

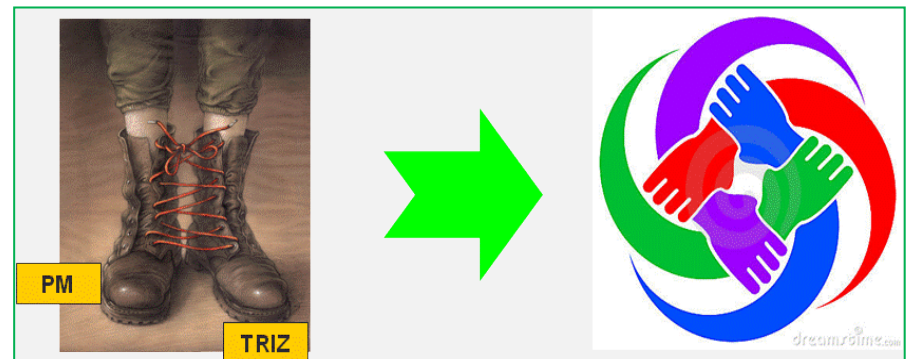
TRIZ BASED APPROACH TO EFFECTIVE PROJECT GUIDANCE IN CREATIVE ECONOMIC

Dmitriy A. Bakhturin

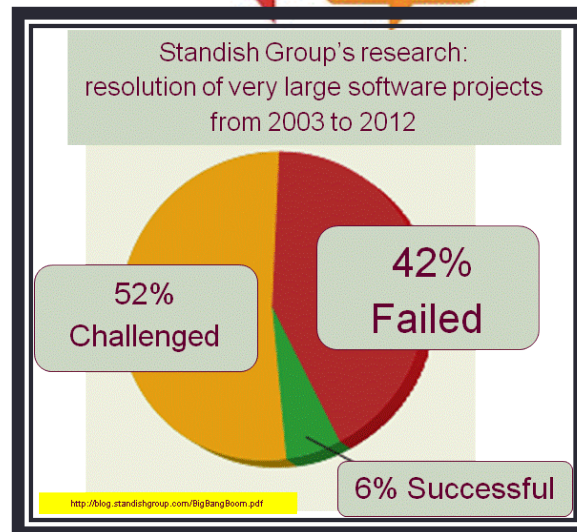
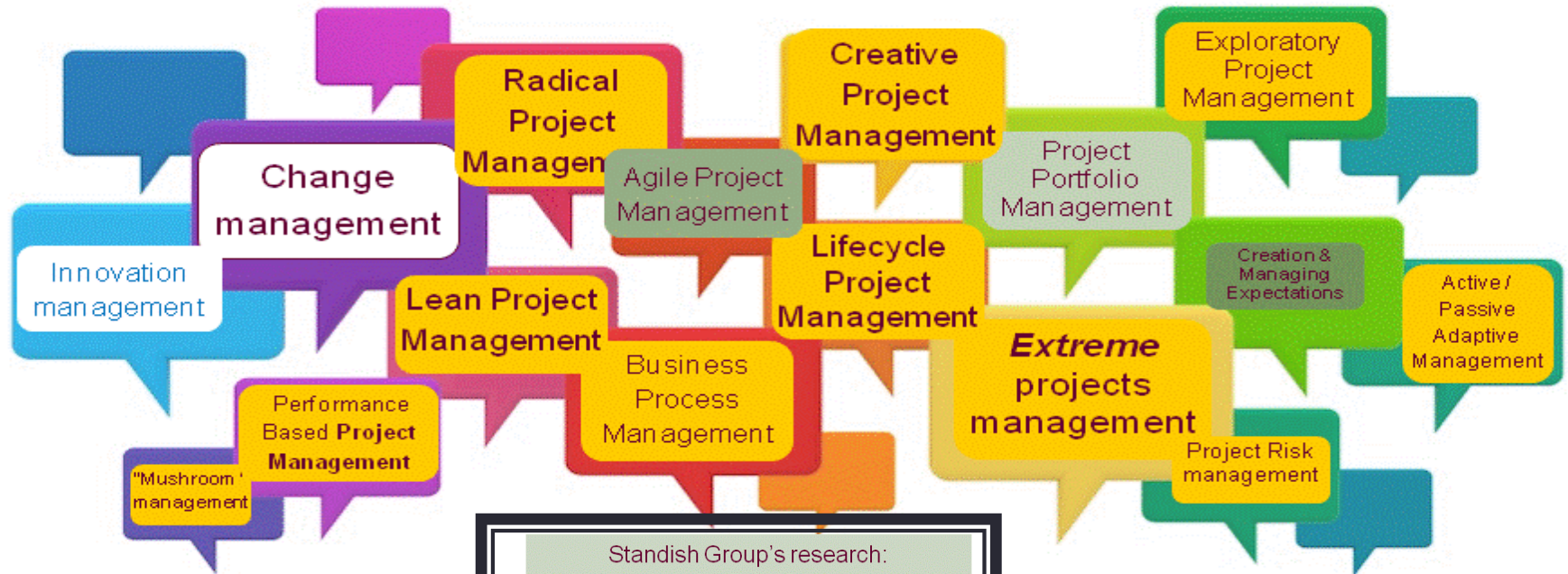
Central Institute for Continuing Education and Training,
/ rosmysl@mail.ru

