



# The Keys to Long Term TWI Rollout & Sustainment

By Art Smalley, Patrick Graupp, and Scott Curtis

By now many people are familiar with the historic Training Within Industry (TWI) courses and the important role they played in the United States during World War II as well as in many companies in Japan after the war ended. If not, we suggest reading Jim Huntzinger's article on *The Roots of Lean* ([www.twisummit.com/roots](http://www.twisummit.com/roots)) for some background perspective. After the war the TWI courses continued to play an important shaping role in companies overseas such as Toyota, Sanyo Electric, and many others. For many organizations around the world today attempting improvement, the TWI content supplies ready-made programs for helping supervisors deal with problems related to training, handling people, and making small daily improvements. The fact that the material exists in clear, logical English and is not based on a confusing foreign language helps in many organizations as well.

The intellectual robustness and universal applicability of the TWI material for Job Instruction

(JI), Job Relations (JR), and Job Methods (JM) is well established. Demand for the courses is growing every year and success stories are commonly presented at various conferences and other venues. Companies using TWI today report significant improvements in critical KPI's even after the initial Pilot Area training. For example, recent results from a producer of turbine blades in the energy industry reported a 90% reduction in process downtime due to failed quality tests. Proper training of operators has further improved quality and reduced failures equating to \$100,000 of annualized improvement in this one pilot area alone. Despite the overall success rate there are many organizations who attend the training and are genuinely interested in making TWI work yet struggle in the beginning. We have seen this unexpected result in health care, manufacturing, and service industries. In other words, we hear a lot of: "Well we did the training and it was great. Now what do we do? How do we expand and make it sustain in the long run?"

Unfortunately, the TWI course materials, as great as they are, don't supply much in the way of advice on this topic. The training classes were designed for in-class delivery with actual demonstration practice involving real situations. However, the JI, JR, and JM material does not go into any depth about how to roll out the programs or link them to existing systems of daily management to ensure long term sustainment. Moreover, in the original days of TWI, trainers stayed with companies longer or made multiple follow up visits to training sites. One can surmise that this problem was simply not as pronounced back then.

Partial aids to this modern-day problem of rollout, connection to daily management systems, and sustainment arguably do exist in lesser known TWI materials developed in the 1950's such as Program Development and Problem Solving. While these materials were not as popular and never caught on with the same level of enthusiasm or success, they provide us with insights into how current TWI usage can be better performed. Additionally, we've collectively been helping organizations face this challenge for some time and have developed certain insights regarding success. In this article, with a nod to good TWI practices, we'll outline what we believe to be the important steps, key points, and reasons why for ensuring a proper roll out. Of course, not every situation is the same so blindly following these steps won't guarantee success. Yet we think these points are all vital to model in some way in every organization.

## PDCA Cycle of Management

Our first point involves the fundamental principle of Plan-Do-Check-Act (PDCA) and how you should think about any cycle of management including TWI content rollout. Consider the following framework as a macro outline for all our steps in this article. Since the TWI JI course is the most widely attended and practiced we'll frame a sample roll out scenario in those terms. (See Figure 1)

**Figure 1**

PDCA Cycle	Important Steps	Key Points
<b>Plan Phase</b>	Plan for preparing the organization Top management alignment Plan for training of personnel Rough concept for implementation -Training -Pilot Area -Daily, Weekly, Monthly Review -Metrics for success -Links to daily management and problem solving -External support (as needed)	Effective communication Goals, roles, & responsibilities 5W 1H assignment clarity 5W 1H assignment clarity
<b>Do Phase</b>	Conduct TWI initial training Develop TWI key person / master trainers Establish a pilot area for implementation Establish specific KPI's for performance Creation of the TWI Training Timetable Establishment of the skills gap and needs Creation of Job Breakdown Sheets Creation of a monthly training plan & review Train operators in pilot area Establish linkage of TWI and problem solving Modification of the daily operational meeting	Certified TWI material Supervisors from area Manageable scope Standard for judging success 5W 1H assignment clarity 5W 1H assignment clarity Established JBS format 5W 1H assignment clarity Following JI 4-step method Problem point clarity Daily TWI focus
<b>Check Phase</b>	Review above items and compare to the plan Review skills matrix on a planned basis Review needed job breakdown sheets (JBS) Review KPI's and problems	Plan versus actual implementation Reduce gaps and increase skill levels Create needed JBS quickly Ensure improvement
<b>Act / Adjust Phase</b>	Review and adjust steps as needed Look for "pull" from other areas and plan next pilot Firm up organizational structure to support JI	Standardize what worked Expand step by step to all areas Provide adequate coverage

