

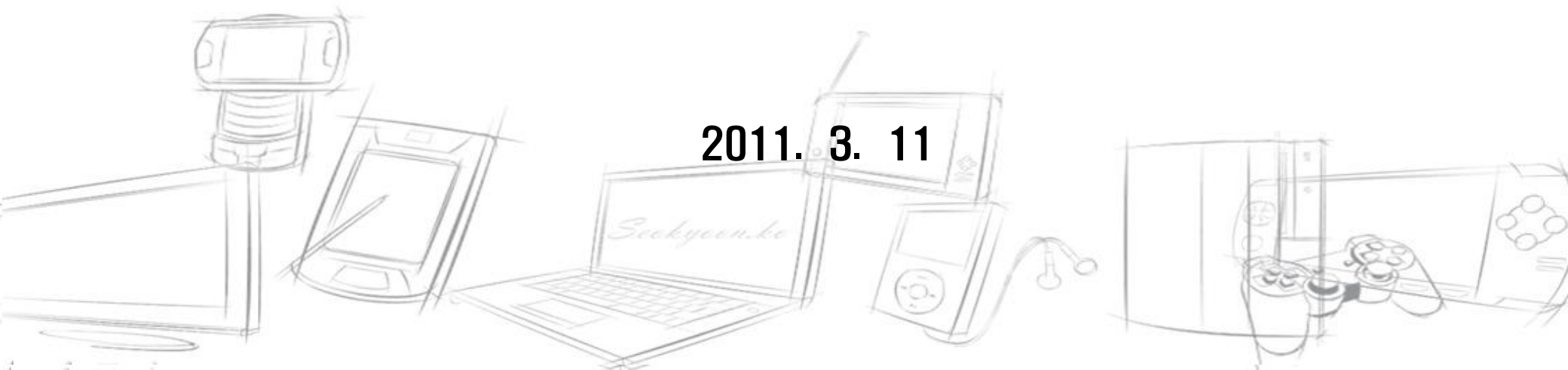


# TRIZ in Hynix Semiconductor

Kim Seong Hwan / Cho Jun Hee

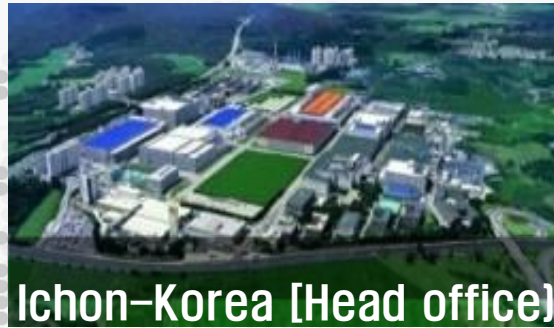
Hynix

2011. 3. 11



# About Us

As we continue to make great leaps forward, we are bringing a better and brighter future closer for everyone.



