What does L.CROWN aim for?

-What is World level Edge IoT Platform? -

Akimasa Koizumi

President and CEO
L.CROWN, Ltd.

Feb 7th, 2018

Connected Industries 5.0

Omotenashi

"Connected Industries" is the future vision that Japanese industries should aim for in order to overcome such an intensely competitive and rapidly changing environment.

People, technologies, machineries, and everything connect with each other across the boundaries of enterprises, industries, and nations.

By creating new products, services, and values through this connectedness, we will solve various challenges facing humankind.
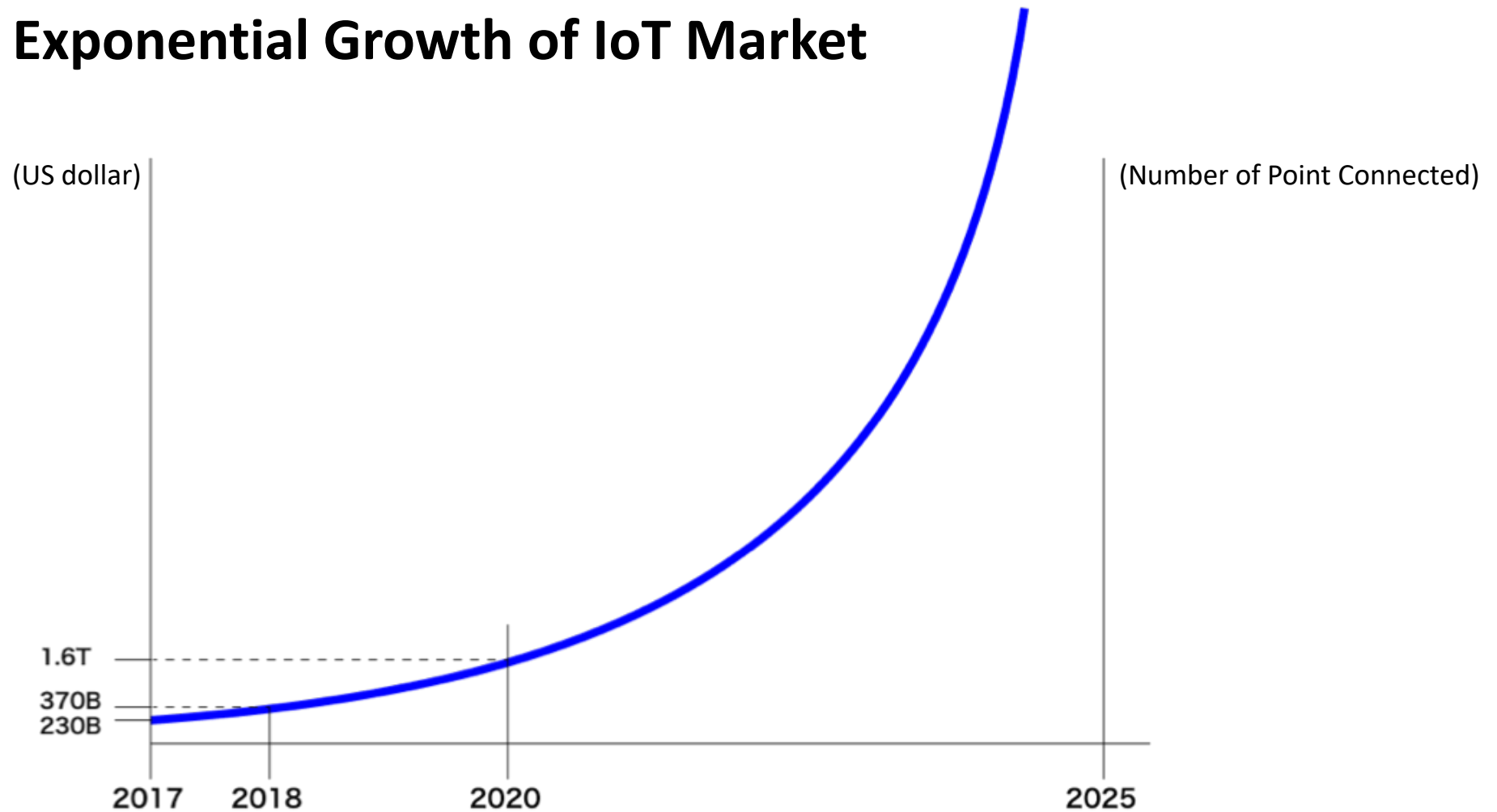
Global Innovation Economy

Intense, Global Competition

Rapid, Exponential Improvement
Unlimited Opportunities

Exponential Growth of IoT Market

(US dollar)

(Number of Point Connected)

1.6T
370B
230B

2017   2018   2020   2025

Internet of Things is New Innovation

The Advent of a Golden Opportunity for Significant Growth

IoT Investment Amount

Now: $230B | 2018: $370B

- 2020 **$1.6T**
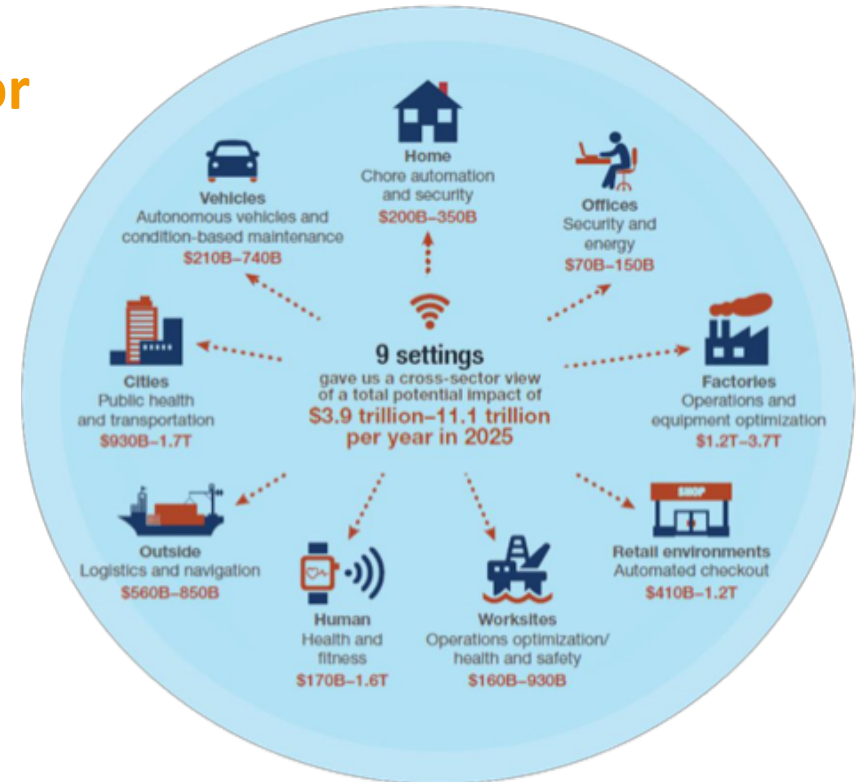- After 2025 still growing

Number of Connected Devices to the Internet*

2016: 20B | 2020: 30B | 2025: 80B

- Increasing 152,000 new connected devices every 1 minute until 2025

Opportunity for Enormous Enterprise Market**

- 2019- 40% of constructed instruments will be for enterprises.

