The Second TRIZ Symposium in Japan, 2006

To be held by the Collaborative Board of TRIZ Promoters and Users in Japan at Pana-Hills Osaka, Suita, Osaka on Aug. 31 - Sept. 2, 2006

Abstracts of Invited/Contributed Papers

(In the order of submission)

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Part I. Invited Papers

I01 Keynote Lecture 1

Innovation of the Integrated Product and Process Development by WOIS – Contradiction Oriented Innovation Strategy

Hansjürgen Linde*, Gunther Herr*, and Andreas Rehklau
(WOIS Institut Coburg, Germany)

Especially for maintaining leadership, company's require strengthening the innovation power.
Consequently companies necessitate a clear picture of the company's competitive situation in future as well as reliable innovation processes for heading towards this future in a focused way.
The innovation strategy WOIS combines in the unique Contradiction Oriented Innovation Strategy elements of known successful methodologies such as the German Design Theory, TRIZ , Synectics and others with new aspects of encouraging a challenging innovation culture, designing highly competitive value creation chains and realising successful innovations for integrated product and process developments.

I02 Keynote Lecture 2

A Simple Theory Underlying Structured Problem-Solving Methodologies – ASIT, TRIZ, USIT (and others)

Ed. Sickafus (Ntelleck, LLC, USA)

Structured problem-solving methodologies, such as ASIT, TRIZ, USIT and others, are made easier to learn and practice through a simple theory. They have a common basis in creative thinking but engage various forms of structure to achieve their goals. They have a common starting point – an unsolved problem. And they have a common end point – innovative solution concepts. Furthermore, they use the same machinery to advance from one end point to the other – our two cognitive engines (our brain hemispheres). This talk is not about variations in methodology. It is a theoretical discussion of how we think as we progress along the path from problem definition to innovative solution concepts. It will be seen that our two brain hemispheres provide near instantaneous insights that are both logical and intuitive. By understanding their fortes we can best use our cognitive resources. Some surprising insights are presented. The theory is relevant to understanding and practicing all problem-solving methodologies.

I03 Invited Paper 1

Why not install "Breakthrough Thinking" -- Get rid of Copycats --

Shozo Hibino (Chukyo University, Japan)

In order to win severe competitions, it is required to open a new virgin world, by getting rid of copycats. The vital point is to install a new creative thinking in your brain. In this lecture, I will introduce well-known super creative thinking,---Breakthrough Thinking. Breakthrough Thinking includes a philosophy, an approach and tools, and has been utilized in the world. Without copying others, we can think creatively ideal solutions from the substance. I will talk about successful cases in Toyota, Mitsubishi and "Papa-Mama Creativity Theory" and the relationship to TRIZ. This theory is a new creativity & thinking theory, based on "system's epistemology".

I04 Invited Paper 2

How Should We Utilize TRIZ for Managing Industries?

Kazuya Yamaguchi (Panasonic Communications Co., Japan)

For managing manufacturing and other industries, the concept of simultaneously achieving contributions to the society, good figures in the management indices, and satisfaction of employees is very important as the mission of companies. For achieving such a mission, people working in engineering must recognize the existence and significance of 'trans-disciplinary fundamental technologies', in which TRIZ is a main part, and must master and practice them. In the present paper I will reconsider and propose how we should understand and integrate QFD, TRIZ and Taguchi Method as the major parts of the trans-disciplinary fundamental technologies, and I will present my vision of fully utilizing TRIZ for the management of a manufacturing industry. I will further go ahead to discuss on the activities necessary in industries for the success in achieving such a mission.

I05 Invited Paper: Introductory Lecture

Fundamental Philosophies of TRIZ and Its Potentiality as Problem-Solver

Manabu Sawaguchi (The SANNO Institute of Management, Japan)

Many advanced TRIZ techniques have been developed and proposed recently. Such developments, however, can be barriers on the contrary for TRIZ beginners to learn TRIZ smoothly. Thus, in the first half of my introductory review, I will organize and consider anew the fundamental philosophies of TRIZ originally developed by Altshuller. In the latter half, I am going to demonstrate that TRIZ methodologies are very effective to solve various problems in companies (especially, to solve technological problems, to find strategies on the basis of next-generation technologies, etc.). I will also mention about current situations of introducing TRIZ in practice in Japan and also in European countries, USA, and Korea.

