Competency: Fitness for Intended Task

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A Systems Approach to Competency

Introduction

The objective of the Comprehensive Unified Training Plan is nothing less than improving human performance by providing competency levels required for every measurable task and procedure, thereby dramatically improving organizational efficiency. The result will be a safe work environment, maximum competitive advantage, and enhanced shareholder value. Specifically, for employees, they will be provided with the precise level of knowledge, skills, and abilities for every task and procedure required for the position they occupy, as well as a clear and accessible path for advancement. Most companies that succeed do so by applying advanced technology, quality control systems and high safety standards. The room for improvement in those areas by simply redoubling efforts is limited. However, by applying the same efforts to *training* in the *use* of that technology in the quest for quality and in vigilance for a safe workplace and procedures, significant improvements can be made in all those areas as well as in resultant productivity. As with any system, once the system itself is fully implemented, the only immediate gains can come from continuous quality improvement and "tweaking" the system for smooth performance.

Purchase the finest shovels technology can design and draw up a set of plans for an irrigation system. Take a group of workers, provide them with the plans and shovels, make sure one can read the plans and one can handle a shovel, and then let on the job training (OJT) take care of the rest. Your irrigation system will most likely work very well. However, if you spend a couple of days training them in the most effective use of those shovels and in team effort, and explain the plans to them, your irrigation system will be online at least 15% quicker – including the time spent training – and if it doesn't work perfectly, you can blame it on the plans instead of the people. Further, you can charge the same price and you'll make 15% more.

Simple, isn't it? So, why is industry so woefully behind the times in training and why are we the first to go in every downturn? Take a look in the mirror, and then pay careful attention to what follows.

Training is a gerund. A gerund is a verb with "ing" added to make it a noun that names the process. It's a verb in nouns clothing. So, to management, "training" says "ongoing, endless expense." "Competency", however, is a noun. It represents an end, not a process. That department which has "training" in its name suggests an endless expense, while "competency" states a clear objective with a price. I did an analysis of a drilling company's crew structure and all the KSA's (Knowledge, Skills, and Abilities) required to be competent in each position. I found out that, out of the five positions that make up a rig crew, over 90% of the training required for them to reach maximum productivity and safety was competency-based. That is, the training had a defined endpoint, as few of the tasks and procedures involved in drilling an oil or gas well change significantly in a short time. I argue that the vast majority of technical training isn't too much different, regardless of the industry involved. Perform an analysis of your industry. I think you will find you have good news for your senior management.

Quit "training" and start to "train." Stop providing management a budget for a process and provide them with a unit cost of competency.

If you apply the basic concepts presented in this book, you will be able to present straightforward cost figures to your manager that say, "THIS is the unit cost of competency." Right now, they feel they are on a

revolving charge plan where the principle always seems to increase regardless of how much they pay and there is no clear outcome.

If you implement these processes, you'll find that next time the economy tanks you'll be the last to go instead of the first. No business jettisons functions that are considered essential to core business, and a Competency Assurance System is essential to any business where productivity and performance are critical to success.

The training industry and training professionals are starving to death in a grocery store because we have lost our way and become reactive instead of proactive. We remain mired in obsolete methodology that costs our companies untold millions, and they see us as a cost center. We "nickel and dime" our organizations to death, and all without any clear results or objectives realized. We must change that. We have the technology and methodology to do so, if we just use it. If you employ only half the material in this book, you will turn your training operation into a profit center. If you invest wholeheartedly in the ideas in this essay, you will see your company dominate the competition. We aren't talking about faith or a 12-step program here, but procedures, processes, and methodology that have proven reliable over a century. What has NOT happened is to pull them all together. We are going to begin that process right now.

Let's start at the very foundation.

1. Competency: How do you know it when you see it?

While you may be certain of what a word means to yourself, others may have an entirely different picture in their minds. When it comes to "competency," even definitions from acknowledged authorities may not tell us what we need to know.

Let's just start with the word itself and some definitions from known and accepted authorities:

competence: the quality of being adequately or well qualified physically and intellectually
wordnetweb.princeton.edu/perl/webwn
Competency - a knowledge, skill or attitude that enables one to effectively perform the activities of a given occupation or function to the standards expected in employment.
roi-learning.com/guides/terms.htm
Competency - the collection of knowledge, skills and attitudes required to perform a task, usually described in terms of observable and measurable behaviors. The description of a competency is often written as 'Ability to...' followed by a task. ...
www.dpc.nsw.gov.au/merit/glossary
Competency - means the outcome of a demonstrated ability by the participant as to their knowledge and skills in being able to recognize hazards and accurately have an understanding as to the instructional procedures associated with the controlling of risks as per the hierarchy of control measures for the performance of a specific work task and /or activity.
www.workplacehealthandsafety.com.au/servlet/Web
Those last two are from Australia. I like them. They get close to what we require in the technical training business to get down to business, and here's why:

If you can't measure it, it's crap!

"Competency" is not a matter of opinion in the clear majority of technical KSA's, as demonstrated by the above definitions. The competency of our people WILL be assessed, if not by us, then by our competition, our clients, lawyers, regulators, the press, investors, and others. As I write this book, BP's training is being investigated, as well as that of Transocean, the rig owner of the Deepwater Horizon rig. If it is determined that the Macondo blowout was in any way related to a lack of competency it will not be the rig crew that is held accountable.

Research and technology have provided us with the tools to set and meet competency standards. If it cannot be measured precisely and verified, it is not competency. Unless competency is addressed, accidents and incidents can only be reduced by inspection, and productivity will only be as high as the competency of the manager. In most cases there is a clear relationship in the success, preeminence and lasting greatness of a company and the emphasis that company places on competency. As a proud veteran of the United States Army, I can attest to this. Proud as I am, when the Marines march by the difference is clear and obvious. Their emphasis on individual and team competency is clear.

