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# DO QUALITY CONCEPTS AND PRINCIPLES APPLY TO COMBAT OPERATIONS?



by


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Lieutenant Colonel, USAF


A RESEARCH REPORT SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE CURRICULUM

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Advisor: Colonel Michael D. Kozak

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**ABSTRACT**

TITLE: Do Quality Concepts and Principles Apply to Combat Operations?

AUTHOR: Andrew S. Dichter, Lieutenant Colonel, USAF

Quality is not just a passing fad nor peacetime management technique, but a comprehensive, strategic, integrated system and leadership philosophy applicable in peace and war. There are several arguments against the applicability of quality to combat. The strongest arguments focus primarily on time-critical tasks at the tactical level. Three key concepts--using quality for preparation in peace, considering combat as a part of a much larger whole, and understanding the importance of time-space relationships are necessary to understand and appreciate the link between quality and combat. Through an examination of the key tenets of the quality approach and applying them to combat situations to achieve combat readiness and effectiveness, we can appreciate the tremendous compatibility of the quality philosophy with that which is required to be effective in combat.

## ABOUT THE AUTHOR

Upon graduation from the Air War College Class of 1994, Lieutenant Colonel Andrew S. Dichter will report to the Checkmate Division, Directorate of Plans and Operations, Headquarters, United States Air Force, Washington, D.C. A career fighter pilot and USAF F-16 Fighter Weapons School Graduate with over 2500 flying hours, which includes 38 combat sorties and 153 hours over Northern Iraq, Colonel Dichter most recently served as the 86th Fighter Wing's chief of weapons and tactics and as a squadron operations officer and commander at Ramstein Air Base, Germany. A 1975 graduate of the USAF Academy with an MBA from Troy State, Colonel Dichter is also a graduate of the Air Command and Staff and Armed Forces Staff Colleges. He is a fully qualified Joint Specialty Officer who served as an action officer in the Joint Operations Division, J-3, Joint Staff between 1987 and 1990.

# I. INTRODUCTION

Do quality concepts and principles apply to combat operations? Does "quality" end when the shooting begins? One would hope the senior leaders of the Department of Defense considered and debated this important question in great detail before they embraced the philosophy and implemented quality in the defense department. Secretary of Defense Frank Carlucci launched DOD on its quality journey in 1988, provided all three services and the combat commanders great latitude in its implementation, but gave no guidance on how it would affect combat operations.[1] It has been over five years now since inception; DOD has experienced one major war and a few small skirmishes, but upon thorough examination of the record, surprisingly, there is very little written on the subject of combat and quality. When the subject is addressed, there are considerable differences on interpretations of what happens to quality when combat begins. One school of thought holds that

> Total quality methods are fine for the widget factory but are incompatible with the swift judgment and immediate obedience required on the battlefield. . . . TQL is not appropriate on the battlefield[2]

Holding a contrary view, that the principles of quality continue to apply throughout the spectrum of conflict, is General John Michael Loh's view:

> The Air Force that waged the most impressive air campaign in history didn't emerge by happenstance. . . . it is a product of the leadership style of our commanders.[3]

General Loh further explained the need for quality as we draw upon the lessons from the Gulf War:

> We set a new standard for victory in the Gulf War. The next time we fight, we know that the American people expect us to win quickly, decisively, with overwhelming advantage, and few casualties. That demands maximum efficiency and effectiveness from all our people. That spurs us on to higher levels of quality.[4]

This article will show that quality is not just a passing fad, nor a peacetime management technique, but a comprehensive, strategic, integrated system, and a leadership philosophy applicable in peace and war. Conclusive evidence is not yet available to demonstrate unequivocally the applicability of quality concepts at all times or at all levels of warfare. There are important exceptions, particularly at the tactical level, when time-space relationships and critical decision-making force a temporary halt to quality mechanisms. But, overall, there is a tremendous compatibility of the quality philosophy with that which is required to be effective in combat.

The article begins by exploring the most prominent arguments against the value of quality in combat. Next, three important concepts necessary to understand and appreciate the link between quality and combat will be examined. Finally, this article will briefly survey several key tenets of the quality approach in achieving combat effectiveness.

This article assumes the reader has a solid working knowledge of the broad spectrum of total quality management (TQM), quality concepts, processes, and implementation throughout DOD. It will only briefly elaborate on the specifics of quality theory, and only when necessary to clarify or validate key concepts or points.

## II. THE CASE AGAINST: QUALITY STOPS WHEN COMBAT BEGINS

The very lack of material written on this subject supports the argument that quality is not complimentary with combat. In a comprehensive survey of the Air University library materials and in working with the Air Force Quality Center, there are hundreds of books and articles written on *quality*. The quality revolution is a dynamic force in our country and gaining emphasis within the defense department, but no one has yet directly tackled the quality in combat controversy in any depth.

