The ~~Art~~ Technology of War

I entered the defense industry in the midst of the Cold War. The only action my systems saw was operational test and evaluation or an occasional Top Gun or Gunsmoke competition. It was a time of scientific tinkering and military conjecture.

On the conjecture side of the equation, then as is now, a 2,500-year-old Chinese general known as Sun Tzu wielded tremendous influence over American military strategy. In fact, his manuscript "The Art of War" may be the most quoted document in military history. When asked to estimate enemy forces, Army Gen. Tommy Franks replied, "The answer I'm going to give you will not be a number, because, as has been the case since Sun Tzu said it, precise knowledge of self and precise knowledge of the threat leads to victory."

While interesting reading for generals and corporate ladder climbers, most engineers find Sun Tzu too ethereal, more reminiscent of a Cheech and Chong elucidation than an Orwellian dissertation. In fact, the title turns many engineers away because art is a dirty word, unless you are a sanguine software tyro. Leave the art of war to Norman and Tommy while we examine the technology of war.

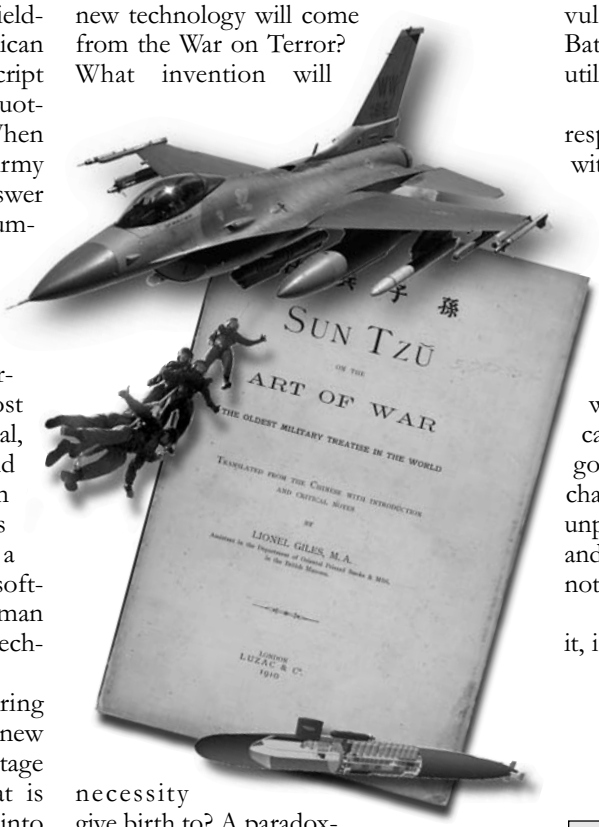
Wars give birth to society-altering technology. During conflict, radically new technologies surface to gain an advantage and quell one's adversary. Once that is accomplished, the technology pops into the commercial sector and alters the direction of humanity.

Eleven years after the Wright brothers flew at Kitty Hawk, World War I erupted. Sparsely used airplanes became courier, reconnaissance, and fighting machines, launching an aviation industry that abridged the world. That war also led to the development of radio. KDKA's historic radio broadcast in 1920 paved the way for Elvis, John, Paul, George, Ringo, Elton, Howard, Rush, and catchy advertising jingles.

World War II led to atomic fission and microwave communication, changing the way we pop popcorn forever. The first computer calculated artillery trajectories so one could accurately rain shells from afar. Now computers facilitate message trajectories so one can arbitrarily rain e-mail from afar and annoy with SPAM, another byproduct of World War II, the edible kind that is.

The Cold War launched satellites to spy. Now we spy with satellite dishes, perusing television's ersatz reality of survivors, bachelors, and apprentices. Now the Cold War is history, with Google at ground zero, and the BLOG intercontinental.

So what is next? What new technology will come from the War on Terror? What invention will necessity give birth to? A paradoxical question for sure.



Maybe Sun Tzu's tome can shed some light on our uncertainty. "Rapidity is the essence of war," he opines. "The pinnacle of military deployment approaches the formless. Then even the deepest spy cannot discern it or wise make plan against it." How does the largest military in the world approach rapid formless deployment? No one, short of George Lucas or Gene Roddenberry, can accurately predict, but here are some good bets.

Remote sensing and surveillance technology that can find, identify, and lock onto individuals versus structures. Smart bombs that get personal, if you will, reversing the situation and striking terror back into the terrorist. Can you hear me now? Good.

Faster processors coupled with intelligent and efficient software sort and match torrents of information from all over the world, finding patterns that predict attacks. That is just to reign in the Bernard Ebbers, Ken Lays, and Martha Stewarts of the world; imagine how it will thwart terrorists.

Bio and nanotechnology can increase a warrior's power while lightening his load. Decentralizing computing and weaving it into the fabric of the warrior increases flexibility and reduces predictability and vulnerability. This is the return of Batman's utility belt, complemented by a utility shirt, jacket, and pants.

These technologies enable rapid response, flexibility, and interoperability without interdependence. All key in a rapid formless deployment. Underlying it all is software. Unfortunately, software's unpredictability and cost are also the long pole in the tent of innovation, toiling to catch up with its hardware, bio, and nanotechnology counterparts.

Several decades ago, we turned to software for its flexibility. Early simple applications were easy to change, and beat going back to the fabrication shop to change the hardware. Increased complexity, unpredictable delivery times, low quality, and cost overruns indicate that software is not soft but rather hard.

Your challenge, if you choose to accept it, is to put the soft back in software.

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