TRIZ シンポジウム 2010
The Sixth TRIZ Symposium in Japan

NPO法人
日本TRIZ協会
Japan TRIZ Society

TRIZ at SMD:

Unique Situation, Unique Goals, Unique Approaches

2010

SeHo Cheong

SAMSUNG 삼성모바일디스플레이

Vision Begins

About the presenter

SeHo Cheong enters in Samsung in 1984.

He is one of the first initiators of TRIZ implementation at Samsung.

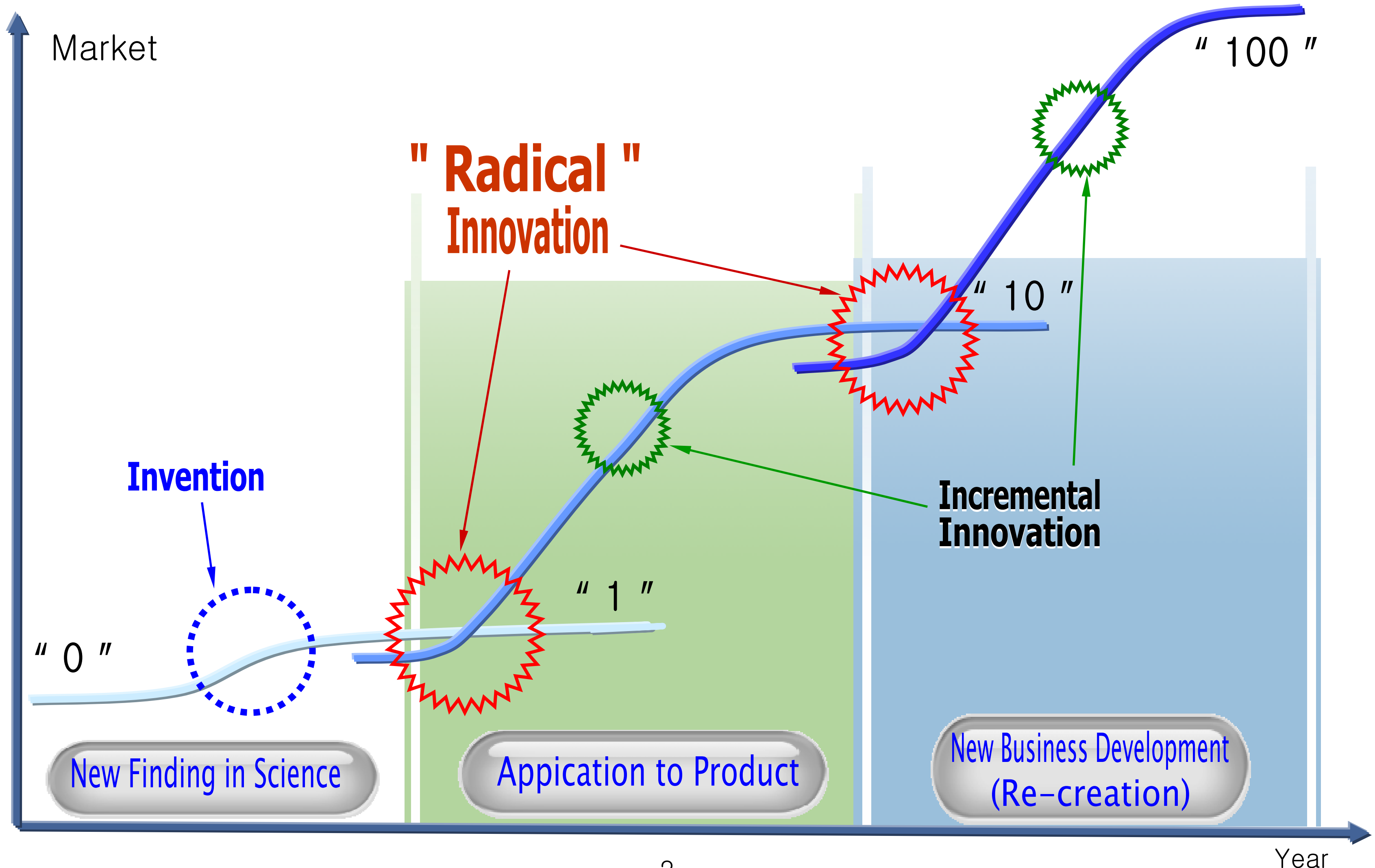
In 2004-2008, SeHo Cheong was vice-president of Samsung Advanced Institute of Technology. He supervises and organizes interaction between Six Sigma and TRIZ applications for R&D. Since 2007 he is vice-president Corporate R&D Institute of Samsung Electro-Mechanics Company, team leader of Solution Creation Group and R&D Innovation Group.

