

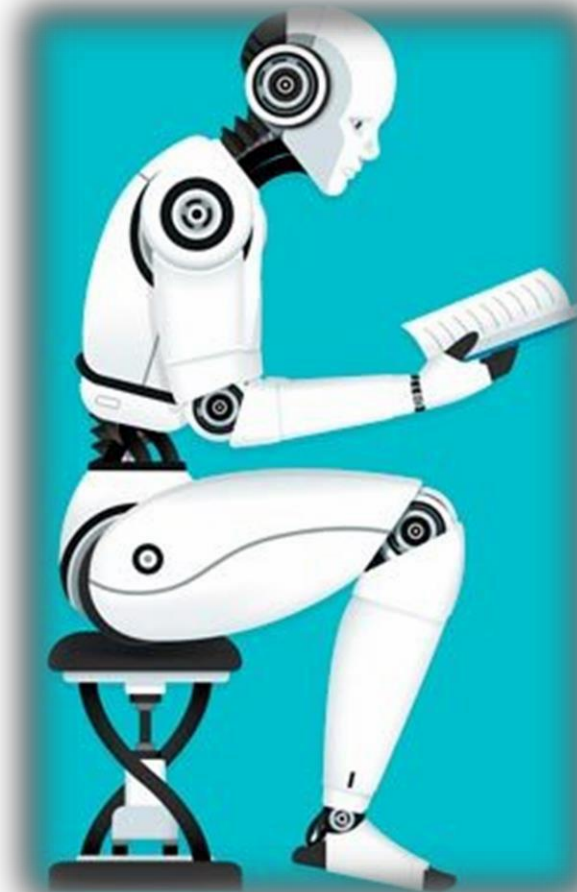
LEADING SOLUTIONS FOR A DATA CENTRIC WORLD...

MARCH 24th 2021
Soygur Kursun

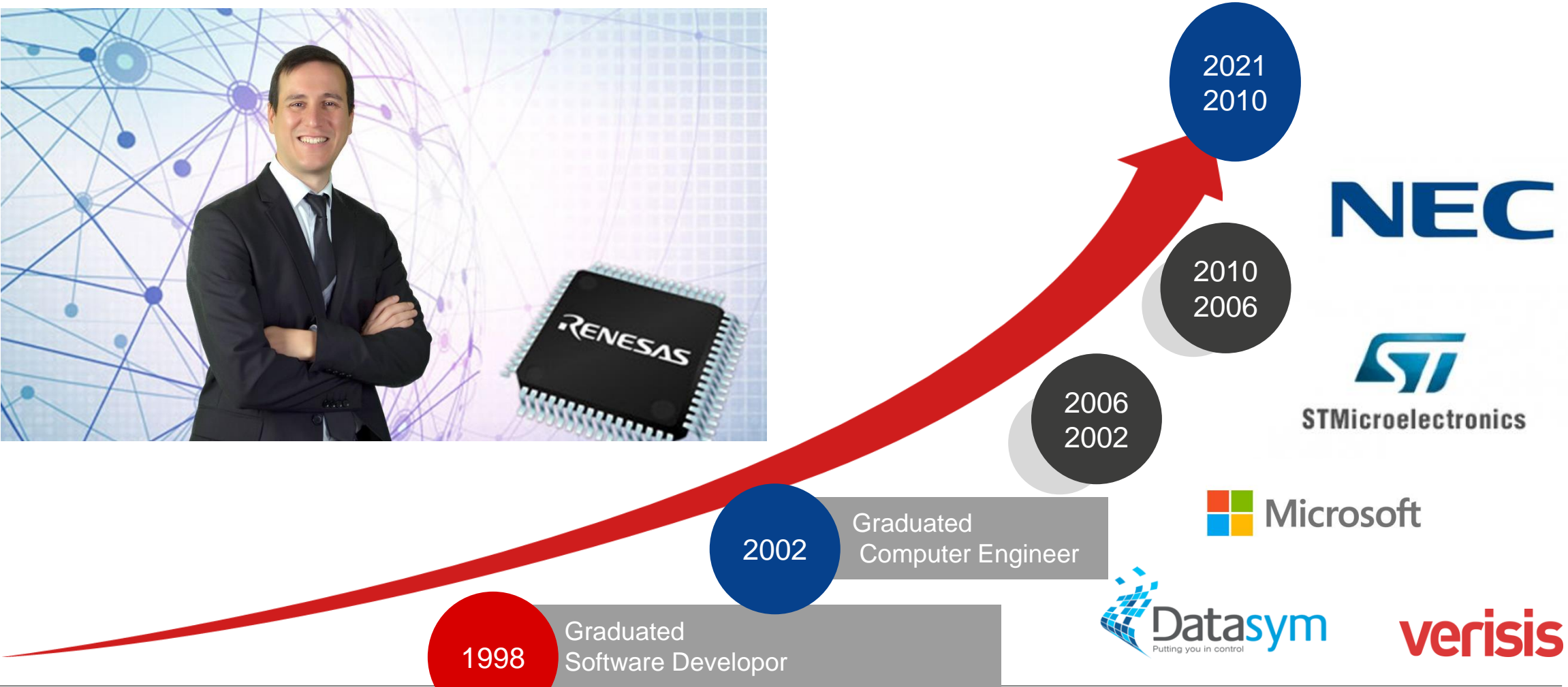


AGENDA

- 1 Major trends & Winning 'Ingredients' for a Data Centric World
- 2 'Built-in' Leading Core Technology Options
- 3 Building Automation Market Trends
DALI, Wireless Sensor, Fire & Safety



SOYGUR KURSUN



EMBEDDED ELECTRONICS MARKET TRENDS...

Increasing Digitalization & Evolving Customer Expectations

- Growing Design Complexity
- Speed of Innovation & Faster TTM
- Acceleration of edge point intelligent & virtual access – pushed forward with Covid



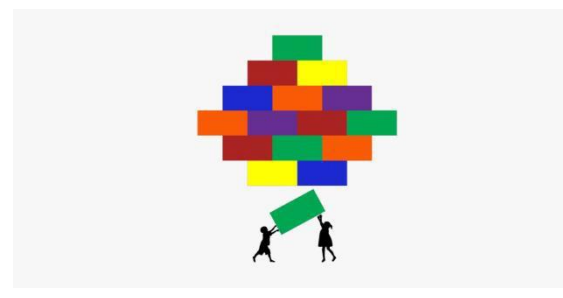
Core Technologies Driving Innovation

- Security as a foundation for next generation designs (connectivity driving demand)
- e-AI adoption accelerating with business-driven use cases (IoT Combined - AIOT)
- Smarter HMI with Gesture recognition, Robust Cap Touch & voice recognition
- Multi-sensing and intelligent system control