Vehicles — Autonomous vehicles and condition-based maintenance $210B–740B

Home — Chore automation and security $200B–350B

Offices — Security and energy $70B–150B

Cities — Public health and transportation $930B–1.7T

9 settings gave us a cross-sector view of a total potential impact of **$3.9 trillion–11.1 trillion per year in 2025**

Factories — Operations and equipment optimization $1.2T–3.7T

Outside — Logistics and navigation $560B–850B

Human — Health and fitness $170B–1.6T

Worksites — Operations optimization/ health and safety $160B–930B

Retail environments — Automated checkout $410B–1.2T

Source: McKinsey and Company

The Challenge: Innovate or Die

Decreasing Lifetime of U.S. S&P 500 Companies

San Francisco Chronicle
HP faces potential takeove[r] value decrease

CIO
Nokia makes loss as smart phone sales drop by a third
Move to Windows Phone has hit sales

HUFFPOST TECH
More Myspace Layoffs Expected This Week

myspace.com

cnet
Oracle buys Sun Microsystems

Mail Online
Google buys Motorola mobile phone division for $12.5bn

Lifetime in years

110
10[0]
9[0]
80
70
60
50
40

1958   1968   1978   1988   199[8]

Year

Source: Creative Destruction

Progression of Customer Value

$882B
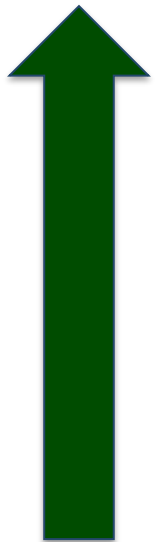
$9B

emotions

↑

experiences

↑

services

↑

goods

Morita and Jobs Got It

For IoT the convenience is
"Easy to Connect"

L.CROWN

Perceptual quality

HDTV

Color TV

B&W TV

FM

AM

shirt pocket radio

CD Walkman

PDAs

iPad

iPhone

iPod

Apple Watch

Convenience
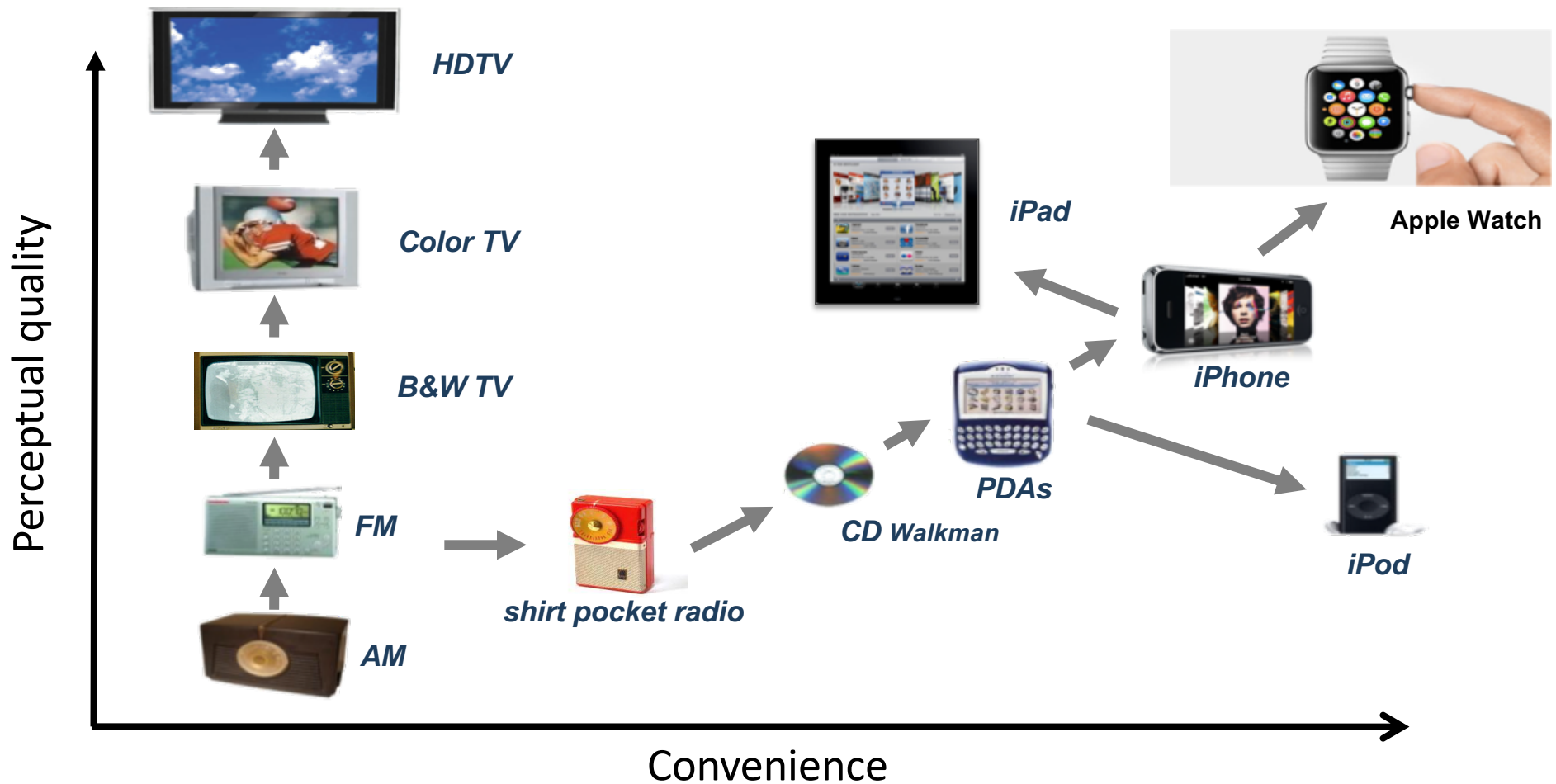
L.CROWN

Aiming for highest
IoT performance

L.CROWN

Japanese hospitality as the basis of IoT

Hospitality

To create a global IoT network, L.CROWN lays the Japanese spirit of hospitality in the heart of its IoT system.
Indeed, IoT accelerates efficiency at a tremendous scale. However, this is only one aspect of what IoT can achieve. Our ultimate goal is to create a good quality of life through the delicate and compassionate Japanese spirit at the base of our global IoT system.

L.CROWN

Our Japanese
Know-how

IoT is hospitality

In Japan, technology has advanced by constantly responding to each user's subtle needs. Technology is not a mere set of skills we present to users. It is a means to create a higher QOL by carefully listening to customer's voices.

