Sixth TRIZ Symposium in Japan, 2010

Collection of Abstracts of All the Presentations from Japan

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Program Committee

JI03 -Zenko(IDEA) (Tutorial)

Tutorial: "Let's Know TRIZ"

Mamoru Zenko (IDEA, Co., Ltd.)

A dozen or so years have passed since TRIZ arrived in Japan, and here also, considerable research has evolved into "usable TRIZ." At first, many people in companies were complaining not to be able to produce results as they would like because of the complex theoretical system of TRIZ, but after making all kinds of efforts and studies, the application of TRIZ which leads to results have been spreading. The introduction of TRIZ is expanding regardless of the scale of operation from usage centered at large enterprises to new introductions at small and medium-sized enterprises. Also, as for the introducing industry sectors, the usage of TRIZ is expanding from electrical equipment, auto and machinery to fields such as medical equipment, machine tool, food and software. Such being the case, an overview of TRIZ as a fundamental knowledge for newcomers to TRIZ will be presented. This talk will consist of 3 parts, namely, (1) Why TRIZ is needed? (2) How to think for idea generation? and (3) How to generate good ideas?, which will be explained through its benefits and concrete way of thinking, and also through practical product cases in terms understandable also to those who hear about TRIZ for the first time.

JI04 -Sawaguchi(WASEDA University) (Special Lecture)

Application of TRIZ for Product Planning

- Development of Innovation-oriented TRIZ-

Dr. Manabu Sawaguchi
(WASEDA University, Graduate School of Creative Science and Engineering),

It was found from the result of my previous study that Japanese manufactures are confident in both "Quality Control Techniques" and "Development Power of New Technologies", in the meantime, face challenges in connection with both "New Product Panning System" and "Innovation Power".

However, Japanese manufactures should not continue "catch-up strategy", which always focuses on high quality of product with reasonable price to insure product value, because they have to avoid a comeback by developing countries like "BRICs". That is to say, BRICs have an ability to realize "high quality of product with low cost" already. Under the circumstances, they are out of options but to be "a front runner" in overseas markets, implementing "Product Innovation" to create innovative new products effectively.

Therefore, I think that it's very important for them to build up effective "Innovation Oriented TRIZ=Systematic Innovation Approach (SIA)" with utilization of "limited Management Resources".

Let TRIZ now come to "this field" (to realize a front runner strategy) as "a big role" to build up "SIA".

In order to realize "SIA" based on TRIZ, I want to introduce "a model of SIA", which combines TRIZ method, some marketing techniques and functional analysis in VE to plan and develop innovative products systematically, in this presentation.

JI05 -Yamaguchi(MOST) (Special Lecture)

TRIZ for Managers

Kazuya Yamaguchi (MOST, LLC)

Since 2000, TRIZ activities have been expanding gradually, but the speed of expansion is slow. From the viewpoint that TRIZ is very effective, the gap between the above and how it should be seems to be tremendous. The main reason for this seems to be that TRIZ has been used just as a mere tool for "Inventive Problem Solving" by engineers, and people including managers up to the top executives of companies have failed to recognize it as an indispensable part for the company's organized activities.

And, taking the changing times into account, most of the top executives of companies usually braced themselves in a dashing manner and produced good results without finding a great tool like TRIZ. Consequently, they have no thought about TRIZ or things like that at management, and firmly believe that to brace oneself in a dashing manner is the fundamental for producing good results. Managers are required to learn the current status well, define their roles for themselves as managers in the companies, and take active procedures to break out of the status quo. And for that, it becomes important how to think about TRIZ as a manager, how to talk around the top executives and/or subordinates, and how to set the environment to utilize TRIZ. These points will be presented together with the combined application with QFD and quality engineering as "TRIZ for Managers" useful for management through the present writer's experience.

JI06 –Kataoka(Patbrain) (Special Lecture)

Intellectual Property Strategy of TRIZ Usage and Practice

Toshimitsu Kataoka (Patbrain, Co., Ltd.)