The Gulf War occurred only two years after DOD launched its quality initiative. In the aftermath of that war, there were numerous articles written which analyzed the successful outcome for the U.S. Various theories explained how Goldwater-Nichols, stealth, cruise missiles, technology, the information revolution, space, and of course, airpower, either single-handedly or in combination with other factors, "won the war." But, alas, no one rose to the forefront proclaiming how "quality won the war." The proponents of quality might argue that the war came too quickly after the launching of TQM to see any measurable effects. Opponents can argue that the lack of quality mechanisms during the war support the notion that combat and quality just don't mix!

Indeed, in examining some areas of the Desert Storm experiences, we see some disturbing conflicts between what are held to be important quality principles and what took place. Starting with the all important leadership element, General Schwartzkopf did not exemplify the quality leadership model. In general, the "quality" leader is seen as a mentor and coach, not a dictator.

He listens and seeks inputs from others, is broad-minded, removes fear from the workplace, and overall, creates a working environment that inspires trust, teamwork, continuous improvement and pride.[5] Anecdotal evidence from recent histories and accounts of the war paint a harsh picture of General Schwartzkopf that diverges considerably from the quality leadership model. For example, the author Rick Atkinson observed:

> [I]n his Riyadh war room (Schwartzkopf's) public mien disappeared, revealing a man of volcanic outbursts. ... His headquarters, swept with his verbal grapeshot month after month, became a dispirited bunker, where initiative withered and even senior generals hesitated to bring him unpleasant tidings. Instead, when the tirades began, they sat with eyes glassy and averted in what came to be called the "stunned mullet look," until his fury spent itself.[6]

Interestingly, General Schwartzkopf displayed another persona when dealing with the military leaders of the coalition.[7] Recognizing the delicacy of egos and working with fragile command relationships, Schwartzkopf skillfully engaged in dialogue, participatory processes, team-work, and team-processes. He built the trust vital to holding the coalition together and benefited from the synergistic effect of multiple forces employed in combat. The latter Schwartzkopf displayed the attributes of a quality oriented leader. Schwartzkopf's adaptive leadership style reflected the fact that sometimes, even in combat, a quality approach is the only way to go.

Turning again to the Gulf War for another experience that digresses from the ideal quality model is the "Black Hole" planning group. When problems developed with the air campaign

and tasking system, rather than using a process approach to identify and correct problems, the "black hole" planning group emerged. This group assumed the lead responsibility for shaping the air campaign and producing the daily air tasking orders. The "black hole" was perceived as a stove-pipe organization which by-passed traditional staff responsibilities, closely controlled information and access, and caused considerable resentment among members of the USCENTCOM planning staff.[8] The "Black Hole" did not embody the qualities of trust, teamwork, and a shared stake for everyone in the outcome--key principles of the quality philosophy and environment.

Again, it is interesting to point out that many believe the "Black Hole" came about because of broken processes.[9] Adjustments to the air campaign were not being made fast enough through existing channels, so a "band-aid" fix was needed. Quality processes take time, and in war, time is critical. In addition, the Gulf War was short in duration once hostilities began, which allowed little time for process adjustment. The quality approach again picked up in the aftermath of the war. Problems experienced were studied, processes were corrected, and "lessons learned" were documented to prevent the same mistakes from occurring in future conflicts.

From a broader perspective, the key tenets of total quality management do not lend themselves easily to application by the defense department as a whole and especially in combat. When DOD first launched the TQM initiative, DOD leaders cited four pillars that were key to understanding and adopting the new philosophy:[10]

(1) Customer orientation (customer driven and responsive)
(2) Quality of the product is defined by the customer
(3) Concentration on processes and process improvement
(4) People are the key (shared responsibility, leadership, participation, motivation, empowerment)

The military, particularly the combat arms, has had difficulty defining and focusing its customer orientation, the customer role, and its product. This becomes especially difficult when war and combat operations commence. There has been a tendency for DOD to identify its customer base from within its own institution, i.e., to view the CINCs, the major and combatant commands, and the user in the field, the soldier, sailor, airman and marine as its customers.[11] Others argue that the ultimate customer is the taxpayer. Similarly, DOD's product, especially during war and combat, differs markedly from that of the corporate world. Who is the customer, and what is the product when you are dealing with 2,000 pound laser-guided bombs being delivered on a bunker?

In bridging the philosophy of the quality movement, which was first implemented in the manufacturing sector of Japan in the 1960's, to the military and combat arms, it might prove useful to turn to Carl Von Clausewitz, the renowned war strategist whose writings are frequently as relevant today as when they were written in the 1800's. There are those who subscribe to the belief that "we have always done TQM;" the quality movement is merely a trend that documents and describes, complete with its unique vernacular, how effective organizations have always operated. If so, then perhaps Clausewitz's insights could shed some insight and support to the quality in combat argument.

Unfortunately, following a thorough review of Clausewitz's writings with a quality perspective, the converse is frequently more supportable.

