Eighth TRIZ Symposium in Japan, 2012

Collection of Abstracts of All the Presentations from Japan

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Program Committee

JI04 Yumino(JCS) -- Special Invited Lecture

Educating Creativity: Making the foundation for disseminating creation techniques

Kenichi YUMINO
(President of Japan Creativity Society; Emeritus Professor of Shizuoka University)

The question of “What”, “Why” and “How” are closely related to the emergence and progress of the study, science and technology. For these questions, Japanese schools and society that put value on “Manabi: Learning” give priority to the "How" question. However, there is “Tsukuri: Creation” together with Manabi, in the education of the "West European countries" which has firstly initiated the study, science and technology. Tsukuri includes something original for the person, not others' imitation, and involves what and why question.
When we think Tsukuri as making the foundation for disseminating creation techniques, it will be necessary to set up the special "view points" which are not included in the traditional culture or education in Japan. These are: a) not only conjecturing the opinion of an author but also requiring a learner's logic and opinion, b) praising a challenge, c) praising creative behaviors, d) praising "originality” and "uniqueness", e) evaluating not only correct answer but also the process of thinking, and f) encouraging debate and discussion based on data and the fact, etc.
If a child grows up with a custom to consider an ambiguous problem by praising from above view points, and mastered creation techniques, such as TRIZ, it might be expected that the higher quality of ideas will be obtained. In this small lecture, I'd like to introduce examples about "Manabi" and "Tsukuri", "Intelligence" and "Creativity", "Western education" and "Japan's education", "the way of praising that develops Intelligence and Creativity", and add comments about these.

JI05 Kasai (IDEA) -- Tutorial

Basics and Usage of TRIZ

Hajime Kasai (IDEA Inc.)

At the 7th Japan TRIZ Symposium held in 2011, Mr. Yoshihisa Konishi explained the basics of TRIZ, the Theory of Inventive Problem Solving, in the tutorial session using documents made by the 3 members (Y. Konishi, M. Sawaguchi and H. Kasai) who were designated as an Educational Materials Task Force by the society. In the tutorial this time, TRIZ basic concepts and typical problem solving tools will be introduced in order for TRIZ beginners to fully understand this method.
Since TRIZ was introduced into Japan in 1996, both domestic and international TRIZ researchers have been conducting revisions of TRIZ to solve the business problems reasonably in their development processes. And, as of today, there are many simplified and/or derived versions of TRIZ. In this tutorial, not only the original version that was directly established by Altshuller but also effective utilization methods based on the actual business environment will be covered.

JI06 Kurosawa -- Special Interest Lecture (a)

"Physical Contradiction" - A study

KUROSAWA, Shinsuke

"Physical Contradiction" is one of the key concepts of TRIZ, the problem solving method. It is a good idea to review this important concept together with the audience of the Japan TRIZ Symposium. Following issues are planned to be discussed:

Placing of the Physical Contradiction in the system of Theory of Inventive Problem Solving
How was the concept born?
How is the concept treated in the contemporary world TRIZ community?
How to use Physical Contradiction as a TRIZ tool

JI07 Kikuchi (Pioneer) -- Special Interest Lecture (b)

Introduction of cases using TRIZ in corporations

**Fumiko Kikuchi (Pioneer Corporation),
Coordinator: Setsuo Arita (Hitachi, Ltd.)**

On the whole, staffs in a corporation who are employing TRIZ (regardless of the way of applying) for solving problems belong to R&D section, developing/designing section or HRD (Human Resource Development) section. On the contrary, a person who would like to introduce TRIZ into his (her) company points out the existence of obstacles even though he (she) considers that TRIZ is powerful and useful. This presentation has some actual cases which were already released in past symposiums and some consideration from some points of view. It is helpful for people who would like to introduce TRIZ into their companies or would like to know TRIZ more.