Naum B. Feygenson

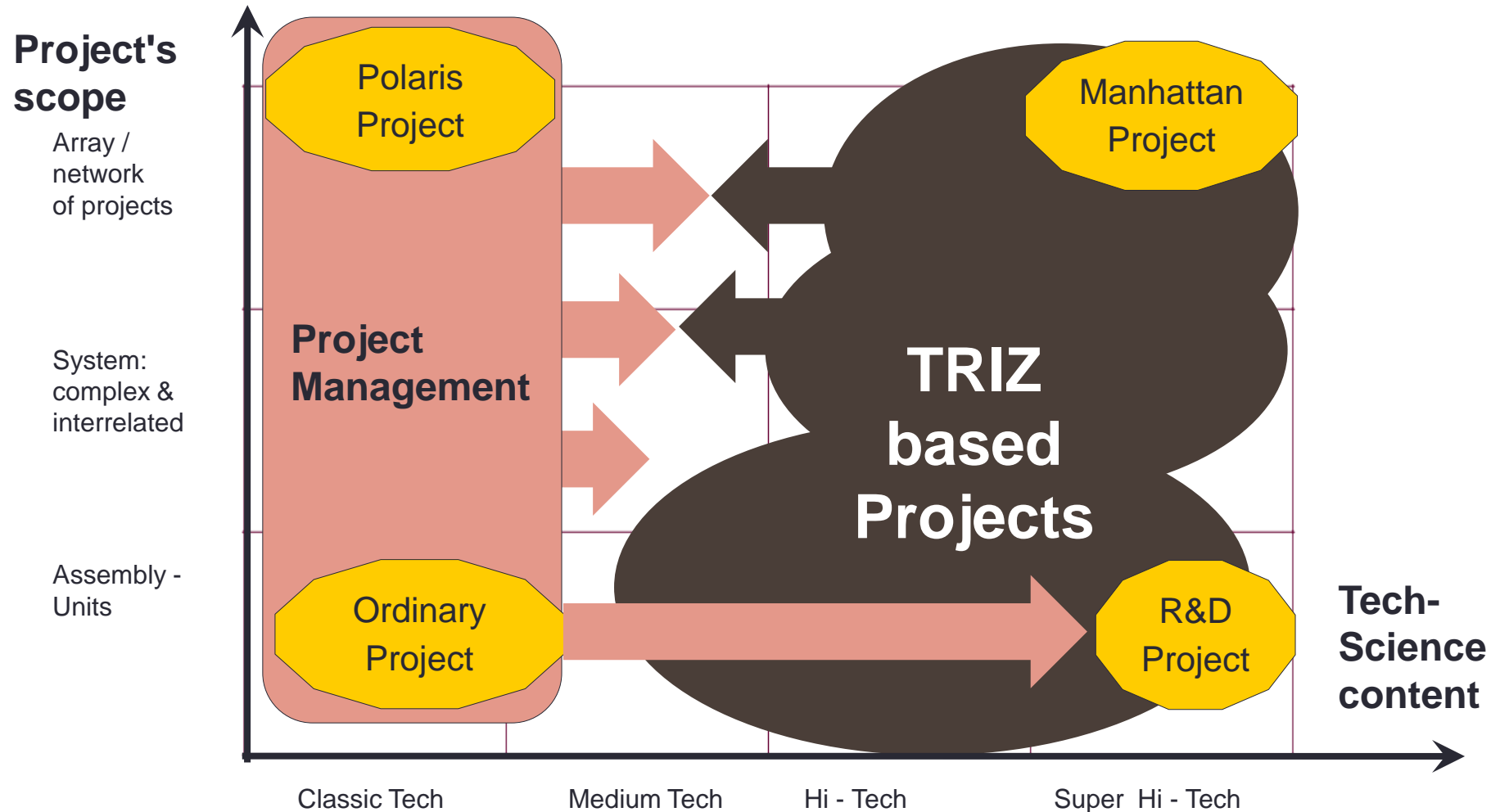
TRIZ-InCon Company / feyg@bk.ru



Panorama of PM



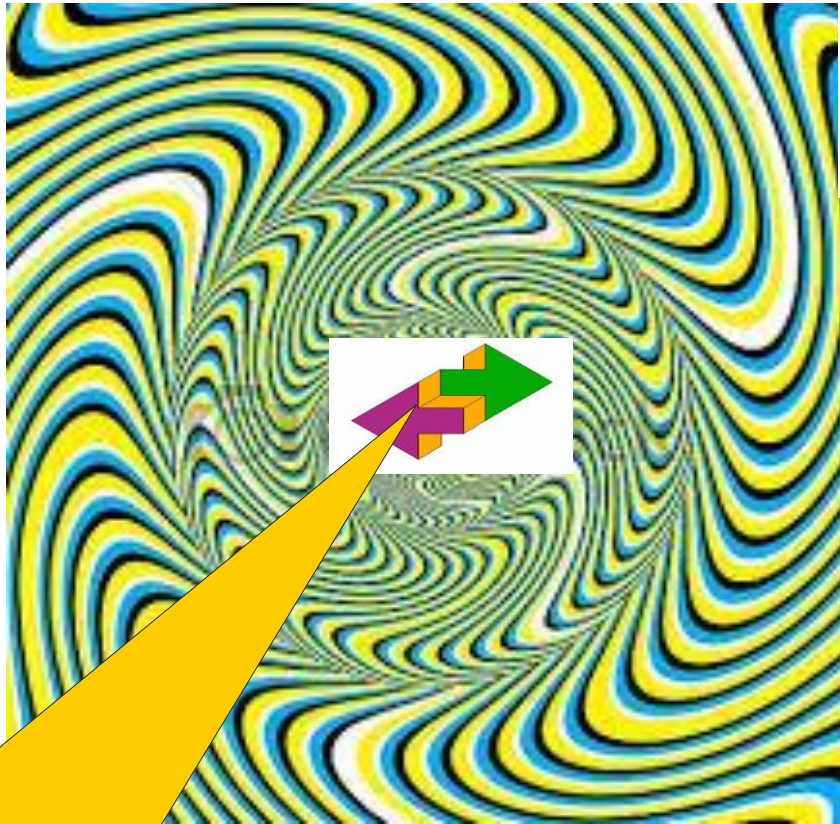
Project Scope and Tech-Science Content



Adopted from <http://www.maxwideman.com/guests/categorization/methods.htm>



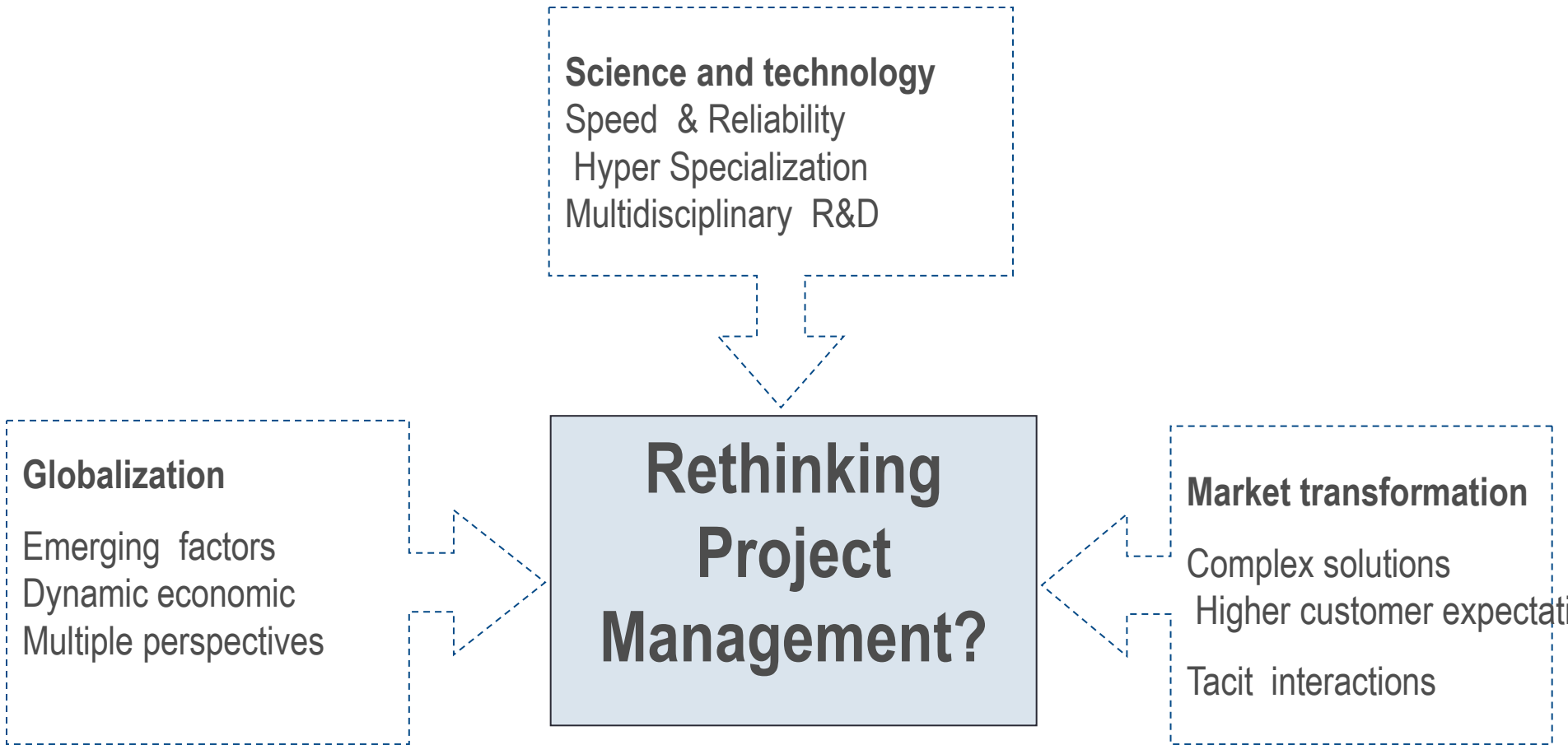
PM limitations



**TRIZ
based
results**

**How to coordinate
→ to harmonize?**

Creative economic - game changing factors



Methodological approach for PM & TRIZ harmonization

- Problems re-thinking :
 - Results of re-writing megaproject's history
 - Personal experience
- Problems solving by modern TRIZ based tools:
 - *Function Oriented Search*
 - *Hybridization (Feature Transfer)*
 - Etc.
- Formulation set of recommendations for project governance procedure
- Substantiation:
 - examples from public domain information
 - test in Russian the State Atomic Energy Corporation ROSATOM

