

# Omron Technology Strategy

July 28, 2016

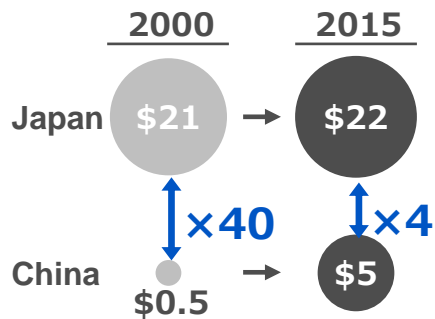
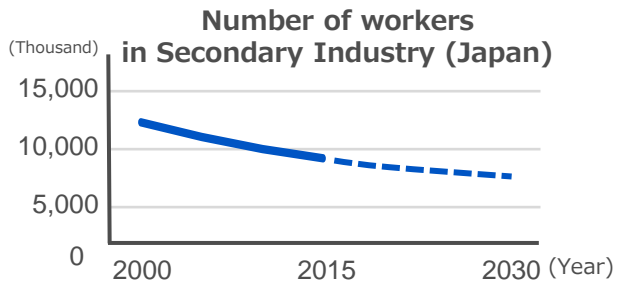
CTO and Senior General Manager, Technology & Intellectual Property HQ.

**Kiichiro Miyata**

# Social Issues to be Solved

## Industrial

- Developed countries: decreasing working population
- Developing countries: soaring labor costs

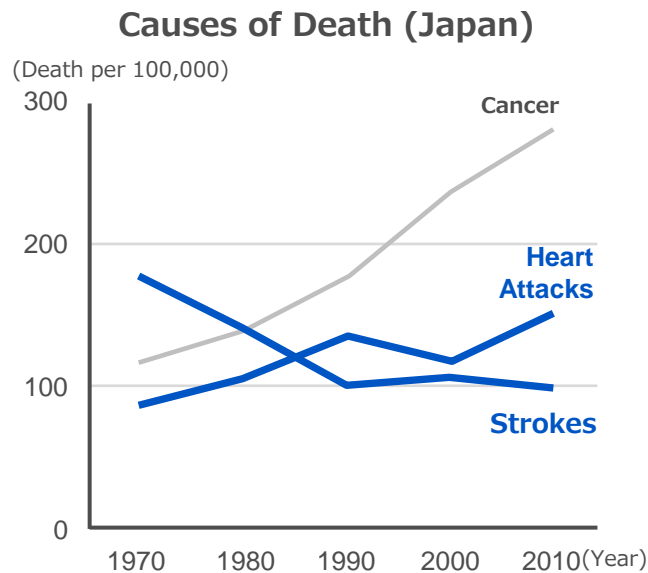


How to improve individual productivity?

Resource: Ministry of Health, Labor and Welfare, Economist Intelligence Unit, U.S. Bureau of Labor Statistics

## Life

- Heart attacks and strokes caused by high blood pressure

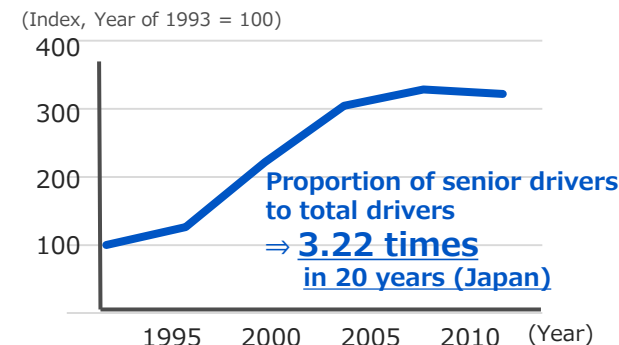


How to reduce the risk of onset?

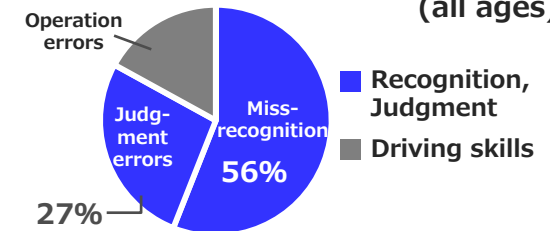
Resource: Ministry of Health, Labor and Welfare

## Social

- Accidents arising from the aging of drivers



Accidents Caused by Human Factors (all ages)



How to reduce accidents caused by miss-recognition or judgment errors?

Resource: ITARDA, National Police Agency

# Solutions through Omron Core Technologies

## “Sensing & Control + Think” Technologies

To solve a variety of social issues, we extract necessary information (Sensing), leverage the cumulative data and human intelligence (Think), and provide solutions (Control).