This is the Japanese know-how which is deeply rooted in our IoT philosophy and this enables us to create unprecedented efficiency throughout the world.
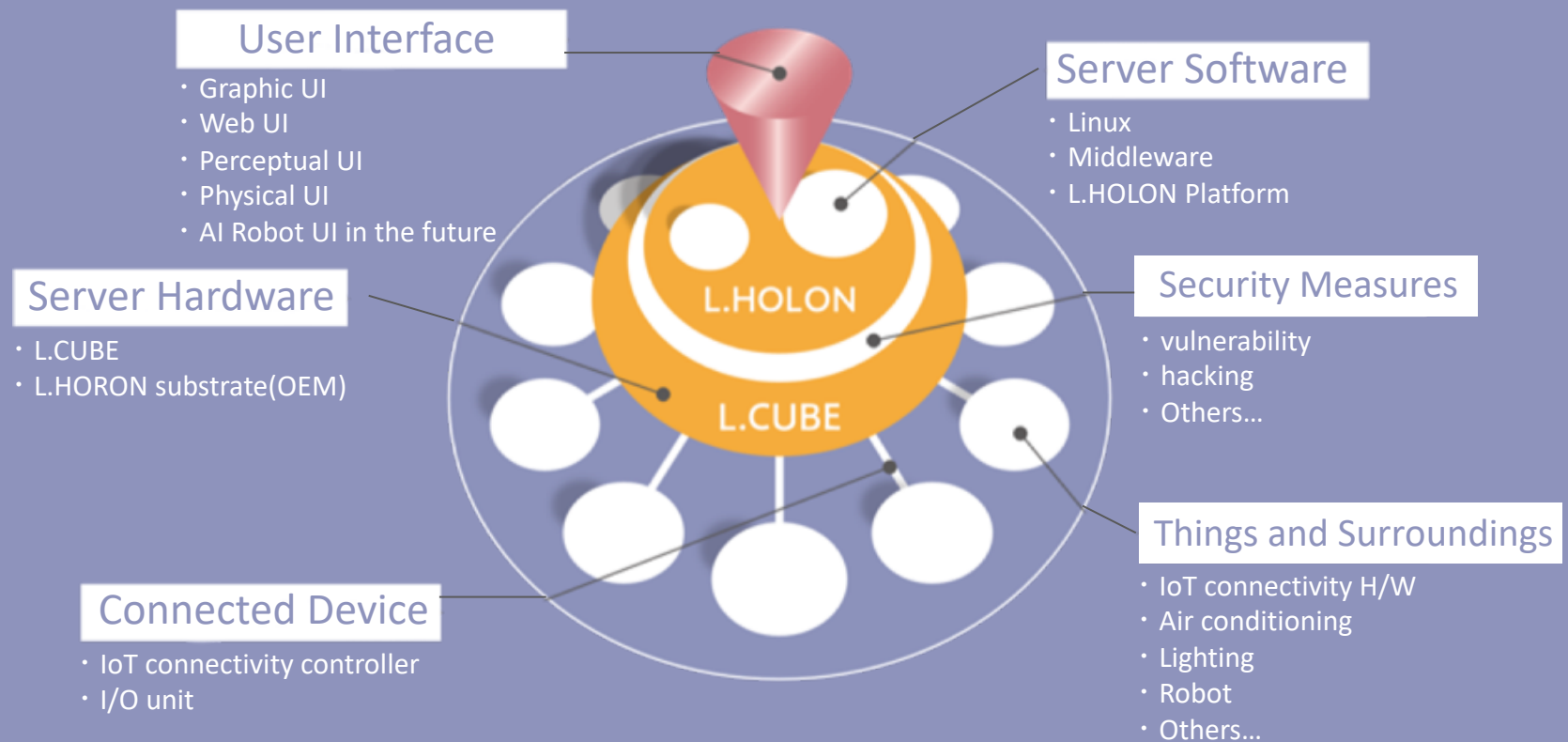
L.CROWN's IoT Technology

L.CROWN
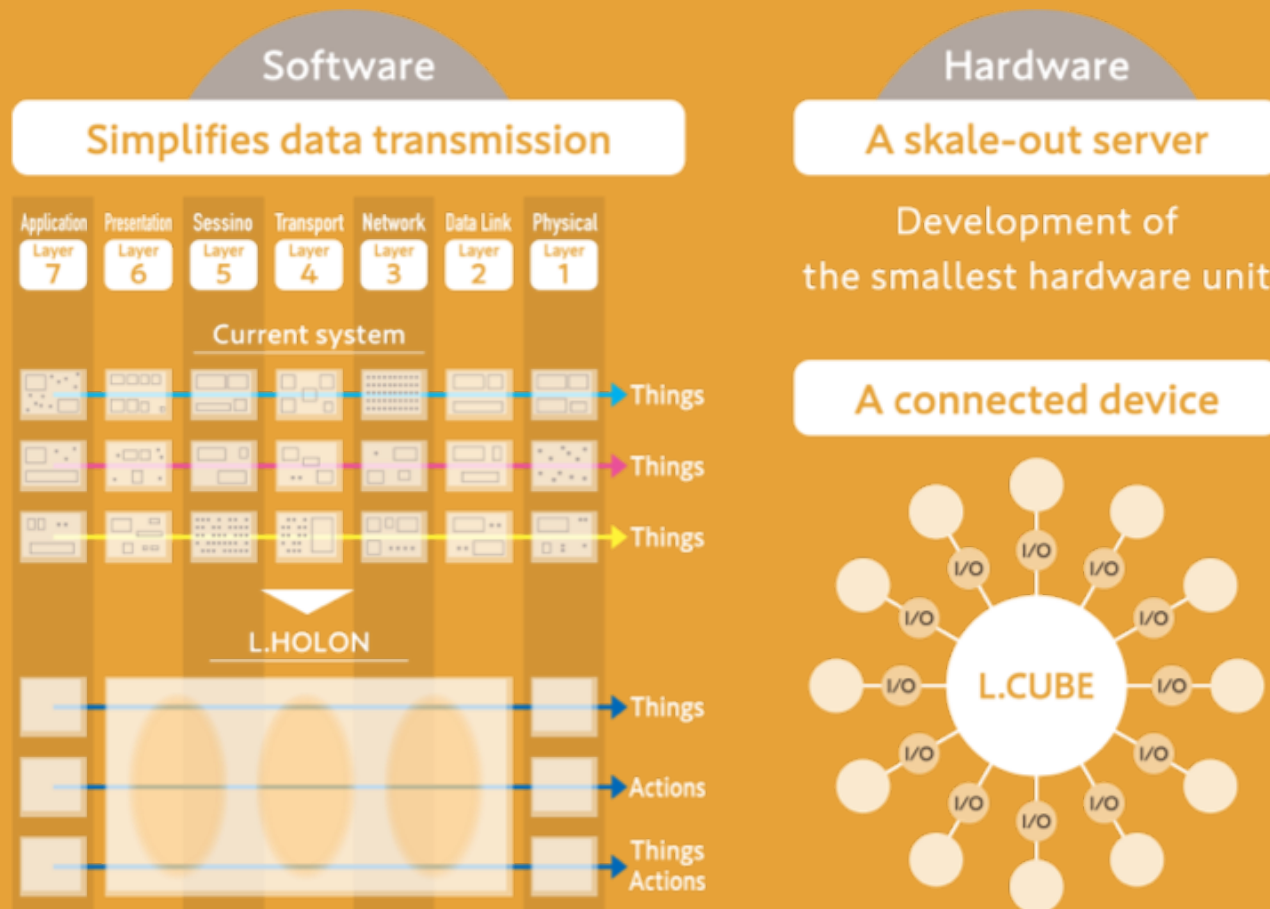
L.Holon is Configured with the Smallest Hardware

