

Compact Air Controller Developed by QFD and TRIZ

Shinwa Controls Co., Ltd.

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Yamamoto

- Corporation Profile
- Objective of This project
- Outline of This Project
- Accomplishments of This Project
- Future Plans



- Company Name: Shinwa Controls Co., Ltd.
- Found: June 21, 1962
(As Shinwa Industry Co., Ltd.)
- Establish: December 15, 1967
- Capital: JPY 50 million.
- Business Contents: Design, Development, Manufacture and Sale for Precise Liquid
Temperature Equipment, Precise Temperature & Humidity
Equipment, and Solenoid Valve
- Number of Employees: 281 (As of June 31, 2012)
- Affiliates: Shinwa Technos Co., Ltd.
Shinwa Controls Taiwan Co., Ltd.

Business Locations in Japan



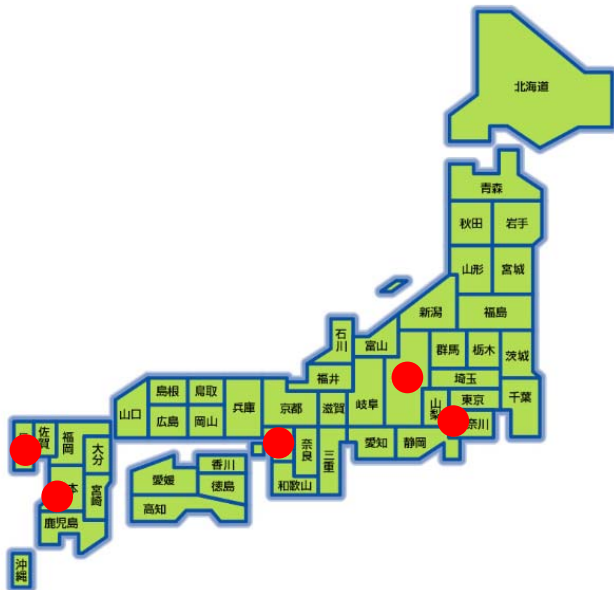
Headquarters: Asaoku Kawasaki-city, Kanagawa

Kyushu Plant: Omura-city, Nagasaki

Nagano Plant: Ina-city, Nagano

Kumamoto plant: Yamae-mura Kuma-gun, Kumamoto

Osaka Sales Office: Osaka-city, Osaka



Product Lineups

Development of equipment to precisely control gas (air) and liquid (fluids such as water, chemicals, etc.) .

Solenoid Valve
Motor Valve



Air Temperature and
Humidity Control
equipment



Liquid Temperature
Control Equipment
(Chiller)



Temperature Air/Liquid-Supply Controlling Equipment

- Our equipment controls on temperature and humidity which are both required in manufacturing processes related to semiconductor and FPD.



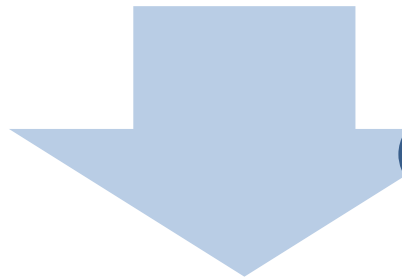
- Heat Removal on the Silicon Wafer Developing Process.
- Temperature and Humidity Control on Coating and Developing Process.
- Heat Removal during Etching Process.
- Temperature Control on Wafer Inspection, Dicing, and Final Inspection Process.
- Temperature Control on the Etching Device for FPD.

- It's uncertain that the customers' needs meet our development point in the aspect of coordination.
- The scope of idea or conception could be quite shallow upon the problem concerned.



In order to break this current situation, apply the QFD and TRIZ, develop the innovative product which meets customer needs.

Target: Break Away from Order-Taking Business.



