For Want of a "Chaoplexic" View of Logistics

■ By Dr. Christopher R. Paparone and George L. Topic Jr.

Logistics has long been considered one of the systems engineering sciences based on laws of physics, mathematical linear modeling, optimization formulas of operations research and systems analysis, and so forth. One could argue that this science of logistics has served the nation well and, as of late, American missions have not failed for lack of viable logistics systems designs.

Our military education institutions, developmental programs, and criteria for promotion have been rightly focused on producing leaders and managers who can solve problems and deliver the support upon which our full range of missions depend. However, we contend that there are other ways of framing logistics designs beyond the traditional systems engineering view. One way is using what author Margaret J. Wheatley refers to as "new science"—using concepts derived from the study of complexity and chaos.

The future presents a paradox: keeping our logistics systems engineering roots while embracing a complex- and chaotic-systems opposing view of logistics. We expect many more complex operations ahead, and we believe logisticians will be better served with an array of mental models that will enable them to appreciate the complexities they face, learn in more sophisticated ways, and deal with challenges that do not fit easily into computational models or doctrinal frameworks.

To face these challenges, many researchers highlight the need to develop highly adaptive and resilient people and organizations. These terms have sprung from the studies of what author Antoine Bousquet calls "chaoplexity." For more information on this concept, we suggest reviewing books and articles on complexity science and chaos theory by Bousquet, Russ Marion, Phillip Clampitt, Robert J. DeKoch, Eric B. Dent, Frans P.B. Osinga, and Nassim Taleb. Another resource known for its interdisciplinary approach to complexity science is the independent research and education center Santa Fe Institute, www.santafe.edu.

It should not be surprising that the current generation of strategic guidance documents—the Capstone Concept for Joint Operations (CCJO), the White Paper on Mission Command authored by the chairman of the Joint Chiefs of Staff, and recent strategic guidance published by the Joint Staff J–4, to name a few, reflect a shift in strategic logic based largely on the concepts associated with chaos and complexity theory. Marine Corps Gen. James N. Mattis, former commander of the U.S. Central Command, and Navy Adm. Mike Mullen, former chairman of the Joint Chiefs of Staff, appeared to have used these frameworks in the drafting of the 2008 CCJO.

We need logisticians and organizations capable of envisioning their part of an interconnected, complex-adaptive logistics system. Indeed, holistic systems thinking provides an opportunity—a necessary consideration—for contemporary military designers, planners, strategists, senior leaders, and, we believe, especially logisticians. The very terminology being used today by writers and thinkers in this field is useful in demonstrating the broader perspective and innovative analytical frameworks that are possible.

We invite readers to explore theoretical concepts such as emergence, holism, mutual causality, indeterminism, polarity thinking, irreducibility, quantum physics logic (nonlinear dynamics and novelty), heterarchy, and the butterfly effect, all of which suggest ways of thinking that can offer creative solutions to some of our most challenging problems.

During the past 12 years, our logisticians have experienced an operational environment characterized by chaoplexity on the job in Iraq, Afghanistan, and in support of other missions around the world. We leave you with this question: Are our logistics doctrinal concepts and educational institutions in line with these theories and concepts?

In our next article we will discuss what chaoplexity means for the professional development of logisticians.

Dr. Christopher R. Paparone is the dean of the College of Professional and Continuing Education at the Army Logistics University at Fort Lee, Va. He is a retired Army colonel and has a Ph.D. from Pennsylvania State University.

George L. Topic Jr. is a retired Army colonel and the vice director for the Center for Joint and Strategic Logistics at the National Defense University at Fort McNair, Washington, D.C. He served as a quartermaster officer for 28 years on active duty and for three years as the deputy director for strategic logistics on the Joint Staff.