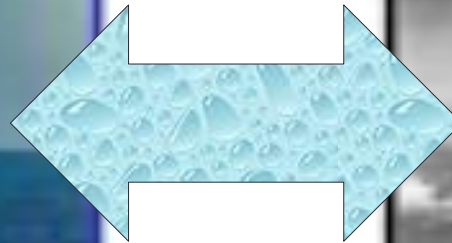
Lessons from history

Big projects ... Polaris and Manhattan

Sylvain Lenfle et.al.; 2008...2012



- Analyze of the situation in which the classic PM tools have been developed : the Polaris case



- Discuss limitations in situation of innovative design : the Manhattan Project

Two styles of projects governance

Characteristics	Traditional project management style (ex., U.S. Navy's Polaris nuclear submarine project)	Innovative& exploratory project style (i.e. Manhattan case)
Character of uncertainty	Deviations in task duration; numerous coordinated tasks	Unforeseeable uncertainty: deficient in fundamental & technological knowledge
Problem novelty	No substantial & unanticipated advance in state-of-art	Highest; no prototypes for borrowing
Competences	Available	Priori not available
Project schedule	Strong & detailed	Permanently revised; demandable results as soon as possible
Next steps after project final	Family of similar related products	Impact to start several new scientific & engineering research
After project methodological outcomes	[PERT] Program (or Project) Evaluation and Review Technique (1950~)	Only S. Lenfle et.al initial re-writing attempts' (2010~)

Main results at glance

L. Lenfle; G.Loch et.al.

???

Colloquium

- Recognize knowledge gaps
- Establish & update vision

Parallel strategies & experimentation

???