In 2009, when SMD was created, he was in charge of organizing the TRIZ team in this company. Since then, SeHo Cheong is Senior Director, TRIZ Executive Office of Samsung Mobile Display.

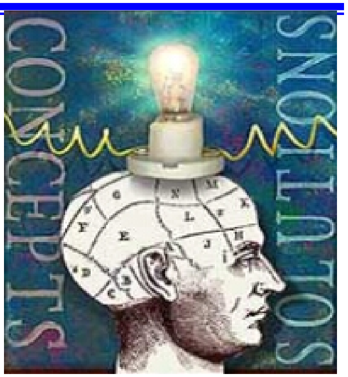
He has qualified a TRIZ Level 3.

TRIZ in Radical Innovation

- TRIZ in Radical Innovation is significant because it will give your company early market dominance.



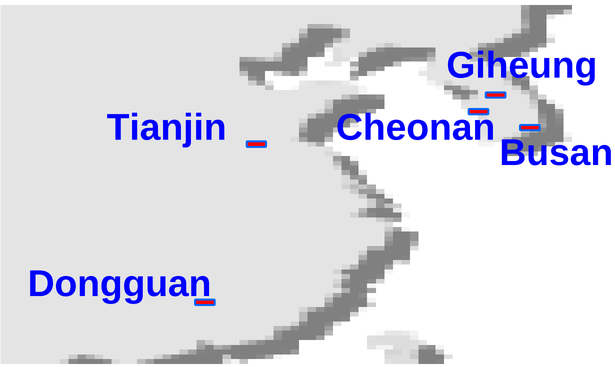
To keep the markets dominance



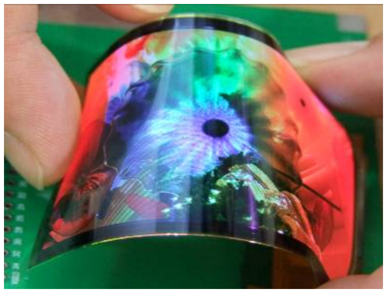
- You desperately need creativity.
- TRIZ is a consequence of creative people and creative works.
  That's why we can make a good solution by using TRIZ.

- A good solution gets the company more competitive.
- Engineers need to focus on something which interrupts development.
- If you formulate contradiction, you'll find the element hampering the development of system.
  - System is enhanced by getting rid of contradiction
  - Can get ground breaking solutions.

"UNIQUE SITUATION" "Samsung Mobile Display" = Display Company



19" qFHD (FPD2009)
Oxide TFT (The first)



2.8" Flexible AMOLED
(The first)

Transparent MP3
(CES 2010)

- **The No. 1 company in the small-and-medium display market**
  (AMOLED, PMOLED, TFT LCD, Touch Panel product)

- **The first company in the world to commercialize AM OLED**
  laptop computers, large televisions, and flexible displays.

14" Transparent Laptop (CES 2010)

Confidential

"UNIQUE GOALS"

- We hope the gap from the competitors be bigger.
  If competitors run, we sprint. If they sprint, we have to fly.
  This is only possible with significantly better approach.

- We has many challenges which did not exist in the past on earth.
  In the tasks of this kind, the are many repeated mistakes and errors
  in setting of early development direction.

