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Reverse TRIZ adaptation of industry newspaper articles

～ Concrete explanation of TRIZ for engineers
in various technical fields in Research and Development ～

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Context

1. Outline
2. Background
3. Approach to easy explanation of TRIZ
4. Reverse TRIZ adaptation of newspaper article
   - Modeling of problem
   - Perceiving by TRIZ
   - Process thinking by TRIZ
5. Why we use newspaper article to reverse TRIZ ?
6. Skill improvement by reverse TRIZ adaptation of newspaper article

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Outline

- Thinking process of TRIZ is effective to problem solving in R&D
- More possibility of solution beyond engineer's specialized field
  ⇒ Need more promotion to engineers

- Less interest of engineers in general explanation of TRIZ
  ⇒ Need common case example for easy explanation of TRIZ

- TRIZ case example need to cover various kind of technology in R&D
  ⇒ General explanation not enough to tell the value of excellent case

- Reverse TRIZ of industry newspaper's article as familiar and latest information
- Use for concrete explanation of TRIZ for engineers in R&D
- Introduce our know-how through the experience of reverse TRIZ

Background

We have being practicing many cases using various approaches

【Approach from method】

- Introduction of TRIZ process by a general case in an in-house seminar etc.
- Though it is understood as a unique idea
- How to use on actual business ?

【Approach from problem】

1. Support R&D engineer in actual practice
2. Educate leaders and promoter of TRIZ
3. Use common example

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Approach to easy explanation of TRIZ

How to make TRIZ more easy to understand ?

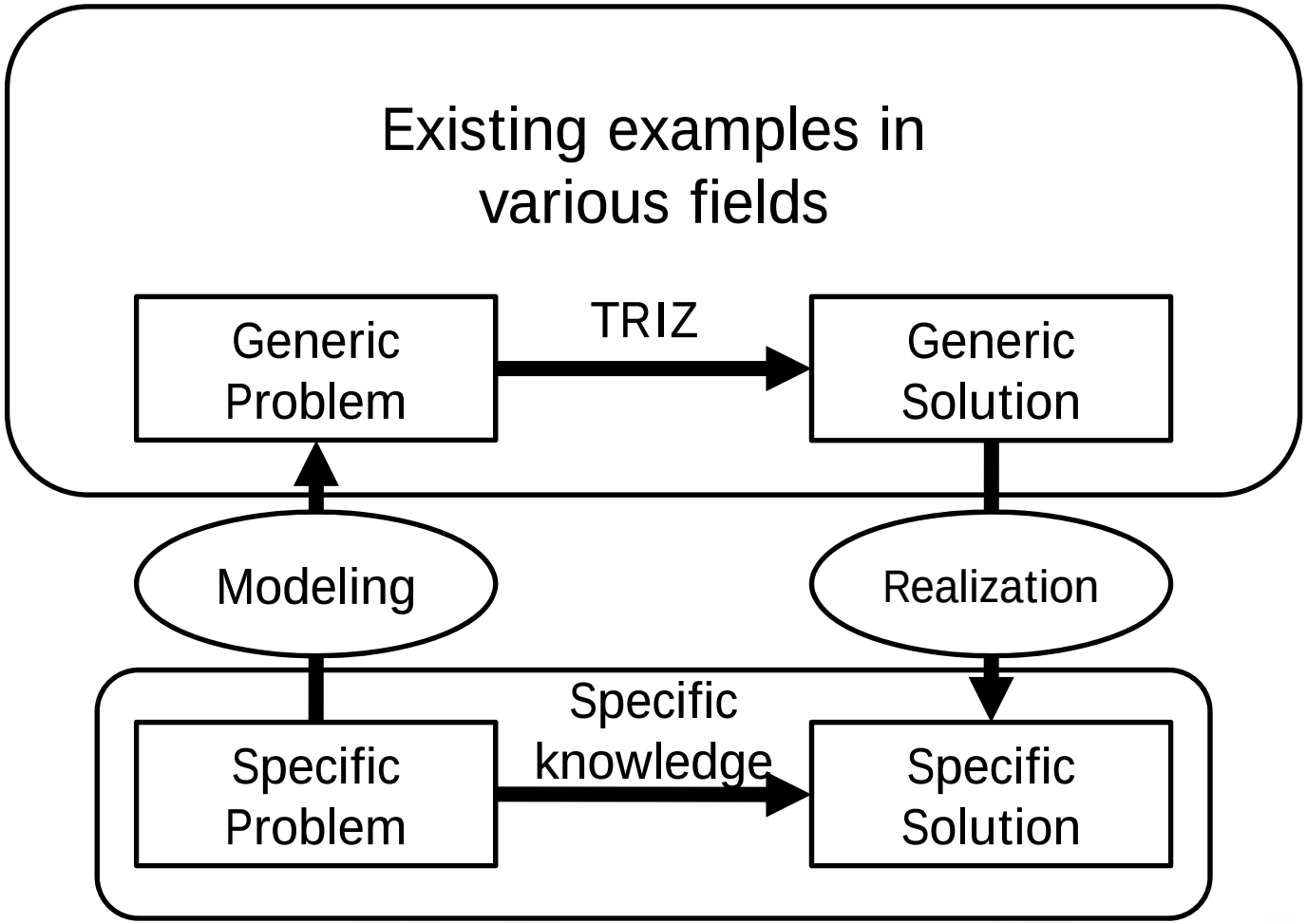
- Explain TRIZ in a specific technical field
  - Enable to explain TRIZ consistently from technical knowledge
  - Difficult to cover every specific technical field

- Explain TRIZ using customized case example
  - Enable to collect information from public domain
  - Not enough information for TRIZ