Titled "Explosive Spread of Super Inventing Art – US Taking Off its Hat to This Russian-born Method," TRIZ was introduced in the May 3rd, 1997 issue of Nikkei Mechanical. As this was a specialized mechanical magazine, many people accepted TRIZ as a potent tool for technical problem solving. Since then, though about 10 years have passed, this situation hasn't changed. Many of the people from intellectual property also have nearly the same perspectives, and they don't look upon TRIZ as an important weapon for intellectual property problem solving. When it comes to intellectual property right acquisition, intellectual property problem or intellectual property strategy, people in any sector try to solve problems turning to means other than TRIZ because they are related with legislation. What a waste! TRIZ will adjust the direction of vectors for management strategy, technology strategy and intellectual property strategy, and will supplement each other. Such being the case, it will be illustrated using cases how TRIZ can advantage intellectual property strategy.

JI07 -Shonai(Hitachi) (Special Lecture)

How to use TRIZ in software and IT problem solving

Toru Shonai, (Hitachi) 、 Yojiro Fukushima

We hope that TRIZ can be used effectively in software and IT fields because TRIZ is said to be useful for the creativity reinforcement in general. However, when software and IT engineers actually tried to use TRIZ in their own problem solving, it does not go well sometimes and some beginners hesitate to use any more. Because TRIZ is based on the basic study of many actual inventions in many fields, it seems that it is applicable even to these fields. But, TRIZ shows no detailed algorithms for idea creation at all. It shows only directions in which deep consideration should be made to get their ideas. Because TRIZ cannot replace our creative thinking, application results depend greatly on those who apply. After a lot of experience of TRIZ application in the fields, some understood a basic part of TRIZ is to apply as it is and efforts have to be made to tailor TRIZ tools to use them in software and IT fields smoothly. In this lecture, we will explain the methods for lowering the wall that software/IT engineers face when they apply TRIZ to their own problems. For instance, the replacement of the characteristic parameter terms in the contradiction table by terms in their fields, extended concepts of the invention principles, case studies of the invention principles in software and IT field, and application example of

evolution patterns in the fields and so on. The TRIZ tools that are not limited to fields such as physics, chemistries, and machines, for instance, function diagram, operators, attribute analysis, SLP and so on can be applicable in software and IT fields as they are originally..

JI08 -Nakagawa(Osaka Gakuin University) (Special Lecture)

Education with TRIZ: For New Perspectives

Toru Nakagawa (Osaka Gakuin University)

TRIZ, a methodology of creative problem solving, has been promoted in Japan mainly in the field of technology and towards industrial engineers. It should be necessary and useful, however, to enhance its promotion in the field of education both in higher education and middle and primary education. For this purpose Japan TRIZ Society has recently started the "Education with TRIZ" Study Group. In the present paper I would like to overview different approaches/experiences done by people in Japan and overseas, including by myself, and make new perspectives for the future.

The first main field is the education and research of/with TRIZ in the universities and graduate schools. It is necessary not only to teach knowledge and techniques of TRIZ, but also to cultivate capabilities of creative problem solving, of comprehension of overall process of developing technologies and products, and of handling large, complex problems. The research and further development of the TRIZ methodology is also needed.

The second main field is the introduction of creative thinking way of TRIZ into secondary and primary education. In this case, it is essential to choose suitable contents and styles of teaching depending on the interest and maturity of the pupils. Attracting their interest is most important, and hence we need to choose proper topics and materials. Since classes for children have been developed and carried out in Russia etc., we would like to learn such experiences. Concerning to the education with TRIZ, it should be effective and helpful for us to go out and learn from various people working for education of creative thinking outside TRIZ.

J01 -Kuwahara(IDEA)

How to Make Good Concepts from Your Ideas Created by TRIZ

Masahiro Kuwahara (IDEA Ltd., Japan)

TRIZ is a strong idea process where ideas to solve technological problems are invented.

Up to now, I have explained how to clarify the root cause, how to formulate the contradictions hidden there, how to advance by imaging the best form of future systems, etc. in order to use TRIZ more effectively.

This time, I will present the way of thinking and method how to systematically select and unite the many ideas thus generated using the improvement of the electric shaver as an example.

