The 11th Japan TRIZ Symposium 2015
Abstracts

August 16, 2015 (3rd announcement)

Symposium Executive Committee

EI01 Valeriy Prushinskiy (TRIZ Master)

Hybridization in Technology

(Keynote Lecture)

Valeriy Prushinskiy (TRIZ Master)

Initially, applying inventive principle ”Combining” for engineering systems was proposed and described by TRIZ founder Genrich Altshuller. Later, algorithm of Feature Transfer (aka Algorithm of Hybridization of Alternative Systems) was proposed by Vladimir Gerasimov and Simon Litvin. Feature Transfer is an analytical tool for improvement of base engineering system by transferring relevant features from the alternative system. In case of complex problem, it is very difficult to resolve contradictions by single-step combining or feature transfer. That is why multi-step hybridization approach for consecutive hybridization was proposed by Valeriy Prushinskiy. Multi-step hybridization is important tool for resolution of complex engineering and technological problems. For simple inventive problems, author had proposed several hybridization schemes. During his presentation, Valeriy Prushinskiy will explain multi-step hybridization approach and basic hybridization schemes based on modern examples.

E01 Yip Mum Wai (Tunku Abdul Rahman University College, Malaysia)

Best Practice of Systematic Innovation Approach: A Case Study of TRIZ in Automotive Industry

Yip Mum Wai (Tunku Abdul Rahman University College, Malaysia),
Keong Chee Sheng (Tunku Abdul Rahman University College, Malaysia),
Swee Shu Luing (Tunku Abdul Rahman University College, Malaysia),
Toh Guat Guan (Tunku Abdul Rahman University College, Malaysia)

The purpose of this case study is to provide a thorough analysis on the application of Theory of Inventive Problem Solving (TRIZ) in automotive industry in Malaysia. The company manufactures the car door trim for automotive industry in Malaysia. In a factory, this car door trim is extruded through extrusion process and transported by conveyor belt systems. During the transportation by conveyor belt system, the cutter will cut the car door trim according to the dimension given. However, the life span of cutter is reduced from 10000 cycles to 5000 cycles. Due to this problem, the company has to spend a lot of money to purchase the new cutters. In addition, a lot of products wasted after the cutting process. Therefore, TRIZ tools such as function analysis, cause and effect chain analysis, engineering contradiction, physical contradiction, Su-field model are used to solve the above problem. It is proved that the TRIZ tools can be successfully applied to solve the above industrial problem.

JI00 Shinsuke Kurosawa (trizstudy.com)

(Tutorial)

Systems Approach

Shinsuke Kurosawa (trizstudy.com)

Altshuller, who made TRIZ has written the text "raising systematic thinking is the final purpose of teaching ARIZ" in 1975 (http://www.trizstudy.com/altshuller1975.html). Any event or problem has occurred in the physical and social environment which encloses it. It means that the watch by the environment it is the key point determining the ability to perform good work. The simple tool of TRIZ often called "9 Windows" is made based on this indication of Altshuller. However, as can be seen from the title referred above, it is one of the essences of TRIZ far beyond the frame of a simple tool that suited the mind of Altshuller. It is "systems approach," one of the pillars of TRIZ on a par with the law nature of evolution, contradiction, ideality, resources, etc.

In this tutorial, I will also include as much exercise as possible within the frame of 2 hours, aiming to get the participants experientially acquire what Altshuller tried to entrust to systems approach.

JI02 Akashi FUKUHARA (ITEM 21, Ltd.)

(Special Lecture)

An Approach to the Design of an ‘Attention-winning’ New Product for a New Market Segment

Akashi FUKUHARA (ITEM 21, Ltd.)

As a means of the activity which supports epoch-making new product development, they are QFD/TRIZ/quality engineering. Leading [organic combination], this past symposium is also discussed in how often. I am. It is the new approach of QFD in the inside to a "setting of plan target" stage this time. I introduce. Application in the case where "the market of the aim" is clear the conventional QFD. It was a center. I examined we making this develop and expand and making it apply to exploitation of a new market and new products. I was sure of validity as a result of some real deployment

examination.

J01 Masahiro Kuwahara (IDEA Inc.)

Can TRIZ help you create a hit product? A systematic product development approach based on the QFD-TRIZ-TM (QTT) process

Masahiro Kuwahara (IDEA Inc.)

