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# **Smart Response to Climate Change: Cities of Korea**

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# JUNGHOON / LEE

#### Current Status

- Professor of Technology & Innovation Management, Graduate School of Information, Yonsei University
- Director of DT (Digital Transformation) Technology Management Center, Yonsei University
- Member of the National Smart City Committee, the Ministry of Land. Infrastructure and Transport. Republic of Korea
- Vice-chairs of Smart City Committee & Data driven Public Administration Committee, Incheon Metropolitan City
- Member of the Smart Cities Committee of Seoul Metropolitan Government (former chair)
- Member of the National Data Policy Working Committee
- Chairman of the Special Committee on the Openness and Utilization of Public Data, Open Data Strategy Council

#### Academic Qualifications

- University of Cambridge, U.K. Ph.D. in Manufacturing Engineering and Management (IS)
- London School of Economics, University of London, U.K.
- M.Sc. in Analysis, Design and Management of Information Systems
- University of Manchester, U.K. / M.Sc. in Information Systems Engineering
- University of Manchester, U.K. / B.Eng. in Electronic Engineering

#### **Industry Experiences**

- Visiting Academic Fellow, University of Cambridge, U.K.
- Visiting Professor, Graduate School of Business, Stanford University, U.S.A.
- Entrue Consulting Partners, LG CNS CO., Ltd, LG Group, Korea (Senior Business Consultant/Senior Research Fellow )
- LG-EDS Systems Inc, Korea Manufacturing and Logistics Consultant

#### Academic Accomplishment [Major Papers - Published in a total of 95 Journals/Conferences]

Lee, Y-J & Lee J-H (2016) "Knowledge workers' ambidexterity: conceptual separation of competencies and behavioral dispositions:, Asian Journal of Technology Innovation, Vol.24, No1. pp.1-22

Hu, MC,Wu, CY, Lee, JH Lu, YC (2014) "The influence of knowledge source and ambidexterity in the thin film transistor and liquid crystal display industry: evidence from Japan, Korea, and Taiwan", Scientometrics, Vol. 99, pp.233-260 [SSCI]

Lee, J-H, Hancock, M-G, Hu, M-C (2014) "Towards an effective framework for building smart cities: Lessons from Seoul and San Francisco", Technological Forecasting and Social Change, Vol. 89, pp.80-99. [SSCI, Most cited articles in TFS ranked 7th]

Lee, J-H, Phaal, R., Lee, S-H (2013) "An integrated service-device-technology roadmap for smart city development", Technological Forecasting and Social Change, Vol.80, pp.286-306. [SSCI, Most cited articles in TFS, ranked 6th]

#### **Major Bibliography**

<sup>®</sup>Strategic Management of Technology and Technology Innovation<sub>J</sub>

<sup>r</sup>R&D Management<sub>J</sub>

<sup>©</sup>Entrepreneurship and Innovation<sub>J</sub>

<sup>𝕫</sup>ITS in Asia」



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### Smart Cities Index Report (2017 ~ 2022)

**Global Index Report** published every two years - Research on global-leading smart cities to understand current status of smart cities and to present future direction of smart cities. Continuously adding new cities.

#### Smart Cities Index Report History



#### Smart Cities Performance Measurement By 8 Dimensions based on 31 cities



#### **Urban Sustainability**

### Sustainable Growth, the Main Concern of Smart Cities







# <sup>r</sup>Seoul, a sustainable city where people, nature, and the future coexist\_

# 2050 Greenhouse Gas Reduction Strategy through Green New Deal





▲ Exhaustemissions



▲ Seoul covered with fine dust



▲ Torrential rain in Gangnam, Seoul

**Smart Service** 







IoT-based Remote Control of Air Pollutant Discharge Facility

Air Environment Information Integration System

Smart Water Circulation City Construction Project







▲ 3D Simulation of Sea Level Rise in 2030



### **Smart Service**



# **Eco Delta City**

Creating renewable energy independent city

#### **AI Marine Debris Management System**

**Predicts the** occurrence of marine debris and analyze the

causes

**Establishment of an** environmental health monitoring system in trafficcongested areas

Incheon & Daegu



Incheon, a leading city for eco-friendly natural circulation

Expanding the Supply of Renewable Energy

**Low-carbon City** 

# Citizens-Centered, Carbon-Neutral Cities



Digital Convergence Industry Innovation City



▲ Rescue flood victims in Nogok, Daegu



▲ Landslides in Suseong-gu, Daegu





▲ Road flooding in Michuhol, Incheon

#### **Smart Service**



#### Smart Green Industrial Complex

- Smart Energy Cluster
- Cloud-based energy-efficient infrastructure



Landslide Prediction and Warning System

Verification accuracy by 80%

# Smart Service

**Urban Flood Monitoring** 

Services

Predict flooded areas



Heat wave reduction service

Temperature reduction by 10% © 2022. Isi all right reserved.