- Explain using reverse TRIZ of industry newspaper

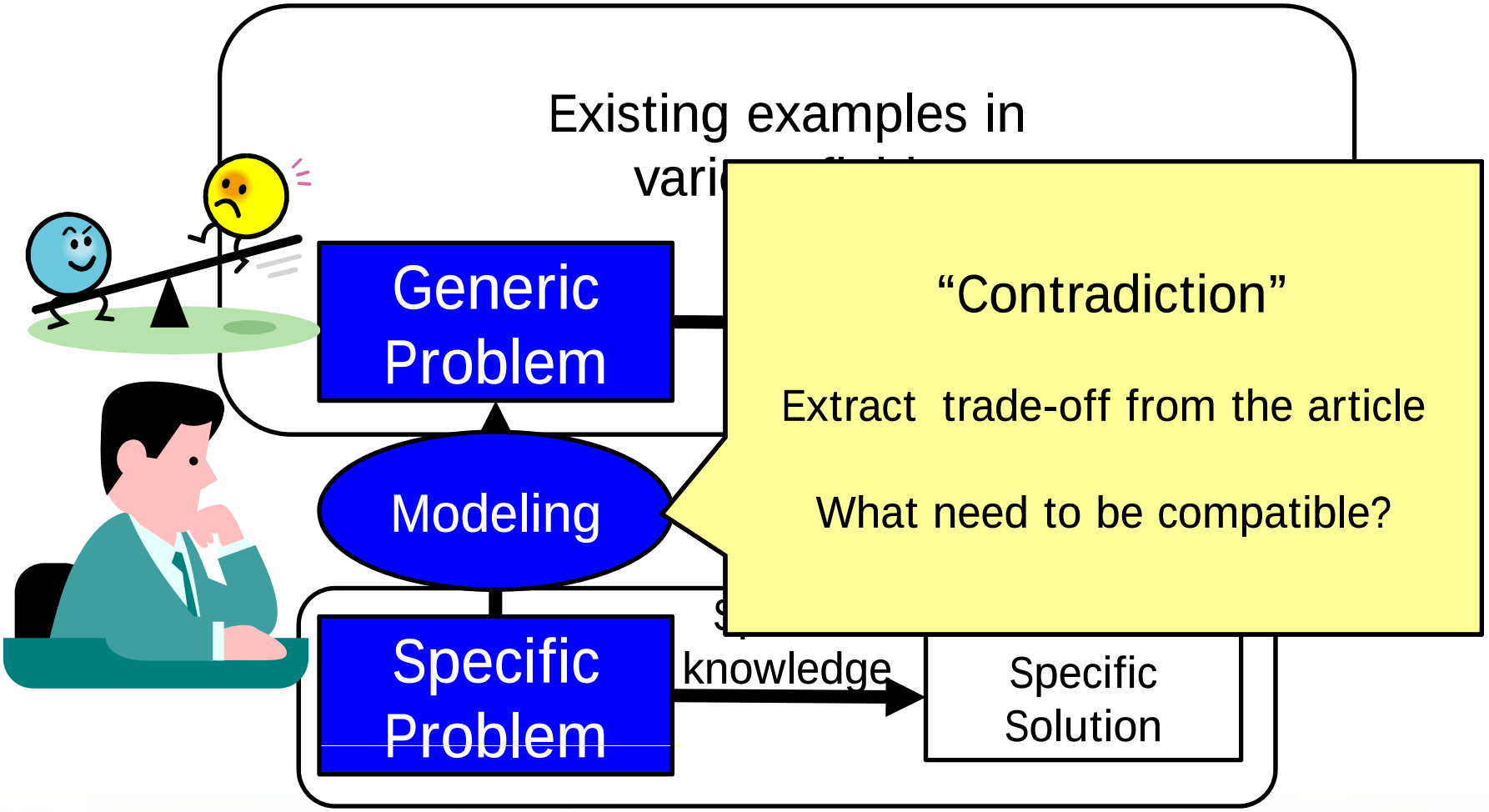
Reverse TRIZ adaptation of the article

Problem solving schema of TRIZ



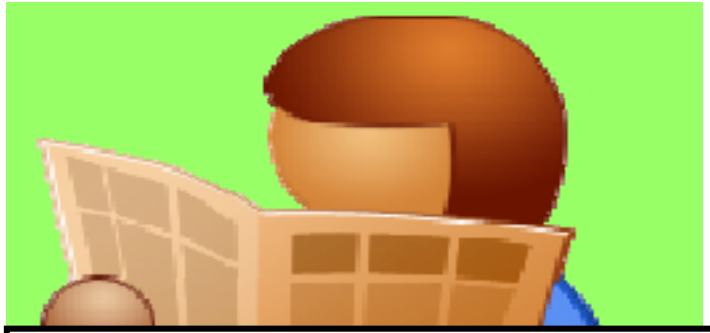
Modeling of problem

Extract "Contradiction" from the article



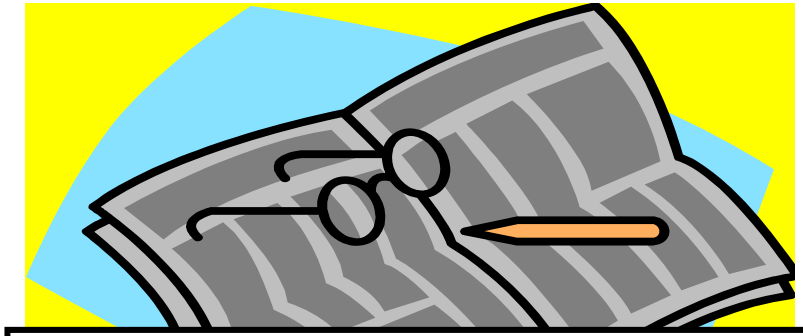
Extract "Contradiction" from the article

Bonding (viscosity)
and Gas sealing
[chemical synthesis field]



Protection of recording area
and Shortening of distance of head
[Electricity mechanical field]

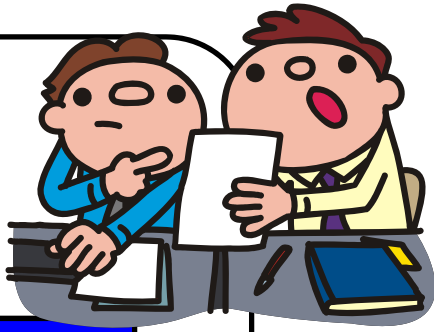
Person recognition accuracy and
Long-term record maintenance
[IT and soft-ware field]



Protection against corrosion and
Reduction in time in construction
[Construction and engineering works]