## Customers



SONY

TOSHIBA

DELL



SIEMENS

IBM

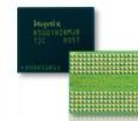


SHARP

## Main Product



Main Memory



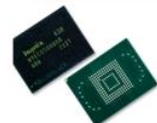
Graphics Memory



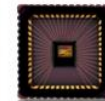
Consumer Memory



Mobile Memory



NAND Flash



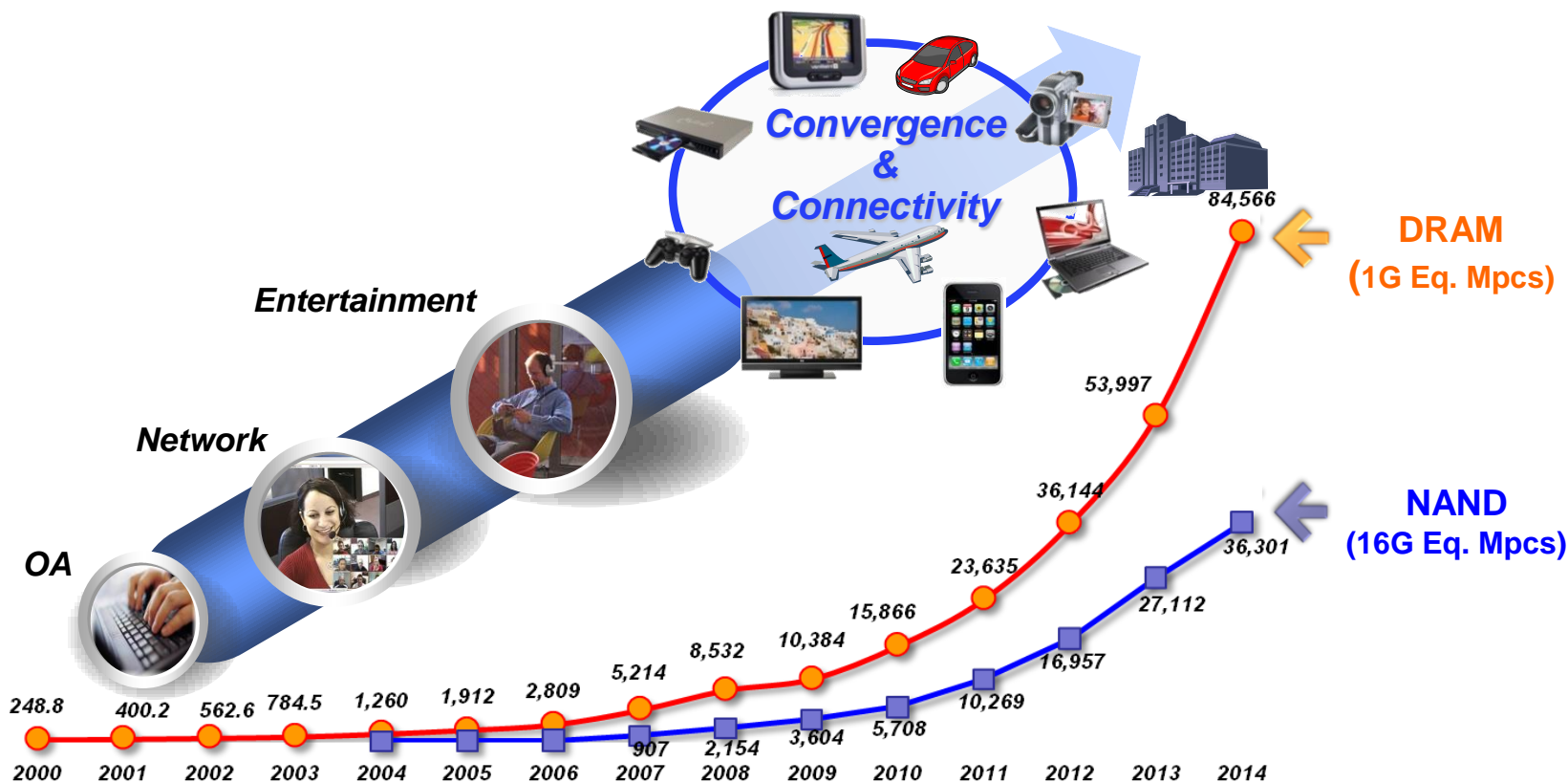
CMOS Image Sensor

Leading the way  
to a better tomorrow



# Semiconductor Business

Semiconductors are among the most critically necessary products in the digital era.