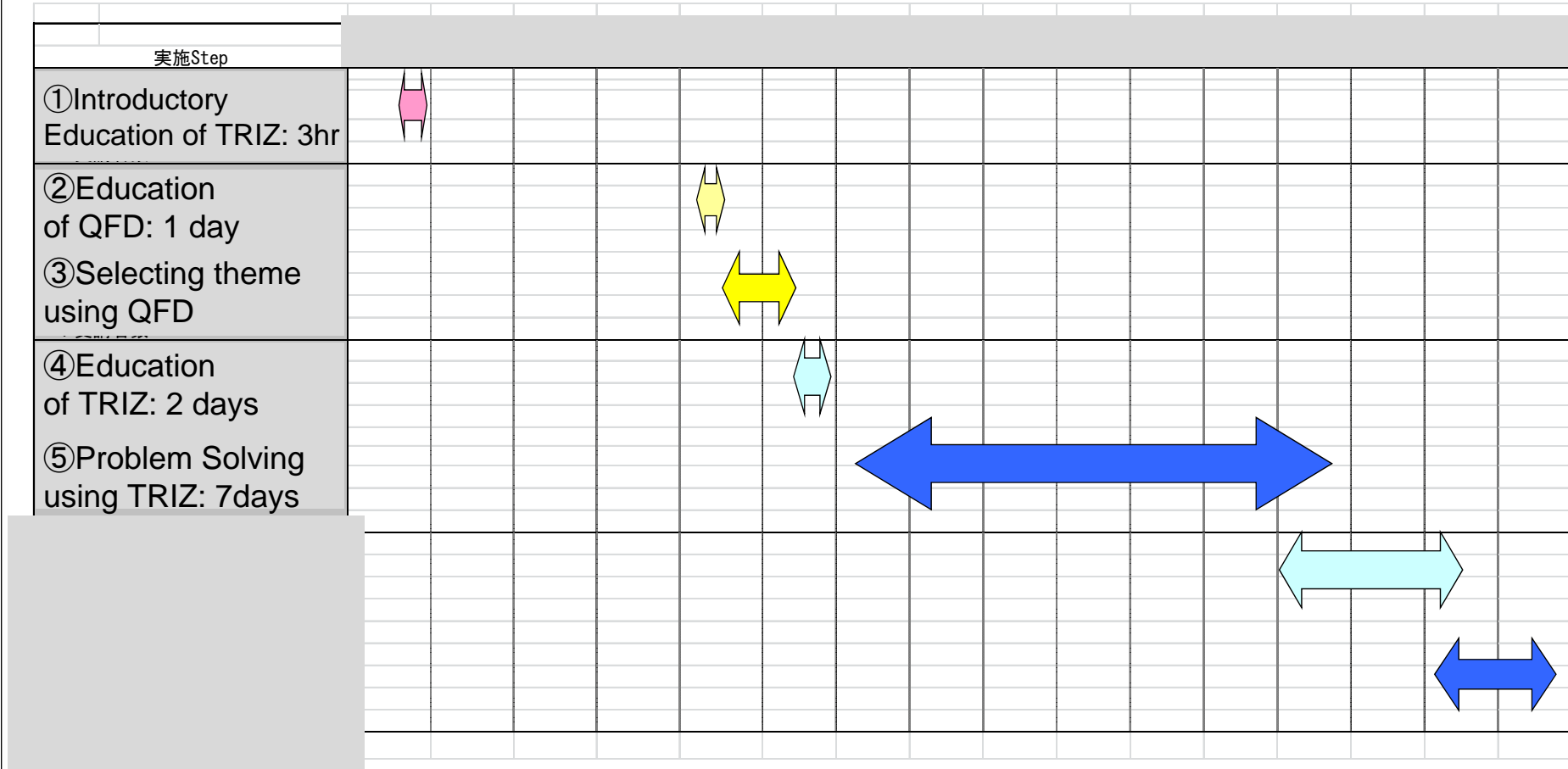
Consulting with
IDEA Inc.

1. QFD: Listen Up Customers' Voice.
2. TRIZ: Obtain Innovative Ideas.
3. Commence the Development → Make It a Product.

Policy Committed

1. Make the Entire Development Process Efficient.
- Introduce the QFD and TRIZ.
2. Resolve the Issue of “Superior Pure Air Supply Equipment” which is One of the Main Products at the Kyushu Plant.
3. Spread the Contents of This Project Company Wide.