If you are still with me, you're hopefully sold on competency as the result of what we try to achieve as trainers...but none of the competency definitions above tells you whether a person who says they are a competent NOV Varco ST-80 Pipe Wrench operator is deluding themselves or not. With reference to that tool, the definition of "competency" for one of its primary functions would be:

- The operator will be able to make or break a connection in 20 seconds or less.

Finally, we have a definition of competency! But wait…what if we are talking about a cable installer? Then that definition is no longer useful.

"Competency" is not only a moving target; it's unique for each and every task, procedure, and situation. If you are suitably confused, join the crowd. I struggled with that for 30 years before a re-read of Deming led me to borrow from him for my own purposes:

"Competency is defined as fitness for intended task."
Like "quality," "competency" must be defined by the "thing itself." Competency requires an object to describe. ***YOU***, as a technical training professional, must define competency and say, "THIS is competency for this task or procedure, and to the extent you meet or exceed this standard you are competent, and to the extent you do not, you are not competent." And if you, the technical training professional, do not precisely define that for every KSA you teach, you are a professional trainer but not a training professional.
The fear many businesses, industries, institutions and other groups have of the word "competency" is because they don't have a working definition and their training people don't or can't provide them one. They fear that if they say their people are competent and an accident happens, they'll be held responsible. I've got some bad news, and some good news.

Bad News: You ***will*** be held responsible if you've failed to ensure your employees are competent.
Good News: You can use this to the advantage of your employees, your competitive advantage, and your shareholders benefit.

In the last year of Nixon's tribulations, the constantly repeated phrase was:

“What did the President know, and when did he know it?”

If you’ve read and followed me this far, you can’t quit now. I’ve got you. The reason is that now that you know how to define competency you are bound to ensure that each and every person you train is 100% competent. In some court right now, it’s likely that an injured forklift operator is telling the court:

“Sheesh, I THOUGHT I was correctly applying the load chart. I did it the way they told me!”

If the above were true, there’d have been no accident. The reason is simple: If a forklift operator correctly applies a load chart, and if this operator’s competency was measured properly, the record will show in a way any jury can understand that the individual either purposely or inadvertently did not perform as he or she was trained. The law deals in facts, and competency is a fact, not an opinion.

One in six of all workplace fatalities in this country are forklift related. OSHA estimates that there are 110,000 forklift accidents each year. The Industrial Truck Association estimates nearly 900,000 forklifts are in use the in the United States. That is an incredible ratio. That means if a forklift is in service for 10 years it’s almost certain to be involved in an accident. If it were an airline, I don’t think I’d fly it.

Perhaps our forklift operators aren’t as well trained as they should be.
In personal encounters I was able to determine that in one of the best trained workforces in the country only about one out of nine certified forklift operators could properly read and apply a load chart. Forklift tip-overs account for 22% of accidents and 42% of fatalities.

Given that the laws of physics dictate that it’s not possible to tip over a forklift operated within its load chart limits, it becomes clear that our operators are not competent, and it’s not their fault.

Enough with the forklifts. The point I am trying to make is that our entire technical training field has failed miserably to perform the only tasks that justify our existence. We are supposed to provide competent workers with a reasonable chance of not being harmed in the workplace, give our companies a competitive edge, and increase shareholder value. If you disagree, then you work for a company that does it right, and always increases your staff and budget during difficult times because you always return an ROI.

No, I didn’t think so…

I’ve been accused of using litigation as a standard so as to simply protect the company. Well, that’s part of my job, because the fact is that the only way you can protect the company is by protecting the employee. If you gird the loins of the employee with the armor of competency, the only remaining accident factors are operator error and acts of God. As the VP of Health, Safety, and Environment of one company said:

“We’d like to say we do this just because it’s the right thing to do. However, we’ve also discovered its damn good business.”

So, what’s not to like? OK, I hear you. You’re thinking you don’t have enough money and staff to do the job right now and this is going to cost big time. No “bad news/good news” this time, just good news you can figure out for yourself:

1. You're going to have to employ the latest and best technology for delivering, tracking, and assessing your training. But that is going to reduce your costs by a factor so great, I usually reduce it a bit just to remain credible.

2. You're going to have to define competency for every task and procedure that your personnel perform.

3. You're going to have to determine very precisely those things that can be taught by technology-based solutions, and those things that absolutely require instructor-led training, and then ensure that the two approaches integrate seamlessly.

You are going to have to measure the knowledge and skills of your trainees unambiguously and reliably, and accurately enough so that no reasonable doubt remains in the minds of the hypothetical jury.

The fact is that we have the science and technology to meet those standards and it's not even new. Further, meeting those standards will reduce costs and increase profitability so profoundly that if you are the chief training officer for the British Drilling Company, the Roman Drilling Company is toast and doesn't yet know it. Don't let them get this book!

2. Foundations

"An objective is a description of a performance you want learners to be able to exhibit before you consider them competent. An objective describes an intended result of instruction, rather than the process of instruction itself."
"The characteristics of a useful objective are:

- ***Performance (what the learner is to be able to do)***
- ***Conditions (important conditions under which the performance is expected to occur)***
- ***Criterion (the quality or level of performance that will be considered acceptable)"***

Dr. Robert F. Mager, 1962
Those first two quotes contain everything there is to know about technical training. Once completely internalized, you can literally change the world with this knowledge. However, as Mager makes clear, "understanding" isn't a performance. It is not making an "A" on our Instructional Design final that proves our ability but delivering training that results in 100% competency at the lowest possible cost and in the shortest possible time. Reaching that level of training professionalism takes many years, mastery of a wide variety of allied skills, working as part of a team all dedicated to the same end, and participating in as much cross-fertilization with other training professionals as possible.