Part 2. Contributed Papers (Oral and Poster Presentations)

#02

Solving Physical Contradictions with Modeling

Valery Krasnoslobodtsev and Richard Langevin
(Technical Innovation Center Inc., USA)

This paper is devoted to consideration of formulating physical contradictions during problem solving process and their mathematical modeling with application of simple expressions and schemes. It is well known, the transition from stated ideal final solution with physical contradiction to specific solution concepts is a difficult part of solving process even for experienced specialist. Application of the separation principles and functional analysis, applied for resolving physical contradictions, acts like bridge between the model of the solution and the real solution does not always give desirable results. Utilization of presented approach provides increases the efficiency of separation principles and functional analysis. Modeling helps with building the additional interaction between a model of the solution and the real solution by using scientific phenomena. The operation of the developed approach for problem solving is presented through specific industry examples and cases studies with schemes and pictures of proposed solutions.

#03

Computer-Assisted Problem Analysis via Semantically Extracted Experience

* Isak Bukhman and Stephen Brown
(Invention Machine Corporation, USA)

To identify the right problem and solve it quickly engineers must be able to find appropriate concepts from among thousands of scientific effects and from tens of millions of articles, patents, and other sources of information. Although Altshuller identified this "informational fund" as an essential component of the TRIZ methodology, little could be done until the sources became digitized and readily accessible. Traditional keyword search methods return documents rather than concepts.

Through new breakthroughs in computational linguistics, it is now possible to generate, from virtually any digitized information source, a Cause-Effect Experience Base of semantically extracted concepts that aggregates and generalizes patterns of effects, or failure signatures, and their causes. Over 15 million patents have already been analyzed and integrated into a Root Cause or FMEA workflow. Altshuller's "information fund" is now a usable reality.

#04

Re-Structuring TRIZ To Meet The Needs Of Software Engineers

Darrell Mann (Systematic Innovation Ltd, UK)

The high-level pillars of classical TRIZ can be shown to be fully applicable in the software engineering context. The working level tools found in Classical TRIZ or its derivatives, on the other hand, are frequently incapable of offering meaningful assistance to software engineers. The starting aim of the paper is to explore the main complementarities and contradictions between TRIZ and the needs of software engineers. During this discussion the paper describes how a re-configured and expanded version of the method has been developed. Particular aspects of these developments discussed in the paper include:

implications emerging from the fact that software systems are capable of evolving at a considerably greater rate than their physical counterparts. While the word 'self' is often used as a theoretical evolution destination in physical systems, in the virtual world it is often a realistic and realisable design aim. Software systems that calibrate themselves, correct themselves, update themselves, and in some cases write themselves look set to have significant implications on the role of the software engineer and the design of effective software systems.

progressing from here to the world of cybernetics, the paper discusses the Law of Requisite Variety and the implications that it carries for the effective management of variation attenuation between the real world and the software domains. Software engineers, in other words, are able to design systems to meet the requirements of today, but are then frequently incapable to anticipate and program for the requirements of tomorrow.

cybernetics also connects the discussion to the Law of System Completeness and viable systems. During this part of the paper we examine how the TRIZ Law needs to be re-thought in order to make it meaningful in the software context. Having done this, we then show the likely impact on the successful integration between software and the sub-system and super-system domains that by definition it must interact and integrate with.

finally, then, the paper moves on to examine the design of very high integrity software systems – systems with a failure rate of 10^{-8} or better – and how TRIZ can better help software engineers and system testers to manage the identification and elimination of rare and therefore difficult to identify failure modes. During this section we examine design and test strategies evolved from the subversion analysis tools found in technical TRIZ.