User Interface
- Graphic UI
- Web UI
- Perceptual UI
- Physical UI
- AI Robot UI in the future

Server Software
- Linux
- Middleware
- L.HOLON Platform

Server Hardware
- L.CUBE
- L.HORON substrate(OEM)

Security Measures
- vulnerability
- hacking
- Others…

Connected Device
- IoT connectivity controller
- I/O unit

Things and Surroundings
- IoT connectivity H/W
- Air conditioning
- Lighting
- Robot
- Others…

L.HOLON

L.CUBE

Our L.HOLON system is configured with L.CUBE (or L.HOLON substrate).
We create universal connectivity by combining the L.HOLON system with our original connected device.
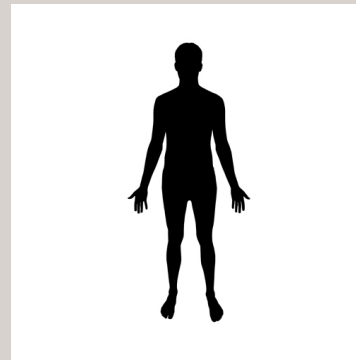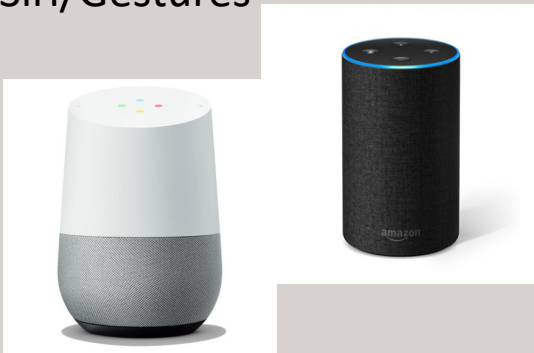
User Interface

Graphic UI
iOS App/Android App

Web UI
 Browser App/Digital signage...

Human being

Perceptual UI
Amazon Echo/Google home/
Siri/Gestures
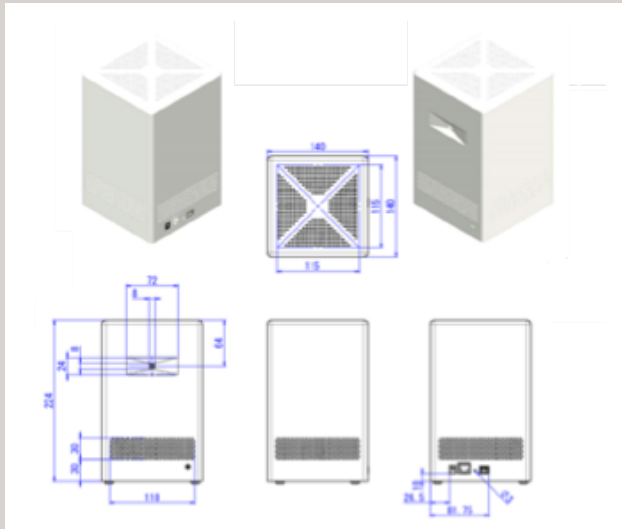
Physical UI
Synchro Cube Switch...
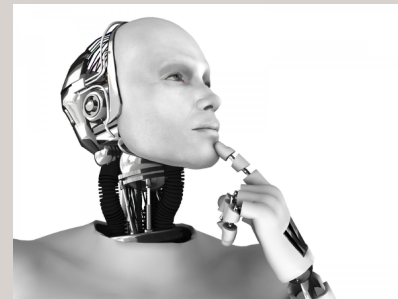
AI Robot UI in the future

Server Hardware

L.CUBE
- Designed by L.CROWN
- L.HOLON inside
- Multi-connectivity model integrated
- Small and exquisite

Server OEM
- Customizable(small to large)
- L.HOLON installation

Things and Surroundings

Facility and sensor

*Ranging over 150 varieties

- Air conditioning, Lighting,…
- Sensor, meter, camera
- PLC
- Robot

Other systems

- Cloud service
- HEMS, BMS, MES, CCTV…

IoT connectivity H/W

- Gateways
- Controllers
- Communication Units

A New and Ideal Communication Platform

On demand
data delivery

+

An indepedent system
which connects instantly
without human assistance.