30" FHD 240Hz/3D TV (2009)

30" OLED TV

Classification of TRIZ Project (2009)

Persistent Problem over two years	51%
Large-size AMOLE display problem	23%
Preceding technology for small-size display problem	17%
Defect improvement problem	9%

- In Samsung Mobile Display,
  only 9% of projects were defect improvement projects.
  The majority were new products/processes for creating the new products.

Typical problems for TRIZ application

- Improvement quality and productivity of technological process
  (Unresolved over 2 years, Defects improvement problem)
  : e.g. AMOLED LTPS process, Evaporation & Encapsulation, Deposition, Plating etc

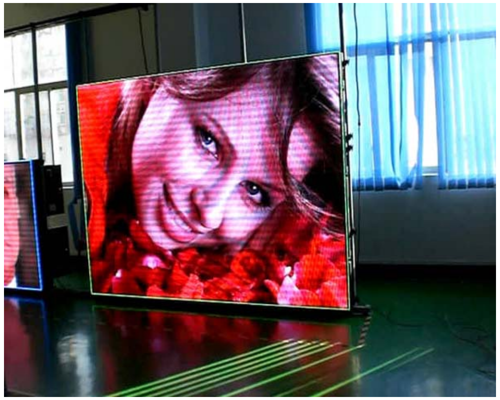
- Development of the core and new technologies or process
  (Preceding technology, Breakthrough concept problem)
  : e.g. large-size AMOLED display etc

- Conceptual design of manufacturing equipment
  : SMD is one of the device industries with lots of equipment installations.

- Development of new business
  : e.g. Flexible Display, X-lay Display etc

- Combined types of problems

- Circumventing patent



"UNIQUE Approach 1"

- "Persuade CEO" and "Bring CEO Message"
  The use of TRIZ can change the uncreative to the creative.
  Give high evaluation grade to person who has TRIZ certification.
  TRIZ is for solving key issues scattered throughout the company.
  The way of thinking based on TRIZ can be utilized in the daily work.

- Top-down project selection
  This protects projects from getting cancelled early.
  19 executives have performed their own TRIZ project as a project leader.

Kang Ho Moon
CEO

The situation & feature of SMD Project

- No Benchmarking Solution

➔ Our company is a frontier one in areas of AMOLED and LCD.

- Top-Down style project selection

Draw

CEO, Team & Group Leader

⇩

Consent

TRIZ Team
(organize TF)

⇩

Approval

CEO

"UNIQUE Approach 2"

- Break psychological inertia

  Many of the engineers experienced in semiconductor, LCD.

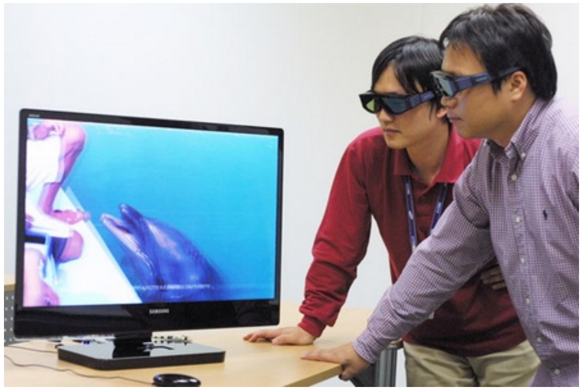
  A lot of problems are solved with breaking their mental inertia.

- In-depth attribute analysis for selected constituents

  How to overcome challenges from the new issues & problems?

  - Find out applicable objective laws and property you want.
  - Discover resources related to the property around problems.

  We have many problem-solving cases with existing resources which are only available during problem operation time.