### + Think

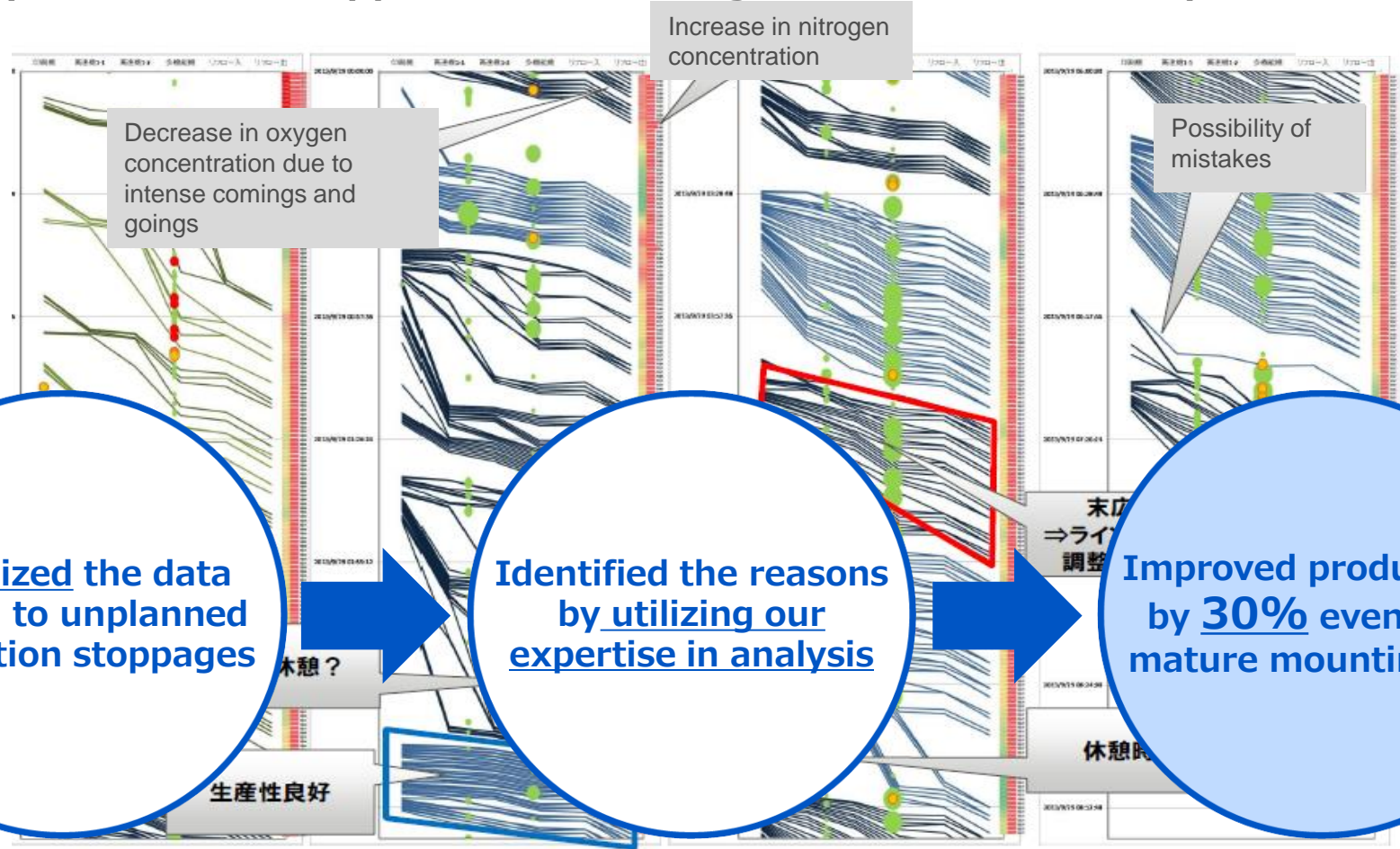
Cumulative Data, Human Intelligence



# Omron's Viewpoint

**Productivity can be further improved by bringing more visibility to data on the production floor.**

Example: "Timeline" application to manage time series of each production line

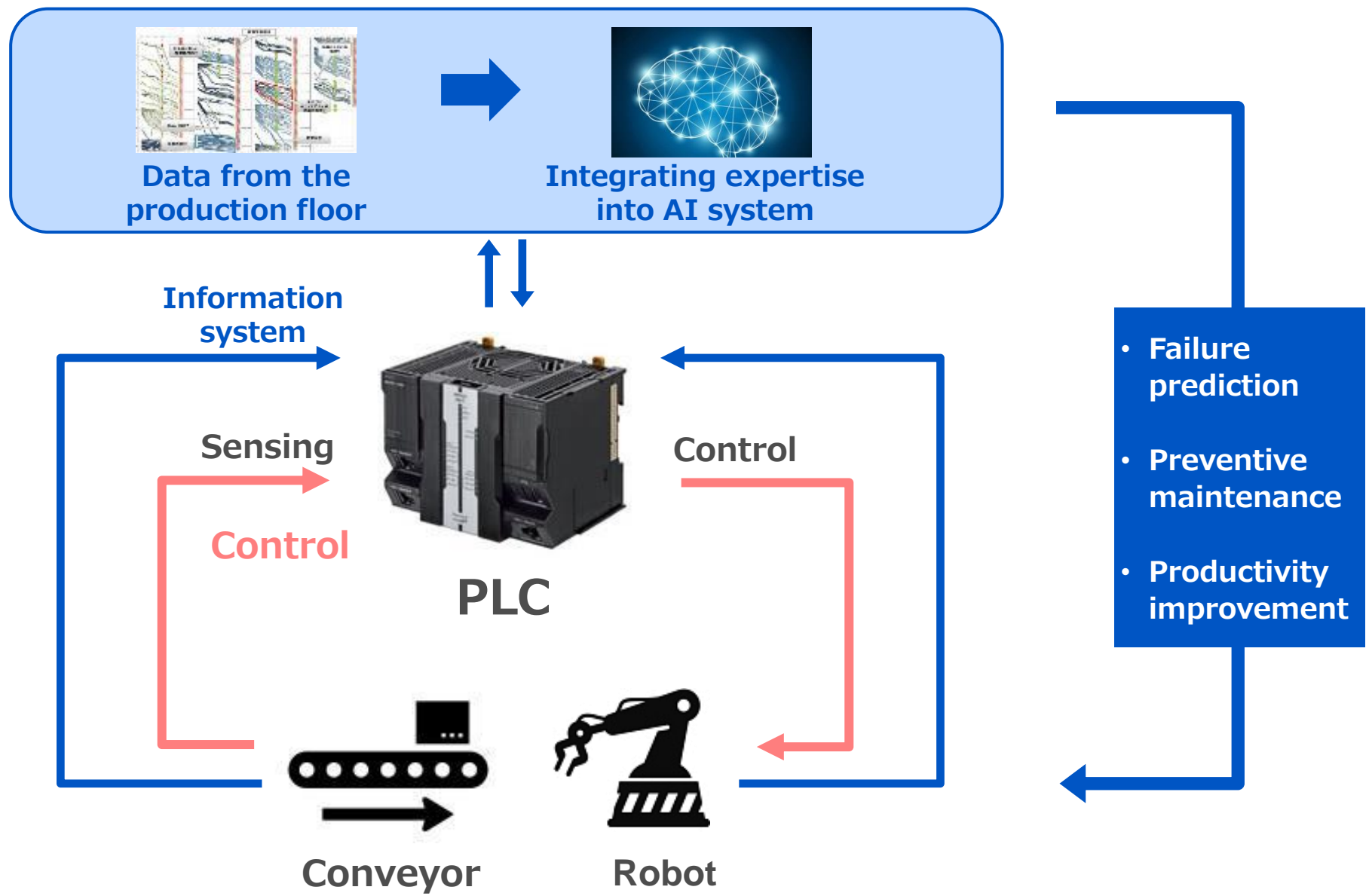


**Visualized the data related to unplanned production stoppages**

**Identified the reasons by utilizing our expertise in analysis**

**Improved productivity by 30% even for a mature mounting line**

# Improving Productivity through AI



The risk of elevation of blood pressure cannot be fully tracked by self-measurement at home in the morning and evening.

