The 40 Principles of illustrated up to 104 case by using 85 kinds of sub principles
Results of trying to the universality of Principles of the smart phone

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First, confirm the keyword

What's universality

Principles of Universal Design (Ronald Mace)
1. Equitable use
2. Flexibility in Use
3. Simple and stylishly Use
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use ➜ Smartphone size
1.1 Conclusion: Obvious and latent needs

Main needs for 40 principles from seminar etc. questionnaire

**Obvious needs**
- Can I get ideas without using a contradiction matrix?
- Can you differentiate your ideas with only 40 principles?
- Do you understand semiconductor cases?

**Latent needs**
- Can I make an idea intuitively?
- How to improve abstraction?
- Can I use smartphones?

1.2 Conclusion: Responses

40 principles that can intuitively conceive ideas using smartphones

40 Principles (pro-engineer)

What’s TRIZ (pro-engineer)

Click

Set the contradiction to solve

Articles that can be read in multilingual on Monodukuri.com
2 Background and aims of the issue

**Background**

Until now, we have tried to create TRIZ tools that can be used by universities and small and medium enterprises. In that process, I was keenly aware that "engineers who are not good at abstraction thinking" are very numerous. Therefore, I thought that I could break through by deepening the original one of the 40 principles for a technician with a clear problem.

About 1 year ago I wrote this commentary on "Monozukuri .com". There is a request for its tool conversion, and it was published to HP of "proengineer-institute".

**Aims**

1. Abstraction (enlargement) and implementation (reduction) can be processed unconsciously
2. Increase the trigger of the idea
3. Brush up universality

3 Specific responses

1. Unconsciously abstract (enlarge) / realize (reduce)
   ➡ Suggest ideas from the 5 viewpoints of principles name of the 2 languages, the meaning of each principles, principles image diagram, sub principles all realistic illustration, and the application example of different fields
2. Increase the trigger of the idea
   ➡ New 40 principles of 104 illustrative examples including 85 sub principles that respect original principles
3. Brush up universality
   ➡ Mobile Friendly matrix of 40 principles and contradiction Matrix
3.4 Concrete illustration of all sub principles

◆ Expand trigger of intuitive idea by concrete illustration of all sub principles

4.1 Google search ranking

◆ Contents of "40 Principles - all deputy principles" will continue to be displayed at the top of Google Search.
4.2 Impressions and overall satisfaction of seminar students

**Impressions (2016)***

1. Compared to other seminars, tools are evolving.
2. Compared to past teaching materials, it is very easy to understand.
3. New 40 principles can be used immediately for work.

**Overall satisfaction***

**Question: Overall, were you satisfied with the seminar***

- Strongly disagree (1)
- Somewhat disagree (2)
- Natural (3)
- Somewhat agree (4)
- Strongly agree (5)

**Precondition:**

1. Program: Lecture & exercise of 7 hour
   - (Purpose principle, 5 whys analysis, 40 principles, Evolution trend, Effects, Ideal Final Result, 9 windows, Self-X, Resources)
2. Students: Active participants + Top manager’s recommendation (10~20%)

4.3 Future prospects

**Only 40% of the idea factor can be supported by the idea method**

- The remaining issues is motivation

**Factors thinking ideas**

- Mental factors
  - Challenge (5%)
  - Trial and error (10%)
  - Patience (25%)
  - Change viewpoint (5%)
  - Flexibility (5%)

- Personal factors
  - Experience (5%)
  - Idea (20%)
  - Sense (10%)
  - New knowledge (10%)
  - Realization (5%)

**Supportable factor of Idea method**

**Motivation method**

1. Interest to work (Curiosity)
2. Challenge to work
3. Communication
4. To be recognized from your superiors, members and customers
5. Contribution to organization or significance of work

**Source:** '87 Nikkei Mechanical (Miura)