Although TRIZ is the problem solving theory borne by many patent analysis, many company promoters worry about the introduction and promotion method. It is development about "an innovative hot-selling product" by TRIZ -- although things are expected, it is because the innovative goods produced by (Classical) TRIZ are not easily connected with the hot-selling product in a market. If an innovative hot-selling product is defined as "the commanding lead goods which give a customer impression and surprise and is widely received in him", I discern a demand of a customer viewpoint and it is necessary there to find and develop a unique viewpoint (demand quality). We reconstructed QFD/TRIZ/TM as a systematic development process to eye others. Analyzing this time the hot-selling product born to the world from the viewpoint of TRIZ, in order to produce an innovative hot-selling product, I explain that the methodology of the product development process systematized not only in TRIZ is effective. I am pleased if this presentation becomes your introduction in a company, and an aid for promotion.

J02 Hiroshi Kawakami (Unit of Design, Kyoto University)

A Matrix for System Design Utilizing the Use of Inconvenience

Hiroshi Kawakami (Unit of Design, Kyoto University),
Toshihiro Hiraoka (Graduate School of Informatics, Kyoto University)

It is pointed out that neither the efficiency of a system simple substance nor the improvement in a function necessarily contributes to the realization "of a human machine system better than", and it is long. Moreover, when bringing systematic methodology to a system design, the present condition is that the methodology which can also be called the tips on the design worked out experientially besides "closing an object system and optimizing a quantitative portion in it", which is the royal road of the system science from the former, is tried personally. Anyway, these point to increase in efficiency and the improvement in functional, i.e., convenience. On the other hand, by a human machine system, worth of the "inconvenience" to which time and effort of using the body and the head is applied cannot be disregarded. Henceforth, I call this value "inconvenient profit." When the good examples are collected just because I was inconvenient, inconvenient profit has many things which cannot be quantified personally in essence, such as joy, a feeling of self-determination, etc. of growth. Therefore, the royal road of system science is not employable as the design or the way of thinking of a system which utilizes inconvenient profit. Then, I imitated TRIZ and carried out case analysis, and while extracting 12 kinds of inconvenience that a value is easy to be obtained, I created the matrix for judging whether it is suitable to introduce inconvenience. This paper reports the result of having used as the card type idea-processing tool eight kinds of values which are easy to obtain from 12 kinds of inconvenience, and it, and having carried out the workshop as a result of mounting the idea-processing tool using this matrix as a Web site application and conducting a subject experiment.

J03 Takashi Ogata (OLYMPUS Corporation)

Creating the engineer's environment for using TRIZ naturally
- The functional approach for connecting methods and 7 solutions -

Takashi Ogata, Kazuhiro Fujikawa, Hiroyuki Tsuchiya, Kazuo Abe
(OLYMPUS Corporation)

Since 2012, OLYMPUS has introduced 7 Solutions based on QFD, TRIZ and Taguchi Method.

Focusing on the function of the system is important for connecting to each method and each solution smoothly. Through applications from technology search to production, we have created the engineer's environment for using TRIZ naturally.

For increasing efficiency of development, it is important to connect 7 solutions and tools by the function.

This functional approach has a high affinity with generalizing a complex problem in TRIZ process.

So, we were able to connect smoothly the various methods and TRIZ in 7 Solutions as follows.

(1) Technology search:
Expand engineer's wants by **TRIZ** with using the logic tree of desire.

(2) Setting theme:
Focusing priorities of problems from competitor information and customer needs, and clarifying the application area of **TRIZ.**

(3) Analysis of the problem:
Cause analysis and desire analysis does no leakage on the basis of the function.
Functional representation of technology leads to desire or eradication approach of **TRIZ.**

(4) Problem solving:
Choice of **TRIZ** or DOE/TM depending on the size of changed the system.

(5) Patenting of technology, reliability improvement
TRIZ is effective for patenting of ideas and avoidance of risk.

J04 Kazuhiro Fujikawa (OLYMPUS Corporation)

Spiral-up of scientific approach promotion including TRIZ

- Promotion activities to support 7 solutions deployment –

Kazuhiro Fujikawa, Hiroyuki Tsuchiya, Takashi Ogata, Kazuo Abe
(OLYMPUS Corporation)

Since 2012, OLYMPUS has introduced and promoted 7 Solutions based on QFD, TRIZ and Taguchi Method. We have promoted the 7 Solutions with the collaboration of support and training. The scientific approach for purposes is understood to engineers and accepted.

As a result, the installation of 7 Solutions, engineers have come to use the scientific approach including TRIZ without regard to method.