4. Apply the Knowledge and Experience of Instructors from Outside the Company.

The Process and Development Plan



QFD Fully Follow Up

Day 1

- ① Collect Requirement Sources from Customers.
- ② Sort Out Quality Requirements.

Day 2

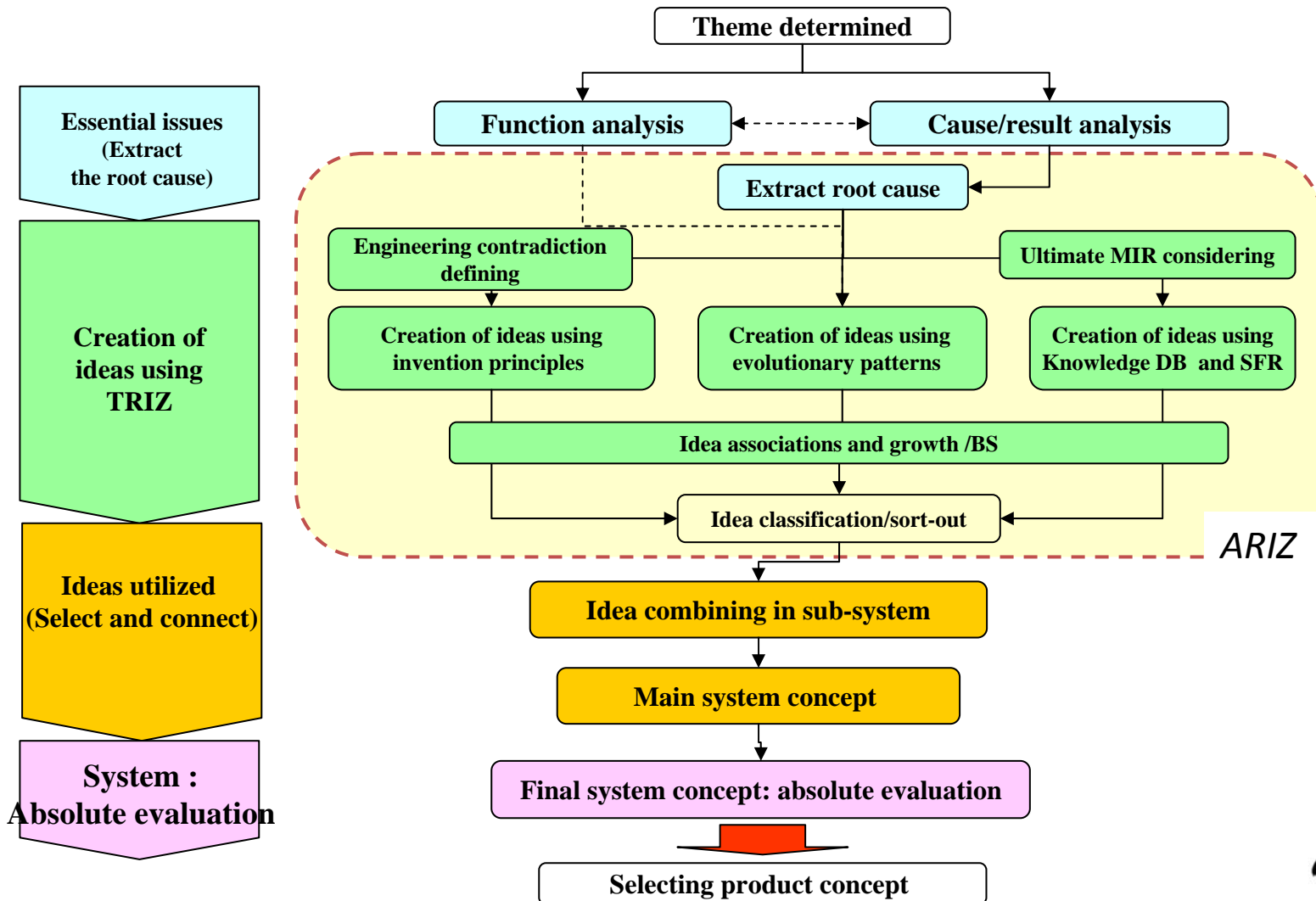
- ① Draw the Quality Requirement Sheet.
- ② Consideration in Quality Control Dept.
- ③ Extract the Quality Characteristic, and Draw a Spread Table.

