TRIZ Propagation Strategies in SAMSUNG Electronics Co.

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Abstract: Samsung Electronics is the world's largest producer of memory chips, TFT-LCDs, CDMA mobile phones, monitors and VCRs. BusinessWeek announced in June 2002 that the Samsung Electronics is the No. 1 in information technology in the world. In this world's leading high-tech corporate, TRIZ is used as an innovation tool more aggressively than any other company in the world. In 2002, TRIZ helped us to save around $25 million and to apply dozens of patents by solving chronic process and product problems. In this paper, I would like to show you TRIZ propagation strategies in the Samsung Electronics in terms of people, process, and product. Speaking of TRIZ people, we have several outside TRIZ experts and scores of Korean Innovation Masters certified by Invention Machine Co. Besides, we set up TRIZ process to give Samsung employees an incentive to learn and use TRIZ. As a consequence, we were able to produce competitive products in the world. This paper will be a good reference to any company who want to use and spread TRIZ efficiently.

1. Introduction

According to our experience in TRIZ application to the industry, TRIZ works very well. However, since It takes long time to learn and utilize TRIZ from scratch, the great concern has to be taken for developing and implementing TRIZ propagation strategies. Only by taking the right people and process, we can get the right product. In this paper, I would like to describe what we have done to propagate and utilize TRIZ in this huge top-ranking company Samsung Electronics in terms of people, process, and product.

2. Samsung Electronics Situation and TRIZ

TRIZ promotion team in Samsung Electronics has been set up in the end of 2001 and has been making an eye-opening progress. In 2002, TRIZ helped us to save around $25 million and to apply dozens of patents by conducting tens of TRIZ projects. I think TRIZ in Samsung is placed at the end of infant stage in S-curve and moving to development stage.

Before I proceed to talk more about TRIZ in Samsung Electronics, I would like to introduce Samsung Electronics. This information will help you to understand the TRIZ propagation strategies in Samsung. Samsung Electronics is one of the few companies in the world that has strength in both core component and network solution devices. Based on these business area, Samsung Electronics consists of four business groups; home network solution group, mobile network solution group, office network solution group and core component group. In core component group, memory chips and TFT-LCD rank No. 1 market share in the world. The office network solution group produces monitors with No. 1 worldwide market share, personal computers, printers and so on. The mobile network solution group produces CDMA mobile phone with No. 1 worldwide market share, and GSM mobile phones. The home network solution group produce microwaves with No. 1 worldwide market share, refrigerators, air-conditioners and so on. Total sales for 2002 amounted to $40 billion, and net income reached $7 billion.

I would like to expain two background information, which could have something to do with TRIZ propagation in Samsung Electronics. First, in spite of huge sales and profit in business, Samsung Electronics has a sense of crisis that we have been a fast follower and we can not survive anymore in this position. Instead of leading the industry by developing innovative products, we have followed fast what the leading companies had developed. Top management pointed out this and asked employee not to be a fast follower, but to be an innovative leader. Second, Six Sigma became a main innovation tool in Samsung. Top management is fully supporting Six Sigma and almost all Samsung employees are taking Six Sigma courses. Fortunately, Six Sigma people began to think that TRIZ can make up for the weak points of Six Sigma process; While Six Sigma goes for finding the best trade-off

solutions, TRIZ goes for overcoming contradiction . After all, Samsung Electronics reconized the need for innovation more strongly than before.

3. People

When a company want to do innovation, the first thing is who is in charge of the innovation. In case of methodology like TRIZ, which takes a long time to comprehend, it is more important. TRIZ people include outside TRIZ experts and inside employees. Outside TRIZ experts from Russia, Belrus, and Ukraine are highly experienced in TRIZ project and training. Inside employees are mostly engineers who have at least three-year engineering experience and are interested in TRIZ. Figure 1 shows the role of each group in TRIZ implementation process.