JI08 Nakagawa (Osaka Gakuin Univ.) -- Special Interest Lecture (c1)

What Should We Do for TRIZ to Penetrate into Younger People? -- Education and Training of Problem Solving with TRIZ for Younger People --

Coordinator: Toru Nakagawa (Osaka Gakuin University)

We, Japan TRIZ Society, recognize the importance of proliferating TRIZ to younger people much better and wider. There can be several different approaches: (a) to challenge the atmosphere of the current era for younger people, (b) to present TRIZ in the form acceptable to the background of the younger people, (c) to make TRIZ easier to understand/accept, (d) to let them practice rather than to let them learn the knowledge, (e) to expand the applicable areas of TRIZ, etc. In the present Symposium, various authors are presenting and discussing their own works in these different approaches. In the present session of Special Interest Talks, we are going to have a few short presentations of case studies of TRIZ education/training at universities, graduate schools, and industries (especially for fresh employees). We would like to put stress on the approaches with exercises and practices of real problem solving rather than those of teaching/lecturing the knowledge of TRIZ methods.

JI09 Ikeda (Kanagawa I.T. & Sony) -- Special Interest Lecture (c2)

Report of Lecture Series on Invention at a Graduate School Aimed for Revival of Japan as a Nation of Outstanding Technology

Akihiko Ikeda (Sony & Kanagawa Institute of Technology)
Masao Ishihama (Kanagawa Institute of Technology)

How can we improve our inventive mind and skill? When is the best time to start learning invention? The author has been continuously asking these questions to himself since he came across TRIZ for the first time. If we can answer to these questions, then revival of Japan as a nation of outstanding technological power will follow. Further, contribution to the world wide social development will be made by solving problems across country borders through invention. As the first step to answer to the questions above, a lecture series titled "Creative Problem Solving" was conducted at a graduate school of Kanagawa Institute of Technology in the year of 2010.
How can we educate students who don't have any work experience in industry? To meet this challenge, an in-company training program that the author had created was implemented with some modification. In this modification, the author exploited his own experiences of consulting research and development in industry. The author's first and most important idea for effective teaching was to let the students enjoy invention. This naturally led the students realizing the importance of creativity. In this report, such items as activities to encourage students move from learning theory to applying it, the students' impression on this lectures and the teacher's impression are described.

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J01 Isaka (IDEA)

Redesign by Reducing the Number of Parts through TRIZ: Break Away from Existing Designs and Enhance Competitiveness on Cost

Yoshiharu Isaka (IDEA Inc.)

Japanese manufacturing companies are being forced to compete with foreign companies while being disadvantaged by external factors such as foreign exchange, oil prices and customs duties. Therefore, in order for them to maintain and enhance their product competitiveness, cost reduction is required more than ever. However, if the uniformed designs with the same structure from before are being continuously used, cost-cutting possibility is limited even when all the necessary requirements are fulfilled at the manufacturing process.
The most efficient measure for reducing cost is, of course, to reduce the number of parts on the design drawings. The simpler the system is, the more the technical advantages can be obtained if an innovative design with reduced parts can be made. To enable that, TRIZ has the "Trimming" method. This presentation will show how the structure of a system, which has been considered impossible to be changed, can be efficiently simplified by using Trimming. In addition, another method other than Trimming will be shown. This method can simplify the structure by setting a new problem, then thinking of problem-solving ideas.
The above-mentioned two part-reducing methods in the system will be explained using simple examples.

J02 Izumi (IZUMI Products)

Design Improvement Methods based on Expert Engineers' Thinking Way: Analysis of Expert engineers Thinking Way based on TRIZ

Heikan Izumi (IZUMI Products Company & WASEDA University),
Manabu Sawaguchi (WASEDA University)

As many of products developments depend on expert engineers, some manufacturers have a feeling of crisis in the lack of expert engineers in Japan. The main difference between expert engineers and other engineers is the difference of skills for functional improvement in design. Though expert engineers have more experience and knowledge than other engineers, we are assuming that the main difference comes from the thinking way for functional improvement. In this study, we have tried to make clear the differences of the thinking ways between expert engineers and other engineers based on TRIZ comparing functional improvements by both engineers. We have proposed design improvement methods in which other engineers can have similar functional improvements as expert engineers.

J03 Mizobuchi (Panasonic)

Study of Development-type TRIZ tool (part 6) Case Study on Smart Little People (SLP)

[TRIZ Spreading/Use Study Group of Japan VE Association Kansai Branch]
Manabu Mizobuchi (Panasonic), Makoto Unno (Kawasaki Heavy Industries, Ltd.)
Kazuyasu Ikeda (Sekisui Engineering Co., Ltd.), Hironori Souda (Panasonic), et al.