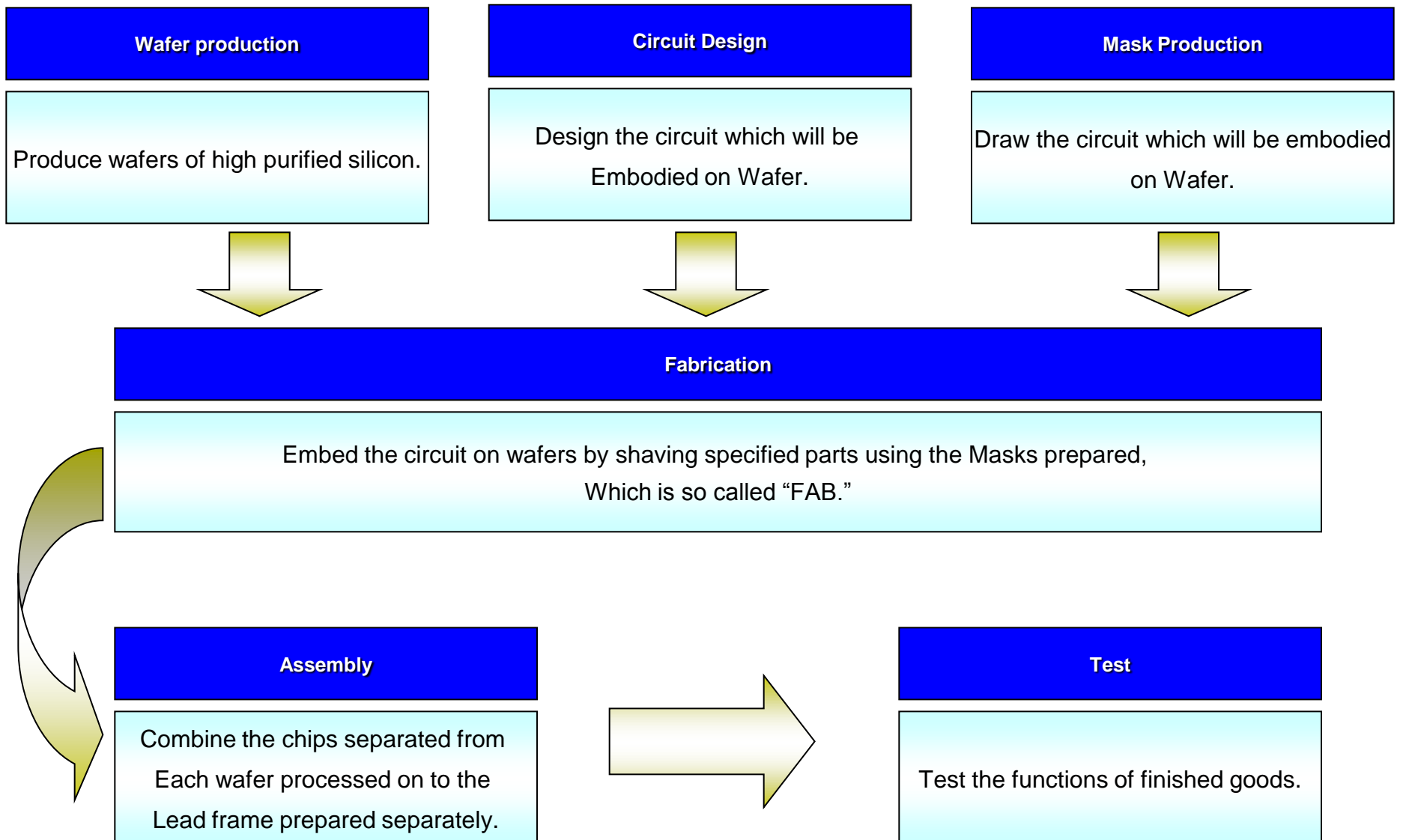


\* Source: WSTS / iSuppli

# Hynix History

<b>2010</b>	<b>Jan. 2010</b>	Development of 44nm 2Gb Mobile DRAM
<b>2009</b>	<b>Dec. 2009</b>	Development of 44nm 2Gb GDDR5
	<b>Nov. 2009</b>	Intel Validation of 44nm 2Gb DDR3 DRAM
	<b>May. 2009</b>	Agreed to establish a backend JV in China with Wuxi Industrial Development Group Company Ltd.
<b>2008</b>	<b>Dec. 2008</b>	Development of 54nm 2Gb mobile DRAM
<b>2007</b>	<b>Nov. 2007</b>	Signed the Partnership Agreement with SiliconFile Technologies Inc. to cooperate on the CIS business
	<b>Oct. 2007</b>	Re-entered the non-memory business
	<b>Jan. 2007</b>	Foundation of sales subsidiary in India (HSIS)
<b>2006</b>	<b>Oct. 2006</b>	Opening of the China manufacturing site
	<b>Sep. 2006</b>	Opening of a 300mm R&D fab (R3)
<b>2005</b>	<b>Jan. 2005</b>	Formed a strategic alliance with ProMOS
<b>2001~2004</b>	<b>Oct. 2004</b>	Transfer the Non-memory Business Unit to MagnaChip Semiconductor Ltd.
	<b>Aug. 2001</b>	Official disaffiliation from the Hyundai Business Group
	<b>Mar. 2001</b>	Change of company name to 'Hynix Semiconductor Inc.'
<b>1983~1999</b>	<b>Oct. 1999</b>	Merger with LG Semiconductor
	<b>Dec. 1996</b>	Initial public offering
	<b>Feb. 1983</b>	Establishment of Hyundai Electronics Industries Co., Ltd.

# Introduction of Semiconductor process

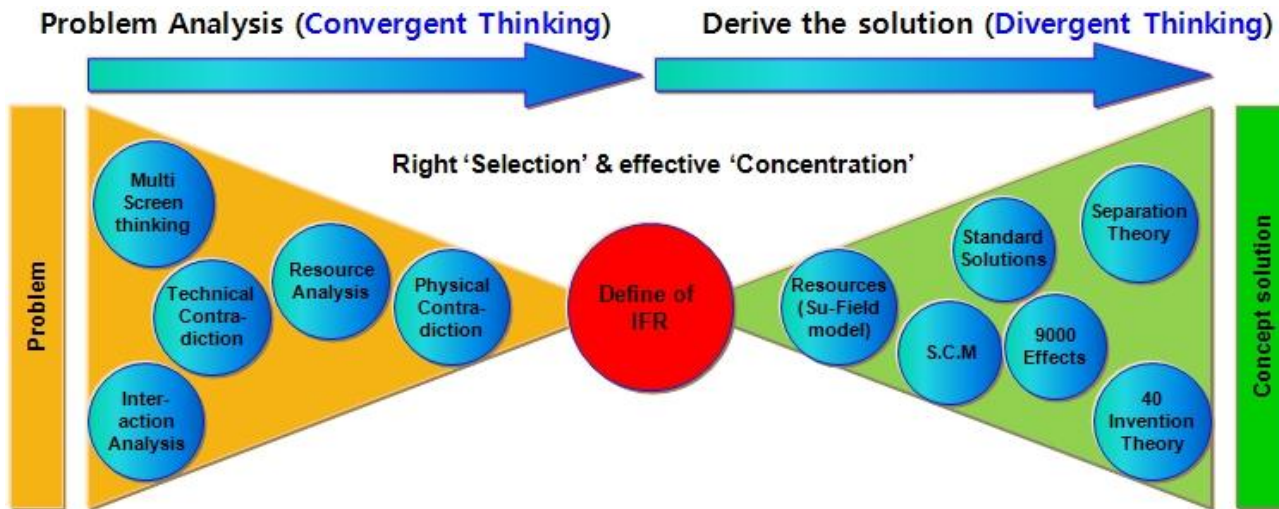


# Why TRIZ ?

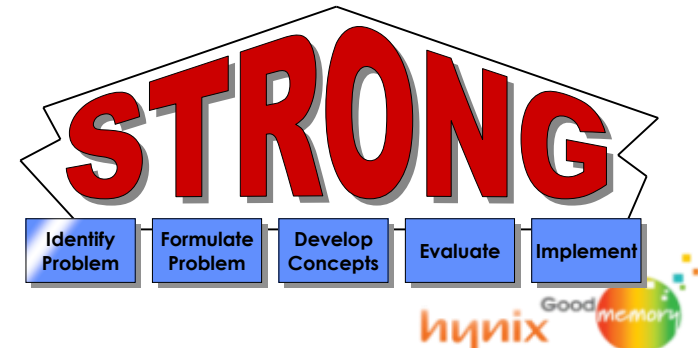
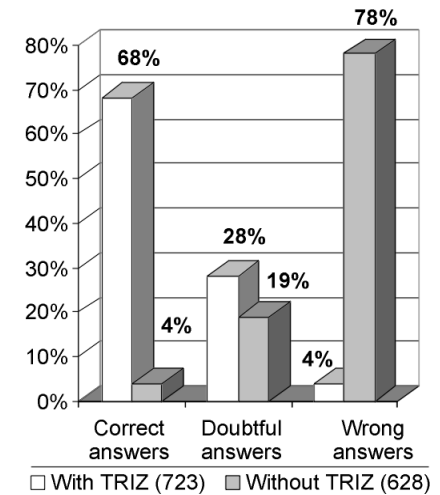
TRIZ is the methodology of technical and inventive problem solving created by G.S. Altshuller