In the past, “good ideas” have been extracted only by the goal attainment level in the QCD aspect for selecting excellent ideas, but this time, I will explain about “making ideas effective,” with which you can more effectively shape into a realistic/strategic concepts by applying affinity diagram and Pugh’s concept selection method and taking in the ideality evaluation thought of TRIZ. This approach may be understood by an analogy of making up a delicious dish from all the ideas, imaging them as cooking ingredients.

J02- Isaka (IDEA)

Development of New Products through Concept Mining and TRIZ

- Thinking of New Innovations for Golf Course Lawn Mowers -

Yoshiharu Isaka (IDEA Corporation)

At the fifth TRIZ Symposium, we presented an application case of concept mining and TRIZ methods, taking up a small-sized cultivator as an example. The purpose of using these methods was to create new competitive value criteria in marketing to replace the current competitive value criteria that are based on slight function or price differences.
This time, we took up an industrial product as an extended application example and the purpose was to show that we could obtain new concepts even through a B2B product.
There have only been a few cases in which concept mining and TRIZ have been applied to B2B products. However, we plan to use a lawn mower (a B2B product) and methodically introduce how we can make the best use of the TRIZ method to solve technical problems, which are technical bottlenecks in creating new competitive value criteria.
We believe this demonstration will definitely show that concept mining and TRIZ are effective and essential methods for the creation of new products, which suggest future value and materialize it throughout the processes, from making product concept to finding concrete and definite solutions for technological problems.

J03- Miyanishi (Kenroku Jr High)

Let's think in Little People's and Person's Worlds! A Summer Homework by Son and Father with TRIZ (2nd Time)

Kai Miyanishi (2nd Grader, Kenroku Junior High School /Son)

[Presenter:] Katsuya Miyanishi (/Father)

”One day, a screw that stuck to a magnet was magnetized. Why? Can I make a permanent magnet?”
The youngest son, who had seen the eldest son's research on water strider, also wanted to try TRIZ. We will report our process of the 2nd research worked together especially with the guidance of TRIZ-thinking by father. The purpose of the present study is obtaining of deep understanding of the principle and a certain experimental methodology. It is achieved by analyzing a technical problem "Magnetization of Metal" in detail by obtaining the hint from the experience of daily life, and producing the experimental methodology. Moreover, we challenged the idea-making of an original merchandise this time. As special mention, we also used some techniques this time not used in the research of the water strider. Conception method by "SLP (Smart Little People) and personification", Analysis method by "T1:T2:T3 (Analysis at time-domain)", "Attribute Listing" and "Substance-Field Analysis", et al. were used this time. We recognized that the hint to solutions for technical problem existed in usual life and our experience. And, when creatively acting with the child, we strongly appeal that the following matters are important. 1: Enjoy it together, not teaching. 2: Using methods isn't the purpose. 3: Moderate "Volume" and "Speed" 4: Continue the motivation of "Curiosity and happiness" by "Praise and Admitting".

J04- Maeda (Takumi System Architects)

Japan-oriented Creative Monozukuri (manufacturing and production) with TRIZ

Takuo Maeda (Takumi System Architects, Ltd.)

Industries, such as automobiles, digital electronic appliances, mother machines, have been producing the highest quality products in the world and having the symbolic status of the strong Japan through "monozukuri". Monozukuri itself just means to make something, that is, to manufacture and produce goods. Today "monozukuri" has a broader meaning including development, production, procurement, service and recycle of products in high qualities.
Monozukuri has been created and improved by hardworking efforts for many years to get the global competitiveness. The efforts are very sophisticated based on the Japanese tradition to produce very fine products. In the modern industries including automobile manufacturing, these efforts are sometimes called "suriawase", have done through lots of engineers cross companies sitting together. This style of effort is intangible, especially by foreigners. However, it seems to have been the key of the strong monozukuri.

Now, growing needs of globally single market and ecological requirements are major drivers for new products. For example, electrical automobile is a typical emerging product to the near future. It requires less suriawase efforts because it is designed based on the modular architecture, integrates less number of parts which are procured openly and globally. Typical suriawase efforts will be less than now, resulting Japanese products might become weaker rapidly.