TRIZ based recommendations

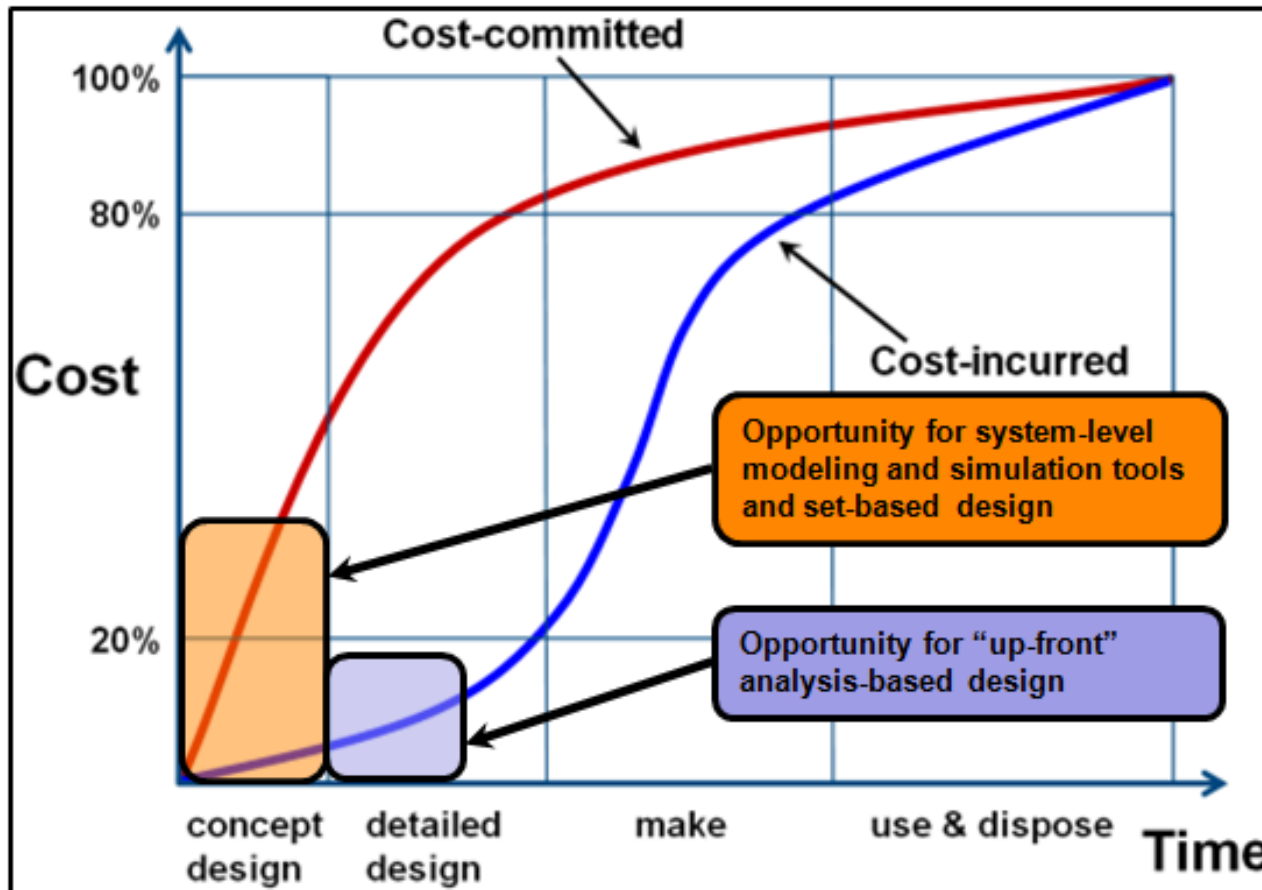
+ Pre-project's TRIZ ideation and idea's constellation

- + TRIZ based facilitation
- + Extensive monitoring by *Function Oriented Search*

- + TRIZ based facilitation
- + *TESE* for comparison & combination of alternative ideas
- + *Hybridization* for aggregation of concepts

Exaptation (after-project's) phase for ideation, idea's blending and co-development of unexpected findings

“Acupuncture point” for TRIZ involvement in exploratory projects



<http://www.engineering.com/DesignSoftware/DesignSoftwareArticles/ArticleID/5762/Engineering-Where-the-Most-Opportunity-Exists.aspx>

“Acupuncture point” for TRIZ involvement in exploratory projects

About LG Chem Research Park

About LG Chem
Research Park

The Research Park's "Research Informal"(RI) is a company sponsored study group where researchers gather to share information and to formulate projects together.

While pursuing research, our researchers are also encouraged to share knowledge and ideas about new projects. Through Research Informal (RI) meetings, researchers with similar interests have the opportunity to share their ideas and knowledge about specific projects or technologies. RI provides a friendly environment to share information, allowing active discussion of specific topics. Once an RI group is formed to research a specific topic or technology, it can receive formal support from the company.

....The RI activities improve their abilities and help them become cutting-edge R&D researchers. Researchers who are dedicated to accomplishing their project goals can openly discuss research ideas with their counterparts in other fields.

http://www.rnd.lgchem.com/eng/about/rp_inside.asp

Exaptation phase as pre-adaptation for future

Exaptation– the idea that an innovative in one area can lead to an unexpected discovery in another field.
[Jack Ulldrich; futurist]

- Ex., Gutenberg's printing press– it combined ink, paper, moveable type and, surprisingly, the machinery of the wine press
- Ex., advances in battery technology will lead to growth of wind power and solar power