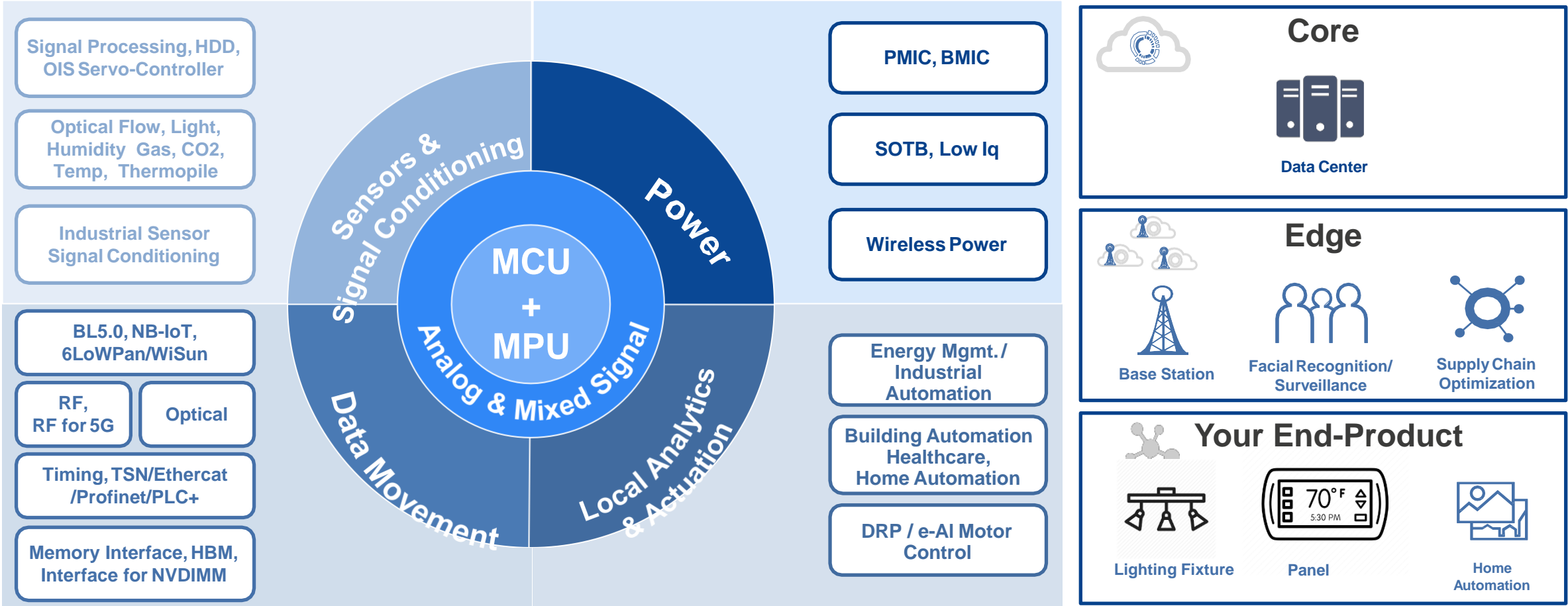


Intelligent Ecosystem

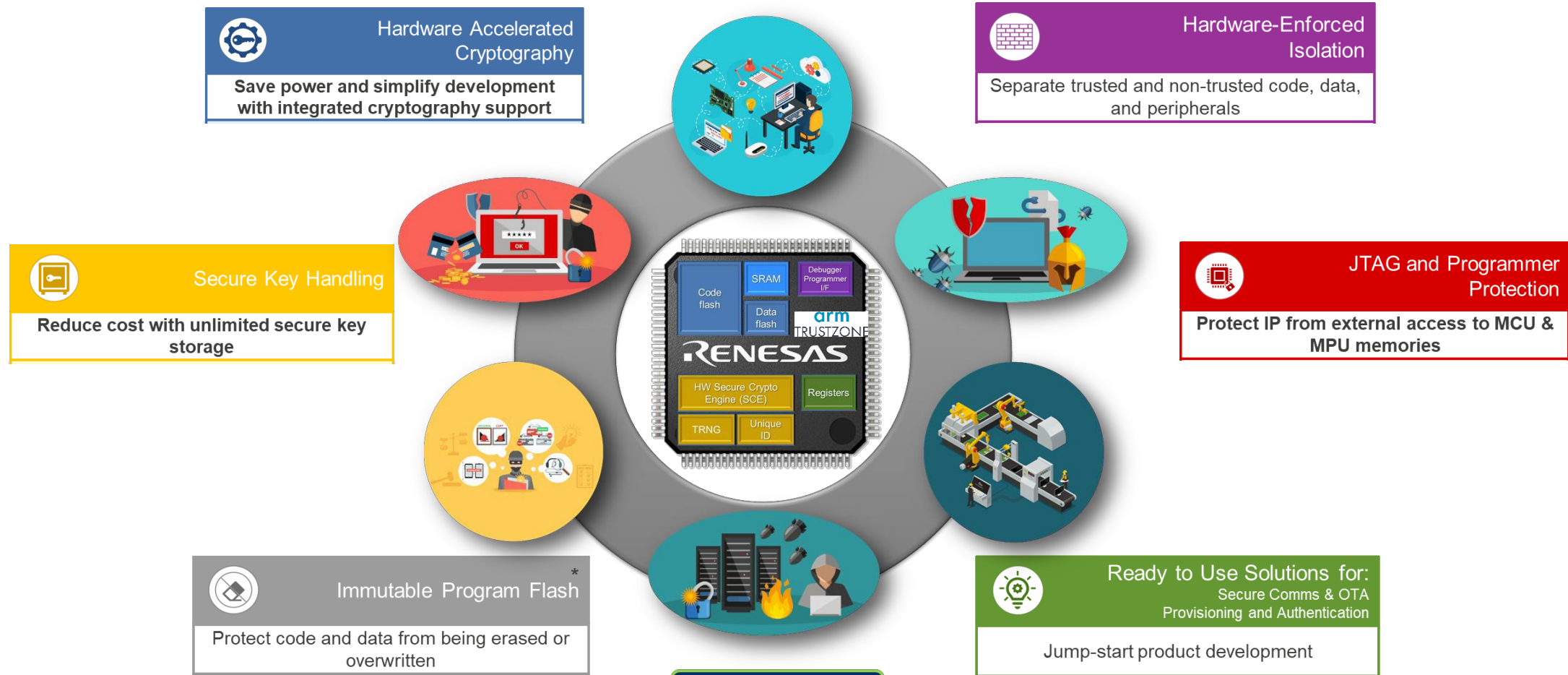
- Increased need for reusable software building-blocks to enable system solutions
- Partnerships enabling early market access, new customer acquisition is a key
- Delivering on increased demand for faster adoption of new technologies