Given the importance of such quality tenets as teamwork, participatory decision-making/problem solving, empowerment, process analysis, continuous improvement, and metrics/predictability, the quality philosophy is at odds with most of Clausewitz's theories. Clausewitz's ideal leader is the military genius, whose qualities of intellect and strength of mind are synthesized in a single, brilliant, decision-making persona. Under this Napoleonic model, decision-making is fixed at the top with the commander-in-chief holding unitary, virtually dictatorial power. In the pure sense, this decision-making model contrasts sharply with the concepts of quality and the image of today's quality leader. An effective military leader today listens, gathers information, takes counsel from others, and promotes participation from his subordinates before ultimately making critical decisions. Had such an approach been used in the past, some famous military geniuses (e.g., Napoleon proceeding into Russia and Robert E. Lee going offensive at Gettysburg) might have avoided disaster.

Examining another principle, Clausewitz viewed war and combat as an art, not a science.

> War is a realm of chance ... the factors on which action in war is based are wrapped in a realm of uncertainty.[12]

Clausewitz's descriptions of the fog and friction of war, the impact of fear in battle, the nature of battle, the importance of moral factors, his discussion of the culminating point, all

combine to present significant challenges in translating these to quality terms and principles. In seeking support from other famous military strategists, Henri Jomini's philosophy, teachings, and principles of war are far more compatible with TQM. This is particularly true regarding the emphasis on the scientific approach to warfare and on the importance afforded metrics. Jomini's attempt to measure and quantify the science of warfare is far more consistent with the teachings and principles of metrics applied by Deming and other TQM disciples. Unfortunately, Jomini fell out of favor with military scholars when his theories could not withstand serious analysis in the aftermath of the American Civil War and other conflicts which followed.

There are, however, a few bright spots for quality in Clausewitz's teachings. Clausewitz's cause and effect analysis parallels process analysis. Clausewitz's discussion of the importance of "rapid and accurate decisions" and time and space relationships are vitally important in understanding when TQM stops and time sensitive crisis decision-making takes over. He provides useful insights for customer identification. Finally, Clausewitz's solution to ease the friction of war is to emphasize education and training. TQM places great importance on education and training and these serve a very important role in bridging quality with combat readiness today.

## III. THE CASE FOR: VITAL CONCEPTS THAT LINK QUALITY WITH COMBAT

Before undertaking the arguments supporting the applicability of quality in combat, there are three important concepts that are useful in understanding the link between quality and combat. These are

(1) Preparation in peace affects effectiveness in war
(2) Combat is only a part of a much larger whole
(3) Time-space relationships have an impact on quality processes

For those military members in the combat arms, it is axiomatic that peacetime training and preparation are decisive in producing effectiveness in war.[13] Air Force doctrine emphasizes that "training should prepare aerospace forces for combat" and that "training should be as realistic as possible."[14] The US Air Force's many "Flag" programs and the US Army's vigorous support of the National Training Center reflect this doctrinal truth. General John M. Loh, commander of Air Combat Command, the USAF's largest MAJCOM and provider of combat forces for the warfighting CINCs, echoes this sentiment when he talks about creating

> an organization that will provide the world's best combat air forces. ACC is committed to quality in everything it does ... Quality is a culture that emphasizes training ... for continuous improvement ... An Air Force committed to quality in peacetime will continue to use quality in war.[15]

The Navy is similarly committed to quality and has launched Total Quality Leadership (TQL) as its "long term program to improve the way" it does business.[16] In implementing its TQL program, the Navy recently took advantage of a unique opportunity, and established a complete Total Quality culture from the ground

floor when it prepared and commissioned its newest carrier, the George Washington (CVN-73).[17] For the past three years, the George Washington has served as a model TQL environment and has performed remarkably well in her initial operations shakedown. She won two consecutive Golden Anchors, has maintained a fatality-free safety record for three years, and is recognized for record-setting air operations.[18] The Navy is committed to TQL and believes TQL improves combat readiness and the quality of life for Navy people and families.[19] The Navy's firm commitment to quality by entrenching it into its premier combat unit will virtually ensure that quality in combat will be tested in our nation's next conflict.

All four services are committed to quality and embrace its concepts in peacetime training. How we train shapes our readiness. It is unlikely that the quality culture being developed will cease when hostilities begin. It will be a quality philosophy and mindset that our nation's warriors carry with them when they are called into battle in the future.

