Simple problem-solving examples in TRIZ practical use

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  “Box sealing mechanism for illegal prevention”
  ➡️ Solution

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  “Missing page prevention in large-scale delivery system of books”
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Company overview

- Trade name: Soyu Co., Ltd.
- Establishment: April 21, 2008
- Capital: 12.05 million yen
- Address
  〒110-0013
  Mekkuwan Building,
  1-24-8 Iriya, Taito-ku
Soyu Business net
It is all developments and Soyu Power

- **Product development**
  - Design/production
    - Hardware
    - Software
    - Mechanical
  - Planning
  - Project

**Soyu Power**
- Technical consultant or making work when detailed specifications are made
- Hardware design/production
- Software design/production
- Mechanism design/production

**Soyu Power**
- Production that can be put on each phase
- Production by development of process control or process control support system
- Functional evaluation
- Function evaluation support system development
Situation needs of severe design development staff

- It proposes a certain technological solution early.
- Processing technology securing to be made embodiment
Power & speedup is promoted by introduction of TRIZ & Goldfire

Aim

Making of problem essence (extraction of primary cause)

Idea generation using TRIZ

Idea Making to effective (selection and connection)

System Absolute grading

Making of problem essence

Function-attribute analysis

Device analysis

Cause-effect analysis

Root cause analysis

Main problem extraction

Theme decision

Idea generation using Inventive Principles

Idea generation using Evolution Patterns

Knowledge retrieval

Idea generation

Physical Contradiction, SLP, Ideal Final Result, etc. are used according to the situation.

Arrangement/classification of ideas

Uniting of ideas of each subsystem

Generation of concept of main system

Absolute grading of the final system concept

Selection of concept

System Retrieval from target function

System Retrieval from pivotal question

The final output: Image chart of concept
Problem 1: Box sealing mechanism for illegal prevention

Sealing mechanism of internal basic case with game device

Purpose of management of unlawful computer access prevention of the main base
Signs opened when the unlawful access person opens the case should remain
Mechanism of sealing

- Work of threaded portion
  - It locks to the screw
    - The screw is increased
      - The threaded portion is covered
        - Dissolution of lock medicine
- Electric lock
  - Setting signal of opening
- Secret gas enclosing
  - Because the gas comes off when opened, it gets known that it was opened

Measures are exaggerated
The cost is high
Conception from Preliminary Action principle

- Part or all of a necessary change are done to the object beforehand.
- The object is prepared beforehand to accomplish operation from the most convenient place, and useless time is prevented being taken to accomplish operation.

Easy God match mechanism
God match
Conception from Preliminary Anti-action principle

- When it is necessary to accomplish operation that brings an useful effect and a harmful influence at the same time, it is necessary to be going to replace this operation with the anti-action later, and to control the malignant influence.
- The stress is generated in the object beforehand, and it opposes the unnecessary operation stress to be generated back.

Driver insertion

Open mouth

Lock

It locks when insertion of the driver is tried and the opening is opened.
The work that the unlawful access person opens by nondestructive is difficult.

The mechanism of the lock is made a Black Box.
Conception from the Self-service principle

- Supplementary support functions are accomplished and the object does self-service
- The abandonment resource, the abandonment energy, and the waste quality are used

The unlawful access person is made to recognize sealing with the screw
The stick to recognize the dummy screw doesn't turn in the opposite direction though it turns in the direction of a positive rotation of the screw tightening by spring in the housing.
Only the screw head is seen from the unlawful access person and the internal mechanism is not understood. Therefore, when the screw runs idle, it misunderstands it.
Problem 2: Missing page prevention in large-scale delivery system of books

In the book sales companies, the book that there is an order for each bookstore is sorted and it sends it out.

Book sales commission company
↓
Each bookstore
Basic mode of packing

It loads it into the delivery car by finally handling the shooter.
**Cause of missing a page of a book**

- Impact at passing the final shooter (70%)
- Fall when system of book is passed
- Hanging book damage of the taking out mechanism
- Transcript of dirt such as oil and drops of water

**Improvement ideas**

- Idea A: It changes it into the method that abolishes the shooter, changes into the elevator type or accompanies it.
- Idea B: The angle of the shooter is made gradual.
- Idea C: The system speed is slowed down.

- Large scale equipment remodeling and restructuring
- Synchronization between systems and the control is not revokable
Simple remediation measure by TRIZ

- From a lot of directions where the hint is obtained from TRIZ
It comes off new awareness multilaterally based on the peculiar technology that we have and it obtains it easily moreover without omission.
Effect and view

Our working environment
・Small-scale organization body
(An organization body that is called TRIZ team does not exist)

Effect
In the business step from the idea putting out to make for trial purposes-
DR-mass production
・Mechanism making for quantification of qualitative product.
・Proof of output of conception
(Oppositely, it is possible to reconfirm directionality of conception from the experience in TRIZ view)

View
In the small and medium-sized enterprise like our company that will advance the development support that the customer requests in the future, I am convinced that the introduction of TRIZ leads to the flowering of a big possibility.
Address of thanks

Thanks to your large effort:

Mamoru Zenko (President, IDEA Inc.)
Thank you for listening

Soyu Co., Ltd.