

Introduction to NEC Solution Innovators, Ltd. And Our focusing Business Domain

Nov 23rd 2017





Orchestrating a brighter world

NEC brings together and integrates technology and expertise to create the ICT-enabled society of tomorrow.

We collaborate closely with partners and customers around the world, orchestrating each project to ensure all its parts are fine-tuned to local needs.

Every day, our innovative solutions for society contribute to greater safety, security, efficiency and equality, and enable people to live brighter lives.

NEC's social solution business

Providing infrastructures for an abundant society for all people via ICT

Social Value Innovations

Orchestrating a brighter world



Ensuring broad range of safety for all from individual to country



Serving society and the Earth



Realizing sustainable growth



Closing the social divide and eliminate inequality



Supporting the Evolution of Worldwide Social Infrastructures through ICT



Energy /
Meteorology



Agriculture



Manufacturing



Distribution



Transportation




Disaster
prevention /
security



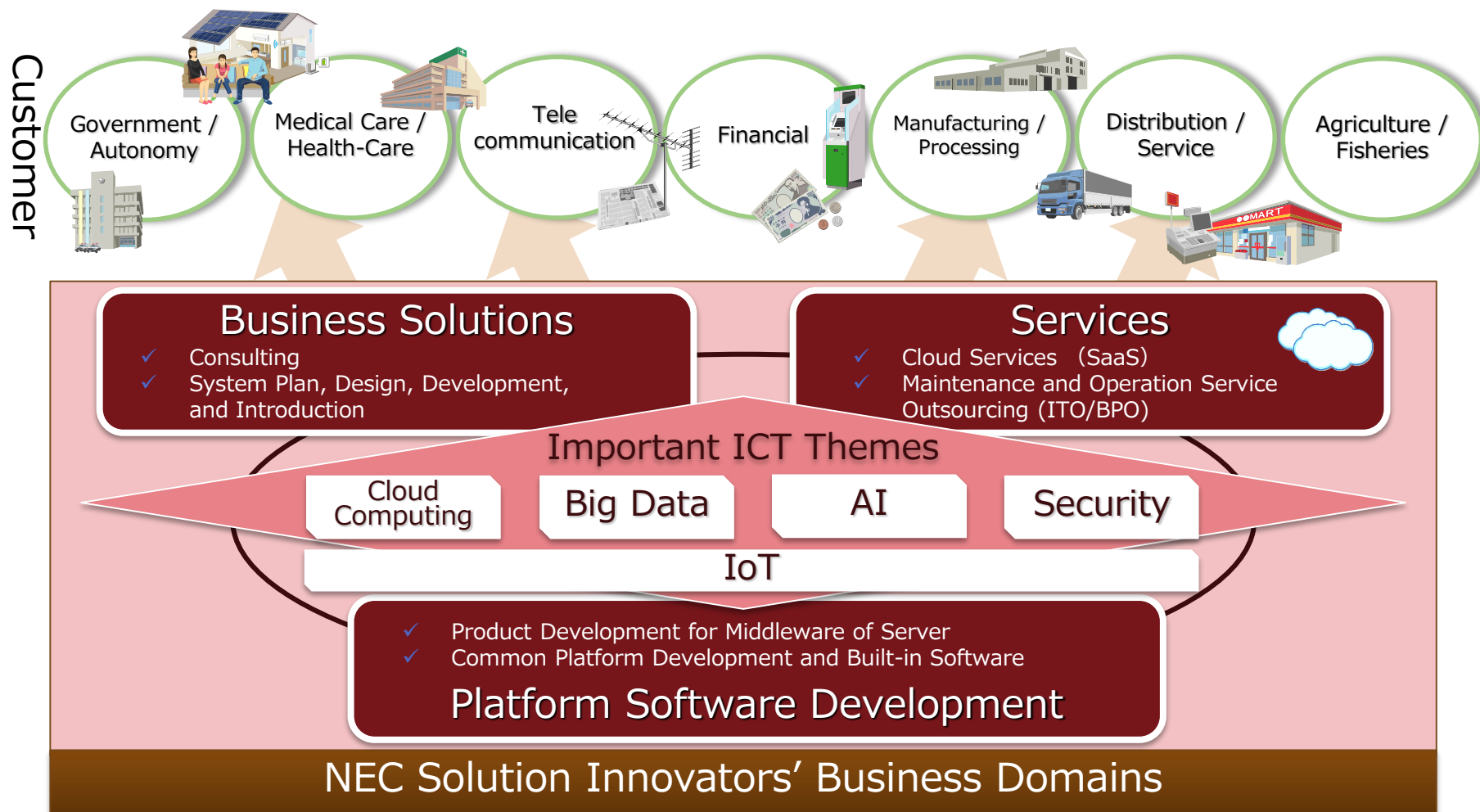
Medicine

Company profile

Company Name	NEC Solution Innovators, Ltd.	
Established	September 9, 1975 *NEC Solution Innovators was established on April 1, 2014	
Capital	8,668 million Yen	
Head Office	1-18-7 Shinkiba, Koto-ku, Tokyo, 136-8627 Japan	
President	Kiyoshi Sugiyama	
Employees	13,181(As of April 1, 2017)	
Services	<ul style="list-style-type: none">✓ Business Solutions (Consulting, Systems integration)✓ Services<ul style="list-style-type: none">Cloud Services (SaaS)Maintenance and Operation ServiceOutsourcing (ITO/BPO)✓ Platform Software Development✓ Sales of System/Network products, Program packages	
Affiliates	NEC Soft (Jinan) Co., Ltd. NEC System Technologies (HangZhou),Ltd NEC Vietnam Co., Ltd. NEC Technologies India Private Limited	

NEC Solution Innovators' business domains

Use our solutions to create social value with customers



SaaS : Software as a Service (Provide application and/or by services)

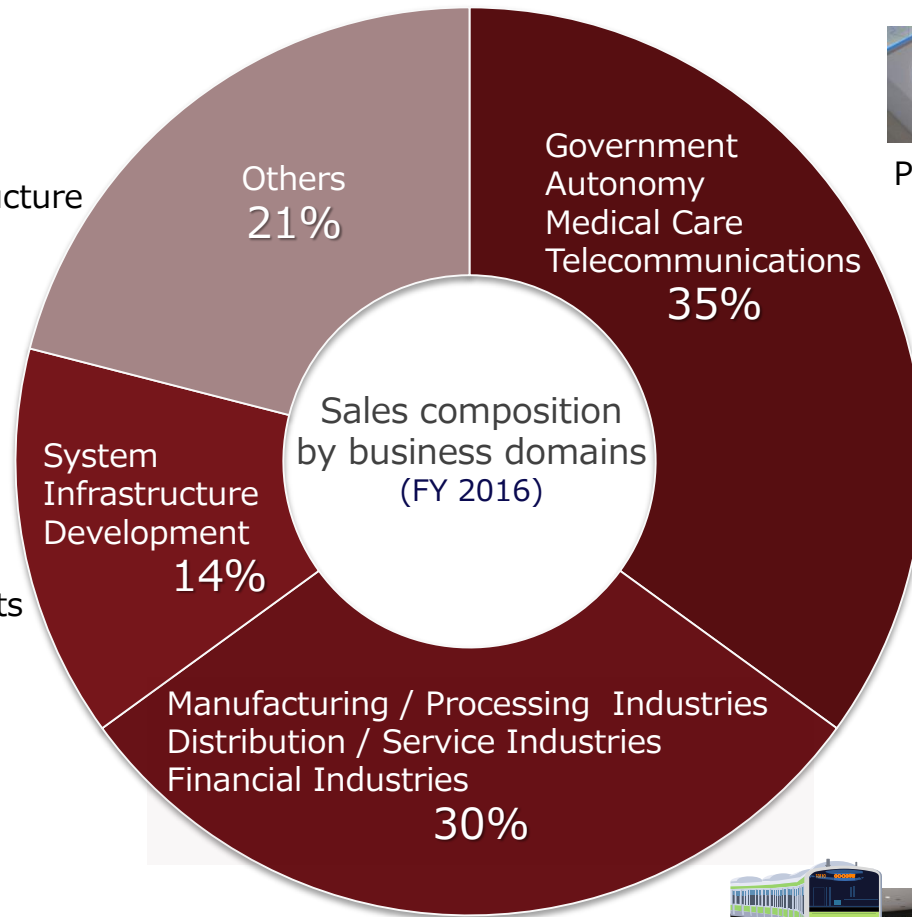
ITO : Information Technology Outsourcing (Companies entrust their IT operation to other companies)