+

The Holon structure
enables accurate connectivity
among various systems.
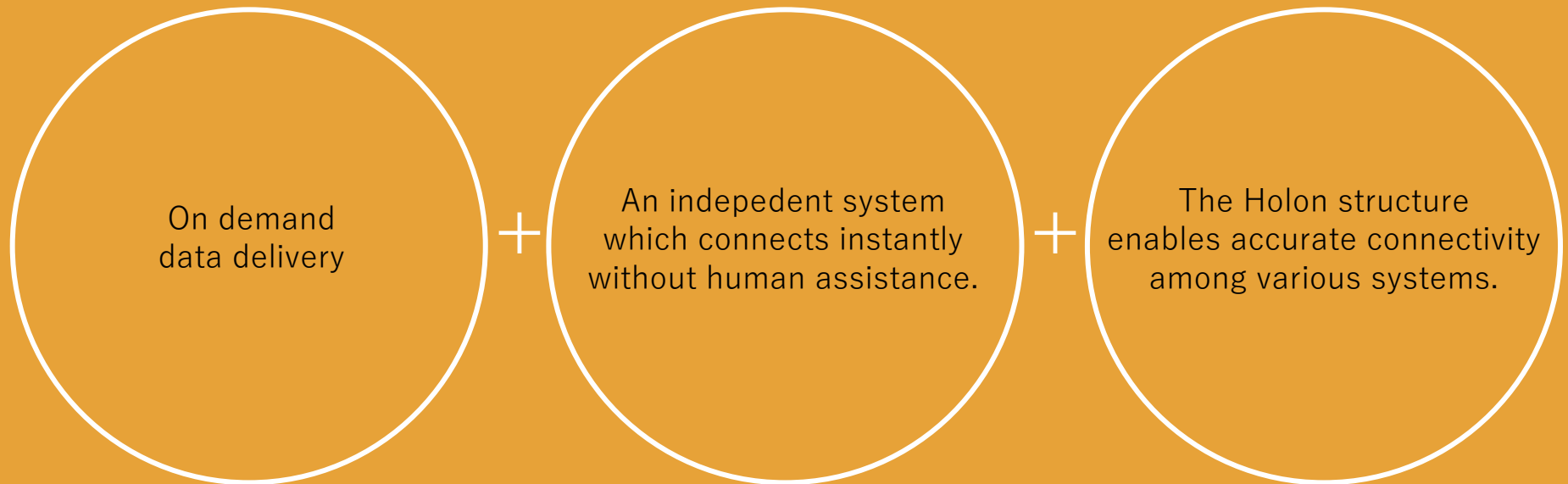
L.HOLON does not only connect to various devices but also creates a network with cloud services, digital signage systems and work attendance management systems. The wider the IoT network expands, it increases its efficiently to support people's decision making processes.
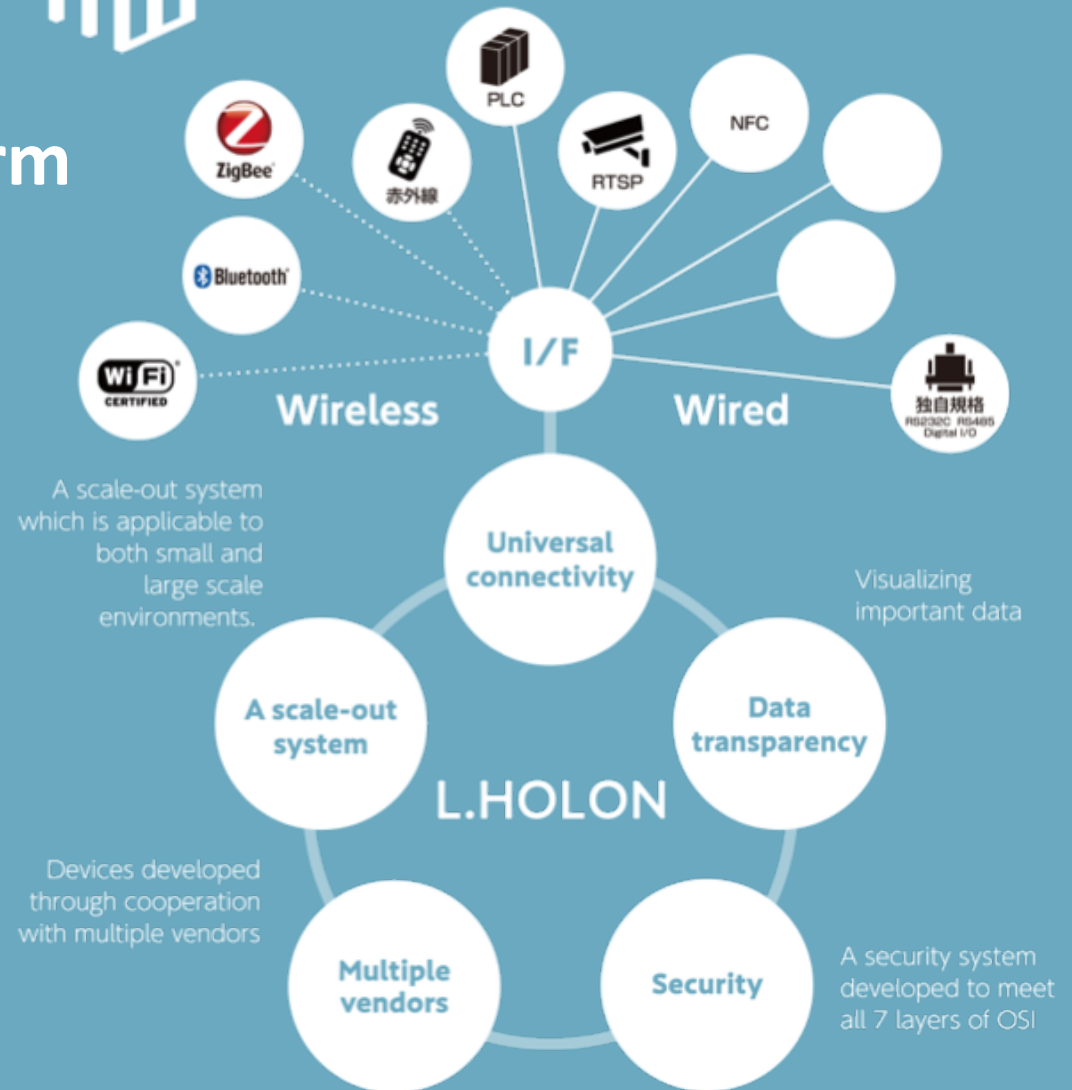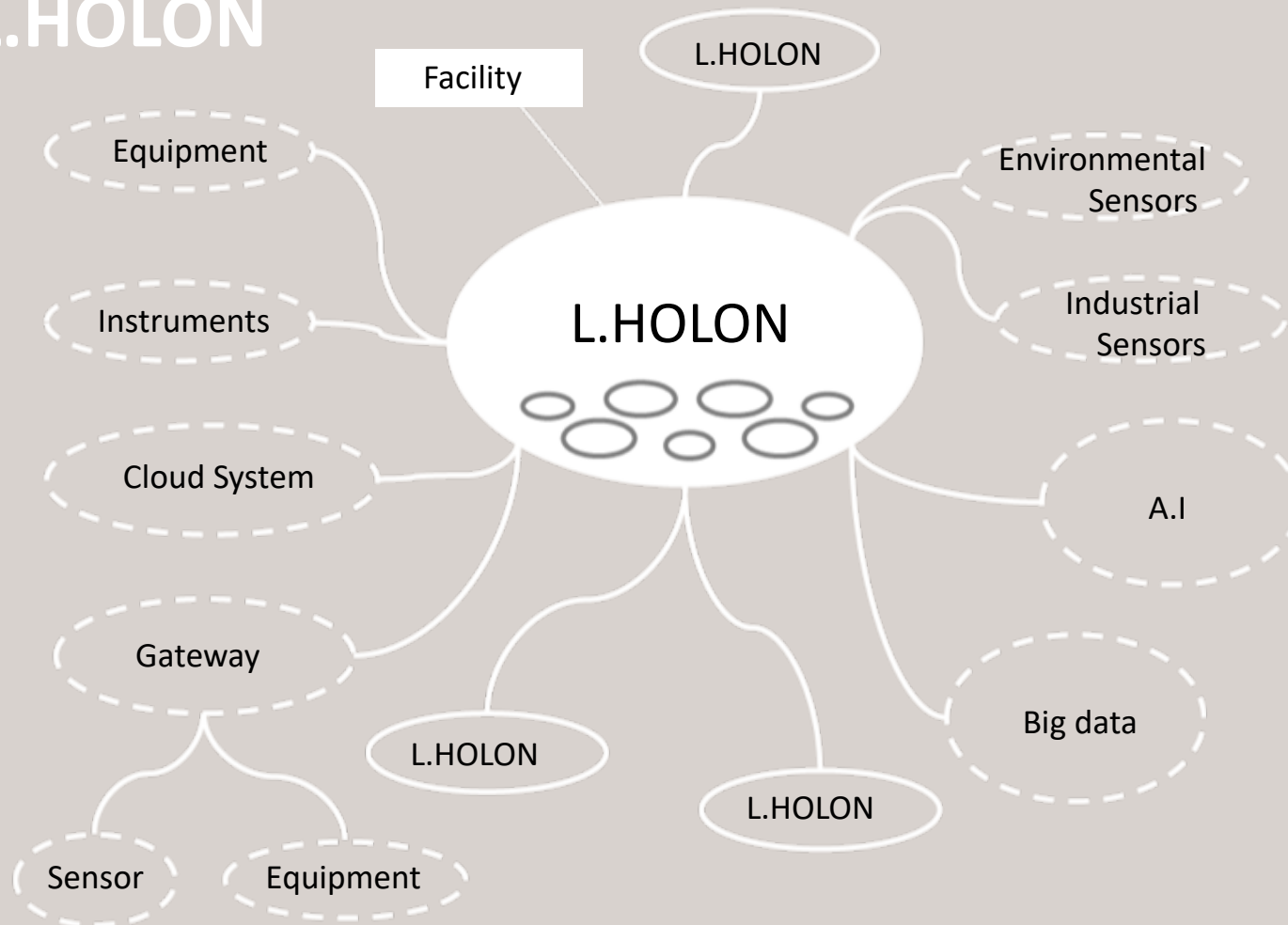
A Unique
Communication Platform
L.HOLON