A concluding section of the paper takes these four aspects and suggests how, collectively, there is considerable potential to transform the software art into a practical and reliable science.

#05

TRIZ as the New Product Concept Development Tool

Ik Cheol Kim (Tecinfo/Korea TRIZ Association, Korea)

There are two kind of new product development method. "Needs intention" that comes from market demand, and "Seeds intention" that comes from new technology. These are useful but have serious problem. That is these methods are too risky.

The major reason of failure is that engineers do not understand what is real problem. They chose the wrong problem, and they try to find the right answer. What does that mean? Their time and money are wasted.
New product is thing that solve the problems of present product by improving the performance, reduced the cost, modifying the function. Therefore, it is necessary to concentrate on the problem to generate the concept of a new product.
"Problem intention new product concept development" finds the problem for the new product development by 31 categories. To analyze the current product by these 31 categories, you can generate the concept of new product. In this paper, example is showed through the vacuum clean machine.

#06

Defining Technical Concepts in TRIZ Practices and in Patent Claims: Filing Patents Effectively with TRIZ Helps Promoting TRIZ

Kimihiko Hasegawa (SANO & Associates International Patent Firm, Japan)

Exhibits of the results obtained with TRIZ are helpful for those who are considering whether to adopt TRIZ and thus for those who are in a position to promote TRIZ. Patents are the means to release the technical results and to pass publicly through objective rating process in a most early stage. For filing a patent, you have to clarify your solution concepts obtained by TRIZ in the “patent claims”. From the viewpoint that “patent claim” is defined as a technical concept, I will describe how to complete a “patent claim” efficiently by comparing the technical concept definitions used by TRIZ and in the “patent claims”.

#08

A New Paradigm of Creative Problem Solving (3) Usage and Significance of the Six-Box Scheme in USIT

Toru Nakagawa (Osaka Gakuin University, Japan)

As the basic scheme for creative problem solving, science and technology in general including TRIZ have been recommending to solve the problem in an abstract level with the Four-Box Scheme; but as the accumulation of knowledge bases the scheme has shifted into the (enforced) analogical thinking with prior model selection. The present author has recently proposed a new basic scheme, i.e., Six-Box Scheme based on USIT (Unified Structured Inventive Thinking). The contents and nature of the information required or generated in each box of the scheme have been well specified, and the ways of transforming among them (i.e., the problem solving processes) have already been developed in detail in the form of the USIT procedure. A case study of solving a real problem achieved in a USIT 2-Day Training Seminar is demonstrated to illustrate the new basic scheme and its significance.

#10

"TRIZ Home Page for Students by Students" — Understanding TRIZ/USIT by Solving Everyday-Life Problems —

*** Masayuki Hida, Tsubasa Shimoda, Naoya Hayashi, Mizuo Omori, and Toru Nakagawa (Osaka Gakuin University, Japan)**

As the results of the Theses Study at Toru Nakagawa's Seminar Class in Faculty of Informatics of OGU, we have created and publicized the Web site "TRIZ Home Page for Students by Students". In the Seminar Class we have experienced a number of group practices of solving various problems by using TRIZ/USIT. For the theses work, we have tackled individually with everyday life problems, including 'How to make a knot with a string shorter than the sewing needle?', 'How to prevent shoplifting in a small bookstore?', and 'How to make the trains more comfortable for commuting passengers?', and have solved them with TRIZ/USIT to generate our own creative solutions. The ways of studying and the results are described in the Home Page. For creating the Home Page, we have tried our best to show how we students learned and what we actually obtained as frankly as possible. We wish our new "TRIZ Home Page for Students by Students" carry frank and vivid messages from us, Students who studied TRZ/USIT, to many Students who are new and about to learn it.

#11

Practices of Applying TRIZ/USIT in Konica Minolta Business Technologies, Inc.