Day 3

- ① Draw up the Duality Chart for Quality Requirement and Characteristic.
- ② Consideration in Quality Design Dept.
- ③ Find Out Technical Issues (to Check.)
- ④ Confirm with Applying TRIZ.

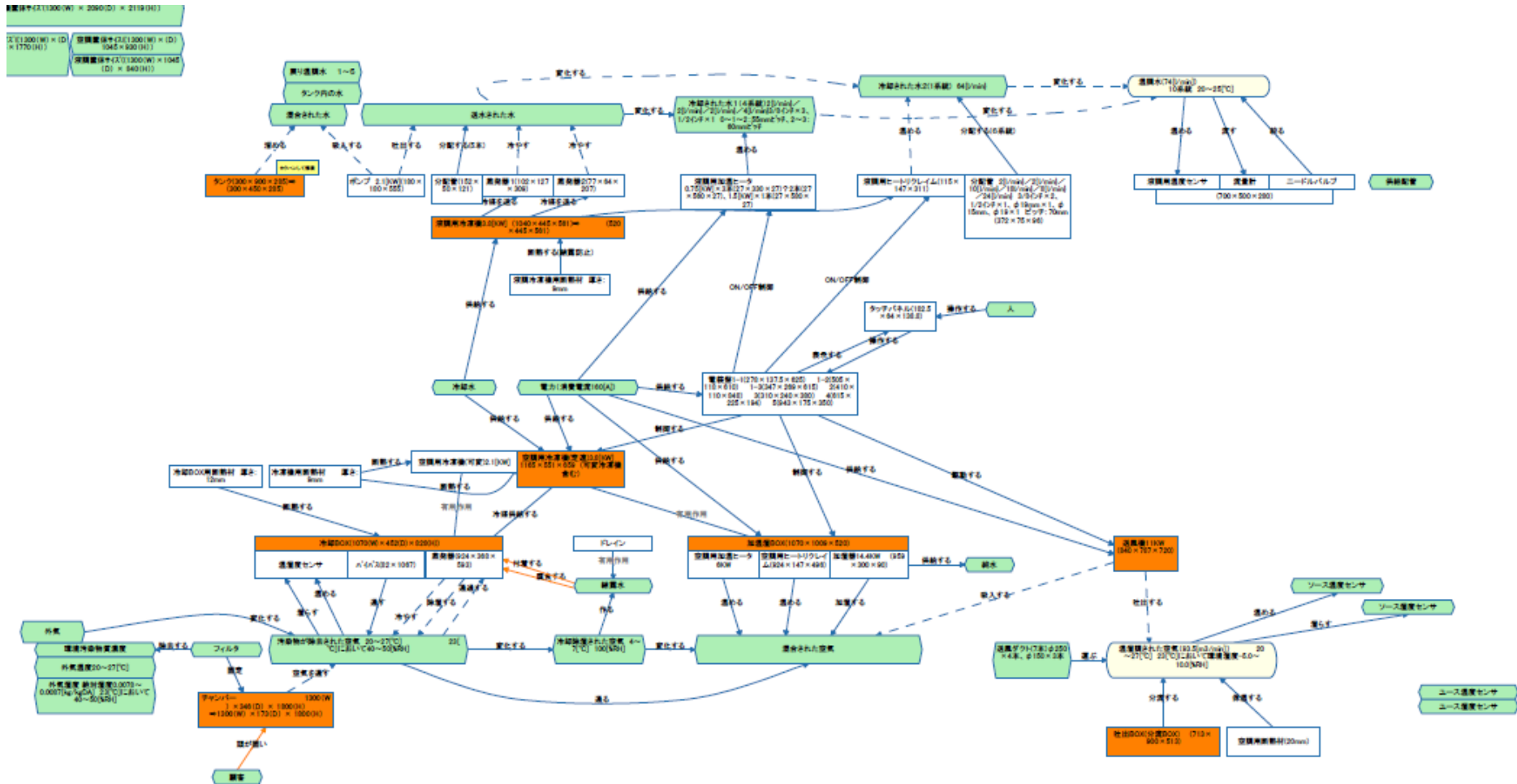


TRIZ Fully Follow Up



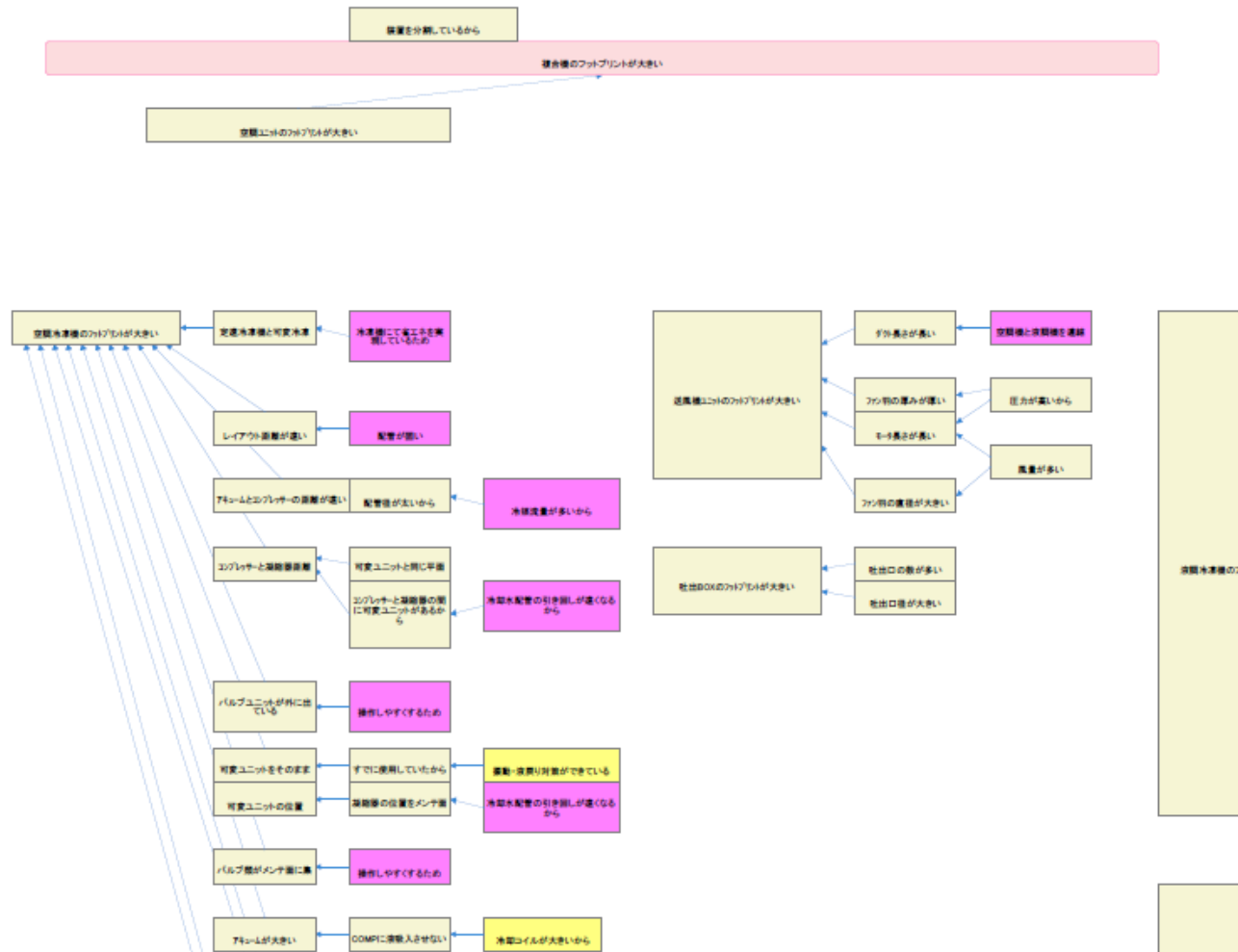
Outline of This Project

TRIZ: Functional Model



Outline of This Project

TRIZ: Cause and Result Analysis

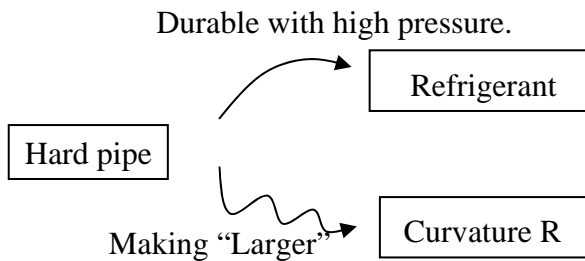


Definition of Engineering Contradiction and Its Resolution