Our know-how is based on the Japanese "Mottai-nai" spirit, which finds value in utilizing old goods.

Our unique L.HOLON platform aims to transcend the boundary of time by enabling systems from all ages connect to the past, the present and the future.

L.HOLON safely transmits information between systems at real time, constantly protecting all data within its highly secure system.

A scale-out system which is applicable to both small and large scale environments.

Visualizing important data

Devices developed through cooperation with multiple vendors

A security system developed to meet all 7 layers of OSI

The Connection of L.HOLON

Facility

L.HOLON

Equipment

Instruments

Cloud System

Gateway

Sensor Equipment

L.HOLON

L.HOLON

L.HOLON

Environmental Sensors

Industrial Sensors

A.I

Big data

An Addable Hardware which can Adjust to Environments at Any Scale.

A scale-out hardware system which can be adapted not only to small-and -medium but also mega sized environments, by utilizing L.CUBE as the basic unit.

L.HOLON Saves Energy and improved production efficiency

L.CROWN

Using FSS (Facility Support System) and acquiring all kinds of data through the sensors, L.HOLON optimizes the system continuously through PDCA cycles and thereby reduces the electricity consumption to the lowest possible level.
AI simulation technology makes the optimization process even faster.
And the optimization is not an one-off process but a PDCA cycle.

One of our customers, the first fully equipped
IoT factory in Japan, reduced electricity
consumption by 37% compared with the previous
year. Also the customer have achieved multipul
improvement of production efficiency.

37%
Energy saving

＊connecting 8,000 devices with 38,000 points.

Installation Work of Card Reader
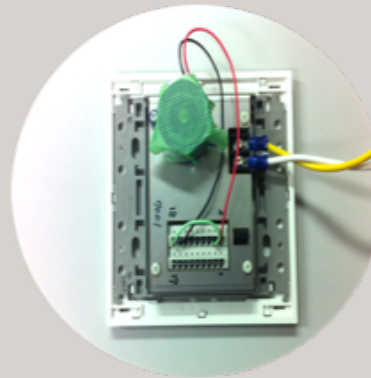
機能
・各ドアごとの権限付与
・入退室履歴の保持、加工
・入退室時のＩＴＶカメラの記録連動