BPO : Business Process Outsourcing (Companies entrust their operation to other companies)

AI : Artificial Intelligence (Intelligence exhibited by machines)

IoT : Internet of Things (Network of physical objects that enables various objects to collect and exchange data)

Sales by business domains



Cloud Infrastructure



Server Software



Smart Device



Public Safety



Public service



Fire Safety & Disaster Preparedness



Hospital



Education



Traffic control / Air traffic control



Automotive, Automotive parts



Electronics, Machinery



Drug, Food



Hotel



Logistics



Retail trade Wholesale

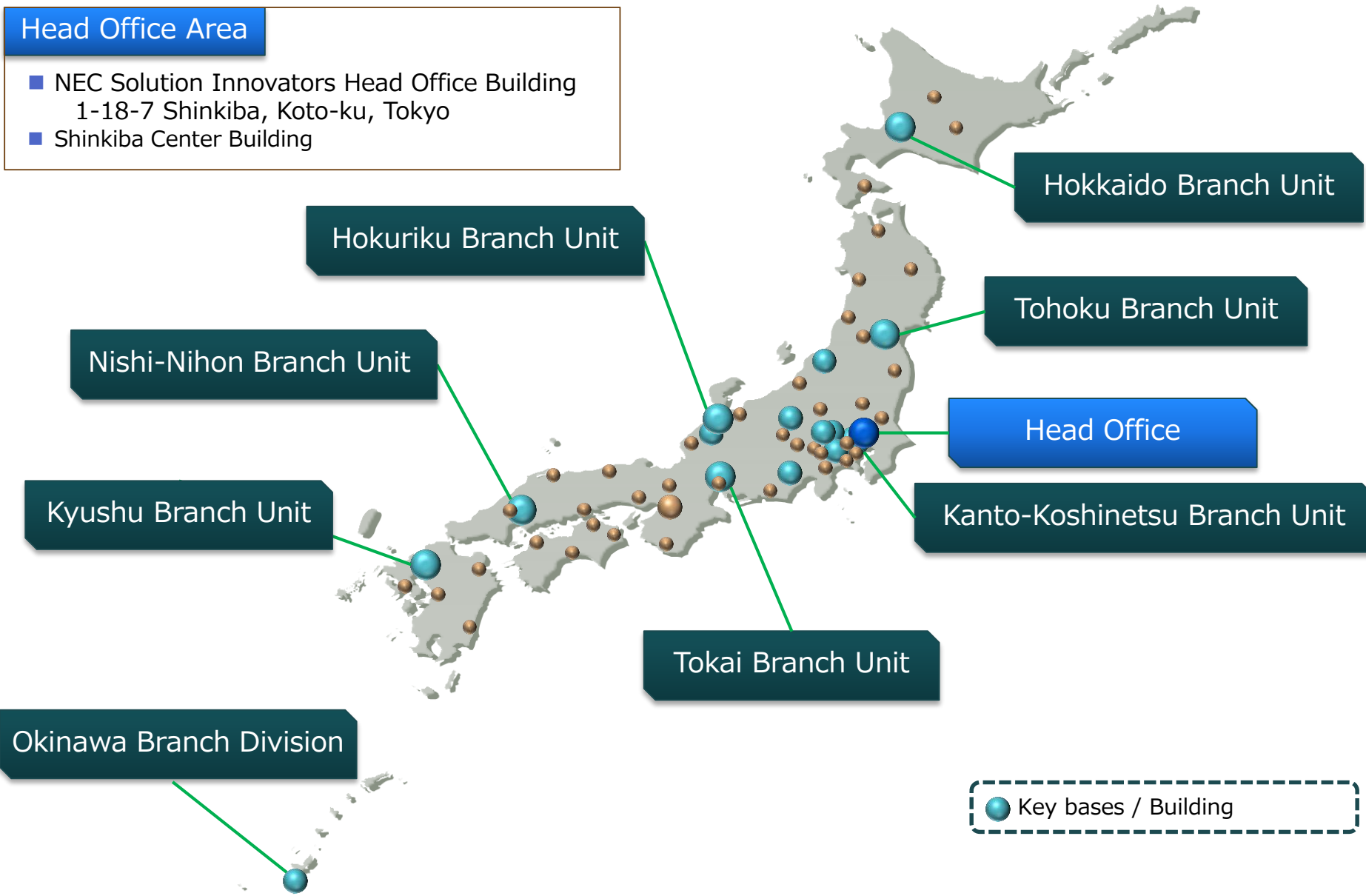


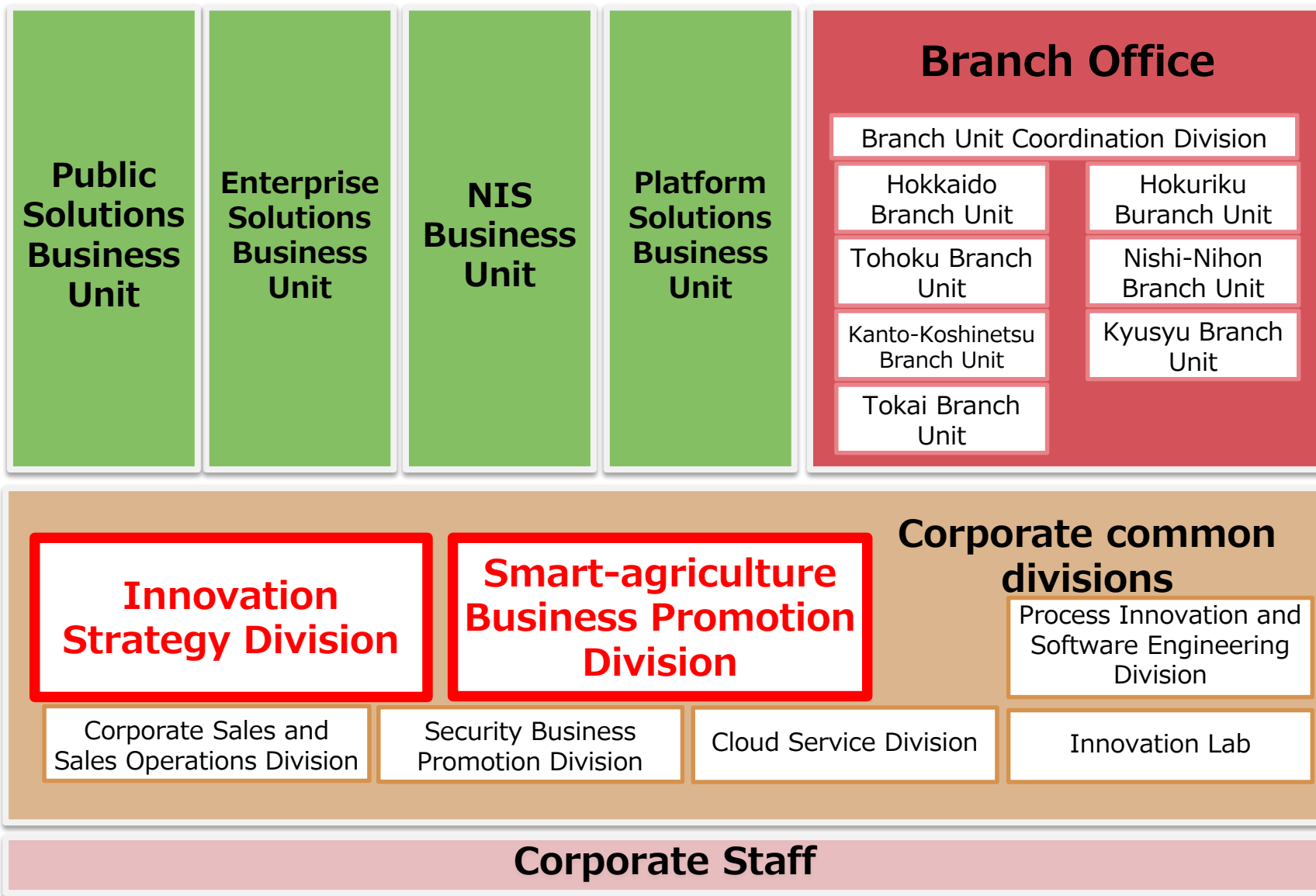
Bank, Insurance, Securities

NEC Solution Innovators in Japan

Head Office Area

- NEC Solution Innovators Head Office Building
1-18-7 Shinkiba, Koto-ku, Tokyo
- Shinkiba Center Building