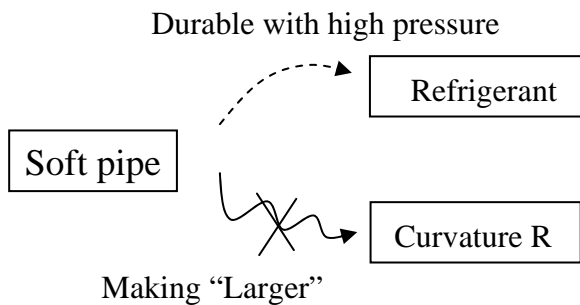
Root cause 1
 Due to hardness of the pipe, the refrigerator size becomes larger.

Cope with engineering contradiction

EC-1



EC-2



Engineering contradiction matrix

Improving characteristics	Worsening characteristics
Use of hard pipe	Large R
Durable with high pressure
.....

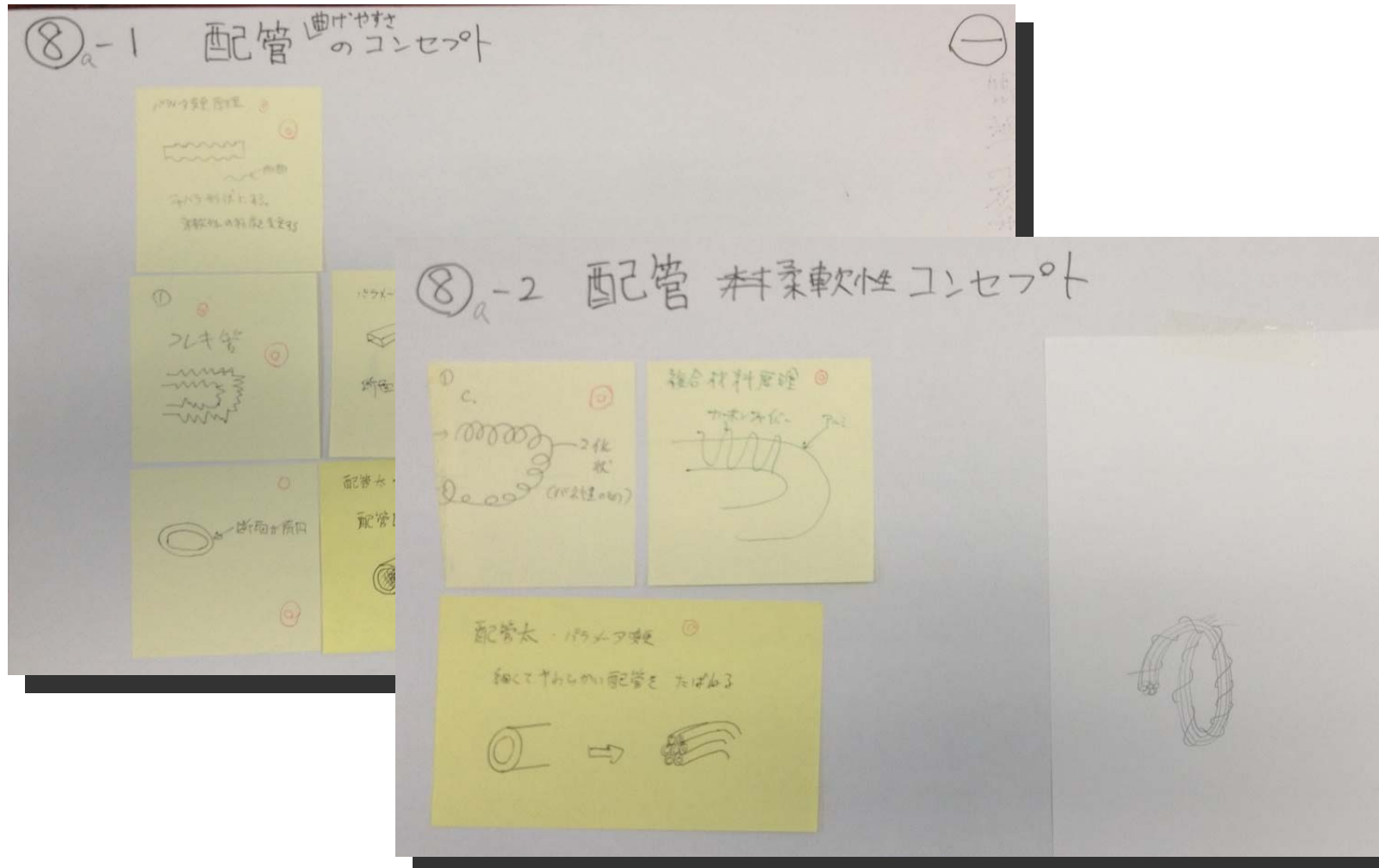
Invention principles

- 10. Preliminary action
- 35. Parameter changes
- 40. Composite materials
- 34. Discharge and recovering

