TRIZ Future Forecast

Alexey Zakharov

Alexey.Zakharov@GEN3partners.com

Abstract

For the TRIZ development forecast the possibility to use some TRIZ diagrams (schemes, flow-charts, etc.) was investigated.

Introduction

The topic "The TRIZ development by TRIZ methods" had appeared on April 07, 2004, on the forum "TRIZ – Creativity Development – Creative Person"[1]

The author of topic has written:

"The modern TRIZ consists of the following parts:

- Trends of Engineering Systems Evolution

- TRIZ Database

- Su-Field Analysis

- Algorithm of Inventive Problem Solving

- Creativity Methods Development

Let's look on TRIZ as the system for inventions creation …"

There were many attempts to structure and to re-structure TRIZ, attempts to establish the general scheme for problem solving. Often these schemes were interesting and had own "gems and pearls." However, never such schemes were intended for TRIZ analyses.

I've picked out some TRIZ models developed recently to test them if these models can be applied to represent the TRIZ itself. Please agree, that it would be interesting from some points of view:

- theoretical – if we successfully develop a good models for different systems, the failure or difficulties to develop the TRIZ model will show that our knowledge / understanding the TRIZ as a system is not correct;

- practical – the adequate TRIZ model will allow to develop TRIZ forecast.

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[1] http://www.triz-ri.ru/forum/index.asp?cat=67#beg

Selected TRIZ models / approaches for TRIZ representation, with comments by the author:

- Toru Nakagawa (Osaka Gakuin University). **Approaches to Application of TRIZ in Japan**
  TRIZCon2000: Apr. 30 - May 2, 2000, pp. 21-35
  http://www.triz-journal.com/archives/2000/08/f/index.htm

Fig. 1 illustrates the general scheme established by TRIZ. The upper part shows the world of information in science and technology, while the bottom part the world of user's own problem. It is not easy for users to utilize the science and technology for solving their problems.
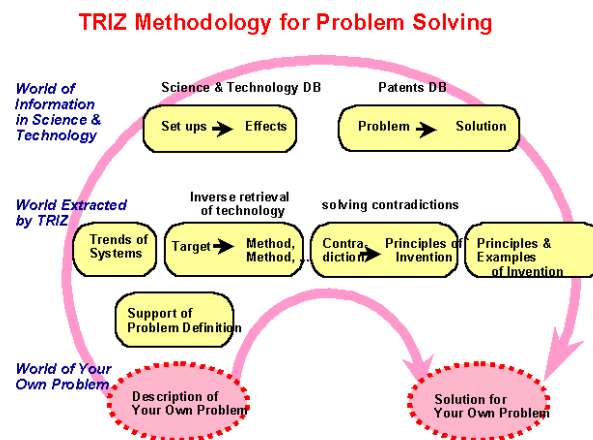
TRIZ Methodology for Problem Solving

Fig. 1

<u>Comment</u>: This scheme is too general and more illustrative than practical to represent TRIZ as a system.

- Establishing European TRIZ Collaborative Environment.
  http://www.triz-journal.com/archives/2001/01/a/index.htm

European TRIZ Association (ETRIA) has stated that "… TRIZ is considered as a cross-disciplinary, generic methodology, *but it has not previously been adequately presented in terms of logic or any other formal knowledge representation. Most of the concepts introduced in TRIZ are fuzzy, and most of the techniques are still heuristic and only partially formalized.*"

On the base of this statement ETRIA "… will focus on the following:

- Structuring the existing TRIZ techniques and development of a *general framework* for analysis of innovative problems, generation of new solutions and intellectual property.
- *Establishing relationships between previously unrelated TRIZ techniques on the basis of introducing sharable ontological concepts and developing general framework* for mapping between designer's requirements and specific procedures defined by TRIZ."

<u>Comment</u>: It would be interesting to see this work done, i.e. to see the strong formalized general framework for TRIZ.

- N. Shpakovsky at al. Structural Scheme For Solving a Problem Using TRIZ. http://www.triz-journal.com/archives/2002/01/f/index.htm.

One of the most carefully developed works presents *a scheme of problem solving that starts from the analysis of the initial situation and ends in solving a mini- or a maxi-problem.* The scheme was developed based on practical use of TRIZ and is used by the authors in their work for the company SAMSUNG.

Comment: Scheme is carefully developed. It would be interesting to ask its authors to use it for TRIZ representation.

- Avraam Seredinski. **System Operator and the Methodology of Prediction**
  http://www.triz-journal.com/archives/2002/01/d/index.htm

Enumeration of all the sub-systems in the 9-screen presentation (system operator) combined with the use of Altshuller's laws of evolution simplifies the method for predicting the technology and operation of future systems.

Comment: It would be useful to use presented approach – "system operator + evolution trends" – to determine the TRIZ supersystem, and then to make a TRIZ forecast.

- V.Petrov. **The TRIZ Future.** The 5th International Science-and-Practical Conference "The Kids Creativity Development by TRIZ Means", Chelyabinsk, June 24-26, 2002. http://matriz.karelia.ru/conf/tezis5k/pet-fut.htm

To develop new unified TRIZ we need to provide:

- The current TRIZ analysis to the deep details – "atoms" to discover TRIZ resources. To do this we need to define -- what TRIZ "atoms" are?
- New TRIZ Synthesis on the base of revealed TRIZ resources.
- Development the system for the TRIZ self-development.

Comment: It would be interesting to see this deep analysis done.

- B.Zlotin and A.Zusman. **General Scenario of Technological Evolution…** IZOBRETENIA Magazine. The Altshuller Institute for TRIZ Studies. Volume V, 2004, p. 18-21

Working on the theory for scenarios development we has got an understanding that although obviously for different situations (systems) different possible scenarios exist, however, at least one *general scenario has been unveiled that could be applied practically every times*.

The picture below shows evolution of a system in the context of overall technology evolution and allows for systematic exploration of possibilities. Like any unveiled and documented pattern or line of evolution, the *scenario … has predicting power*.
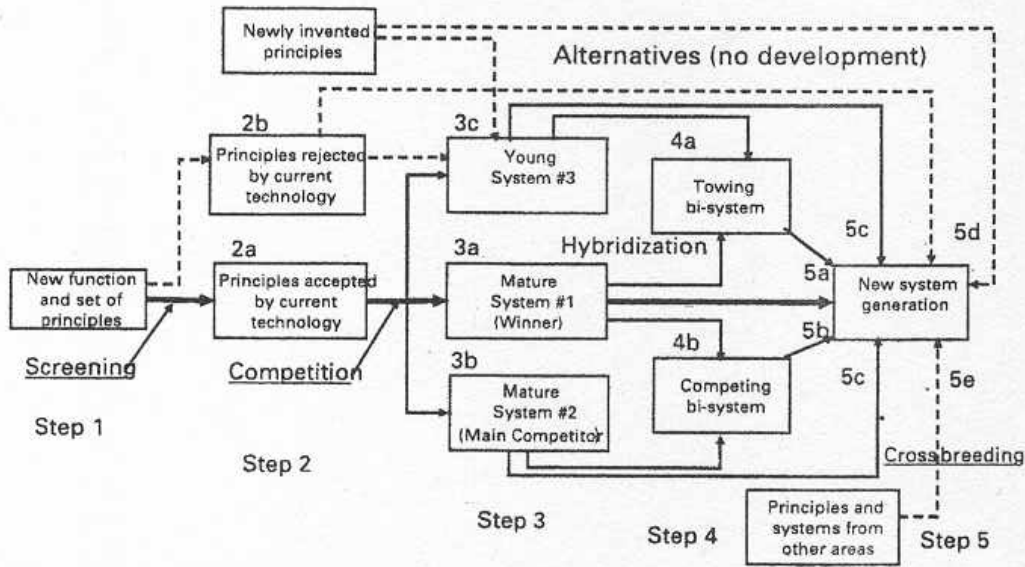
Fig. 2

Comment: It would be interesting to use this scenarios' map to predict TRIZ development. Maybe my attempt below will excite authors to do so, and we will see TRIZ hybridization in forms of competing (4b) and/or towing (4a) bi-systems?

