



ELECTRO-MECHANICS



TRIZ and innovation culture at Samsung Electro-Mechanics Company

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About the author



SeHo Cheong enters in Samsung in 1984. He is one of the first initiators of TRIZ implementation at Samsung. Since 2004 SeHo Cheong is vice-president of Samsung Advanced Institute of Technology. He supervises and organizes interaction between 6 Sigma and TRIZ application for R&D. Since 2007 he is vice-president Corporate R&D Institute of Samsung Electro-Mechanics Company, team leader of Solution Creation Group and R&D Innovation Group. Mr. Cheong was educated at the Seong-Gyun-Gwan University in Seoul, Korea, and received his degree in Management and Industrial Psychology in 1984.



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Samsung Electro-Mechanics core competence

Samsung Electro-Mechanics (SEM) is the leading electronic components maker in Korea and a major world player. Over 80% of our sales come from outside Korea through a growing global network of manufacturing plants, R&D centres, and sales subsidiaries and offices that covers Europe, the Americas, Japan, China, and Southeast Asia. SEM operates 7-country, 9-plant manufacturing network and 17-country, 32-offices sales network. SEM management is determined to become the world's top electronics parts maker by selectively concentrating resources on constant quality improvement and advanced technology development. SEM is focusing on the development of system modules and high-tech devices.



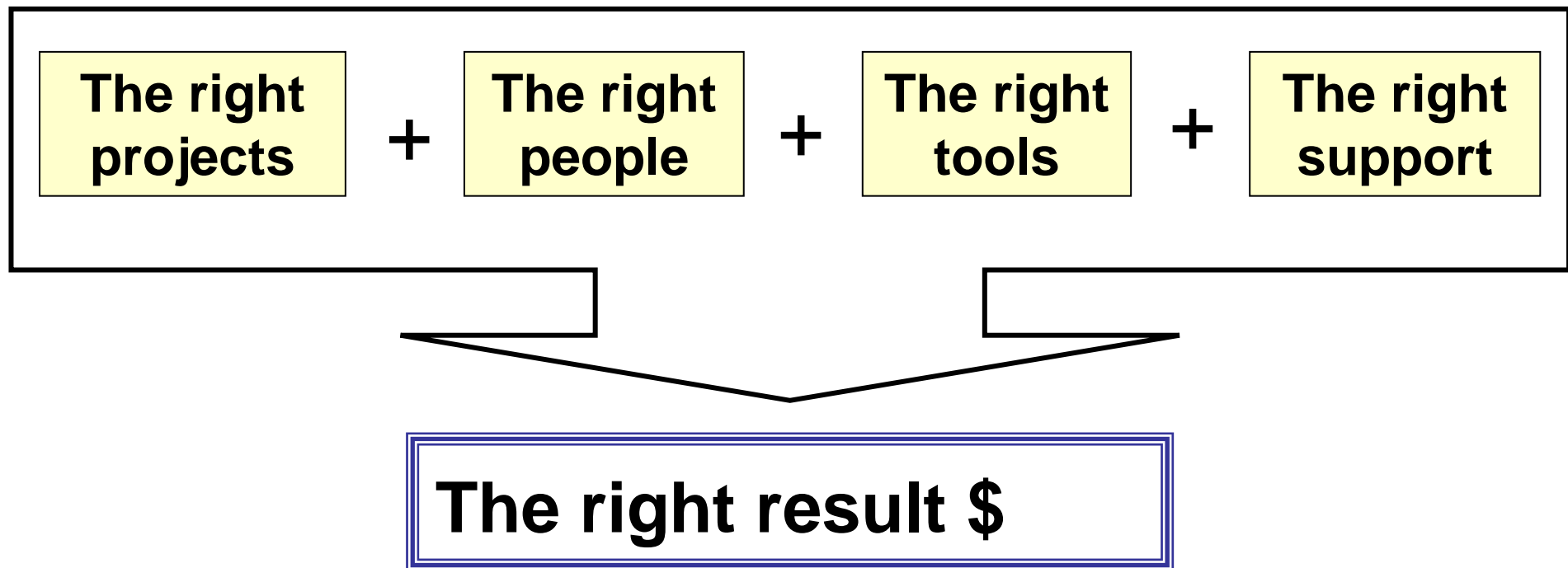
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Samsung Electro-Mechanics activity