In Japan VE Association Kansai Branch, as part of VE technical research, "TRIZ Spreading/Use Study Group" was established in 2003 focusing on TRIZ technique as a means for new value-added creation. With the intention of using VE and a variety of TRIZ techniques in fusion, we have examined various related TRIZ tools extensively. In our Study Group, we consider applications of specific tools expecting to crystallize the method of application and to utilize efficiently at the new product concept planning phase and technical development phase for new value-added creation especially at the manufacturer's side. Since 2006, case studies have been done for precise understanding of various TRIZ tools' features, and this activity is continued till 2011. In this presentation of our 6th case study, the implemented content of last year's case study on "Smart Little People (SLP)" together with the practical and useful knowledge obtained from it will be reported.

J04 Ogata (Olympus)

Promotion of scientific methods including TRIZ (Part 2) Provision of various solutions and visualization for technical issues

Takashi Ogata and Kazuhiro Fujikawa (OLYMPUS Corporation)

OLYMPUS has introduced and promoted QFD, TRIZ, and Taguchi Method as a scientific method for improving the development process since 2009. We had been first introduced to the application of scientific methods in the general procedure, such as QFD -> TRIZ -> Taguchi Method.
However, we found that it was effective to combine the optimal scientific methods depending on the purpose and the development period. As a result, we have been switching to how to provide solutions from the provision of the scientific method. Through this activity, our work steps of TRIZ can be applied

effectively to a variety of purposes and development processes.
In this paper, we report the following results that we have applied the scientific method flexibly in the field of development.
1. Visualization of the fuzzy front end process
2. Effective use of scientific methods by visualizing the technical issues at the start of development.
3. Switching to how to provide solutions from the provision of the scientific method

J05 K. Makino (Waseda Univ.)

An idea quantity evaluation method for idea generation methodology

Koichi Makino and Manabu Sawaguchi (Waseda University)

To generate many ideas is important for development or improvement activities of products or services. In these activities, the meaning of “many” is not so simple, but includes various meanings. When managements select the way to product development or improvement, they need to know what difference rises from the result of idea generation activities, whether they adopt idea generation activities such as TRIZ or not.
This paper proposes an idea quantity evaluation method for idea generation methodology. The proposed method considers the number and variety of ideas. The proposed evaluation formula is verified by generated ideas from a case study. The generated ideas are categorized and the number of ideas is counted. In addition, the formula includes entropy. The number and variety of ideas and entropy lead to the quantity of ideas.

J06 Migita (Resonance IP Firm)

Application of I-TRIZ for "invention strategies”

Shunsuke MIGITA (Resonance IP Firm)

To respond to the competitive environment increasingly stringent in recent years, realization of "a trinity strategy" of business strategy, technological strategy and patent strategy has been strongly demanded. It is also required to create inventions, which are the source of technologies and patents, in a more strategic way. On the other hand, some techniques for the creation of invention have been proposed. In this study, typical techniques such as "a subject-solution schematic diagram", "a thinking development diagram" and Ideation TRIZ (I-TRIZ) are picked up. It is reported that strategic creation of inventions and building of strong patent networks are possible by using properly and combining these techniques. In this paper, a concrete example of "Invention Strategy" to achieve the trinity strategy is presented.

J07 Furumoto (SANNO Inst. of Management)

Research on discovery and solution of bottleneck in business operation activity with the knowledge-creation model (SECI) base that uses TRIZ

Takeshi Furumoto（The Sanno Institute of Management）

This study is a research to which the bottleneck of the business operation is discovered and solved by using TRIZ in the company. TRIZ has been chiefly made a refinement during half a century as "Practicing technology management technique". The thought, the idea, and the approach can be said that it can use it even in the management area, and it use it even by the consultant activity etc. in the business operation. In this study, the discovery and the problem solution of the bottleneck on the business operation that was the management area were tried by applying TRIZ with the novelty as an engineering

research. The problem was able to be specified by the experimental study by using TRIZ with VE and QC in the discovery of the bottleneck of the business operation. Moreover, the solution idea was able to be created by using the TRIZ technique, and to prove the effectiveness of the settlement plan from the questionnaire to the business person concerned in the solution of the problem.
This study was written based on the author's master's thesis reserached at Sawaguchi Laboratory in Business Design & Management Creative Science & Engineering of Waseda University graduate school to which the author was on the register until March, 2012.