Universal Scheme of Evolution use for the TRIZ future forecast

We see that there are very well developed tools to predict future for systems. However, no author told about TRIZ prediction. Is it impossible to develop recommendations where TRIZ will move further? Is it impossible to use TRIZ to analyze TRIZ itself? I may be mistaken, but it seems that in the TRIZ-experts community such a problem was not discussed at all...

Thus, I suggest using the advantage of the experience developed in TRIZ by today to investigate carefully the declared theme «Analysis of TRIZ by TRIZ methods».

To find out – how TRIZ influences the User, let us begin from two questions:

- What is the main point of interaction between User and Investigated system?
- What is the result of interaction between User and Investigated system?

The result is presented in Fig. 1 as the chain of functions: "Investigated system" changes "Person mind" → "Person mind" generates "Generated image (false)[2]." Please do not be surprised by its simplicity. We will find many more details step by step.
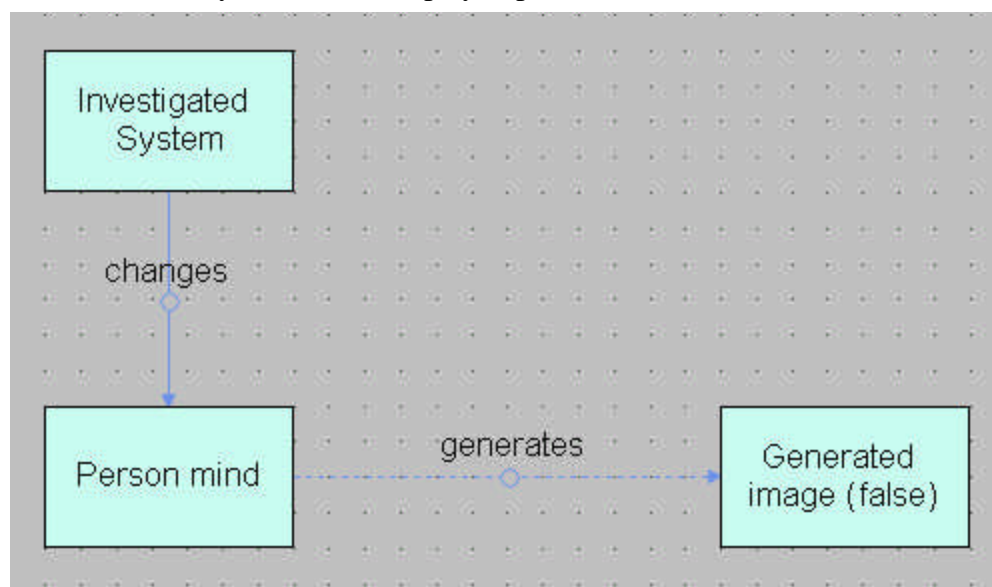

Fig. 3

As shown in Fig. 2, to help the User to get an accurate understanding about the Investigated system and its sequential development we need to equip User with TRIZ knowledge. As a result, the more right (real) image of system will be generated.[3]

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[2] The first impression is often misleading. To prevent it the numerous approaches were developed. TRIZ was developed with the same goal too. The discovered trends of evolution of nature, of society, of productive and engineering systems showed the strict accuracy of this method.

[3] Y.Salamatov. TRIZ Today and in the Future. Research program "Creation of foundations for new TRIZ." ETRIA World Conference "TRIZ Future 2002". November 5-6, 2002, Strasbourg, France.
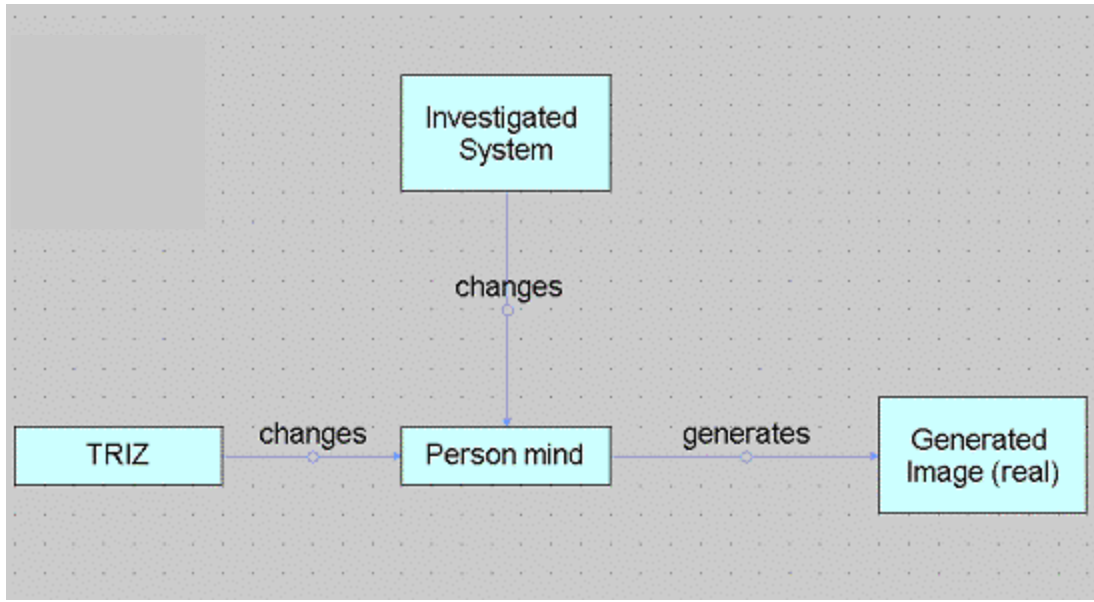
Fig. 4

However, any development has its own price. The positive (useful) TRIZ feature that helps to investigate the system – the variety of tools, has the negative feature – the sharp rise of complexity. From this point of view, the TRIZ can be shown
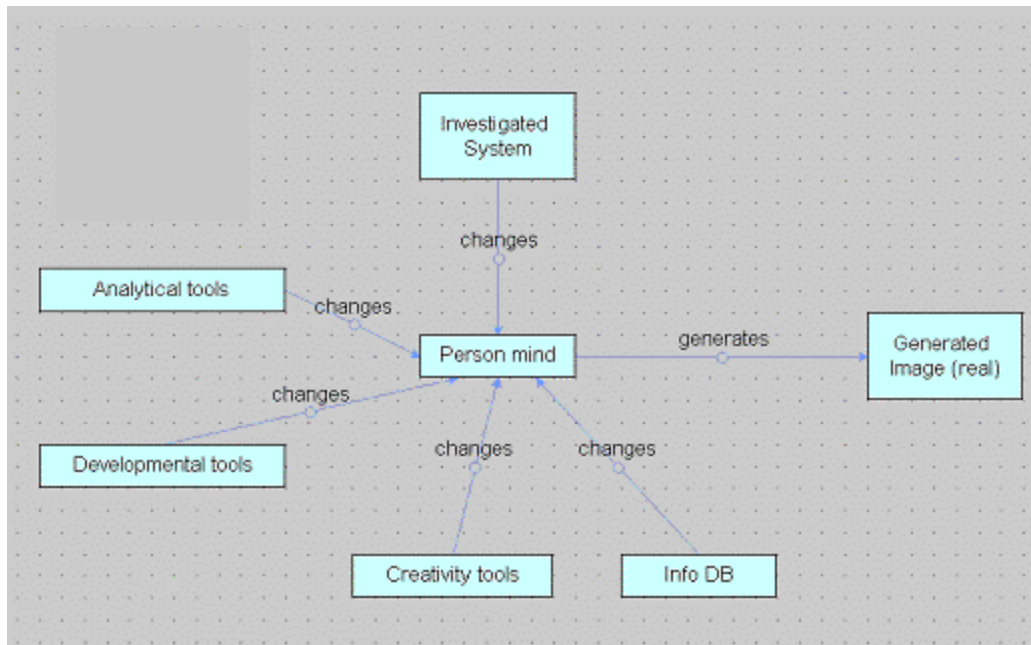

Fig. 5

with the mentioned variety of tools - analytical and developmental tools, information database, creativity tools (the last one for overcome psychological inertia).