Successful organizations build a plan like this up front for their TWI implementation efforts. Plans can be rough outlines in the beginning but they should be reviewed and refined as the learning progresses. The most common failure mode we observe is to plan simply for the basic 10-hour training of a TWI course such as Job Instruction and then send people back to their areas of work without a structured support mechanism like the

one above. As the famous saying goes, “Failure to plan is the same as planning to fail”. Returning people to their previous system of work without a solid plan is not a foundation for long term success. Completion of a basic training class alone won’t change the culture or existing processes in your organization. All the points in the table above are important and can be a cause for failure if neglected. For reasons of length in this article we’ll hone in on a few of the most important steps which, for the most part, occur after the initial TWI training is complete.

## 1. Top Management Alignment and Preparation

A critical step that is often underestimated or overlooked is the importance of Top Management support for implementing TWI. Whether it is assuming TWI is just a “training” process that a staff member should work on or assuming this is a 12-week project that is finished after the 10-hour classes are completed, the results are the same and can be linked back to top management lack of preparation and understanding. Getting true top management buy in is a critical step in the long-term success of TWI. A simple but effective series of steps can help guide an organization to getting management alignment.

Top Management should:

- Understand the role of TWI
- Tie TWI to key Strategic Objectives – Why are we doing this work?
- Select a strong TWI Champion to drive change
- Designate a member to report progress to management
- Openly support the TWI initiative, go to Gemba and participate

With top management support, many of the normal obstacles encountered while doing the initial pilot work can be quickly eliminated.

## 2. Designation of a Pilot Area for Implementation and Learning

This step is very important for several different but related reasons. After the initial class room training is complete you need an area to go to practice the newly acquired skill and take things to the next level. Only so much can be demonstrated or learned in a class room. Just like physical sports or martial arts you must leave the comfort of the meeting room and get on an actual practice field to improve. It is natural to have questions, doubts, or even face struggles when you begin implementation. The best way to meet this challenge is to designate a pilot area up front of manageable size to practice the TWI skills of JI, for example. We also need real world feedback as we learn how to create job breakdown sheets, the training timetable, TWI JI training activities, and the all-important connection to real world daily problems.

Importantly, when selecting where to pilot the training, pick an area that is representative of your work with *actual problems* related to TWI contents. Don’t cherry pick the easiest place possible. The application and practice of JI starts in the Pilot area after the 10-hour training is completed. The objective is to increase skills and competency in JI and to establish and maintain new standards in the Pilot area. The long-term success of the roll out will depend on the very visible success of this pilot project, so select a location where people will think, “Wow, if it worked there like that then it will work just about everywhere!” Try to create some interest and excitement with your pilot location so that the whole organization sees the value and importance of the new skill being acquired.

### **3. Establishment of KPI's to Monitor Performance**

In addition to defining a pilot area, for learning purposes it is vital to also establish a clear set of goals and metrics to evaluate the impact of, for example, TWI Job Instruction training. Metrics taken during TWI's initial use during WWII showed that, in virtually every instance of application, productivity improved, defects were reduced, safety was enhanced, and training time was reduced, etc. by more than 25%. Today these improvements are still being achieved and many are even more significant than experienced during that era. For example, training time to attain a higher skill level is regularly reduced by 50% - 75%. That means that if entry level employees take on average four weeks to get to a level of proficiency, you can reduce this to one week with the proper application of JI. You need to have your set of metrics and goals in place to evaluate the effectiveness of the TWI program implementation. Training for the sake of training is not bad, however it should exist for a specific purpose. Be clear on what you are trying to impact and how it trends over time with the introduction of TWI skills to the area in question. Understanding how TWI helps improve performance is critical if you want this program to stick in the long run.