- Systematic problem solving process which created based on the analysis results of excellent inventions.
- Give the guide lines of systematic and creative thinking way using the define of contradiction and a few analysis tools

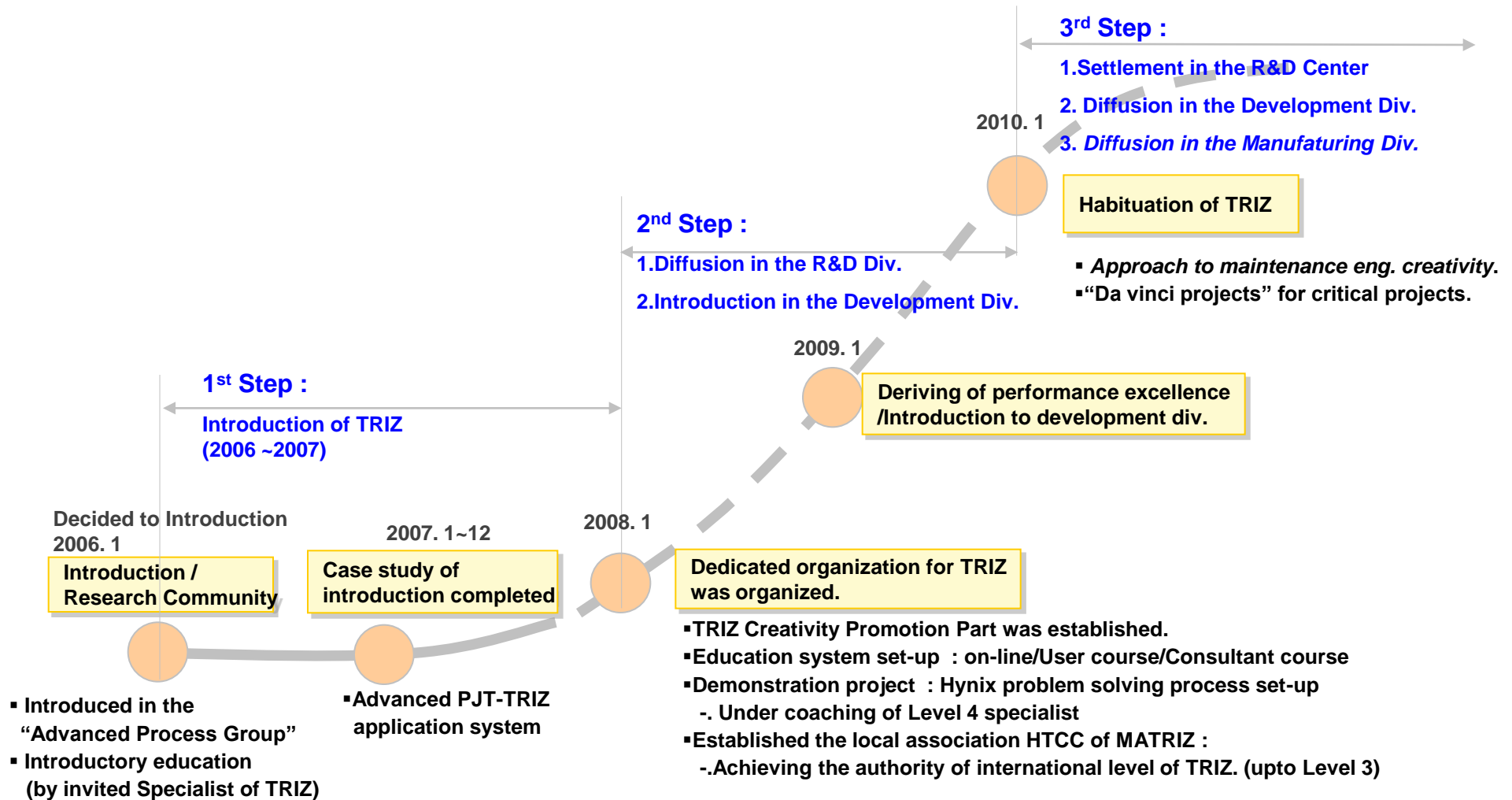
## Algorithm of TRIZ problem solving



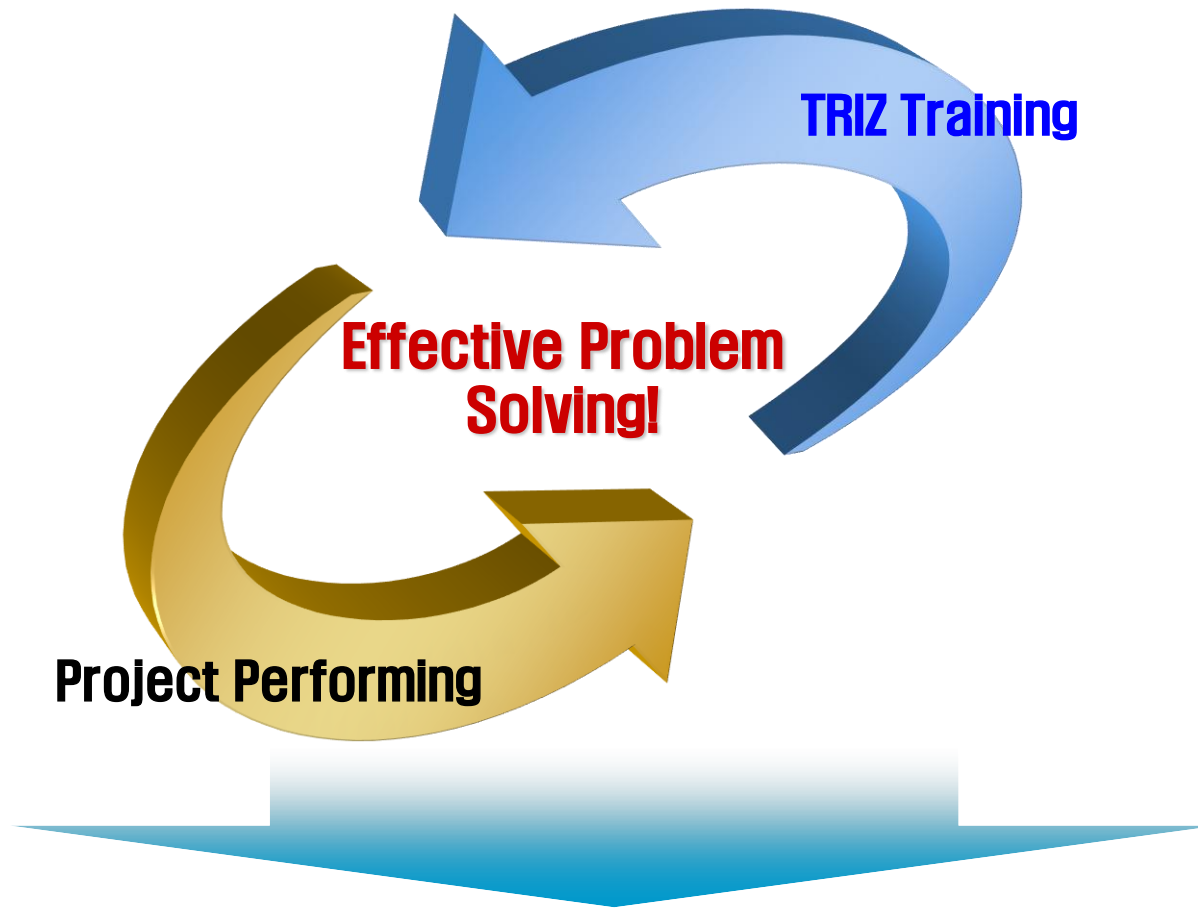
**Expectation :**  
Improvement of creative problem solving ability



# History of TRIZ Application



# TRIZ applying Strategy



1. Finding creative solution of problem
2. Innovation of thinking way
3. Accelerating TRIZ propagation
4. Access to the tool of Improving problem



# TRIZ Process@HTCC

To strengthen our user-focused project, we have developed various problem Solving process such as TRIZ 1\_Step / 3\_Step / 4\_Step / 5\_Step Process.