Knowledge of Gagne, Kirkpatrick, Bloom, Mager, and all the giants of theory; skills and abilities like videography, photography, bitmap graphics, vector graphics, programming, simulations design, logic flow, technical writing, audio engineering, narration, computer design, database management, AICC/SCORM, networking, 3D solids modeling, business process management, project management, and more are fundamental to a successful training professional. Further, you need a keen sense of your company's politics and culture to develop a true competency assurance program that delivers on the promises. But you can purchase most of those things. However, if you don't completely accept and understand the singular nature of Mager's definition, you are playing the game of "hit the target." That is:

1. **Shoot an arrow.**
2. **Whatever it hits, call it the target.**

That is what I see in most training organizations today. As I hardly consider myself a great thinker, most of my working definitions, like that of competency offered earlier, are based on the works of others. So, you won't be shocked to find I have a use for Occam's Razor.

Occam's razor is often expressed in Latin as the *lex parsimoniae*: the law of parsimony, law of economy or law of succinctness. The principle is popularly summarized as "the simplest explanation is more likely the correct one".
In training, I consider Mager's definition of an objective to be our razor. You use it to shave off the redundant and superfluous. Look at one of your training efforts, preferably one with a single objective that conforms to Mager. Now, mark through every word, picture, video, ANYTHING that is not absolutely required to develop mastery of that objective. If you are brutally honest with yourself and shave close, you are going to find an awful lot of material that may be nice but isn't necessary. That stuff is fatal. Get rid of it. It is costing your company a lot of money and it is damaging your students. If you want to get laughs or entertain your target audience, get into comedy or make movies. It will be very hard for many to give up these things, but to graduate from professional trainer to training professional, it is necessary. It is a significant part of the ballast that is preventing our profession from reaching the level of competency assurance rather than just "training."

I found it useful in many cases to boil Dr. Mager's philosophy down a bit. I have had students attempt to push the case that there are some things that resist measurement. I refuse to accept that and am deeply suspicious of anything in technical training that resists measurement. Also, I have always urged my students and staff to think big. Most people seem to try to work out what needs to be done to achieve competency for a task within only the confines of pedagogic techniques and technologies they know. It's a mistake. One should work out the very BEST way to develop a competency without regard to cost, complexity, or available technology. The only way to determine the price-performance-time crossover point to achieve an objective is to start at the undoable and work down to practical methods. This will inevitably be the most effective and efficient available means -- Occam's razor again.

One of my staff added a routine from one of our development tools to another tool in order to provide an interactive exercise she felt necessary, but the base authoring tool couldn't deliver. I had always told them not to think about what they knew how to do, or what the computer could do, but what needed to be done to meet the requirements of the learning objectives. If it proved unfeasible, then you back up just as far as you can so that you still wind up where you need to be. In this case, the primary authoring tool was Articulate. Articulate has become one of the most ubiquitous tools in training development due to its ability to create a web-friendly, SCORM-compliant publication from a PowerPoint presentation. In the hands of a first-class instructional designer/developer, one can develop almost any training need with it. But PowerPoint has a lot of limitations and we use another tool, Opus Professional, to build sophisticated and complex simulations. Opus can also output in the Flash format. Since the videos in Articulate are Flash-based, my developer wrote an exercise in Opus and embedded it. It worked, and we were able to not only make some changes to our code that allowed Flash-based simulations from other tools to run in and communicate data to Articulate but even more sophisticated non-Flash simulations. However, as we looked at what she had done, another staff member said, "That's really thinking outside the box." I agreed, and then rephrased it:

"There is NO box!"

It became our watchword. The fact is that simply "thinking outside the box" admits that there are constraints. In making that admission, one establishes those constraints, constraints that may only exist

in the mind. The most successful trainer will be that trainer who never gives any thought whatsoever to the constraints of technology but concentrates entirely on the requirements of producing training that meets the objective in the shortest possible time at the lowest possible cost regardless of what it takes.

In 1995, I found myself with some executives of Vastar, Inc., which was the wholly owned offshore production arm of ARCO Exploration and Production Technology, where I was to explain the $2.5 million-dollar cost of a simulation we'd developed for replacing a five-day Federal safety certification course. I was the contract Project Manager of what we'd dubbed the ARCO Technology Transfer Group under ARCO's Manager of Technical Training, Vince V. Hall. Vince had brought in several of my students from the University of North Texas to work on video projects. In my advanced class in non-broadcast video, they'd used a donated Amiga computer to produce animations and simulations for inclusion in their projects and heard my message that video wasn't where the future was, but computer-based interactive instruction was. They tinkered, cobbled, and in about 18 months had created one of the earliest PC based simulators, the ARCO SimStation, which was patented and trademarked. I was amazed at their accomplishment and became involved. After a few months Vince called me into his office and said the project was bogged down in red tape and disputes with the Federal regulators. He asked me if I could straighten it out and I accepted. Within a few months we had Federal approval and were ready for field tests. The course was called Production Safety Systems Training (PSST) and was developed to address a Federal requirement that all personnel on offshore production platforms in Federal waters be certified on platform safety systems every two years. This cost several thousand dollars per trainee and took five days in the classroom. PSST cut that to an average of 12 hours per trainee and allowed the training to take place on the platform instead of at an onshore training facility on the employee's days off on overtime pay.

The Vastar representatives were certainly interested and finally the subject of cost came up. As an ARCO subsidiary, they weren't expected to pay for the development costs, but they were expected to pay for the hardware and other ancillary costs of getting the systems in place. They asked what the cost of SimStation was and I responded that it was about $10, 000. The responses were immediate and not repeatable here; let's just say their enthusiasm was rather muted. Once they'd calmed down, I told them, "Use it to train ten crew members, then drop it over the side and it won't have cost you a dime." SimStation reduced their costs by 80%. The case was so compelling that seven major oil companies formed a group called the Technical Training Consortium and cut a deal with ARCO that paid for the development costs in six months. After that, PSST made money like a free-flowing oil well, was transcoded to Windows, and was in use until the Macondo fire that resulted in the re-organization of the MMS and the Code of Federal Regulations.