Additionally, products with embedded software have the critical problem. Because new products require more software to add new features with it, then embedded software will become large-scaled and very complicated. More software engineers are required because of less productivity of software development and additional efforts, then software supply falls into negative spiral, never coming up to the surface. Modern software development requires very structured approach with strategically reused software components based on modular architecture under the globally shared process on the network, which seems to be a virtually-configured logical software factory. Japanese software used to be delivered derivatively through generations from an original source code. It would become more difficult in case of delivering more large-scale software products.

These issues are very critical to Japanese monozukuri. They should be resolved urgently with the bird-eyed and monozukuri strategically reconstructed to produce very qualified products with embedded software through redesigned products and processes. Requirements for the future monozukuri need to be redefined in global perspectives, including product and software engineering process, shared and collaborative resources with globally and highly qualified people and network, and visible, easier and productive suriawase of technical and management process. Japanese intangible skills to have produced very qualified products will be built into the newly defined tangible processes to make products competitive. TRIZ tools, such as, evolution trends, contradiction matrix, and others, will be used for creating new products and accelerating processes creatively.

J05- Ishida (Hitachi Consulting)

Evaluation of Methods for Creativity by Applying the TRIZ-based Business Idea Database to Business Problem Solving

Atsuko Ishida (Hitachi Consulting Co., Ltd.)

Methods and tools which support improving creativity and innovation are compared and evaluated. View points for evaluation are four essential elements for creativity which were got by applying the TRIZ-based Business Idea Database to three business problems. These are ‘Abstraction’, ‘Flexibility’, ‘Experience’ and ‘Comprehensibleness’. Firstly, IDEO’s Ten Faces of Innovation is studied as the best practice. With the result four methods for creativity are evaluated. The first one is “Crowdsourcing” which is useful for ‘Abstraction’, ‘Flexibility’ and ‘Experience’. The second one is “Ethnography” which is useful for ‘Experience’ and ‘Comprehensibleness’. The third one is “Bloom’s taxonomy revised in 2001” which is useful for ‘Abstraction’, ‘Flexibility’ and ‘Experience’. The last one is “the Equivalent Transformational thinking method” which is useful for ‘Abstraction’, ‘Flexibility’ and ‘Experience’. In addition, how to improve ‘Comprehensibleness’ which is not noticed is proposed.

J06- Takahara

The Ideal of TRIZ
TRIZ as the Way of Life? Part 2

Toshio Takahara

TRIZ could be applicable to every area including technological area and institutional area because TRIZ is an assemblage of methods consisting of changing one attribute, solving contradictions, segmenting and merging of attributes and objects, as I presented at the 4th Japan TRIZ Symposium. This paper surveys an idea of object, methods and thought of TRIZ. I will investigate the movement of objects of consciousness at the beginning

process of barter as an example in the area which usual TRIZ does not deal with. And I will show unified four types of realization of purposes and propose a radical thinking for enumeration.

J07- Sanjou (DOCOMO Systems)

A Practical-type Approach Applying TRIZ to the Mind Field
- Toward the Establishment of a TRIZ Mind Training -

Hideto Sanjou (DOCOMO Systems, Inc.)
Yukie Hanaoka (Wisdom, Inc.)

Comparing and selecting various tools for strengthening the problem-solving thought in the mind field such as employee training in companies, eliminating individual's worries, etc., TRIZ, which aids creative thinking, has proved useful. Psychological conflicts were cleared up following the TRIZ technique, psychological changes were predicted and the 40 Inventive Principles were applied for an approach to the creative ideal result that is not trapped by stereotypical views. As there were parts difficult to apply to the mind field with the traditional TRIZ technique only, an integration with tools which have been used in the mind field followed by optimization made it possible to establish a new field of "TRIZ Mind Training."

J08- Kurosawa

What are "The Laws of Systems Evolution"
TRIZ, Phenomenology and the General Systems Theory

Kurosawa, Shinsuke

The author discusses plans to strengthen TRIZ theory regarding two of its fundamental issues;

The Laws of Systems Evolution are the foundation of TRIZ. However, the author cannot agree with the TRIZ community's general understanding that the laws rule the Objective World just like the Laws of physics. In author's understanding there is a transcendental and dynamic organic structure in the human consciousness just like there is an organic structure in the human body when a person is born. The author tries to identify what the set of TRIZ Laws of Evolution discloses about the structure of consciousness.