To accelerate this activity, we made effective promotion of the scientific approach including TRIZ.

This effective promotion is repeated the following steps. The 1st step is that we organize the know-how obtained in theme support. The 2nd step is that the new know-how is reflected into texts and tools. The 3rd step is that we use new texts and new tools at training of engineers.

We introduced the following measures to make activities more effective.

- Training video.
  We recorded training contents to the video.
  Engineers can attend timely the necessary training.
- Rehearsal of the utilization by e-learning.
- "Tool BOX" that collected manuals and tools on the database
  We made "Tool BOX" on the database in the company.
  Engineers will be able to search and use when needed them.

J05 Akihiko Ikeda (SONY, KANAGAWA INSTITUTE OF TECHNOLOGY)

Instruction Know-how of Creative-problem-solving Practice

- From Child-rearing to University Education and Company Practice -

Akihiko Ikeda (SONY, KANAGAWA INSTITUTE OF TECHNOLOGY)

"I want to raise up my child so that it can get by in the present severe world." "It is the education which sways to room and knowledge unbalance, I want to make the power about which I think long and hard to the students who fly at the search for a correct answer learned." "I want to raise the problem-solving power of the employee who tackles a problem in a company every day to raise the result and worth." In order to meet these serious requests currently called for in Japan of now, it is indispensable to raise people's creative problem-solving power.

Although TRIZ is an effective means there, many of foreign presentations are research of TRIZ, the promotion activities of a company, and an anecdotal report, and what is described about the method of the practice instruction is little. The know-how exists as the lecturer of the company which has succeeded in introduction, and tacit knowledge of the external consultant who supports it. It seems that this is one of the causes by which the degree of practical use of TRIZ does not improve.

So, this presentation explains the know-how of the practice instruction. This is based on the construction and practice of the systematic creative-problem-solving lecture which the author has tackled for ten years in the company and additional leader training experience of TRIZ trainers and idea creators training, etc. I also introduce the knowledge acquired from the creativity education from the childhood time to the regular lesson of the creative-problem-solving method in the graduate school for five more years, and my child to an adult.

I am pleased, if you utilize this presentation for instruction of your own TRIZ practical use or creative-problem-solving practice, the pile serves as a big surge and it leads to whole Japan's improvement in creativity.

J06 Takayoshi Ohtsu (National Institute of Technology, Numazu College)

TRIZ Practice in the Creative Career Education by the Cooperation of Kindergarten, Elementary School, Junior-high school and Technical College

- Application of 3D block to creativity education -

Takayoshi Ohtsu (National Institute of Technology, Numazu College)

As training of the industrial human resource which bears the future of the area, creative career education from low age is desired. Mental faculties, such as capability to compare and contrast and analyze and the capability to find and combine the relation and law of things are searched for especially in "creative activities", and the five conditions for the activity are said to be (1) low age, (2) environment setup, (3) taking out child's capability, (4) giving freedom, and (5) helping. Authors are developing educational contents which use 3D block of Artec co, ltd as a tool of creative education. Since this can be assembled to 3D (up-and-down front and rear, right and left slant), the feature is at the point that I have realized the form which considered. This report describes the validity of the example to the creative education using 3D block as an application of TRIZ to conquest 2 clause confrontation comparing the measure by cooperation of kindergarten, elementary school, junior-high school and technical college with the Reggio Emilia method famous for early childhood education.

J07 Koichi Makino (IHI Corporation)

A Functional-analysis Method Effective in TRIZ Practical Use

Koichi Makino (IHI Corporation), **Manabu Sawaguchi (Waseda University)**

When reflecting a customer's voice on a design proposal, the viewpoint of a functional analysis is indispensable. Therefore, a functional analysis is considered to be very important by design activities at TRIZ with the high degree of practical use, QFD, or VE. However, a beginner unfamiliar to a functional analysis may spend much time on grasp of a required function, and becomes the cause of worsening product development and the speed of improvement activities. Therefore, a required function modeled after the functional model expression language (Function and Behavior Representation Language, henceforth "FBRL") which is one of the tools of ontology engineering in this research, I propose the new hand method for grasping rationally (I call it henceforth "a definition of a function"). Furthermore, I also propose the method of utilizing for selection of the various effects of the natural science of Effects, and characteristic selection of an inconsistency matrix the functional distribution diagram used by a functional analysis. Furthermore, I will introduce concretely the method of a definition of this new function, and the practical use method of a functional distribution diagram through the example applied to the machine for agriculture.

