Efficient education system of scientific methods including TRIZ for improving the development process

- Trial of an education in close contact with the engineer’s needs -

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Presentation of Today

1. About Olympus
2. Promotion of scientific methods in Olympus
3. Listening to engineer’s needs
4. Activities focus on time
5. Education system to meet the needs of the engineer
6. Contents of Solution
7. Result
8. Summary
1. About Olympus

Established: October 12, 1919
Head office: Shinjuku-ku, Tokyo, Japan
Capital: ¥73,332 million (As of March 31, 2013)
Consolidated net sales: ¥743,851 million (Fiscal Year Ended March 2013)
Consolidated headcount: 32,937 (As of March 31, 2013)

Next-generation gastrointestinal endoscopy system
EVIS LUCERA ELITE

Medical systems

Aomori

Life Science & Industrial systems

Fukushima

Nagano

Tokyo

Imaging systems

OM-D

PEN EPL6

Biological Confocal Laser Scanning Microscope 「FLUOVIEW FV1200」
2. Promotion of scientific methods in Olympus (1)

Providing a solution, depending on the purpose and period of the theme

Typical Use of Methods

Using various types of methods according to the problem

90 min Basic Training, applied to the theme

Solution for

- Fuzzy Frontend
- Setting Theme
- Fast Cause Analysis
- Making Strong Patent
- Cost Reduction
- Evaluation & Experiment
- Risk Prevention

Providing optimal solutions to the problem
2. Promotion of scientific methods in Olympus (2)

Trends of Trainees and Themes

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<td>consultation</td>
<td>Group seminar &amp; Training for R&amp;D</td>
<td>QFD,TM,TRIZ 90 min Basic Training</td>
<td>Support of the theme</td>
<td>Solution support</td>
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TM: Taguchi Method

QFD, TM, TRIZ 90 min Basic Training
Support of the theme
Solution support
3. Scoop out to engineer’s needs

**Engineers are sensitive to time!**

- **No time for training** by the time savings of the development work
- **I want to know quickly the effect** of new tools.
- **Methods such as QFD** were not useful even though they were time-consuming. My purpose is **not the use of methods**, but the efficiency of development
- **Experienced engineers** want to know **the directly linked methods to problem solving**. And they want to know the best approach to each scene in particular

**Long time to train and to apply methods is NG!**
4. Activities focus on time

Encourage experiences before becoming to dislike methods

How fast to reach the Recognition Level of Importance

Proficiency of the methods

Time

- Grasp Overview
  - 60 min
  - Briefing session

- Acquisition of minimum Knowledge
  - 90 min
  - Basic training

- Trial in a familiar theme
  - 90 min x N
  - Consultation

- Repeat an important theme

- Expand utilization
- Manager’s admits

Recognition Level of the importance in the scientific approach

Recognition Level of the importance

How fast to reach the Recognition Level of Importance
5. Education system to meet the engineer’s needs

By focusing on time, creating the system for various engineer’s requests

◆ Minimum knowledge in minimum time
  ⇒ 90 min “Basic training“ (QFD/TRIZ/TM)

◆ Supporting the use of the methods in the theme
  ⇒ Applying their own knowledge to the theme,
    and increasing the "problem-solving drawer"

◆ Providing exercises courses to young engineers
  ⇒ "Exercise Course" provides an experience of the
    development flow in the actual subject.
    (2 days: Half of the conventional lesson)

◆ Provides an opportunity to make a solution to
  the experienced engineers
  ⇒ 90 Minutes of 7 Solution courses
Using various methods naturally while deploying 7 solutions

Engineers should have many “Drawers” for the solution of problem.

Mr. A knows the scientific method
Many “Drawers” for the purpose

Mr. B relies on his knowledge and experience of the past

Forcing to use the method is not our purpose!

QC7? Statistical methods?

Learning by practice in close contact with the theme

Training solutions and 90 minutes Basic course

Get a new “Drawer”!

Support engineers at the seams of theme

Evangelist of the method is not required.
Introducing solutions for experienced engineers

Core Method
- QFD
- TRIZ

Search
Technology Development
Product Design
Preparation for production
Production

Fuzzy Frontend
Setting Theme
Fast Cause Analysis
Making Strong Patent
Cost Reduction
Evaluation & Experiment
Risk Prevention

※ TRIZ includes Functional approach and Root cause analysis
7. Results (1) Education contents

Expansion of educational materials for each purpose and in-house cases linked to the 7 solutions

- **Basic training (QFD/TRIZ/TM)**
- **7 Solution courses**
- **2 Days course of lectures and exercises**
- **Case studies for Each Solution**

Sharing the Case Studies on the Company Data base

Contents include Purpose, Method, Result and Effect on one page
7. Result (2) Merit of 90 min

90 minutes class is hard for the teacher, but there is also a benefit

【Effect of the basic course and the solution course】

- Teachers seriously consider what they want to transmit first.
  And their skills get polished. They added a twist to the program.
- Plan a flexible training to suit the convenience of developers.
- Plan easily a remote training using the TV conference system.

Training held simultaneously in Tokyo and Nagano
7. Result (3) Devised Points of the exercise

Exercise from setting theme to solving problem by QFD and TRIZ

Previous model: Cleaner  Current Model: Flashlight with Manual generator

《Devised Points》

- Exercise in real product planning
- Contents including mechanical, electrical and optical systems that OLYMPUS engineers are interested in
- Fun new products launch a competition by the training team at the end

Scene of exercises
7. Result (4) Actual Case of Exercise Course

[Efficient Thinking] “Develop new products of flashlight!”

I want to light up flashlight with less power

TRIZ
Problem Analysis
Idea Generation

Presentation of Concept Ideas

TRIZ
Problem Analysis
Idea Generation by Teams of Eradicating Type and Desire Type

VOC
Selection of priority

QFD

Flashlight

Desire Type
Idea Sample

Eradicating Type
Idea Sample

Brainstorming by TRIZ

Flashlight

Presentation of Concept Ideas

Efficient Thinking

"Develop new products of flashlight!"
2 types of idea approaches by TRIZ to the purpose

Type of eradicating the problem

Why can’t I supply sushi fast?

Root cause analysis

I found the cause of slow work

Can I cut the fish quickly without remainder on the kitchen knife?

In Sushi Bar

New type of Kitchen Knife

You can solve the problem concretely. However, the range of ideas is narrow.

Type of fulfilling the desire

Why can’t I supply sushi fast?

Expression of desire

Brewery

Got it!

Belt-conveyor Sushi bar

You can obtain a wide innovative idea. However, the idea lacks detail or specifics.
Aiming at a common language of engineers in the "OLYMPUS College"

Trainees can obtain points for promotion participating in the “Two-day Exercise Course.” So, awareness of the trainees have increased.

*OLYMPUS College
Company-wide education curriculum organized by the human resources department

Management
- Laws and Regulations
- Quality Control
- Expertise
  - Mechanics
  - Electric
  - Software

Scientific Methods
- Basic Course
- Exercise Course
  - (Solution Course)
Summary

1. The approach that focuses on time is acceptable to the developer, and, applied themes and number of trainees have also increased.

2. Training of 90 minutes brought the benefits of a short period. It has become possible to greatly increase the opportunity to learn scientific methods simplifying trainings in remote areas.

Next challenge

Practice support and education are the two wheels of solution deployment. The development of human resources that can be utilized across each method and 7 Solutions is the next challenge.
Special Thanks

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Thank you for your attention