### **4. Creation of a Cross Training Matrix and Skills Gap Prioritization**

The TWI JI training class introduces you to the concept of the TWI Training Timetable. The matrix is an excellent tool for visual control and seeing where we have skills gaps and training needs. Every situation we observe is somewhat different. Some organizations struggle with training of new employees, some struggle with creating enough skilled back up operators, some face chronic quality or safety problems. The purpose of the Training Timetable is to help surface these issues and help put focus on specific needs first. Think of the matrix as a combination "heat map" and "Pareto chart". When properly created and analyzed the matrix

should help point you where to go for maximum impact. Of course, human considerations always need to be involved, but don't just generically settle for vague plans like "we'll do it everywhere" or "We'll focus here first because it is perceived as easier".

### **5. Creation of Job Instruction Breakdown Sheets (JIB's)**

Our experience shows that after taking the Job Instruction 10-hour course, trainers still need additional coaching and practice in making good Job Breakdown Sheets. Even professional athletes continue to train and hone their skills on a weekly basis. With the TWI "learn by doing" approach, participants bring in "small and simple" jobs for practice to the training with the purpose being to learn the instruction method and not to handle the most difficult job in the department. Once in the pilot, though, the real world of work complexity and size comes into full scope and this is where true application of the method begins to take place as JIB's for the pilot area jobs are developed. Virtually always in our experience, new JI instructors make their job breakdowns too detailed or wordy and good coaching by the TWI trainers is needed to guide them to find the "few and simple" words that make an effective JIB. Keeping a good balance between important steps and key points also takes practice and experience. Even then, it is necessary to "road test" these breakdowns and continue to refine them as they get put into use.

### **6. Creation of a Monthly Training Plan**

Based on the Training Timetable developed earlier, a defined plan for training jobs in the pilot area must be made and carried out. Depending on the scope being tackled, this plan can take many different shapes. It could be for a variety of different jobs on one production line, or one part of a production line, or focus on a few employees who work in a critical area. Or it could be for a single job trained to a multitude of people across several

different departments. This was the case when, at a large hospital, they picked as their JI pilot, “How to wash your hands” for reducing the spread of germs or infections and associated problems. Nurses on multiple floors of the hospital were taught this single job by several trainers over several weeks’ time. This simple yet fundamental task was sufficient to reinforce the concept and drive home certain key points. (See Figure 2)

people, or lean scheduling for that matter. The pull method is generally more effective and easier to maintain. Let’s explain this by use of an example:

One company implements TWI JI training in an area because they know it is a good thing to do and they roll it out accordingly. Job Breakdown Sheets are created and some training conducted. Some positive results are noted but it is anecdotal in nature. In the end, the effort does not stick because

people don’t see the point or need. This represents an example of “pushing” a solution that does not have a goal or a clear problem to solve. Even when it does people might not make the connection of how specific training affected a previous performance problem. As a result when humans do not see the logic or the benefit then the methods usually don’t sustain.

Another company, however, realizes it has a set of specific quality problems that greatly affect process yield.

Analysis of the problem shows that the yield varies widely both by shift and by operator. It becomes clear that certain operators were present during the installation of the equipment and learned specific practices and adjustment methods from the OEM. Unfortunately, those methods were held as tribal knowledge and were never documented or shared widely. Realizing this as a specific problem, the company created Job Breakdown Sheets for all aspects of the process based upon the best knowledge of the key people. In other words, they worked with the skilled