## Self-Measurement at Home to Date

## New Solutions

Method



Timing

Morning & Evening

24 hours

Measured data

Average of hundreds of beats

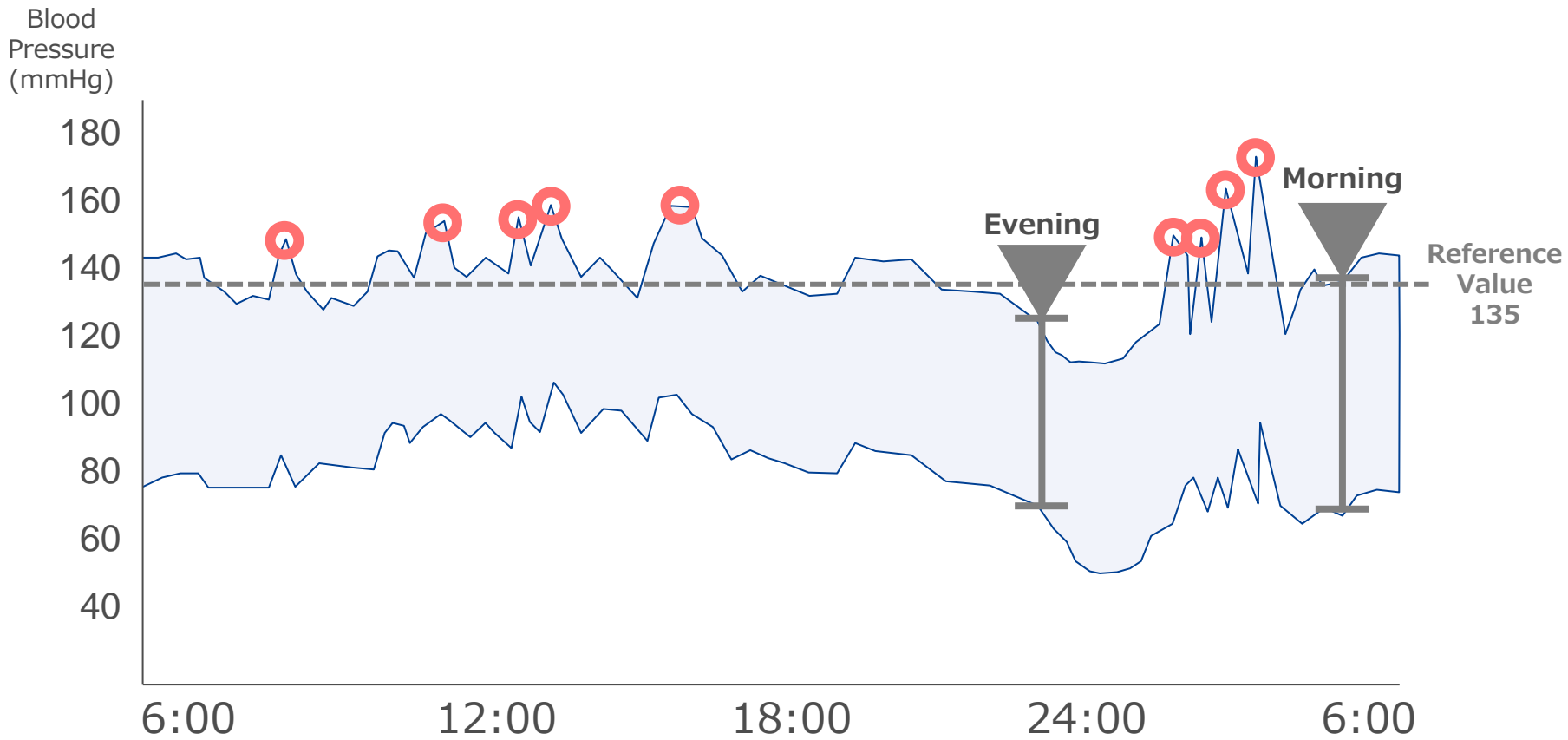
Beat-by-beat,  
data of 100,000 beats/day