J08 Nakagawa (Osaka Gakuin Univ.)

Multiple Modelling to Set Up the Problems/Tasks: Establishing and Penetrating the Methodology of Creative Problem-Solving/Task-Achieving

Toru Nakagawa (Osaka Gakuin University)

Why does TRIZ, a creative problem-solving methodology, not penetrate more smoothly? And, what should we do? -- This is the starting point of the present study. The problem is quite common in nature, and is related to humans, organizations, and society rather than to technology. The present study has made an approach to this problem by building multiple models of the problem situations viewed from different angles.
In Phase 1, I have build models for a person to learn something and for an industry to accept a technique, and further a model where a person learns/applies/masters the TRIZ method under the influences of various information from outside and of TRIZ-related activities in a company. In Phase 2, I have built a model of the activities to be achieved by various TRIZ promoters and users as a whole, and also of the domains where TRIZ applications can be expected in the scale of a country (i.e., Japan). As a result, I obtained the Statement of our General Purpose: "To establish a methodology of creative problem-solving/task-achieving, to spread it widely, and to apply it to problem-solving and task-achieving jobs in various domains in the whole country (and world)".
In Phase 3, I have broken down the General Purpose to build a model of the contents of the methodology to be established and another model of activities for establishing and spreading the methodology. In Phase 4, I am going to model micro-situations of common, real problems which would prevent the penetration and to seek for directions to solve the problems. -- The present approach of using multiple models is still at a stage of initial trial, but it is found easy to understand and useful for obtaining consensus by different groups of people.

J09 K. Hasegawa (Ideation Japan)

Invention value evaluation according to patent information and market information (The 2nd version): “electrical toothbrush” as a case example

**[The Intellectual Property creation research subcommittee of Japan TRIZ Society]
Kimihiko HASEGAWA, Toshimitsu KATAOKA, Shigeru SUZUKI,
Nozomu TAKEUCHI, Narumi NAGASE, and Toshiaki MASAKI**

Inventions enhancing market size or raising market share are recognized to have high technological value, (entitled as useful technology), contributing to the profit in business to satisfy customer needs. On this viewpoint analysis is continuing to specify the value of invention by comparing its patent information with the market information of the corresponding product. In this report the analysis is based on the data of technological trend of electric toothbrush consisting of 520 utility or patent documents published by JPO from 1991 to 2010, as prepared in the previous report, plus the market trend data showing transition of sales amount for the 5 most important manufacturers of the product. Results of analysis on the relationship of the cost accompanied by the inventive activities, including estimated research

development expenditure and procedural payment from application to registration of the patent, with the degree of success of the resulting product in market in terms of market size enhancement or market share increase will be reported. Substantially, the possibility to identify differences of business strategy, research development strategy or intellectual property strategy among companies will be presented by clarifying the transition of object and means of technology from the cause effect relationship model shown in the "invention diagram" elaborated for each invention using technology trend data. Also, the mode of variation in market share of each company as a result of various strategies is to be made clear by examining the change in kind of product and their sales amount from the market trend data.

J10 Yoshizawa (SANNO Inst. of Management)

Analyze "Hot Sellers, Services" with TRIZ, and Investigate the Creation Method for a New Product and Service

[Business & Management TRIZ Application Sub-Team, Japan TRIZ Society]
Ikuo YOSHIZAWA(The SANNO Institute of Management),
Hisataka IZAWA(Sony Corporation), Fumiko KIKUCHI(Pioneer Corporation),
Yasuo MORIYA(FUJITSU Advanced Technologies Ltd.), and
Osamu IKEDA(NIKON Imaging System Inc.)

