WISE–IoT, EU-KR Collaboration

SeungMyeong Jeong (KETI)

OVERVIEW

- Project Name: Worldwide Interoperability for SEmantics IoT

- Project Duration: 2 Years (2016. 06 ~ 2018. 05)

- Partners: KR - 10 institutions, EU - 9 institutions

- Propose: Globally linking IoT services of goods using semantic technology

THE KR CONSORTIUM

SEJONG UNIVERSITY
- Coordination
- Demo Coordination
- Develop Interworking technique

KETI 전자부품연구원 (Korea Electronics Technology Institute)
- Recommended service use case definition
- Semantic resource structure design

SAMSUNG SDS / SK telecom / SOLU M
- Cross-platform interworking technology architecture tasks and requirements design (oneM2M to Insator)

- Development of Lora sensor and deriving service and use case

KAIST
- GS1-oneM2M Global Use-Related Use Cases and Requirements , Interworking structure design

KNU (KYUNGPOOK NATIONAL UNIVERSITY)
- Demonstrate global interoperability use cases and requirements related to healthcare

GSIPA 강릉과학산업진흥원 (Gangneung Science & Industry Promotion Agency)
- Supporting the execution of tests and pilot services on project deliverables

1THEFULL
- Development of user recommendation service based on context awareness using Big Data

IReIS ㈜이레아이에스
- Development of service application software, application of platform demonstration complex and acquisition of empirical data

THE EU CONSORTIUM

- Coordination
- Demo Coordination
- Semantic mapping technology development based on FIESTA project

- Semantic technology and ontology development
- Semantic annotator and mapper implementation

- Design of key interfaces and component structures to ensure interoperability between one-EU test beds

- FIWARE adapter maintenance and support

- Interoperability validation for an integrated platform implementation based on requirements and technical specifications

- Feasibility evaluation of mechanism of user feedback analysis and recommendation system

- User-based feedback and analysis techniques

- Development and implementation of social IoT function and recommendation service

- Development of healthcare sensor and deriving service and use case
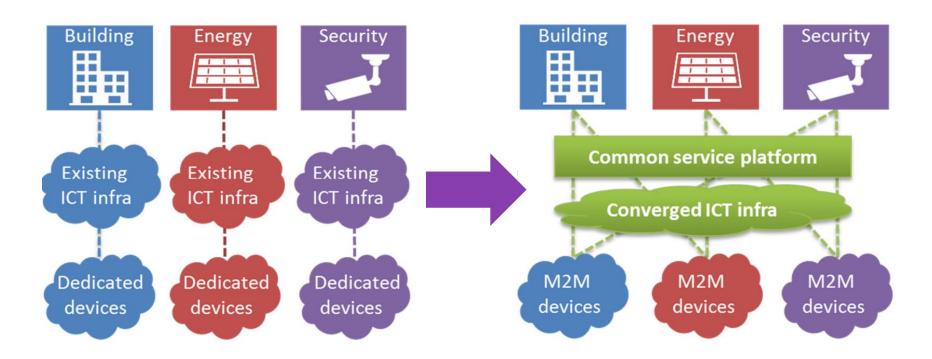
WHY HORIZONTALIZATION IS URGENTLY NEEDED?