# New Challenge to Reduce the Risks

Blood pressure in the morning and evening

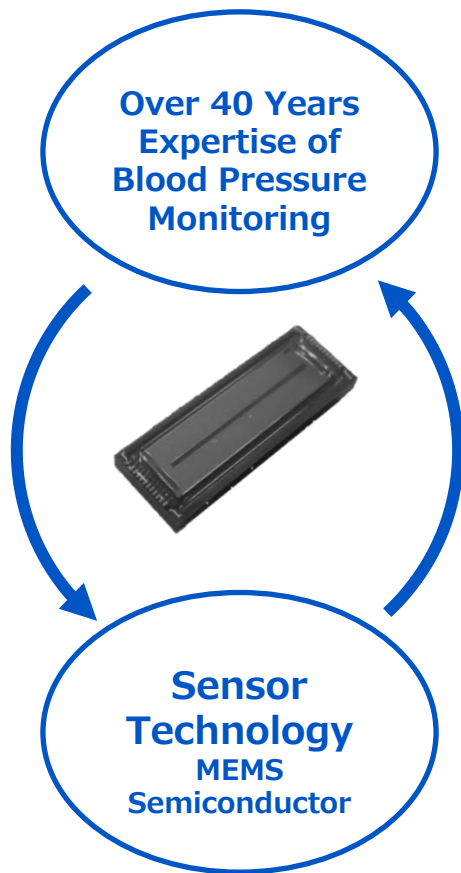
Fluctuations in blood pressure

Peaks in blood pressure



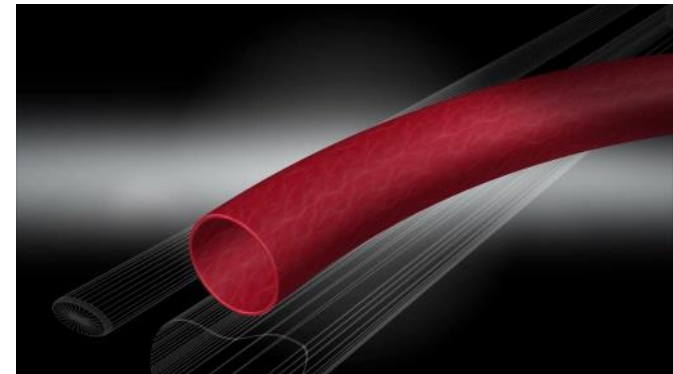
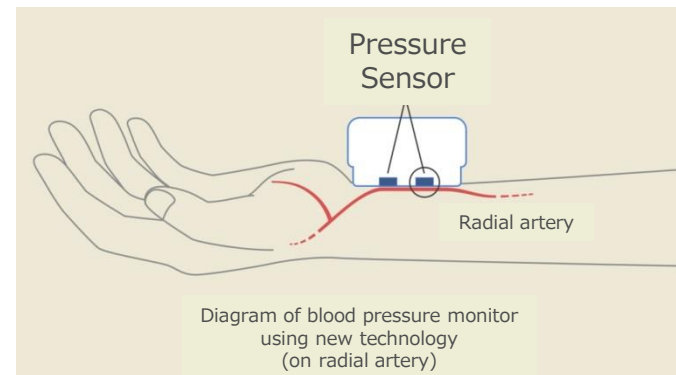
## Pressure Sensor

High performance pressure sensor  
to measure every heartbeat accurately



## Angle Control Technology

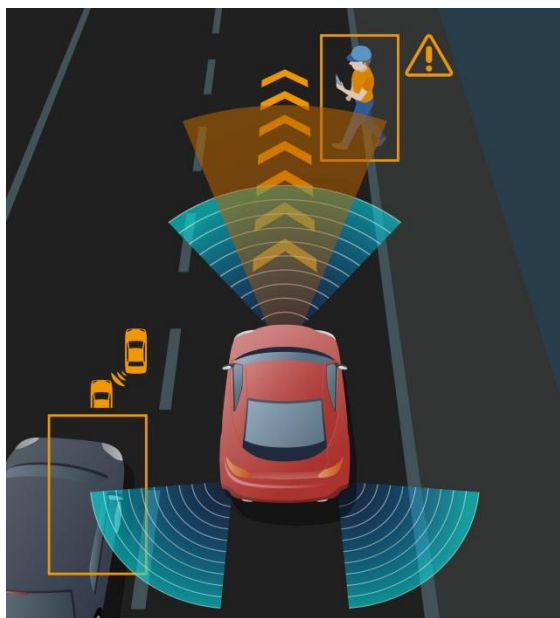
Control technology to adjust  
the sensor angle suitably





It is important to have "eyes" to assess driver status, in addition to the "eyes" looking out of the vehicle.

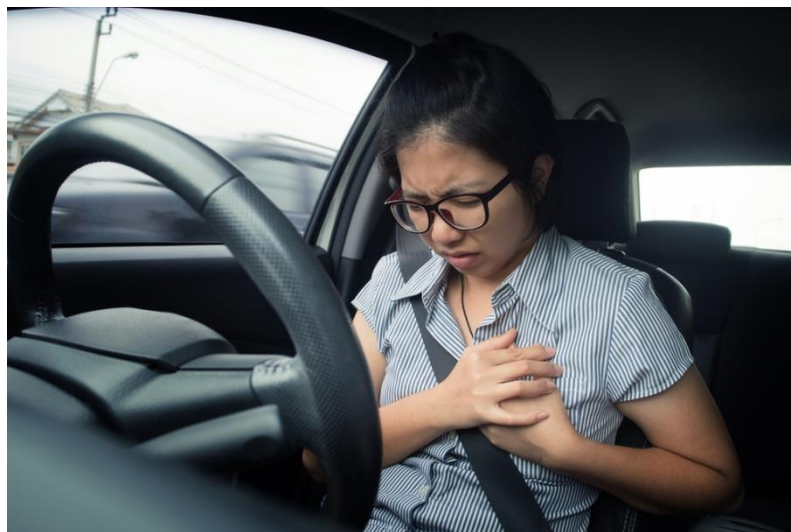
## Eyes looking out of the vehicle



Collision safety system, automatic braking, cruise control, etc.

+

## Eyes looking inside the vehicle



Sudden onset of a disease, an abnormal situation, drowsy driving, etc.

Attentiveness

⇒ High

⇒ Medium

⇒ Low

\*Lv 1 : 77 %  
Lv 2 : 9 %  
Lv 3 : 12 %



Lv1 (Leaning on a window)

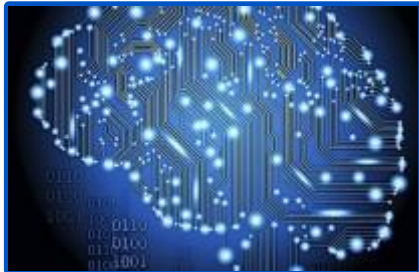
\*Permission gained to use this image

# "Killer App" in the Automated-Driving Future



Sensing technology to measure the level of driver attentiveness

How much does a driver concentrate on driving?