A second important concept in appreciating how quality is vital to combat effectiveness is understanding that actual combat operations are only a part of a much larger whole when we are dealing with war. Furthermore, the combat arms form only a segment of the entire defense community during large scale conflict. A nation's infrastructure, its resources, its logistics train, combat support and combat service support all play vital roles in waging and winning wars. During the recent Gulf War against Iraq, a vast support structure of supply, maintenance,

communications, and medical support was called upon to move 540,000 tons of cargo and support over 500,000 people in a combat theater over 7,000 miles away.[20]

It is noteworthy that, within DOD, perhaps the greatest inroads in the quality movement have occurred in those functions which support the front line combat units. Two recent studies of TQM implementation within DOD reveal that all of the services have had their greatest successes in the combat support, combat service support, and logistics arenas.[21] The Air Force Systems Command (now Air Force Material Command), and especially its Air Logistics Centers, were at the forefront of the quality movement in the Air Force. The Navy's greatest successes with TQL have occurred in its industrial facilities, such as Navy Aviation Depot and Norfolk Naval Shipyard.[22] Similarly, the Army's best examples of quality at work are in such support elements as Army Materiel Command and Communications-Electronics Command.

It is important to point out that for these units, their combat missions differ little from peacetime except for the magnitude, scale, and speed of their operations. Efficiencies gained through the practice of quality in these units are directly applicable in both peace and war. Just as preparation affects combat performance, from the perspective of support units, quality doesn't stop when the shooting begins.

The third, and perhaps most important concept, vital to understand the role of quality in combat, is *time*. Quality emphasizes: a long term outlook; strategic quality planning; process analysis, study and improvement; and participatory

management mechanisms. All of these take time. However, in the dangerous new world era, with its high technology, precision, and revolutionary information processing, the "time factor has assumed increasingly critical significance."[23] A conflict appears to arise between the rapid-paced decision processes required in combat with the need for time to apply quality principles. There is considerable consensus, that due to the time factor,

> TQL is not appropriate on the battlefield. The point of TQL is ... to improve the way we prepare for war--from strategy making to acquisition, to logistical support, to training ... not to manage the conduct of war.[24]

> During fast-paced operations in a crisis situation when immediate action is required, ... the traditional authoritative form of decisionmaking is appropriate. the quality method of decisionmaking--thorough analysis, participation by all concerned, and consensus building--is not appropriate.[25]

Let us quickly examine a wartime example to facilitate further discussion of the value of quality during the time-constrained tactical level of warfare.

> *July 18, 1991, Day Two of the Gulf War. A flight of four F-16s, led by their squadron operations officer, takes off from Thumrait, Oman, on an air-to-surface, Offensive Counter Air mission against an Iraqi airfield. Enroute to the tanker for air refueling, the flight lead observes that his right wing tank fails to feed. After refueling, and only minutes from crossing into Iraq, he quickly calculates that if the 2400 lbs of fuel remains trapped, he will have insufficient fuel to return to Thumrait as planned. He weighs the alternatives, does not confer with his other flight members, and decides to press with the mission. His rationale: (1) he has sufficient fuel to attack the target and egress to a friendly base; (2) he has limited confidence in his deputy lead; (3) to abort this mission, in light of yesterday's frightful combat sortie, might be perceived unfavorably by others and undermine his leadership; (4) a radio call now would violate minimum communications and add unnecessarily to his flight member's concerns; and (5) he can safely and effectively carry out the mission.*

*Enroute to the target, the tank still does not feed. He leads the flight successfully to the target, but his rear element falls back to four miles in trail. Enemy AAA is intense. His element rolls in on the target, releases their bombs, and maneuvers to reestablish proper formation position. As he checks his wingman, he observes an enemy aircraft at his wingman's six o'clock position, and calls out:*

*"Falcon 22, Break Right! Bandit, Six O'Clock, One Mile."*

*His wingman immediately responds with an 8-G hard turn. The Bandit breaks off his attack and performs a "Split S" maneuver exiting below and away. The flight lead calls out a reference heading, quickly reforms his entire flight of four, egresses south, and exits Iraq.*

*Once in Saudi airspace, the flight leader now informs his flight (on a discrete VHF radio frequency) of his fuel problem. He passes the lead to number three and directs him to work on obtaining post attack refueling clearance. He puts number four in charge of monitoring most appropriate divert bases and fuel required. He asks number two to back him up with checklist procedures and fuel problem analysis. The fuel problem persists, but after 30 minutes, a tanker is located, the flight lead obtains the needed gas, and the flight returns uneventfully to Thumrait.*

In the above situation, the flight leader employs both traditional decision-making and quality decision-making processes. When he first encounters the fuel problem, he quickly assesses the problem. Although the problem is ideally suited for a participatory, process-oriented, team approach, he defers using this method due to competing priorities of the tactical situation at hand. The next situation that arises, the bandit appearing in a threatening position, mandates a traditional command and response approach. There is no time for discussion or explanation. He directs a break turn, and his wingman, because of proper training, immediately and appropriately responds. After exiting Iraqi airspace, the flight leader now forms the equivalent of a process action team to solve the fuel problem. Responsibilities are divided, the problem discussed, and a team solution is achieved.