J08 Manabu Sawaguchi (WASEDA University)

Possibility of Collaboration between Japanese Grass-Roots Innovation and That of Developing Countries

Manabu Sawaguchi (WASEDA University)

Japanese manufacturing technologies ("*Monozukuri-gizyutsu*" in Japanese) mainly have two strong points. One is the cutting-edge technologies in R&D which lead the rival companies in the developing countries. The second one is competitiveness in "Kaizen activities" with the power of skilled workers at actual work sites ("*Genba-ryoku*" in Japanese) based on Management of technologies (MOT) techniques (like IE,QC,VE and so on). The strength in R&D is referred to as "Radical innovation" and "Kaizen activities" are recently called "Grass-roots innovation (GRI)" Because of this situation, "GRI in Japan" based on "Kaizen activities" is considered to be "Japanese style Grass-Roots Innovation (Js-GRI)". In addition, the association between Js-GRI and "Karakuri technology", a Japanese unique method, which aims to utilize natural physical phenomena, is shown in the first half of the paper.

In the second half, the possibility of 'New reverse innovation" based on a bandwagon effect between Js-GRI and Developing countries' GRI(Dc-GRI) ,which create the unique products rising out of the necessity of the local communities in developing countries, is discussed from the aspects of Js-GRI. In particular, Dc-GRI in India is called "Jugaad innovation". "Jugaad" is a colloquial Hindi word that means an innovative solution. Therefore, this paper approximately treats "Jugaad innovation" as Dc-GRI. To be concrete, it will be provided the fact that Js-GRI is helpful for improving Dc-GRI's value from the results of the survey clearly showing people's problem awareness against some living facilities in Japan and developing countries, being looked into the features about Dc-GRI from the standpoint of MOT techniques, mainly VE and TRIZ. Finally, further analyses of the survey will show clearly the challenges for facilitating the collaboration between Js-GRI and Dc-GRI.

J09 Takashi Shikata (JTS Open Task Subcommittee)

Proposal of creativity education by TRIZ
- Open Task Subcommittee report -

Asahiko Katagiri, Hideaki Kosha, Takashi Shikata, Shigeru Hisanaga, Ikuo Yoshizawa

(JTS Open Task Subcommittee)

[Educational Research Subcommittee of a New Era (Japan TRIZ Society, NPO)]

- Introduction of subcommittee meeting
- Background and purport of this project
- Procedure of project
- An open task is solved (problem solving approach by TRIZ).
- Explanation and approach of problem
- Confirmation of tomorrow's procedure

J10 Toru Nakagawa (Osaka Gakuin University & CrePS Institute)

USIT Case Studies in the Six-Box Scheme
- Understanding Various Examples of Creative Problem Solving in the New Paradigm -

Toru Nakagawa (Osaka Gakuin University & CrePS Institute)

The present author has been working since 1997 for the research and proliferation of TRIZ and creative problem solving methods. (1) At first, I worked for studying the TRIZ methods, (2) then I introduced USIT (as an overall process of simplified TRIZ). (3) Then we integrated all the idea generation methods in TRIZ into USIT, and (4) further represented the USIT process in the data-flow model of the Six-Box Scheme and found it a New Paradigm of Creative Problem Solving. (5) Hence since 2012, I have been advocating the 'General Methodology of Creative Problem Solving (CrePS)' as a new methodology which can integrate TRIZ and various other creativity methods on the basis of the new paradigm, and have been demonstrating USIT to be a concise process for applying the CrePS methodology.

In the present paper, (a) the author has written 'USIT Manual' in the Six-Box Scheme (of about 30 slides). (b) Various case studies of creative problem solving (using TRIZ, USIT, etc.) and practices in education are made into a 'Collection of USIT Case Studies' (including over 10 cases, described in about 20 slides, each). The Six-Box Scheme is found useful to describe these case studies and to actually lead the process of problem solving. For instance, a sophomore seminar of 'Studying the evolution of technologies by using familiar items such as writing instruments' was a trial to guide the students to understand the important TRIZ concepts using no TRIZ terminology nor TRIZ tools (see Nakatani & Nakagawa 2010). The process in the seminar was in good accordance with the Six-Box Scheme, I myself realized recently.