Session Scene

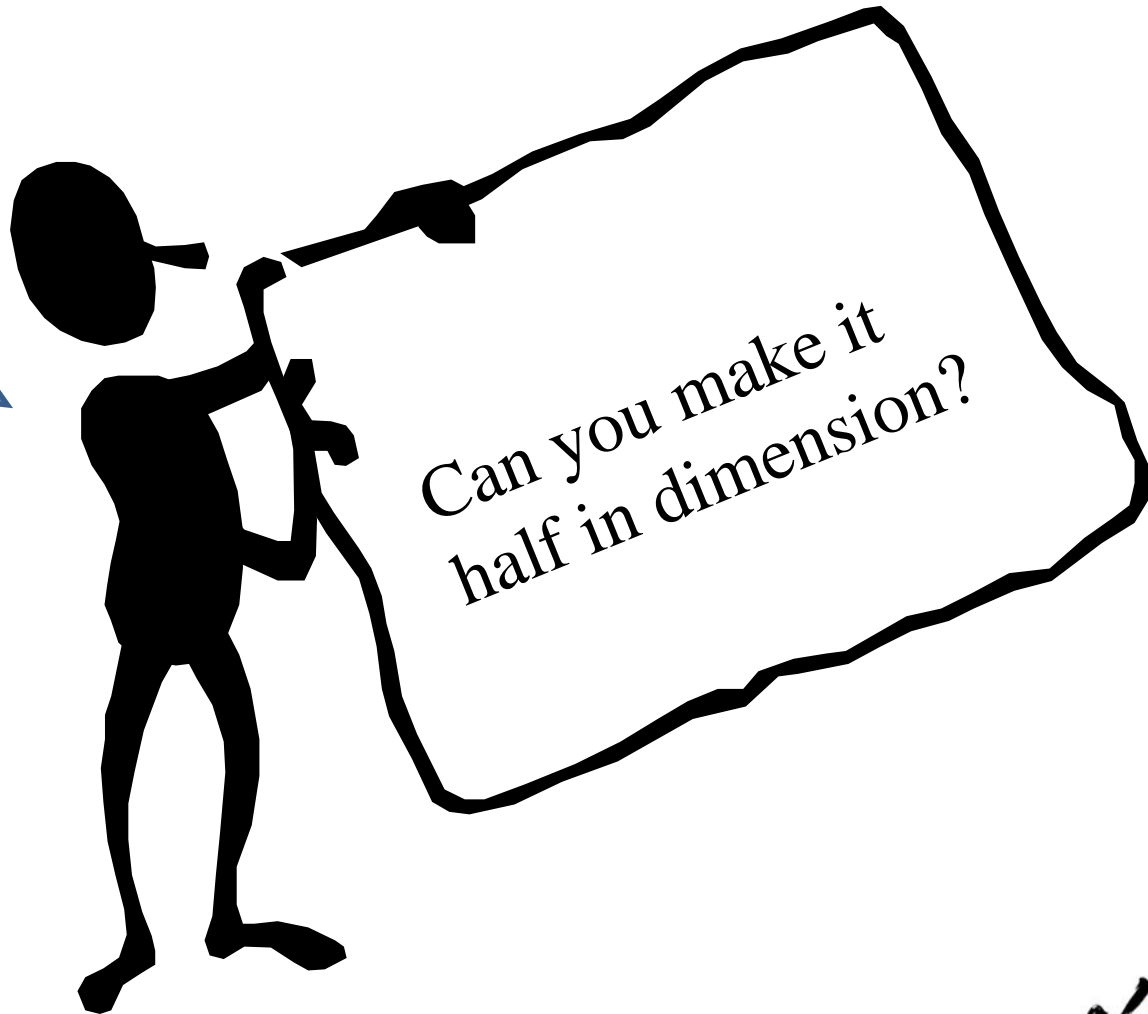


Examples of Ideas

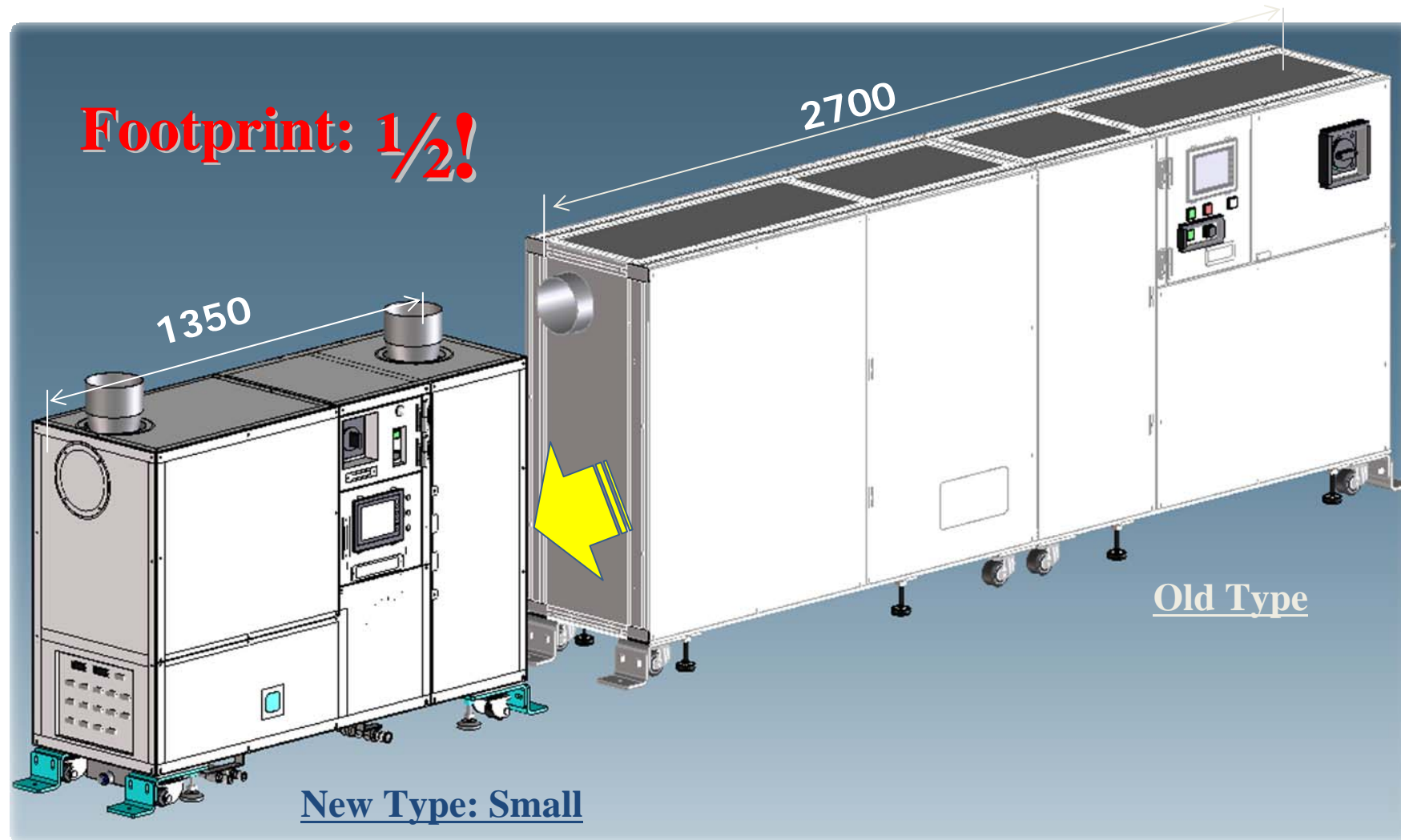


One Day...

A person in charge
of corporation A
offered an inquiry