## \*\* TRIZ 5\_Step Process

### Step 1 Problem analysis

- A. Problem Description
- B. Primary Contradiction & Goal of Task
- C. Multi Screen Thinking

### Step 2 Selection of Core Element

- A. Function Analysis
- B. Core Element List

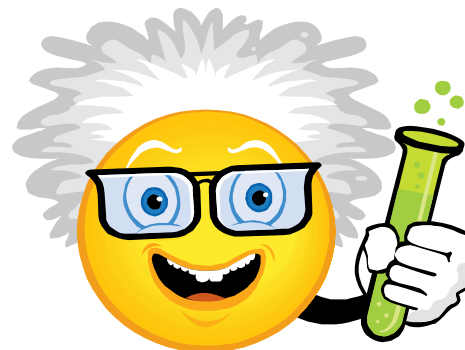
### Step 3 Resource, Contradiction, IFR

- A. Resource Analysis
- B. Contradiction of Core Resource & IFR

### Step 4 Idea Generation for Prob. Solving

- A. Idea Generation
  - 40 Inventive Principles
- B. Concept Solution
- C. Logical description of Concept Solution

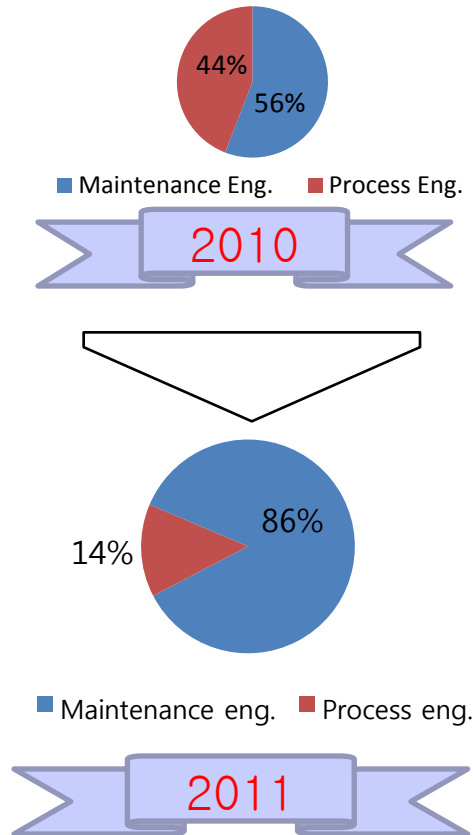
### Step 5 Final Solution & Future Plan



# TRIZ in Hynix Manufacturing Div.

As TRIZ has been known that TRIZ takes advantage in improving problem, That makes increasing voluntary educational applications of maintenance eng.

Training rate of Members of Mfg Div.