J11 Yoshinori Takagi ( )

Inventive Principles Workshop to Expand TRIZ User's Range

- Bi-direction, experience, oneself declaration -

Yoshinori Takagi ( )

I designed a workshop where TRIZ 40 Inventive Principles can be studied through various experiences, and carried out a total of 20 times or more. I state, the participant number amounts to 300 or more persons, and one of them is all 75 new appointment engineer training of in the National Institute of Advanced Industrial Science and Technology.

Since various devices were performed from what "experiencing remains in the head most" in these workshops, I will introduce in this presentation. For example, even if the number of participating students became large, "making the answer plate by oneself" prevented losing bi-directionality, and the "Inventive Principle toy" imitating the Inventive Principle symbols were popular. This toy attracted attention also from the Japan Science and Technology Agency (JST), and was displayed also on the Web of a science communication center (CSC).

I plan to prepare so that these devices can actually be experienced on the day of presentation. In addition, I lead each activity including my work, and I regarded TRIZ as "the common language of problem solving which connects knowledge of all fields", and am promoting it. It is because the way which it leads to the spread of a user's foot expansion and deeper TRIZ practical use, and I make by extension contribute to the world by making whole Japan into business solution advanced nations is considered. I will be pleased if I can acquire various opinions.

J12 Hideaki Kosha (USIT manufacturing technology support)

Interpreting the Important Technical Elements of the Blue LED with TRIZ

Hideaki Kosha (USIT manufacturing technology support)

An inspiring feat that Mr. Isamu Akasaki, Mr. Hiroshi Amano, and Mr. Shuji Nakamura won the Nobel Prize by "invention of blue LED" was accomplished in 2014. Two breakthroughs by the group of Mr. Akasaki and Mr. Amano contribute to the creation of the basic structure greatly, and I unify these two breakthroughs, and presume that Mr. Nakamura's group contributed greatly by having realized intensity increasing through double-hetero structure, which is the 3rd breakthrough.

I can read having accomplished this achievement in what was written about the difficulties by three persons' development by investigating thoroughly the peculiar technology which each has. In the latest technical development in the world, the talent of peculiar technology will be important.

In this report, I considered the point of technical difficulty about the "low-temperature buffer layer technology" which is the first breakthrough among these, and extracted the viewpoint (Inventive Principles, mainly) of TRIZ currently utilized in it. Furthermore, I mentioned the tentative plan whether research progressed more efficiently by adding such a viewpoint.

J13 NAGAI Tetsuya (MPUF, Japan)

Deployment for Searching the Causes: (DeSC)

To organize all the causes of the problem

NAGAI Tetsuya (MPUF, Japan),
Tsuyoshi Todome (MPUF, Japan)
Yuji Mihara (Creative Technology Institute Co., LTD)
Takashi Shikata (KUBOTA Corporation)
HIDEAKI KOSHA (USIT manufacturing engineering support)

In the previous time, we reported a new method, Deployment for Searching Causes, which refers a check list during the process of making divergence of the causes in order to carry out why-why deployment effectively that is one of measures for examination of problems. In addition to that, this time we report about the convergence process that is "how to organize the causes into a tree form."

Each member of the study group got to be able to make divergence adequately. But some members felt some difficulty when they tried to organize the causes into a tree form. Therefore we set an example and tried to make the procedure and the know-how be explicit, drawing a tree all members together.

In consequence we found that key points lay where the causes that were obtained as the result of divergence were grouped and we make layers when the tree was built.

We named anew this method "Deployment for Searching the Causes: DeSC" in which this procedure is used in conjunction with existing DeSC.

J14 Kimihiko Hasegawa (Intellectual Property Creation Research Subcommittee, Japan TRIZ Society)

Method for Creation by Means of Value Evaluation

- Taking the Proposal for a New Life Style of the Elderly People as an Example – (Part 2)

Kimihiko Hasegawa, Toshimitsu Kataoka, Narumi Nagase,
Shigeru Suzuki, Hirotsugu Ishihara, Sadao Nishii, Nozomu Takeuchi
(Intellectual Property Creation Research Subcommittee, Japan TRIZ Society)

Currently, we are advancing research on the theme "Proposal for a New Life Style of the Elderly People", and it will be the 2nd presentation this time. In the last presentation, we performed a quantitative evaluation called the elegance degree ((expectation / realization power) x ease of using resources) mainly about universal-design-related existing products and services using the "Platinum Design Assessment Sheet" which we developed. Then, we performed reexamination for raising the compatibility of the evaluation value of the elegance degree and the evaluator's feeling.