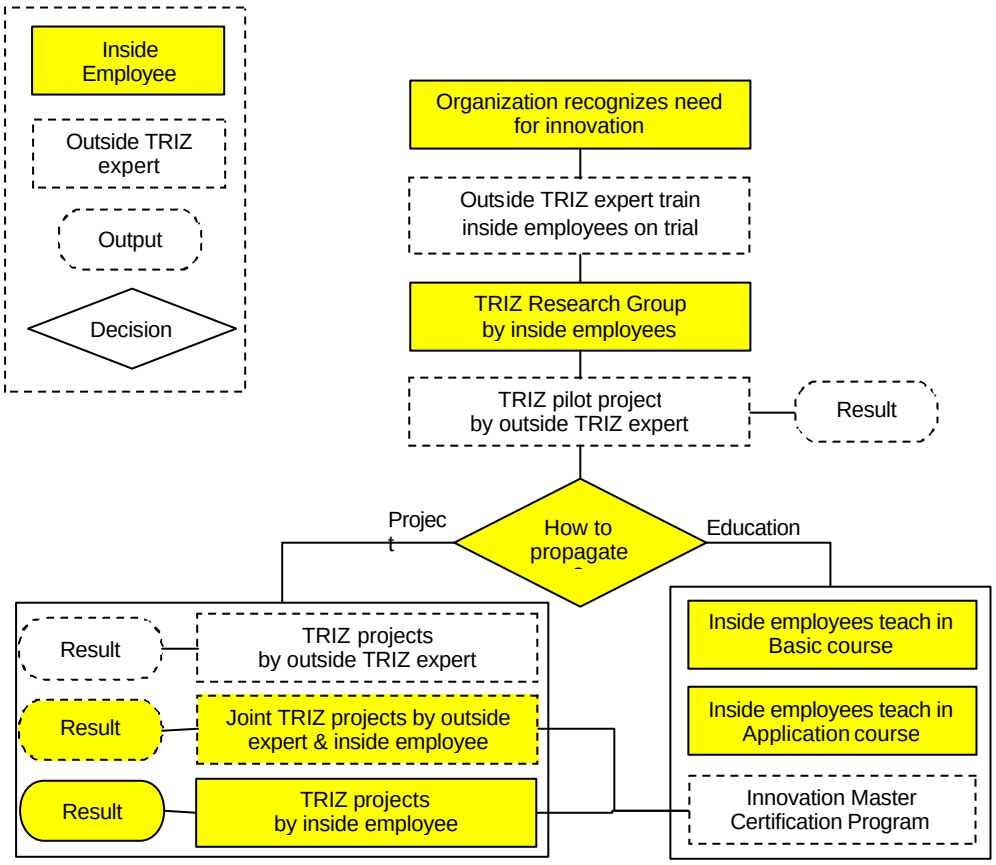

Figure 1. Flow Chart for Samsung TRIZ implementation

3.1. Outside TRIZ Experts

Samsung Electronics invited several outside TRIZ experts, who have more than ten-year TRIZ experience and specialty in other fields. To conduct real industry projects and obtain good results, specialty in other specific field as well as TRIZ experience is of great importance. The dahed-line boxes in Figure 1 show what outside TRIZ experts have done so far in Samsung. First of all, they trained a group of inside employees on trial. This group of inside employees formed a TRIZ study group. Outside TRIZ expert started a pilot TRIZ project with a small success. A small success in this stage is very important. After this stage, Outside TRIZ expert joined joint TRIZ projects by outside experts and inside employees. In addition to joint TRIZ project, they were also involved in training inside employees. One of our goal is to let a lot of inside employees conduct TRIZ projects by themselves.

3.2. Inside Innovation Masters

Since TRIZ is a methodology which needs a lot of time to learn and apply, it is neccessary to train inside employees through well-organized training courses with hands-on practice. To tell the truth, there is a big contradiction of TRIZ application in industry between the time needed to learn TRIZ and the time the management can wait.

The gray boxes in Figure 1 show what inside employees have done so far. We recognized the need for TRIZ and formed TRIZ study group after pilot training. Inside employees are now in charge of basic and application TRIZ courses, and professional TRIZ-based CAI trainer from Invention Machine Co. trains us only in certificate course. Scores of innovation maters certified by Invention Machine Co. have been produced so far. The inside innovation masters work hard to train other employees and conduct TRIZ projects with the help of outside TRIZ experts. I think we are at the beginning of the stage, “TRIZ projects by inside employee“ in Figure 1.