NEED TO KNOW TERMS FOR A DATA-CENTRIC WORLD



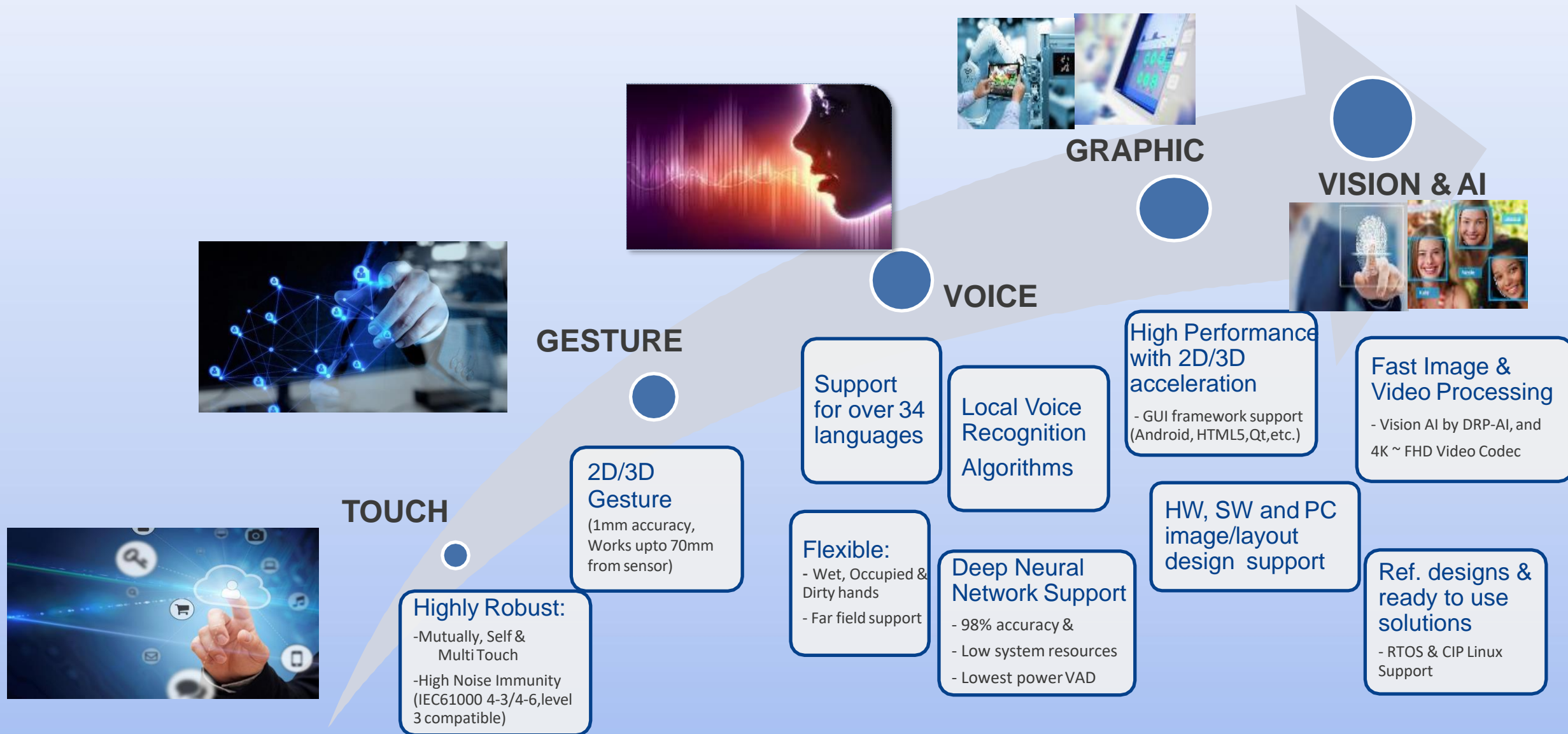
HIGHEST SECURITY FOR A CONNECTED WORLD...



* MCUs Only

NIST **CERTIFIED Crypto HW** **psacertified™**
Arm® TrustZone® to Isolate security critical components

ADVANCED USER INTERFACE SOLUTIONS...



INTRODUCTION TO BUILDING AUTOMATION

A blurred background image showing a person's hands typing on a laptop keyboard. The person is wearing a dark sweater over a light-colored collared shirt. The image is out of focus, emphasizing the text overlay.

Building System Configuration

Your four focus points

HVAC

Zone controllers
Boiler control
BEMS

Thermostats

Temp sensor
Humidity sensor
Flow sensor
IAQ sensor

Chillers
Rooftop AC
Pumps

Lighting

Control panel

Occupancy,
Daylight
sensors

Dimmer

LED light

Building Security

Keypads

Control panel

Motion
Glass break
sensors

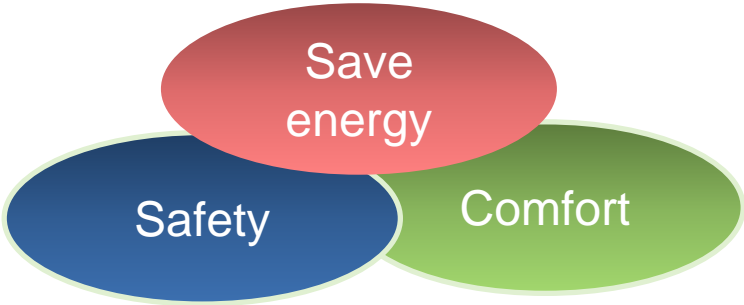
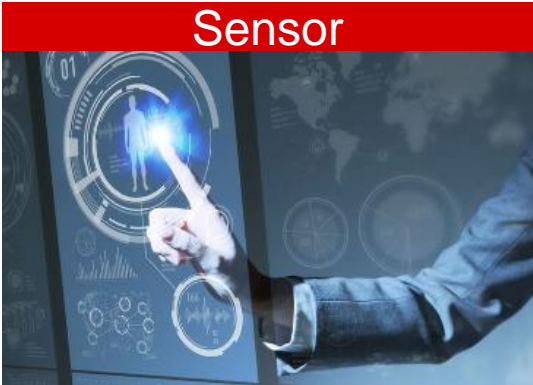
Fire & Safety

Control panel

Fire Alarm

Smoke,
CO, Gas sensor

Sounders,
Flashers



BA MARKET TREND

WW Ecology/Sustainable direction makes market requirement for various segment to bring smart society and ecology friendly environment.

