Omron Technology Strategy

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Social Issues to be Solved

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

**Life**
- Heart attacks and strokes caused by high blood pressure

**Social**
- Accidents arising from the aging of drivers

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### How to improve individual productivity?


### How to reduce the risk of onset?

- Resource: Ministry of Health, Labor and Welfare

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

- Resource: ITARDA, National Police Agency
“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).
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

- Decrease in oxygen concentration due to intense comings and goings
- Increase in nitrogen concentration
- Visualized the data related to unplanned production stoppages
- Identified the reasons by utilizing our expertise in analysis
- Possibility of mistakes
- Improved productivity by 30% even for a mature mounting line

Improved productivity by 30% even for a mature mounting line
Improving Productivity through AI

- Data from the production floor
- Integrating expertise into AI system
- Information system
- Sensing
- Control
- PLC
- Conveyor
- Robot

• Failure prediction
• Preventive maintenance
• Productivity improvement
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**
- **Method**
- **Timing**
  - Morning & Evening
- **Measured data**
  - Average of hundreds of beats

**New Solutions**
- **Timing**
  - 24 hours
- **Measured data**
  - 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

Blood pressure (mmHg)

6:00 12:00 18:00 24:00 6:00

Reference Value 135
Two Technologies for the New Device

**Pressure Sensor**

High performance pressure sensor to measure every heartbeat accurately

- Over 40 Years Expertise of Blood Pressure Monitoring
- Sensor Technology
  - MEMS Semiconductor

**Angle Control Technology**

Control technology to adjust the sensor angle suitably

Diagram of blood pressure monitor using new technology (on radial artery)
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.
World-First: Sensing the Level of Driver Attentiveness

Social

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  Switch  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

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<thead>
<tr>
<th>App</th>
<th>Platform</th>
<th>Sensor</th>
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<tbody>
<tr>
<td>Manufacturing</td>
<td>Healthcare</td>
<td>Mobility</td>
</tr>
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<td>Company E</td>
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<td>Company B</td>
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<td>Company J</td>
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Mechanism to pull out the necessary data for necessary users when it is necessary
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

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

Outdoors

Hospitality
Energy
Comprehensive Regional Care
Robust Society

Water Boilers
A/C
Toilet
Bed

Surveillance camera

Sensing Data Trading Market
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

OMRON

Provide technology

Backcast

Propose

Development Projects

Social

Life

Industrial

Vision of Future

Social

Life

Industrial

Technology/Business Ideas

Technology/Business Partners

Accelerate

Sympathize

Now

Future
Our Mission

To improve lives and contribute to a better society

Core Technologies

“Sensing & Control + Think”