Leading Software Package Supplier

DASAN HANDYSOFT

HANDYSOFT IoT Business Introduction

September, 2016

www.handysoft.co.kr

www.handypia.co.kr

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Ⅰ. OVERVIEW

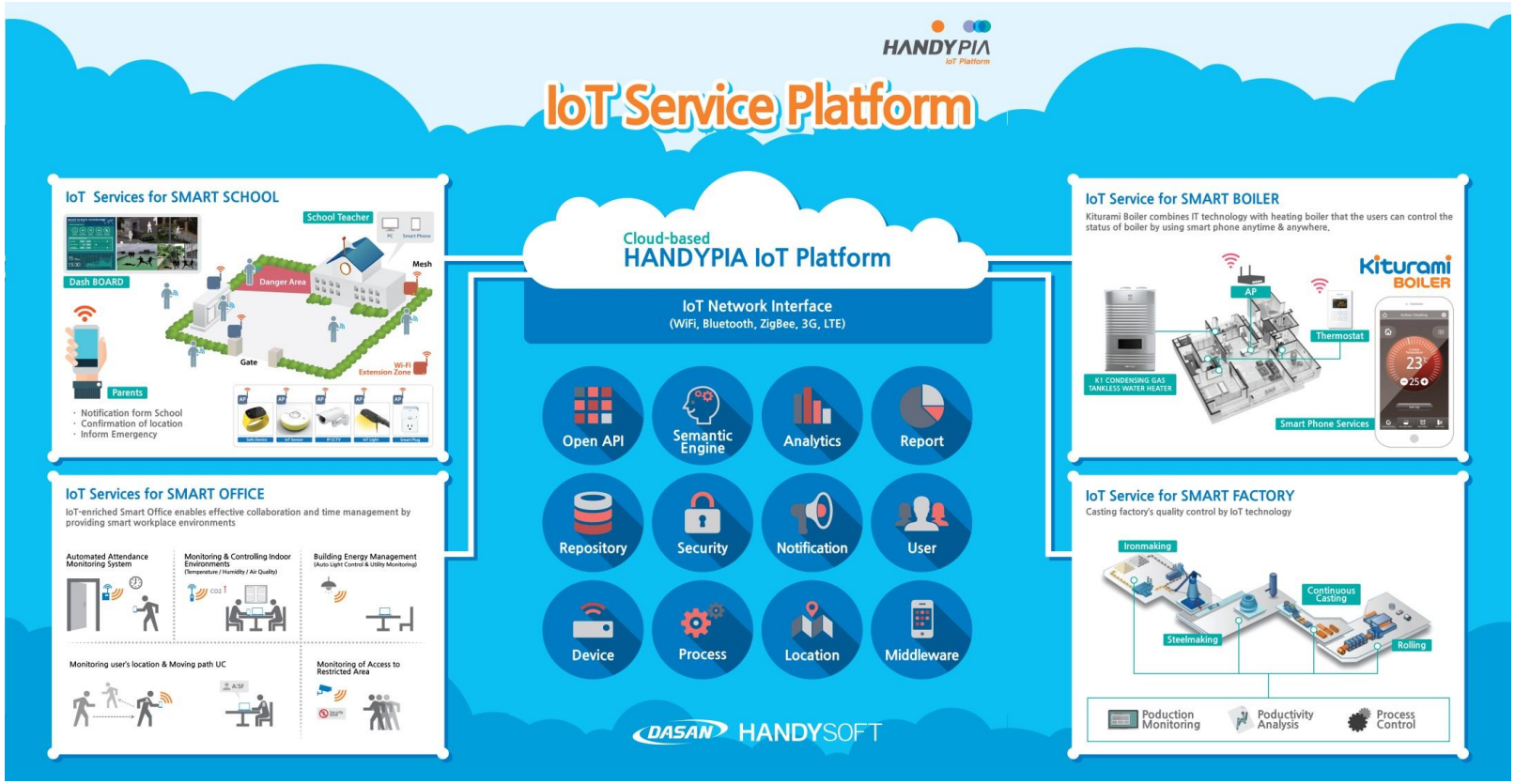
HANDYPIA IoT Platform
For the IoT Eco System
Service Model

HANDYPIA IoT Platform

- Software platform based business
  - IoT platform with original technologies
  - IoT application solution developed based on the platform

- **Collaboration with DASAN Group:** DASAN HANDYSOFT | DASAN DASAN Networks | DASAN KYS

HANDYPIA IoT Platform (March, 2014: Version 1.0 Release)

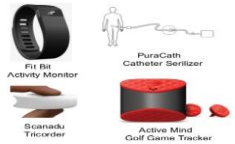


For the IoT Eco System

IoT Eco System through HANDYPIA

Professional Cooperative Partners

Sensors/Devices



Service Contents

Communication Module

Bigdata Artificial Intelligence

HANDYPIA IoT Platform

- **Platform Functions**
  - Device Management/Authentication
  - User Management
  - Control Management
  - Sensing data collection & Analysis
  - Metering
- **Platform Features**
  - Data Collecting & Analysis
  - Bigdata Storage & Analytics

HANDYPIA IoT Solutions

Smart Appliance (Kiturami Boiler)

Loss Prevention (Alton Sports)

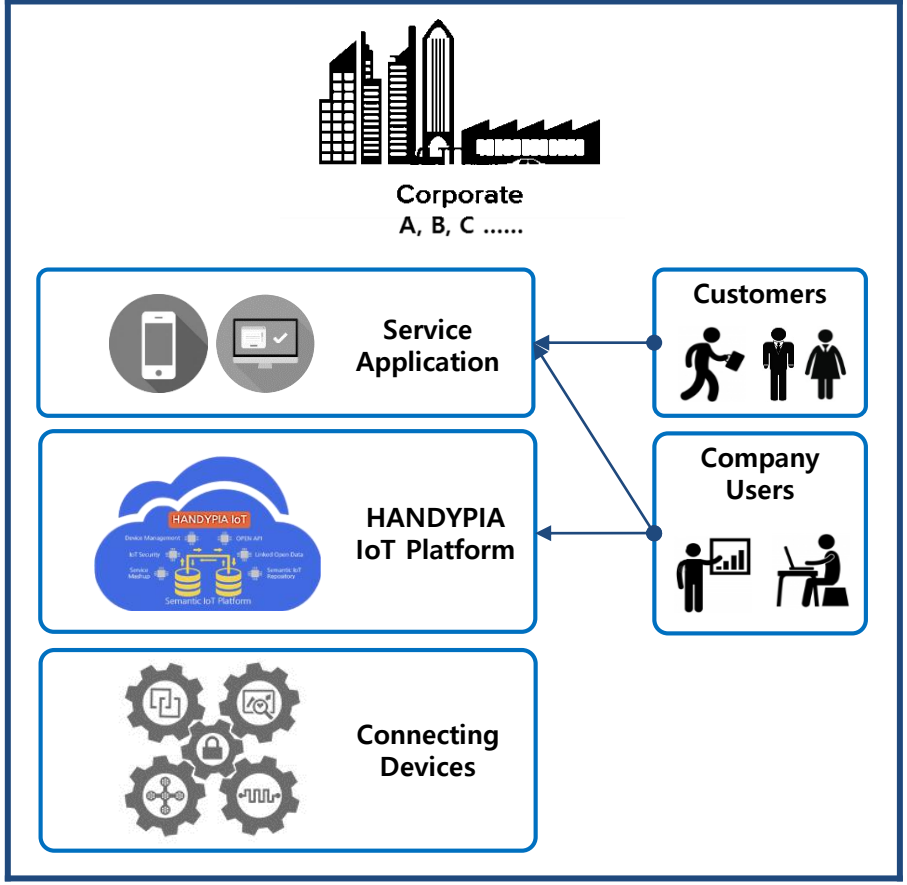
Smart Healthcare (GearBit ⓢ)

Smart Bed (Furnistem Bed)

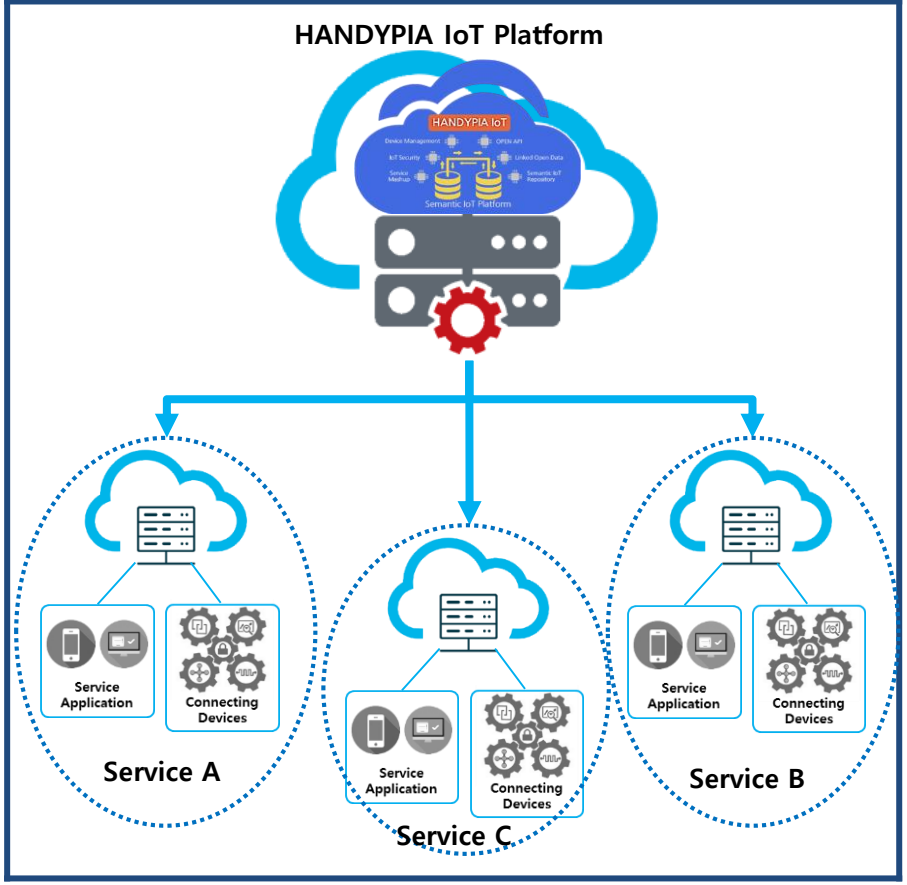
Service Model

- We have dual price model that are on-premises license model and cloud service fee model