**Figure 2**

**JOB INSTRUCTION TRAINING TIMETABLE - Healthcare**

	July 26th - Aug 1st	Aug 2nd - 8th	Aug 9th - 15th	Aug 16th - 22nd	Aug 23rd - 29th	Aug 30th - Sept 5th	Sept 6th - 12th	Sept 13th - 19th	Sept 20th - 26th	Changes In Schedule
1. Hand Hygiene - Soap & Water 2. Hand Hygiene - Gel Job Name: <u>3. Hourly Rounding</u> Depart(s): <u>17, 16, 15, 14, 10, 9, 8, 7</u> Date: <u>Summer 2009</u>										
Level 9	X	X	X							
Level 14	X	X	X							
Level 8			X	X	X					
Level 7			X	X	X					
Level 17					X	X	X			
Level 16					X	X	X			
Level 15							X	X	X	
Level 10							X	X	X	
<b>Turnover</b>										
<b>Work Performance</b>										

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**7. Establish a problem-solving effort in conjunction with JI**

One of the most critical things you can do to ensure long-term success with TWI programs such as JI is to roll them out and properly connect them to your organizational problem solving routine. If you don’t have such a program, then we strongly urge creation of one in conjunction with TWI. Think of this as the “Push” versus “Pull” in sports, influencing

operators to create the JIBs thus capturing their knowhow. Proper TWI style training was then conducted across the shifts for all personnel involved with the process. Process yields improved dramatically and everyone now performed at the same higher level. In this scenario, the TWI training is far likelier to sustain moving forward because it proved its worth in helping solve a critical problem. The result is a natural organizational pull for more and not a hard sell or push to continue.

We cannot overstress how vital it is to connect your problem solving process and thinking patterns to the TWI skills. This logical connection will help generate better results and make the overall process more likely to stick in the long run. The TWI founders realized this connection when they later made the TWI Problem Solving Training which incorporated the three traditional J programs (Job Instruction, Job Methods, and Job Relations) into a unified approach to resolving problems. Beginning with isolating the cause, this method guides the user to finding which TWI skill to apply for problem resolution depending on whether the problem is mechanical or human related, or both. Operator error for example is not an acceptable root cause for any problem. How can the steps and key points of a job be made clearer? How can the job in question be made safer and easier? All of these points are important angles to consider in both training and problem solving particularly when the human method is involved.

## **8. Creation (or Modification) of the Daily Operational Meeting**

In conjunction with problem solving another key point that needs to occur involves your daily operational meeting. It takes time for the TWI practices to become part of the culture and not just training done in a training room away from production. Many companies have some form of a daily stand up meeting at the start and end of shift where performance is quickly reviewed. If you don't have one then we suggest you start one in

conjunction with your TWI pilot area. We even go so far as to suggest the basic pattern for the meetings. For example:

- A. Daily Safety Minute
- B. General Announcements
- C. Operational Review (Output, Quality, Delivery, etc.)
- D. Red / Green Status (Green = Good, Red = Gap and next steps discussion)
- E. TWI Training Plan Related
- F. Assignments, Follow Up, and Next Steps

Start with safety and have a safety review of any recent incidents as needed but also consider a specific safety theme or message for the day in a proactive manner. Follow with any general announcements regarding operations in your area and key pieces of information that need to be shared with everyone.

Of course, your daily meeting for operational performance should focus on results (plan versus actual) and incorporate your key metrics such as safety, quality, production, delivery, etc. If performance meets standard then we call that "green" and move on. If performance falls short of standard we call that "red" and make it visually apparent to everyone in attendance. For each "red" occurrence discuss the problem in a simple format such as the 4C's. What is the *concern* i.e. reason for the underperformance? What is the perceived *cause* over the situation (usually going and seeing to get the facts is a natural follow up)? What is the right and quick *corrective action*? And lastly how will you follow up to *check results* and adjust as needed? This should stir up some good TWI related content reflections and discussion.

However, for companies just starting with TWI we found that we often need to add a special section to the meeting where we reflect and review TWI concepts in connection to problem areas. Virtually every process or problem has a human element as part of the equation. Unfortunately, we continually find that some organizations fail to connect the

logic of TWI and its underlying principles to the actual daily realities of running the operation. For this reason we recommend coaching and practicing TWI principles in conjunction with your daily operational meeting. Even if there is no pressing problem to discuss you should still review the training plan and the creation of Job Breakdown Sheets and set up the details for the next session of on-the-job training to occur. If you don't manage and practice the process then unfortunately it won't sustain in the long run.