If we show all components of these tools, the complexity of the diagram, shown in Fig. 5, increases sharply.   Therefore, the problem appears – the growing TRIZ complexity. It

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complicates, first of all, the TRIZ education, which leads to a very long time to get TRIZ experience and to become a TRIZ expert.

The other side of TRIZ complexity is its components incoherence. This incoherence prevents the understanding of the TRIS logic, prevents searching ideas for how TRIZ can be developed, and prevents finding TRIZ's position among other sciences.

Let's use Universal Scheme of Evolution that was developed on the TRIZ base, to find the possibilities to remove the mentioned disadvantages, and to develop TRIZ into universal tool of systems' investigation and development. It will be the exact implementation of idea "to develop TRIZ by means the TRIZ itself."

For the first sight, the use of Universal Scheme of Evolution looks like a vicious circle, i.e. for the TRIZ forecast it is suggested to use the structure that we want to get as the result. Nevertheless, there is a helpful detail to help break this vicious circle – it is the same situation when we use the tool to develop the better tool, the tool of new generation. Universal Scheme of Evolution today is the logical and structural development that includes the maximum number of TRIZ tools. Because of that, the use of Universal Scheme of Evolution will hopefully lead to discovery of new additional possibilities of forecast.

Use of Universal Scheme of Evolution[4] traditionally starts from initial description of situation.

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[4] Editor's note: This software is not available - the author uses it for testing the USE. We have included it in the article because it demonstrates the USE method. Please do not request the software from the TRIZ Journal or from the author.

Fig. 6

The system under investigation is TRIZ; its main function is "to change User's mind."

Further, the program logic describes the situation in which the presence of problems leads to decrease of TRIZ attraction for User, i.e. TRIZ loses its survivability. The low level of TRIZ survivability can be evaluated by low level of Value (Ideality), where Value is the relation between useful functions and harmful functions. The harmful functions existence means that Value level are lower than possible one.

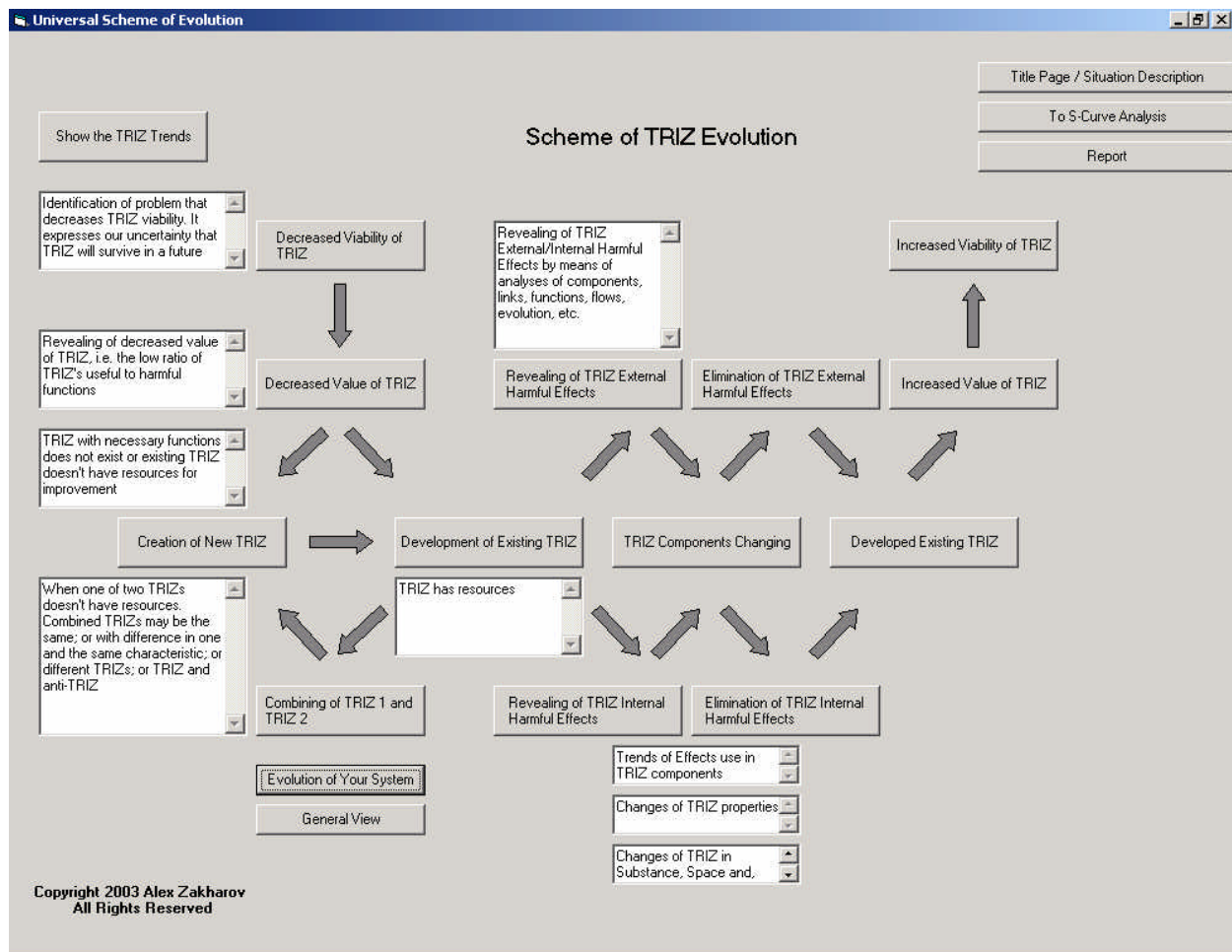Evolution stages and directions of TRIZ changes are presented on Fig. 7.

Fig. 7

The presentation of evolution directions in the form of some scheme, which pretends to be universal, must be supported by real facts. These real facts must be the clear examples of evolution of a wide set of systems – nature systems, social, productive, engineering, scientific, artistic ones, etc, - in accordance with this scheme.

Only after enough number of similar examples, we can suggest that evolution really can be presented with such scheme, and this scheme can be used to study evolution of any system.