Some critics of the quality approach fear that military members who train in a quality environment may not be able to revert to traditional command and obey situations in combat. To allay those fears, the example of the wingman's immediate execution of a break turn provides a good example. It highlights the importance of proper training and education (important quality tenets). Sound training can instill in combatants the understanding that there are times when quality mechanisms are appropriate and times when they are not. In most circumstances, it is the criticality of the time-space relationship which mandates the appropriate response. This is not a new or particularly difficult concept for fighter pilots; they have been practicing it successfully for years. And with tongue in cheek, if they can figure this out, certainly other more intelligent practitioners in the combat arms can too.

Too often, when we think of combat, as in the case above, we think of only the tactical level of warfare--the level where time is most critical. To apply quality concepts to combat, we must broaden our perspective and take a comprehensive view that includes the operational and strategic levels of warfare. We should also take into account, that during war, the actual amount of time in direct combat engagements is very small in relation to the time performing other tasks.

In his article, "Employing Air Power in the Twenty-first Century," Colonel John Warden eloquently elaborates on this concept:

> Thinking about war and actually conducting war require that we have a good understanding of what war is ... Too frequently, our vision of war concentrates almost exclusively on its most obvious manifestation--the clash of the contestants' fielded forces. Indeed, Clausewitz identified the battle as the essence of war. Perhaps, however, Clausewitz identified battle as the essence of war because from his vantage point in time and place, battle dominated the process of war ...
>
> Clausewitz may have been right for his time and place and accompanying technology, but it is not clear today that the actual clash of men on the front is the only way or the best way to wage war. To the contrary, we suggest that it may be the most costly and least productive approach in perhaps the majority of cases.[26]

Warden believes that the Gulf War was won at the strategic level. It was the decisive dominance at the "idea" level, where campaign planning occurred, that produced the tremendous successes at the tactical level.

The Gulf War campaign planning did not occur overnight, but rather over a period of months. It was an iterative process, studied, modeled, brainstormed, and refined over time--in essence, it was a quality process that provided the formula for success. Time is available at the strategic and operational levels, and when time is available, quality mechanisms can work.
If we limit the discussion of combat to only the engagement phase at the tactical level, it is difficult to appreciate the compatibility of quality with combat. But a broader perspective of combat to include strategic and operational levels, where time is available, will allow quality mechanisms to produce truly outstanding results.

## IV. QUALITY TENETS AT WORK IN COMBAT AND WAR

The aforementioned concepts were vital in laying the groundwork for the strongest case supporting the applicability of quality to combat, the application of quality principles to a wartime environment. In this final section, this article will explain how key quality tenets apply to achieving combat effectiveness.

*The Customer.* "The primacy of the customer is one of the most fundamental concepts in TQM."[27] Therefore, it is vitally important to identify the customer in order to apply quality to combat. A survey of DOD quality literature provides little assistance, defining customers as "anyone for whom an organization or individual provides goods or services."[28] Again turning to the master war theorist, Clausewitz, proves useful. Although he never used the term "customer," at the foundation of his explanation of what war is all about, Clausewitz identifies the key customers of warfare at the macro level. The customers in war are the remarkable, or paradoxical, trinity comprised of: the people, the army (the military), and the government.[29] "The first and most critical step (regarding factors in quality practices) is to identify customer requirements: his wants, needs, and expectations."[30] This most basic of quality principles is clearly manifested when combat occurs, and the military is held accountable to satisfy the demands of the remarkable trinity.[31] One need only compare and contrast the "customer satisfaction" of the people, the government, and the military in the Vietnam and Gulf wars to gain an appreciation of the applicability of this important quality concept.

*The Product*: A product is broadly defined as "a thing produced by labor and efforts."[32] TQM is concerned with customers and processes that focus on quality outputs, "the products, materials, services, or information provided to customers (internal or external).[33] The defense department is a huge institution with many products and processes, but, with no single core product clearly defined. Again, at the macro level, I would argue that there are two core products of the military: (1) combat readiness in peace, and (2) combat effectiveness in war. If one accepts this precept, and given that DOD as an institution is firmly committed to the philosophy and principles of quality, then there is an inextricable link between combat and quality.

*Strategic Quality Planning*. A key principle of TQM is its philosophy of long term planning with a constancy of purpose, and the process of determining the long-term vision and goals of an organization. An organization with the proper strategic vision will conduct itself and pursue its mission

> in such a way as to slice through the operational cloud cover of day-to-day business, gaining continuous access to the mountaintop from which to view and evaluate the terrain, the entire situation, even the future, all in order to direct day-to-day operations through the prism of clear and holistic strategic thinking.[34]

A clear understanding of an organization's mission and purpose is vitally important to all organizations, and is profoundly important to the combatant arms. While all of the services have defined their missions, the US Air Force, embracing quality principles, recently redefined its mission and articulated its vision:

> Our Mission: To defend the United States through control and exploitation of air and space.
>
> Our Vision: Air Force people building the world's most respected air and space force ... global power and reach for America.[35]

These brief and simple statements reflect the USAF's profound understanding of what business it is in and what kind of organization it wants to be.

