Thoughts about history of Inventive Machine Projects

Dmitry KUCHARAVY

LICIA / LGECO - Design Engineering Laboratory
INSA Strasbourg – National Graduate School of Science and Technology
24 bd de la Victoire, 67084 STRASBOURG, France

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To my mentor, friend, and colleague – Nikolai Khomenko

… to my mentors, friends, and colleagues…

Who supposed to make this talk?

DEVOINO Igor G., PhD, (Minsk, Belarus)

- 2011- Leading system architect at Invention Machine (Invention Machine Belarusian - R&D Facility);
- TRIZ Master (diploma #73, August 29, 2009);
- 25 years experience for the innovation practice methods;
- took part in development of all versions Invention Machine software (1989-2011);
- More than 30 training courses for PhD students, professors, engineers and inventors in Belarus, Russia, Czech Republic, Bulgaria, The Netherlands, Sweden, United States of America;
- Author and co-author for about 10 Author Certificates (equivalent of patents in the former USSR) and 2 US Patents.

How this talk have been prepared?
[methodology]

Inventive Machine Lab. Minsk, 1990

four questions

1. *What are the main stages of project?*
2. *What are the main achievements of IM project?*
3. *How does it improve efficiency of inventive problem solving?*
4. *What will be the next step for Cognitive technologies and Inventive problem solving?*

five interviews in August, 2011 (Minsk, Belarus)