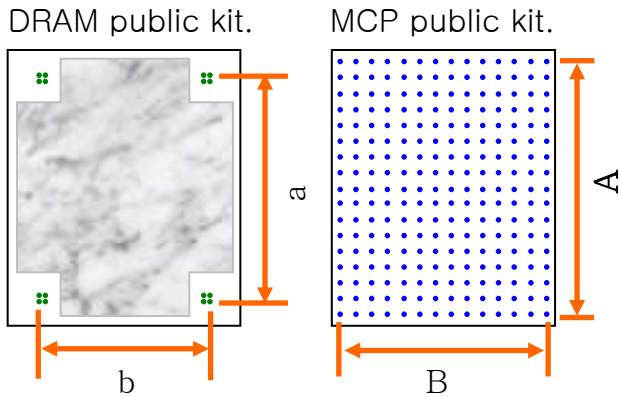


Voluntary commuty of Maintenace Eng. [w/ TRIZ consulting]



# Case

This case has been received Award of private proposal at 2010 quality Competition Korea Standards Association



Project background

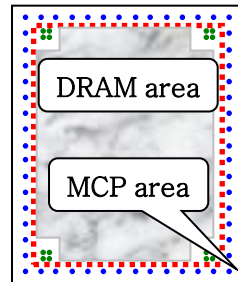
- Increase of MCP(Multi Chip Package) varieties. So We needed Small quantity batch production system.
- An increase in the number of varieties of switch transition times to increase the importance of expanding Commonization Kit

[1<sup>st</sup>, Physical contradiction]

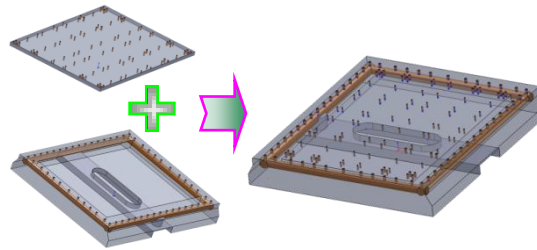
Suction area is too wide and too narrow

=>

In case of using the DRAM Kit, block MCP kit. And using the MCP kit, block the DRAM kit



[1<sup>st</sup> Solution ]



[2<sup>nd</sup>, Technical Contradiction]

Commonization had been completed, but because of too large inside area generated thermal transformation.

[2<sup>nd</sup> Solution]

Used Contradiction matrix.

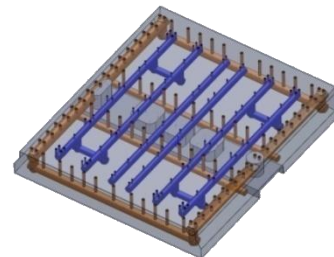
Y axis : Easy of operation

X axis : Reliability



- 17. DIMENSIONALITY CHANGE
- 27. CHEAP DISPOSABLES
- 08. WEIGHT COMPENSATION
- 40. COMPOSITE MATERIALS

z-axis connection system



Effects

- varieties of switch transition times : 1.52hr → 0.69hr(54.61%) ↓
- Productivity / year : 786K ↑
- Kit investment : ₩71,300 K ↓