[\[http://jumpthecurve.net/energy/exaptation-the-future-of-energy/\]](http://jumpthecurve.net/energy/exaptation-the-future-of-energy/)



First result of TRIZ involvement in mega-project

ROSATOM: Mega-project «**Breakthrough**» for New Nuclear Technology

Key Deliverables of the “Breakthrough” Project

Reactor BREST-300

- 17 tons of year overall production
- Increased level of reactor operation safety

2019

On-site demonstration SNF complex

- 20% decrease of SNF handling & management costs

2020

Reprocessing Unit

- 5 tons / year SNF
- No staff irradiation due to automated processes

2020

Dense Fuel Fabrication Unit

- 17 tons of year overall production
- Increased level of reactor operation safety

2019



Basic Detailed Design Commercial FR-1200 & on-site CNFC complex

- Power 1200 MW (e)
- Solemn regarding all regulatory requirements

2020

No analogue for the complex technology in the world

Initial situation in sub- project:
→ 2 alternative parallel technologies

Results of TRIZ based facilitation:

→ New design-concept
by combination of previously
non- Interacted technologies

<http://www-pub.iaea.org/iaeameetings/cn206p/Panel4-Pershukov.pdf>



References

- Lenfle, S. "Exploration, project evaluation and design theory: a rereading of the Manhattan case", In: International Journal of Managing Project in Business, Vol. 5, N° 3, pp. 486-507. (2012)
- Lenfle, S "Big R&D projects and design theory : revisiting Manhattan and Polaris"(2012) In: 5th SIG Design Theory Workshop, Paris, ENSMP <http://crg.polytechnique.fr/fichiers/crg/publications/pdf/2012-02-05-1688.pdf> (last view March 8, 2014)
- Litvin, S. "New TRIZ-Based Tool—Function-Oriented Search (FOS)." In: TRIZ Journal, August (2005). <http://www.realinnovation.com/archives/2005/08/04.pdf> (last view March 8, 2014)
- Arkhangel'skiy, G. Non-projective approach to the organization of activity. In: <http://www.improvement.ru/bibliot/neprozh/> (in Russian; last view March 8, 2014)
- Magness, T. Leading in Chaos - Lessons From the Fog of War. In: <http://www.thayerleaderdevelopment.com/faculty/leader-blog/item/leading-in-chaos-lessons-from-the-fog-of-war.html> (last view March 8, 2014)
- Gerasimov, V. et.al. Hybridization of alternative systems. In: TRIZ in Progress, Ideation International Inc, 1999, p.p. 221-224. <http://www.ideationtriz.com/new/materials/ITRIZforAFD.pdf> last view March 14, 2014)
- G. Bersano TRIZ as a Catalyst for Project Management Excellence. <http://www.triz-journal.com/archives/2008/10/04/>
- G. Bersano, V. Bregonzio: "TRIZ as a catalyst for Project Management (PM) excellence (and PM as catalyst for systematic innovation, i.e. the other way around)", TRIZ Future Conference 2007.
- G. Bersano, T. Eltzer, R. Uhl "The integration of TRIZ and Risk management to increase the ratio of success of innovation Projects", TRIZ Future Conference 2008. http://www.aim-innovation.com/cariboost_files/trizfuture2008-aim-paper.pdf
- J.J. Monteiro "TRIZ Supporting the Project Management Effectiveness. / Int. J. Systematic Innovation, 2(2), 24-42 (2012) <http://www.maxwideman.com/guests/categorization/methods.htm>
- <http://www.engineering.com/DesignSoftware/DesignSoftwareArticles/ArticleID/5762/Engineering-Where-the-Most-Opportunity-Exists.aspx>
- http://www.rnd.lgchem.com/eng/about/rp_inside.asp
- <http://jumpthecurve.net/energy/exaptation-the-future-of-energy/>
- <http://www-pub.iaea.org/iaeameetings/cn206p/Panel4-Pershukov.pdf>