In the "Platinum Design Assessment Sheet," we established an item for writing down the evaluator's opinion as a proposal for evolving the improved product or service to a still better one. While having exchanged arguments for improving the elegance degree, which is the evaluation scale, we were able to invent a method for proposing concepts of new products and services, by further investigating the main point of the proposal item of the improved product or service. This time, we will report this methodology and individual case.

J15 Shinsuke Kurosawa (Education of a New Era Research SC., JTS / trizstudy.com)

Introduction to the Subcommittee and its Activities

Shinsuke Kurosawa (Education of a New Era Research SC., JTS / trizstudy.com)

The Subcommittee and its activity up to now will be introduced.

- Purpose
- Member
- Time for delivery
- Background
- Purpose of the lecture
- Method outline of problem solving and solution
- System View of the world of problem solving
- Function as a technical system
- Resources
- Problem-solving approach entering from Contradiction specification
- Problem-solving approach paying attention to the defect of technical system structure
- Problem-solving approach paying attention to deviation from the Law of Evolution
- Problem-solving approach considering the policy to bring close to the ideal system
- Test trial
- Outline of the subcommittee activities up to now

J16 Michael Chen (Hsinchu Jiao Tong University)

QFD, TRIZ Example in "Attachment-and-detachment Type Battery Management System for Union Brand Electric Two-wheeled Vehicles" Development

Michael Chen (Hsinchu Jiao Tong University),
T Y Kam (Hsinchu Jiao Tong University),
Mac Zenko (IDEA Co., Ltd.)
Chi-Min Chang (Hsinchu Jiao Tong University)

Let the mainstream of an electric two-wheeled vehicle be an electric scooter (ES) without a paddle. It is advantageous to the weight of a battery pack carrying by hand, and when there is possibility of long-distance use especially, the role which an attachment-and-detachment type battery plays becomes very important, and the spreading and promotion are demanded strongly.

On the other hand, looking on the present conditions, the distance a driver will actually run by ES, influenced by "range anxiety," is generally about the half of the distance which can be run, resulting in the existence of "semi-“ electric scooters. This, therefore the purchase volition of an electric scooter are scarce, and have been a mortal wound which checks expansion of a market.

This research started from hearing the voice of the end of the market about ES which the consumers feel purchase volition, and when a questionnaire was carried out for search of a new goods concept, we were sure that there is no mistake in the solution direction by an attachment-and-detachment type battery. Then, we analyzed by using consumers' voice as source data, making full use of the technique of QFD (Quality Function Deployment), in other words, what consumers are asking for, That is, Voice of Customer becomes clear and what are the potential needs. It is called concept mining invented in order to express strongly the brand image which can embody the value which consumers are calculating truly about the function for fulfilling it.

The catchphrase is "attachment-and-detachment type battery management of a union brand".

If TRIZ for solving the bottleneck characteristic shown by QFD as concept mining and the back process as a last process of creating QFD is considered, the superiority of being able to precede and start discovering a theme early acts more effectively from the ability to perform idea generation efficiently, when TRIZ is used.

Simultaneously, from the technique of the technical innovation of TRIZ creativity, by quoting the education and cautions which the principle of the innovation derived positively, an idea good enough will appear and I will be connected to TRIZ creativity.

Thus, of course, the generalization management of fulfilling the specification of a union maker's battery pack is attained as an attachment-and-detachment type battery of a union brand, by contributing to the cost reduction of an infrastructure very greatly, I become mutual interest and sharing of firm consciousness is produced.

Even if a union maker's attachment-and-detachment type battery has a difference in form, there is no problem.

When it can be made to carry out generalization management of two or more makers' battery pack, the ability not only to reduce maintenance cost required for future reconstruction but advanced spreading and promotion are attained by being able to carry out common management of the resources of an effective platform, including in the managerial system which escapes redundant investments and generalizes the battery of a different standard, and sharing the resources of the operating system of a platform.

Therefore, without being restrained in any way by the battery of each brand, it can become possible to replace batteries, and the consumers of an electric two-wheeled vehicle can raise the degree of satisfaction to an electric two-wheeled vehicle.

While expecting that the infrastructure of an attachment-and-detachment type battery to the electric scooter of a various kind will carry out parallel development simultaneously, improvement in the vehicle operating ratio by the standby time of the charge which is the greatest merit becoming unnecessary is sure that it will make the whole industry of an electric scooter certainly produce an infinite big business opportunity.