System Evolution	System Evolution through USE
Affinnova, the Cambridge startup, has created a mathematical model of Crayola markers in which key aspects of the marker's visual appearance are dictated by eight numeric parameters — the "genes." To breed two markers, Affinnova's software combines two parents and creates a range of children that have some characteristics from each parent — and perhaps a random "mutation" thrown in every now and then for	Crayola marker description as a gene → Population of Crayola markers' genes generation → Mutations in Crayola markers genes → Cross-breeding of pairs of Crayola markers genes → Genes' fitness evaluation and the most fitted Crayola markers genes selection

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[5] **Technology applies survival of fittest to product evolution.** By Simson Garfinkel. The Seattle Times; Business & Technology; Monday, June 24, 2002; http://www.simson.net/clips/2002.SeaTimes.06-24.Affinnova.htm

good measure. By cross-breeding the programs that performed well at a particular task, then simulating thousands of generations, researchers were able to evolve programs that could sort numbers, fly airplanes and even make money on the stock market. [5] Affinnova has come up with a revolutionary new twist on the 1980s concept of "genetic programming." Back then, a bunch of computer scientists realized the principles behind natural selection could be easily applied to computer design. The scientists treated the actual machine code of a program as its genetic blueprint.	
North Carolina State University and University of Utah researchers have advanced evolutionary robot controllers by combining artificial neural networks and teams of real mobile robots to demonstrate that the behavior can be evolved in a simulation. The researchers' randomly generated a large population of neural networks, then organized individual neural networks into teams of simulated robots that played tournaments of games against each other. After each tournament, the losing neural networks were deleted from the population, and the winning networks were duplicated, altered slightly, and returned to the population. After several hundred generations, the neural networks had evolved well enough to play the game competently and were transferred into real robots for testing in a real environment.[6]	Population of Neural networks' generation → Neural networks' fitness evaluation by the game and the most fitted Neural networks' selection → Population of Neural networks' generation → Mutations in Neural networks' → Neural networks' fitness evaluation by the game and the most fitted Neural networks' selection…
High tech optical fibers can be designed by 'breeding' fiber designs and letting them evolve, according to an Australian scientist. Designing optical fibers best suited for each application is a complex problem that has so far been a matter of trial and error. A computer program that uses the principle of evolution can produce better results, and in some cases is the only design method that fits optical fibers to specific applications. Evolution happens as organisms best suited to the particular environment pass on their genetic material to their offspring. Optical fibers can be designed using a similar process. The computer program combines two patterns to create a third fiber 'offspring', which Manos described as "similar but a bit different". This process is repeated thousands of times with the 10 designs best suited for the particular application chosen to 'breed' again.[7]	Optical fiber description as a gene → Population of Optical fibers' genes generation → Mutations in Optical fibers' genes → Cross-breeding of pairs of Optical fibers' genes → Genes' fitness evaluation and the most fitted Optical fibers' genes selection…

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[6] **Evolution Trains Robot Teams.** MIT Technology Research News; May 25, 2004;
http://www.technologyreview.com/articles/rnb_052504.asp
[7] **Evolution breeds better optical fibers.** By Heather Catchpole. ABC Science Online. Wednesday, June 9 2004;
http://www.abc.net.au/science/news/stories/s1127384.htm

At the turn of the century two powerful forces have emerged to change the mass communication model. The first is the use of computers as a means of processing, analyzing, and disseminating information. The second is the constantly accelerating capacity of that technology to enhance communication so it is almost unbounded by time and space. Today anyone with a modem, personal computer, and a telephone line can become a publisher, as we now know the term. But it is a mistake to eliminate totally the old model in favor of the new. By juxtaposing the best of the new model -- computerized access, delivery, and packaging of information -- with the best of the old model -- insightful reporting in a well written story -- a better hybrid model that combines the best of both is created.[8]	Computer as a media tool description as a gene; Newspaper as a media tool description as a gene → Populations of computer and newspaper tools generation → Cross-breeding of pairs of computer and newspaper genes → Genes' fitness evaluation and the most fitted better hybrid model genes selection…
One of the cornerstones is the use of genetic algorithms in producing new molecules. Public schools may still debate the teaching of evolution, but scientists are using evolutionary theory to allow computers to invent new molecules. It may not sound like the most likely place to use evolution, but the combination may help treat disease. Computers may not appear to be very "biological", but they can be instructed to mutate and sexually combine virtual molecules or other data. In addition to producing new molecules from various combinations of existing molecules, equations can create the evolutionary "survival of the fittest" and remove the less-fit candidates.[9]	Virtual molecule description as a gene → Population of Virtual molecules' genes generation → Mutations in Virtual molecules' genes → Cross-breeding of pairs of Virtual molecules' genes → Genes' fitness evaluation and the most fitted Virtual molecule genes selection…

The understanding growth of nature's trends uniformity leads to simplicity of examples' search. Taking into account the "sufficiency of intuition" principle,[10] let us assume that the presented examples give us a right to believe that the Universal Scheme of Evolution is applicable in our specific situation. From this point of view, the possible stages of evolution and directions are as follows.

- Box 1. Low TRIZ survivability (because of disadvantages the attractiveness of TRIZ is being lost) → rejection of TRIZ use or dramatic reduction of Users number
- Box 2. Low TRIZ value (together with the certain advantages there are the certain disadvantages)
- Box 3. Creation of new TRIZ (the existing TRIZ has too many disadvantages that are accompanied by the lack of resources)
- Box 4. Development the existing TRIZ (the existing TRIZ has only few disadvantages, and it has enough resources for development)

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[8] **The Evolution of the Newspaper of the Future.** By Chris Lapham. CMC Magazine July 1, 1995 / Page 7. http://www.december.com/cmc/mag/1995/jul/lapham.html

[9] **Survival of the Fittest in Drug Design**. ByMichael J. Felton. Modern Drug Discovery. Nov/Dec 2000, Volume 3, No.9, pp. 49–50, 53-54. http://pubs.acs.org/subscribe/journals/mdd/v03/i09/html/felton.html

[10] There are enough facts to put forward a hypothesis.

- Box 5. Combining at least two variants of existing $TRIZ_1$ and $TRIZ_2$ (advantages combining and mutual exclusion of disadvantages)
- Boxes 6 and 7. Disadvantages discovering in TRIZ, development of cause-and-effect chain of disadvantages, the key disadvantage(s) revealing.
- Box 8. The key disadvantage(s) elimination.
- Boxes 9, 10, 11, 12 and 13 – developed TRIZ (without disadvantages → more valuable → more survivable)

To point out the direction of TRIZ change (what is the way from Box 2 – to Box 3 or to Box 4?) let's analyze the S-curve for TRIZ. The Internet statistics of propagation TRIZ in the world clearly says – TRIZ is on the second stage of its life circle.
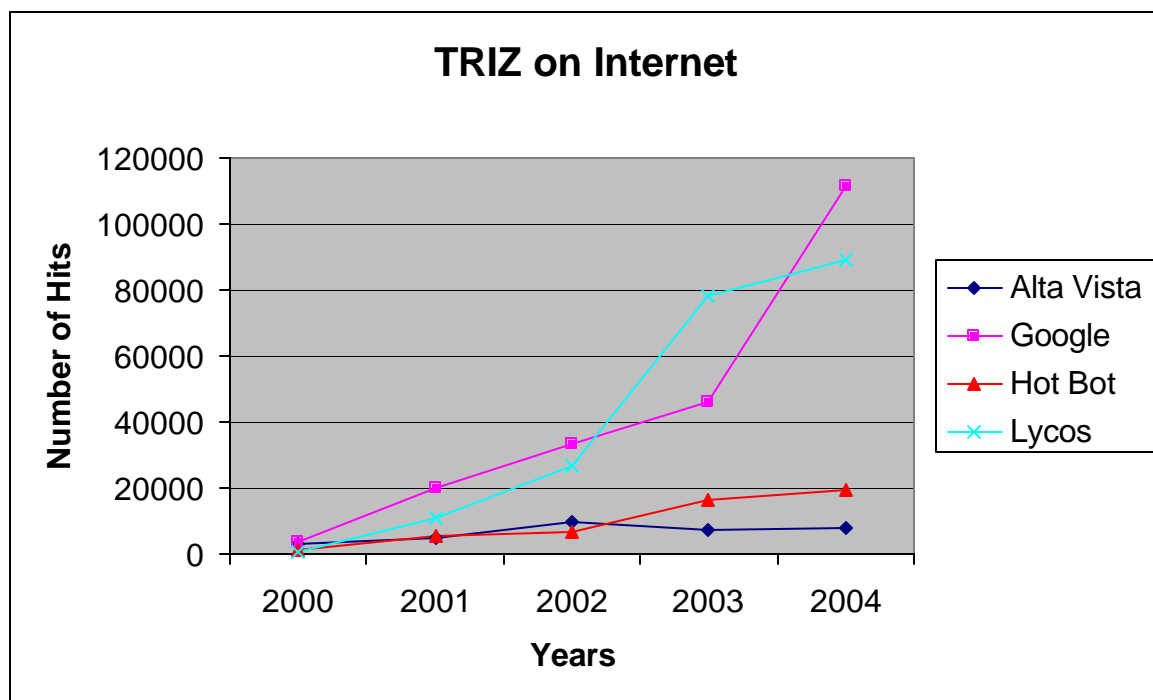
TRIZ on Internet