On Premise Model
• License: Server & Devices



Cloud Service Model
• Pay per use

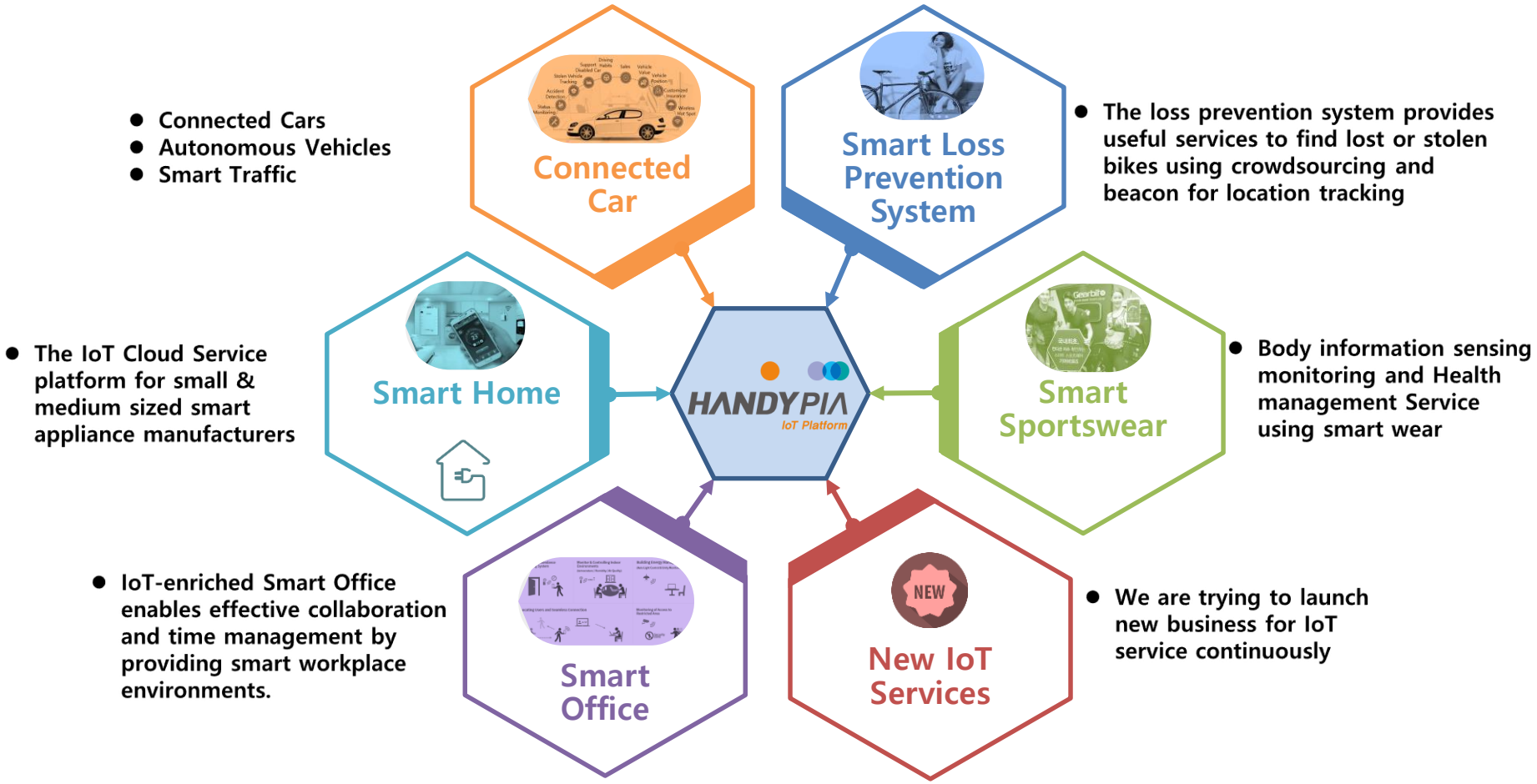


Ⅱ. CASE STUDY

IoT Business Area
References
CES 2015, 2016

IoT Business Area

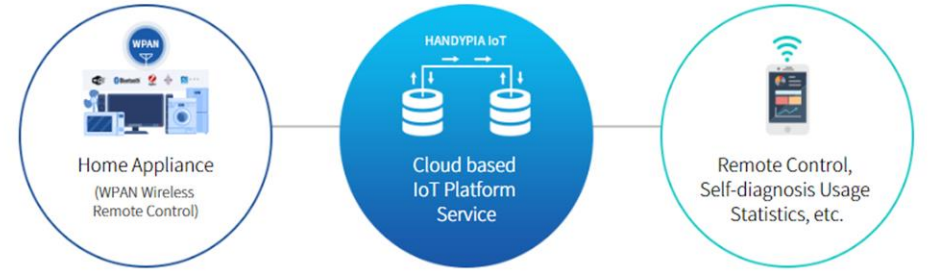
- By 2020, over 26 billion IoT devices will be installed, generating $300 billion in revenue and over $1.9 trillion in global economic value [Gartner, 2015]
- We are trying to develop variety of IoT services may easily be launched with the cloud-based HANDYPIA IoT platform



Smart Home Appliance

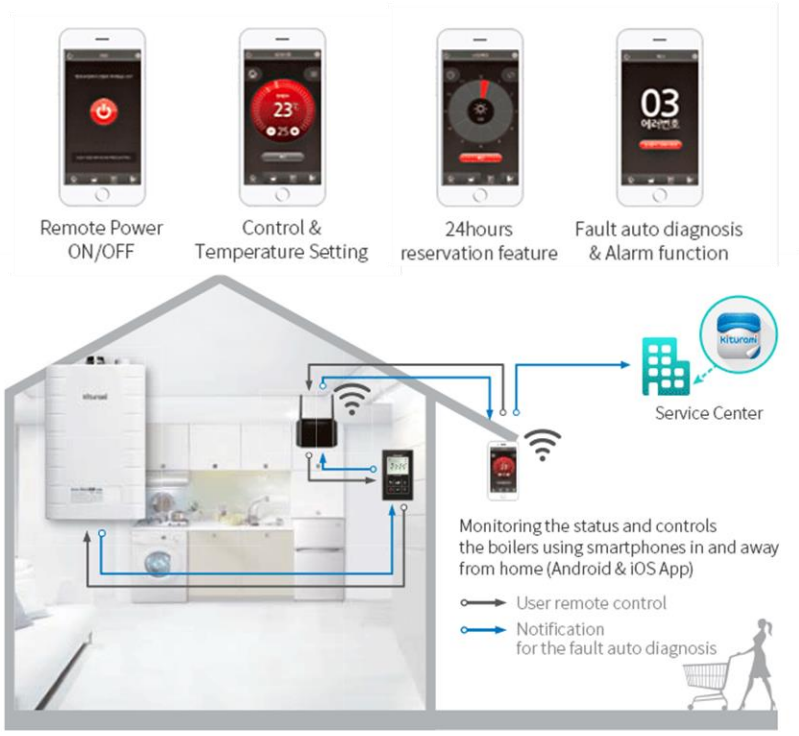
- Smart home appliance IoT services connected with home appliances enable on & off of all connected home electronic appliances using smartphones while away from home.
- In addition, it offers multi-functions, such as energy usage monitoring, saving and statistical analysis.
- The IoT boiler is providing convenient services for monitoring the status and intelligent control the boiler using smartphones in and away from home.

Cloud based IoT Platform Service for the Smart Home



B to B Customers (Small & Medium sized smart appliance manufacturers)	Handysoft HANDYPIA IoT Platform	End Users
Efficient IoT Service	Customized Cloud IoT Service Platform	Best Optional IoT Service Benefits
· Low-cost service for IoT convergence products · Product monitoring and convenience of management · Convenient application of the additional Service by products · Device management and Customer management	· Real-time control · Products monitoring · Connectivity of Devices and Operation · Billing management(Pay per Use) · Customized API	· Out-door Remote Control · In-door Warless Control · Self-diagnosis Service · Information of Usage Statistics · Personalized Information

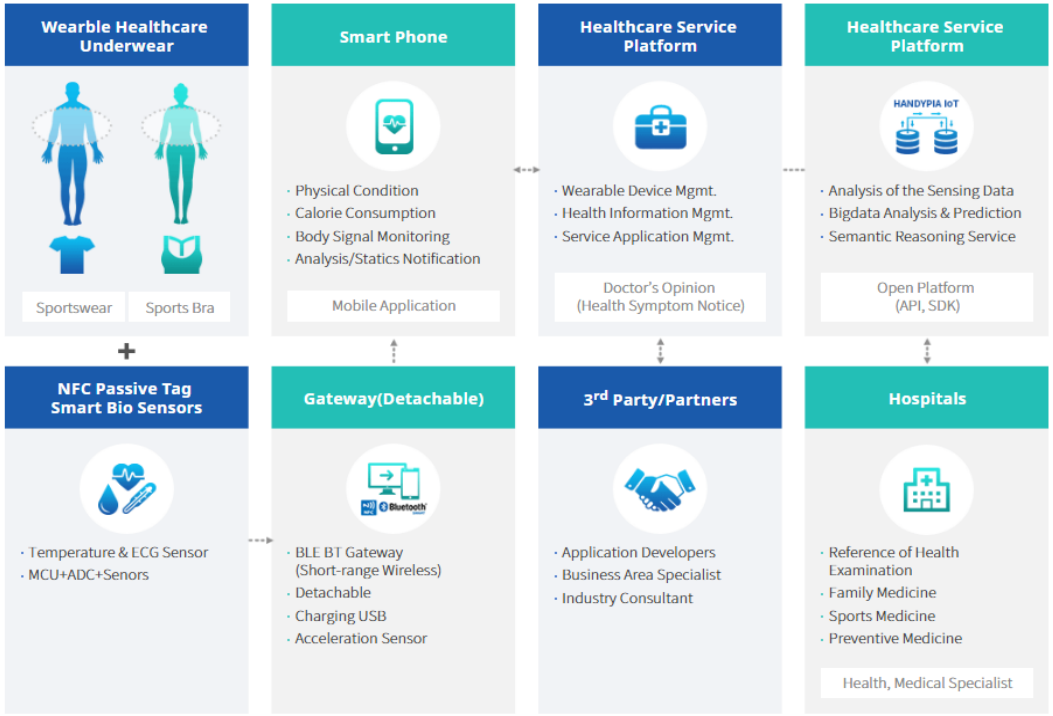
Smart Boiler Service



Smart Wearable Service for Healthcare

Healthcare Eco-System based on IoT Platform

• Body information sensing monitoring and Health management Service using smart wear

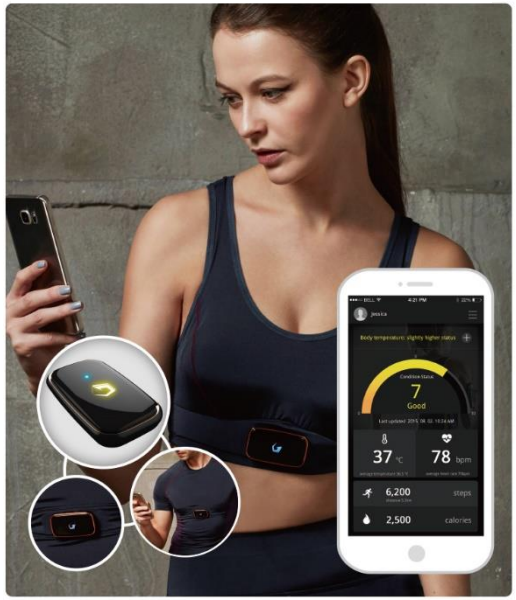


Target Customers & Healthcare Services

Patients	· Biological signal Capture · Emergency Notice · Grasp Emergency Situation	Elderly	· Biological signal Capture · Emergency Notice · Disease Prediction · Family Protector Monitoring
Sports Man	· Biological signal Capture · Emergency Notice · Disease Prediction · Coach/Manager Monitoring		

Smart Sportswear

• Body signal sensing, monitoring and health management service using smart sportswear based on IoT Platform.