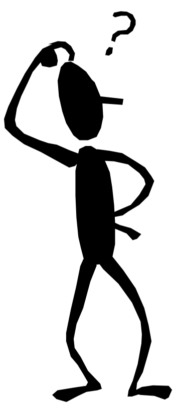


Flexible

OLED

Engineers are asked if they ~

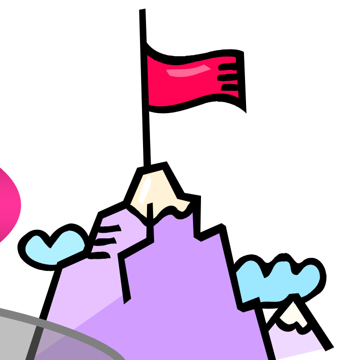
- focus on major contradictions?
- use resources?
- have a concept for future super systems and sub-systems?
- investigate the root cause of the problem?
- draw various concepts at the beginning of the project?



Problem

- **Psychological Inertia**
- **Lack of Knowledge**
- **Trade-off. Give up**
- **Wrong problem**

Solution



"UNIQUE Approach 3"

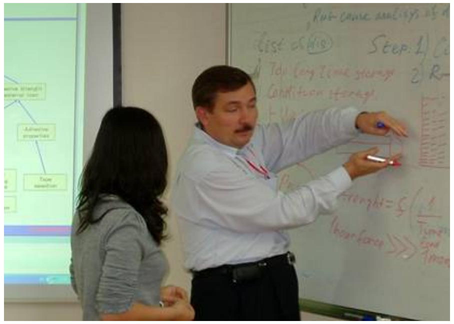
- Train all technical employee.

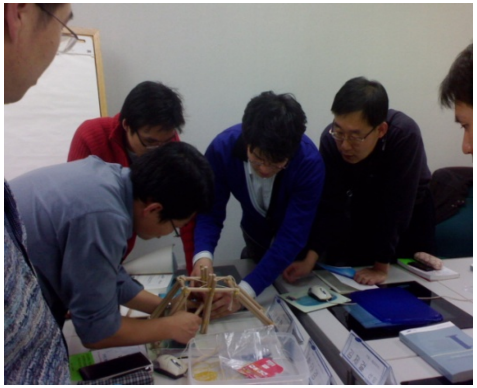
  For 1,600 engineers, TRIZ basic training is given for 3~4days.
  The training will be done throughout 3 years (from 2009 to 2011).

  Use SMD own cases in the TRIZ training.
  - It make trainees to apply what they learned to their work easily.

- Use small group(5~6 members) for solving project problem.

  Figure out his project with other participants,
  who have different backgrounds, can help each other.