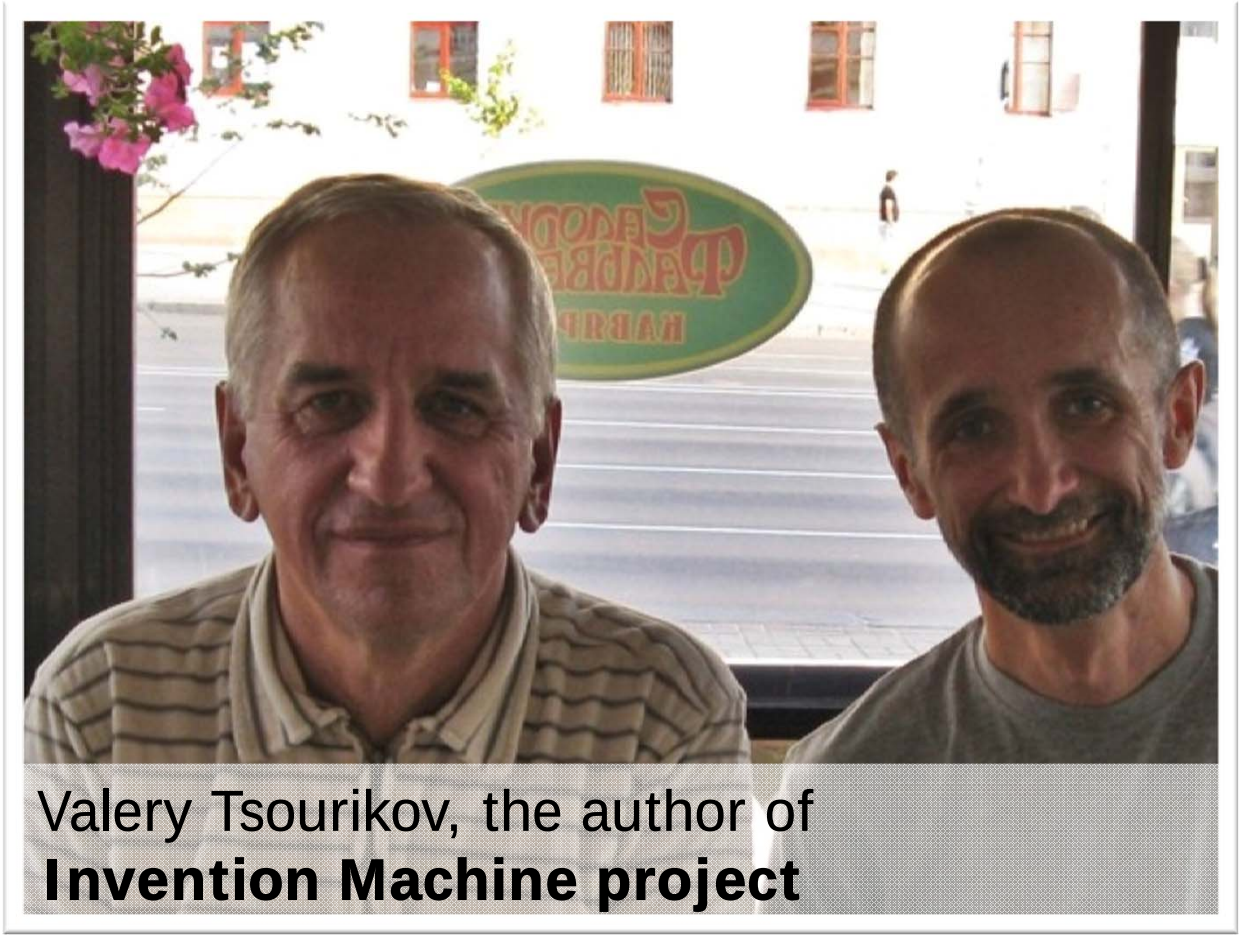

Alexander Skuratovich


Oleg Shmigelsky


Andrei Kurian


George Severinets

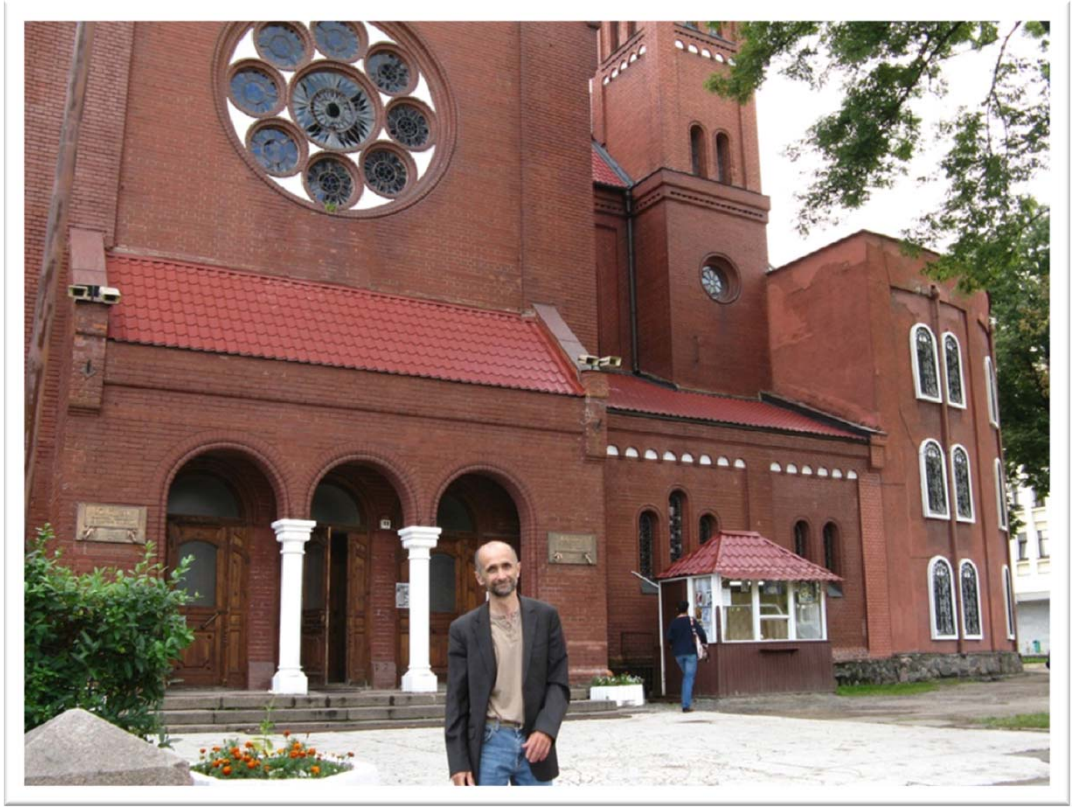
August, 2011 (Minsk, Belarus)