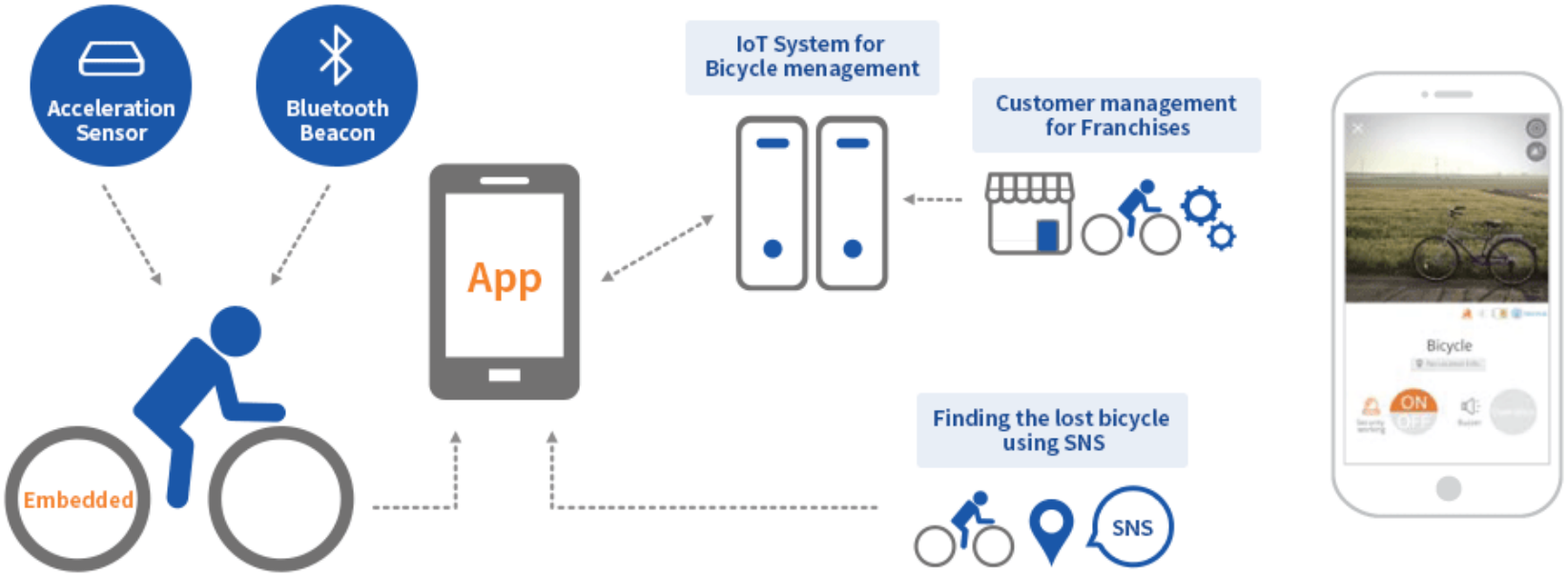


Smart Bicycle(Smart Loss Prevention System)

- The loss prevention system provides useful services to find lost or stolen bikes using crowdsourcing.
- The smart bicycle has a beacon for location tracking.
- Also it provides sales & repairing history management and customers information management system.

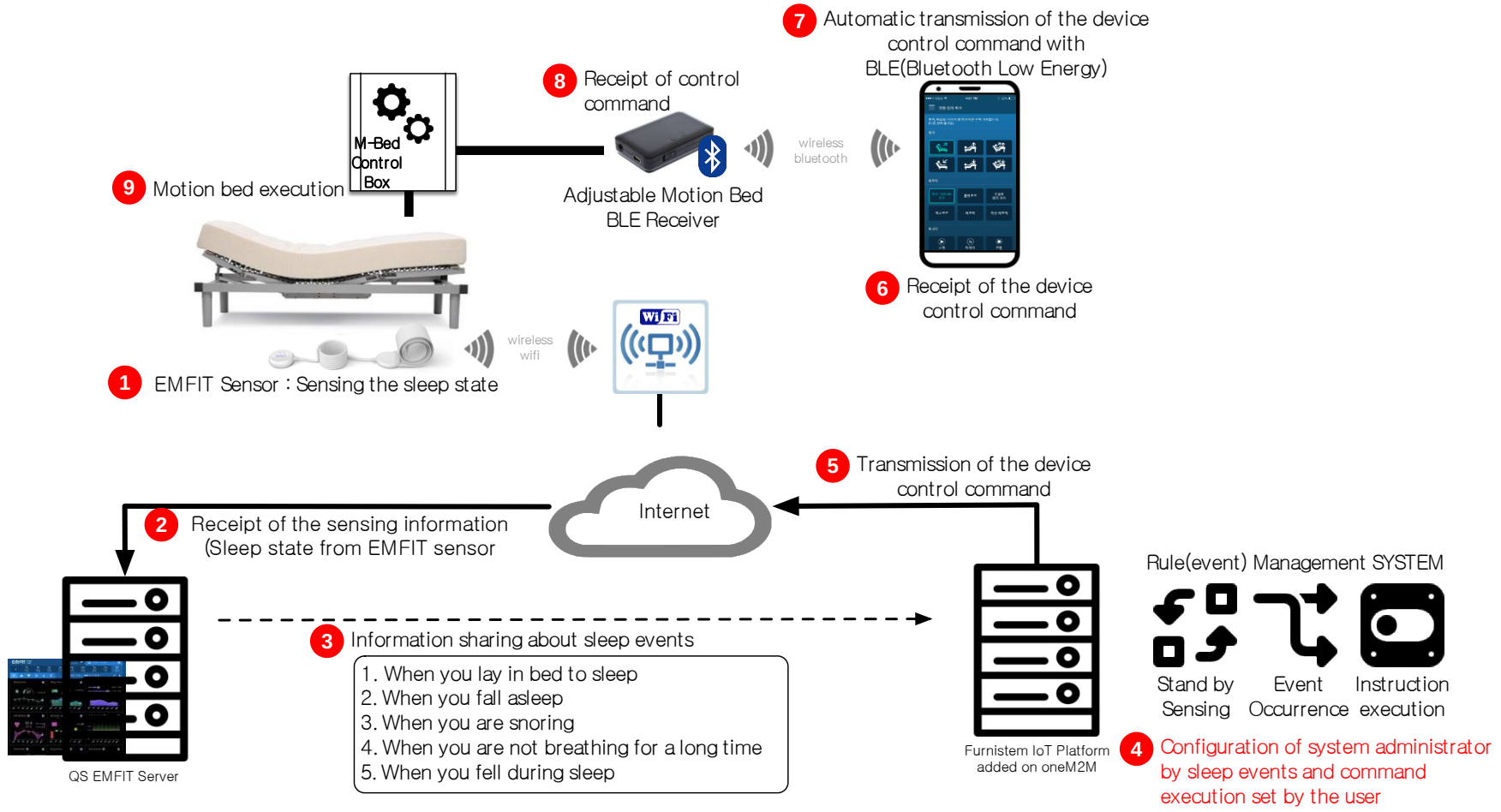
alton

- The only self-producing Korean bicycle brand
- No.1 in and the leader of the bicycle culture in Korea



Smart Bed

- Adjustable smart bed provide sleep tracking information, automatic control and remote control with the IoT technology.



Smart Office

- IoT-enriched Smart Office enables effective collaboration and time management by providing smart workplace environments.
- You can create process-based collaboration model using various services on the IoT platform.

Automated Attendance Monitoring System

Monitor & Controlling Indoor Environments

(temoerature / Humidity / Air Quality)

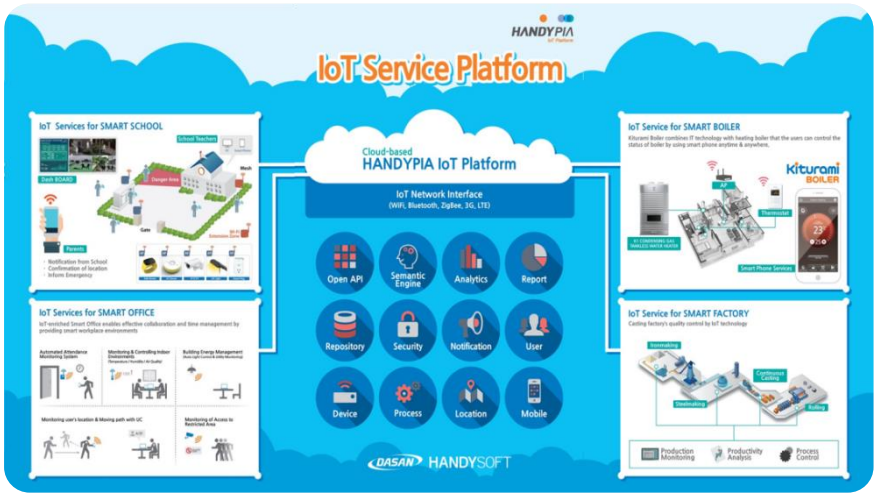
Building Energy Management

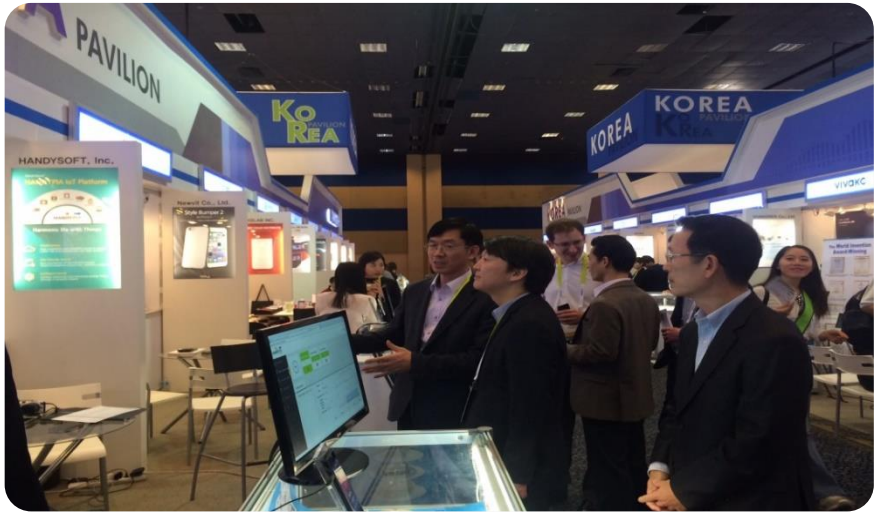
(Auto Light Control & Unity Monitoring)

Locating Users and Seamless Connection

Monitoring of Access to Restricted Area

CES 2015, 2016





Ⅲ. HANDYPIA Cloud Service

HANDYPIA Cloud Service
Architecture
Major Features for HANDYPIA IoT Portal
Price Plan

Cloud Service

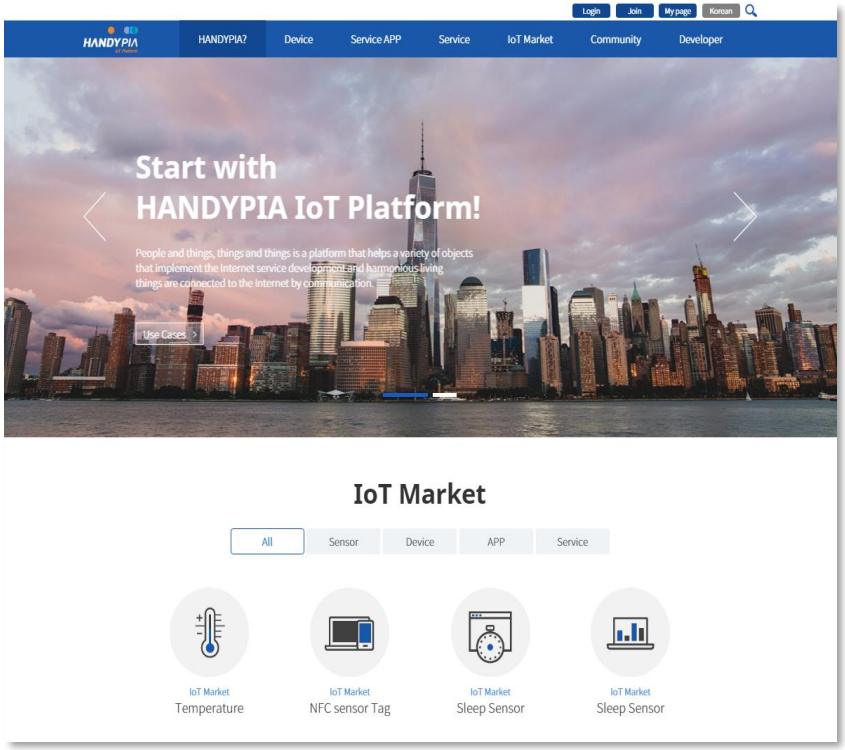
- **High availability and scalability of the cloud**
- **Lower risk and cost (Pay-per-use SaaS service)**