The System is one of the fundamental concepts of TRIZ. In 1950s Ludwig von Bertalanffy founded the General Systems Theory. Many of his ideas are applicable to TRIZ systems. But as long as the System is understood as an object in the Objective World, it is not possible to realize how such thing as *General* Systems can be conceived. The author tries to identify what are the TRIZ systems in the above mentioned structure of human consciousness.

J09- Hasegawa (IP Creation Study Group)

Analysis of Inventions in Patent Journals -The 3rd version

[Intellectual Property Creation Study Group, Japan TRIZ Society]
Kimihiko Hasegawa, Nozomu Takeuchi, Teruyuki Kamimura,
Toshimitsu Kataoka, Narumi Nagase, Shigeru Suzuki,
Atsushi Nagayama, Hiroshi Ueda, Toshiaki Masaki,

In the 4th TRIZ Symposium in Japan, we presented the "invention analysis sheets," which summarized the result of our analysis of inventions disclosed in the selected Japanese patent journals in several technical fields, from a viewpoint of how the inventions solved specific technical contradictions. In the 5th TRIZ Symposium, we presented - as supplements for the above-mentioned "invention analysis sheets" - the "analysis memorandum

sheets," which showed our comments on how we analyzed the inventions and the original text of portions of the patent journals we used as the basis for our invention analysis.

In this 6th TRIZ Symposium, we present the result of our new analysis of total 100 inventions including the previous inventions and new additional inventions, not only from the previous viewpoint of how to solve technical contradictions but also from a new viewpoint of how each technology evolved along specific patterns/trends of technical evolution as a result of solving the contradictions.

For each invention, we selected one or more patterns/trends of technical evolution which seemed to us to be suitably applicable to the invention, from the 19 patterns according to Invention Machine Corp., the 12 patterns according to Ideation International Inc. and the 35 trends according to Darrell Mann.

J10- Yoshizawa (SANNO Inst. Management)

An Application of TRIZ Way of Thinking and Its Tools to Develop a New Business Model

Business & Management TRIZ Application Sub-Team, Japan TRIZ Society:

Ikuo YOSHIZAWA (The SANNO Institute of Management), Kimihiko HASEGAWA (Ideation Japan Inc.), Akira SATO(Keio University), Shigeru KUNO (NKN Consulting CO., LTD), Yasuo MORIYA (FUJITSU ADVANCED TECHNOLOGIES, LTD.), Takuo MAEDA (Takumi System Architects, Ltd.), Teruyuki KAMIMURA (Willfort International Patent Attorneys), Fumiko KIKUCHI (Pioneer Corporation), Osamu IKEDA (NIKON Corporation), Hisataka IZAWA (Sony Corporation)

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.

The B & M Application Sub-Team of the Japan TRIZ Society was organized two years ago to address this challenge. We plan to study methods how to apply TRIZ to tackle business and management problems through analysis of real life cases. We intend to make up the guidance for TRIZ application for the purpose. The present report is about our effort up to the present time and some of its results. The subject we choose is "TRIZ application for developing a new model of business that brings in the best economic performance for a given product."

We divided the process of our study into the following 5 phases;

1. Selection of the target. (A product or a field of business)
2. Understanding the present situation (Interviews and analysis of available information)
3. Drawing a scheme for developing a new business model.
4. Developing a business model based on the scheme.
5. Presentation of the model and the evaluation. (Presentation to subject matter experts and interviews)

We choose as our first target "the Large-Screen Television System". This report focuses on the above-mentioned phase 3 in the course of our study and clarifies a basic scheme of developing a new business model. This report also provides the results of our research for identifying the components of the new business model for "the Large-Screen Television System," which we have developed using the above-mentioned basic scheme and based on the result of our previously-conducted study at phases 1 and 2.