These students demonstrated the principle of "There is NO box."

Mager's ideas, imagination and creativity, science, and technology combined with an unwavering dedication that there is no acceptable alternative to competency in the workplace, whether it involves setting explosive charges to demolish a building in the middle of a city or bagging groceries, are the foundations of a training professional.

The sad fact is that we of the training profession are rarely trusted. Given our rather dismal record of providing the ROI promised by the science and technology discussed so far, it shouldn't come as a shock. Let's do a reality check using a different metric: the law. Training professionals take the stand many times every year. Training records are frozen and examined with fear and trembling by company

legal departments, and with zest by plaintiffs' lawyers. Application of the principles in this book can turn that around. Let's see if our fear is based on our profession or our performance.

The Daubert standard originated in the case *Daubert vs. Merrell Dow*, a toxic tort suit that eventually found its way to the Supreme Court and thence by an interpretation by the Texas Supreme Court into Texas state law that is used to define standards by which judges should consider the credibility of expert witnesses. However, as industrial training all too often winds up as exhibit "A" for the plaintiff, it also a good standard to use in evaluating training programs. Daubert is quite rigid. Nonetheless, application of unyielding standards is a requirement of a competency-based training program.

1. **The extent to which the theory has been or can be tested**

2. **the extent to which the technique relies upon the subjective interpretation of the expert;**

3. **whether the theory has been subjected to peer review and/or publication;**

4. **the technique's potential rate of error;**

5. **whether the underlying theory or technique has been generally accepted as valid by the relevant scientific community;**

6. **The non-judicial uses which have been made of the theory or technique.**

Let's look at the six metrics of Daubert and see how the technical training profession fares.

1. **The extent to which the theory has been or can be tested**

Theories of education and tests of those theories have been a major feature of the past 100 years. Pavlov, Piaget, Gagne, Mager, Kirkpatrick and many others have provided clear and succinct definitions, taxonomies, and theories that have been subjected to a wide variety of tests. March a squad of Navy SEALs into the courtroom and ask them how they became the finest fighting force in the world. They exemplify the reliability of technical training theory and the practices that are based on it.

2. **the extent to which the technique relies upon the subjective interpretation of the expert;**

Tests, assessments, and evaluations based on proven science will resist the most vigorous attack and convince the most skeptical jury. This country has a large number of very lonely test and measurement specialists who spend way too much time demolishing the poorly conceived, badly written, "teach the test" questions penned by members of our profession. One of the best worked with me on this book and will be featured in the chapter on test, measurement, and evaluation. We have the tools and expertise to demonstrate conclusively and with objectivity that our techniques ensure competency.

3. **whether the theory has been subjected to peer review and/or publication;**

PuhLEEZE. Thousands upon thousands of grad students all ringing bells and making dogs drool for a hundred years. Not all tested theories see the light of day, but it is not hard to stake the claim that, although journals vary in their quality and stated objectives, those research findings that do get published are of higher quality than those that do not.

4. **the technique's potential rate of error;**

While human error will always be with us, the error rate of 100% competent workers will always be as close to 0 as our human status and subjection to forces we cannot control allows. As a frequent flyer, I appreciate that.

5. **whether the underlying theory or technique has been generally accepted as valid by the relevant scientific community;**

The theories and techniques underlying the field of technical training are a direct result of observations and hypotheses tested by a wide variety of scientists and academicians for over a century. Disciplines developed in the 20th century such as Industrial and Organizational Psychology, Instructional Systems Technology, Adult Learning, and Educational Technology have arisen and become accepted based on these theories and techniques.

6. **And the non-judicial uses which have been made of the theory or technique**

It's safe to say that between the military, business, and industry there's been a lot more non-judicial than judicial uses of our profession. One of the purposes of this book is to reduce judicial use of it even more.

I am not a judge, and have never played one on TV, but it's my belief that any reasonable and prudent person would agree that technical training as a profession fits the rigorous Daubert standard very nicely when practiced in accordance with the theories and techniques described here.

Don't be afraid to learn to think like a lawyer. I've been criticized many times over the years for using legal standards for training as being more concerned about protecting the company from lawsuit than in doing the right thing for the employees.

"Members of the jury and this honorable court, I plead guilty as charged!"

Why? Very simple: humanity has developed no better system than that of our adversarial legal system to determine the truth. I examine each and every training objective, every quiz and certification test, and every practicum making every effort to place myself in a jury faced with the question, "If this person was charged with being competent in this task or procedure, **would I vote guilty beyond a reasonable doubt**?"
Due diligence for a training professional means leaving no stone unturned, no question not asked, no procedure or task unquestioned in the quest for competency.

Where do we draw the line? Somebody is going to say, "What are the odds of that happening?" at some point in your career. I suggest you think very, very hard before responding. At some point somebody asked, "What happens if we lose all engines on takeoff?" and developed a procedure to cover it instead of dismissing it as highly unlikely. Because of that, Capt. Chesley B. Sullenberger was calm and competent when it happened over the Hudson in 2009 and made a potential tragedy into a heroic triumph.

The training processes that prepared Captain Sullenberger to calmly deal with a horrific situation, that enable our soldiers to stand fast and deliver in the face of enemy fire, and that prepare top flight drilling rig crews to keep "turning to the right" when it's 20 below zero, dark, and the wind is howling require procedures and methodology to be repeatable, efficiently transferable, produce consistent results, and be

subject to continuous quality improvement. For these reasons, the training professional must not only be results-oriented but also process-oriented.