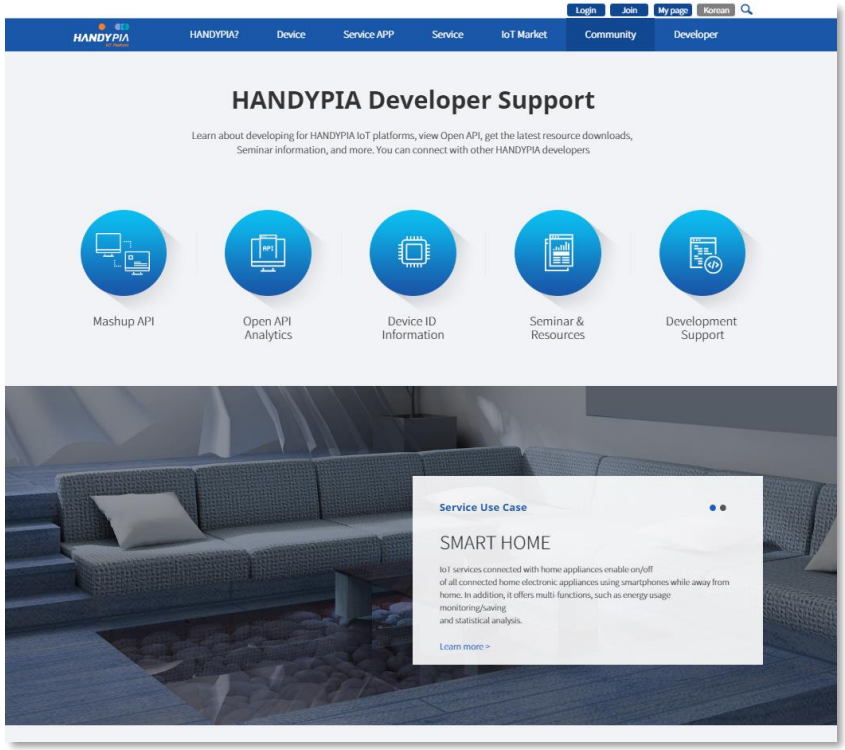
Open API — Users can develop additional services by using developers' open API and software.

Repository — It can collect data from various sensors by using the cloud-based platform.

Security — The service data and devices are managed and maintained securely.

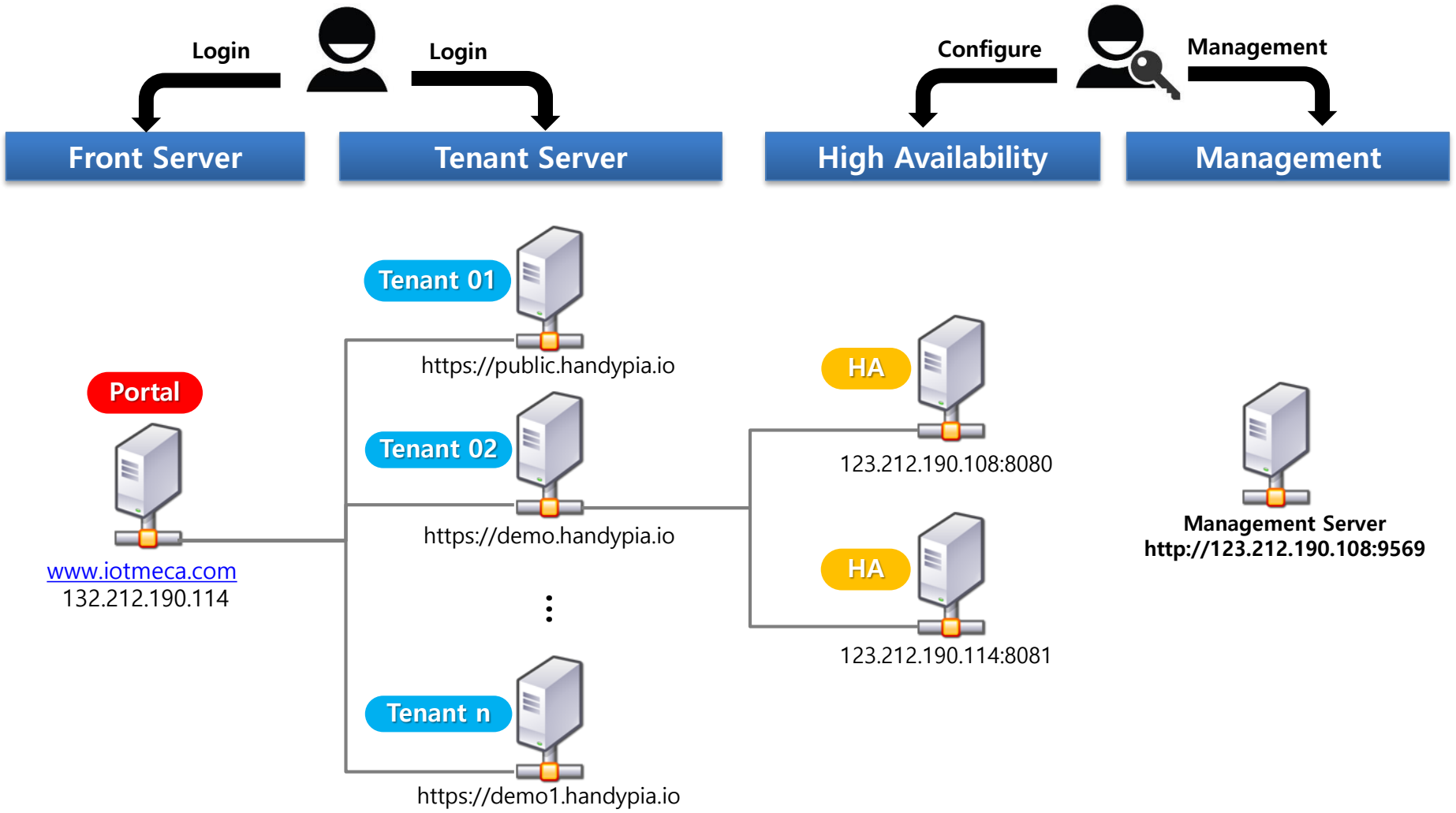
Pay per Use — The HANDYPIA IoT Platform is easy to use and affordable because it is based on pricing policies that consider users, devices, and data.





Cloud Service Architecture

Multi Tenant Support & High Availability



Major Features for HANDYPIA Portal

Portal Service Features

HANDYPIA?	Device	Service App	Service	IoT Market	Community	Developer
• IoT Platform • Use Cases • Service Guide • Notices	• Device Info • View Devices • Register Devices • Monitoring Devices	• Service App Info • Register Service App • App Statics	• Dashboard • Time Line • Sensor List • Sensor Analysis • Setup & Administrator • Profile	• IoT Market • Sensor Market • Device Market • App Market • Service Market	• Community service • Developer community • IoT community • My community	• Mash-up API Info • Open API Statistics • Open API Test • Device ID Info • Seminar & Materials • Developer Support

Register Process of Devices

 Preparing Open H/W ①	 Preparing Sensors & Actuators ②	 Connecting Sensors & Actuators ③	 Installing Device Library ④	 Check Sensor/Actuator Type IPSO Smart Object ⑤	 Register Device Model (Acquisition Device Model ID) ⑥
 Register Device (Acquisition Device ID) ⑦	 Check Registered Devices ⑧	 Device App Modification Development ⑨	 Test Device App ⑩	 Test Registered Devices ⑪	 Using Registered Devices Statistical Analysis Mash-up ⑫

Price Plan

Features	Portal			Tenant		Remarks
Join Type	Guest	Logined personal	Logined Business	Personal	**Business**	
Price (Plan)	Free	-	-	Free	**$50 / Month**	
User				Developer	**Cooperate company Service provider**	* Contact us for details
Community	View	O	O	X	**X**	
IoT Market	View	O	O	X	**X**	
Service	Contents Only	Contents Only	Contents Only	• Dashboard : 3	• **Fare Management** • **Dashboard : 100**	
- Data Storage	-	-	-	1 month	**3 years**	
- Network	-	-	-	TBD	**TBD**	
Device						
- Device Info	O	O	O	X	**X**	
- View Devices	O	O	O	▲	▲	▲ view only private devices
- Register Devices	X	O	O	5	**100**	
- Monitoring Devices	X	O	O	O	**O**	
Service App	View	Register	Register	▲	▲	▲ view only private app
Developer	X	O	O	O	**O**	

※ For service provider, we request extra charge as the number of devices

IV. HANDYPIA IoT Platform

Platform Overview
Differentiation Factor
Architecture
Features
Big Data Framework
Device Management
Dashboard
IoT Market
Community Service

Platform Overview

- HANDYPIA IoT Platform is an IoT service platform optimized for big data processing and data analysis
- HANDYPIA IoT platform provides real-time, personalized information services to interact sensing information to connect all things on the Internet so that users can easily access anytime and anywhere you want sensing information regardless of time and space

Cloud Service

- High availability and scalability of the cloud
- Lower risk and cost
  (pay-per-use SaaS service)

User Friendly Service

- Easy connection of devices and sensors
- Smart management
  (diagnosis, statistics, analysis, etc.)

Intelligent Service

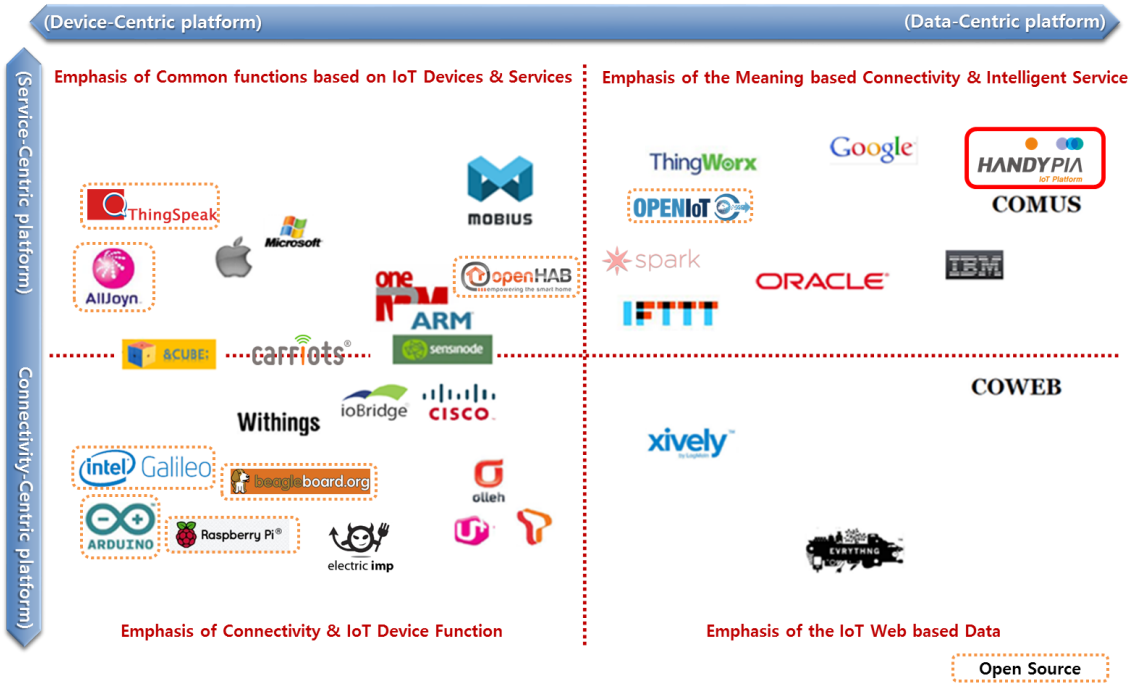
- Context awareness and reasoning between
- devices through a semantic engine

Differentiation Factor

This platform provides the function linking standard-based diverse devices and saving the big-data sensor information, management, analysis and monitoring.