Most of reported TRIZ applications are for solving technological problems. One of the challenges for TRIZ to be deployed in much wider scale is to prove its capability to help solve business and management problems.
We plan to study methods how to apply TRIZ to tackle business and management problems through analysis of real cases. We intend to make up the guidance for TRIZ application for this purpose. The present report is about our effort and some of its results up to the present time.
As the second round, we applied TRIZ thought and technique to analyze "hot sellers, services" and tried to investigate the creation method of a new product and service. We aimed at the following phases for the examination this time:
1. Identify a business that continues to grow by providing hot sellers, services.
2. Analyze the characteristics of hot sellers, services.
3. Consider whether the application of contradiction elucidation and evolution trend is effective for the creation of hot sellers, services.
4. If effective, devise a process for new product and service creation through application of contradiction elucidation and evolution trend.
We will report the result of the examination phases 1-3 above this time.

J11 Takahara

Radical Thinking for Enumeration and Contradiction

Toshio TAKAHARA ( )

Necessary condition of changing object is to decide adequate granularity of object and to use methods of change correctly. The right enumeration of object and type of methods guarantee right change. Usually we act to change objects remaining unconscious of granularity of object and enumeration of objects. I propose some laws to decide granularity of object. Constraints between granularity and enumeration are shown.

Contradiction is generation and movement of two terms which have relation with outer part. This contradiction or synthesis of the contradiction can approximate

phenomenon to become model of the world and becomes a unit of dialectical logic.
Usually the present contradiction or dialectical logic is for many people that of Hegel, autonomous contradiction by Marx or "Three Laws" by Engels. The re-formulation of contradiction which has a possibility overcoming these usual ones is totally and only based on my generalization of contradiction of TRIZ by G. S. Altshuller which is briefly summarized in "Essence of TRIZ in 50 Words" by NAKAGAWA.
Contradiction is either generalized "Physical Contradiction" which two attributes are going together or "Technical Contradiction" which two values are resolving differences according to density.

J12 Nagase (Sony)

Proposal of how to work out your ideas using TRIZ method

Narumi NAGASE（SONY Corporation）

When engineers utilize TRIZ for devising solutions of problems or inventing within a team, they tend to aim at many ideas coming from brainstorming. They study various aspects with all the members and make various suggestions, then they would get contentment or accomplishment when they have reached a certain amount of ideas on the table. After that, they prioritize those ideas from the point of view of ROI or compatibility of existing technologies. As the result, they conclude to choose some of the ideas.
On the other hand, the many ideas which were not chosen fade away. However, there are some ways to utilize those ideas which were not chosen. In this presentation, we propose a practical approach using TRIZ method for the convergence to maximize various suggestions and ideas.

J13 Kobayashi (THK)

Application of USIT to the Problem of Seismic Isolation of Water Tank

**[MPUF (Microsoft Project Users Forum) USIT/TRIZ Study Group Working Group]
Hisao Kobayashi (THK Co.), Kazushige Aoki *, Tatsuhiko Atsuta *,
Shoichi Ishii (THK Co.), Hideki Ohmori *, Fumiko Kikuchi (Pioneer Corp.) ,
Takashi Shikata (KUBOTA Corp.), Noritaka Nakayama*, Hirotake Makino *,
Yuji Mihara (Creative Technology Institute Co.)**

* Member of USIT/TRIZ Study Group, whose affiliation is not shown.

As one of the activities in MPUF (Microsoft Project Users Forum) USIT/TRIZ working group, we focused on why seismic isolated structure of water tanks had never been installed at sufficient quantities even though many water tanks were damaged in East Japan Earthquake Disaster.
The technical difficulty of water tanks is different from that of buildings and instruments. Therefore we challenged the subject to solve this problem using USIT in this report.
Promotion of seismic isolated structure, which is well known as anti-earthquake measures, was challenged. Under the business environment, this was not challenged due to its high technical difficulty. Therefore much more effort is required to innovate under the existing conditions.
It is considered that clarifying the technical problems by USIT has greatly contributed to creating innovations.
A seismic isolated structure is one of the methods which can reduce the vibration using the difference of characteristic frequencies between the water tank and the ground (building). Therefore it is generally installed between the water tank and the ground (building). Problem analysis using USIT found some locations where the characteristic frequencies can be changed.
We introduce how to create innovative ideas regarding to the water tank using USIT, even though they thought that the seismic isolated structure of water tank was impossible.