TRIZ education curriculum

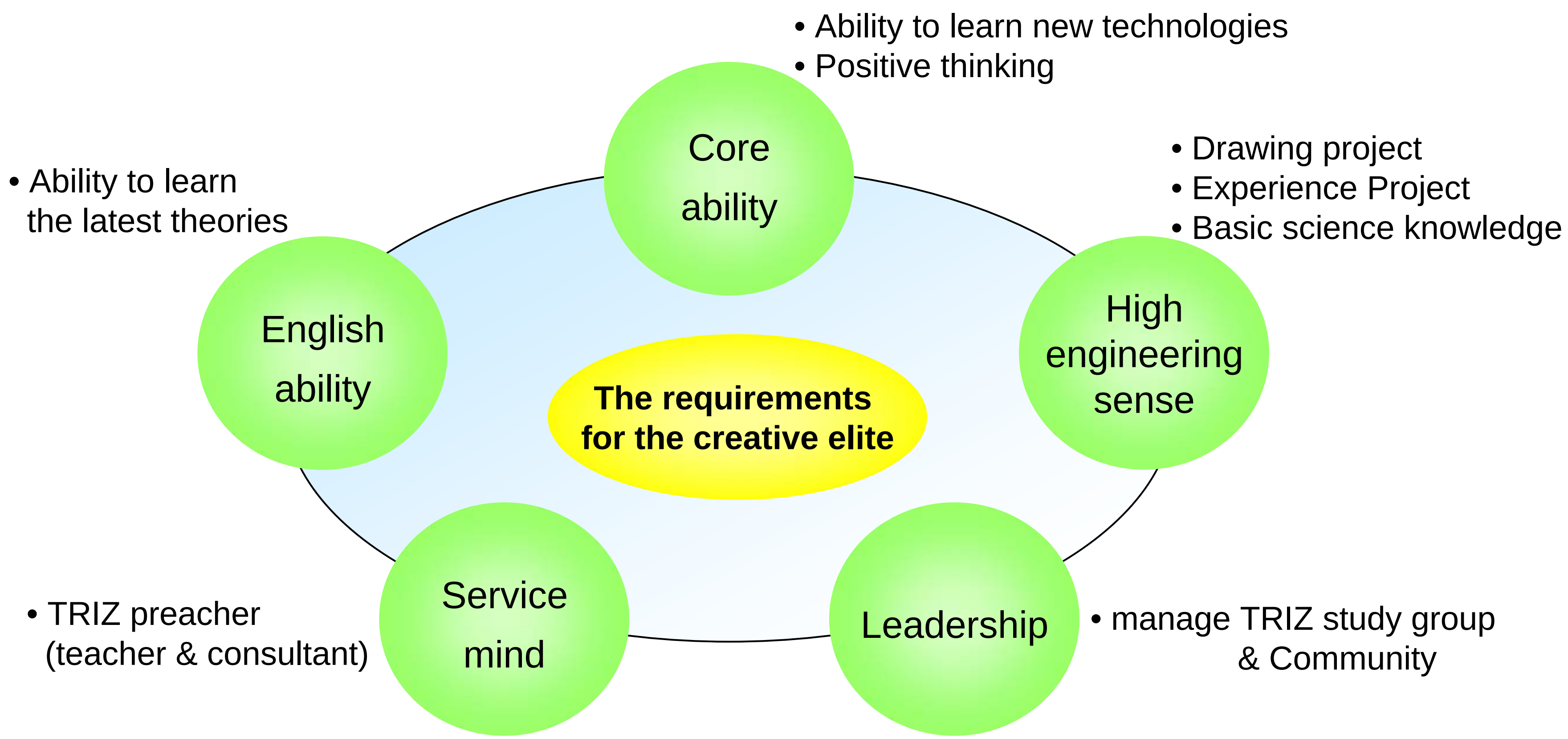
- **CEO and director have to pass through a basic training course.**
- 4 Step Education Course

Cyber Training → Basic Training → Level 2 Training → Level 3 Training

Step	Course	Attendance	Type	Time		Main contents
				Training	Project	
1	Cyber	All staff	On-Line	24hrs	-	Fundamental TRIZ
2	Basic	CEO / Director Engineer	Gathering	3~4 days	-	Classical TRIZ
3	Level 2	Creative Elite	Camp	10 days	10 days	Modern TRIZ Basic of ARIZ TRIZ Software Practice Project
4	Level 3	Level 2	Gathering	10 days	10 days	Advanced ARIZ Coaching Skill Practice Project

"UNIQUE Approach 4"

- **Select people for "Creative elite" (internal TRIZ promotion & education team) who have both the technical ability & personality to help other people succeed.**



Bring up Creative Elite

- Program

  - Education

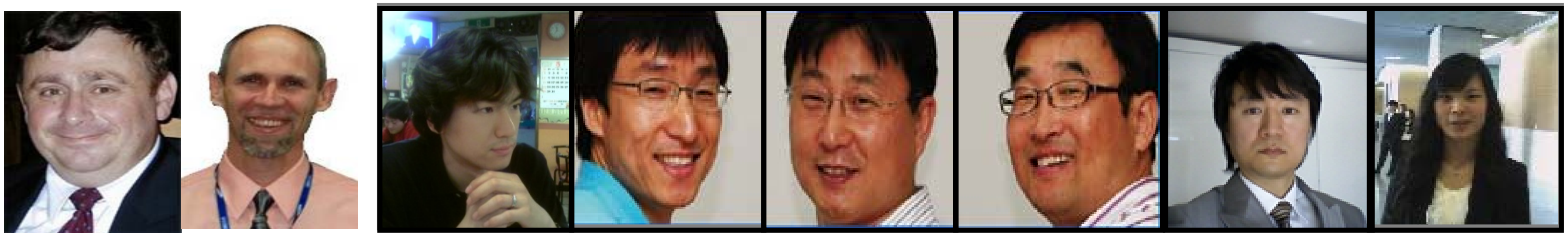
    By samsung trainer (TRIZ Level 3,4) 2 weeks for 2 months