to Shinwa that is...

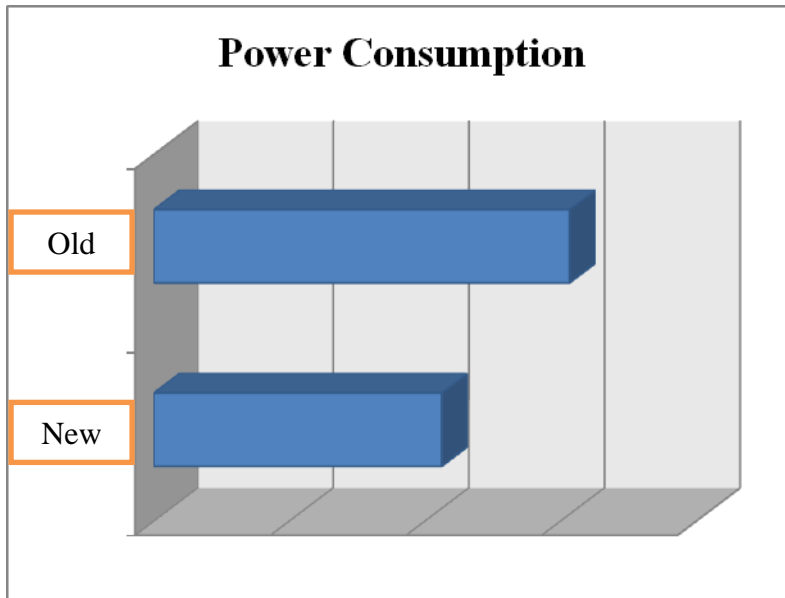


External View of the Final Product

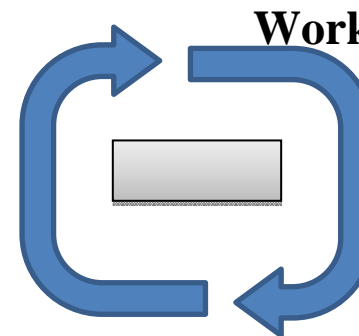
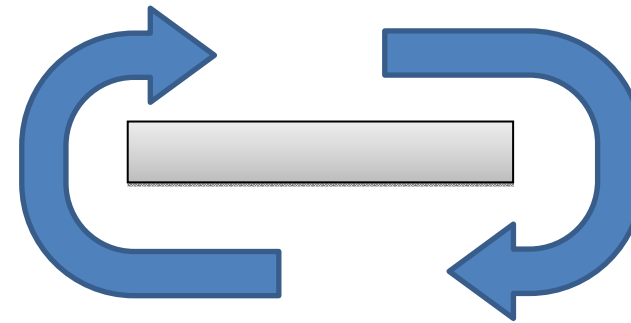