# Activities

TRIZ Conference / Forum



Group TRIZ Community



40 Invention principles Card

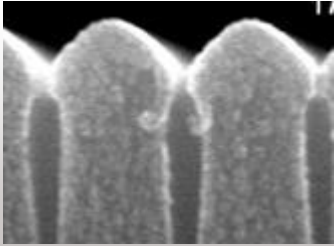


Div. TRIZ Community

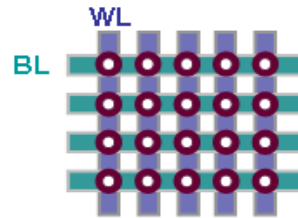


# TRIZ Application in Hynix R&D Div.

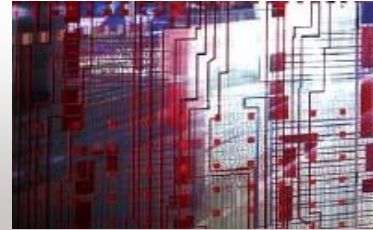
Process



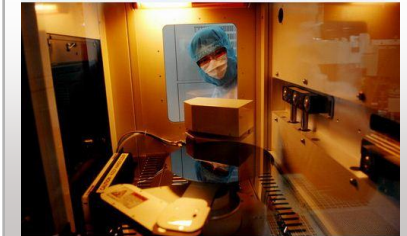
Device Integration



Design



Equipment

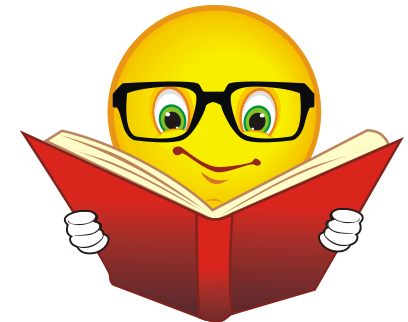
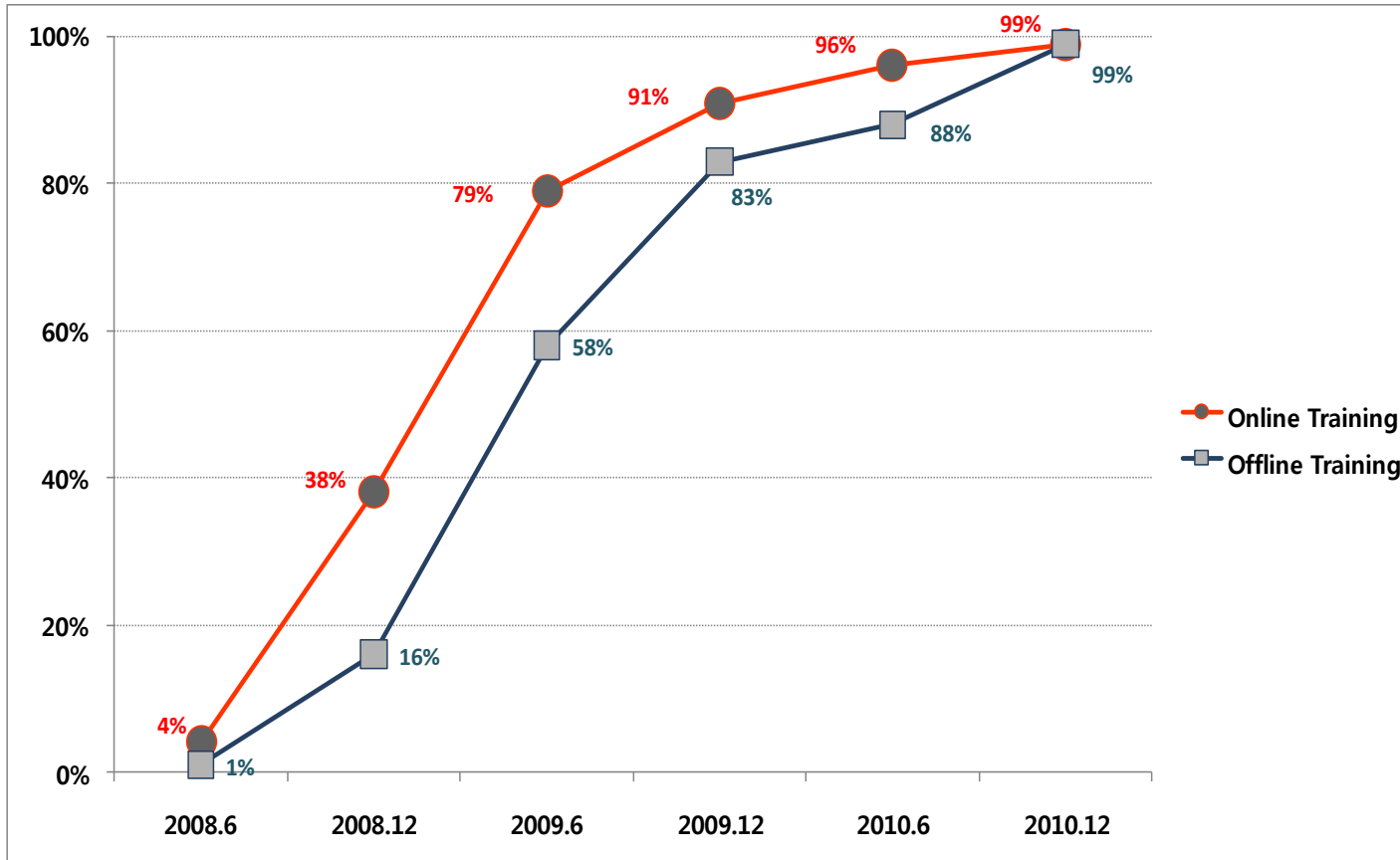


## Problem Solving by HTCP (Hynix TRIZ Creativity Process)

- Scope : Process, Device Integration, Design, Equipment...
- Target Performance : Creative Problem Solving & Comprehension of TRIZ Process

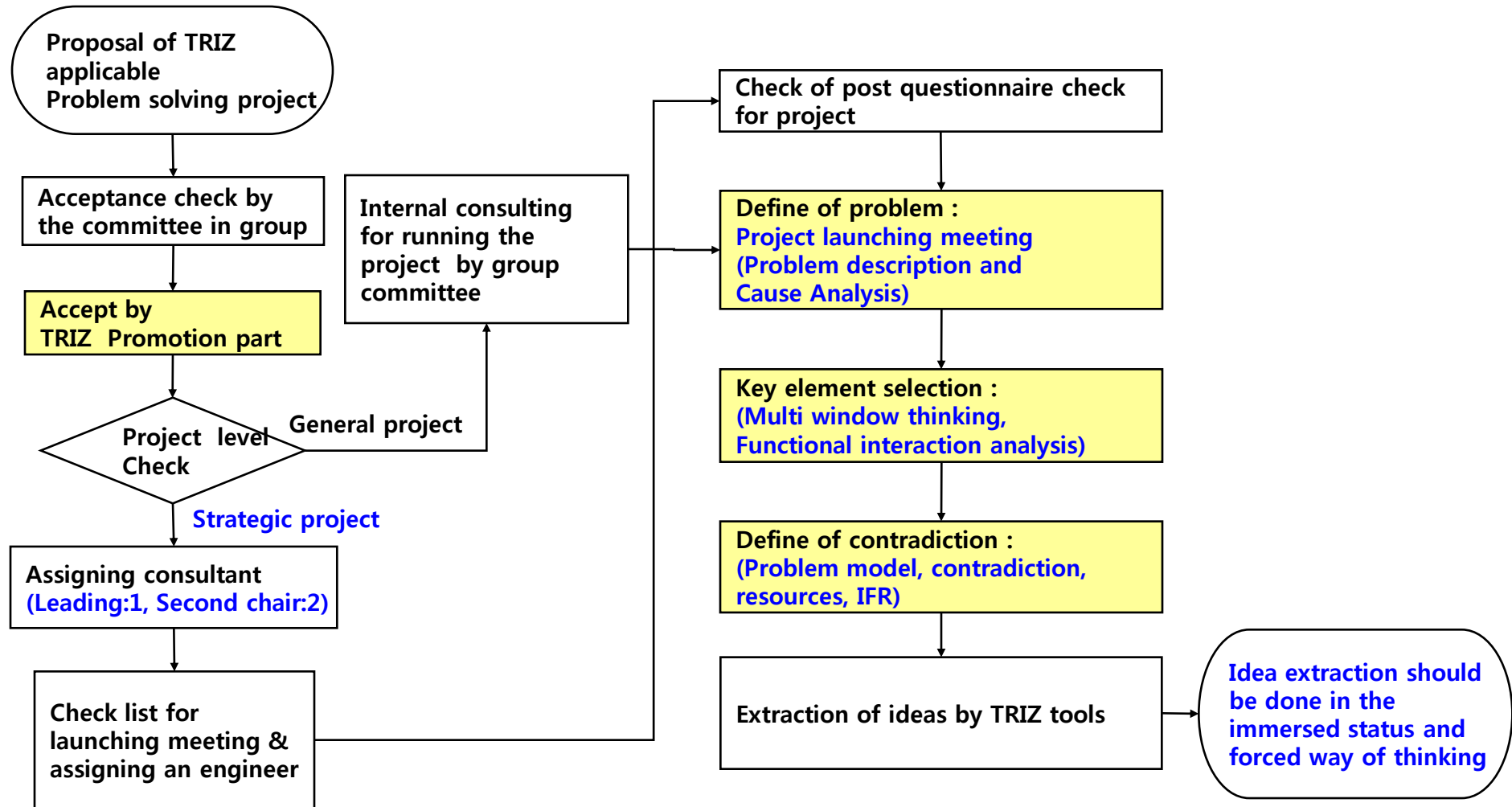
# TRIZ Training Status in R&D Div.