Business Domain for Research in IVO

IoT in Smart Agriculture :High Performance Greenhouse Plant

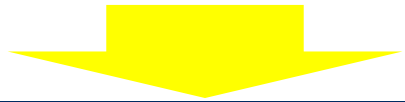
IoT

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Facilities

×

Cultivation Knowledge

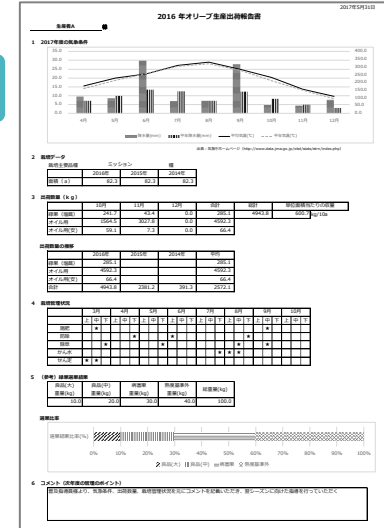


High Performance Greenhouse Plant

- High Yield
- High Quality
- Low Cost

Reporting

Knowledge



ICT

User Interface



Greenhouse



Facilities



Sensors

Research for “Possibility of High Performance Greenhouse Plant” and “Market potential of the Greenhouse Plant”

“High Performance” means

- High yield
- High quality
- Low cost – both of “initial cost” and “running cost”

Greenhouse Plant’s components are

- IoT system – ICT and Sensor
- Cultivation Knowledge
- Greenhouse facilities – House, Facility and Construction
- Seeds and Seedlings
- Fertilizer
-

Tell us situation bellow in your country...

Performance of IoT system

- System Architecture (Hardware, software)
- Function
- Network Response
- Security Level
- Initial Cost
- Running Cost

IoT system includes Drone/Robotics Technology.

Cultivation Knowledge

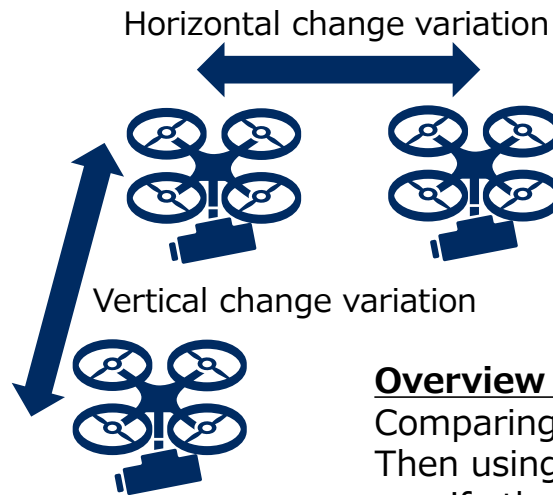
- Collecting, Accumulating and Delivering process
- Retaining of freshness process
- Classifying process

Case study: Estimation for drone self position



Research overview

Technology of handling the self position estimation at the out of GPS range (ex. Inside of greenhouse, near by bridges, etc.), using by only RGB camera of drone.



Overview of technology realization








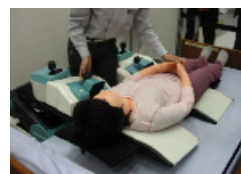




Comparing the RGB camera images by the unit of frames. Then using by the time-series image changes, estimate and specify the change rate of the self position.

Based on the time-series processing from its takeoff, it can estimate and detect the change rate at anyplace (height).

Control the self position with highly accurate level without sensors.

The other Technology Research Area in next step

We focus on the robotics, especially technology research of communication robots and drones.