連動
・勤怠管理との連動

導入メリット
・配線材料、工数のコストダウン
・各システムとの機能連携が容易

RF-ID ユニット（CR）
電気錠I/F付

AIOI中継装置
ユニットの接続例

執務室扉の利用イメージ
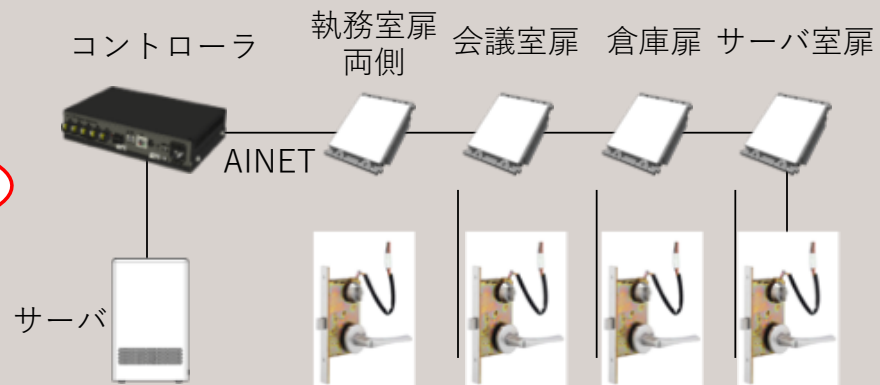
設定によりＩＴＶカメラとの連動可能

ピッ！

ピッピッピッ！

正常入室時

不正使用時

サーバ室

コントローラ　執務室扉両側　会議室扉　倉庫扉　サーバ室扉

AINET

サーバ

Construction Work of Card Reader

L.CROWN

扉解錠アイコ　カメラアイコ

開放警報

ＩＴＶカメラ連動

設備記号　DR-F-4-2
設備名称　４Ｆ表面処理室
設備種別　ドア
接続状態　接続中
アドレス　[7064]
状態　軽警報

4階（事務棟・厚生棟・工場棟）

カードリーダ付き自動扉　　　　　　　　監視中画面

Installation Work of
The Attending and Leaving Management Card

出退勤用カードリーダ

監視中画面

Construction Work of
Temperature and Humidity Sensor
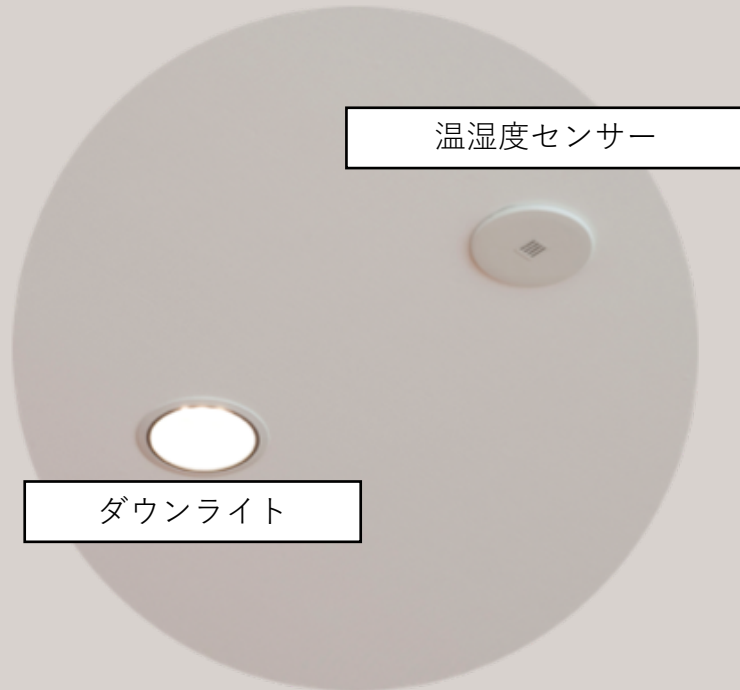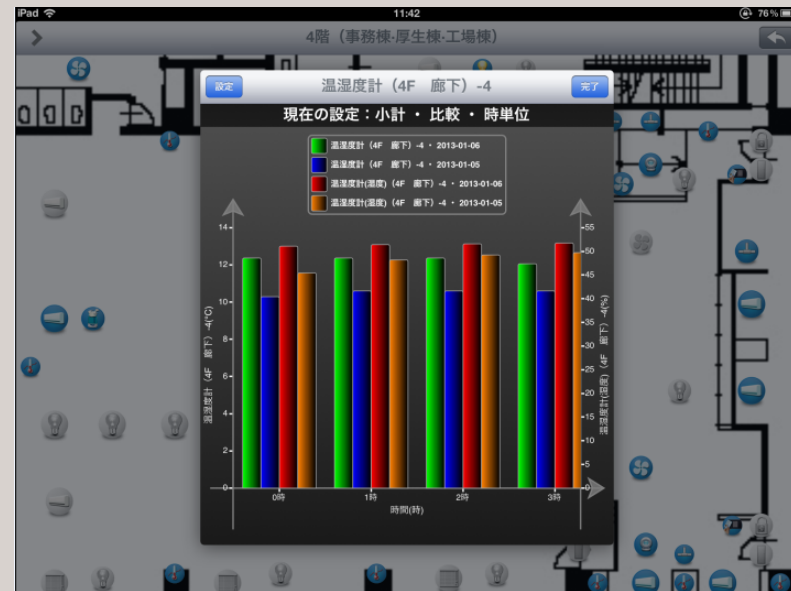
照明アイコン　温湿度アイコン　空調アイコン

温湿度センサー

ダウンライト

温湿度センサー

監視中画面

Construction Work of
Electric Roll Screen

ブラインドアイコン
オープン中

クローズ中

電動ロールスクリーン

監視中画面

Construction Work of
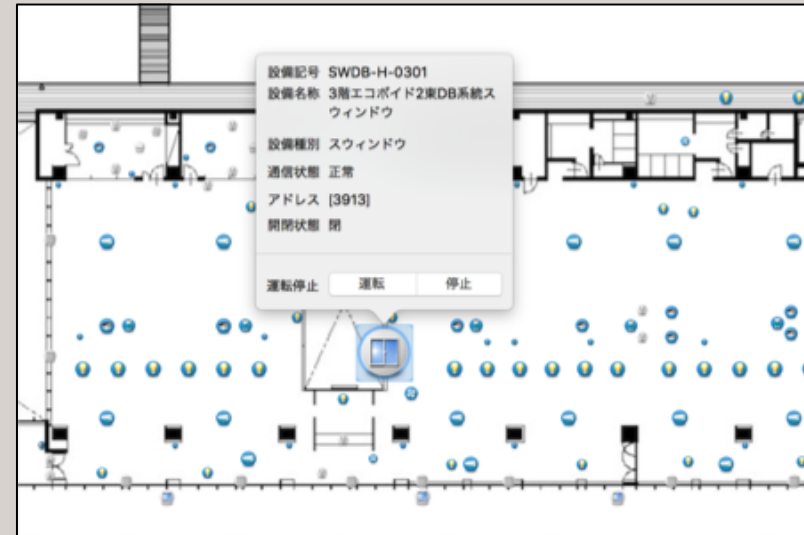# AC of Natural Ventilation Interlocking Device

全熱交換器や空調を利用
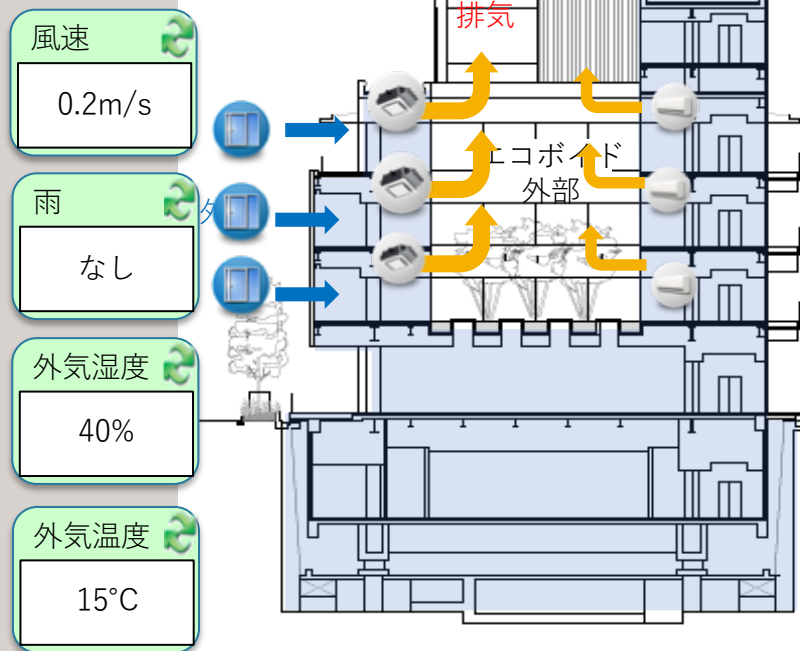
全熱交換器や空調を停止して、
自然の外気を取込み、
省エネやオフィス快適環化

自然換気停止

自然換気運転

設備記号　SWDB-H-0301
設備名称　3階エコボイド2東DB系統スウィンドウ
設備種別　スウィンドウ
通信状態　正常
アドレス　[3913]
開閉状態　閉

運転停止　運転　停止

管理中画面

During a Verification of Reducing Environmental Burden by Natural Ventilation (2016)

条件が全てグリーン時に自然換気を行います。
＜条件＞
風速５m以下
外気温＞室内温度

風速	0.2m/s

雨	なし

外気湿度	40%

外気温度	15℃

排気

エコボイド
外部

自然換気経路

稼働時間	6時〜２０時

夜間時間	３時〜５時

エンタルピ	XXXXX

室内温度	２０℃

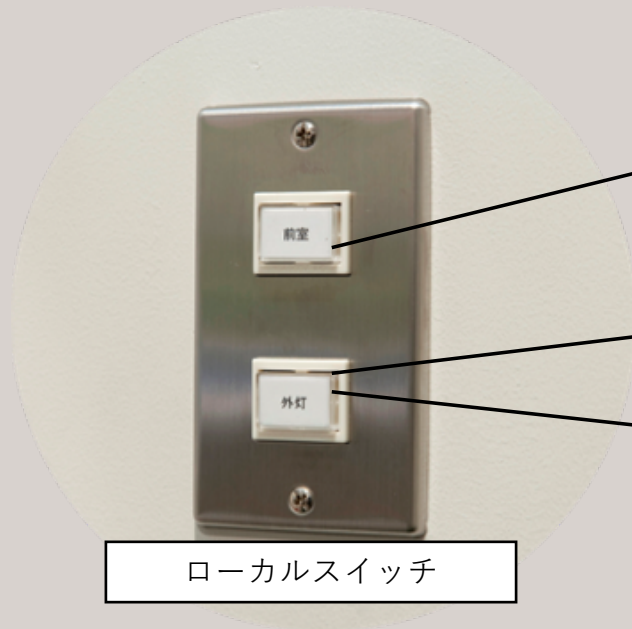| 室内湿度	40%

露点温度	19%

自然換気口兼用の光庭エコボイド見上
頂部には太陽光集光装置

外気の状態や天候、温度・湿度、窓の開閉、ドア、空調機など様々な設備情報を取得して幅広い制御をマルチベンダーで行うことが可能。容易に条件を変更でき環境改善時のコスト削減に繋がります。