*** Tateki Oka and Shigeru Sawada (Konica Minolta Business Technologies, Inc., Japan)**

The practice of applying TRIZ/USIT in product development has been advanced by a Working Group since two years ago, with the following three points in particular:
(1) The databases of TRIZ and USIT are arranged and unified in a manner for the engineers easy to utilize them in practice.
(2) An in-house USIT 2-Day training seminar was carried out, resulting our appreciation of the importance of problem analysis.
(3) Training program of engineers was implemented in the field of problem analysis by linking TRIZ/USIT with TM (Taguchi Method) which is widely used in our company.
On the basis of these activities, a practical process flow of using TRIZ and USIT in parallel has been set up to maximize the user-friendliness and has been implemented in practice.

#12

A Method of Resolving Differences Based on the Concepts of Functions and Process Objects — Or a Comment on "Hierarchical TRIZ Algorithms" —

Takahara Toshio (, Japan)

This article shows a framework of a method of "resolving differences" which includes problem solving, based on the concepts of "function" and "process object". "System object" and "process object" correspond to "being" and "action" respectively, and are everything to be recognized by us. The relations between functions and types of operation on objects give a guidepost to a method of "resolving differences". I will take some examples from Larry Ball's "Hierarchical TRIZ Algorithms" and explain them on the present method as a comment on his book.

#13

Technology Forecast by the 9-Window Method and the FDMS Cycle

Kunio Fukatsu (TOSHIBA Social Automation Systems, Japan)

This study concerns an application of TRIZ system operator (9-window method). In the scene of technology forecast and decision making, usefulness of this method is widely recognized. I found a unique cycle which appears in the alteration of product generation, and named FDMS cycle, based on the analysis of paper handling machines which I was involved in as a design engineer. The cycle is composed 4 generations, which have each characteristic, F: Function realization, D: Discrimination, M: Multi function and S: Standardization. The existence of such a cycle enables us to consider and estimate the technology forecast of a product from the view point of generation characteristics. I introduce the FDMS cycle to the original 9-window method, and the application of new method to a paper feed mechanism give us new ideas and new conception.

#14

Using TRIZ One Parameter Method to Solve Empty Cells Problem in TRIZ Contradiction Matrix

Jahau Lewis Chen (National Cheng Kung University, Taiwan)

The 40 inventive principles and contradiction table of TRIZ method are a good approach for solving innovative design problem with system contradictions. However, designers may discover some empty cells in the contradiction matrix of TRIZ method without any suggested principles. This paper describes a method for designers to solve the empty cells problem by using a modified TRIZ technique without contradiction information. Some practical cases are illustrated to demonstrate the capability of proposed method.

#15

Changing the Paradigm in Business English Learning Using TRIZ

Manoj Kumar Jaiswal and * Padma Rajeswari Tata
(Infosys Leadership Institute, India)

Infosys Technologies Limited (NASDAQ: INFY) being a global organization has clients and offices across geographies. For the success of the organization, communication and mastery in Business English was identified as one of the crucial competencies for all the employees.

The learning challenge was to show high effectiveness in training Infoscions* in Business English. The learning intervention was expected to be scalable and with minimum instructor dependency. The existing paradigm was that a lot of instructor time is required for developing Business English competency.

Using TRIZ principles, Infosys Leadership Institute** redefined the approach to the problem and developed a scalable learning intervention. The intervention was deployed on a pilot group of over 100 Infoscions* and the intervention has been validated.

#16

Conception of Application of TRIZ to the University Education

Victor D.Berdonosov and Anatoliy R.Koudelko
(Komsomolsk-na-Amure State Technical University, Russia)

Application Purpose – to increase professional standard of specialists at the expense of:

- teaching the methodology of solving technical problems;
- forming and developing of culture of powerful creative thinking;
- transferring knowledge in compact, short-cut form.

The Heart of Conception

- TRIZ must become a basic subject (like mathematics, physics, and information science) which all other subjects rely on.

Four conception realization stages

- The task of the first stage – to work out a system of involving students in active study.
- The task of the second stage – to collect and prepare materials for remaking courses according to TRIZ methodology.
- The task of the third stage – to work out the methodology of giving courses remaking according to TRIZ.
- The task of the forth stage – to apply widely TRIZ in learning process.