- Highly fragmented market with small vendor-specific applications

- Reinventing the wheel: Same services developed again and again

- Each silo contains its own technologies without interop

- End-to-end platform: common service capabilities layer

- Interoperability at the level of communications and data

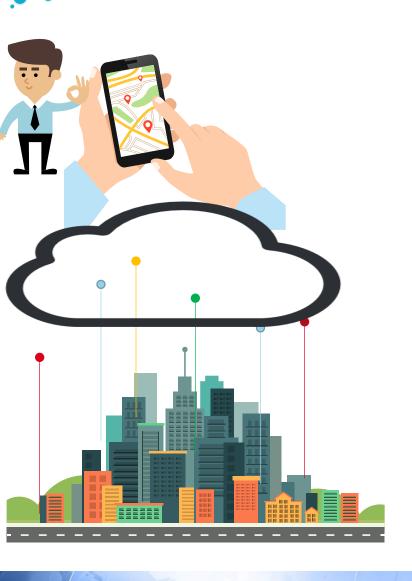- Seamless interaction between heterogeneous applications and devices
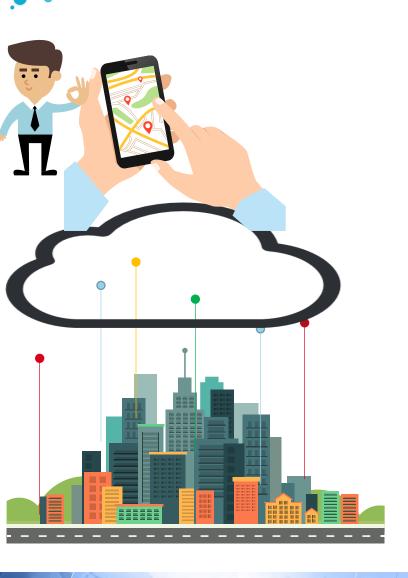
PROBLEMS AND BACKGROUND
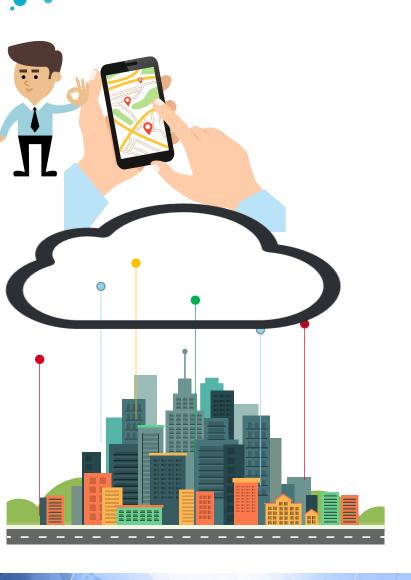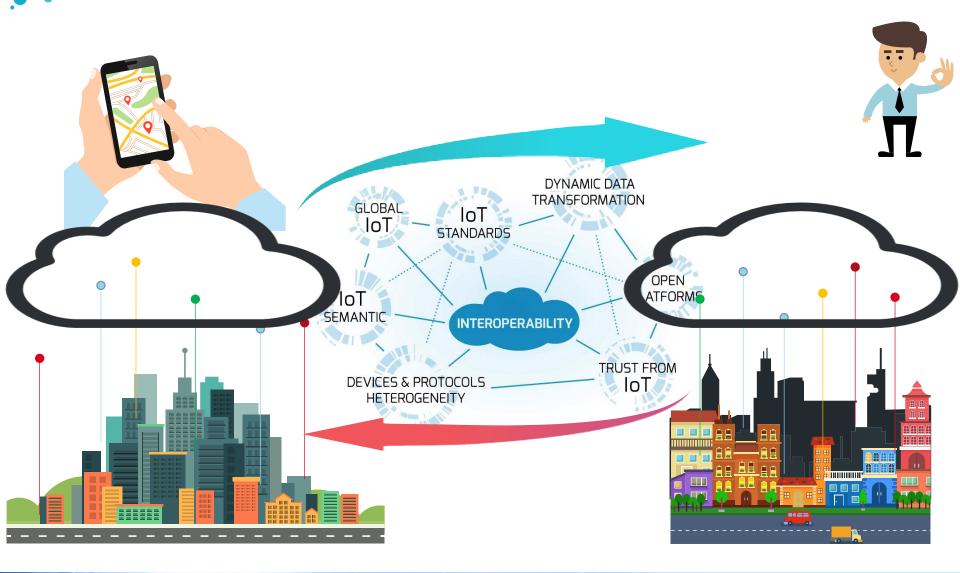
CHALLENGES & OBJECTIVES

- Security interoperability
- Privacy awareness
- Achieve use of the GIoTS

Openness & scalability

Trust Privacy and security

Application and service portability in complex scenarios

- Replicate services across the test sites
- ✓ re-use enablers across eco-systems
- Roaming of applications and services

Smart objects and semantic interoperability

- Include intelligence on the edge
- ✓ Achieve semantic interoperability
- Demonstrate added value

Standards Interoperability & Interworking

- ✓ Multiple test sites & protocols
- ✓ Research integration methods
- ✓ Cross-testbed scenarios

Common IoT reference architecture

- ✓ Integration of IoT systems
- ✓ Standard Inclusiveness
- ✓ Contribution to Standards

WISE-IOT VISION

- Problem:
  - Fragmentation of IoT Technologies and Deployments

- Solution:
  - Semantic Interworking between FIWARE ↔ oneM2M

- Success Criterion:
  - App and device developers may work on one stack

- Trials:
  - Smart Skiing (CEA), Smart Resort (SDS)
  - Rich/Smart Parking (UC, KETI), Bus Management (KAIST, UC)
  - Deagu Fitness Testbed

- Validation: cross-cutting global mobility scenarios
  - access to remote IoT data
  - travel of applications and devices to remote places