Incidental Effects with Compactness

**Power Consumption to
2/3**



Assembling Time: 15 % Cut



Work Line Curtailed

Incidental Effects of This Project

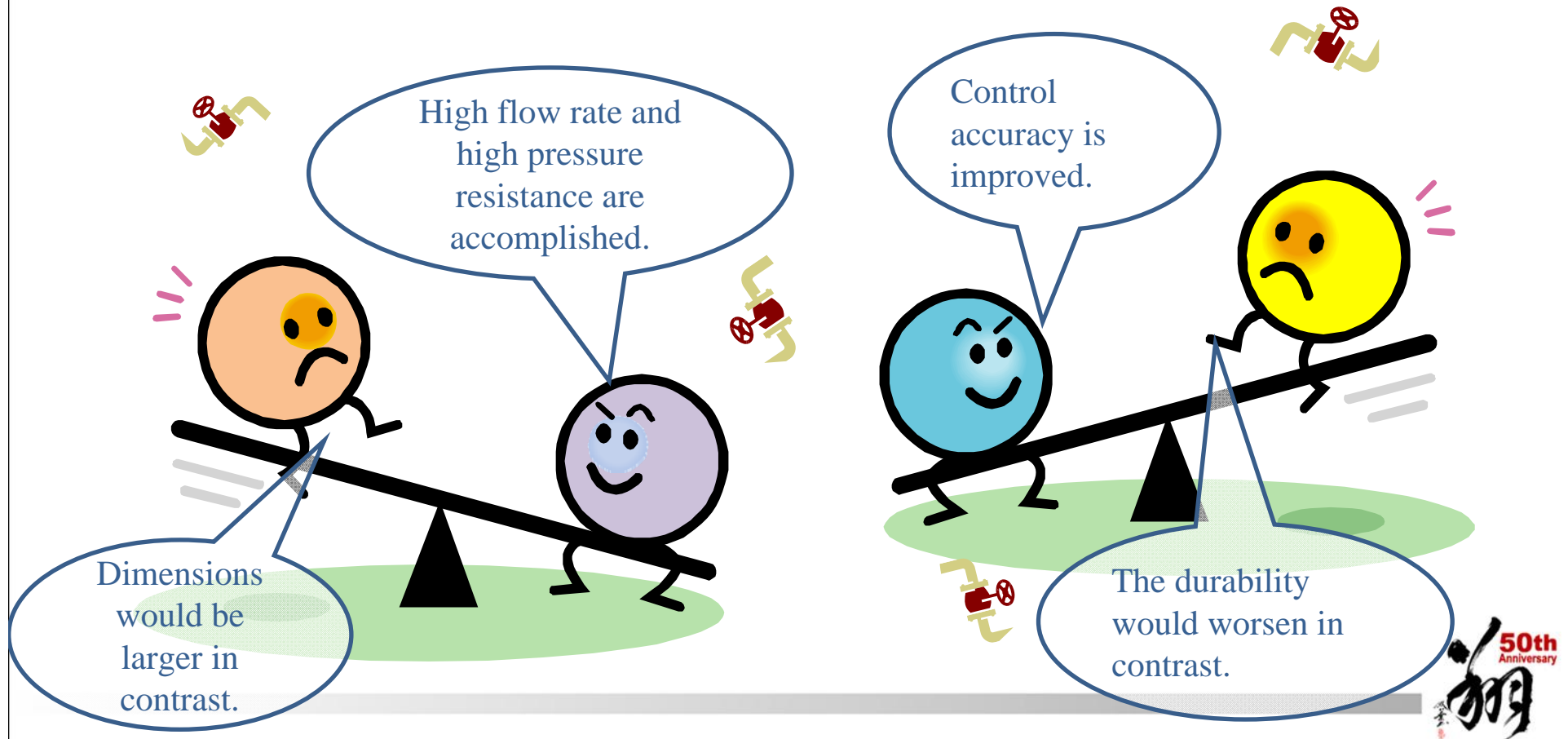
This project provides the opportunity for newcomers to succeed technical skills from experienced workers.
Convert individual work to a team-organized work.

What You've
Learned with QFD:
Do it the Way
Customers Would
Want.

What You've
Learned with TRIZ:
Gain Effective Ways
to Find Out Ideas.

- An approach that converts customers' requirements to parameters is the most useful.
- Upon a development, I realized two important things: first, clarify the goal (or objective) and second, solve the problem.
- I used to be satisfied creating only one idea before this project. Now I try to create many ideas.
- I noticed as an engineer that I'd be able to expand my capabilities by being accustomed to investigating useful information such as Patent and knowledge using Goldfire.
- In case of problem solving concerning a discrepancy report (DR), I became able to create ideas with an aspect of TRIZ.

Two projects now are being developed using TRIZ in the field of solenoid valve and motor valve.



Thanks to:

- IDEA Inc.
Mamoru Zenko (President)
Hajime Kasai (QFD)
Masahiro Kuwahara (TRIZ)
- All the Customers who Assign Us Challenging Issues.

ありがとう

Thank You for Your Attention.



Shinwa Controls Co.,LTD.

