city
- Strong connection with semiconductor/logistics industry for job security
- Road design that brings easy connection to city amenities
Smart Services of Dongtan

Dongtan aims for a safe and convenient city through the citywide implementation of smart services and network infrastructure.

Dongtan Smart City

3 Major Themes

- Safe City
  Preventing urban crimes and bring sense of safety
- Convenient City
  Efficient and easy accessibility to city information
- Clean City
  A city that sustains the environment

Smart Services

- Safety
- Portal
- Traffic
- Media Board
- Environment

Public Services for Citizen & Tenant

Integrated Operating Center & City Platform

N/W, High-End Infrastructure & facility
03 Dealing with issues during development

Related government organizations and resident committee has made a Steering Committee to mediate developing issues of Smart city

**Key Findings**

- Main public and private interests of the city participate in regular meetings
- Related Departments of Hwasung City and Resident Committee are core participants of the Steering committee
Songdo Smart City
01 Songdo – Sustainable Smart City

Songdo Smart City is pursuing the establishment of four development directions to become an international business hub.

- **Composition of a Cluster** consisting of industrial, academic and R&D org.
- **Development as a hub for multinational companies in Asia Pacific**
- **Setting a complex of high-tech, knowledge-based industries**
- **Developing an International business center** including Convention Center and Exhibition Centre, etc.

**General Information**

- Total area: 53.4 km² (5,340 ha)
- Expected Population: 252,500 by 2020 (Current 55,000)
- Total Budget: 7.6B USD
- Locates World Bank, GCF (Green Climate Fund) HQ

**Development Directions**

1. **Composition of a Cluster** consisting of industrial, academic and R&D org.
2. Development as a **hub for multinational companies in Asia Pacific**
3. Setting a complex of high-tech, knowledge-based industries
4. Developing an **International business center** including Convention Center and Exhibition Centre, etc.
02 PPCC Model for Songdo Smart City

To overcome the issues of public based Smart City development, Incheon U-City Co. was created for a sustainable business model structure and stable city infra operation.

**Challenges facing Smart City development**

- Uncertainty in public service value proposition
- Difficulty in securing budget for operation
- Stable and reliable service management

**Launch of Public-Private Cooperation Company**

Incheon U-City Co. established as a public-private cooperation company

- Shareholding Structure: KT & Cisco (Centios), Incheon City, local SMBs of Incheon
- Main Business: Implementation & Management of Incheon smart city & buildings
Engagement model for PPCC

To overcome the issues of public based Smart City development, Incheon U-City Co. was created for a sustainable business model structure and stable city infra operation.

A. Smart city IT project initiated through Incheon U-City Co., a PPC company

B. • Develop user oriented service concept
   • Selection of best of breed solutions for implementation

C. • Service Implementation
   • Direct Operation & Maintenance of city infrastructure

D. Strategically invest in future city development and management projects based on expertise
Contents

1 Introduction to KT
2 Smart City Development in Korea
3 KT’s effort in sustainable smart city development
4 Major Reference
5 Direction of development
01 Direction of City Development

Fixed computing, one way information transfer
- A one way information transfer from services to user
- PC oriented smart service: limited information access

Increasing Operation and Upgrade cost
- Operation cost of smart city infrastructure and services increase bringing burden to city budget

Mobile and IoT based services
- The change to mobile based services can increase customized and location based services
- The use of big data of government for wider service options for the citizens

Cost savings, prolongation of city resources
- City facilities and infra can benefit from the use of sensors and IoT technology

- Cloud based computing for efficient demand control
Thank you!

irene.seo@kt.com