Perceiving by TRIZ

Specify “Inventive Principles“ from the article



Existing examples in various fields

Generic Problem

TRIZ

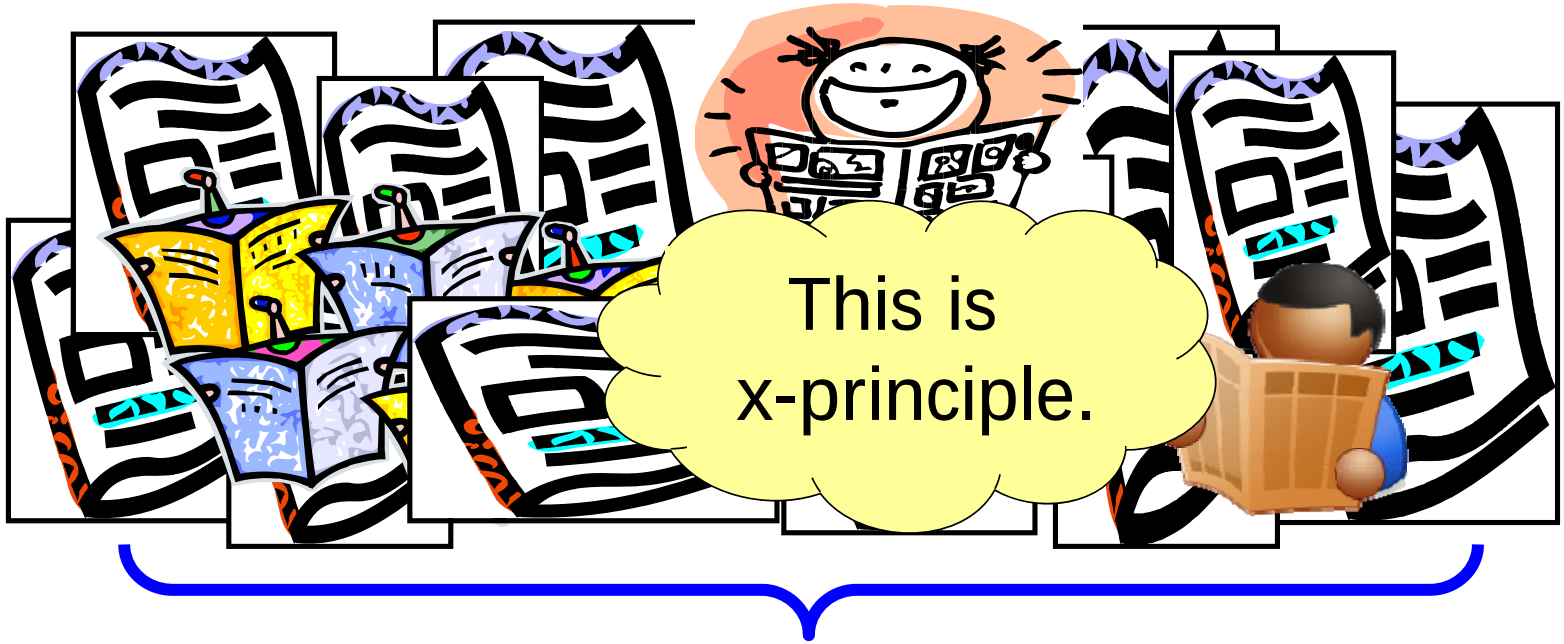
Generic Solution

Modeling

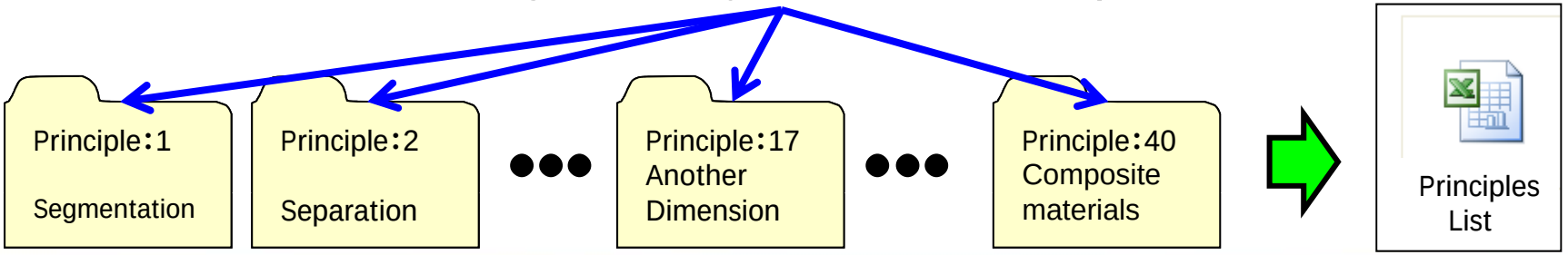
Specific Problem

Specify “Inventive Principles“ from sentences and charts in newspaper

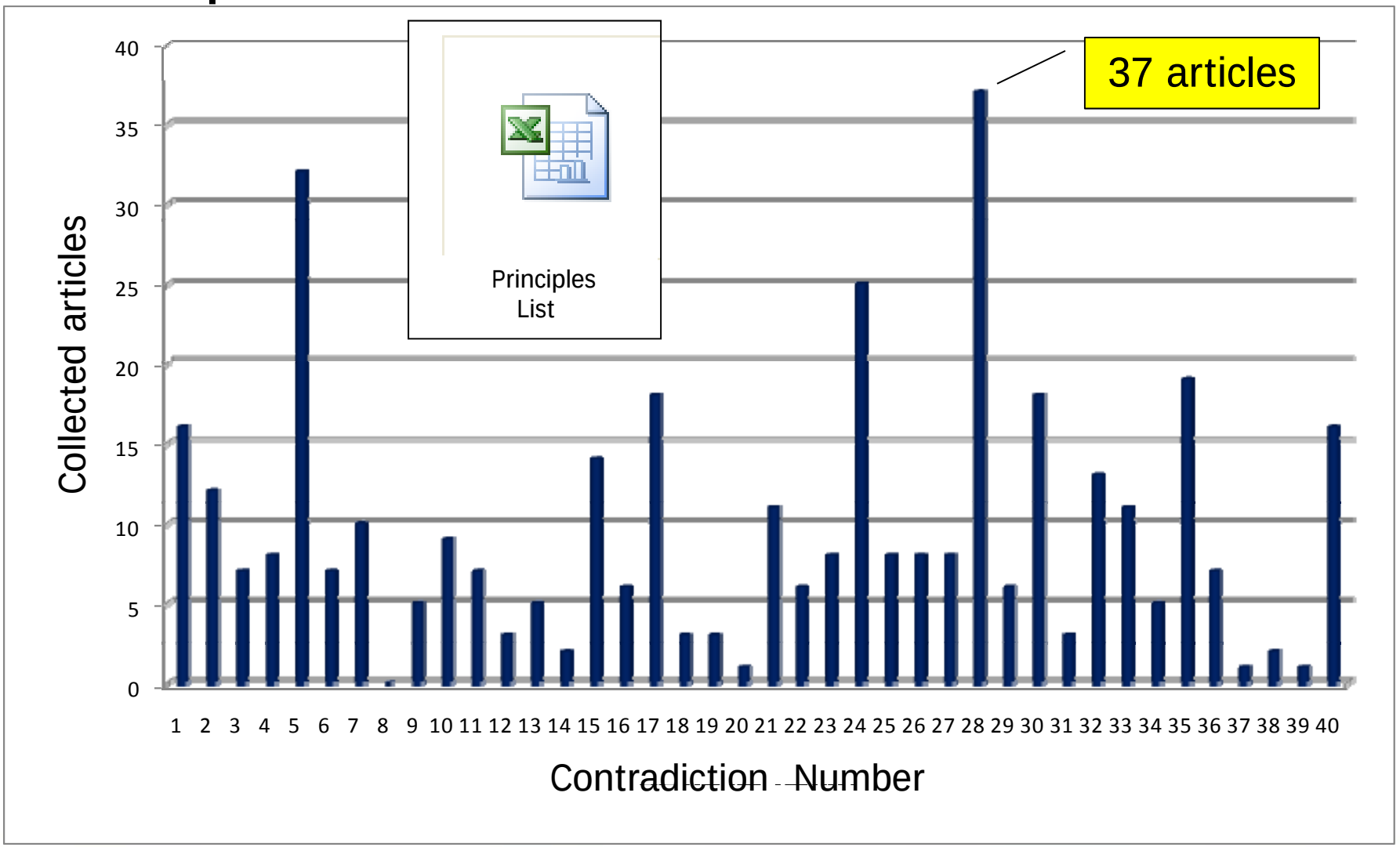
Specify “Inventive Principles“ from the article