The basic definition of "process" is "a systematic series of actions directed to some end." Business Process Management (BPM) further expands that to "a management approach focused on aligning all aspects of an organization with the wants and needs of clients. It is a holistic management approach that promotes business effectiveness and efficiency while striving for innovation, flexibility, and integration with technology."

Your training operation is a business in a business. Your clients are the workforce, management, and the shareholders. Some of you may be painfully aware that your clients are free to buy from you or to take their business elsewhere. Strict adherence to BPM principles, as well as to those specific to technical training, will ensure your competitive advantage.

Look back at the opening two quotes from Dr. Mager, and then consider my own commentary on them in the light of what you've read since then:

"On these two commandments hang all the law and the profits."
We must meet the highest standards humanity has to offer for our companies to compete in a constantly more difficult world.

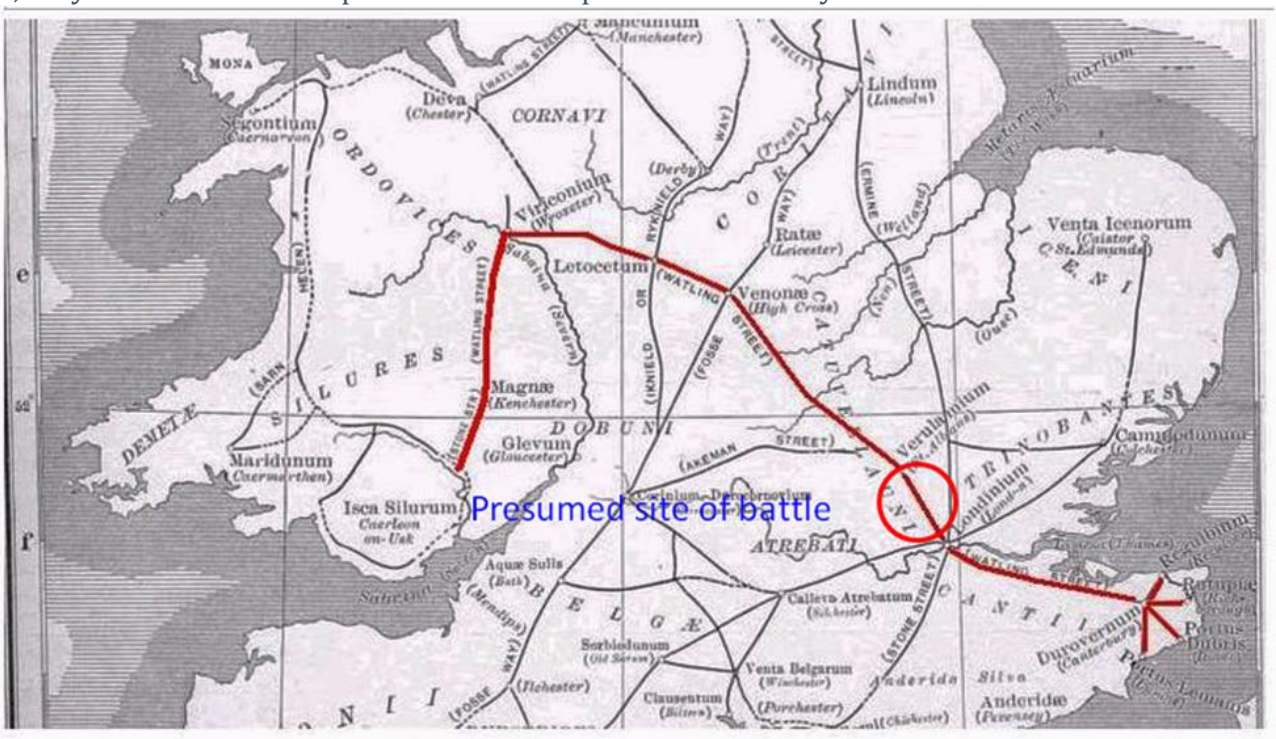
3. Procedures and Methodology

Before getting to the "how to do it" part, we need to consider the work environment within which our 100% competent workforce will be working. If every cockpit were unique, and every takeoff and landing unique, and all the signals and radio calls made up as required, even the 100% competent pilot would have a great deal of difficulty performing consistently. Efficiency requires a procedures and methodology driven company.

- **A process must be repeatable**
- **A process must be efficiently transferable**
- **A process must produce consistent results**
- **A process must be subject to continuous quality improvement.**

For the clear majority of tasks and procedures there is precisely one "best practice." I have observed workers at grocery stores bagging groceries. In most cases, all are working very hard. Some are bagging twice as fast as others and at the same time properly compartmentalizing meat, frozen, fragile, dairy, etc. There is no reason to assume they all couldn't be bagging at the same pace and at the same proficiency level. It's also a safe bet that if a grocery company ever recognizes this and applies to all their

operations, they'll trounce the competition. Let's step back into history for an example.