Fig. 8

The S-curve shows (presents, reflects) how the Value of investigated system changes through the time.
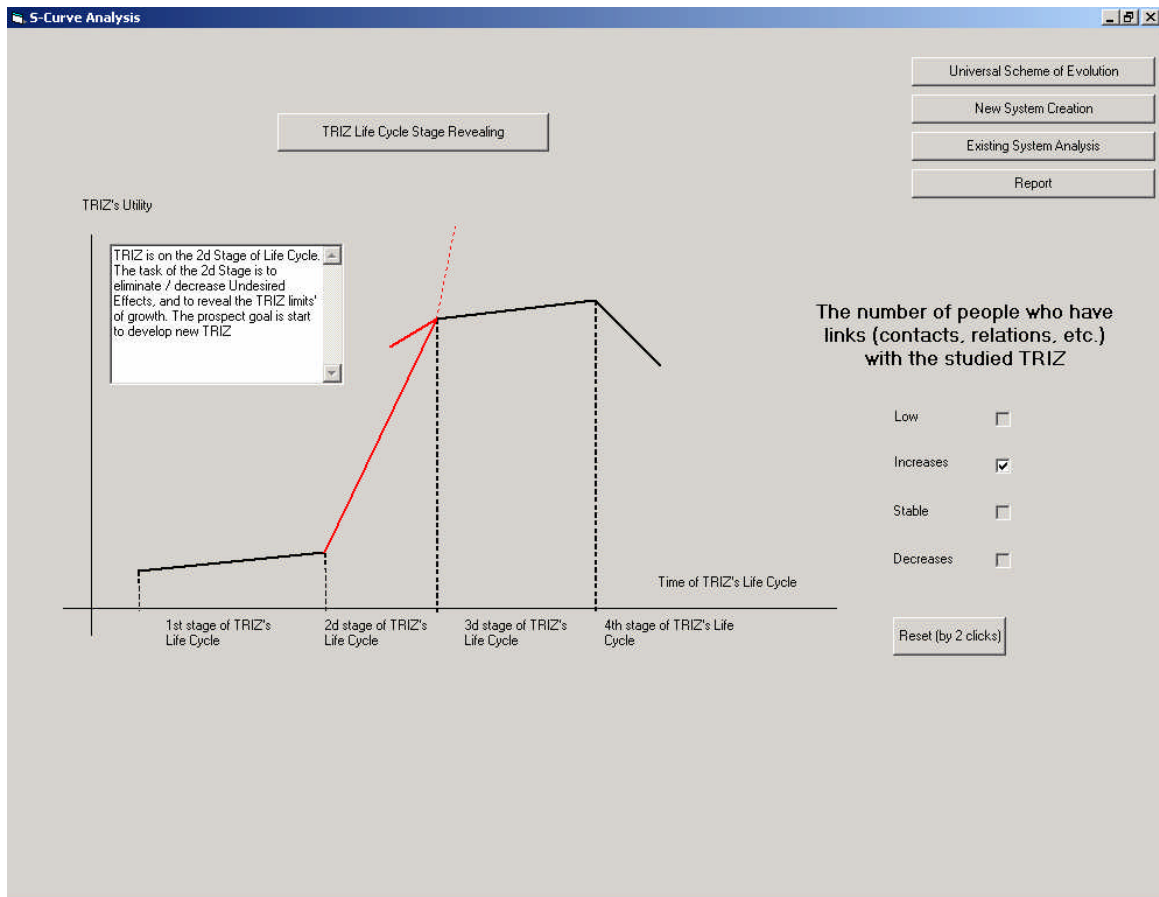
Fig. 9

The tasks of the 2d stage of life circle are as follows:

- The disadvantages elimination or their quantity reduction
- Discovering the limit of growth for TRIZ main parameter
- Long perspective goal is creation and development of new TRIZ

The two last points are consequent links of the one chain: discovering the limit of growth for TRIZ's main parameter means the formulation of its principle of operation, but the formulation of its principle of operation means the new TRIZ creation and development, i.e. its long term forecast.

In accordance to definition, the principle of operation is the base for main system function performance. Let's remember that the main TRIZ function is "to change User's mind". In details, the User's mind is being changed to be:

- Dialectical – User's mind gets the ability to see phenomena hierarchy and its structure,
- Flexible – User's mind gets the ability to adapt to changing situation,
- Open – User's mind gets the ability to overcome psychological inertia.

We will find the TRIZ principle of operation when we will answer to question: Why the User's mind can be changed? Or in slightly different form: On what base the User's education can be performed?

The answer is the User's mind can be changed, on the base of psychological effects, because of the adequacy of the taught information and information from surrounding world. As a result,

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TRIZ changes fuzzy pre-TRIZ thinking to more right perception, and, what is very important, to more successful use of natural phenomena.

People are different, and even the simplest truth is interpreted differently. Truth is not only interpreted differently, but is used differently. Because of that, the right system study requires deleting the human out of image generating. The TRIZ trend of human being displacement out of system states namely the same. From this moment, we have some features for the "portrait" of future TRIZ.

We will skip the Box 4 "Development the existing TRIZ" because we are interested in the long-term forecast. Therefore, we are going to "The New System Creation" screen.
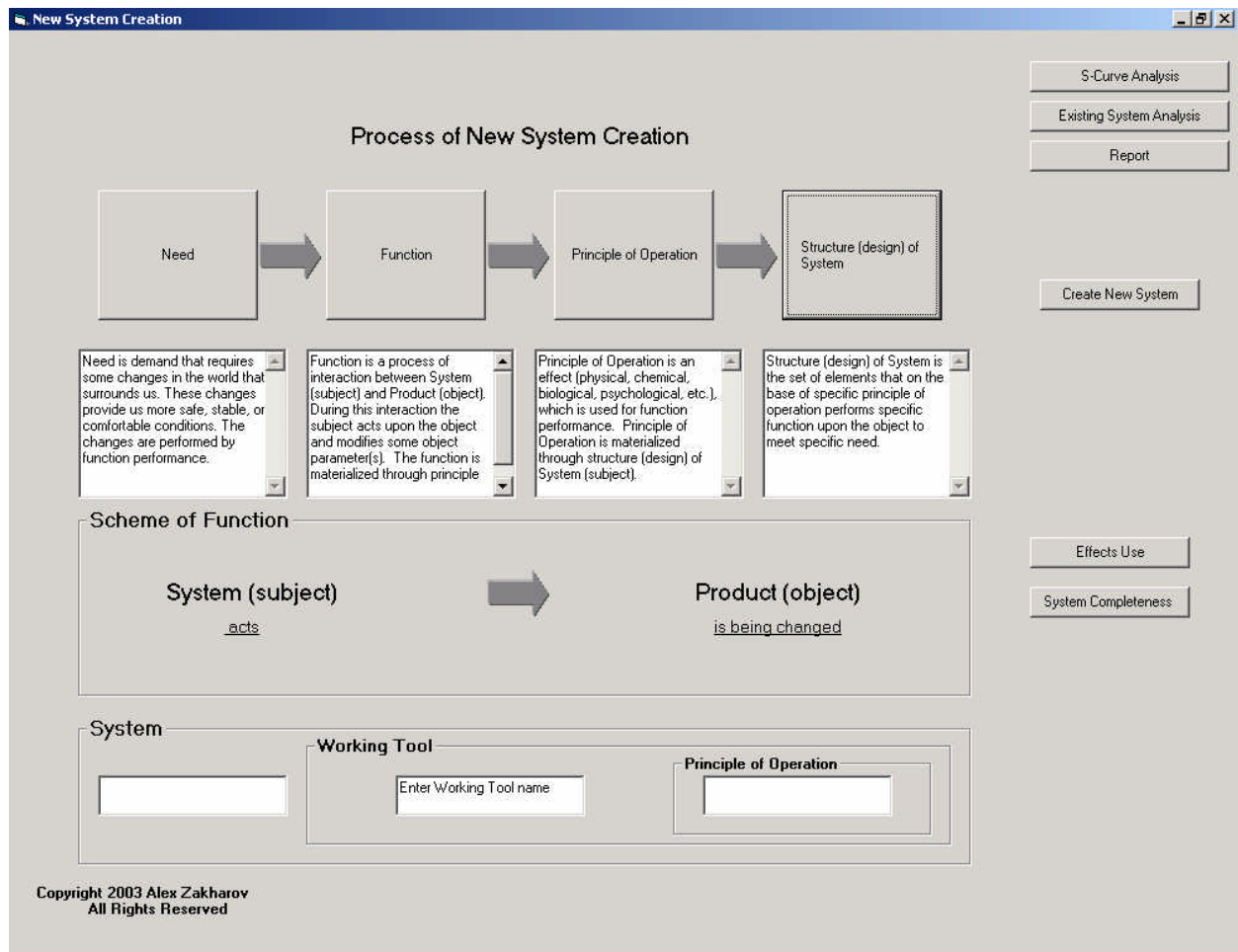