The primacy of the objective and a clear understanding of the mission is vitally important when dealing with the use of military force, especially in combat. World War II, Operation EL DORADO CANYON (Libya, 1986), and DESERT STORM provide outstanding examples where this quality principle was fulfilled with highly effective results. In contrast, where objectives were ill defined, such as Korea, Vietnam, and Lebanon (1980), disaster followed.

*Process Orientation.* A core TQM principle is its major focus on achieving continuous improvement through process identification and analysis. Secretary of the Air Force, Dr. Sheila E. Widnall, echoes her commitment to quality and understanding of this concept when she recently commented on quality in the Air Force:

> Quality is not a static description, but a dynamic process for an attitude of continuous improvement within the constraints of available resources.[36]

This systematic approach to achieving continuous improvement in quality is frequently explained through the Shewhart Cycle, also referred to as the Ishikawa Circle or Deming Wheel. The framework relies on the continuous, repetitious "Plan-Do-Study (or Check)-Act" cycle.[37]. Most TQM handbooks provide the Shewhart model as an easy to understand framework for the strategic planning and implementation process.[38]

During the "plan" phase, organizational and systems analysis is completed, strategic objectives (long term) and tactical objectives (short term) are determined, and implementation is planned. The "do" phase requires actual implementation. The "check/study" phase relies on performance measurement, and during the "act" phase, an implementation review is conducted and the entire process is evaluated for improvement. Plans are revised as required and the cycle continues.

Now, lets apply this model to DOD, and its most recent application of combat, the Gulf War, and specifically, the air campaign. For starters, the Department of Defense has hundreds, if not thousands of planners who perform the strategic planning function, the "plan" phase. They prepare and develop war and contingency plans. In peacetime, the "do" phase is occasionally simulated through exercises or war game analysis, but never actually implemented. Only in wartime and in combat does the Shewhart cycle come to fruition. When Desert Shield began, service planners took USCENTCOM CONPLAN 1002, The Defense of Saudi Arabia, off the shelf, began modifying it for the specific situation, and transitioned into the "do" phase. Although forces began deploying almost immediately, the "do" phase began in earnest on January 17th, 1991, when the first bombs and missiles were launched against Iraq. Due to the nature of warfare, the need for customer feedback was immediate, and the "check" phase became critical. Bomb Damage Assessment was never fast enough or accurate enough, which was not really surprising, given the difficulty of refining this process in peace.

Finally, in the "act" phase, the process was adjusted; air-to-ground sorties were shifted to SCUD missions, or away from Baghdad, or toward the Republican Guard--all in the interest of process improvement. In the complex decision-making environment of the Gulf War air campaign, we clearly see a case where the quality principle of process analysis and improvement (the Shewhart Cycle) became a reality in combat, rather than a model in peace.

*People: the Most Precious Resource.* The Air Force defines quality as "a leadership commitment and operating style that inspires trust, teamwork, and continuous improvement everywhere."[39] That in itself highlights the vital importance of the final pillar that connects combat and quality: the people dimension. There are many sub elements to this key area, and this article will briefly address the most important points.

The disciples of quality, Deming, Juran, and many others all recognize that quality starts with leadership. Teaching, encouraging, mentoring, setting the vision and goals for the organization, and establishing the proper working environment are the functions of leadership; they are equally applicable in peace and in combat. Few can explain it better than General John Michael Loh:

> Leadership is the art of inspiring others to achieve extraordinary goals and levels of performance. Leadership creates trust which leads to teamwork and the ability to work toward continuous improvement together in a mission-oriented way, rather than a functionally-oriented way.[40]

The next critical element of the people dimension involves teamwork. Quality consultants have expended tremendous efforts explaining and teaching team concepts to managers.[41] But, the importance of trust and teamwork in achieving warfighting effectiveness has long been understood and practiced by military combatants. Fighter aircraft tactics emphasize the vital importance of teamwork, virtually mandating formation flights of two to four aircraft with carefully defined mutual support responsibilities.[42] Teamwork is essential in all combat units and becomes absolutely essential in war.

Another major tenet of quality is that "motivation is a function of growth from getting intrinsic rewards out of interesting and challenging work."[43] For those who serve in the profession of arms, combat is certainly the zenith of interesting and challenging work. During war and combat, the stakes are raised to unprecedented heights. Lives are on the line, and the importance and contribution of the tasks performed by combatants men and women in uniform is more easily understood. Combat is a tremendous motivator.

TQM motivational theory further recognizes the final element of the people dimension--the importance of empowerment. Empowerment can be defined as "the act of placing accountability, authority, and responsibility for processes and products at the lowest possible level," to enhance performance. Empowerment is one attribute of quality that is important at all times and all levels of warfare.