WW direction



By
United nations,
WW Summit,
Environmental association

Market requirement



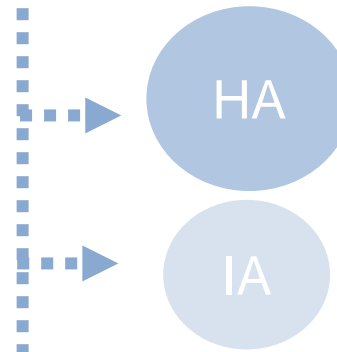
Save energy
Comfortability
Safety and Security

- Environmentally friendly product
- Energy saving, cost saving application
- Comfortable and safety, security product

Segment requirement



- ✓ Building Energy Management
- ✓ **Air Quality Control (PM2.5, CO2 etc.)**
- ✓ **Human Centric lighting**
- ✓ Security gate with face identification
- ✓ Efficient maintenance
- ✓ Connect to IoT
- ✓ Data control by network
- ✓ Avoid failure operation



- ✓ Smart home
- ✓ Home Energy Management
- ✓ Security
- ✓ Connect to IOT

- ✓ Energy saving
- ✓ Efficient Maintenance

SENSORS THAT CAN BE USED IN BUILDINGS

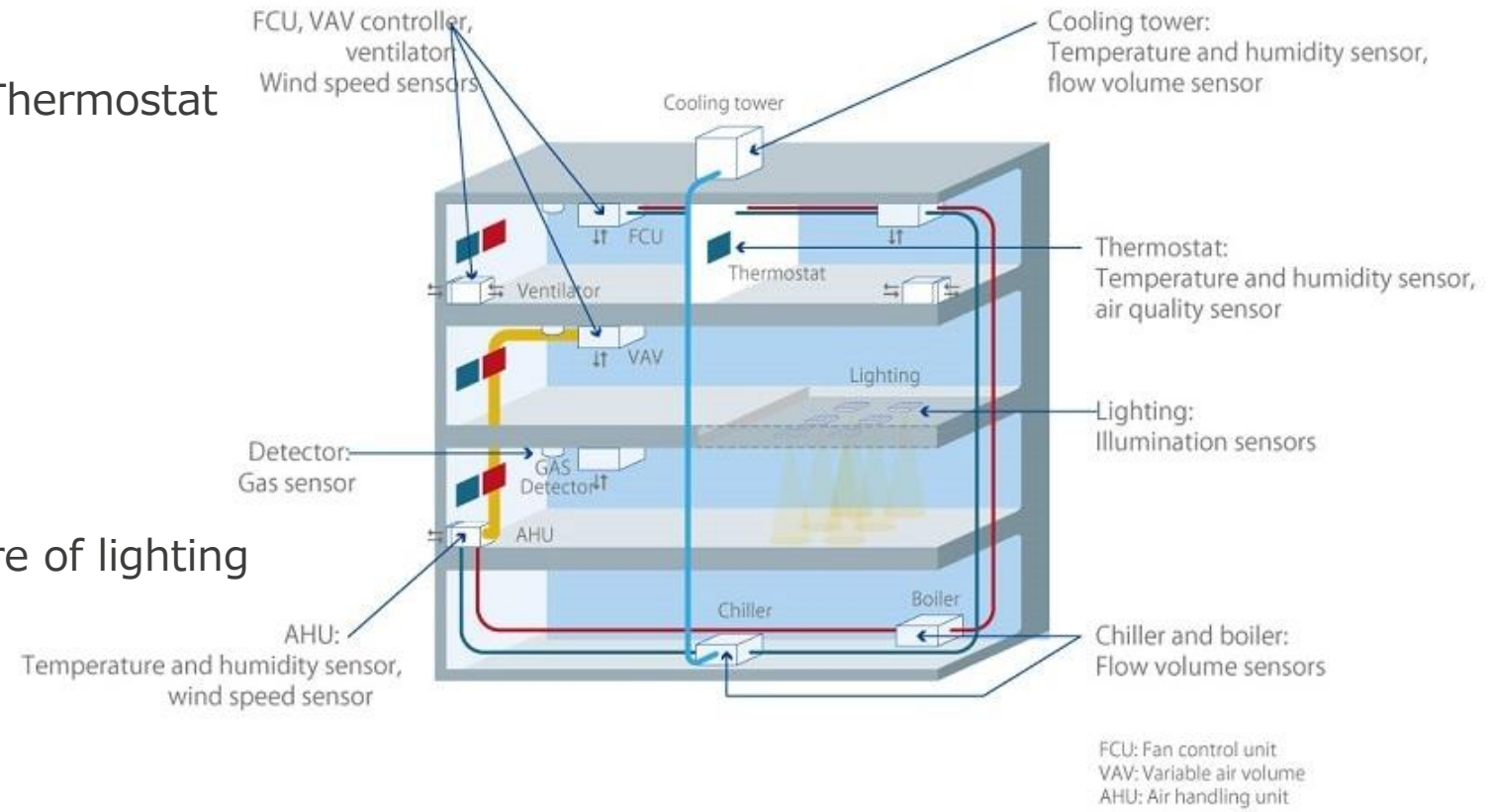
Temperature/humidity, air quality, and illuminance sensors can provide comfort in conjunction with HVAC and Lighting control.

Temperature/Humidity sensor :
Measuring temperature/humidity in HVAC/Thermostat

Air quality sensor :
Measuring air quality in Thermostat

Flow/Air sensor :
Measuring flow/air Volume in HVAC

Illuminance sensor :
Measuring illuminance and color temperature of lighting



A low-angle, upward-looking photograph of several tall skyscrapers in a city, reaching towards a bright blue sky with scattered white clouds. The buildings have various architectural styles, including glass facades and older stone structures. A dark blue horizontal banner is overlaid across the upper portion of the image.

BA's systems in various fields

HVAC SYSTEMS

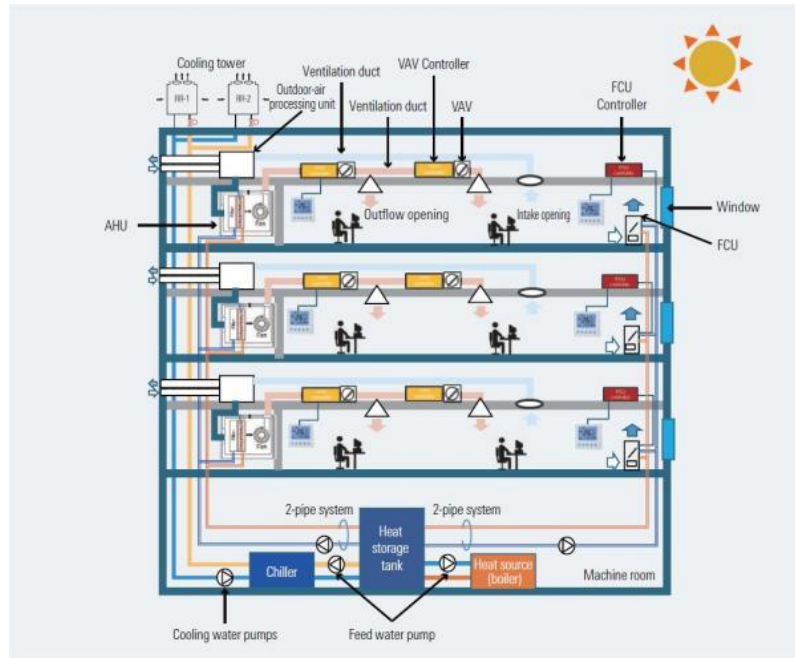
HVAC are classified into two systems.