Communication Robots	Mobile robot type		Wearable type	Boarding type	Universal type
	Controllable type	Autonomous type			
<p>Supporting daily life (Customer service, guidance, education, etc.)</p> 	<p>Surgical robots, Rescue robots, Drone, etc.</p>  <p>da Vinci</p>  <p>Rescue Robots</p>  <p>Drone</p>	<p>Cleaning robots, Security robots, Guidance robots, Transport robots, etc.</p>  <p>Guard robo</p>  <p>Robina</p>	<p>Robot suits, Motion assists, Robot for transferring to bed, etc.</p>  <p>HAL</p>  <p>Transfer assist</p>	<p>Transfer support robots</p>  <p>Ninebot (Segway)</p>  <p>Mobiro</p>	<p>Universal Humanoid</p>  <p>ASIMO</p>  <p>ATLAS</p>

Source:: METI (Ministry of Economy, Trade and Industry) with revised and edited

Ref : Communication Robot Industry Map in Japan

Communication Robot Industry Map / 2017 / 1st Half / Japan /

Contact : map@robotstart.co.jp

Media 日本経済新聞 日経産業新聞 Recruit 日経インテリジェント Consulting 日本ロボットスタート ROBOT START INC.

Our Focus Area

TECHNOLOGY

Voice Recognition

FueTree AIR-Trek
speechRec
amazon Google
Watson
RECAUS
NEC
TheVoice Julius

Machine Learning

TensorFlow
Watson
DEEPstation
Chainer

Cloud Service

Microsoft Azure
myThings

Voice Synthesis

AITalk
FUE TRAK
amazon Google
Watson
NEC
docomo
Open JTalk
AQUEST

Conversation Engine

Corevo
Watson
PASCALIA
COTON
AIR
TASHI
INAGO

Translation Engine

AITalk
FUE TRAK

Communication Robots

BIPED

ROBO-YOH
PALM
PALO
NAGO
ROMIO
ATOM
ROBE
ROBE2
ALPHA2
ALPHA1 S

WHEELED

PEPPER
EMIEW3
ZENBO
BUDDY
DOMOY
FURO
AMYROBOT
SAMBOT

DESKTOP

XEROB MIBI
SOTA
XIBIO
MEBO
LEGAROBO
TARA
TARA2
BOCCO
LUBO
OHANAS

HUMANOID/ANDROID

ALTER
ANDROEOLU
ERICA

Application Developer

4+10 Robotics ACCESS
AGS株式会社
AIR-TRAK
ArTra
Asuka-ici
auris
BlitzGate
OXYZ
BSN
CAPICE
CAMEL
CREATE
Cuddeaware
curiosity
DenCubic
Denzan
DSK
Directorz
Jeki
Eclipse
Elvez
EUPRY
Fabric Arts
FERNET
Fics
Focus Systems
G-angle
GAM CO.,LTD.
GKi
GLOBALWISE
HINOX
HCS
HINTERRACE

CMS

robot library
store
Smart at robo

Application Market

robot library
store
Google play
amazon

Scenario

Star System

Contest

WRS

Rental

Canora S&S
NISHIO
Rentio

Event

CEATEC
Maker Faire Tokyo
Japan Robot

USER

Robotics technology industry is wide, and we focus on the Software technology and AI research.

Pet Robots

HOME ASSISTANT
XPERIA AGENT
EMIEW3
SMART ASSISTANT
VOFLIX
DIENGO
DINGDONG
CLARITY
KOROBING FELLOW
PATIN
OUBI
COCOROBO
ROOBYA

Tele-Communication Robots

DIR-ME
TELENOE
CABA

Tutorial Robots

COZMO
PLENO
PLEN2
BEZEL
MECHANOID
KUMETA
MAGI
TOY BLOCK
KOOPY
OTOMOT
KRYPTON

Hobby / Entertainment Robots

GATEROX
TAO-ROBOA
PELMAID #8
EDULL
WODMO
ROBI.R
BAURIGOTANG
BB-4
SPHERO
OLIE
KODAMA
ROBOHIA
VORTEX

Distributor

atelier
CONNECTLY
Tokyo Robot Lab.

Costume

ROBO-UNI
jet
merie

Group

iROBO
ROBO-UNIT
peepio

Performer

misa capsule
RoboDoll
Buddi

Lab

NEDO AR
MMRI
lab.

Fund

ROBOtech
robotnews.net
ROBOTRY
INVCC

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Communication Robot Industry Map 2017 1st - (c) Robot Start Inc.