At the strategic and operational level, consider the views of General Chuck Horner, Joint Forces Air Component Commander during DESERT STORM, who when asked about micro-management versus empowerment during DESERT STORM stated:

> You cannot run a war from Washington. During the Gulf War, we were fortunate to have truly outstanding leadership from above, the team of Bush, Cheney, and Powell, as well as the CINC in the theater--they all allowed us to run the air war from where it ought to be run--in the JFACC. We learned the lessons well from the problems in Vietnam, and as a result, enjoyed spectacular results.[44]

Empowerment clearly applies at the tactical level as well. For the fighter pilot "coming down the chute" on a bombing run or engaged in an aerial dogfight, for the M1A1 tank crew engaged in battle, for the marine storming the beach, and for the destroyer crew defending against Silkworm missiles, they find themselves fully empowered when the shooting starts. In direct contact with the enemy, they find themselves fully empowered to make life-sustaining and life-threatening decisions. Even in this age of rapid communications, we decentralize the execution and empower the combatant. Clearly, we see can see this quality principle sustained by training and fully actualized in combat situations.

As a final point to wrap up this section which has covered the key tenets of quality in combat, let us return to our earlier discussion of *vision*. Taking the liberty to extrapolate the Air Force vision statement to all of DOD, we can argue that the US armed forces' commitment to quality springs from its vision as the world's best and most respected military forces. Only in combat is this vision tested, and only after combat, as experienced through the results of DESERT STORM, does this vision approach a reality accepted by virtually all of the world.

## V. SUMMARY AND CONCLUSION

In summary, this paper has shown that while there are some difficulties that occur when quality is applied to combat situations, overall, quality is a comprehensive leadership and management philosophy that does not stop when combat begins. TQM is an effective way to enhance combat readiness and training in peace. It pays huge dividends in efficiently providing the resources in the support and industrial base of DOD (those areas which most closely parallel industry). While some decision-making processes revert to classic authoritarian task models during fast-paced combat operations, other quality tenets come into far greater play when the shooting starts. Through the use of logic and by drawing upon the lessons of military history, military theory, and applying selected examples from the recent Gulf War experience, this article has illustrated the compatibility of quality theory and practices during combat.

*Does quality apply in combat?* Perhaps a more appropriate question might be, *What makes an armed force effective in combat?* Certainly, the answer lies in the characteristics of the fighting force. The leaders of the Defense Department are commited to quality and believe that quality concepts and principles will produce a military with the following characteristics:

- Services that understand their mission and possess a proper vision of their future
- High calibre, quality-oriented leaders who will seek and obtain clear objectives before commencing in combat
- Highly motivated members with iron-clad teamwork skills
- A system that employs a process approach in solving problems

- A system that acquires equipment that works and is responsive to both customers and suppliers
- A working environment where sound ideas can flourish both in peace and in war
- A military force that has earned the support and respect of the nation and the world
- Soldiers, sailors, airmen and marines--properly trained in peace and appropriately empowered when called into combat

These are the traits that are needed for combat effectiveness and quality can produce the desired results. As the military continues to draw down, and faces uncertain threats, it is essential that DOD use its scarce resources efficiently and effectively. The quality approach holds promise in sustaining and improving our combat effectiveness in the challenging years ahead.

## ENDNOTES

(1)"DOD Implements Total Quality Management," OASD/PA News Release No. 418.88, 18 August 1988.

(2)J. Daniel Howard, "The Only Way Ahead," Proceedings, June 1992, p 86.

(3)General John Michael Loh, Speach to the Hampton Roads Quality Council, Hampton Va, 1 Oct 92. In addition, interviews with members of the Air Force Quality Center disclosed that they had heard General Loh say that quality principles do not stop when the shooting begins, but to date, he has not elaborated on that thesis to any great extent in any written articles.

(4)General John M. Loh, extracts from an address to Vice President Gore in the summer of 1993 as part of the National Performance Review in "Reinventing Government." Provided to the author by Air Combat Command's Quality Center, March 1994.

(5)Extracted from a variety of sources including The Quality Approach: Your Guide to Quality in Today's Air Force, USAF: The Air Force Quality Center, Maxwell AFB, AL, Chapter II, and Air War College lesson plans, most notably, Lesson 2104, "Quality Air Force and Senior Leadership," Maxwell AFB, Air War College, 31 August 1993.

(6)Rick Atkinson, Crusade: The Untold Story of the Persian Gulf War, New York: Houghton Mifflin Company, 1993, pp 3-4.

(7)IBID. Thematic in several sections of Atkinson's book and also in Schwartzkopf's biography, It Doesn't Take a Hero.

(8)This evidence is primarily anecdotal and is based on interviews with past members of the US Central Command staff, members of the Black Hole, and a variety of other sources. However, the very fact that an ad hoc group was formed instead of relying on or using in place mechanisms such as the Tactical Air Control System, numbered air force frag shops, or J-3 Planning Staff is evidence in and of itself.