- **Central air-conditioning system**

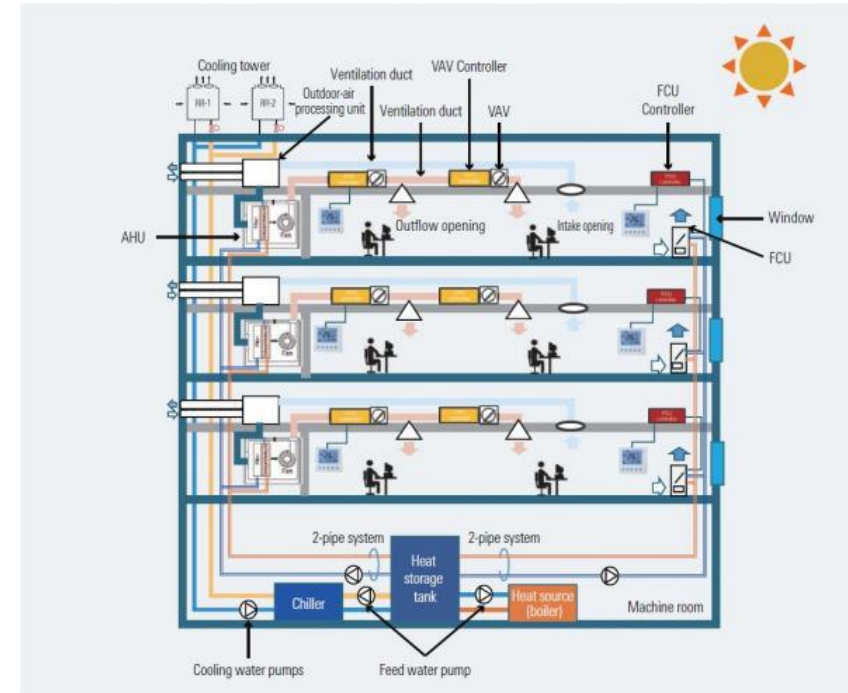
It can carry heat sources created at one location to each room.
Bulk air-conditioning control of the entire building is possible.

- **Individual air conditioning system**

It can individually control multiple indoor units with one outdoor unit.
Simultaneous operation of cooling and heating is possible (Ex : VRF)



Central Air Conditioning System



Individual Air Conditioning System

SECURITY SYSTEMS

Security are classified into two systems.

- **Monitoring Systems**

It monitors buildings using cameras and sensors.

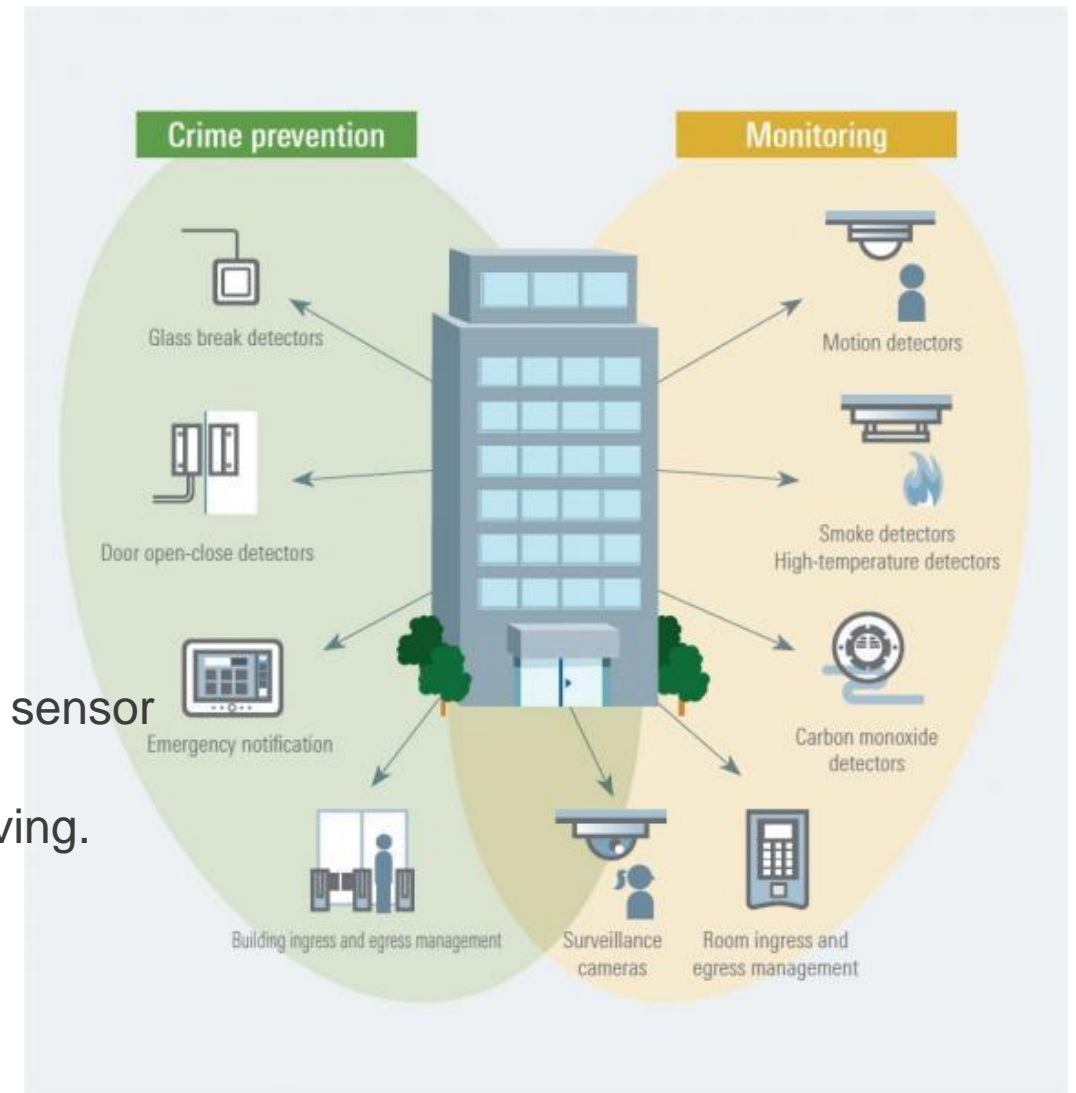
Ex: Intrusion monitoring by motion sensor

- **Crime Prevention Systems**

It perform ingress and egress management and control based on the information from the monitoring systems.