4. Process

As in Figure 1, after deciding to utilize TRIZ, we had to do two main works such as TRIZ project and education. I would like to discuss the processes which we are in for doing TRIZ project and education.

4.1. TRIZ Project Process

In spite of the notice in ARIZ 85C that “as a rule, improving the solving of one problem renders the solving of other problems more difficult...“, lots of arguments about TRIZ problem solving process are going on in TRIZ conference; how to improve ARIZ, how to make ARIZ more simple and practical, and how to combine TRIZ problem solving process with other methodologies such as Six Sigma, Value Engineering, and so on. We are also trying to set up Samsung TRIZ project process based on our experience. While building Samsung TRIZ project process, we came across another contradiction between the standard process for convenience and accessibility and the flexible process for boundless creative thinking. Although it admits no refutation that ARIZ is a great process for problem solving, we needed to organize TRIZ project process for more effective project management. We classified Samsung TRIZ project process into five stages: define, analyze, generate, evaluate, and verify as in Figure 2. The “define” is the stage where we can use ISQ(Inventive Situation Questionnaire) to clarify problem situation. We can use ARIZ and some TRIZ tools mostly in “analyze” and “generate” stage and somewhat in “evaluate concepts” stage with the help of CAI tool. Even though “verify“ stage have nothing to do with TRIZ, it is included to manage TRIZ projects to the point of practical application.

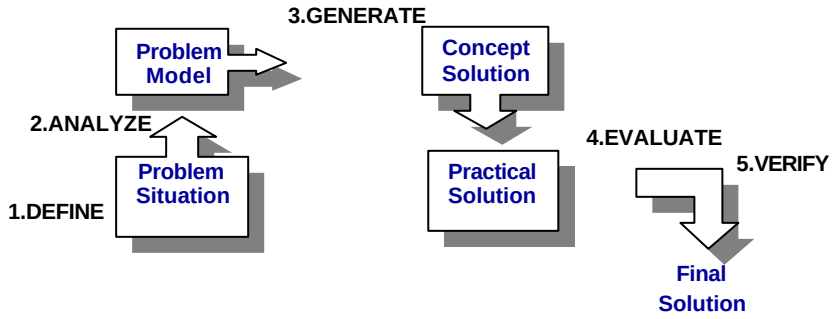

Figure 2. Samsung TRIZ Project Process

4.2. Education Process

Samsung Electronics has well-organized TRIZ courses including basic, application and certificate courses. In every courses, we are focusing on training employees instead of lectureing them. Forty-hour basic course consists of TRIZ concepts part and ARIZ training

part. The main objective of this course is to interest the student in learning more about TRIZ. More than fifty percent of students became eager to take application course. Another forty-hour application course consists of TRIZ-based CAI tool training and some more about ARIZ with hands-on task. In certificate course, students have to solve two practical tasks using TRIZ besides sixty four-hour class. In this stage, students work together with outside TRIZ experts or get some advice from them.

5. Product

By the people and the process mentioned above, the following products have been obtained. To survive this competitive industry, any methodology has to prove its effectiveness repeatedly in terms of money. Short-term product is economical savings from TRIZ projects by outside TRIZ experts and long-term product has to be economical savings from TRIZ projects by inside employees.

5.1. Short-term product

Short-term product is very important to let any methodology survive. The projects about process improvement, cost reduction, and patent avoidance have been conducted by outside TRIZ experts in the first place. From the small successes in TRIZ project by outside TRIZ experts, we were able to obtain substantial economical savings and convince inside employees to take TRIZ education.

5.2. Long-term product

Long-term product has to be inside TRIZ experts. Once we obtain well-trained inside TRIZ experts, they can apply TRIZ by themselves and make much more economical savings. We can also expand TRIZ application to the field of software problem solving, new product concept generation, and forecasting.

6. Conclusion

Samsung Electronics made the first step toward TRIZ applicaiton to the industry successfully and is trying to make another step. Experinced outside TRIZ experts contributed to the successful first step by conducting TRIZ projects well and training inside employees. The processes for TRIZ project and education have been developed on the basis of our experience and culture. In the second step, inside TRIZ experts will play an important role. In addition, the combination with Six Sigma process will be a matter of great importance in Samsung Elecetronics.

7. References

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