The content of the report in fiscal year 2010 makes four of the examination phases a nucleus, locates a new business model in the time axis, and reports on the result of review of the concept construction of a short-term, mid/long-term business model. In addition, it reports on the evaluation result in which the concept of a short-term business model is made a nucleus and the content is presented to the large-scale vision entrepreneurs.

J11- Kosha (MPUF USIT/TRIZ Study Team)

Study on USIT Operators Application Examples (2)

[MPUF-USIT/TRIZ Study team]

Hideaki Kosha, Yuji Mihara, Noritaka Nakayama,

Toru Nakagawa, Kouichi Nakamura, Hirotake Makino, Kazushige Aoki,

Hideki Oomori, Tatsuhiko Atsuta, Tsuyoshi Todome

The aim of our study team is to offer a guide for USIT users to utilize the USIT Operators. The USIT Operators were developed as clues to generate technical ideas from the viewpoint of Object-Attribute-Function relationship.

From a hundred and several tens of reverse engineering analyzed examples, we realized the following:

1) Technical problems of familiar products seldom meet "functional level unstable"

2) Descriptions of plausible root causes vary among members -> difficult to standardize

To complete USIT Operators' Application Examples, we will continue the following works:

1) Expanding the scope of examples

2) Making out a guide for extracting plausible root causes

3) Verification of USIT Operators' Application Examples

J12- Izawa,(SONY)

Approach of Reverse TRIZ Using Industry System Newspaper Articles

Hisataka Izawa, Narumi Nagase, Shusei Kunitomo
(Development Engineering Section, Sony Corporation)

The problem solving that uses the TRIZ method is effective for the improvement of the product and the technology. In addition, it is effective for the problem solving in the research and development stage without the experience enough.

However, it starts solving it only by experiencing his/her specialized field for the person who doesn't know knowledge and the use method of TRIZ. Cases and the explanations of TRIZ that offers them easiness to understand and sympathy are requested.

However, it is not easy. In the research and development, the specialized field of anyone is narrow. On the other hand, the entire section takes up various topics widely.

An approach which offered them an attractive explanation has begun. An industry system newspaper that is familiar with latest information is used. Development articles on the corresponding technology are extracted. Next, it arranges it adding the analysis with TRIZ. Case and explanations of TRIZ are made.

Those who research and develop it learn cases and explanations of their own specialized fields.

It introduces understanding by a current content of execution and a continuous approach.

J13- Hasagawa(Konica Minolta BT)

Expansion of USIT Operators' Matrix to Software Technical Domain

Satoshi Hasegawa, Shoichi Tsuge, Tateki Oka

(Konica Minolta Business Technologies, Inc)

We originally arranged USIT operators as a table (USIT operator matrix) and applied it to technology development and products development stages to promote efficiency of the development. In addition, we extracted frequently-used USIT operators from the application patent investigation of the electrophotograph technical domain and planned promotion of efficiency in generating ideas in combination with the USIT operator

matrix. Furthermore, we extracted frequently-used USIT operators from the application patent investigation of the software technical domain and arranged the USIT operator matrix to generate ideas effectively in the software technical domain.

J15- Matsueda (JR West)

Study of Development-type TRIZ tool (part 4)

– Case Study on Substance-Field Analysis / Standard Inventive Solutions –

TRIZ Spreading/Use Study Group of Japan VE Association Kansai Branch
Shinichi Matsueda (West Japan Railway Company)
Satoshi Hirono (OMRON Corporation)
Hideaki Masaki (Nitto Denko Corporation)
Makoto Unno (Kawasaki Heavy Industries, Ltd)
Kazuyasu Ikeda (Sekisui Engineering Co., Ltd), 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 planned to be continued till 2011. In this presentation of our 4th case study, the implemented content of last year's case study on "Substance-Field analysis / Standard Inventive Solutions" together with the practical and useful knowledge obtained from it will be reported.

J16- Hamaoka (Wisdom)

Practice of Creative Thinking through TRIZ Mind Cards
- Everywhere with Essence of TRIZ -

Yukie Hanaoka (Wisdom, Inc.)
Hideto Sanjou (DOCOMO Systems, Inc.)