Estimation algorithm for "probable time of the return"

How many seconds it takes to back to normal driving?



Automated driving

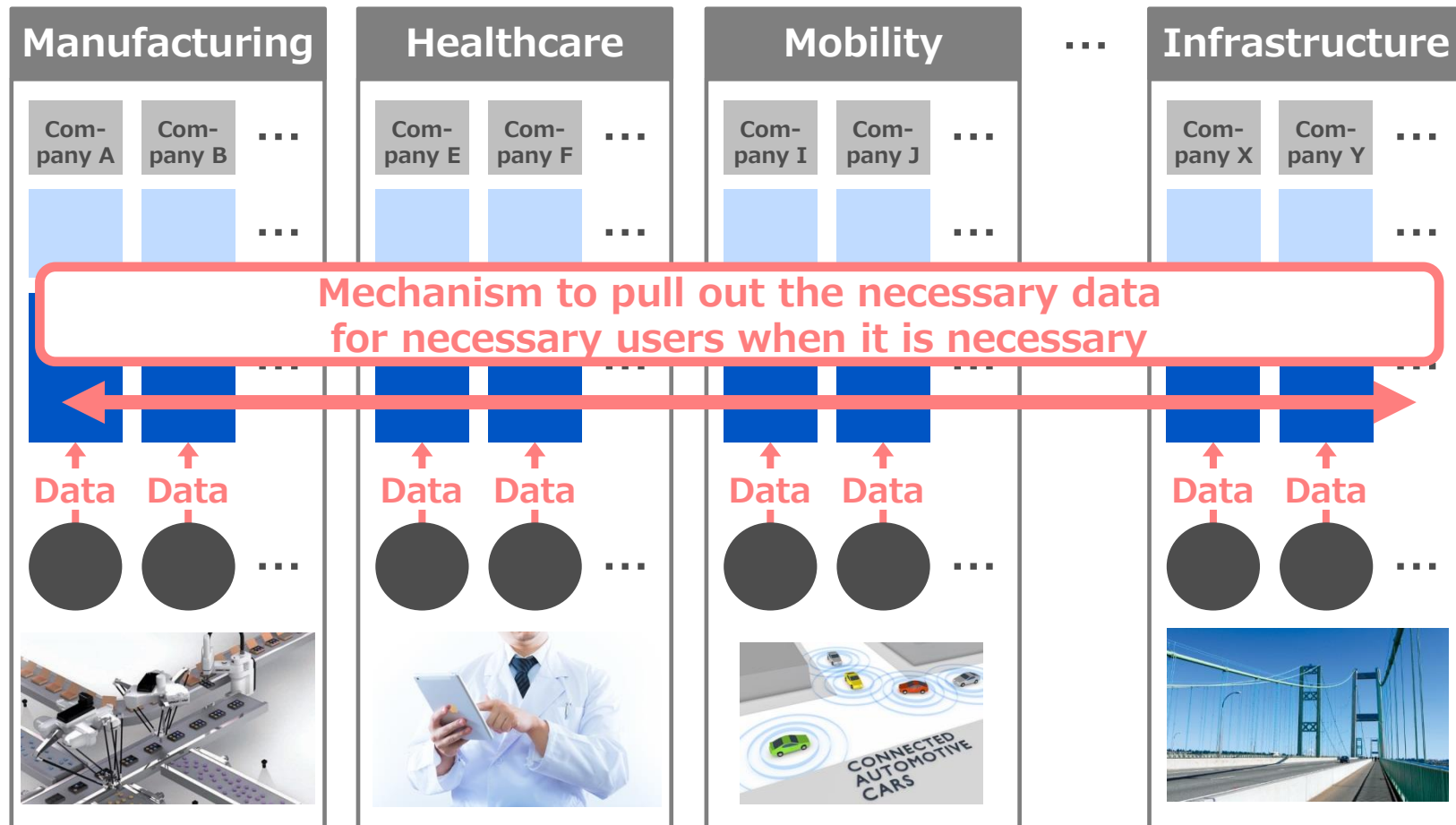


Manual driving

Is it good to switch from automated driving to manual driving?