Responding to water disasters as climate change Protect citizens' lives and property Sharing Opinions with Citizens

source (left) https://www.conventioncitoyennepo urleclimat.fr (right) https://www.ukparliamentweek.org

**Climat France, CCC** 

**Convention Citoyenne pour le** 

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**Climate Assembly UK, CAUK** 

#### Sambang Water Living Lab : Gimhae



#### Sambang Water Living Lab Season5 2022.10 ~ 2022.11

#### Living Lab for Preventing Urban Flood and Drought

- Preventing urban flooding and drought of urban with the citizens
- Water resource management and use awareness of the citizens. •

#### Why Living Lab?

- Fatal accident occurred by underground road flood in 2020
- Insufficient amount of total water resources such as decrease in the water level of the river
- · Necessity of discovering problem-solving skills that citizens can feel











# Living Lab Activities and KPI



#### Living Lab On-line Platform

- Urban river system to protect citizens' property and lives
- Efficient data analysis & disaster prevention by linking real-time river
- Effizer-defiric data collection activating citizen participation

















Satisfaction rate

### Eco Delta Smart City : Busan



# EDC Smart Village Pre-Living Lab2021.09 ~ 2022.01

#### A Global Innovative City to Accelerate The Life Of The Future

- Sustainable life for future generations
- Maximizes social utility value

ä:

'Smart Life, Smart Link, Smart Place' a model for future cities

#### Why Living Lab?

- Test bed to demonstrate future life and technologies in citizens' daily lives
- Optimized for technological advancement and service expansion reflecting citizens' practical needs

#### ~2022.11 The Future Cities ens' daily lives asion reflecting Cities Ci

### **Smart Zero Energy City**

### **Innovation Technology Service**



# Shared Electric Vehicles

- Reduce carbon emissions
- Mobile application service
- Substituting a personal vehicle

# 

# Smart Water Platform

Advanced flood management system

- Water quality and information
  platform
- Smart Water Purification Plant
- SWM (real-time water management)

Solar Skin

Minimizing carbon emissions

- The city implemented renewable energy complex system on the exterior of every housing
- Achieved 1<sup>st</sup> class zero energy for the first time in a domestic housing complex.

Innovative technology services and self-sufficient energy system

'Platform Center' that collects & monitors village generated data

# Smart Farm

EDC Smart Village Living lab 2022.10

- Self-sufficient urban farming model
- Natural purification process using collected rainwater
- Alleviate water/soil pollution through raised bed cultivation



### Smart Trash Can

- Waste Management Services with Waste Data Technology
- Analyzing data to implement solutions

## Eco Delta Smart City : Busan



Envisioning Workshop

Mobility



· 문격인 지원 활용을 문주 211년 745 월년을

지입 VS 제품에 출고 이 문제 있다. YT

Water Environment

Smart Farm



#### **Envisioning Workshop**

• Public-Private-People **Co-activities** 

Energy

Smart Home

- Sharing expectations and needs with each other

ന Robot

Safety

- Promoting the use of technology and citizen participation in EDC



- Create data dictionaries from a citizen's perspective
- Redefine data for intuitive understanding, activating energy conservation and understanding of usage status













Participants





**Tech Companies** 



\* Pre-living Lab Included

10 Living Lab

Sessions by Sector

Healthcare

Hours



# Smart City, A Regional Innovation Platform fueling Urban Growth

# Core Unit of Intelligence

For better decision and effective operation

# Test Bed for Innovation

In order to support existing industry and foster emerging industry

# Sustainable Development

Respond smart to climate change for future generations

# **Cradle for Social Inclusion**

Socially, digitally, and ecologically





Information Systems Intelligence