A viewpoint from the mind field revealed that there is a mental discrepancy between ideal and reality in company employee training, in eliminating individual's worries, or in taking measures against and resolving each problem that could happen both socially and professionally. Upon Learning that the TRIZ technique, which assists creative thinking, also helps to solve contradictions on a technical level, and imagining that it could help to resolve the mental discrepancies on the mind level, Mind Cards, which applied the 40 Inventive Principles in a word game sense, were created. The Inventive Principles, which encourage creative operations and ideas, not only have the effect to break down mental stereotypes but also show extension to images, so they could be used in various fields.

J17- Nakatani(Osaka Gakuin University)

A Large Variety of Writing Instruments:

Studying the Evolution of Technologies in Familiar Items

Kurumi Nakatani (Osaka Gakuin University, 2nd Year Student),
Toru Nakagawa (Osaka Gakuin University, Japan)

This paper reports the activities in Nakagawa's Seminar Class for the 2nd year students (with 10 members) in the 1st semester, i.e., from April to July, 2010. The students selected (or were assigned to) this Seminar class just after reading my syllabus with the title shown above. Without any knowledge about technology development, systems engineering, creativity techniques, nor, of course, TRIZ, the students started this class.

At first, for recognizing a variety of writing instruments, the students were requested to show their own items which they are carrying around at school and to describe the good points of their favorite items. Then a home work was assigned to visit stationery stores and home-centers and to report about as wide variety of writing instruments as possible. Then they are advised to observe various writing instruments, to consider their mechanisms/principles of writing and their merits, and further to classify them in a hierarchical manner. Then the wide range of intended use were considered to specify 'what, on which, and how (during the process and as the results)' to write/draw, and were built up into a hierarchical system. It was gradually understood by the students that with the requests of different use a variety of writing instruments have been developed, such as different in their mechanisms/principles, in shapes, in the characteristics of materials (e.g. inks), etc. This class is designed to make gradual understanding of the ways of evolution of technologies through familiar items, and understanding of important TRIZ concepts without using TRIZ terms. -- Ms Nakatani will talk about her experiences in the Poster Session.

J18- Nakamura (MPUF)

Application of USIT to Useful Paper Fastener

MPUF (Microsoft Project Users Forum) USIT/TRIZ Study Group:
Kouichi Nakamura (USIT/TRIZ Study Member),
Noritaka Nakayama (Konica Minolta Technology Center, Inc.),
Hirotake Makino (USIT/TRIZ Study Member)
Hideki Ohmori (USIT/TRIZ Study Member),
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Osamu Kumasaka(Kumasaka Professional Engineer office)
Minoru Takimoto (Fuji Xerox nformation Systems Corporation) and
Tatsuhiko Atsuta (USIT/TRIZ Study Member)
Advisor ：Yuji Mihara (Creative Technology Institute Co., Ltd.)

MPUF (Microsoft Users Forum) is an NPO aiming at the improvement in the quality of Project Management. The number of study groups launched is about 20, and the USIT/TRIZ study group was launched in April, 2007. Members aim at improving through events, seminars, communities and study groups, about various subjects related to project management. The theme introduced this time is the achieved result through the Working Group activity of the study group.

The following result was able to be achieved by using the technique of USIT in the WG to cope with the issues facing the existing paper fasteners.

1. It became easier to advance discussion because the procedure and things to be done become clear by using the USIT workbook (announced from this society last year). And, the USIT template form was used to arrange the results. As a result, it was confirmed that the results could be effectively shared by using the USIT template form to summarize the process of each STEP.
2. Key Words of a wide viewpoint were obtained from this approach, and some ideas generated from these Key Words will be introduced.

J19- Ishihama (Kanagawa Inst.Tech)

Guiding Noise and Vibration Design along General TRIZ Process by Misunderstanding Case List

Masao Ishihama (Kanagawa Institute of Technology, Japan)

To improve noise and vibration (NVH) performance is important in such products as motor vehicles and home electrical appliances. To improve NVH and other performances simultaneously requires inventive design solutions. The author presented his study on the effective application method of TRIZ on NVH design at the 4th Japan TRIZ Symposium. The method has two new and major tools. One of them enables the user classify particular problems into seven standard NVH problems and the other provides more than 40 standard NVH solutions. This paper discloses the results of study for improving this method further. The new feature is to place three kinds of knowledge bases (KB) in standard TRIZ process. The KBs prevent designers from side-tracking by showing negative examples. This method plays as a complement of normal TRIZ tools that attract people toward ideal directions.