Strategic Technologies	Mainstay Product Lines
Materials	<ul style="list-style-type: none">- Multi-layer circuit boards- Passive Components- Precision Motors
Radio Frequency	<ul style="list-style-type: none">- Digital Tuners- Power Supplies- Mobile RF & Network Modules
Optics	<ul style="list-style-type: none">- Camera Modules- LED's and LED Backlight units

Basic approach to the problems of TRIZ proliferation at corporate level





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The right projects

Major Development Areas of Solution Creation Group

- To solve the technical problems in the company creatively
- To activate scientific R&D methodology by modern TRIZ modification
- To find the core future product and business
- Improvement and development of TRIZ methodology
- TRIZ teaching/training

The right projects

Typical problems for TRIZ application

- Improvement quality of technological process - e.g. deposition, soldering, plating etc
- Increasing productivity of technological process
- Development of new technologies or product – from the conceptual stage to verification and mass production stages
- Patent Circumventing
- Combined type of problems
- Conceptual design of manufacturing equipment and product

The right projects

Comparison 2 kinds of projects

Criteria	Main features of a project	
	Mass production technology process	R&D
Possibility of changes of initial technical system	Restricted	Possible
Main criteria of concept evaluation	Simplicity, easiness for realization	More effective solution for mid and long term
Level of description of the proposed solutions	Detailed as much as possible	Brief but clear description

TRIZ methodology - “Harmful system”

- “Harmful system” takes part in technological process of useful product fabrication and simultaneously produces “harmful product”. It is “invisible system” because it consists of the same elements as existing technical system and can use subsystem or super-system elements. We can say that “harmful system” does not specially create but it exists and produces a “harmful product”. After determination the major components of “harmful system” we know how to destroy its activity.

The right people

Solution Creation Group as TRIZ “promotion-locomotive”

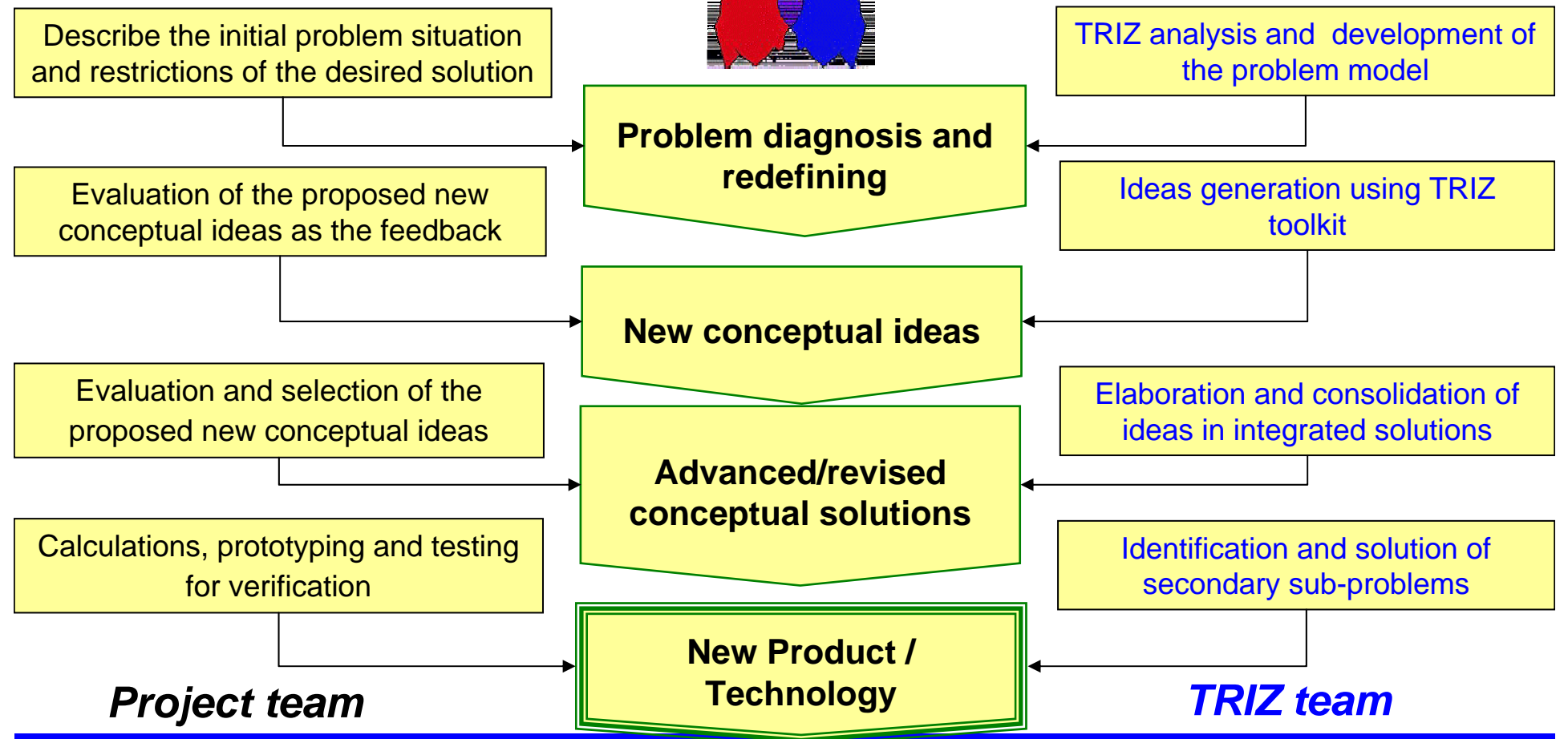
The mission of Solution Creation Group is generating creative solutions for unsolved technically difficult problems and spreading the scientific methodology including TRIZ and its contemporary modifications to all over the company. Moreover, recently the team is focusing on core future technology and its incubation.