Valery Tsourikov, the author of
Invention Machine project

sources for story:

four questions +
five interviews (3.5 hour of voice memos) +
personal archives + phone calls +
Internet search + e-mail exchange =
a particular vision about history of IM project



outline

1. Project timeline
2. Possible stages of IM project:
3. What is next?

INVENTIVE MACHINE

[democratization of creativity]

main objectives of the project:*

- *developing the intelligent systems for supporting a creative thinking of engineers and researches;*
- *teaching the IM-Technology of inventive problem solving;*
- consulting and coaching for solving complicated engineering problems.

* Source: advertising materials, 1992

Inventive Machine

Goals of the IM Project:*

to provide the highest possible concentration of all the necessary knowledge in order to solve complex problems of engineering design:

- *to shorten the period of designing;*
- *to increase the quality of engineering design*

the main idea* of the project is to combine AI with the theory of inventive problem solving (TRIZ, Altshuller G.)

* Source: Tsourikov, V.M., 1993. Inventive machine: Second generation. AI & SOCIETY, 7(1), pp.62-77.

timeline of IM project

stages of IM project

I. Preparation: 1975-1986 – AI, TRIZ

II. Start up: 1987-1991 – AI + TRIZ

III. International development: 1990-1996

– TRIZ + Engineering Design (e.g. VEA)

IV. 1995-2001 – AI (semantic models) + TRIZ-data bases + Internet

V. 1999-2010 – TechOptimizer + Knowledgist + CoBrain =

Goldfier Innovator; Semantic models

What are the main stages of project? (1975-2011)*

by computer platform:

- DOS version
- Windows version
- Client-server architecture

by content:

1. Technical support of **problem solving** methods (principles, standards, effects) with minimum of information support: patterns to formulate steps, texts of recommendations, examples for recommendations.
2. Technical support for **problem statement** methods (cause-effect analysis, value-engineering analysis, risk analysis) with minimum of information support: specific editors for diagrams, automatic problem formulator, automatic generator of reports about analysis.
3. Semantic support of **problem statement and problems solving** process. Relevant information is supplied at needed time (statement or solving a problem) from available data bases.

* Devoino Igor G.

What are the main achievements of IM project?

- Invention Machine project initiated of new class of software for supporting Inventive practice;
- Invention Machine made, grew and grabbed new market; offices and implementation centers around the World (Japan, Europe, Asia)
- Growing interest to TRIZ around the globe and spreading knowledge about practical application of TRIZ-based methods;
- Many generations of developers of IM improved their professional skills (problem solvers, trainers, researchers, software engineers, managers, project leaders);
- Promotion of new pioneering idea:
  to invent – can be done professionally with high quality;
- Personal achievements: professional growth; very interesting job; new friends and eminent colleagues;
- Semantic support of main steps and phases for stating and resolving inventive problems contributed significantly for efficiency of inventive problem solving;
- Democratization of creativity ??

How does it improve efficiency of inventive problem solving?

- cause-effect analysis using support of semantic search of possible causes of problem – is an interesting way to reformulate problems and to discover key origins of problem;
- one of the element of problem solving – search of precise answers for stated questions (relevant to problem);
- instrument to excite thinking process; to switch it into unusual directions; it doesn't work by itself (like ski doesn't work without skier);
- in border of project TRIZ-technology to work with problems has been improved, but scientific component of TRIZ goes away under commercial interests – disappearance of open environment – slow down development of new methods and research;

What is next?

…knowledge appear so fast… there is no time to draw pictures, diagrams… it is essential to have access to information…
-Valery Tsourikov, 2011

Knowledge about scientific effects, study using ARIZ and inventive standards allow to develop breakthrough ideas, but it is necessary to develop this ideas (research and development) towards solutions. The costly process of problem solving play essential role.

Semantic technologies (Knowledgist & Cobrain) facilitate access to information about latest applications of breakthrough solutions.