Fig. 10

The software implements the well-known chain "Need $\rightarrow$ Function $\rightarrow$ Principle of Operation $\rightarrow$ System (design, structure)."

The boxes' general content

- Need is demand that requires some changes in the world that surrounds us. These changes provide us more safe, stable, or comfortable conditions. The changes are performed by function performance.

- Function is a process of interaction between System (subject) and Product (object). During this interaction the subject acts upon the object and modifies some object parameter(s). The function is materialized through principle of operation.
- Principle of Operation is an effect (physical, chemical, biological, psychological, etc.), which is used for function performance. Principle of Operation is materialized through structure (design) of System (subject).
- Structure (design) of System is the set of elements that on the base of specific principle of operation performs specific function upon the object to meet specific need.

During the consequent substitution into software, the specific names for need, function, principle of operation, and design, and these definitions are being gathered inside definition in box "Structure (design) of System." If all these definitions are logic and properly linked (structured), in the result we get the logical phrase, which in generalized form describes the required System.

Names of system, function and function' object are automatically substituted into "Scheme of Function" to test the accuracy of function structure.

Names of system and its principle of operation are automatically substituted into scheme "System → Working Tool ← Principle of operation" to make easier the search of specific component for the System's Tool.
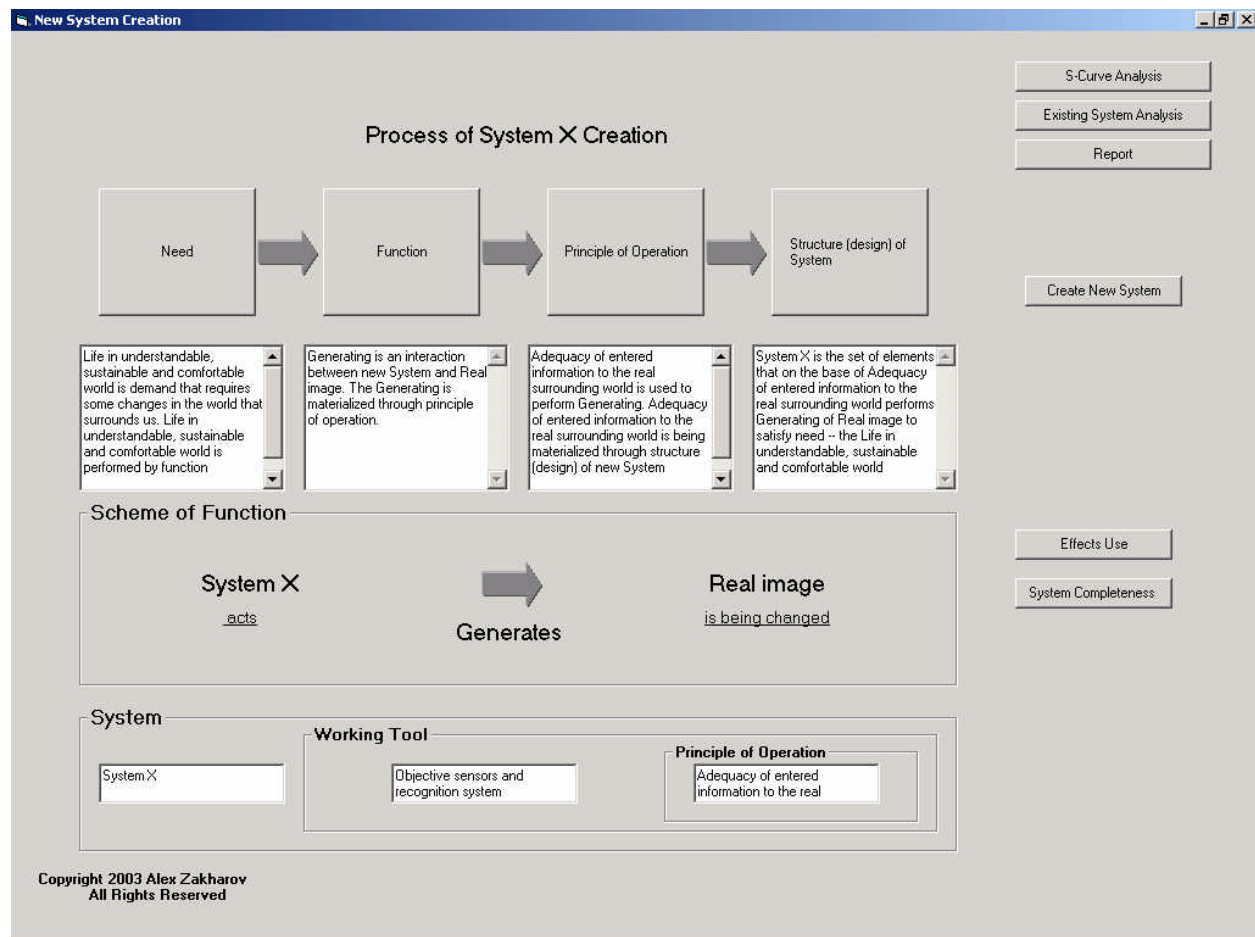

Fig. 11

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For new TRIZ creation the content of described boxes are:

- Life in understandable, sustainable, and comfortable world is demand that requires some changes in the world that surrounds us. Life in understandable, sustainable, and comfortable world is performed by function performance.[11]

- Generating is an interaction between new System and Real image. The Generating is materialized through principle of operation.

- Adequacy of entered information to the real surrounding world is used to perform Generating. Adequacy of entered information to the real surrounding world is being materialized through structure (design) of new System (subject).

- System X is the set of elements that on the base of Adequacy of entered information to the real surrounding world performs Generating of Real image to satisfy need -- the Life in understandable, sustainable and comfortable world.

Principle of operation is the adequacy of the taught information and the information from surrounding world.

Working tool - Sensors and recognition system

It is evidently that function is formulated correctly: System X generates real image of object under investigation.

For "System → **Working Tool** ← Adequacy of the taught information and the information from surrounding world" scheme the Tool is the "Sensors with Recognition System."