IoT Platform optimized for sensing data analysis

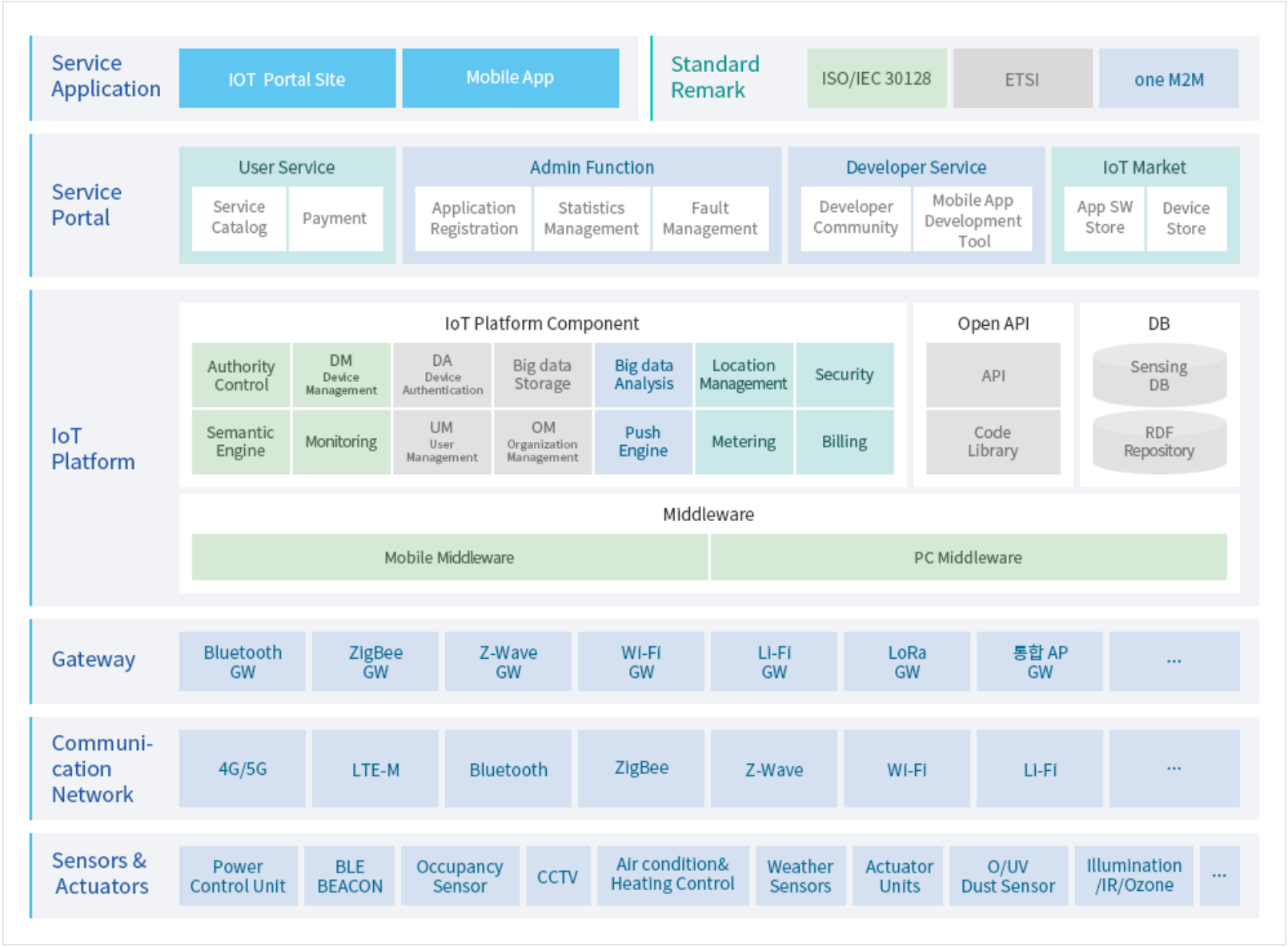
- Big Data Analysis Services
- Process-based sensing data Analysis for Intelligent Forecasting



Following International Standards

- ITU & ISO/IEC IS 30128
- oneM2M

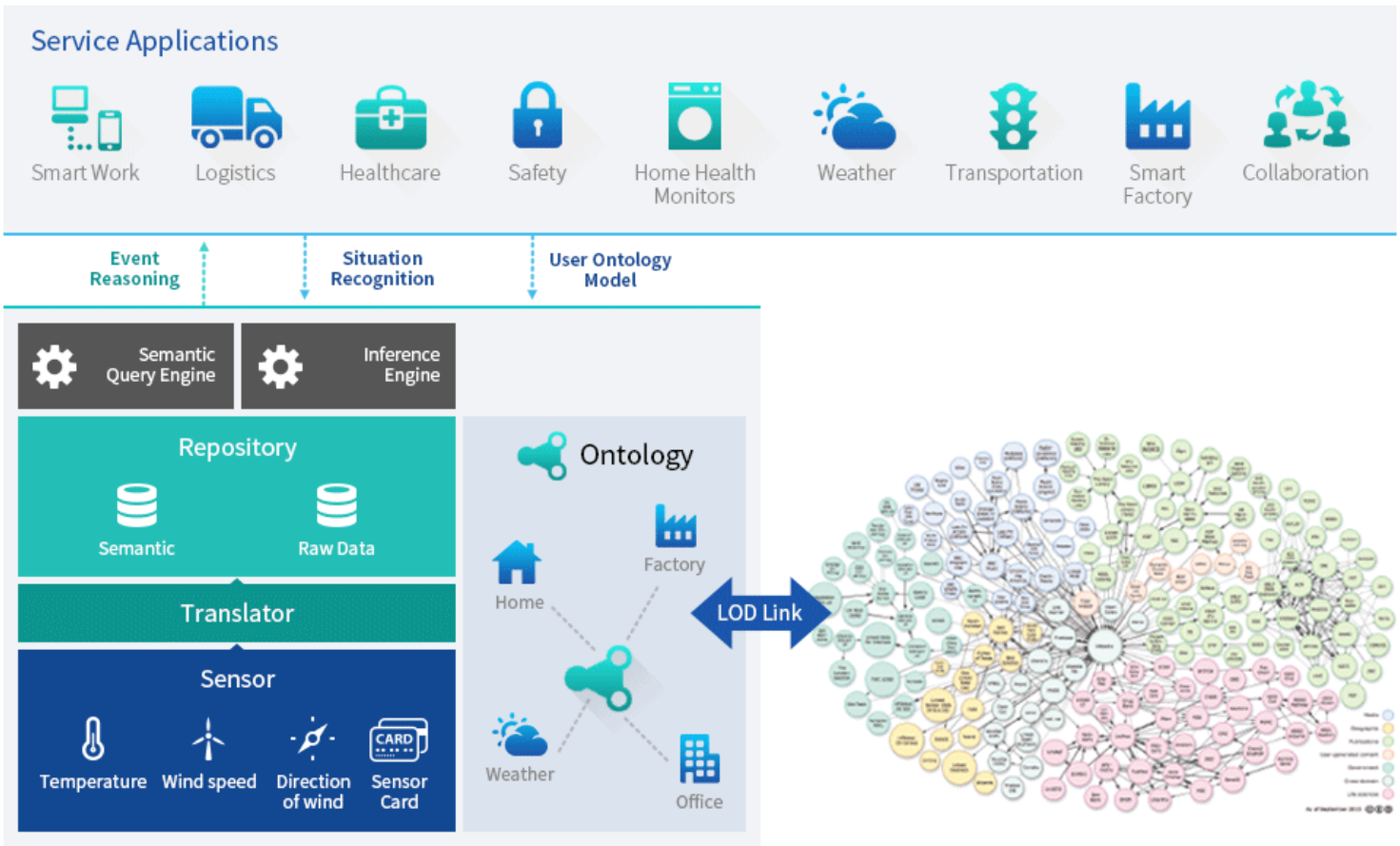
Architecture



Features 1: Semantic Analysis

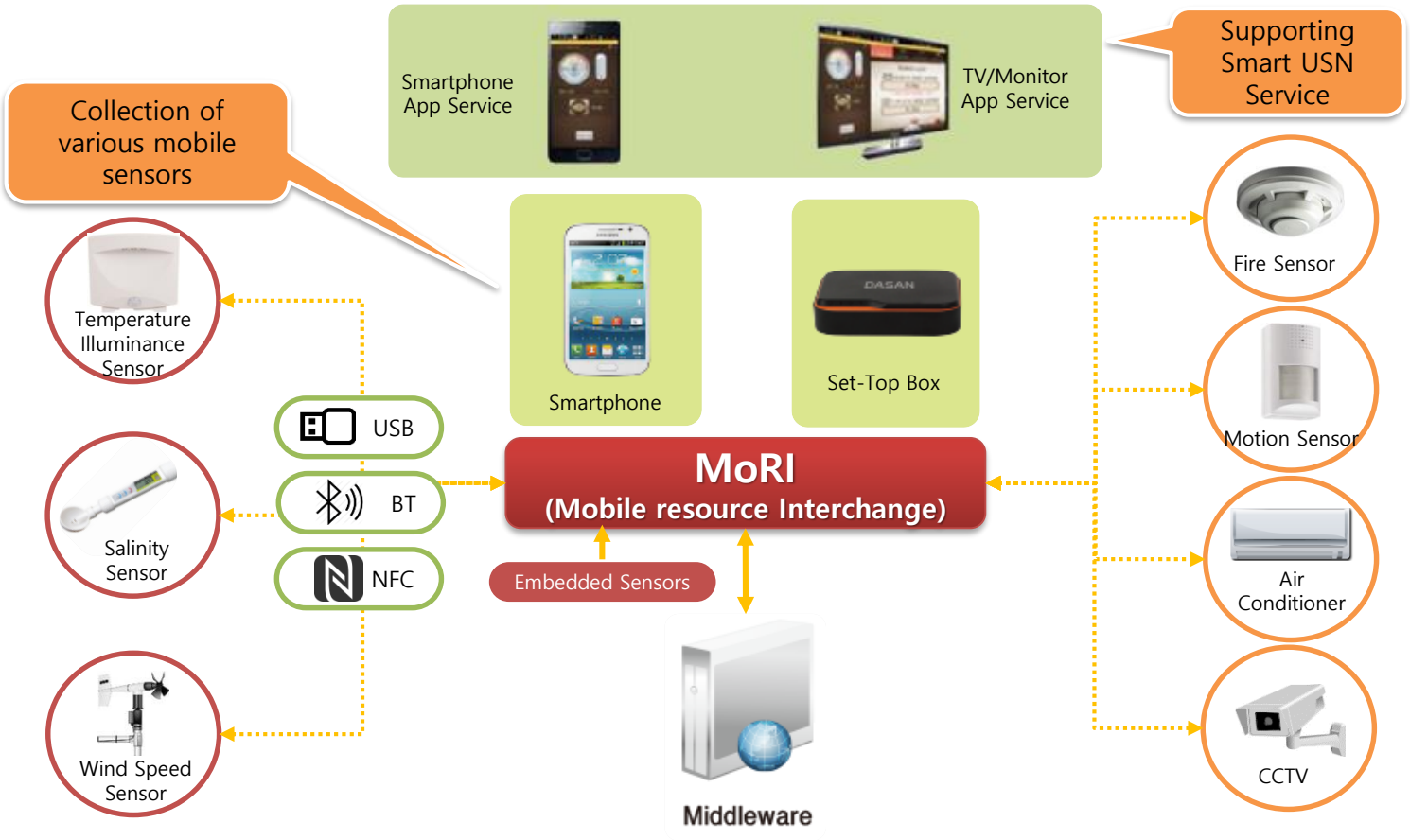
The HANDYPIA IoT Platform has...