# Omron's New Business Strategy on IoT

Creating new applications and services through cross-application exchanges of sensing data



# Realization of a Society with Seamless Flows of Data

## Example: Smart Monitoring

### Current Situation and Issues

Internet-based monitoring services provided by each company separately

- Smart water boilers
- Smart air-conditioners
- Smart toilet
- Smart bed



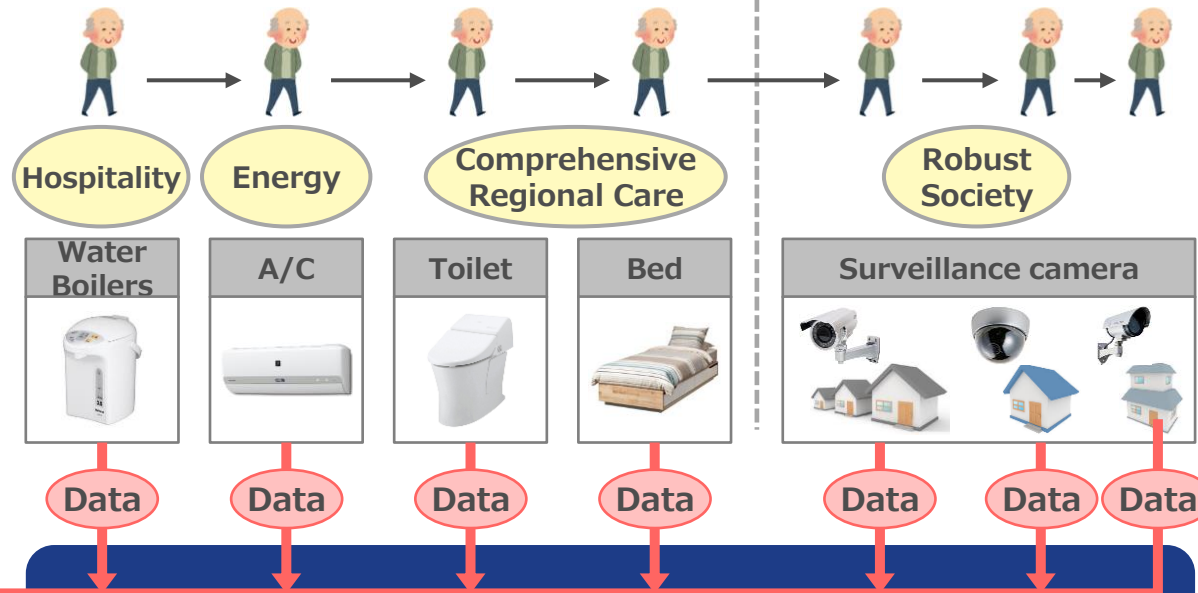
### Monitoring "Point" only

- Lose track once move away from "point"
- How to monitor movements?

### Future Vision to Achieve

Indoors ← → Outdoors

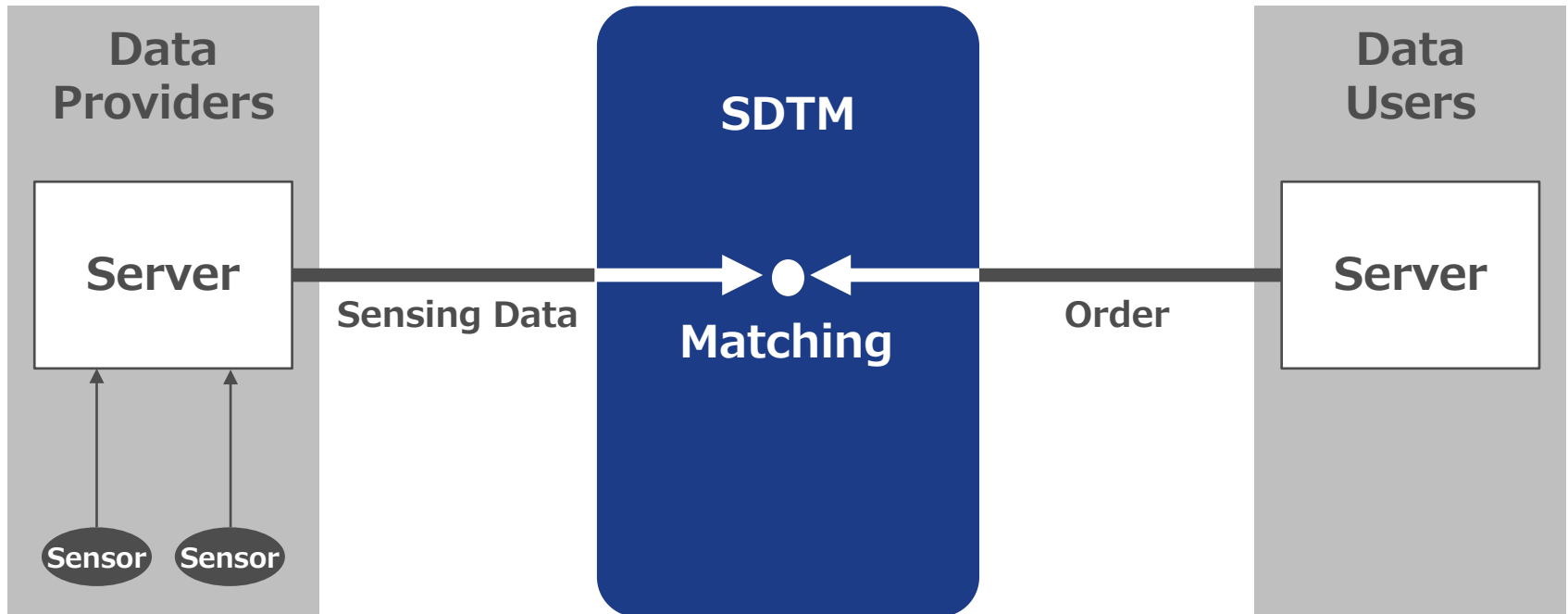
Monitoring applications, nursing care providers, home medical care providers, families