#17

Patent Analysis by "Function Diagram"

Toshiaki Masaki (NITTO DENKO, Japan)

In the initial stage of research and development, the existing patent must be investigated and duplication on the technology already invented and devised must be avoided. Unobviousness is required in order to patent the result of research and development. Unobviousness can be referred to as being by adding a new function to the conventional technology. By performing functional analysis of a precedence patent, it becomes clear how a function should be added and the direction of new research and development can be found out. As this analysis means, a "functional diagram" is considered to be effective.

#18

TRIZ Promotion Activities in NEC Corporation

* Takehiro Suzuki, Takashi Kimura, Toshihiro Kamiyama, and
Shinichi Emoto (NEC Corporation, Japan), and
Tokiaki Takai and Kazuyo Shibusawa (NEC Patent Service, Ltd., Japan)

We, NEC Corporation, have been promoting the introduction of TRIZ in NEC and its subsidiaries from 2002. In 2005, a variety of new training courses and events were held in order to accelerate the recognition of TRIZ. Moreover, we have been attempting to apply the TRIZ-based methods to come up with a good idea concerning utility computing and some new services for medium and small companies in our “BIGLOBE” business, i.e. Application Service Provider service, for about half a year. In this session, we would like to present you the summary of our TRIZ Promotion Activities and their future.

#19

Joint Structure to Realize Weldingless Pipe Structure

Minoru Yokouchi (Takano Co., Ltd., Japan)

The frame structure such as semiconductor production devices was produced conventionally by welding plural SUS pipes. However, craftsman skill is necessary for welding, and regulation (mine dust disorder prevention synthesis measures) by law and environmental measures such as green supplies (CO2 reduction) are demanded. We set development of joint structure to realize weldingless pipe structure with an aim to solve these problems and performed design, trial manufacture / evaluation, patent investigation from getting out idea. We utilized TRIZ to overcome an important problem and practiced development. As a result, the new joint structure that We called dice joint structure and high nut structure was born and was able to realize house brand through design / trial manufacture / suggestion to some customers. We applied for five patents, and it was adopted in this year by a grant system of Japan.

For the medium and small-sized company where turnover from trust type to a suggestion type company is demanded from, I think that there is an effect in the idea method that utilized TRIZ and recomend to use it positively.

#20

Educational Seminar Project: Introduction to the Inventive/Creative Thinking System "To instruct students how to invent creatively"

*** Mitsuo Morihisa, Hiroshi Kawakami, Osamu Katai, and Takayuki Shiose (Kyoto University, Japan)**

TRIZ was strikingly introduced into JAPAN in 1996. Since then the Kyoto University Symbiotic Systems Laboratory examined a TRIZ seminar instructing how to design (improve) products systematically by applying TRIZ theory and its software. The seminar was named "Introduction to the Inventive/Creative Thinking System" and started in the year 1998 for the third grade of students, department of engineering science, Kyoto University. But after several years' practices, 5 problems (2 philosophical and 3 practical) inherent in this seminar became apparent. Complete reexaminations seemed to be necessary.

We analyzed by the three viewpoints in the symbiotic systems thinking and decided to add "Patent Specification" exercise for the first time in our year 2004 seminar.

The first reason was that to write Patent Specification was very effective to learn the consistent invention process from idea to realization.

And the second reason was that year 2004 was also a valuable timing to revise. Owing to the Japanese government policies of turning national universities into independent administrative entities since 2004, Kyoto University's intellectual property policies also are noticeably changing. For example invention done by university researchers shall belong to university since 2004. So university researchers should be careful to patents, especially to the Patent Specification writing know-how .

Above are the main reasons why we added Patent Specification exercise in our year 2004 and 2005 seminar.

This seminar now aims to instruct undergraduate students who are beginners of both TRIZ and invention how to invent creatively. So the year 2006 seminar was planned to double the seminar training period (from 9 hours to 18 hours total) to enrich TRIZ training.