- Divers service domain ontologies for IoT services
- Ontologies easily extendable for developers
- Optimum semantic IoT-based services, connecting external linked open data(LOD)



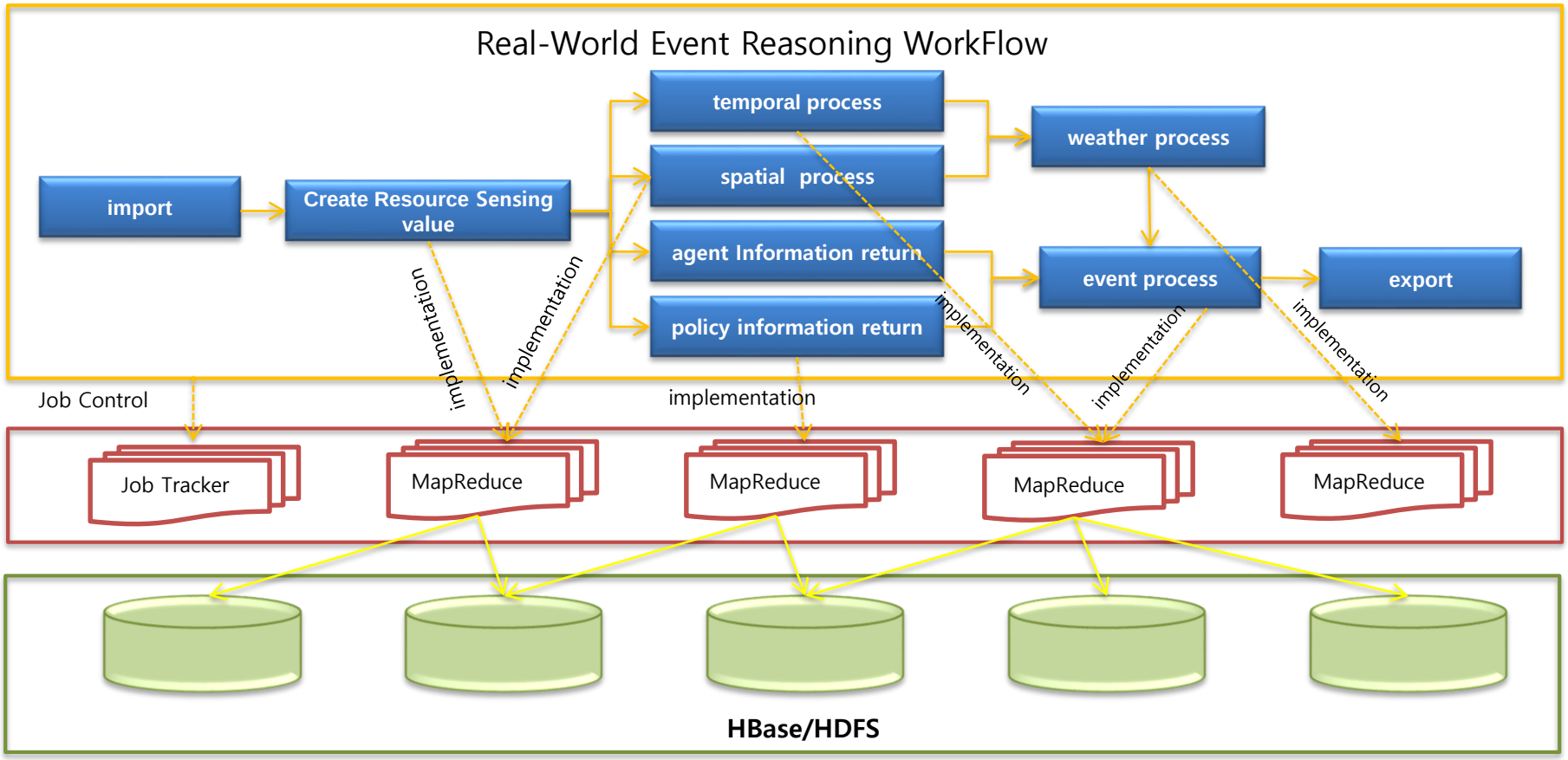
Features 2: Mobile Middleware

- Facilitates mobility, because MoRI(Mobile Resource Interchange) is developed for mobile devices
- Offers easy connection among users, sensor networks and the platform
- Applicable to various services such as Smart Environment Management, Intelligent Home Network, Healthcare and Personal Services based on Mobile Sensors



Features 3: Scale-Out

- Supporting scale-out for various IoT decentralized data processing
- (AS-IS) Local processing method ➔
  (TO-BE) Semantic-based parallel inference and decentralized process method



Big Data Framework

Cloudera Big Data Manager for the HANDYPIA IoT Platform

- Collecting of the diverse IoT devices' sensing data
- Data Parsing through IoT middleware

Collection

Sensing Data
IoT Sensors
Devices
LOD
...

Kafka
(Distributed
Messaging Queue)

MLlib → MLlib → MLlib

- Smart Sensors
- IoT Devices
- Gateway
- ETL, ELT
- Data Collector

Storage

Big Data Repository

HDFS
(Hadoop
Distributed
File System)

Hbase
(Columnar NoSQL)

MongoDB
(NoSQL)

- Distributed File System
- NoSQL

Search&Process / Analysis

Distributed Parallel processing of data and analysis

SQL | Streaming | MLlib | GraphX | R

Spark

MapReduce
(Distributed
Processing)

Hive
(SQL Processing)

Impala
(SQL Processing)

R
(Statistical
Computing)

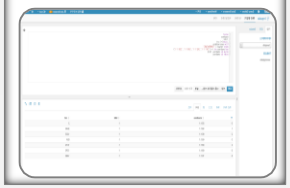
- Streaming Processing
- Parallel & Distributed Processing
- SQL Processing

- Searching
- Statistics Analytics
- Text Analytics
- Machine Learning

Reporting

Actionable Insight
Decision making support
Diverse View

Hue
(User Interface)

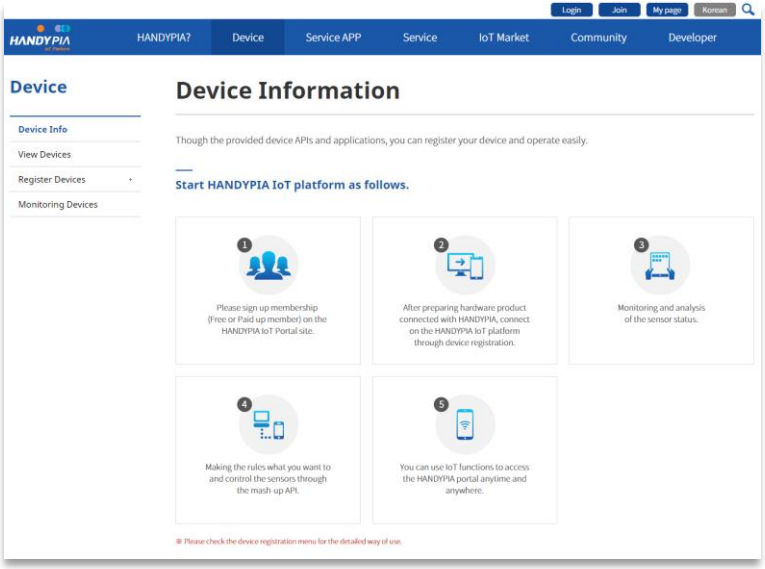


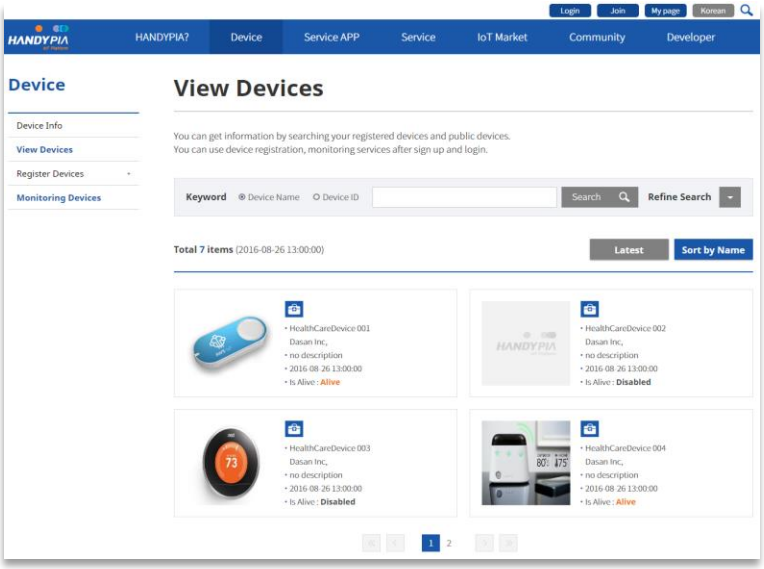
Zeppelin
(Web-based
notebook)

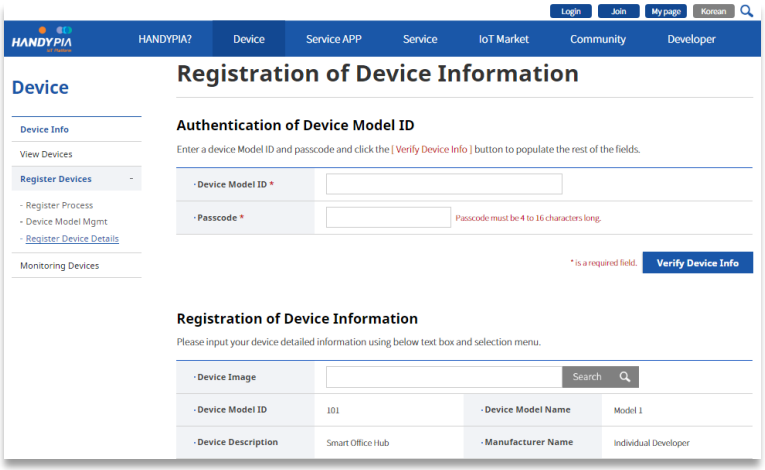
- Visualization
- Structured Dashboard
- Report
- IoT Services

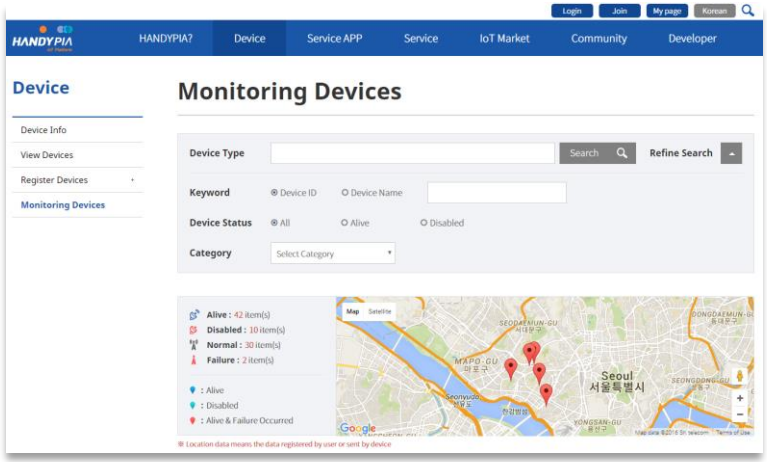
Device Management

Though the provided device APIs and applications, you can register your device and operate easily.