10 Samsung Electro-Mechanics Company, Corporate R&D Institute, Solution Creation Group

The right tools

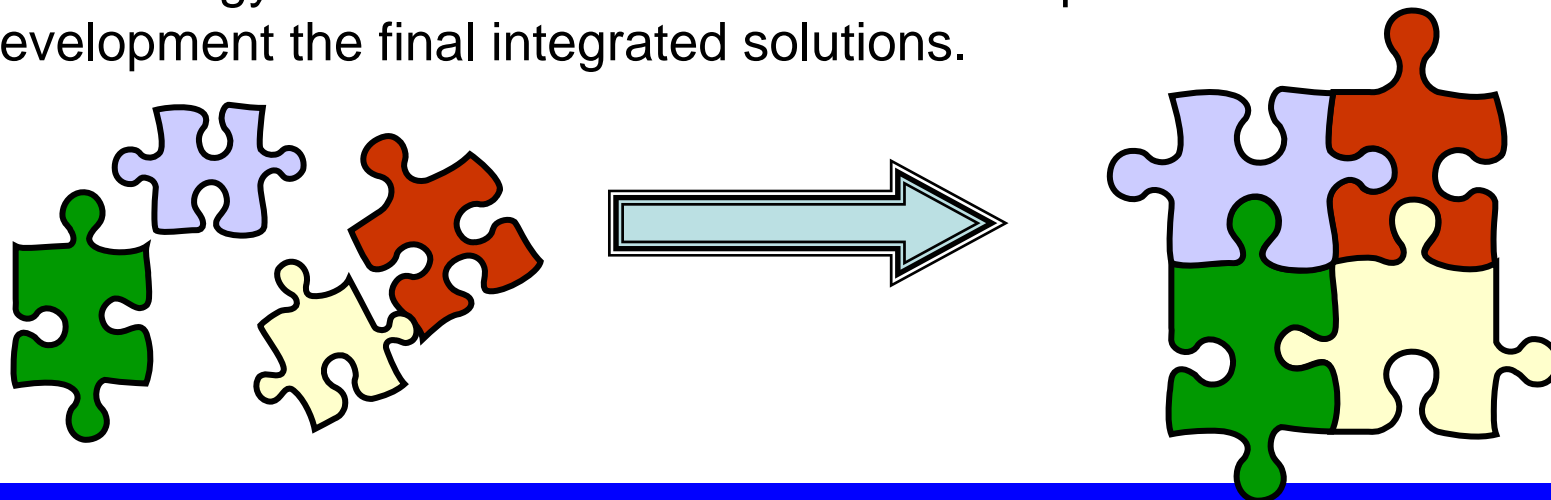
Optimal interaction between project team and TRIZ team



The right tools

Optimal interaction between project team and TRIZ team

- Both regular open discussion and demonstration how TRIZ tools works help to overcome syndrome "not invented here".
- In the cooperative work we usually apply solution-building strategy. This strategy involves creative combination of partial solutions for development the final integrated solutions.



The right tools

TRIZ methodology - Functional approach

- Functional approach is widely use for practical application for supplying performance of the technological processes.