Today, it is not necessary to make a study of 1 000 000 patents for building a new collection of breakthrough solutions of pointer of effects.
Semantic processors retrieve “grains” properly and quickly.

Next step: How to make synthesis of that “grains”?
(what has been retrieved)
Can we apply next generation semantic technologies (AI) for that?

Acknowledgements

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- Pesetsky Sergei
- Shmigelsky Oleg
- Suchkov Valeri
- Yaroshevich Dmitry

THANK YOU

for your attention!

LICIA / LGECO - Design Engineering Laboratory
INSA Strasbourg, 24 bd de la Victoire,
67084 STRASBOURG, FRANCE

dmitry.kucharavy@insa-strasbourg.fr

www.seecore.org
dk.seecore@gmail.com

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5. Tsourikov, V.M., 1991. Inventive Machine project: intelligent environment for supporting engineering. Journal of TRIZ. 2(1), pp.17-34 (in Russian)
6. http://inventionmachine.com/
7. http://www.scnsoft.com/Science-Intensive-Experience.html

Dmitry KUCHARAVY

www.seecore.org
www.trizminsk.org

About 20 years experience in TRIZ as engineer, researcher, consultant, and instructor

1987-1988: the first acquaintance with TRIZ as mechanical design engineer;

1989-1993: research engineer at IMLab, Minsk, Belarus;

1994-1998: freelance TRIZ-consultant, entrepreneur;

1997-1998: invited instructor in SADT, IDEF0, and TRIZ at Belarusian state and private universities;

1998-2001: professional TRIZ consultant & instructor at LG-Production and Research Center (LG-PRC, Pyeongtaek, S.Korea);

2001 - : research engineer, instructor, adviser and consultant at LGECO, INSA Strasbourg, France.

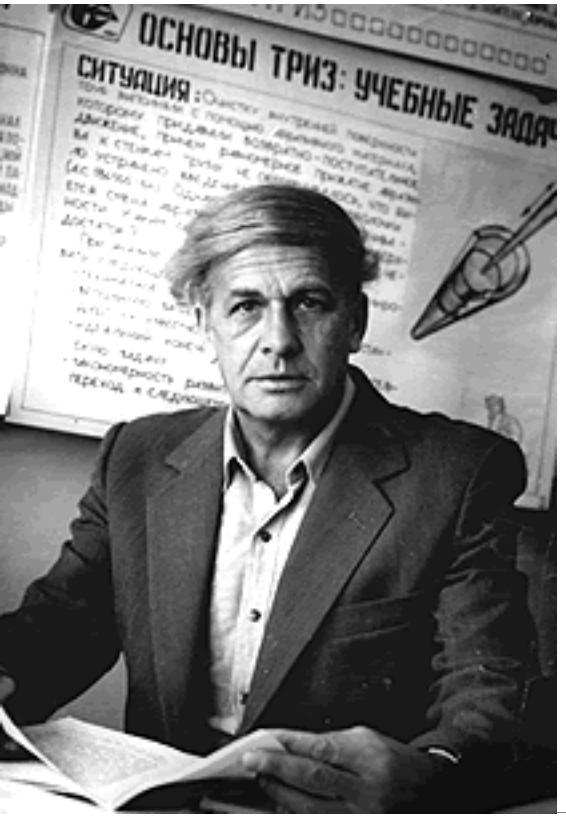
2004 - : OTSM-TRIZ instructor for educational Program "Advanced Master of Innovative Design" (AMID).

2004 - : regular research about "Reliable forecasting of system's evolutions"

Creativity is not a born gift.

Any engineer can learn to be inventive.

Genrich Altshuller



TRIZ related software (2010)

[what are the achievements of IM project?]

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2. Ideation International Inc. , http://www.ideationtriz.com
3. CREAX NV, http://www.creax.com/software_introduction.htm
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10. Natural Innovations LLC, http://www.idealmatrix.com/
11. The TRIZ consortium: INSA of Strasbourg, Alstom Transport, ArcelorMittal Research, EADS CCR // TRIZacquisition, http://lgeco.insa-strasbourg.fr/trizacquisition/versions/