J14 Takagi (Sony)

Symbolize TRIZ 40 Principles

Yoshinori Takagi (Sony Corp.)

As you know, TRIZ 40 inventive principles is a basic & very powerful tool. 40 is too many to memorize, but, very easy to use if you can know it by heart. Then, I symbolized 40 principles. For example, 1st "Segmentation Principle" is represented by a couple of hemisphere, which separated by "1". 2nd "Taking Out" is represented by a large Circle and a small filled Circle. 3rd"Local quality" is represented by a Triangle with 1 colored corner. As a result, the increased availability of matrix and contradiction, made it easier to reverse TRIZ. Also contributed to improve the productivity of the idea creator

J15 H. Makino (MPUF)

A trial to use TRIZ for risk management

Hirotake Makino (MPUF)

Since there is an effect which extends thinking in TRIZ, it is used in many technical fields. On the other hand, risk analysis process of risk management needs that effect. This process is recognized as for it being important to improve the sensitivity over a risk, but the process is now developing. I tried to apply some of TRIZ methods to this process. When I used TRIZ, I combined some of the methods which included 9-windows and ultimate ideal solution, and extended them. The concept of S-shaped curve was applied for the convergence of the idea. Probably, some people think that TRIZ and risk management are completely different categories. But, I want to develop a new world by paying attention to and uniting the points of comparison in a different field.

J19 Kasuya (Yamaguchi Univ. & Proengineer)

Devised contents in the elaboration stage of the "Creation design engineering" project currently taught at Yamaguchi University

Shigeru Kasuya (Yamaguchi University & Proengineer)

It is highly expected that even the academic organizations such as universities would focus on "The Creativity Education" which connects with "the product manufacturing" as the practical action taken in the industrial world.
In this project called "Creative design engineering", the students at Yamaguchi University can develop their interest in and motivation towards the manufacturing in the special product creating education with the appropriate design method and systematically learn various methodologies including marketing, QFD, TRIZ and so on that help develop their creativity.
This project helps the students build a foundation on which their sense of independence is enhanced by giving them the opportunities of the creative enlightenment with PDCA cycle and some creative work.
In this report, the "Creative design engineering" project containing TRIZ and has been continued for

seven years is related with the spontaneous motivation attachment (motivation) factor to a student, and the verified result is explained about the point which were devised from the educational viewpoint.

J20 Sawaguchi (Waseda Univ.)

The Possibility of the Workshops for Engineers based on TRIZ to Facilitate Innovation Power

Manabu Sawaguchi (WASEDA University)

These days, Japanese companies have a lot of challenges regarding “Product planning power” and “Innovation activities”. Nevertheless, they still focus on the workshops for engineers based on “Catch-up strategies” to chase the efficiency of production site and cost reduction of products. On the other hand, some of them are expecting TRIZ to facilitate innovation power through the TRIZ-oriented new workshops for engineers and its practice activities. Therefore, validating the effectiveness of “the new workshops” with classical TRIZ techniques at “East Japan Railway Company”, I would like to consider “the possibility to facilitate innovation” in this study.
Finally, introducing one of my classes focusing on the product development managements with some TRIZ techniques at the graduate school, I’m going to refer the synergy effects between the trainings in corporation and the educations for graduate students at the engineering department.

J21 Okada (Hitachi)

Development of Methods Cooperating TRIZ and KT

Satoshi Okada and Setsuo Arita (Hitachi, Ltd.)

Combinations of TRIZ which is used for technical breakthroughs and KT which is used for systematic decision making are applied to solve technical problems in Hitachi. There are many problem solving methods, such as problem solving, technical evolution prediction, and failure prediction and analysis etc., in TRIZ. On the other hand, KT has various methods, such as situation analysis, problem analysis, determination analysis, and potential problem analysis. Combinations of TRIZ and KT are also useful for practical uses, such as development strategies, research and development, and countermeasures against product failure. We reviewed various combination patterns of TRIZ and KT in application cases in Hitachi. Finally, guidelines for combinations of TRIZ and KT for solving problems effectively are developed.