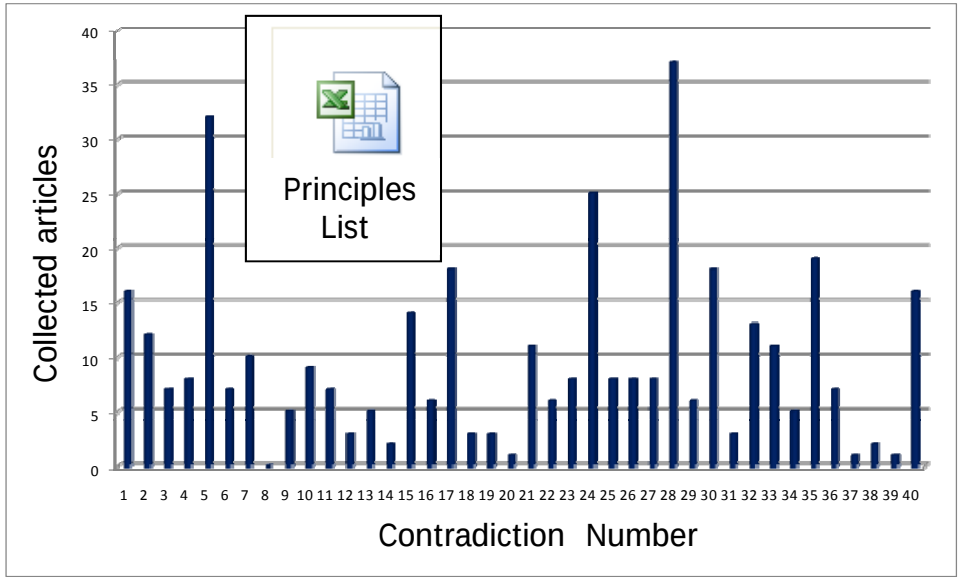
Specify “Inventive Principles“ from solution in the article
⇒ Organized by Inventive Principle



Number of articles of Inventive Principles extracted from the article



Number of articles on each Inventive Principle



Our perspective

Distribution of principle

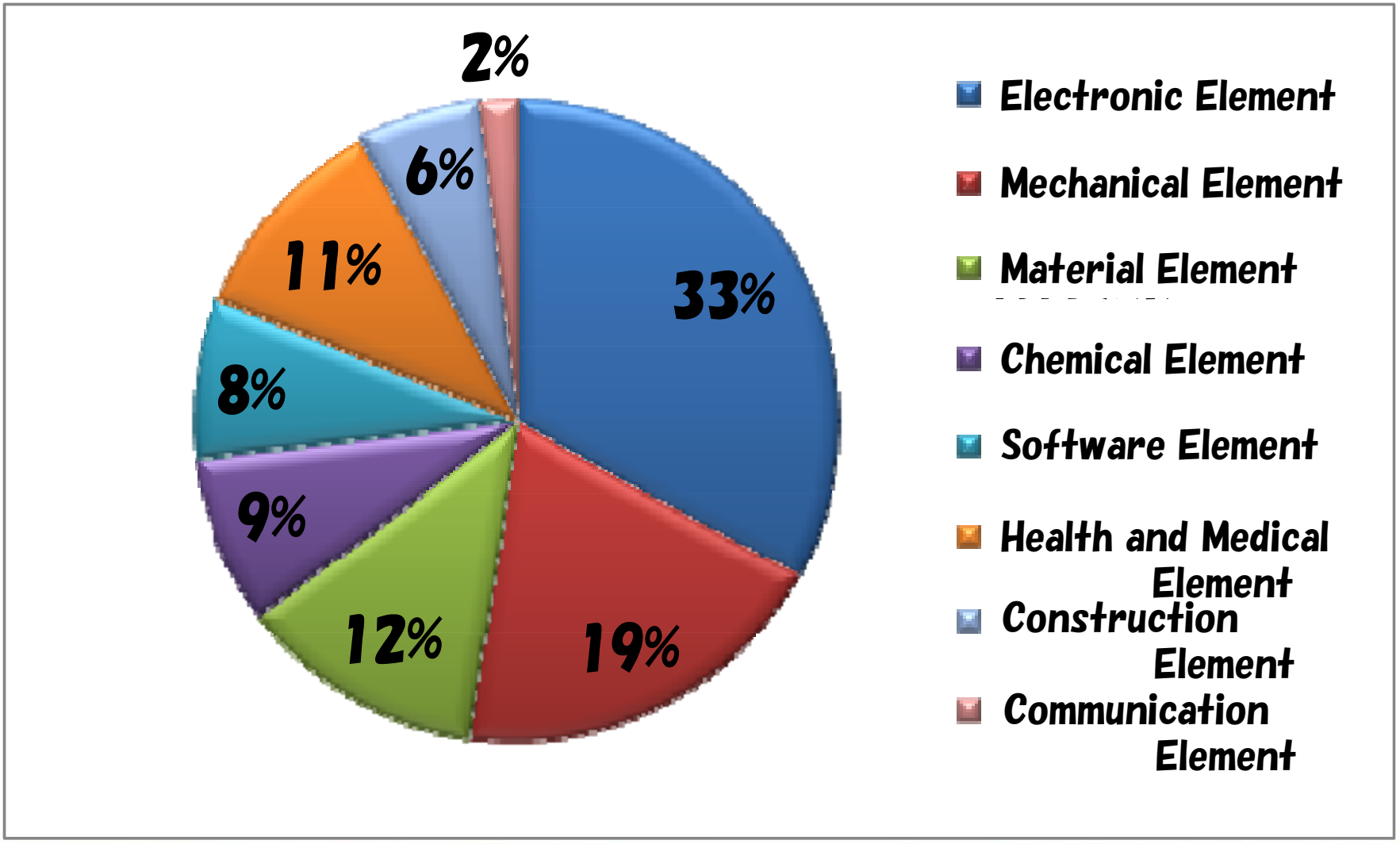
Principles with many articles

①28: Mechanics substitution (37)
② 5: Merging (32)
③24: 'Intermediary' (25)
④35: Parameter changes (19)