Main features :

- Utilization of advanced procedure but “half-remembered” technique for exact definition of function
- Function-Oriented-Search for identification non-obvious “distant” prototype of solution
- Function synthesis for radical changes of technical system
- Functional language for description and/or explanation of initial state-of-art situation, technical and physical contradictions, ideal final results etc

The right support

TRIZ education

Basic training-programs Main fundamental TRIZ tools such as:

- 40 Principles
- System of standards
- Technical system evolution
- ARIZ etc.

TRIZ education is provided under the guidance of experienced mentors. Main part of education performed on the Korean language. Detailed Korean textbooks are prepared and systematically updated for supporting educational process. The text is supplemented by many examples from real projects and case studies.

The right support

TRIZ education

Advanced course of the new development methods such as:

- “harmful system”
- functional approach etc.

Main features of TRIZ education:

- Practical solving of real problems
- Collegial discussion in learner’s micro-teams
- individual consultation with participation of Russian TRIZ experts
- Personal follow-up consultations
- Evaluation of outcomes of graduation work completed using opinion of project leader

The right support

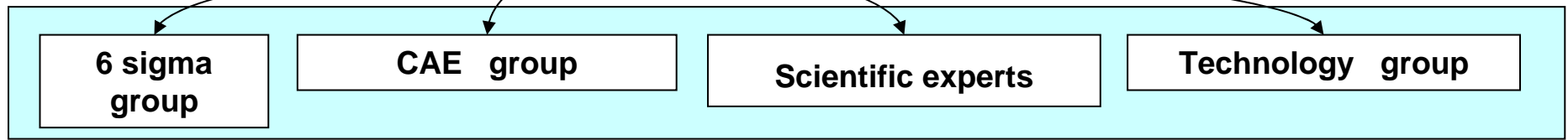
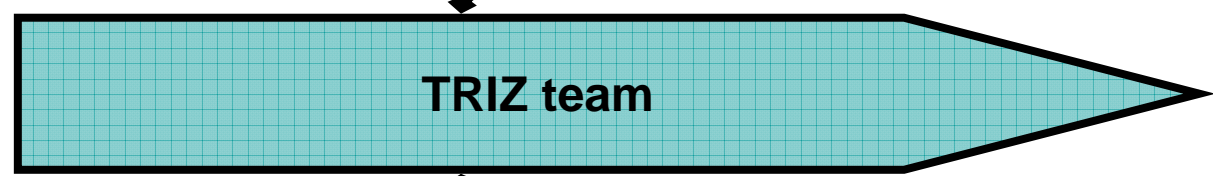
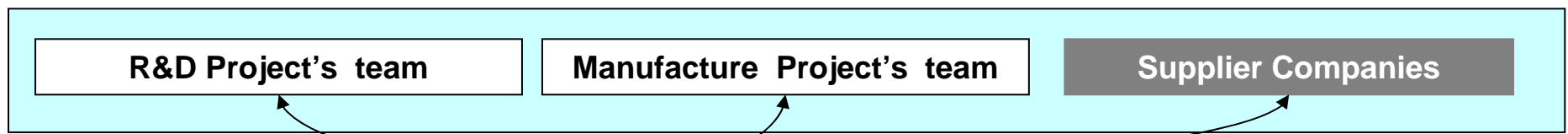
TRIZ education

For motivation of education course's participant we organized special TRIZ festival. For examples, at December 2007 the best 10 of our learners presented their graduation works for top level technical management. According decision of technical management board 6 of them were awarded cash prizes.

The right support

Interaction between TRIZ team and other divisions

Level of clients



Level of partners

The right results

Typical results of TRIZ projects

- Improvement of manufacturing efficiencies
 - Resolving key contradictions rather than compromising
 - Using existing but not obvious resources to solve contradictions
 - Reducing the number of parts and complexity of a engineering system
- Recognition patterns of technical evolution and predict how a system will evolve practically
- Implementation practical, simple and low-risk solutions

Implementing TRIZ methodology with continuously modified toolset allows the organization to build a high performance innovative culture and resolve many complicated projects

Next steps

- Improving quality and effectiveness of TRIZ education
 - New educational courses with participation external TRIZ specialists
 - Adaptation certification requirements of International Association of TRIZ (MATRIZ) for certification according our practical needs.
- TRIZ development as science
 - Adaptation the technology predicting methods for business-to-business applications
 - Advanced modification of functional analyses for more compact and exact description of problem's solving process