GLOBAL MOBILITY
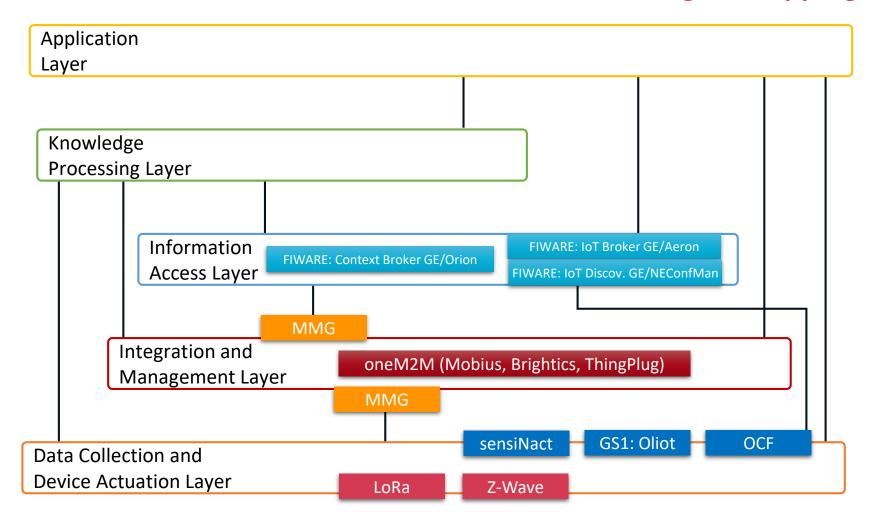
WISE-IOT LAYERED VIEW

with Technologies Mapping

Application Layer

Knowledge Processing Layer

Information Access Layer
- FIWARE: Context Broker GE/Orion
- FIWARE: IoT Broker GE/Aeron
- FIWARE: IoT Discov. GE/NEConfMan

MMG

Integration and Management Layer
- oneM2M (Mobius, Brightics, ThingPlug)

MMG

Data Collection and Device Actuation Layer
- sensiNact
- GS1: Oliot
- OCF
- LoRa
- Z-Wave

- ## Smart City use cases:
  - > Smart Parking → Santander 🇪🇸 and Busan 🇰🇷
    - ◊ 2 roaming applications
  - > Bus Information System → Busan 🇰🇷 and Santander 🇪🇸
    - ◊ 1 roaming application

- ## Skiing use cases
  - > Smart Skiing → Chamrousse 🇫🇷 and Alpensia 🇰🇷
    - ◊ 1 roaming applications
  - > Smart Resort Management → Alpensia 🇰🇷 and Chamrousse 🇫🇷
    - ◊ 1 roaming application

- ## Fitness use case 🇰🇷

SMART PARKING APPLICATION: EU APPROACH

- Objective
  - Enhance user parking experience in the city by providing information ab out parking spots/areas and routes based on recommendations
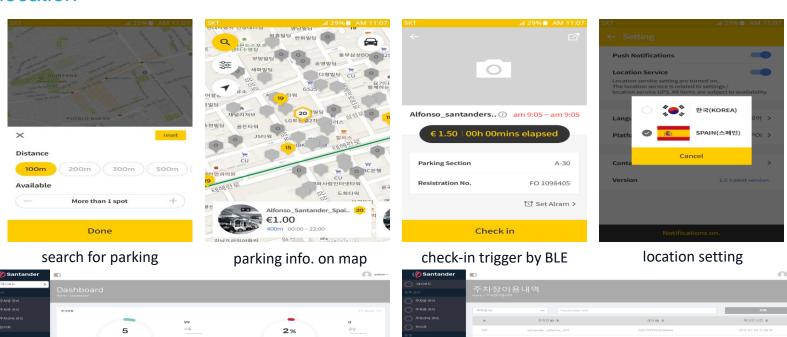
SMART PARKING APPLICATION: KR APPROACH

- Objective
  - Enhance user & manager parking experience in the city by providing information/services related to parking spots/areas, and routes based on geo-location

search for parking

parking info. on map

check-in trigger by BLE

location setting

manager page for overall status

status of parking lots

- Objective
  - Collection and presentation of real-time bus information to stakeholders
  - Improving user experiences while using and managing bus and dealing with missing transparency and situation awareness

SMART SKIING: EU USE CASE

- Objective
  - Provision of IoT services to both skier and ski resort managers to enhance the experience of the user in the resort and improve the effectiveness of the actions taken by the resort managers