J17 Naoyuki Yoshida (JNC Corporation)

Change in TRIZ Activities at JNC Corporation

Naoyuki Yoshida (JNC Corporation)

JNC, Inc. is a comprehensive society company, and it is doing active conduct of business by using liquid crystal material as core products now. I tackled TRIZ beginning in the 2010 fiscal year, and have performed activity which extends the technique and a view in the company. Five years pass, the director in charge who was a top-down center takes the place, and in-company environment is also changing. And the measure of the persons in charge, we, itself has been changing from the original form. Although the announcement of this symposium will be continuation for three years, while describing change of the measure for these five years this time, I describe how in the current fiscal year to tackle.

J18 Tomohiko Katagiri (IDEA Inc.)

Development of Spinning Tops by TRIZ & TM & Simulation

- Challenge to the All Japan Manufacturing Industry Top Competition

Part 2 -

Tomohiko Katagiri (IDEA Inc.), SWCN (Solid Works Club of Nagano)

Revitalize the Japanese manufacturing industry!

With the slogan above, the "All Japan Manufacturing Industry Top Competition," which started in 2012, is showing a great climax where the battle to which a large adult loads a small top with the soul of his company and technology has called reputation, and a hundred and several tens of top competitions including national ones held at various places.

By a cooperated application of TRIZ, Taguchi Method, 3DCAD and motion analysis introduced at the TRIZ Symposium 2014, Team IDEA developed the strongest top [TRIZ No. 1], also trained the strongest pitcher [Zenko AMG], and aimed at domination of the 3rd national competition.

Regrettably, at the district elimination, we had an unfortunate luck and were not able to participate in the national competition, but the fighting power of [TRIZ No. 1] was high, and it was able to achieve a full championship at the competitors-crushing G3 Ueda Site performed thereafter, without losing a single time.

At the presentation this time, I will talk about the TRIZ problem solving process applied in development, what kind of ideas were incorporated into [TRIZ No. 1] from this process, what kind of ideas were incorporated into the tops at a national competition, etc. And I will also consider the possibility of the [Top Competition] as a tool to spread TRIZ.

J19 Masahiro Hayashi (KYOWASEIKO CORPORATION)

Problem Solving and Product Planning with QFD-TRIZ

Masahiro Hayashi (KYOWASEIKO CORPORATION)

KYOWASEIKO CORPORATION is 135 employees and the company of sales of 1,300 million yen which build a production base on the basis of the wonderful natural environment of the foot in Nagano Ina valley Minami-Alps. Manufacture of the design of the electromagnetic brake and disaster prevention apparatus equipment for safe, manufacture, sales and medical equipment, a semiconductor, and liquid crystal manufacture equipment parts, sale although handled, especially an electromagnetism micro clutch and a brake are a custom-made product corresponding to the visitor's needs, and I am doing my best in them every day to be able to propose the basis of the design and design used as an axis, and the product of an ideal based on a visitor's request.

However, when aiming at the development company of proposal molded goods which further took a step forward, the fact also felt the limit of the old way.

Since introduction of the systematic development technique of the proposal molded goods by cooperation application of QFD-TRIZ was obtained from IDEA Inc. in such a situation, I am -- also carrying out -- I am tackling new product development in the style which I practice while learning synchronizing the systematic development technique which applied an actual development matter and QFD-TRIZ there having been an inquiry matter of the electromagnetic brake in a new field to the term, and running and learning.

This paper will report these contents of a measure.

J20 Yoshiharu Isaka (IDEA Inc.)

One Method for Expanding TRIZ Application II

- Utilizing SWOT Analysis and TRIZ to Create Strong Products –

Yoshiharu Isaka (IDEA Inc.)

In order to manufacture a product that is market-strong and profitable (selling well), we must make it a long-time seller that other companies cannot compete with, as well as making it have attractive qualities. To achieve that, it is important to create a product that has a unique concept by utilizing the company's managerial resources.

Until now, extracting potential needs has been considered to be important in product planning. However, in reality, it is hard to find a viewpoint in the general quality table to utilize the strength of a company. On the other hand, "SWOT Analysis" is commonly known as a viewpoint for utilizing managerial resources, but it has not been applied to the manufacturing field that much.

Therefore, this time I will show a method in which we first find out the target direction of utilizing the strength of the company by SWOT Analysis, and then we will extract and detail the ideas for materializing, followed by linking those ideas to the product concept. As for the target item, I have taken up the general-purpose engine that has not progressed technically for a long time and has been considered to have no new needs. Assuming this as a preliminary step for starting the TRIZ method flow, we will set the technical problem found by using the SWOT Analysis as a TRIZ theme, creating steps to come to a solution. By doing so, the application range of TRIZ can be expanded to other products, such as machinery, which is considered to be difficult to apply TRIZ to.