AI technology research in robotics

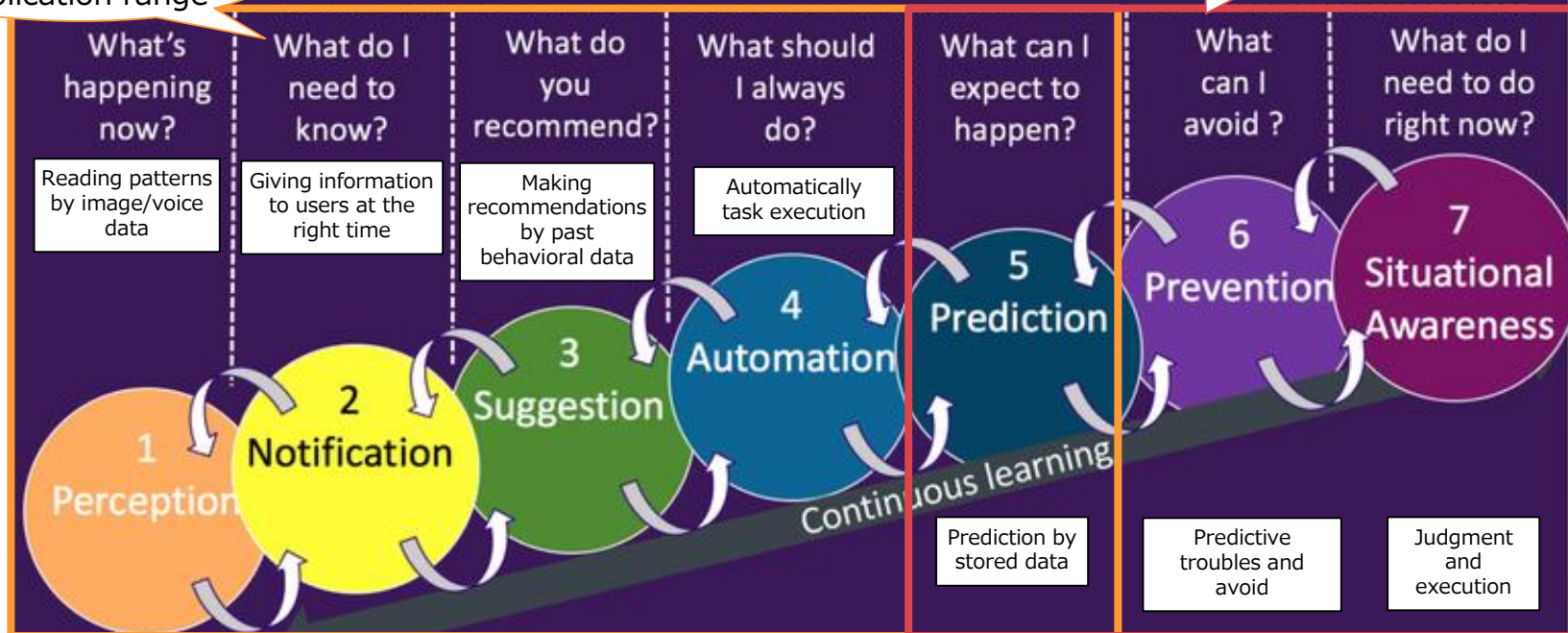
Our technology research target is autonomous operating robot by their own recognition and judgment with AI.

- In particular, we research the technology for risk avoidance and decision/execution by using prediction.

Seven spectrum of outcomes for AI

Current application range

Required range in the future



Research theme in next step

1 Cognitive robotics technology

Cognitive development robotics	To acquire the technologies for approaching the unknown tasks
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Ex. Learning the unknown tool's operation, Moving unknown place with out of touch, etc.

Symbol emergence in robotics	To acquire various actions and concepts by experiences, and communicate by recognized symbols (≠language)
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Ex. Communicate by learning language, etc

Robot social intelligence	To acquire communication skills through social learning with unique knowledge and inference functions.
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Ex. Understand rules, read the situation, etc

2 Drone control technology with image recognition

To estimate the situation by image recognition, and control their own devices.

Ex. To approach and collect detail information when robots detects anomaly of objects by camera,
To estimate self position by time-series variations of camera images, etc.

3 Efficiency technology for machine learning data

To streamline the improvement of machine learning by defining the category of learning data.



Find an invisible
future with our hearts

 **Orchestrating** a brighter world

NEC