Ex : Door open/close detection, glass breakage detection by sensor

Egress management functions to enforce entrance and exit regulations and keep logs of those entering and leaving.



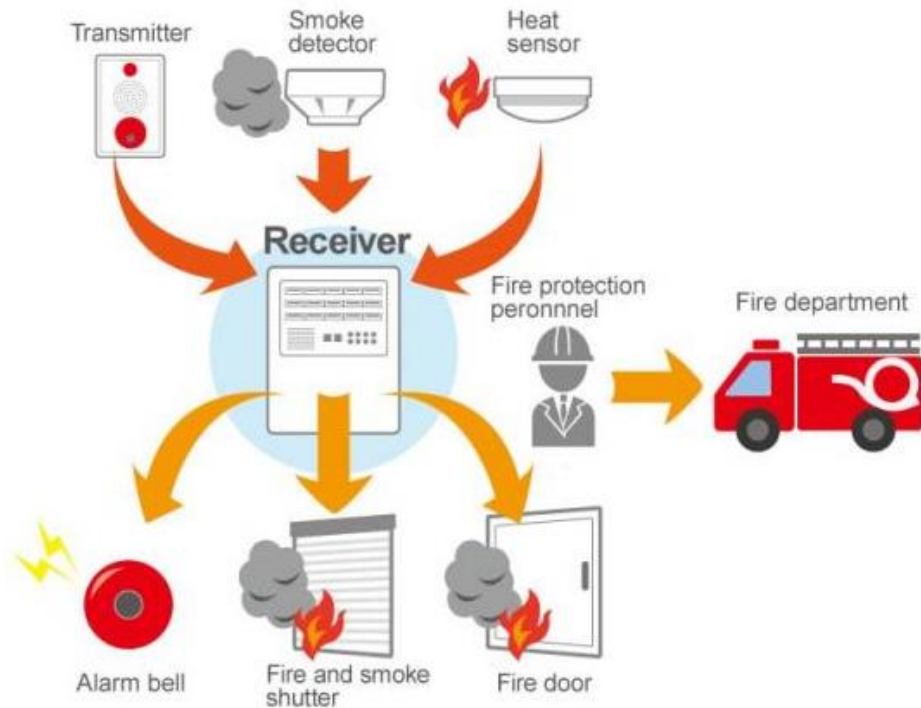
FIRE & SAFETY SYSTEMS

Fire & safety are classified into two systems :

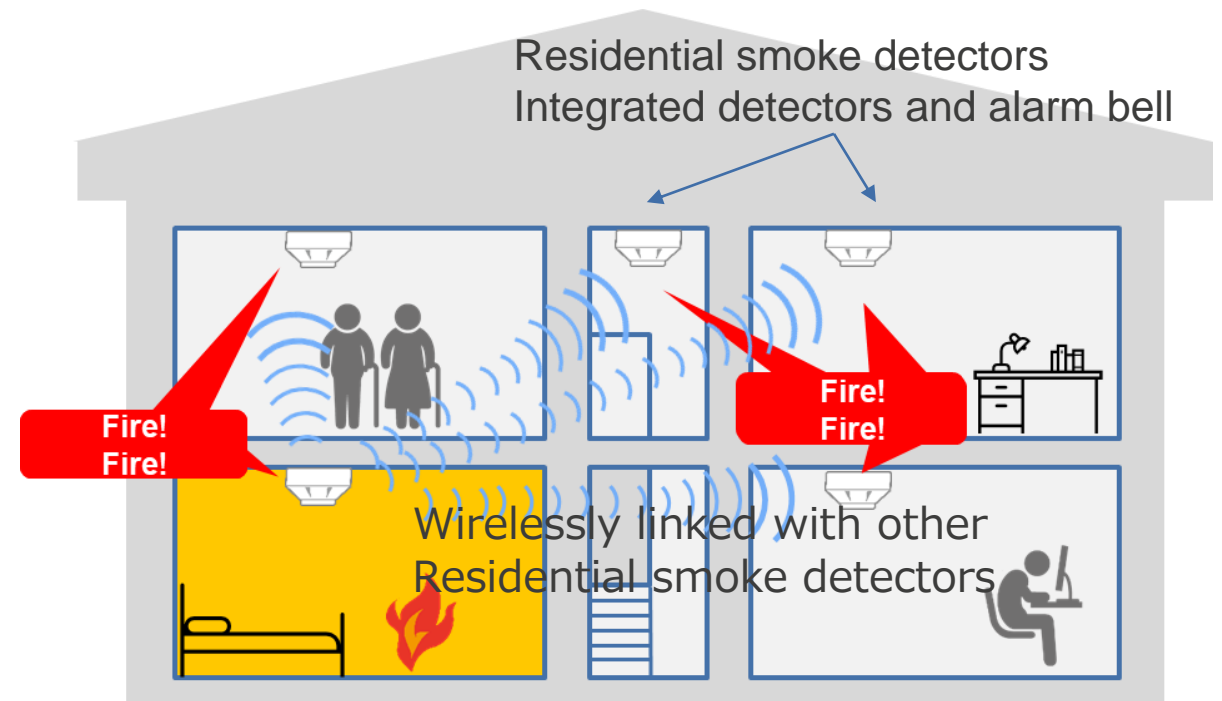
Buildings (automatic fire alarm systems) and Residences (residential fire alarms).

After detecting a fire with a detector or residential fire alarm

It will be a system to notify the entire building of a fire with an alarm bell and evacuate.