With the establishment of TRIZ Promotion Part in Hynix, we are embedding culture of creative thinking and TRIZ knowledge to employees.



# TRIZ Project Selection

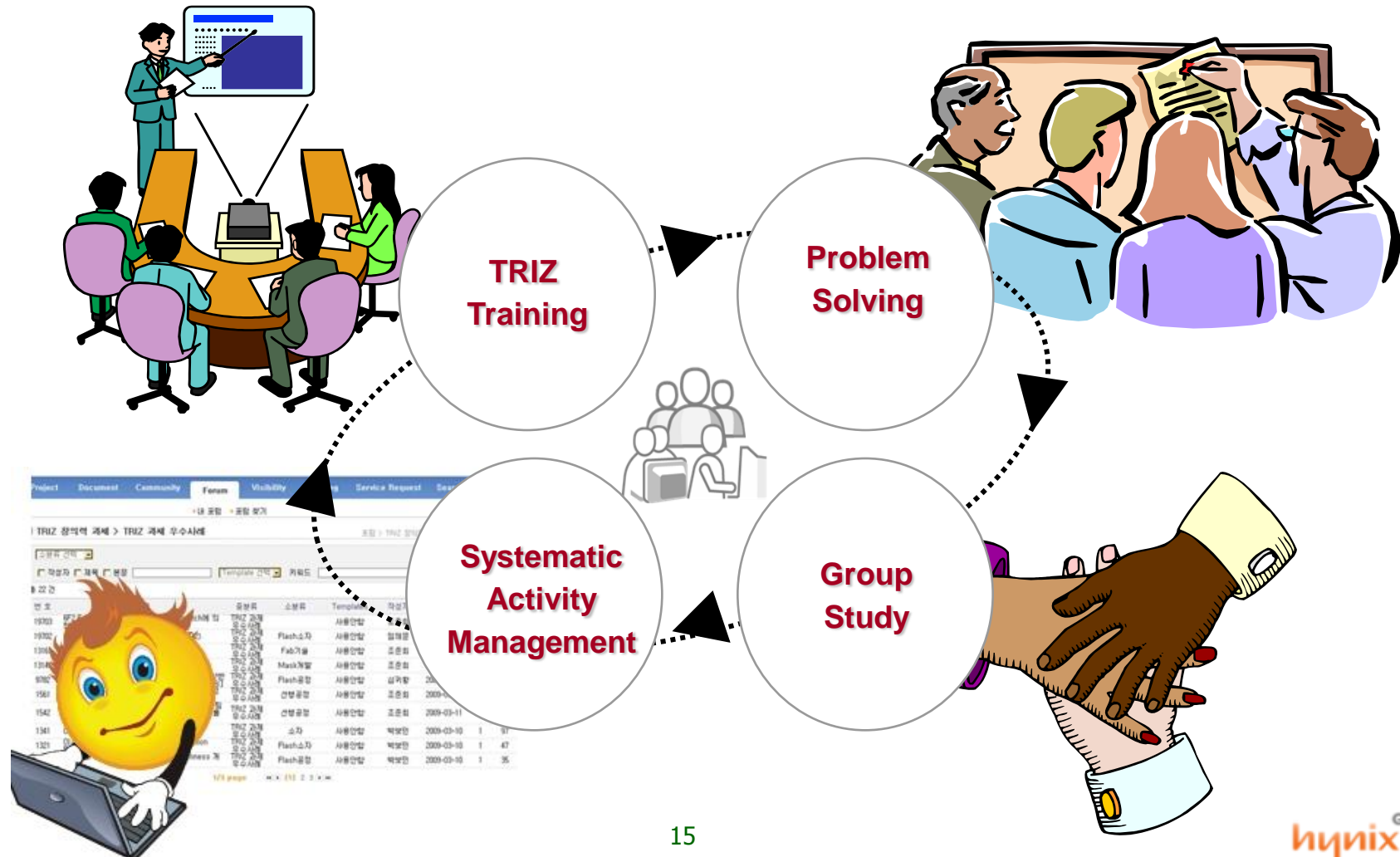
TRIZ project is chosen based on importance of task and strategy of users.



# TRIZ Future in Hynix

We want to...

1. **Innovate the technology** through the change of problem solving way.
2. **Innovate the thinking** by overcoming any stereotypes, and guide a personnel to be a creative one.







**Thank you.**