    Starting his own 2 project during education

  - Project : Consult by Samsung Consultant & Russian Expert

  - Role : Propagate TRIZ

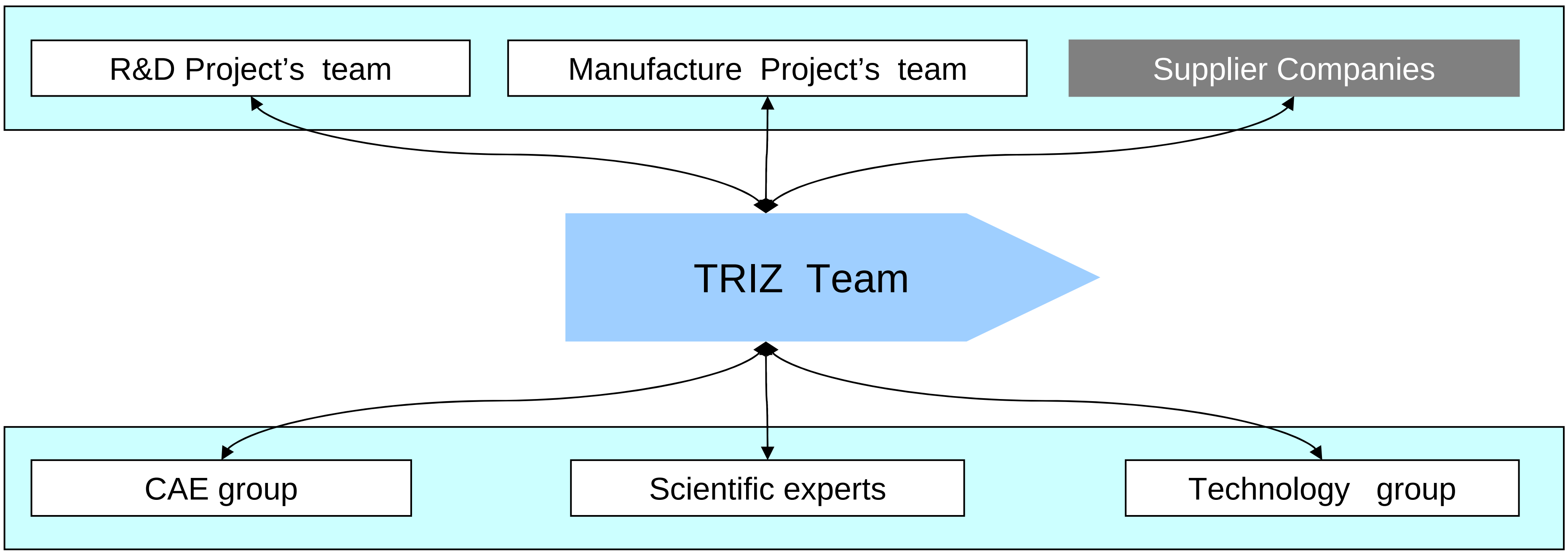
  - Result of 2009 : 20 engineers qualified as ‘Creative Elite’.