Accordingly, the "portrait of answer" – what will be the TRIZ in the distant future? – gets the new elements. Let's talk a bit about this distant future.

The term "distant forecast" has appeared in the times of forecasting by means of experts' evaluations. The experts' evaluations had the subjective nature, in spite of special procedures for objectiveness increasing.

After forecasting, experts had closely watched the systematic changes of object that was under investigation, and coincidences and convergences between forecasted changes and real changes were being marked. Because the object has evolved at its own pace, it was a slow movement. Object was achieving the dramatic changes, because only the dramatic changes were especially interesting, through very long years.

TRIZ forecast has the radically different base – the objective trends of evolution. TRIZ forecast leads to discovering features or condition, which the evolving object really will get. In TRIZ forecast, there are no words about timeframe, when object will get one or another forecasted condition. If the set of forecasted features is known (is formulated), there is nothing to stop object to get the forecasting features at once after forecast.

If industry is ready to produce the forecasted object (if industry has the capabilities, materials and personnel), and society is ready to use this object, then the distant future forecast can be achieved practically at once.

Now it's time to go to trend of system completeness to test the newly produced system X.

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[11] It's very simple to test this need – only ask yourself: "Why I use TRIZ?" Answer is: "I use TRIZ to solve problems, i.e. to get life in understandable, sustainable, and comfortable world."
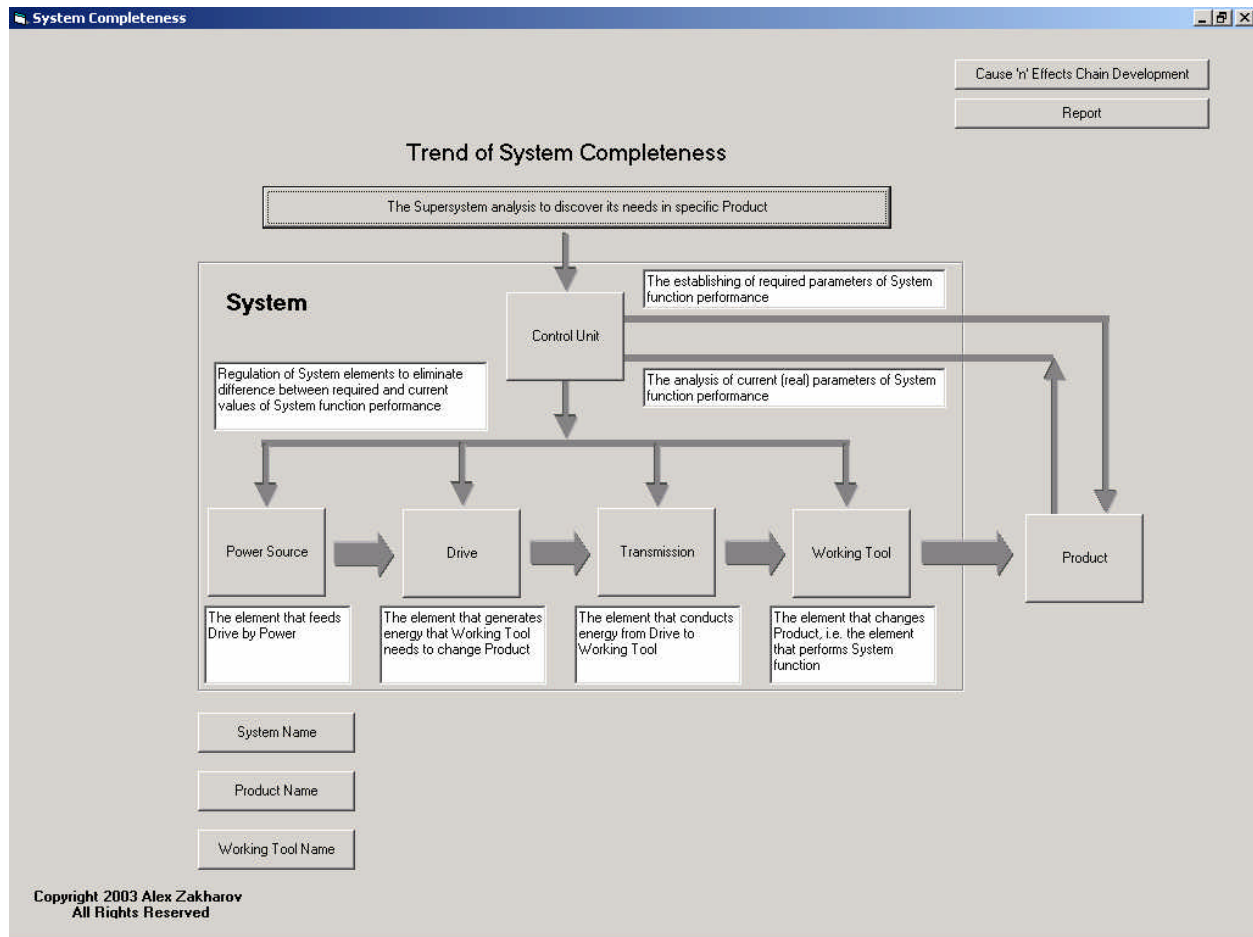
Fig. 12

The main concepts of this screen are as follows:

- presentation of set of systems, which is enough to fulfill the Main function by investigated system
- evaluation of quality of functions' fulfillment by elements and links
- recommendations for system development