Improved year 2006 seminar is scheduled to start in mid-October this year.

#21

Case Studies From A Breakthrough Innovation Product Design Programme For Local Industries

Darrell Mann (Systematic Innovation Ltd, UK), Joseph Poon (Hong Kong Productivity Council, Hong Kong), and Matthew Driver (Network China Ltd, UK)

Starting in August 2004, the Hong Kong government began sponsoring a deployment of TRIZ to a cluster of eight local companies. Over the course of the next 15 months, each company was invited to assemble a team of between 5 and 8 engineers and designers each of whom would be exposed to a series of six three-day TRIZ education and utilisation sessions. The aims of the programme were for each company to realise new products, patents and tangible financial benefits, and to measure the extent to which TRIZ allowed companies to accelerate their rate of innovation.

This paper describes a collection of some of the success stories emerging from the programme. The case studies cover a range of different industries and the deployment of a TRIZ tools. They include the following:

- resolution of manufacture quality problems in a paper manufacturing company, utilising the contradiction elimination part of the TRIZ toolkit
- identification and then evolution of a novel technology-leap suitable from a consumer audio-equipment company, using a combination of knowledge database searches and the TRIZ trends and Evolution Potential tools
- identification and then evolution of a novel technology-leap suitable from a consumer electronics company, using a combination of knowledge databases and the TRIZ contradiction elimination tools
- application of a variety of TRIZ tools to design patent-free design solutions in a computer hardware products manufacturer
- conceptualisation and realisation of a novel air-conditioning control system using a combination of Contradiction and Evolution Potential tools
- conceptualisation through to realisation of a novel consumer electronics product using Trimming and Trends tools, and successfully culminating in a $2M order received while the programme was still running

A final section of the paper draws together some of the overall conclusions reached during the programme. In this section we will report on the applicability of TRIZ to the Hong Kong and China industry context, and on the planned future activities.

#22

A Method of Solving Engineering Contradictions

Masahiro Kuwahara (IDEA Co., Ltd., Japan)

TRIZ has been introduced and utilized in a large number of industries for supporting engineers to generate technological solution ideas. When engineers apply TRIZ to their real technological problems, however, they often meet difficulty in the process of defining engineering contradiction and selecting appropriate invention principles. The difficulty, we suppose, comes from the inconcrete nature of the series of processes of abstracting their problem in terms of the TRIZ concepts and of devising solution ideas. For solving this difficulty, we have made up a general and effective method, i.e. a method of solving engineering contradictions in the "IDEA" way.

#23

An Educational Challenge in Yamaguchi University for Engineering & Manufacturing Technology Innovation Project and TRIZ Education

Shigeru Kasuya (Yamaguchi University and Fujixerox. Co., Ltd., Japan)

In a university education, it is required to implement industrial proven practical Engineering & Manufacturing practices into a course for developing creativity of students. A project for Engineering & Manufacturing Technology Innovation in Yamaguchi University

has such purpose by introducing industrial design technologies and by teaching Marketing, QFD and TRIZ for stimulating students' creativity.

The students have been experiencing their creativity inspired and learning how to make creative designing through PDCA (Plan Do Check Action) cycle. This also helps them to think self-supportive for their learning and for their future business life.

In this report, an overview of "Global Design Engineering" course of the project and TRIZ course are introduced.

Purpose of the project

The purpose of the project is to provide students courses for stimulating their creativity for developing product concepts that can solve global environmental issues with high customer value. These courses enable students to develop design sensitivity, creativity, capability and knowledge for solving problems.