Interaction between TRIZ team and other divisions

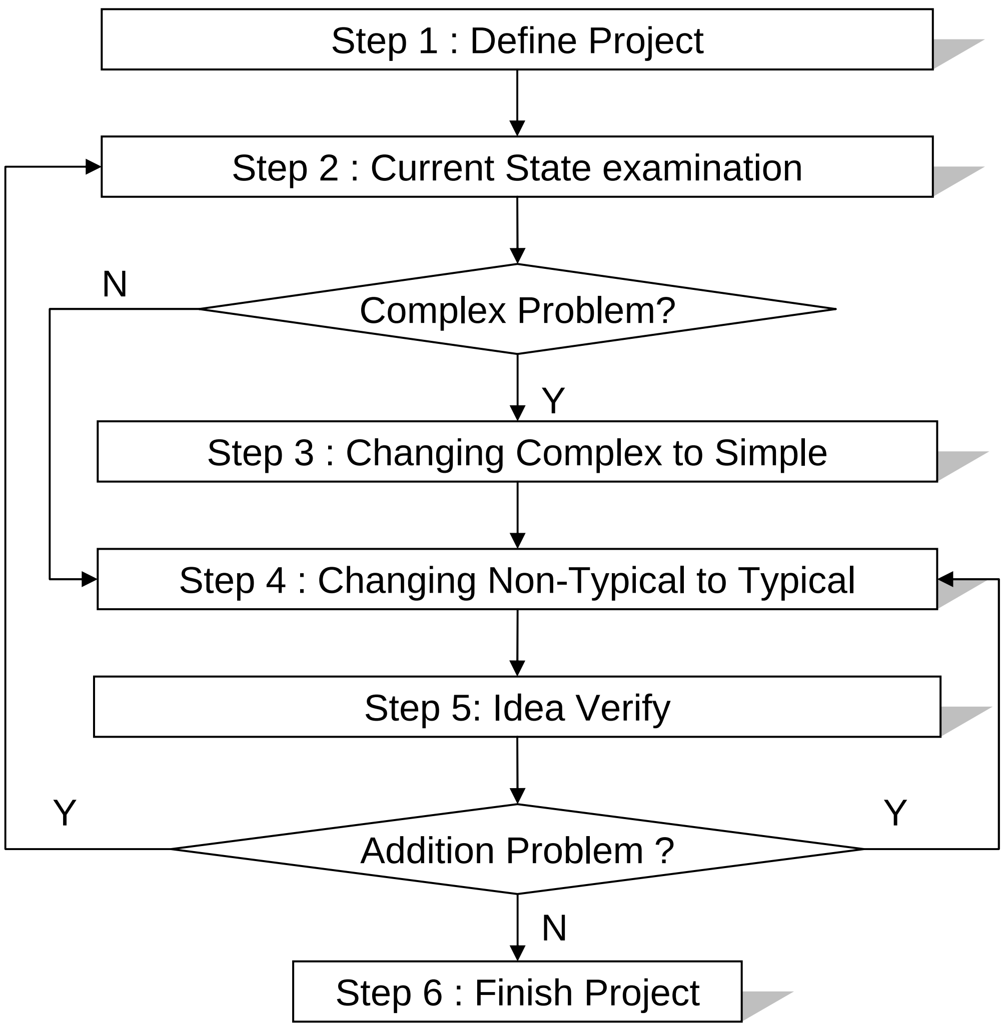
- **Use a task force for big projects with the project team and the TRIZ team as partners.**

Level of clients



Level of partners

We use a very basic flowchart where appropriate for the specific project.



- Multi Screen Thinking
  Operation Zone
  Operation Time

- Feature Transfer
- Root Conflict Analysis
- Function Analysis

- Inventive Standards
- 40 Principles
- Separation rules
- ARIZ

TRIZ Supporting System

Mission

Effective operation of the TRIZ project and Communication between user.

Main Features

TRIZ Support System

TRIZ Project

- Registration / Progress
- Monitoring / Assessment
- Output Doc. registration

TRIZ Data room

- Education material
- Seminar material
- Good cases of Projects

TRIZ Boom-up

- Festival
- Level management
- Communication

TRIZ Festival in SMD is held annually

- Purpose

  To motivate performing of TRIZ project and boom up TRIZ.

- 2009's TRIZ Festival

  The 12 best Projects presented and 62 Projects posted their result.
  According to decision of jury consisted of CEO and inside directors,
  7 awards were given.

STA (Samsung TRIZ Association) Webzine

- **Purpose**

  To enhance TRIZ activity and create synergy effect among Samsung relatives through sharing TRIZ information & their issue.