J22 Nakamikawa (Hitachi)

A Simple Method for Future Technology Prediction

Tetsuaki Nakamikawa (Hitachi, Ltd.)

DE is known as a method for future technology prediction based on TRIZ. We have tried to apply and enhance the original DE method since 2003, and now introduce a new method for future technology prediction. The new method is formed in four steps. The first step is problem definition, the second is S-curve judgment, the third is S-curve change trial, and the last is decision making. The main target of this new method is research and development engineers. By using this simplified method, engineers can define their own problem and make their own prediction themselves. So, they can break away the psychological inertia of the current development line.

J23 Kosha (USIT Manufacturing Technology Support)

Method for structuring powerful technological barrier from prior pinpoint patents (Application of Fujifilm style USIT's thinking way on the square rice cake patents)

Hideaki Kosha (USIT Manufacturing Technology Support)

Satosyokuhin was ordered to pay 800 million yen in compensation concerning the square rice cake side slit case last March. The author et al. tried to create technological concepts which circumvent the patents of Echigoseika (the complainant) by using TRIZ thinking. As a consequence, we could create more than 30 new technical concepts.
The rice cake manufacturers' prior patents seem to focus only on the instance of rice cake cracking. They may have a "Psychological Inertia" of "The cause of anomaly lies in the changing point from anomaly to normal" because of their troubleshooting way for the manufacturing process.
The point of this approach is to imagine and illustrate the phenomena in baking rice cakes from the beginning to the end carefully. Spatial and temporal viewpoints show us the systematic idea generation area framework to offer us a clear thinking guideline. Hence, we found that we could get a powerful technical barrier which was formerly inconceivable to rice cake manufacturers.

J24 Koshimizu (AIIT)

TRIZ/USIT Education at AIIT

Shigeomi Koshimizu (Advanced Institute of Industrial Technology)

AIIT (Advanced Institute of Industrial Technology) is a professional graduate school founded in 2006. The lecture of Conceptual Design Engineering, introduced in 2010, focuses on inventive problem-solving theories such as TRIZ/USIT. This report covers USIT exercises conducted during a lecture held in 2010. The USIT exercises spanned over seven classes (90 minutes per class). 30 students were divided into teams of six. They chose a product, identified its problem, and worked to solve the problem using USIT methodology. The exercises involved applying USIT methods to define and analyze a problem, and then create a solution. In fact, students came up with a number of unique solutions and presented them to their peers. After the presentation, students were asked in a survey to identify the USIT method they found useful. The Uniqueness Method and the Particles Method scored highest in the survey. This result suggests that coming up with various viewpoints and approaches to analyzing a problem leads to a solution. Creativity is not a gift of nature: it can be enhanced by methods, techniques, and support tools.

J25 Yamamoto (Shinwa Controls)

Reduction of Footprint Size of Industrial Air Conditioner through TRIZ

Kenji Nishimura, Masakazu Kuroki, Mayumi Ikeda, and ○ Takuji Yamamoto (Shinwa Controls Co., Ltd.)

One of the strong demands from device manufacturers of semiconductor or FPD is the compacting of machines (reducing the footprints of machines), which makes it possible to place the manufacturing equipment efficiently in limited locations. We, with the task aimed at reducing the footprints of air-conditioning systems, adopted TRIZ as a method of problem solving technique, which enabled us to reduce the footprints of machines by 50% compared to conventional products.

J26 H. Hasegawa (Shibaura Inst. of Tech.)

Creative and Inventive Thinking Process for Promoting a Qualitative Change

Hiroshi Hasegawa (Shibaura Institute of Technology)

Most inventions were composed of combination of existing technologies, and it was reasoned by Altshuller that new invention or discovery was less than 1%. Therefore, the creative design solution can be defined as a new combination of existing elements (functions or technologies), which is believed to have an edge on others, by a user (a designer or development team). For creation of this design solution, a new function Fn = G(R, T) is obtained by inputting requirement R and its technology T as a design solution to the creative and inventive thinking process G( ). If a requirement with no solution or a contradiction between requirements is solved by G( ), G( ) can promote a qualitative change for a product. In this paper, support systems—CDSS and FSA—for a creation of a function and an exploration of a new combination of functions are presented and findings are described.