Principles with a few articles

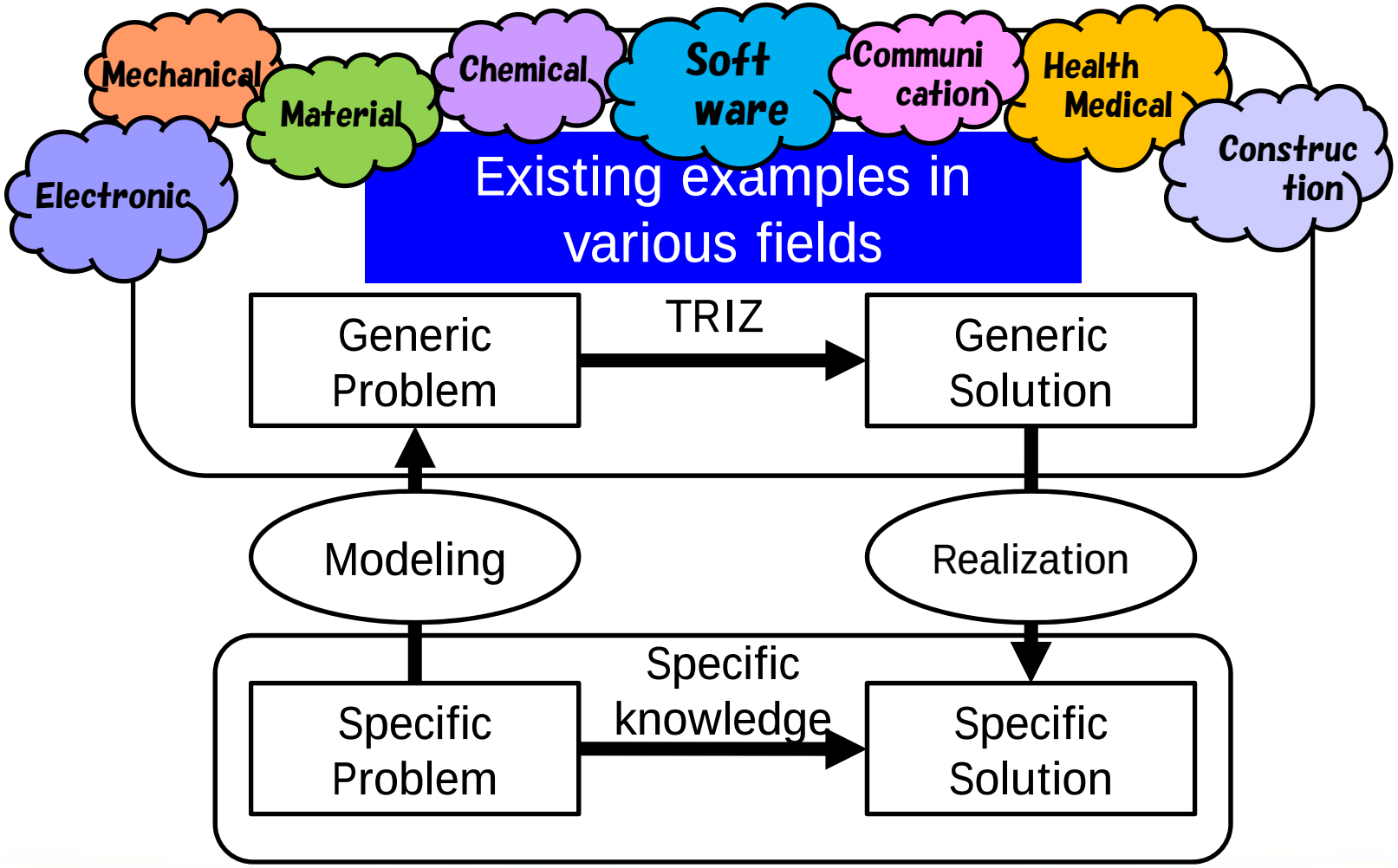
① 8: Anti-weight (0)
②20: Continuity of useful action (1)
③37: Continuity of useful action (1)
④39: Inert atmosphere (1)

Fields of extracted from the article



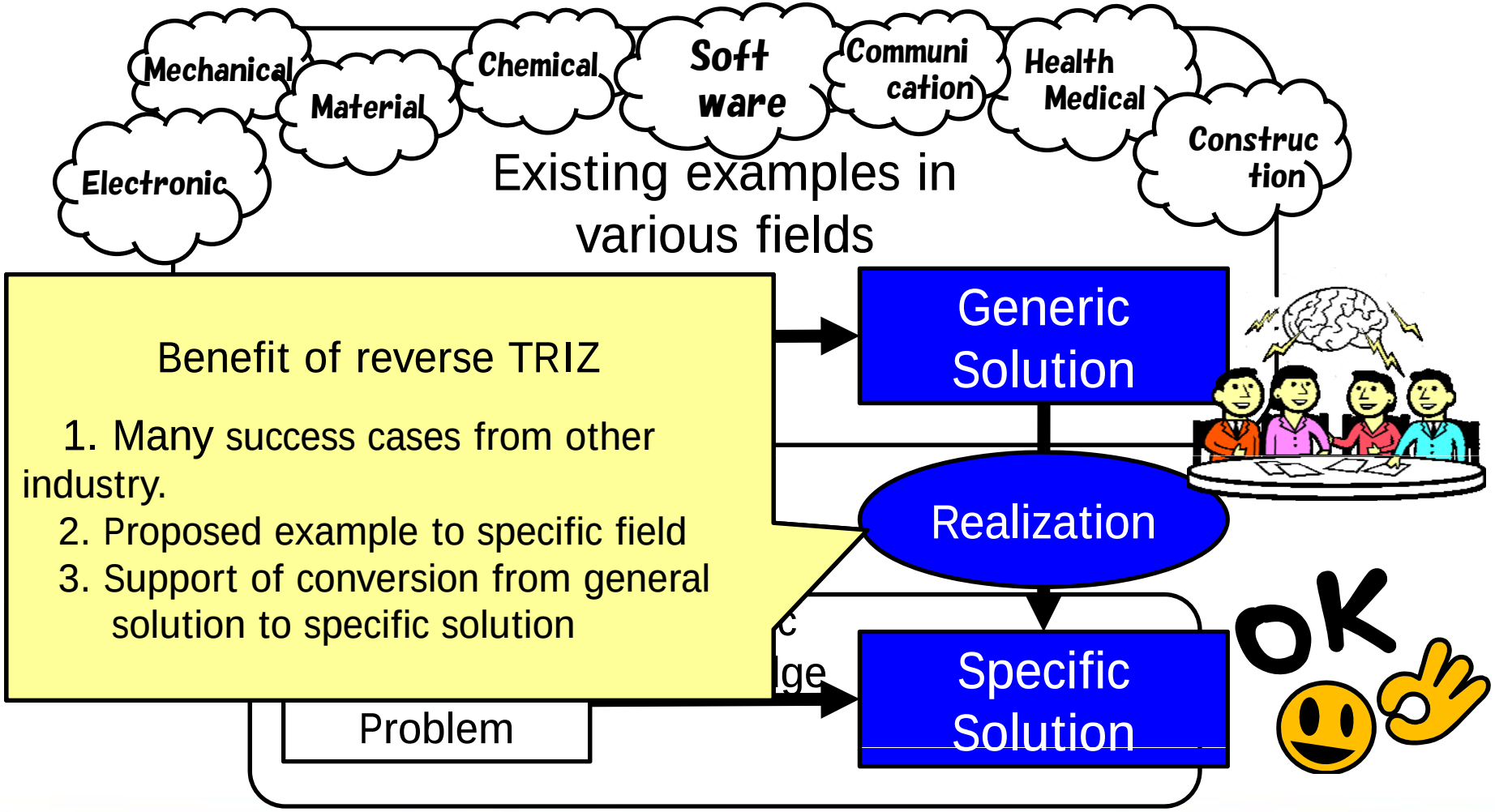
Explain “invention principles” from various examples