- **Corporate member**

  Samsung Electronics Co.

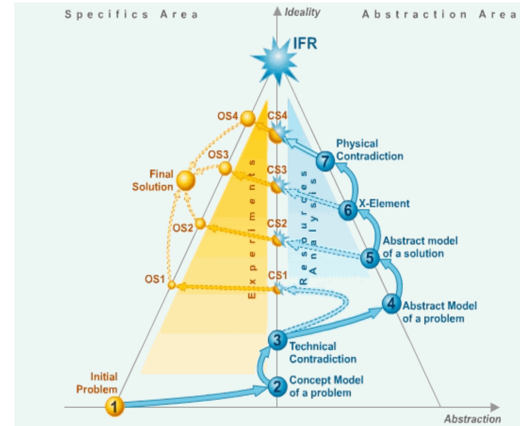
  Samsung Electro-Mechanics Co.

  Samsung SDI Co.

  Samsung Corning Precision Glass Co.

  Samsung Mobile Display Co.

Results of SMD TRIZ in 2009



48 TRIZ Projects

- 50 patents
- Focus on verification.

  Creativity comes from execution. Waiting kills creativity.
- Cooperation with Simulation, Chemical analysis and manufacturing technique division

  e.g.) Cell Seal Crack, FMM Mask etc

Right Tools

- Find useful tool for SMD : Separation (OZ,OT), Multi screen thinking, X-element

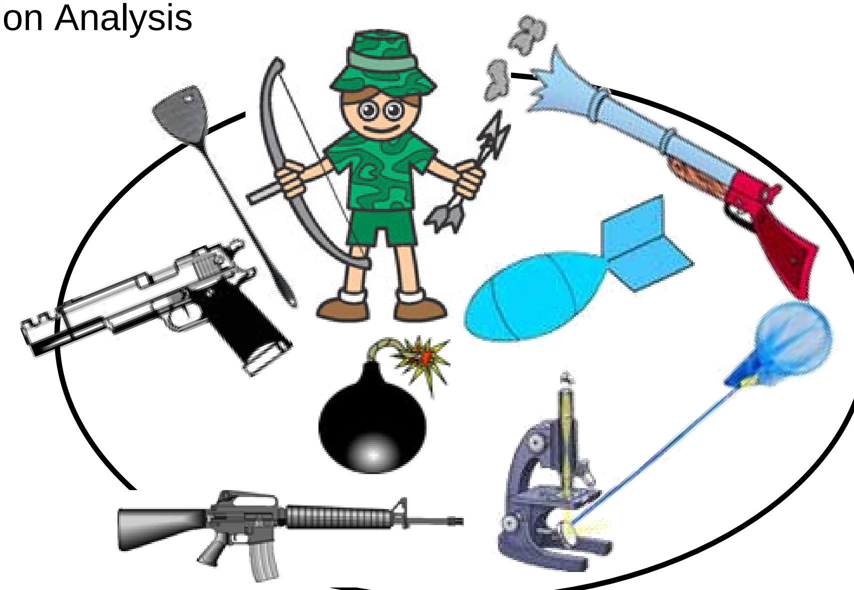
  e.g.) Electro-Mechanics: RCA, Electronics : Function Analysis

Supports

- Develop TRIZ support program and system

  : Idea portal, TRIZ material share, BP share
- Introduce TRIZ S/W : Goldfire 5.5

  e.g.) Electronics : I-spark 2.0



Now works

- Projects are expanding
  - Develop a broad base of projects (not just top-down)
  - Reinforce Task Force Project
- Creative Elite : more than 100% increase (Level 2/3)
- Tools are expanding
  - Improve TRIZ methodology with continuously modified toolset
  - Abstract problems such as the signal or control logic, and compensation circuitry / power structure are solved by TRIZ in SMD
- Right Supports
  - Improve quality and effect of TRIZ education & consulting program.
  - Open TRIZ Festival regularly

We wish to solve the problem with the first trial, but usually it suffers several rounds of contradiction.

Thank you

for your attention!