J27 Kurosawa

Positioning of TRIZ in the system of the Science

Kurosawa, Shinsuke

When G. S. Altshuller founded TRIZ, he intended to establish something new and different from traditional branches of the Science. Now, after half a century, some of his students try to prove that TRIZ is counted in the rank of sciences. What has happened in between? We do not see a principal change in TRIZ during its history. The only difference is between attitudes of Altshuller and some of contemporary TRIZ specialists. There is no chance for TRIZ to become a part of the Science through efforts to make it look like, typically, physics or geometry. TRIZ should not be anything like other learning and stay thoroughly itself in order that it is accepted as a part of the Science. The task of TRIZ students is not to make it welcomed by the established academic society but to change the existing notion of the Science by identifying the deficiencies of today's sciences and by reaffirming how TRIZ can improve the situation.

The Science cannot be other than a tool for better human life. However, in a stage of its history when it decided to become value-free and, thus, to handle solely abstract pieces of knowledge, it started to forget its own purpose. The Objectiveness of the modern science has helped it achieve incredible results that have changed the surface of the Earth. However, the same Objectiveness has proved to be its disadvantages and makes it powerless in solving complex problems of the contemporary life with multiple values. Because sciences do not know the value, they cannot help people to increase values of their lives. The author believes that TRIZ is a method that helps change knowledge into values for human lives and proposes a rough sketch of TRIZ in the system of the Science as a tool for life.

Key findings:

1. Notwithstanding different definitions of science about its objectiveness, a science is useless if it does not serve for subjective lives of people. In other words, it should help increase values for people, which are always subjective.
2. Modern sciences chose the way to endeavor for enrichment of value-free knowledge and, thus, have lost possibilities to be valuable in its own right.
3. In Europe, when Christianity lost power to dictate values, the science found itself without a guide that dictates directions in the world of relativity of values.
4. TRIZ has a possibility to stand in between multiple human values and traditional sciences and thus change the whole structure of the Science to make it human in the sense that it serves for values of human lives.

J28 Ishii (IdeaPlant)

An idea-generation workshop with TRIZ Cards (Chie Cards)

Rikie Ishii (IDEAPLANT, Japan) and
Jaeho Park (Yeungnam University, Korea)

Game-based idea generation workshops have been conducted in two cultures – Japan and Korea. Simplified 40 TRIZ game cards (Chie cards) have been used for 88 people (undergraduate, graduate as well as researchers in Think Tank Organization) in Korea and 128 people in Japan (employees of auto parts, electronics, precision machinery and power companies). Subjects of each culture were divided into 4 person's teams and the workshop took about 60-90 minutes. The team members played TRIZ cards according to rules and to generate "Ideas of a new trash container" and "Ideas to reduce traffic jam" competitively. Subjects in both cultures were novel to TRIZ methods, however they found this game-based idea generation method (TRIZ cards) productive, interesting and pleasant.

J29 Ono (Chiba Institute of Technlology)

The Equation of Creation
An educational program on creativity developed for small business –

Shuitiro Ono, Tsutomu Ohta, Yutaka Sirai, Hiroyuki Ono
(Chiba Institute of Technology)

The educational program developed in the project 'Development of educational program of creativity for regional small business' supported by Ministry of Education, Culture, Sports, Science and Technology is presented as a text book entitled 'the equation of creation', a DVD video in the same title and the question list for the group discussion. The program is based on the equation of creation as K→A＊B＝N, which describes the creative process. K is the clue to start the creative process, A and B are 2 already known information elements, A, one of which is specified from K, then B is searched in the vast information region of the creator's mind, thereafter A and B are combined to produce N, the new information element. Several hundreds of creative cases obtained by hearing from staffs in private companies, by questionnaire survey from students and graduates of Department of Management Information Science, Chiba Institute of Technology, and from internet web-sites, books and TV, have been applied to the equation of creation to produce sets of 4 parameters, K, A, B, N. The relationship among these 4 parameters has been examined to systematize the creative process. The combination type which means the relationship between A and B were categorized as 26 types. A new parameter, the sense of distance between A and B was found to be useful to categorize the level of creation.