J21 Teruyuki Kamimura (Ideation Japan Inc.)

A New-product Planning Technique Combining Three-directional Approach of Technology, Market and Society - Application Practice Method of Directed Evolution Anyone Can Do -

Teruyuki Kamimura (Ideation Japan Inc.)

These days, a difference is no longer looked at by no product of a company. Therefore, many companies have the problem of the product planning "what kind of goods to build" and "how I to create new value and charm."

The cause is in not having a feasible and reliable technique for inventing a new product concept.

Actually, even if told to "watch the market well, and find out the new needs which are latent there", etc., there is no telling what with what I should do. Very uneasy in whether to believe it seriously and to further product development, even if it fortunately carries out and is able to find out something which seems to be new needs.

The maker who takes charge of a new product plan does not have few engineers of a research-and-development field. For an engineer, prediction of future needs, etc. are the weakest. "Isn't there any product planning method which will end if only a technical side is run after?" "Even if it is not market watchers, isn't there any how to foresee the future of a market?" I have such important point wishes.

If even an idea is logically carried out even if this announcement is an engineer, and it is whom, it will introduce the technique which can invent a promising new product concept. The point is in combining the evolution law of the three directions of technology, a market, and society. This applies the essence of the Directed Evolution methodology, which U.S. Ideation International has developed.

J22 Osamu Ikeda (NIKON CORP.)

How to apply TRIZ style reasoning to construct "Clever Business Model" - TRIZ style analysis and patterning of "Innovative Business Model" -

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Business and Management TRIZ Research Subcommittee (Japan TRIZ Society, NPO)

In this study group, we are working for the purpose of presenting spread and development of TRIZ to the subject of business, management, and the management field aiming at researches for utilizing TRIZ, such as application methods and case studies, and guidance construction.

At previous activities, we applied TRIZ thinking and techniques to analyze "a hot-selling product or service", and designed the fundamental framework for the creation method of a "new product or service". We presented the result of this examination at the 9th TRIZ Symposium (2013). In the presented fundamental framework, we have applied the Evolution Trend in Business Management Systems proposed by Darrell L. Mann. During the process of this examination, we got the necessity to make the Evolution Trend in Business Management Systems to a tool that is effective and can improve convenience. Therefore, we created a description as intelligible as possible about the definition contents of the Evolution Trend in Business Management Systems and Evolution Levels proposed by Darrell L. Mann. About the result of this examination, we presented at the 10th TRIZ Symposium (2014) including practical use examples.

As TRIZ-style analysis tools (Contradiction Matrix and Inventive Principles, Evolution Trend and Evolution Levels, etc. for management systems) have become almost ready by previous activities, we decided to try the following examinations:

This time, we will mainly present the examination method and results about item 1.

1. Select some "Business Models with a Sufficient Line" up to now as the main viewpoint, and analyze the success factor in a TRIZ style
2. Try patterning the reason for building a "Business Model where Success Can be Expected"

J23 Narumi Nagase (SONY)

A study of ARIZ thinking framework for brainstorming of customer value creation

－Feel ARIZ more familiar and Use ARIZ more practically－

Narumi Nagase (SONY)

It is needless to say that the company must generate new values and provide them for the customer, in order to grow sustainably.

Recently, many brainstorming sessions are held in the business scene. The number of sessions for the customer value creation may be more than that for the technical solution to the problem.

Many planners, many researchers, many design engineers and many manufacturing engineers participate in that.

However, the inspection of the new customer value in the brainstorming session is difficult compared with inspection of invention.

Therefore, there are quite a few voices of the participant who was over in disappointing brainstorming which could not achieve new value proposal in spite of exciting discussion.

This paper provides several brainstorming type of frameworks based on ARIZ, which are collecting the wisdom of the many participants and efficient for a practice of the new customer value creation.

In addition, the author expects that the practices in this paper promote ARIZ85 understanding.

J24 Takashi Shikata (JTS Open Task Subcommittee)

Introduction and explanation of example solutions

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[Educational Research Subcommittee of a New Era (Japan TRIZ Society, NPO)]

- Your idea introduction
- Introduction and explanation of example solutions
- Each prize announcement
- At the end