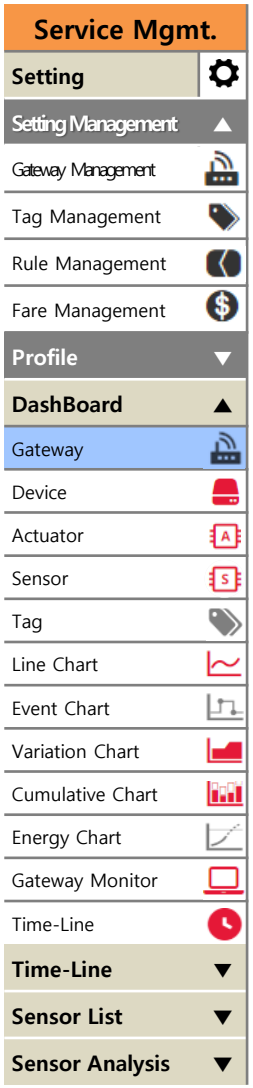




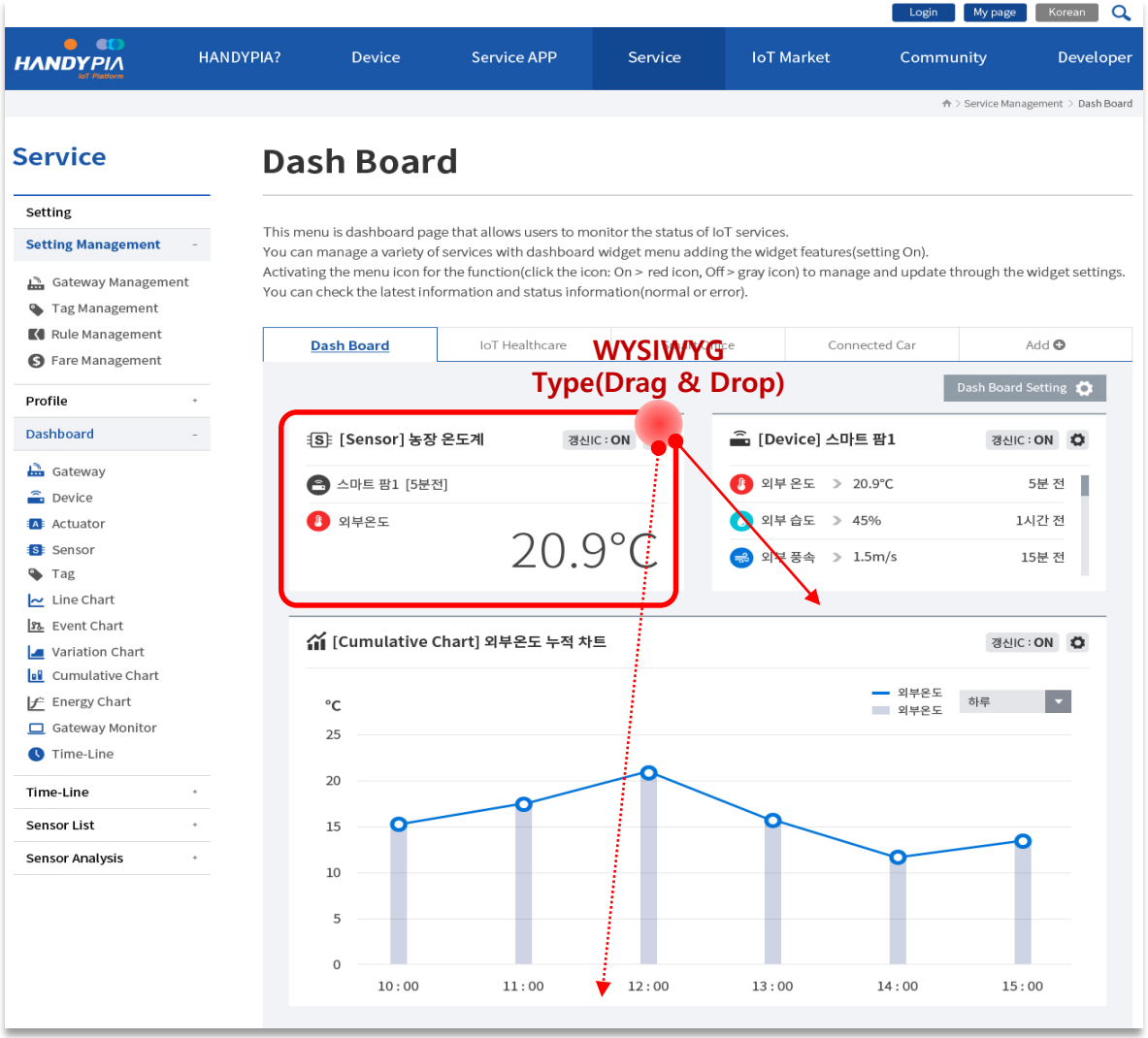


Dashboard

You can manage a variety of services with dashboard widget menu adding the widget features(setting On).

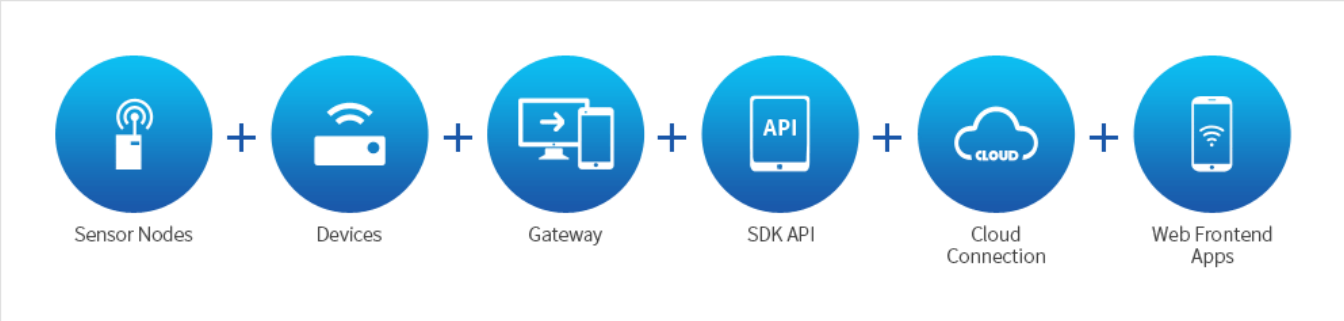


Widget Type Setting Menu

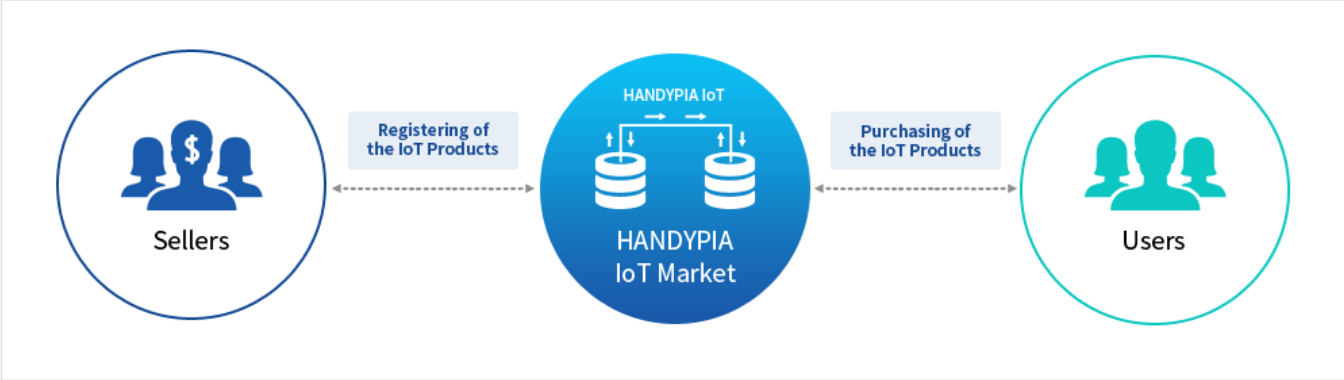


IoT Market

IoT Market is a specialized online market place that you can buy in one place a variety of hardware and software products related to the Internet of Things. Discover diverse IoT products on HANDYPIA Portal site.

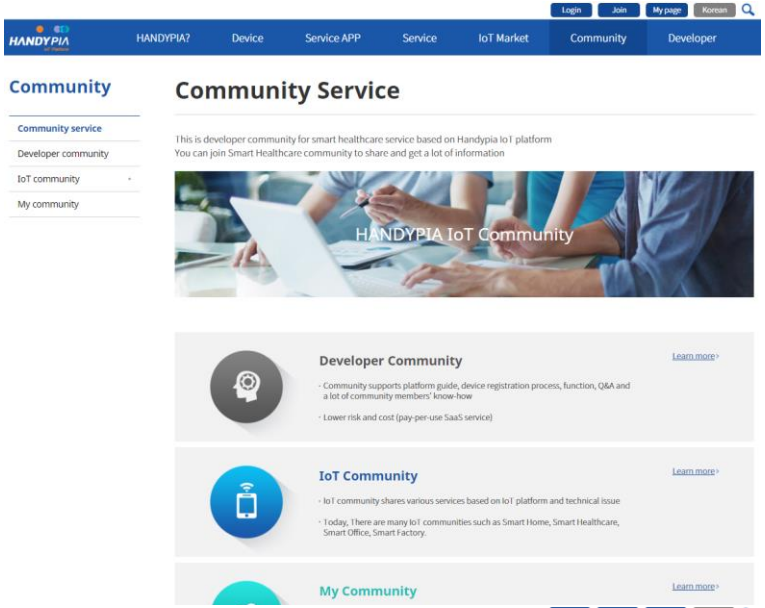


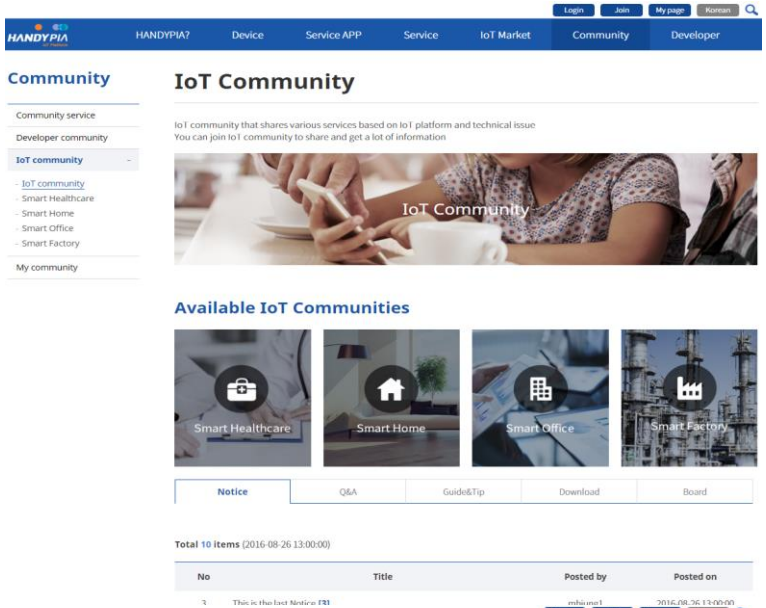
Sensor Market	Device Market	App Market	Service Market
Sensors & Actuators	Open Hardware & IoT Products	Open Source & IoT Service Applications	IoT Package Service & Device Products

