THE RENAISSANCE OF METHOD TWI – TRAINING WITHIN INDUSTRY

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Abstract

The paper analyses the method of Training Within Industry, which was founded during World War 2 in the USA. Specifies the main modules TWI methods - Job Relations, Job instruction, Job Methods and Job Safety. Present its relationship with the Kaizen and Lean production method. Justify a renaissance with TWI methods currently in preparation for the implementation of Lean production.

Key words: TWI-Training Within Industry, Kaizen, Lean Production

INTRODUCTION

The Training Within Industry Service was developed in the U.S. during WWII to train replacements of an industrial workforce off to fight a war. It provided rapid and consistent training and is recognized as part of what helped the Allied forces secure victory as they boosted industrial production and out-produced the economy. TWI was an unqualified success. [2]

TWI method was later applied in many countries around the world. Training Within Industry was introduced in Japan during post-war rebuilding. It is still in widespread use in Japan and most notably, in Toyota as part of the Toyota Production System (TPS). It is a foundation to Toyota’s success in continuous improvement, standard work and more importantly, in its ability to sustain those improvements.

During the prosperity of post-war America, the TWI program was abandoned and it soon became a faded memory. Thanks largely to the not-for-profit Central New York Technology Development Organization; TWI is experiencing a rebirth throughout industry. In what has been described as a "movement," lean enterprises are increasingly turning to TWI as a means to emulate Toyota’s ability to sustain improvements and achieve standard work. Industries such as healthcare, construction, and manufacturing are reaping modern day benefits from this proven and recently revived program.

A group of the best U.S. experts in training and development of their time developed the TWI program. Their initial approach to boosting industrial production involved deploying consultants to the each factory to assess the situation and develop a customized approach to increasing production. This approach failed due to inconsistency, lengthy implementation schedules for recommendations, lack of qualified consultants, and the inability to tap into the productive potential of the employees.

The experts soon refocused their approach to tap into the knowledge of the supervisors. After heavy research and testing, the TWI Service was established to deploy TWI throughout the United States and that “the real jobs had to be done by industry within industry”. [6]

MAIN MODULES OF TWI METHOD

The base structure of the TWI includes three basic modules JR, JI, JM and module on work safety-JS. [6], [7].

Job Relations- JR

Building positive employee relations, increasing cooperation and motivation, and effectively resolving conflict Job Relations teaches the foundations of positive employee relations. Developing and maintaining these good relationships prevents problems from arising and is paramount to earn loyalty and cooperation from others. When problems do arise, Job Relations teaches a proven method of getting the facts, weighing options, deciding, taking action, and checking results.

Benefits experienced from practicing Job Relations include increased productivity, improved attendance, better morale, and higher employee retention rate.

Job instruction- JI

Quickly training employees to do a job correctly, safely, and conscientiously. Demands of developing a flexible workforce and training employees require standard work. Program attendees are taught how to effectively breakdown a job and deliver instruction for individual tasks. Developing and delivering training in this structured fashion fosters the conditions for process stability.

The Job Instruction method teaches preparing the operator to learn, giving a proper demonstration from a breakdown, observing the operator perform the task, and tapering off coaching with proper follow-up. Benefits experienced when practicing Job Instruction are reduced training time, less scrap and rework, fewer accidents, and increased job satisfaction.

Job Methods- JM

Improving the way jobs are done for continual improvement. The aim of the program is
to produce greater quantities of quality products in less time by making the best use of the people, machines, and materials currently available.

Participants are taught how to break down jobs into their constituent operations. Every detail is questioned in a systematic manner to generate ideas for improvement. Eliminating, combining, rearranging, and simplifying steps in the process develop new methods.

Job Methods yields significant benefits including reduced cost through productivity gains, increased throughput, and reduced work in process.

**Job Safety - JB**

Creating a safe workplace. Based on the TWI instructional model, Job Safety (JS) is a complementary program focused on environmental health and safety. JS provides a framework for supervisors to engage employees in identifying potential hazards and eliminating them in conjunction with their training and knowledge in OSHA and EPA regulations.

JS was developed in Japan and, although it was not part of the original TWI program, it plays a critical role in industry today. This program teaches supervisors a method to analyse the chain of events leading to accidents and hazardous situations. Root causes are identified and premeditated to "break the chain". JS stresses that the relationship of the supervisor and employees plays a pivotal role in a safe and environmentally responsible workplace.

Graphical model relationships TWI modules is shown in Fig. 1

![Sustain Standardize Stabilize Safe, Positive Workplace](image)

**TRAINING WITHIN INDUSTRY AND KAIZEN**

In several studies analysed the relationship between the methods of Training Within Industry and Kaizen. Figure 2 is a comparison of the first steps by Allen version of TWI, TWI Final method and Kaizen.

The Four-Step Learning Process developed by Charles R. Allen for TWI [2], [3]:

1. **Preparation** Make the learner think to aid comprehension of the new idea.
2. **Presentation** Add the new idea to those already in the learner’s mind.
3. **Application** Train the learner to apply what was presented and check the results.
4. **Testing** Test the ability of the learner to apply the new idea on his or her own.

![Fig. 2 Comparison steps in TWI and Kaizen](image)
Today a lot of focus is being given to the Toyota techniques of problem solving, and many of the roots to that system can be seen in the TWI methodologies. Let’s compare the two using the Steps presented in [4] on TWI Summit:

**Toyota Problem Solving**
1. Clarify the problem.
2. Break down the problem.
3. Target setting.
4. Root-cause analysis.
5. Develop countermeasures.
6. See countermeasures through.
7. Monitor both results and process.
8. Standardize successful processes.

**TWI Problem Solving**
1. Isolate the Problem
   - State the problem.
   - Give proof or evidence.
   - Explore the cause.
   - Draw conclusions.
2. Prepare for Solution
   - Use JM, JI, JR steps 1 & 2.
3. Correct the Problem
   - Use JM, JI, JR steps 3 & 4.
4. Check and Evaluate Results

**CONCLUSION**

The question arises why the method TWI has lost a long time in industrial practice. According to [7] publication two factors played an important role. After World War II, the United States became a superpower by the output without damage to its own infrastructure. Morale was high, a large industrial base and strong. Absent a need to further develop the TWI. TWI extinction factor was one factor in the extinction of that it developed in unique circumstances. 

*Parallels to today:* When companies prepare to move the production of lean thinking about the instruments. TWI programs are also tools, but they differ from the typical tools of Lean. Tools such as, SMED (single minute exchange of dies) are sophisticated. JMT but encourages people to think about their work in its simplest elements. This is a skill that every worker can learn at his or her works. TWI It may be the missing link to move to the Lean methodologies.

For those who have heard of lean manufacturing, Japanese management methods, and kaizen, TWI may well be the ground zero of these modern manufacturing philosophies that have developed into the most promising methods in industry today.

The Training Within Industry Service was a forerunner of modern manufacturing techniques. It remains a model for training people in industry and may well be the ground zero of lean manufacturing and kaizen. [5]

To be competitive in today’s global market, it is more important than ever to hire, train and retain great employees. Businesses adopting Training Within Industry (TWI) have consistently increased productivity, reduced training times and improved morale.

Training Within Industry is a dynamic program that uses a learn-by-doing approach to teach essential skills for supervisors and team leaders from all industries. These programs work together to help supervisors build and maintain positive employee relations, train workers to quickly remember how to perform jobs correctly and safely & conscientiously improve the ways in which jobs are done.

**REFERENCES**

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