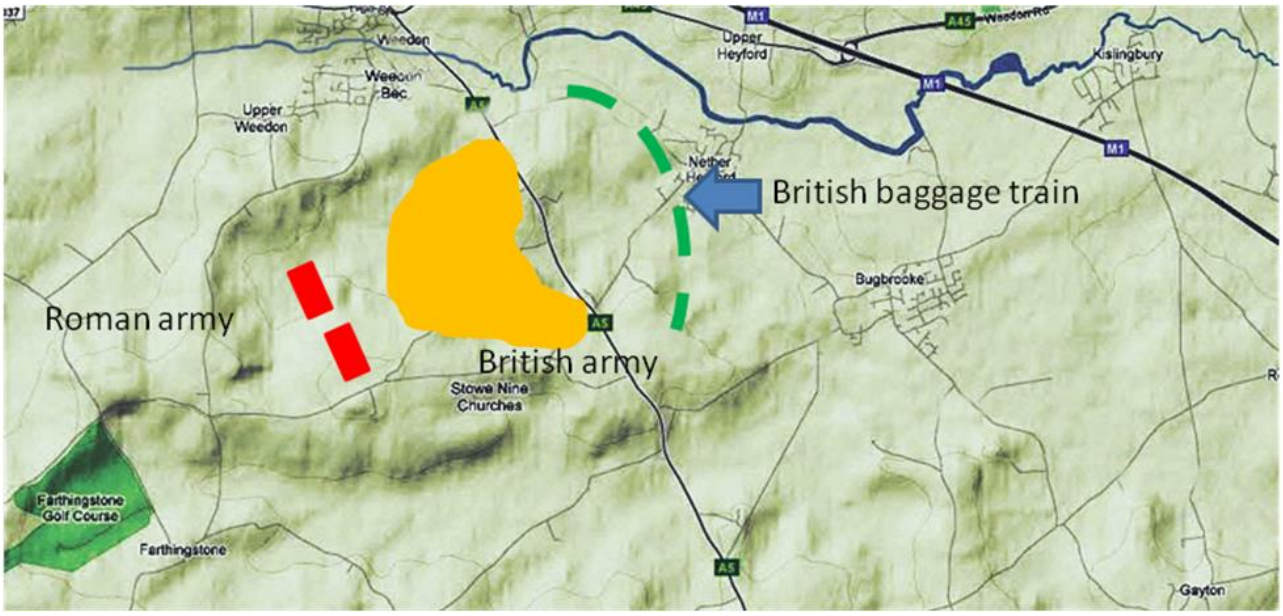


Ah, here we are. This is Roman-occupied Britain in either AD 60 or 61. Somewhere inside that red circle an alliance of indigenous British peoples led by Boudica and a Roman army led by Gaius Suetonius Paulinus were involved in a serious disagreement.

The site is not certain, but modern research based on the primary source descriptions of the terrain suggests a site near modern St. Albans, ancient Verulamium.

As a determined, experienced, and ruthless business leader, Boudica was one tough contender. She'd thoroughly surprised and whipped the Romans on several occasions and had them pretty rattled. Boudica was queen of the Iceni tribe. Her father had left the kingdom jointly to her and the Roman Empire on his death. However, the Romans had her publicly flogged and had brutalized her daughters. Boudica raised the banner of revolt, and the Iceni were joined by the Trinovantes and tens of thousands of other native British peoples. The Roman governor, Gaius Suetonius Paulinus, was busy campaigning elsewhere and the legion sent to deal with Boudica promptly determined that discretion was the better part of valor and withdrew. Boudica proceeded to destroy three Roman settlements (including London) and killed tens of thousands of Romans and Roman sympathizers.

Gaius Suetonius Paulinus feinted towards Boudica, then appeared to retreat north with Boudica and her hoard in hot pursuit. However, Suetonius was not simply retreating but looking for the right spot.



Suetonius chose his battleground carefully. He selected a narrow gorge with a forest behind him, opening out into a wide plain. The gorge protected the Roman flanks from attack, whilst the forest would impede approach from the rear. This would have prevented Boudica from bringing considerable forces to bear on the Roman position, and the open plain in front made ambushes impossible. It also created a funnel that limited Boudica's options of attack to where Suetonius wanted it to be. Suetonius placed his legionaries in close order, with lightly-armed auxiliaries on the flanks and cavalry on the wings.

Boudica placed her wagon train in a crescent at the large end of the field, from which point their families could watch what they may have expected to be an overwhelming victory.

Tacitus wrote of Suetonius addressing his legionaries: "Ignore the racket made by these savages. They are not soldiers - they're not even properly equipped. We've beaten them before and when they see our weapons and feel our spirit, they'll crack. Stick together. Throw the javelins, then push forward: knock them down with your shields and finish them off with your swords. Forget about booty. Just win and you'll have the lot."

Boudica led her army forward across the plain and into the narrowing field in a massive frontal attack. As they advanced, they were channeled into a tightly packed mass. At approximately forty yards, their advance was staggered by a volley of Roman pila, the Roman javelin.

With the Britons in disarray, Suetonius ordered his legionaries and auxiliaries to push forward in the standard Roman wedge formation. With their superior discipline, the Romans were able to continue fighting as fiercely as ever. With a clear advantage in armor, weapons, and discipline, this gave them a decisive edge in the close quarters fighting against the tightly packed Britons. The cavalry, lances extended, then entered the fray. As their losses mounted, the Britons tried to retreat, but their flight was blocked by the ring of wagons and they were massacred. The cavalry also attacked the Britons from the flanks as the Roman infantry advanced. Tacitus relates a rumor that 80,000 Britons fell for the loss of only 400 Romans.

So, what does this have to do with a modern drilling company? Let's review:

A process must be repeatable
Repeatability requires discipline, and discipline comes from training. When Boudica and her lieutenants shouted, "To arms!" her eager soldiers grabbed their swords, shield and spears and ran towards the enemy with enormous gusto and determination.