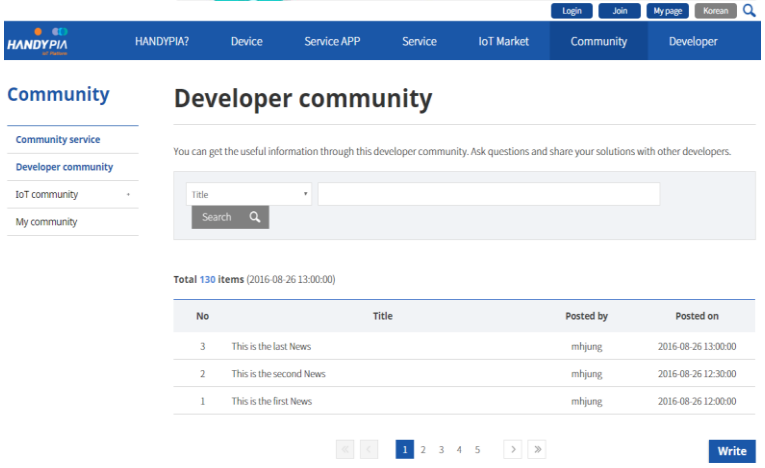


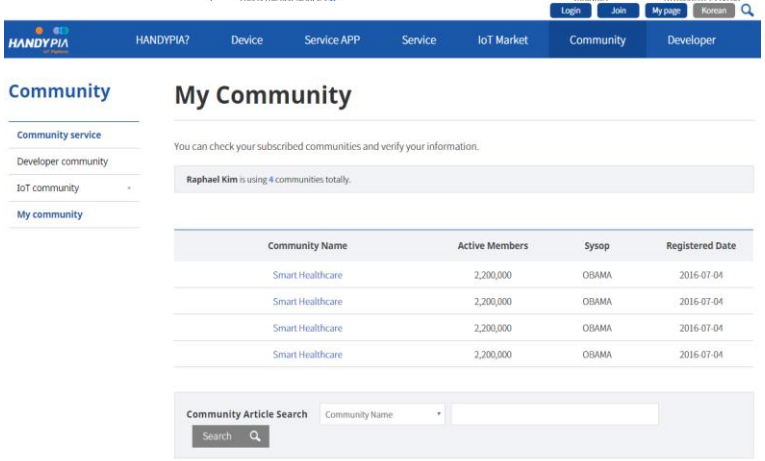
Community Service

Community Service supports HANDYPIA Portal service members to operate various services based on IoT platform.
Community Service wants members interested in community with special theme such as a club.









V. HANDYSOFT PROFILE

Company Overview
Profile
Organization
History
Excellency

Company Overview

General Facts

- **Company Name: Handysoft, Inc.**
- **Year of Incorporation: November 1, 2009**
- **CEO: Sang San Lee, Jin Soo Lee**
- **Capital: $2.4M**
- **Annual Revenue(FY13): $62M**
- **Employee Size: 200**
- **Company URL: www. Handysoft.co.kr**

Main business Areas

Profile

- Company name : Handysoft, Inc. [http://www.handysoft.co.kr]
- Establishment date : Established as Handysoft Corp. (1991)
  : Merged with DASAN SMC (2011) to Handysoft Inc.
- CEO : Sangsan Lee & Jinsoo Lee
- Sales : 44,200M (KRW, as of 2015) (£ 25 M)
- Number of staff : 168 (2015. 9)

Major Management

Management

Dr. Sangsan Lee

Education : Seoul National University, BS & MS
Stanford University, Ph.D.
Professional experience :
CEO, Handysoft (current)
VP, Korea S/W Industry Association(current)
Executive VP, DASAN Networks
Adjunct professor, KAIST & SUNY Korea
Postdoc fellow, NASA ARC

Mr. Jinsoo Lee

Education : Seoul National University, BS
Korea Advanced Institute of Science and Technology(KAIST), M.S
Professional experience :
CEO, Handysoft (current)
CEO, NHN Search Marketing
Executive Director, ICUBE, Inc.
Research Engineer, ETRI

Major Affiliated Companies

Affiliated Companies	Main business	Remarks
DASAN Invest	Financial & subsidiary management	
DASAN Networks	Network equipment development/selling	KOSDAQ
Solueta	Electronic component development/selling	KOSDAQ
LIKE LAB	IoT service	

Major shareholders

Shareholder	No. of Stock	Ratio
DASAN Invest	2,000,000	39.0%
DASAN Networks	1,315,650	25.6%
Venture capital	1,312,500	25.6%
Minority shareholders	504,130	9.8%
Total	**5,132,280**	**100.0%**

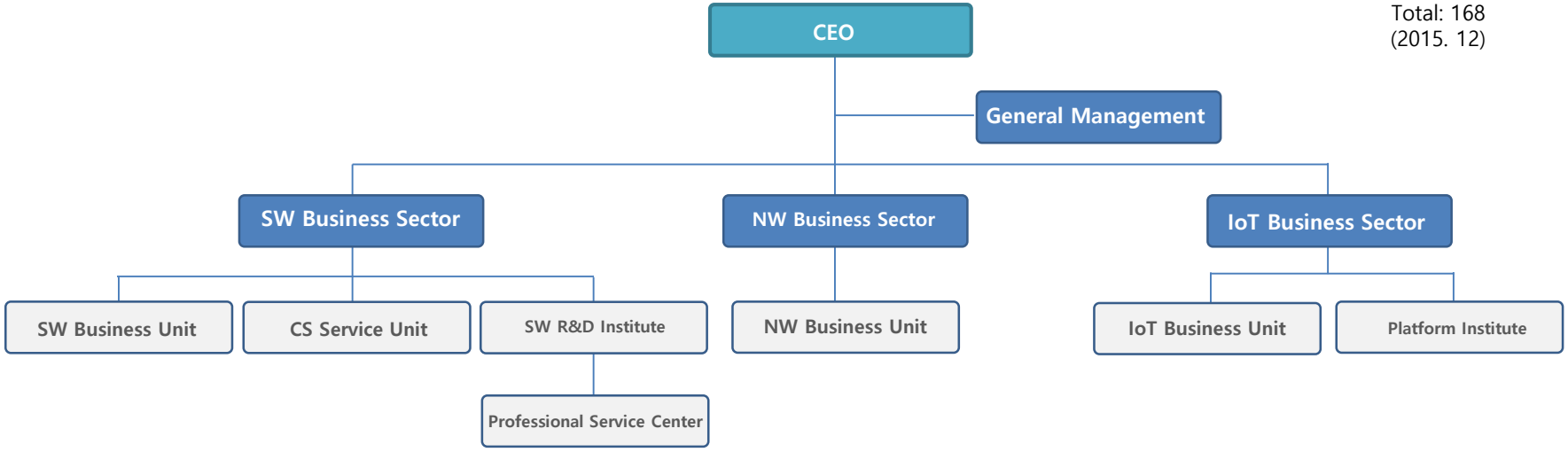
Organization

IT professionals with proven technical knowledge and expertise (R&D 63%)

[Human Resources]

Part	2012	2013	2014	2015
Total	**261**	**279**	**194**	**168**
Sales/Management	113	109	67	62
Research	**50**	**58**	**43**	**43**
(Ratio)	19.2%	20.8%	22.2%	25.6%
Development	**98**	**112**	**84**	**63**
(Ration)	37.5%	40.1%	43.3%	37.5%
Research & Development	**56.7%**	**60.9%**	**65.5%**	**63.1%**

[Organization Chart]



History

1991 ~ 2010

HANDYSOFT Corp.	
[1991]	· Established as HANDYSOFT Corp.
[1995]	· Selected as the official groupware for the Korea Ministry of ICT
[2000]	· Certified ISO9001 (first in Korea)
[2004]	· Awarded 'Grand Prize' in New SW Products Presidential Award (Groupware)
[2005]	· Certified CMM Level 5 (first in Korea)
[2007]	· BPM Listed in the Gartner Magic Quadrant

DASAN DMC.	
[2009]	· Established as DASAN SMC (Spin-off) · Exclusive contract with DASAN Networks (enterprise business) · Inno-Biz certified
[2010]	· Venture company license acquired

2011 ~ 2015

[2011]	· Launched backbone switch · **Merged with HANDYSOFT Corp.** · **Named as HANDYSOFT, Inc.**
[2012]	· Attraction of investment (₩ 11,500M) · Launched HANDY Groupware 8
[2013]	· Sangsan Lee takes office as CEO · Launched HANDY PAL 5
[2014]	· Launched HANDY Mobile GW 8 · Launched HANDY Messenger 5 · Commercialized IoT Platform (HANDYPIA) · 'Global Eminent SW 9 in Korea' awarded
[2015]	· Jin Soo Lee becomes a Co-CEO · Turned into profit · **Public & Listed in KONEX (2015. 6)** · Launched HANDY Groupware on cloud

Excellency

High Value

Provided Various Customer Value via the Best and Largest Construction Experience in Korea

Korea EKP/BPM
Market Share #1

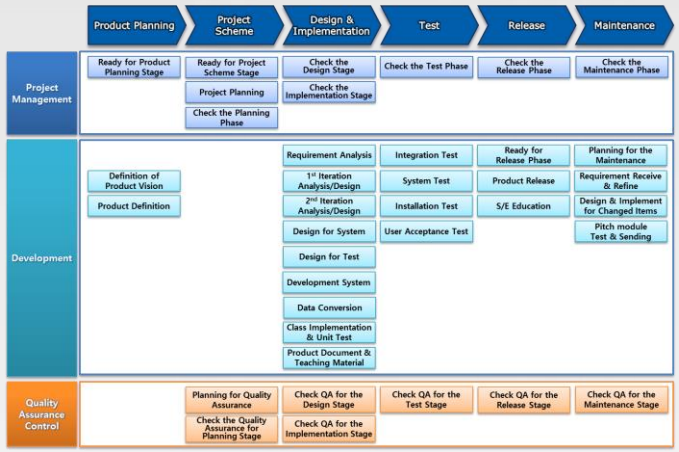
Won New Software Awards
2nd time President Awards

BPM Field'Best Provider
(Strong Performer)' Selected

Global Excellence
Awards in Workflow
5 Years Continuous
Prizewinner

High Quality

SW Development Management Methodology



First CMM Level 5 Achieved
Among Korea Software
Company

ISO 9001
Quality
Certificate

Harmonic Life with Things
HANDYPIA IoT Platform

DASAN HANDYSOFT

www.handysoft.co.kr

www.handypia.co.kr/