(9)Based on numerous discussions, readings, lectures, and panels on the Gulf War at the Air War College, 1993-1994.

(10)Lauri A. Broedling (and others), "Total Quality Management--The View from the Top," Defense '91, Jan/Feb 1991, p 9.

(11)Richard A. Dilorenzo, Quality Management for the Air Force and DOD, Wright Patterson Air Force Base, Ohio: AFIT, October 1991, p 4-4.

(12)Carl Von Clausewitz, On War, Edited and translated by Michael Howard and Peter Paret, Princeton: Princeton Press, 1984, p 101.

(13)The author, a graduate of the USAF Fighter Weapons Instructor Course, qualifies as an expert on fighter training as a command pilot with over 2500 flying hours, over 1400 hours of instructor time in fighter aircraft, and 138 hours of combat time.

(14)Basic Aerospace Doctrine of the United States Air Force (AF Manual 1-1, Volume I), Department of the Air Force, March 1992, p 18.

(15)Lt Col Michael B. Perini, "Air combat command: Rapid, Decisive Airpower," Airman Magazine, December 1992, pp 11, 14.

(16)Admiral Frank B. Kelso II, "Total Quality Leadership: The Way of the Future," Proceedings, Naval Review, 1991, p 107.

(17)Rear Admiral Robert Nutwell, "TQL at Sea," Proceedings, September 1993, pp 86-88.

(18)IBID, p 88.

(19)IBID.

(20)An outstanding book that details the importance of the contribution of the logistics effort in this war is William G. Pagonis', Moving Mountains: Lessons in Leadership and Logistics From the Gulf, Boston, Mass: Harvard Business School Press, 1992.

(21)Carolyn Applegate (and others), "Total Quality Managment in Ten Exemplary Department of Defense Organizations: Lessons Learned, Innovative Practices, and Quality Measurements," Monterey, California: Naval Postgraduate School, November 1991, pp 6-9.

(22)Cletus F. Wise, "Implementing Total Quality Management in the Department of Defense," Maxwell AFB, Alabama: An Air War College Research Report, April, 1991, pp 6-10.

(23)General Charles G. Boyd, "Air Power Thinking: 'Request Unrestricted Climb,' Airpower Journal, Fall 1991, p 7.

(24)J. Daniel Howard, "The Only Way Ahead," p 86.

(25)Admiral Robert Nutwell, "TQL at Sea," p 88.

(26)Colonel John A. Warden, "Employing Air Power in the Twenty-first Century," The Future of Air Power in the Aftermath of the Gulf War, eds. Richard H. Shultz and Robert L. Pfaltzgraff, Maxwell AFB: Air University Press, July 1992, p 62.

(27)The TQM Transformation, ed. John Persico, Jr., New York: Quality Resources, p 134.

(28)Quality Air Force Glossary, Maxwell AFB: Air Force Quality Center, January 1993.

(29)Carl Von Clausewitz, On War, p 89.

(30)Thomas J. Cartin, Principles and Practices of TQM, Milwaukee, WI: ASQC Quality Press, 1993, p 84.

(31)It is interesting to note that this definition of the customer is consistent with the Air Force vision statement which identifies 'America' as its customer. See "Building a Quality Air Force," (pamphlet), Washington DC: Air Force New Agency, 1992.

(32)Random House Dictionary of the English Language, edited by Jess Stein, New York: Random House, 1986.

(33)Quality Air Force Glossary.

(34)William C. Bean, Strategic Planning That Makes Things Happen, Amherst, Mass: Human Resource Development Press, March 1993, p 7.

(35)"Building a Quality Air Force," Department of the Air Force, Washington DC: Air Force News Agency, 1992.

(36)Dr. Sheila E. Widnall, "Building a Quality Air Force for Today and Tommorrow," Current Messages for Senior Air Force Leaders, Washington DC: Secretary of the Air Force Office of Public Affairs, 93-02.

(37)For a short, but effective explanation of the Shewhart cycle, refer to The Quality Approach, Maxwell AFB, AL: The Air Force Quality Center, Fall 1993, p IV-2.

(38)William C. Bean, Strategic Planning.

(39)USAF, The Quality Approach, p I-1.

(40)General John Michael Loh, Speach to the National Quality Month Kick-Off at the Hampton Roads Quality Council, Hampton, VA, 1 October 1992.

(41)Peter R. Scholtes, The Team Handbook, Madison, Wisconsin: Joiner Associates, Inc., August 1992 provides an excellent example of the detailed examination and emphasis being placed on teams by TQM advocates.

(42)Refer to AF Manual 3-3 for an unclassified explanation of how teamwork is integral to fighter aircraft tactics.

(43)Mary Walton, The Deming Management Method, New York: The Putnam Publishing Group, 1986.

(44)General Charles Horner, published with his permission, from an address to the Air War College, Maxwell AFB, Alabama, 7 March 1994.