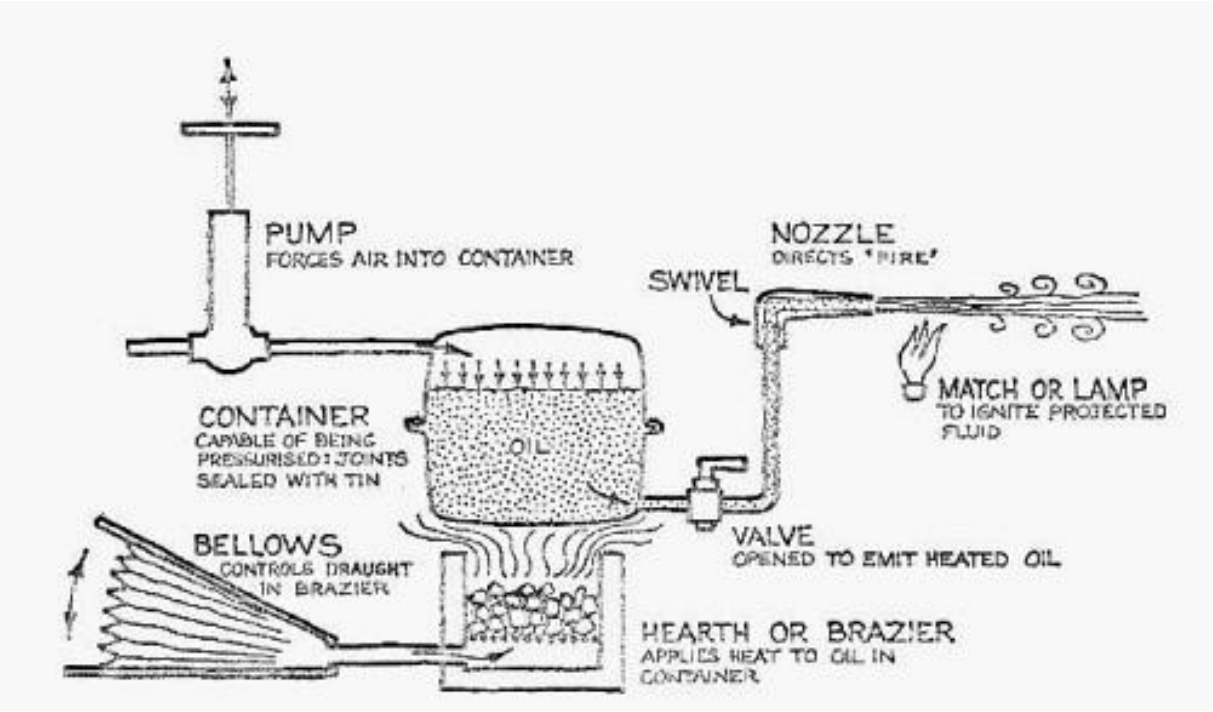
When Suetonius shouted "To arms!" his troops formed up in well drilled formations with each and every soldier clear as to his role.

Each and every one of Boudica's soldiers knew how to kill and how to defend themselves with great skill. Some did it one way, some did it another, but all were very good at it. But the Romans knew how to defend each other as well as themselves. They had learned that the best defense of themselves was the defense of all and that if you found yourself on your own it was probably because you'd goofed up somewhere.

A process must be efficiently transferable
All drilling companies employ the same basic technology, just as armies did in ancient times. But the Romans had taken "field learnings" and improved on this basic technology. For instance, they learned that if you put soft iron behind the head of your spear, it would bend as it entered an enemy shield and was very difficult to remove, especially with a Roman legionary attempting to relieve you of your head. That made the shield difficult to handle and ensured that he wouldn't throw your own spear back at you.

A process must produce consistent results
One doesn't have to be a history expert to realize that, given an empire stretching from Scotland to Asia and from the north coast of France to Africa, the Romans met an extremely varied enemy armed with a wide variety of technology. The one thing that did not change was Roman training, discipline, and tactics. These produced consistent results regardless of whether the opponents were an enraged barbarian rabble or a Seleucid army as well equipped and armed as they were. The training they received and the confidence and discipline that arose from it gave Rome an edge that it lost only when it ultimately began to face opponents who duplicated their methodology, as Patton famously said on his first defeat of one of Rommel's crack units, "Rommel, you magnificent bastard! I read your book!"

Must be subject to continuous quality improvement.
While simply instituting the procedures and methodology found in these pages will place you as far ahead of the competition as Suetonius was against Boudica, you'll eventually find yourself in the same position as the Romans did at the end of their reign when they faced opponents who had "read their book." For reasons beyond the scope of what we are discussing, Roman tactics and technology didn't change a whole lot over the centuries with one notable exception, the "Greek fire" that enabled a weakened Eastern Roman Empire to fend off more powerful adversaries for centuries.



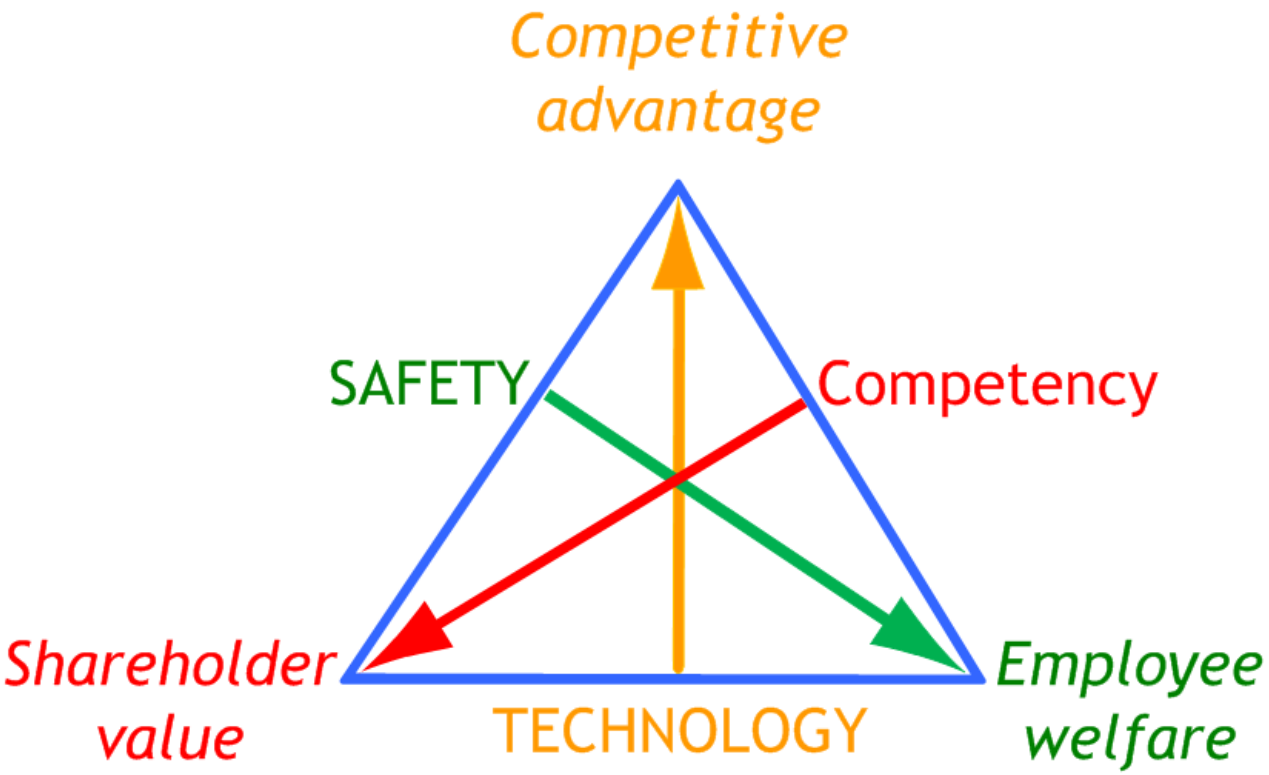
The advanced formula, now lost, was combined with an advanced technology projection system whose precise composition is also lost to history. In fact, the Romans had a lot of advanced technology, and if the Romans had spent more time on continuous quality improvement rather than resting on their laurels history would likely have been very different.