L.CROWN

Construction Work of Equipment of Switches

ローカルスイッチ・中央監視・iPhone・ iPadから

照明をつける事も

ローカルスイッチ

iPhone

タブレットマシン
iPad

空調ON・ブラインド開も同時に

9階

設備記号　LIGHT-MLF-0907
設備名称　照明(9F事務室) -7
設備種別　照明
接続状態　接続中
アドレス　[1007]
状態　ON

点灯　　　消灯

警報通知　警報履歴

警報メッセージ
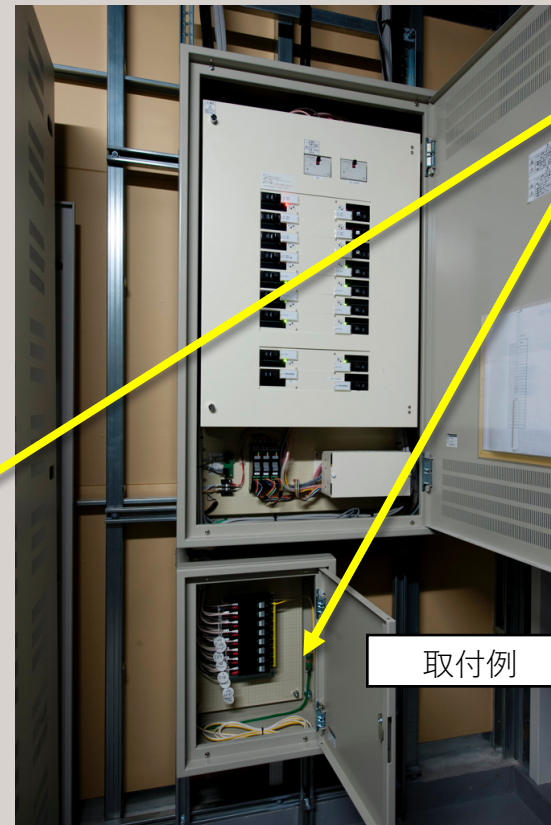
管理中画面

導入した建物は、各設備機器からの情報収集を容易に可能とし、中央監視のＰＣやiPhone・iPadからも設備監視・制御が可能となります。また、多くのシステムと連携し、情報活用を可能にして、自由な発想で効率的な設備利用をすることが可能になります。

リレーユニット

取付例

分電盤
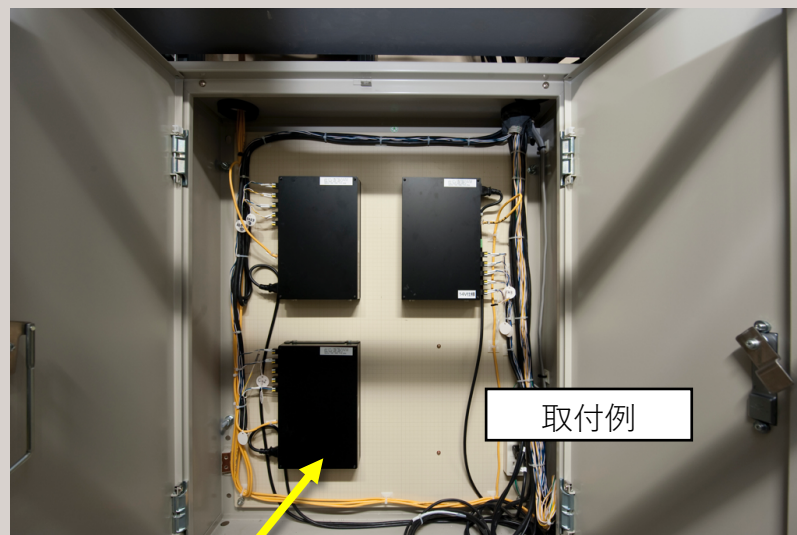
調光盤

取付例

AINET盤

コントローラ

AINET盤(UPS付き)

LIFT: Predictive Maintenance Solution

L.CROWN

System Construction

Cloud

LCUBE
Lift System

Sensor

SmartDB 1

LCUBE

SmartDB 2

iPhone/iPad App

WIFI Router

Elevator

LCUBE Introduction

L.CROWN

Management Center
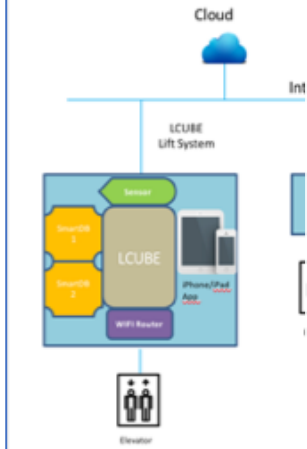
Installation Location（LCUBE & SmartDB）

http://www.straitstimes.com/singapore

Scale x 12

System Construction LCUBE life system

Main Motor

Electric Cable
（Main Motor）

WIFI Router

WiFi

Distributor
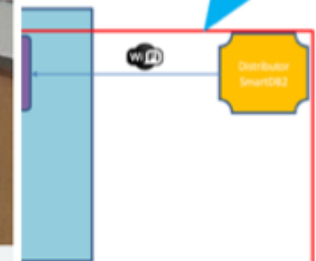SmartDB2

5
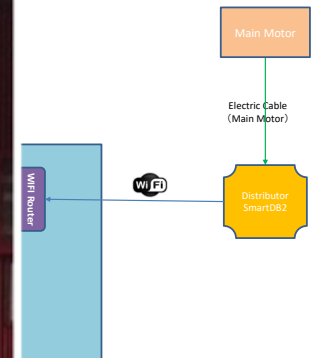
Collecting and processing real-time electrical data of door motor and main motor from SmartDB through LAN & WIFI

WiFi

Distributor
SmartDB2

Global L.C/LCS structure

JAPAN

L.CROWN

L.CROWN, Ltd.

L.CROWN

L.CROWN Systems Pte, Ltd.

Challenges toward Smartnation

SINGAPORE

Cooperators

- IoT Connections
- Architecture/Construction
- Network Tech
- Industrial Robot Control
- Robotics
- Medical/Nursing Care
- 3D Mapping
- Communication Security
- Sensor Tech
- A.I. Simulation

Temasek Polytechnic

Applied Research

A STAR

Basic Research

Easy to Connect
Scalability
Flexibility

Thank you.

L.CROWN