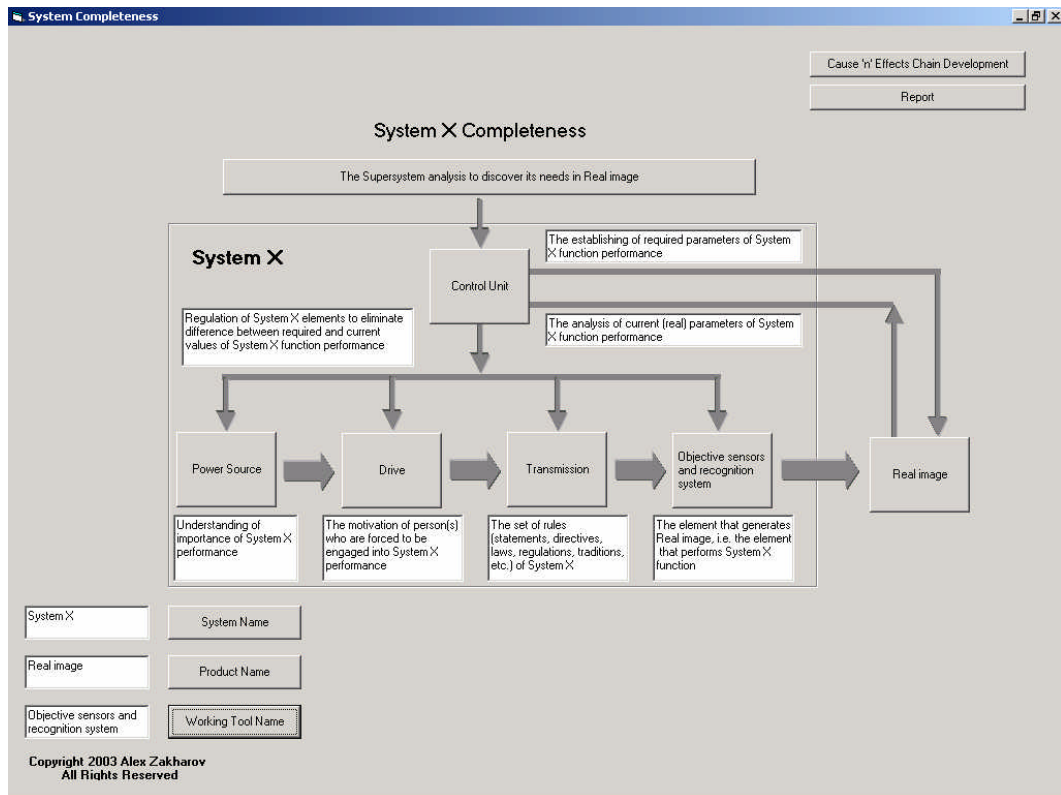The substitution into software the system name, Product and Tool gives a result:
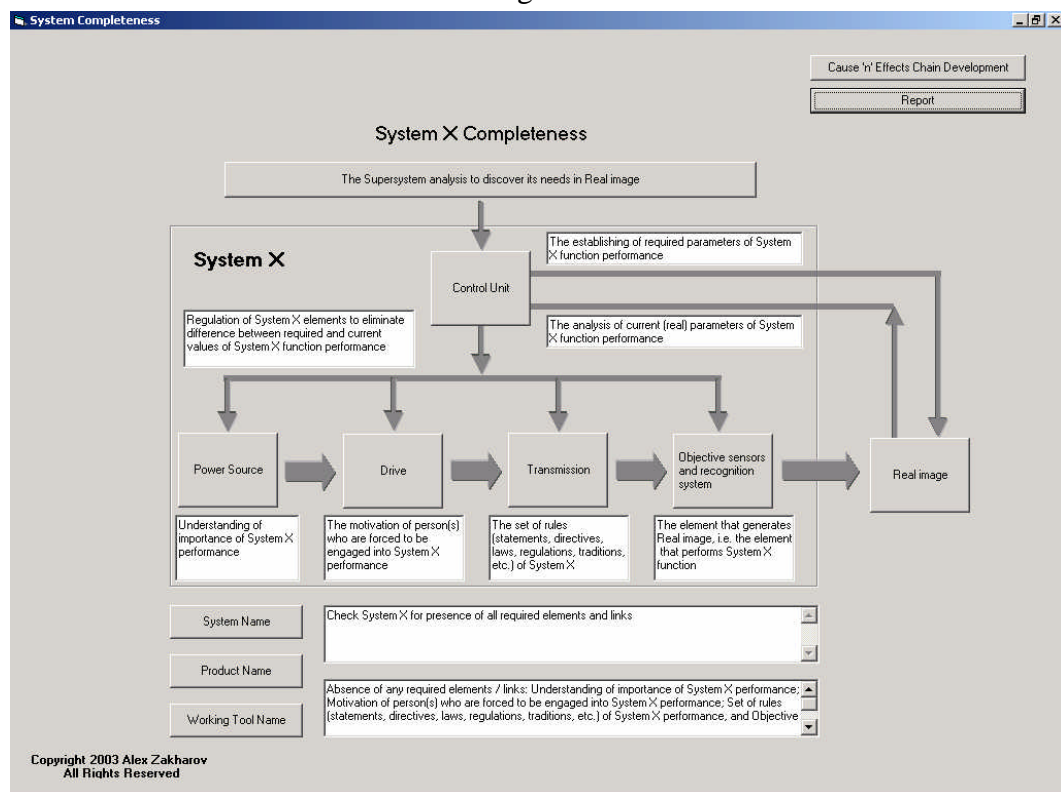
Fig. 13

Fig. 14

- Check System X for the presence of all required elements and links;
- Absence of any required elements/links or low efficiency functionality of mentioned elements/links:
    o Understanding of importance of System X performance;
    o Motivation of person(s) who are engaged into System X performance;
    o Set of rules (statements, directives, laws, regulations, traditions, etc.) of System X performance, and
    o Sensors and Recognition system, that generates the real (true) image the investigated system,

    must be qualified as harmful effects.

Recommendations for this hierarchical level "Society – System X" suppose the human activity, which develops set of rules (statements, directives, laws, regulations, etc.) for work of System X, and then the System X operates independently. This human activity dramatically grows every day; of course I mean a programming.

The combined altogether the "portrait" features of System X:

- Universality of tool for problems solution;
- For right object understanding and proper handling the object that ought to be developed, it is required to eliminate the User's out of object image generating;
- System X is the set of elements that on the base of adequacy of entered information to the real surrounding world, generates the real image of the object that ought to be developed, with the goal to satisfy User's need -- the life in understandable, sustainable and comfortable world.
- Humans develop set of rules (statements, directives, laws, regulations, etc.) for System X work, and then System X operates independently.

The features obtained, even if they are too heretical, are being integrated into Artificial Intelligence system.

To survive successfully in the unpredictable world the system ought to solve the numerous arising problems:

- In modern world such system is a human being + effective and universal methodology of problem solving, i.e. TRIZ. TRIZ proved its universality by solved problems in many various fields – first, in technology, but not only.
- In future world it could be a system without human being + software that developed on TRIZ base. On the TRIZ base software "Universal Scheme of Evolution" is developed.

The last one could be the Artificial Intelligence system. Let's say, as a first step. There is one interesting example of approach in AI "cultivation/growing"[12]

The «Maxwell Damon» experiment that was placed into nervous system model:

Message # 1. «I want to survive, and even more – I want to make my feelings (understanding of situation) better and better constantly.

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[12] A.Zhdanov (Dr. Sci., Head of Systems Simulation Dept., Institute of System Programming of Russian Academy of Science). Simulation of Nervous System Activity. Part 1. "Science and Life" Magazine, 2000, V.1, pp. 58 – 64.

The survival and the better feelings' making inside situation are the goals of nervous system control. As the result of natural selection, the pleasant feelings in the some circumstances/conditions ought to fit to objective benefits of these conditions for object under control.

Message # 2. «I ought to act actively to find new possibilities to make my conditions better».

...

Message # 4. «To make my conditions better, I ought to find the control method, i.e. I ought to find the links between my actions, the sensors' reading, and my emotions».[13]

So, Damon has formulated one more goal function – the knowledges' search and its collection. It is obviously, the more knowledge database, the more reliable survival methods/means it could find, and the more successfully it could make its conditions better. The both goal functions – survival and knowledge collection are tightly tied one to another.

Some extracts out from AI discussion[14]

- As a whole, the thinking it is a mind-understood behavior of system, and this behavior leads to survival. Therefore, the AI goal is to be the ideal system for action standards' making, and this system can be used in any situations' invariants in the habitat.

- A human being certainly has the intellect. Human being got the intellect in the course of evolution, and it was his weapon in the struggle for survival.

- One of the prospective and convenient ways to AI is the use of combined human-technological systems. I.e. such systems, in which human being and computer are combined into one team, and solve problems together. In practice the "team work principle" orientation leads to gradual transport of human being performed functions to "computer part" of team.

- The AI concept arises when it comes down to motivation. Any living thing has the survival instinct.

- Intellect is the feature of matter; this feature allows matter to find optimal solutions in the time and in the space, and these solutions fit best to conditions of goal achievement.

- Let's use the name "the intellect" to the matter's characteristic "to survive (to win) in given and deeply structured environment," and this environment is not necessarily a part of our world.

It may happen that the TRIZ software will be the software for AI. From the beginning, it may be only 1% of AI and 99% of human being intellect. However, let's remember that only human controlled the first airplanes, but with time the autopilot got its place in the cockpit. Moreover, computer started evolution from knots on the rope, abacus, and counting frame.

In conclusion

The possibility to use TRIZ for development of TRIZ itself has generated the chain: TRIZ → Universal Scheme of Evolution → Artificial Intelligence. Isn't it really interesting?

June 14, 2004
Boston, Massachusetts, USA

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[13] I have inside me something like "the conditions' evaluator", which allows me to feel my condition in accordance to the scale "extremely well – very well – so-so – bad – very bad – insufferably," and it allows me to feel the conditions' changing to good or to bad side.

[14] The Problems of AI Development Discussion. Membrana Online Magazine.
http://www.membrana.ru/forum/articles.html?parent=1040072314#1040072314