Whilst the underlying theories and practices of training are unlikely to change in a radical way in the near future, the technology we use to apply them is changing almost constantly. As this is written, computer-based technology is under almost constant improvement, bandwidth is steadily increasing, new software is making more adaptive instructional techniques practical, and the convergence of all these technologies into user friendly devices offers us the ability to use these procedures and methodologies more efficiently and effectively. If I can shave off 5% of the time required to reach a competency level, I am saving my business 416 hours over 5,000 hours of training time.

Boudica's "British Drilling Co."	**Same basic technology as the Ro >Extremely loyal >Highly motivated >High level of individual skill**
Suetonius' "Roman Drilling Co."	**Same basic technology as the Bri from "field learnings:" >Extremely loyal >Highly motivated >Highly trained >Disciplined >Team based**

Patient readers will undoubtedly be pleased to hear at this point that we are about to leave the Romans to history and get down to something they can use. First, look at the above table that compares the two competitors we've discussed. The first CEO I worked for had a sign in his office on the wall right behind

his head. It read "Business is NOT sport, it's WAR." While it may not seem "nice," the fact is that it is the duty of any business to not just compete, but eliminate the competition. No bad ethics there. Who needs a business that is not safe, clean, competent, profitable, and offering competitive rates? A modern industrial company can "slaughter the competition" the same way the Romans did with a true competency- based training program. We are not talking about a slight improvement here, but a paradigm shift.



The above tripod, one of the simplest stable structures in existence, pulls it all together. All three legs are essential: pull any one leg and it becomes unstable and vulnerable.

We start with an idea, a new technology or an improvement of an existing one and start a business. Because injured employees cost money, we implement improved safety in that technology and train our employees to use it in a safe manner. Because those two qualities are pretty much the norm in the business world, our better technology will likely provide adequate competitive advantage to succeed in the marketplace and draw investor interest and capital. We'll do fine for a while, but our competitors will likely copy or improve on our technology and we'll have to respond. Like the trench warfare of World War I, we'll gain a few miles, and then lose a few, but there will be no knock-out punch. This is what has been going on for centuries.

However, once competency enters the picture, the dynamics change. Technology provides a competitive advantage, safety improves employee welfare and reduces costs, and when you add competency you get more from your technological advantage and your employees as well. This greatly amplifies your technological edge and while also significantly improving employ welfare by increasing their productivity and reducing accidents dramatically. Evidence suggests that a competency program can reduce employ churn by 50% and productivity by at least 15%. Unless your competition is doing the same thing, you

will be able to undercut their prices while improving your own profitability at the same time. And, that, my friends, is how business is done.

Most of your competitors have at least one of the above qualities or they wouldn't be in business. Many of the best have at least two. Only a few have all three and in every case, they completely dominate their competition. In that case, you have two options:

1. Convince your management that unless you immediately adopt and rapidly implement a competency assurance program that meets the standards outlined in this book that your company will not thrive and may not survive.

2. Failing that, immediately apply to your competition for a job because they will be hiring as they take your business away.

As I've no desire to offend, I am not going to refer to them by name, but in my experience, there are quite a number of gigantic and apparently successful companies who meet only two of these qualities. Needless to say, they are vulnerable to the savvy competitor who implements all three. As more and more companies implement competency assurance and reap the benefits, it will become the new norm and the tripod model of technology, competency, and safety will be a fundamental requirement for corporate survival.

A true competency assurance program will provide much higher productivity and significantly reduce costs from accidents, incidents, and downtime that will result in a dramatic improvement in competitive advantage. It will enhance employee welfare by reducing undesirable events, and instilling in workers a sense of pride, professionalism and loyalty that will result in greater productivity and lower costly "churn."

The remainder of this book will be a "how to" manual on the implementation of a competency assurance system. Much of what follows will be new even to experienced training professionals because the various technologies and disciplines that are required to produce a functioning competency assurance system have their roots in fields that no one could predict would converge. When ENIAC first came online calculating firing tables for the US Army artillery late in World War II, I rather doubt the most wild-eyed and visionary professional trainer would have envisioned ENIAC only six decades later delivering simulations to delivery truck drivers. While the 21st century trainer need not be an expert in all these various technologies and disciplines, success depends on having a good understanding of all these tools and most of all remembering that:

THERE IS NO BOX!