Problem and solutions are crossed over many fields repeatedly



Process thinking by TRIZ

The idea creation is strengthened by reverse TRIZ of the article.



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Practice of “Inventive Principles”

Analysis of newspaper article

Solution of contradiction

Extraction of article

B had worsened when A was improved.
Then, ＊＊＊ was devised.

Before

After

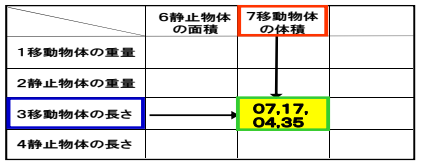
Simulate

Set problem

There is an improvement request of K in A commodity.
However, B deteriorates when starting making it to H.

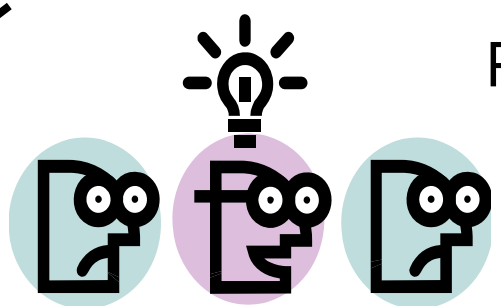
Now let's do very.

Contradiction



Inventive principles

Reverse TRIZ of solved content



Let's think proactively using unused Principle.

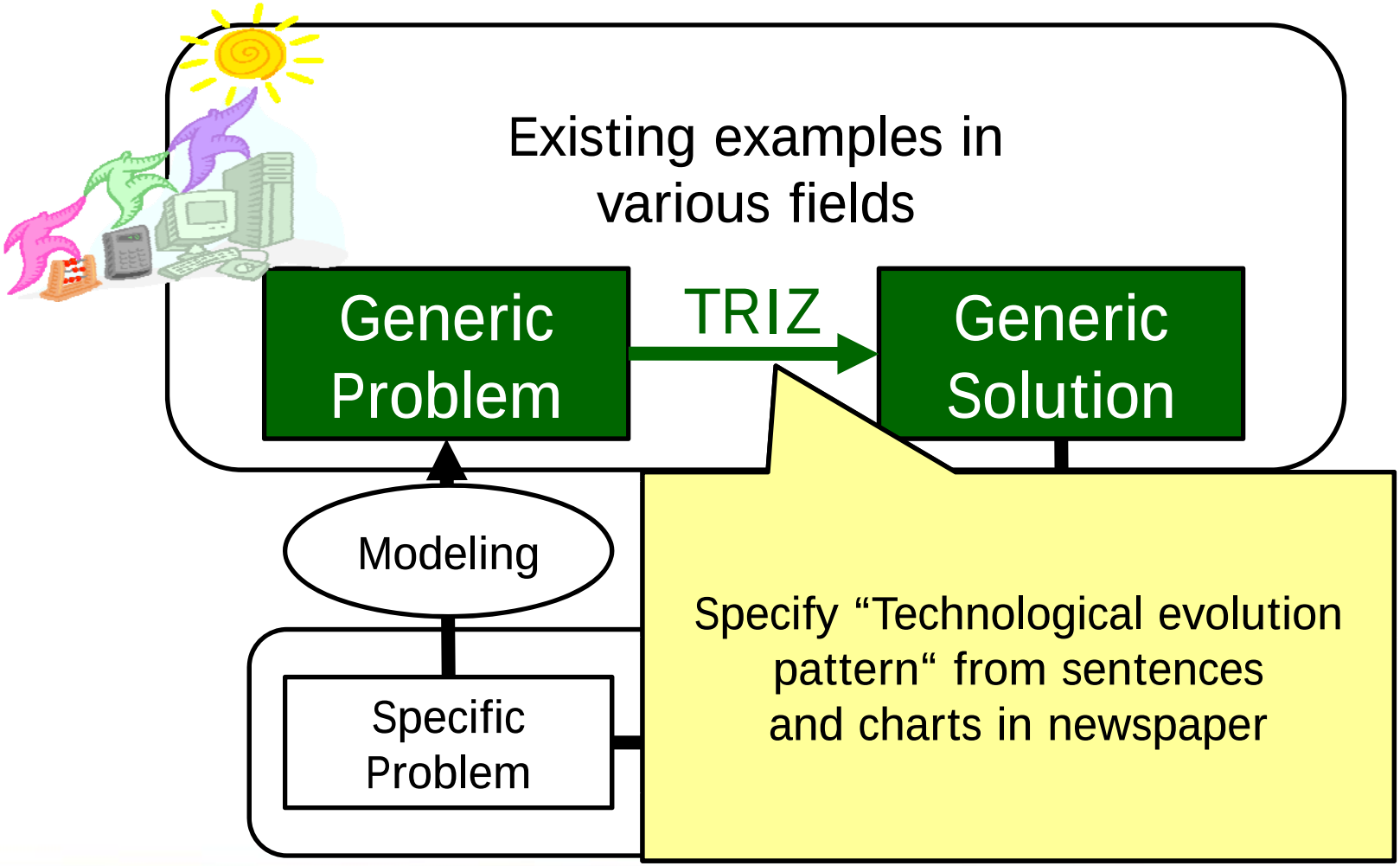
7:’Nested Doll’	3:Local Quality	2:Separation
Unused	Used	Used
10:Prior Action	13:’The Other Way Around’	Thinks freely
Used	Unused	Let's write anything.