You will know the moment JI becomes imbedded and part of the daily routine when, during the daily meeting, any “red” conditions related to human performance occur and one of the first questions asked is, “OK do we have a JIB for this job?” If yes, then the next question should be, “Did we training everyone properly?” and then, “OK are all the necessary important steps, key points, and reasons why properly on the document?” And of course, if “no” to any of the above then, “Let’s discuss how we build a proper JIB and work it into our training plan?” This connection and thought process becomes the intellectual pull system and will help identify the next area of need for the application of JI. Not all problems are this straight forward, of course, but you should get a sense of the mental attitude and mind shift we are looking for.

## Summary

In summary we have just shared with you an overview of the important steps, the key points, and reasons why we tend to emphasize over and over in our TWI follow up activities. Every situation is different, of course, but there are similarities we observe in many instances. The key to sustaining programs is to get off on the right foot with a solid plan. If you create a plan emphasizing the activities discussed above along with problem solving and strong daily operational management we think you'll have greater success and increase your odds of sustaining TWI programs in the long run.

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## About the Authors

### Scott Curtis

*TWI Institute - President & CEO*



Scott brought 25 years of manufacturing experience and leadership and a deep working knowledge of TWI programs when he joined the TWI Institute in 2012. Since then, he has been working on growing the Institute into a Global leader in TWI with partner locations throughout Europe, Asia and the America's. Scott began his career with Mobil Chemical and held several engineering and management positions including Plant Superintendent and Plant Manager in his 13 year career with Mobil/Pactiv. Scott spent 5 year at Huhtamaki Consumer Packaging as Op's Manager and 7 years at Albany International as Plant Manager. Scott has training in Six Sigma from the University Of Tennessee Knoxville, and earned a bachelor's from the Rochester Institute of Technology and an MBA from the University of Phoenix.

## Patrick Graupp

*TWI Institute - Senior Master Trainer*



Patrick began his training career at the SANYO Electric Corporate Training Center in Japan. There he learned to deliver TWI from his mentor Kazuhiko Shibuya. Mr. Shibuya was trained by Kenji Ogawa who was trained by the four TWI Inc. trainers sent from the US

to help Japan rebuild industry in 1951. He was later promoted to the head of Human Resources for SANYO North America Corp. in San Diego, CA where he settled. In 2001 Patrick started to conduct TWI pilot projects that became the foundation for the TWI Institute that is now delivering TWI training in the manufacturing, health care, energy, and service industries in the US and around the globe. These efforts were outlined in his book *The TWI Workbook: Essential Skills for Supervisors*, a Shingo Research and Professional Publication Prize Recipient for 2007. Patrick is also the author of *Implementing TWI: Creating and Managing a Skills-Based Culture*, *Getting to Standard Work in Health Care: Using TWI to Create a Foundation for Quality Care*, and *Building a Global Learning Organization: Using TWI to Succeed with Strategic Workforce Expansion in the LEGO group*.

## Art Smalley

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Art learned TWI principles while working for Toyota Motor Corporation in Japan at Kamigo Engine plant which was one of the birth places for lean management. His trainer was Isao Kato who was the master TWI trainer at Toyota for several

decades. During his time at Toyota Art played an instrumental role in the startup of various Toyota facilities outside of Japan. After his time at Toyota Art later worked for the international management consulting firm McKinsey & Company. Eventually in 2002 he started his own consulting organization. In addition to aiding companies on the topic of TWI Art works in the field of leadership, management, and performance improvement through implementation of lean operating principles. Art has published multiple Shingo Prize award winning books such as *Creating Level Pull*, *A3 Thinking*, and *Toyota Kaizen Methods*. Another book is due out this fall from the Lean Enterprise Institute on *Four Types of Problems*.



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