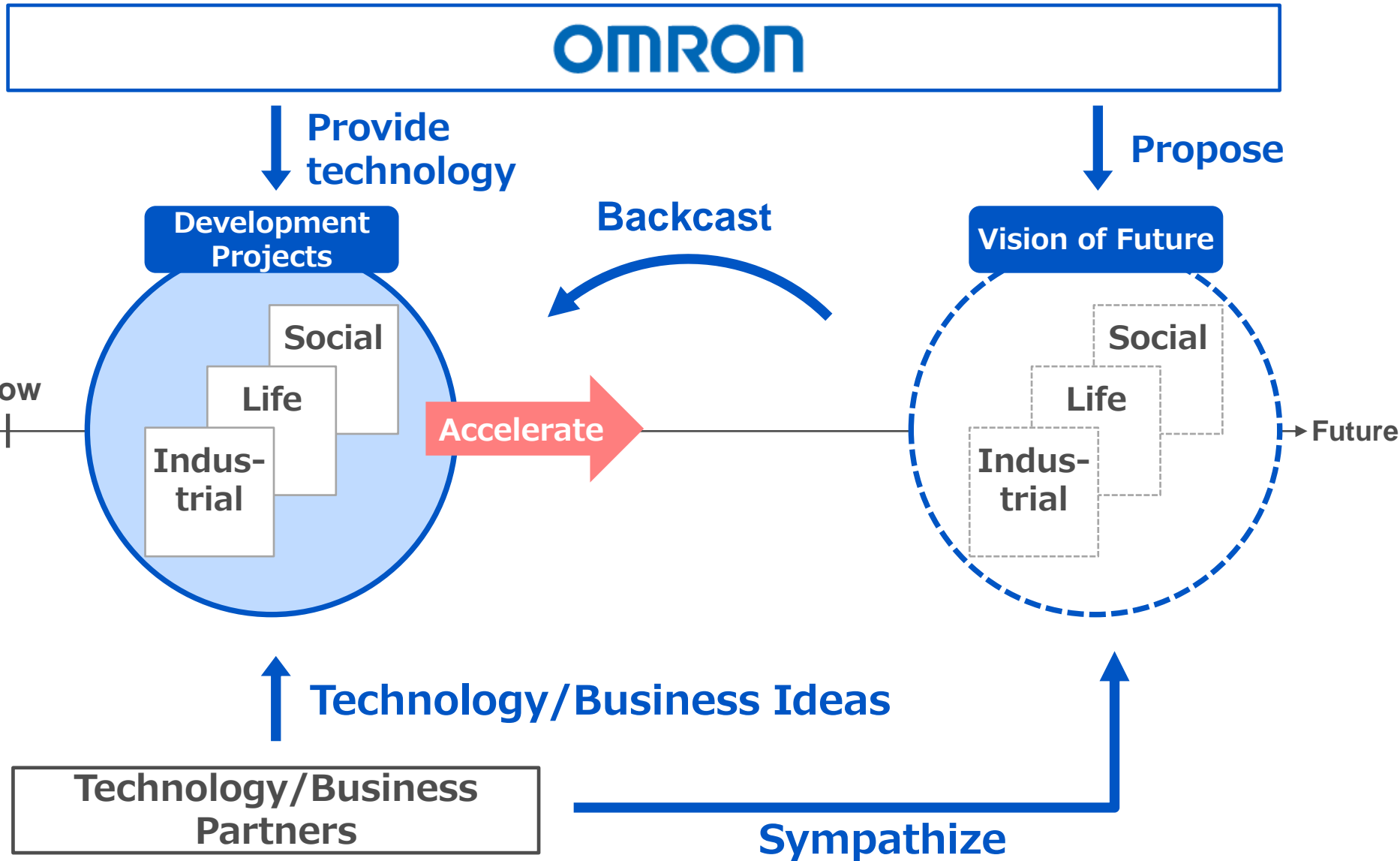
Sensing Data Trading Market

# Sensing Data Trading Market (SDTM)

SDTM is a trading market that matches the data users with data providers, making the necessary exchanges of sensing data possible.



# Open Innovation by Sharing Our Vision



## **Our Mission**

**To improve lives and contribute to a better society**

## **Core Technologies**

**“Sensing & Control + Think”**



**OMRON**