7:’Nested Doll’	3:Local Quality	2:Separation
Let's put B in A.	Let's use a partial, local character.	Let's divide an unnecessary part
10:	Around	
Let's set beforehand.	Let's inversely do the composition and the action.	Let's write anything.

Idea format

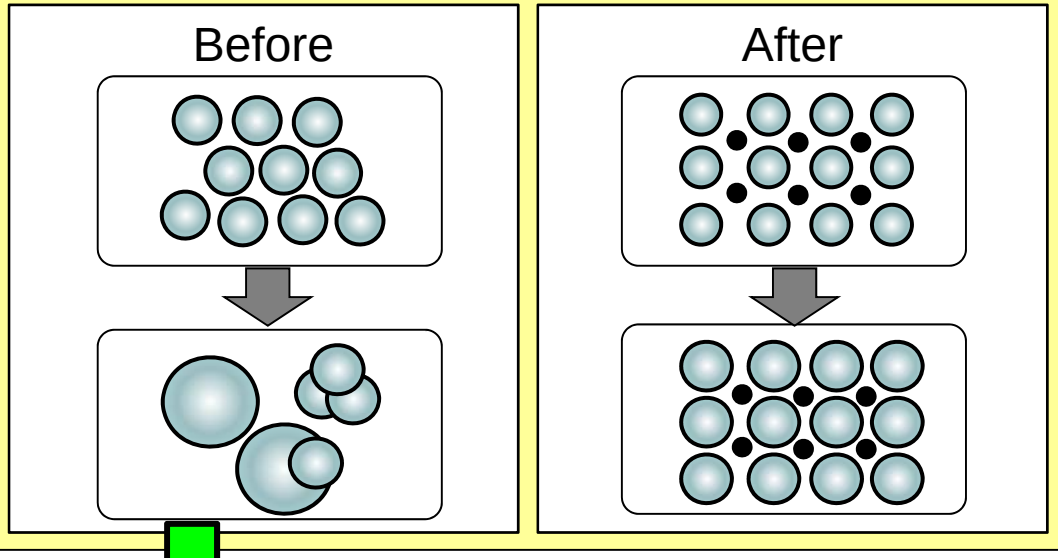
Perceiving by TRIZ（Part-2）

Specify “Technological evolution pattern“ from the article

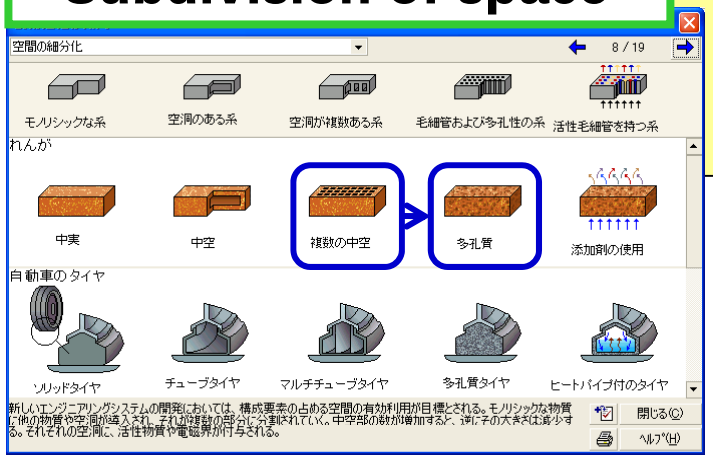


Technical evolution pattern in the article.

** company developed the process of manufacture of ** that lightening ** is possible.
** particle association was able to be obstructed in ** particle of spongy.