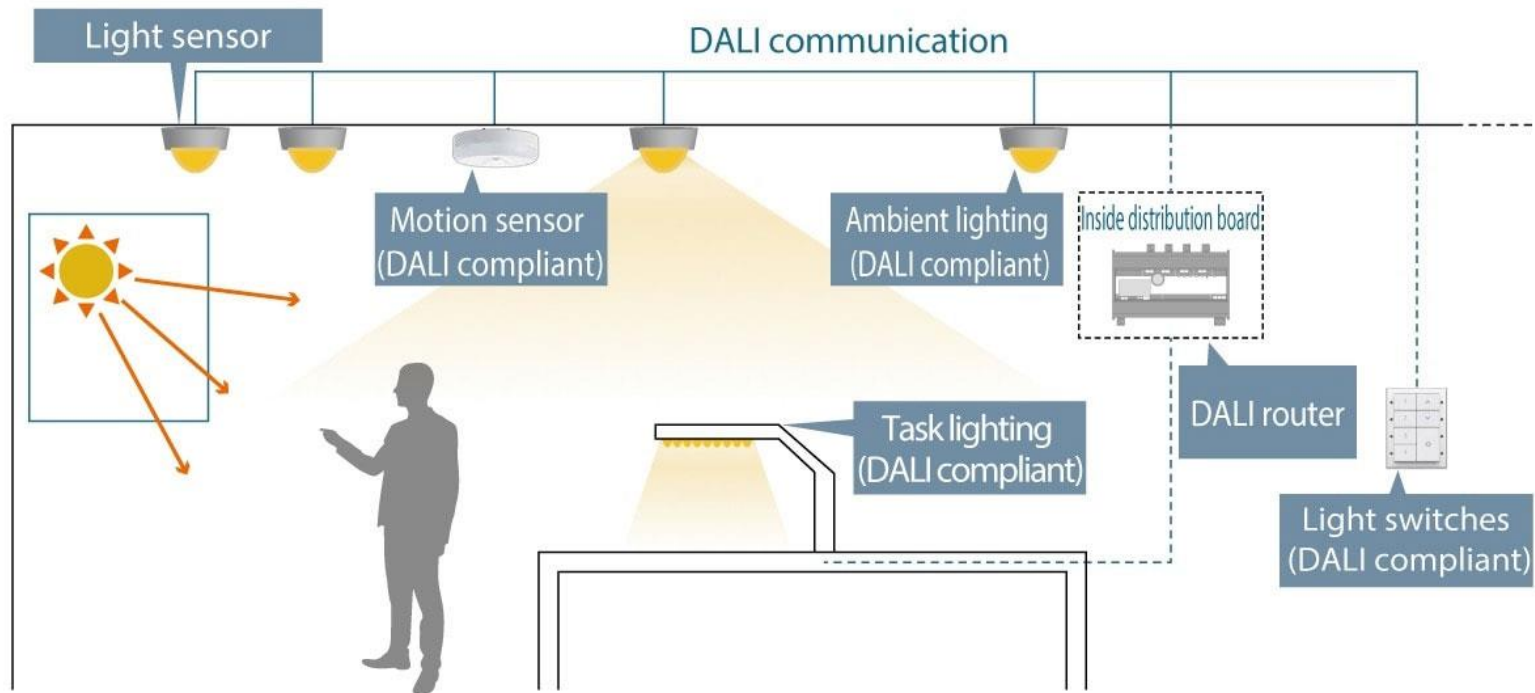
For buildings (automatic fire alarm system)



For houses (Residential smoke detectors)

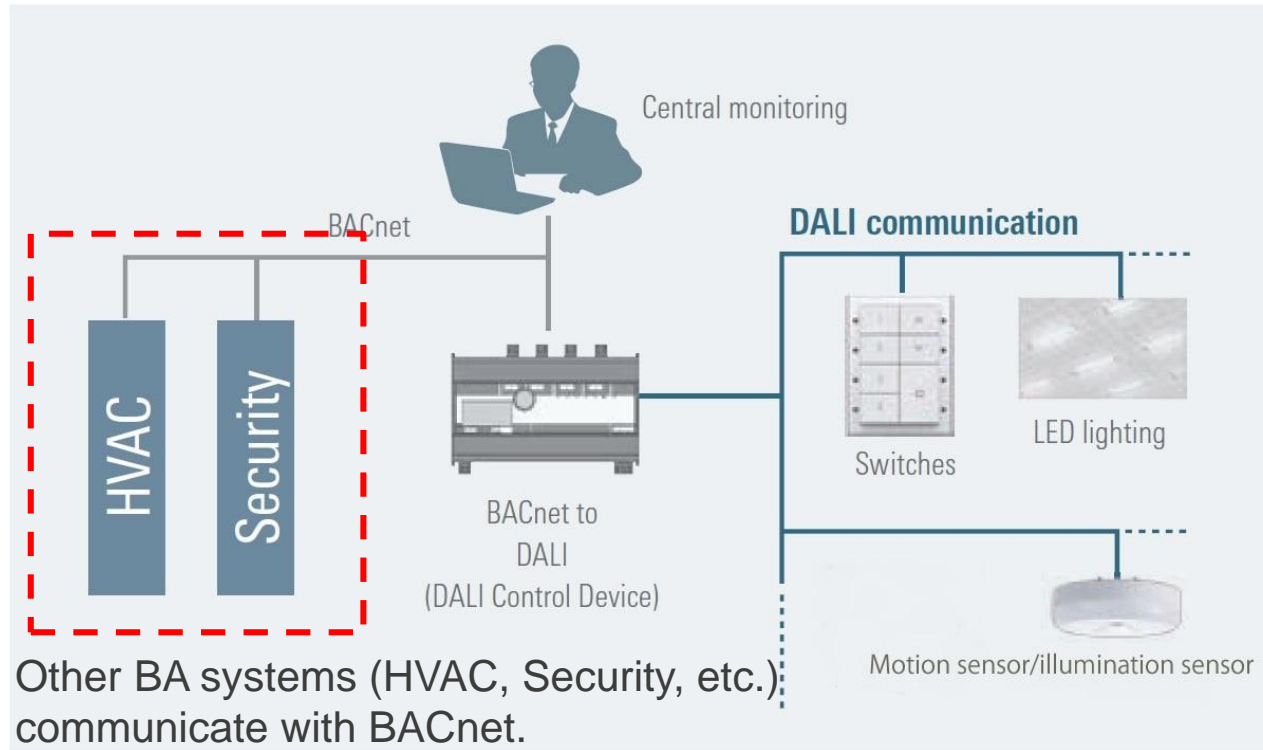
LIGHTING SYSTEMS

Lighting system can achieve a comfortable spatial effect
by adjustment of the brightness and hue to match individual preferences.