1. Design engineering process
2. Communicating Idea 1
3. Creative thinking
4. Design specification review
5. From Idea to feasible design
6. Solving problems
7. Design concept review
8. Communicating Idea 2
9. Implementation
10. Presentation by students

#24

Using TRIZ in Project-Based-Learning Assisted by CAE and Manufacturing Experiences

Masao Ishihama (Kanagawa Institute of Technology, Japan)

Our department has drastically changed teaching method to project based learning (PBL) from a conventional system, i.e. from basics to applications. To wake freshmen's interest in engineering subjects and to develop their skill of applying knowledge to real problems are the major objectives of this PBL. In this report, two examples of invention by students in PBL will be presented. One is an engine intake system design that solves trade-offs between maximizing engine performances and minimizing space the system occupies. The other is a front suspension system that enables a newly developed walking aid to over-ride high gaps with small thrust force while giving it stability and shock absorbing function. In both cases, students' skill of using computer aided engineering (CAE) software and their manufacturing experience has an important role. It was found that PBL is a good environment to teach TRIZ, and CAE and manufacturing experiences help students to learn it.

#25

Introducing USIT in Matsushita Electric Works

Kouji Tsuji and Jiro Hashizume (Matsushita Electric Works, LTD., Japan)

USIT (Unified Structured Inventive Thinking), i.e. a simplified and integrated version of TRIZ, has been introduced in Matsushita Electric Works, with the aim of utilizing it for efficient R&D and patent application. The two corporate engineering departments, namely Intellectual Property Department and Technical Management Department, worked together for the promotion. USIT 2-Day Practice (instructed by In-Company lecturer) were conducted, where USIT were applied in group practices to solve 14 actual on-going problems in our Corporate Research Laboratories or business headquarters R&D. As the results of the evaluations after the practice, USIT has been found effectively applicable to the problems in the fields related to mechanics, information systems, and materials, and also found that 27 ideas respectively (average) was created, and the validity to a theme was also quite good. We will aim at settling USIT down in our company from now on.

#26

Study of Selected 100 US Patents with TRIZ Views — An Interim Report of the WG of Creativity Techniques Part of Knowledge Creativity Study Group Organized by Mitsubishi Research Institute —

Osamu Ikeda (Nikon Corp.), Masayuki Ishii (Sumitomo Electric Industries, Ltd),
Youichi Katsuki (Anritsu Corp.), Keiji Kawamo (Shibaura Institute of Technology),
Kazuo Goto (Ricoh Corp.), Yuji Shindo (MRI Research Associates Inc),
Toru Nakagawa (Osaka Gakuin Univ.), * Jinkichi Miyai (DKK-TOA Corp.),
Hiroaki Yazawa (Brother Industries, Ltd, Japan)
[in the order of Japanese Alphabets]

Actual cases of TRIZ applications have been seldom publicized due to companies' secrecy policies. For studying TRIZ under these situations, the information disclosed in the patent documents is very valuable as references. By studying excellent patents with the views of TRIZ, we should be able to 'Study the patents with TRIZ and study TRIZ with the patents, simultaneously'. With this intention, we started a multi-company collaborative group for studying 'Selected 100 US Patents' which Darrell Mann had selected and analyzed in his work (July 2004) of verifying the effectiveness of 'MATRIX 2003'. Our intention is to find out the inventor's original thoughts through the description in the patent, to trace Mann's analysis objectively, and further by ourselves to analyze the technical problem posed in the patent document and to apply the TRIZ methodology to it. So far we have analyzed about 20 selected US patents, described the analysis in a specific format of patent study, and discussed about them. As the results of our work for one year, we have jointly built a fruitful method for studying TRIZ by using patents.

#27

Practice of TRIZ, Systematic Creation Process "An Example of Chestnut Peeler"

Hiroshi Ueda (Souzou Kaihatsu Initiative (SKI), Japan)

SKI published the Japanese Edition of Darrell Mann's textbook "Hands-On Systematic Innovation" in 2004 with the translation supervised by Toru Nakagawa. The book has rich and deep contents as a textbook of TRIZ practice. Thus SKI has prepared a set of work sheets to be used along the systematic creativity process described in this book. In training seminars organized for schools and companies, these work sheets are selectively used to meet the demands to solve specific problems. As an actual example of practice, I will demonstrate a recent invention of "chestnut peeler" carried out with this systematic creation process.