- Objective
  - Operational information and controllability to the resort managers by providing visualization the location and status data of not only rescue teams, children/elder and disabled visitors, but also valuable belongings of visitors, vehicles and even equipment which belong to the resort
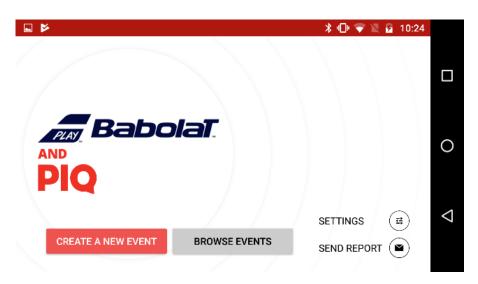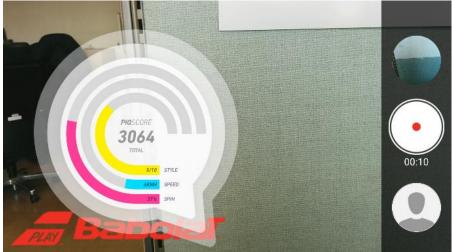
FITNESS USE CASE

- Objectives:
  - Analysis on Daegu daily health care smart city testbed to assess the feasibility of using fitness related use cases in both EU and KR
  - Develop fitness related Wise-IoT devices & apps & services and introduce users in both EU and KR

- Demonstration of global IoT services in Korea and Europe

- Global IoT services through semantic data interoperability

감사합니다 !　　THANK YOU !

Worldwide Interoperability for Semantic IoT

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WISE IₒT

Ministry of Science and ICT

APPENDIX. ACHIEVEMENTS

MEETINGS

- Plenary Face to face
  - 160627 KR Kick Off - Pangyo
  - 160711 EU Kick Off - Nice
  - 161010 Plenary F2F #1 – Seoul
  - 170123 Plenary F2F #2 – Grenoble
  - 170606 Plenary F2F #3 – Geneva
  - 171013 Plenary F2F #4 – Seoul, Alpensia
  - 180130 Plenary F2F #5 – Santander
  - + Monthly conference calls

- Ad-hoc technical meetings & workshops
  - 160825 EU Smart City UC Meeting – Santander
  - 160823-24 Smart skiing UC workshop - Alpensia
  - 160920&21 - WISE IOT - Meeting minutes - Skiing UC Workshop
  - 161013 Smart city workshop Seoul
  - 161016 Use case visit Alpensia
  - 161209 T2.4 Workshop – Windisch/Zurich
  - + Weekly conference calls

WEB SITE (WWW.WISE-IOT.EU)

ACHIEVEMENTS

DEMO AND INTEROPERABILITY EVENTS

- 2016 and 2017 IoT Week Korea
  - SJU, KETI, EGM,NEC, UC, FHNW, KAIST

- 2016 and 2017 ETSI M2M showcase events
  - SJU, EGM, KETI, NEC, UC, FHNW, KAIST, IMT-TSP

- oneM2M Interop 3
  - 29 Nov.- 2 Dec. 2016, Kobe, Japan

- oneM2M Interop 4
  - 16-19 May 2017, Taipei, Taiwan

- oneM2M Interop 5
  - 04-08 Dec 2017, Sungnam, Korea

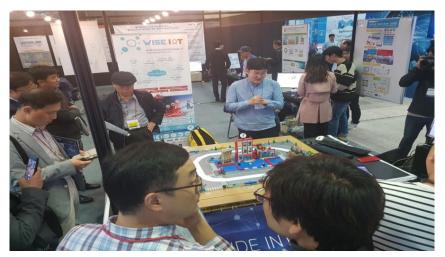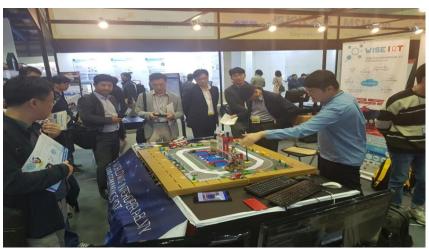< The 3rd oneM2M Interop Event >

ACHIEVEMENTS

<Wise-IoT Kick off plenary meeting – Nice>

<Wise-IoT plenary meeting – Seoul>

<IoT Week Korea 2016 >

<Joint Workshop in IETF - Managing Networks of Things workshop>

ACHIEVEMENTS

<2017 IoT Week EU – Geneva, Switzerland>

EVENT PHOTOS

<Wise-IoT KR Review – Seoul>

<Wise-IoT ER Review – Belgium>

<Wise-IoT Living Laboratory – Daegu, South Korea>

<2017 IoT Week KR– Seoul, South Korea>

<2017 ETSI M2M showcase – Nice, France>

<Wise-IoT Plenary Meeting, Alpensia, South Korea>

<Wise-IoT Plenary Meeting, Santander, Spain>