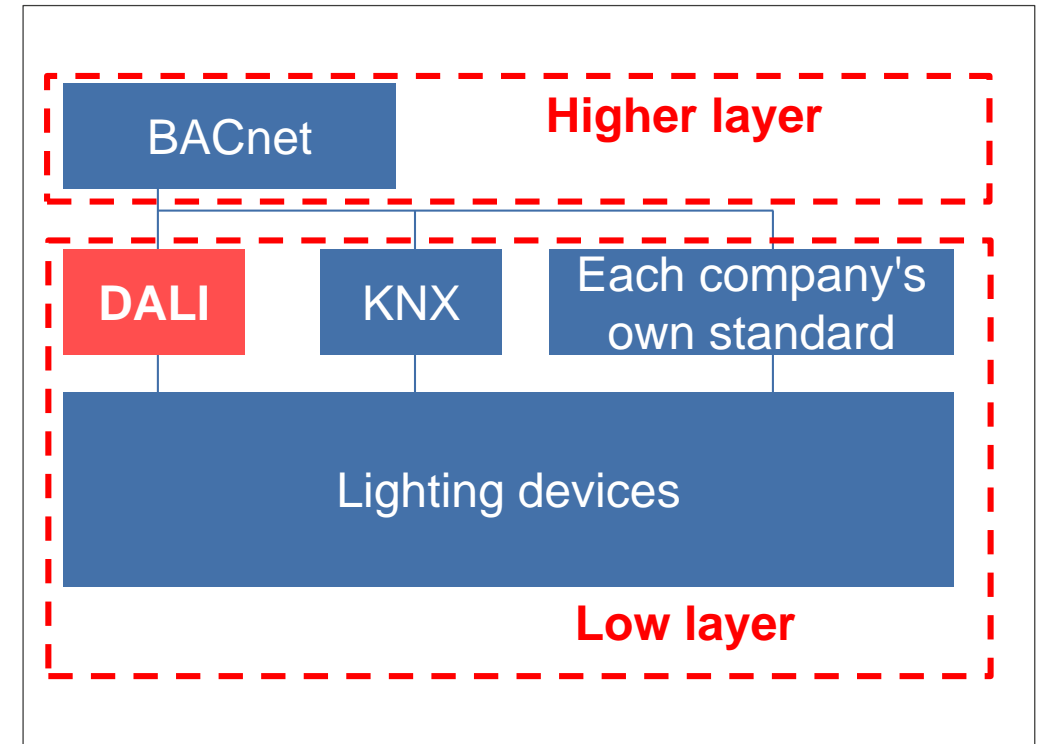


COMMUNICATION OF LIGHTING SYSTEMS

There are higher-layer systems (BACnet) and lower-layer systems (KNX, DALI, each company's own standards)



BA Lighting networking



Lighting Communication Standards

DALI is the most popular system for wired communication

LIGHTING DALI SOLUTION





WHAT IS DALI

What DALI is

- ✓ DALI (**D**igital **A**dressable **L**ighting **I**nterface) is international **communication protocol** for building lighting applications that defined by IEEE
- ✓ network-based systems that control lighting in building automation.
- ✓ Start from Europe, penetrating WW recently.

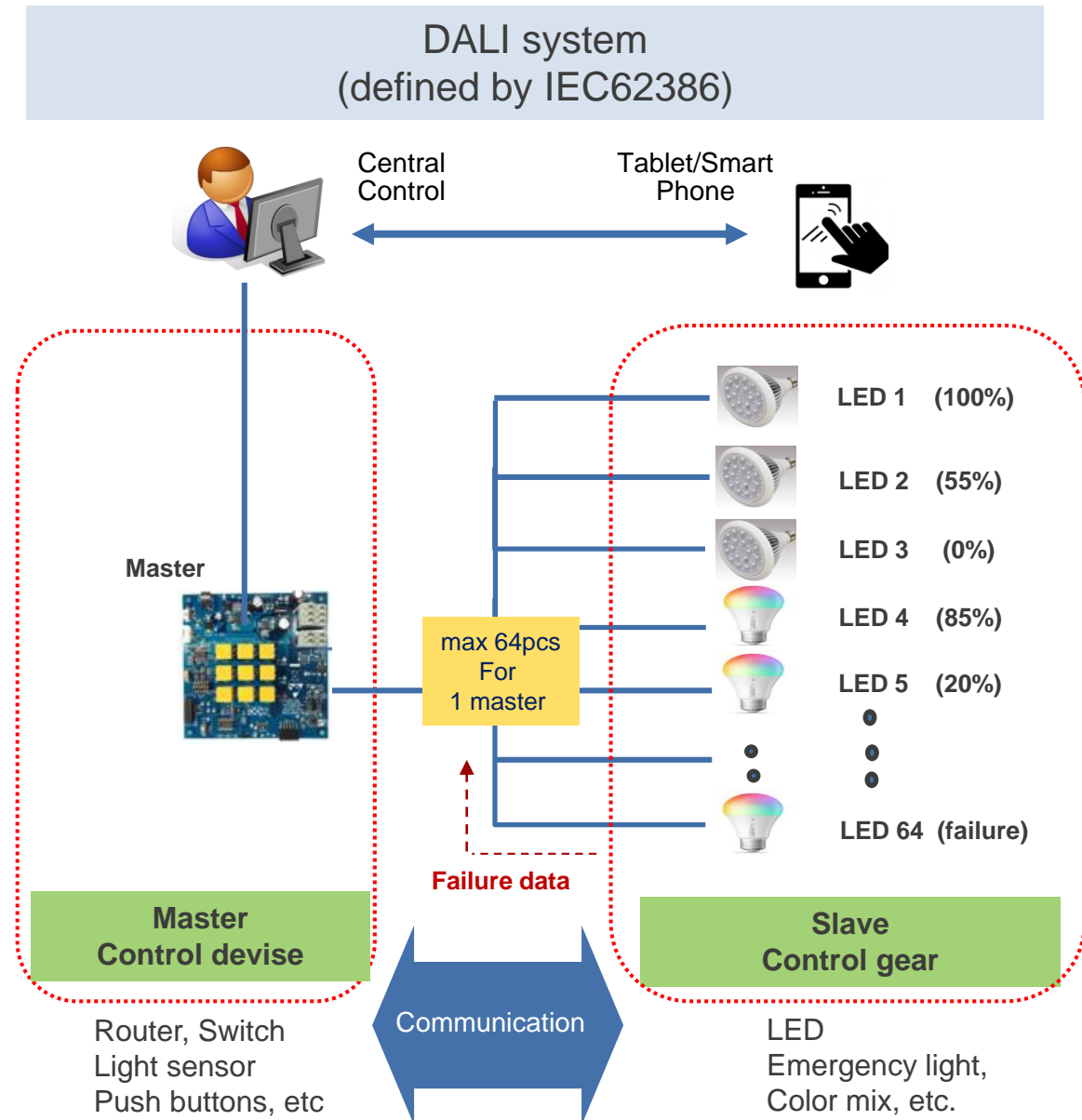
What DALI can make possible

- ✓ “Control devise” can control max 64pcs of “control gear”
- ✓ Control how strong LED light finely for each LED separately
- ✓ Get data of LED status (failure or run out battery) by interactive communication

DALI merit

- ✓ **Comfortability** (by control finely for each lighting)
- ✓ **Saving energy** (by Low consumption)
- ✓ **Cost saving** (by energy saving)

Renesas is the first semiconductor company who joined standard organization, DiiA (Since 2010-)



QUESTIONS