#28

"Phenomena-Attributes Analysis (PAA)" in USIT Demonstrated for the "Picture Hanging Kit Problem"

Hideaki Kosha (Fuji Photo Film co., Ltd., Japan)

"Phenomena-Attributes Analysis (PAA)" is a new tool developed in our company for the problem analysis stage in USIT. It is used effectively for us to find (or speculate) plausible root causes and the mechanism of the problem, especially for uninformative engineering problems (presented at The First TRIZ Symposium in JAPAN). Though PAA was originally developed for analyzing uninformative engineering problems, we tried in the present paper to verify its effectiveness in solving general and informative problems such as "Picture Hanging Kit Problem". We have found that PAA helps us understand the mechanism underlying the problem phenomena in a more natural way in such cases as well.

#29

Using TRIZ Tools for Eco-Innovative CAD Software Development

* Hsiang-Tang Chang and Ya-Chuan Ko (Shu-Te University, Taiwan)

In this paper, the new edition Chinese eco-innovative CAD software "Eco-Design Tool V.1.0.0 CHT" will be proposed. Different from other TRIZ software, Eco-Design Tool focuses on eco-innovative design. After couple of times of updating, the software became more conducive to development of eco-product. The software composed of seven worksheets, including Design Strategy Making, Estimation for Product, Recommended Design Parameters, Problem Resolutions, Inspiration by Animations, Eco-Product Examples, and Solution by Su-Field Modeling. A designer could make a proper strategy through AHP (Analytic Hierarchy Process), and then find out some feasible principles through the match of recommended parameters. Next he could be inspired by the detailed solutions, fascinating animations, and eco-product examples. Finally his idea of new eco-product would be completed. If his design problem is still perplexing, the Su-Field Modeling could assist him to obtain some clues for resolution.

#30

Using TRIZ as a Strategic Tool for Intellectual Properties

Toshimitsu Kataoka (Patbrain Corporation, Japan)

There are a number of cases where companies introduce TRIZ with the expectation that the problem solving with TRIZ will generated a larger number of inventions and a larger number of patent applications. However, the increase in the patent application number alone does not mean the increase in the strength of intellectual property strategy in the company. In order to obtain strong IP rights strategically, TRIZ should be used effectively in every process from problem discovery to the acquisition of IP rights for the solutions. For this purpose, I will discuss in the present paper how to utilize TRIZ in the IP tasks as a strategic tool for intellectual properties.

#31

Discussing TRIZ Dogmas

Shinsuke Kurosawa (The SANNO Institute of Management)

The history of TRIZ is a history of struggle for the method to be accepted by the market and the society. The struggle forced earlier TRIZ developers to overemphasize some characteristic features of TRIZ when they taught TRIZ or explained about it. In order to understand the real value of TRIZ that has been added to intellectual assets of human being, we need to separate true essence of TRIZ as the learning about artificial systems evolution and its usage for real life problems from those impurities that have crept into TRIZ during the struggle. This paper discusses TRIZ premises "Ideality", "Contradiction/Conflict" and "the structure of Patterns of Technological Systems Evolution" with the aim to distinguish their true value from the embedded impurities.

#32

Proposal of Fault Analysis Method merging Kepner-Tregoe Method in TRIZ

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The Failure Analysis of TRIZ is very useful to extract the candidates of failure causes by analyzing the inherent problem of the system. However, some effort is required to find out the true cause from the candidates. The KT (Kepner-Tregoe)-PA(Problem Analysis) is known as one of the strong tools, which can help us to find out the most probable cause from presumed causes. So, we have merged the KT-PA in TRIZ to realize an effective failure analysis and proposed the two methods; one is to extract the true failure by TRIZ after finding the reasonable candidates from the roughly presumed causes by the KT-PA, and the other is to find out the true failure by the KT-PA after extracting the candidates of the failure causes by TRIZ. The former method was applied to a practical system and was confirmed to be effective.