J20- Hamada (Kanagawa Inst. Tech.)

Concept Design of a Child-Seat by TRIZ Style Problem Identification Second Report

Minami Hamada (Kanagawa Institute of Technology)

Only 50% of cars carrying children on Japanese roads are equipped with child seats. Behind this low penetration number, sits insufficient performances of conventional child seats. To solve this situation, the author has been studying child seats that can swing on a spherical surface to cope with deceleration in collision and to absorb vibration while allowing children move freely during stable cruising. This concept was reported in the 5th Japan TRIZ Symposium. However, a problem was remain unsolved at that time, i.e., rocking vibration continues after a shock due to the lack of a damping mechanism. To invent a damping mechanism without any adverse effects, contradiction matrix was used first. Then, substance - field analysis was conducted. Introduction of a new "field" in a system came to the author's mind. From here, the author searched physical principle that can act as damping but not utilized yet. Electro-magnetic induction that generates eddy current seemed to be the solution. From this, analogy was taken to find realizable mechanism in different industry field. The study is in the stage of embodiment design at this moment.

J21- Mihara (Creative Technology Institute)

The Techniques to Detect and Solve Innovative Problems

― The Proposal regarding "Two types of Redesigned Contradiction Matrix" for TRIZ Beginners ―

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We think that skilled TRIZ practitioners studying and implementing some of TRIZ techniques several times are accustomed to a series of procedures to define each problem, formulate some challenges and create highly-valued ideas. On the other hand, it's very hard for TRIZ beginners to reach effective solutions through utilization of existing TRIZ techniques. Therefore, in this paper, we would like to propose "Two types of Redesigned Contradiction Matrix (RCM)" developed by us as one of effective TRIZ techniques for TRIZ beginners.
Firstly in the paper, we want to make "Real Required Functions (RRFs) for TRIZ practitioners" clear.
In other words, we try to define "What do we have to do in our minds?" and " What should we do right now ?" with thinking deployment about "RRFs". Secondly, we would like to introduce two types of "RCM" for TRIZ beginners to understand and utilize easily. Because we noticed that not only skilled TRIZ practitioners but also some of TRIZ beginners actively use "Contradiction Matrix developed by Altshuller (Original CM)" as a convenient technique to select some applicable principles from "40 principles" and create ideas by utilizing them. We basically focus on "a series of Functions" in the system and consider "Required Functions (RFs)" for each component in it at the upstream stage of product development activities. That is to say, we are required to define the challenges related to "Functional Parameters (FPs)"at this stage. At next stage after development design of product, we have to search the challenges regarding to "Concrete Implementation Tools (CITs)" to realize the system. That is why we decided to prepare two types of "RCM". I n order to develop them, we tried to analyze "Original CM" and categorize "39 parameters" on it as "two types of "Redesigned New Parameters (RNPs) for two types of "RCM" from the standpoint of TRIZ beginners. I n addition, we have the guidelines for beginners to use two types of "RCM" easily at our fingertips. We expect to be used proposed "RCM" for TRIZ beginners as the gate to enter "attractive TRIZ world" without having a resistance to utilize a series of TRIZ techniques.

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Present State and Problems in Creative Education at Technical College

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There are 51 national, 3 public and 1 private technical colleges in Japan. Unlike the education systems in the universities, the technical colleges admit junior high school graduates, think a great deal of experiments and actual practices, and conduct consistent professional 5-year education in order to nurture experts who can respond to the progress of science and technology needed in society. After 5 years of a regular course, advanced 2-year engineering courses are set up. Besides the acquisition of scientific and technical knowledge, which has been cultivated to date, the cultivation of creative skills to build new things and engineering design abilities in fusion/composite regions are included as the ability expected to students by higher education industrial institutions. Cases and problems will be reported on creative education in regular and major courses at Kushiro National College of Technology.