Subdivision of space



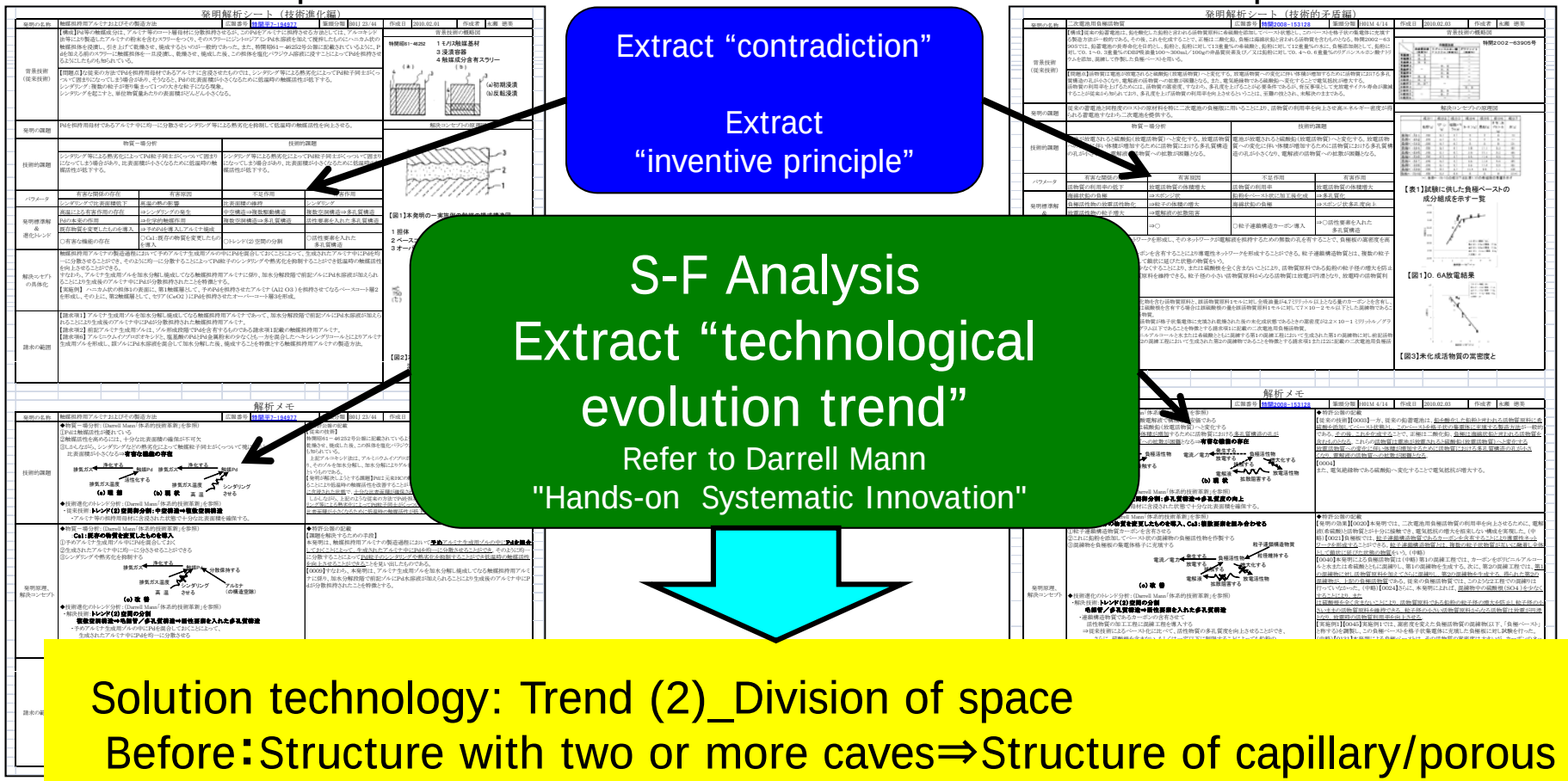
From GFIN software

It is just like the subdivision of the space!

Example of analyzing patent publication

Example of analyzing patent of Mazda Motor Corporation

Example of analyzing patent of NTT DATA Corporation



Extract “contradiction”

Extract “inventive principle”

S-F Analysis

Extract “technological evolution trend”

Refer to Darrell Mann "Hands-on Systematic Innovation"

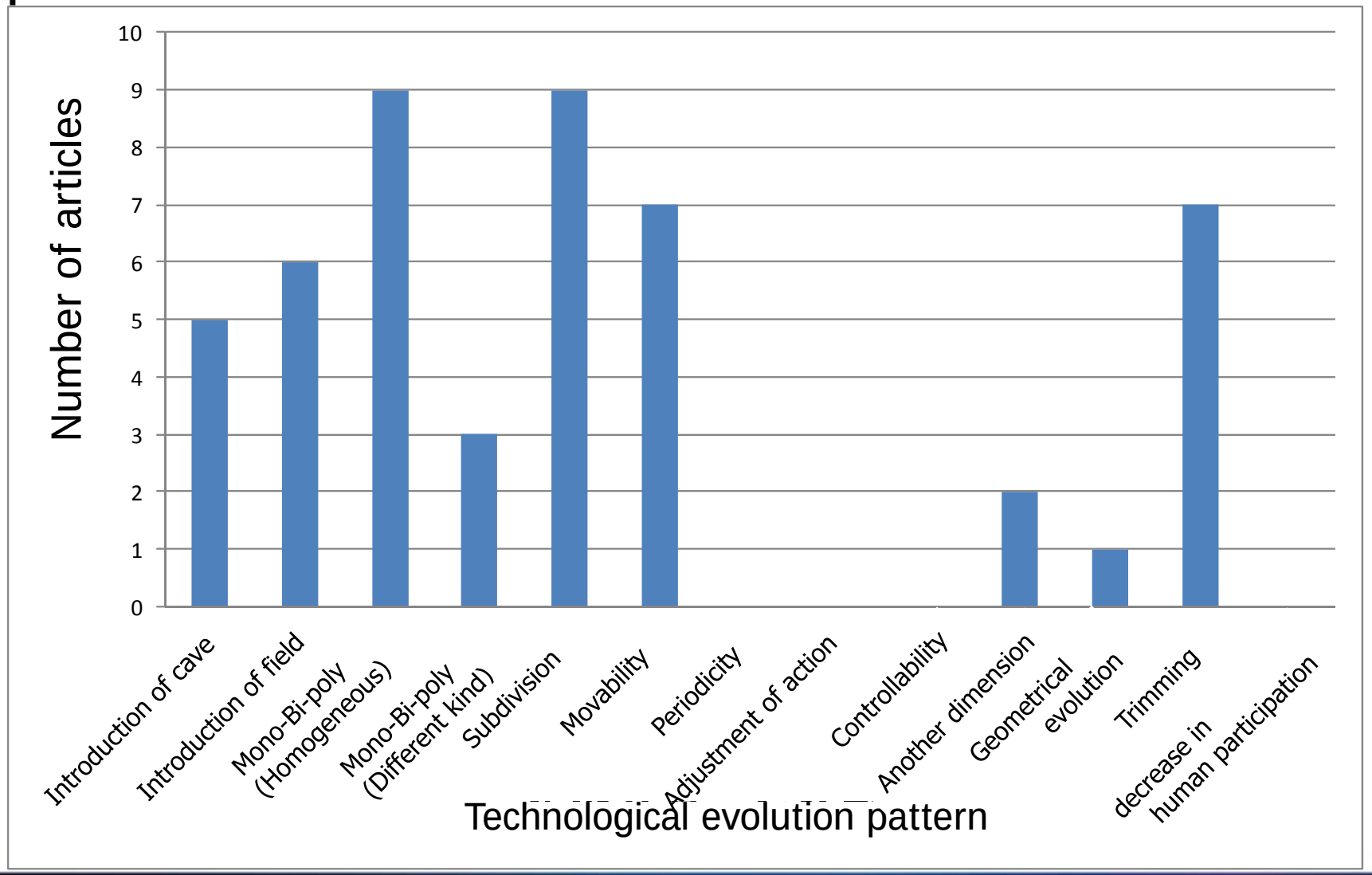
Solution technology: Trend (2)_Division of space

Before：Structure with two or more caves⇒Structure of capillary/porous

After ：Structure of porous within revitalization element

The patent analysis paper made by Intellectual Property Creation Study Group, Japan TRIZ Society

Number of articles of technological evolution patterns extracted from the article



Why we use newspaper article to reverse TRIZ ?

There are a lot of useful elements in articles

1. Explains core technology using charts
2. Many explanations of difference points from previous technology

3. Problem, solution and the effect are described
4. Well summarized

5. Familiar to both TRIZ promoter and engineers
6. Information source is clear, and it has technological proof

Skill improvement by reverse TRIZ adaptation of newspaper article

Common practice thinking of TRIZ, and using TRIZ

1. Adapt inventive principle from articles
2. Apply the technological evolution pattern
3. Search other idea of TRIZ
4. Understand of the value of the article by using TRIZ
5. Have more interest in various technical fields
6. Accumulate know-how from the article
7. Practice TRIZ using actual case

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Wrap up

Reverse TRIZ adaptation of industry newspaper articles

- By using reverse TRIZ adaptation of industry newspaper articles, we can explain TRIZ more efficiently to many engineers
- The newspaper article is good resource for reverse TRIZ
- Improve TRIZ promoter's skill by a daily practice

We will introduce our actual examples
during in our presentation

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