

# MILITARY RESPONSE TO INFORMATION AGE

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**Abstract:** *The article shows how military organizations from different countries have reacted to the information technology revolution. At the end of the twentieth century the unprecedented development of information technology has forced companies to adapt to the conditions imposed by the new economic environment. Because of the cold war, the military organizations remained frozen in the old postwar structure. The end of the Cold War era and the new challenges have forced the military structures to adapt to the challenges of the beginning of the XXI century.*

**Keywords:** military, information age, evolution

## 1. Information Technology evolution

Technological breakthroughs have revolutionized communications and the spread of information. In 1875, for example, the invention of the telephone breached distance through sound. Between 1910 and 1920, the first AM radio stations began to broadcast sound. By the 1940s television was broadcasting both sound and visuals to a vast public. In 1943, the world's first electronic computer was created. However, it was only with the invention of the microprocessor in the 1970s that computers became accessible to the public. In the 1990s, the Internet migrated from universities and research institutions to corporate headquarters and homes.

All of these technologies deal with information storage and transmission. However, the one characteristic of computer technology that sets it apart from earlier analog technologies is that it is digital. Analog technologies incorporate a combination of light and sound waves to get messages across, while digital technology, with its system of discontinuous data or events, creates a "universal model" to represent information that is expressed by almost anything using light and sound waves. To use an analogy, a digital world is a world united by one language, a world where people from across continents share ideas with one another and work together to build projects and ideas.

More voluminous and accurate information is accumulated and generated, and distributed in a twinkling to an audience that understands exactly what is said. This in turn allows the recipients of the information to

use it for their own purposes, to create ideas and to redistribute more ideas. The result is progress.

## 2. Business response to IT revolution

The IT revolution is affecting some countries earlier than others. For IT to weave its magic, it must find a hospitable social and political environment. New technologies threaten existing power and economic relationships, and those that benefit from these old relationships put up barriers to the spread of the new technologies. It is important to remember that technology is shaped by society as much as it shapes society. Thus, those interested in harnessing the power of new technologies should help create the right environment for it to flourish.

An information economy is where the productivity and competitiveness of units or agents in the economy (be they firms, regions or nations) depend mainly on their capacity to generate, process, and apply efficiently knowledge-based information. It is also described as an economy where information is both the currency and the product.

The information economy is *global*. A historically new reality, the global economy has the capacity to work as a unit in real time on a planetary scale. Corporations and firms now have a worldwide base for skilled labor to tap. Capital flows freely between countries, and countries can utilize this capital in real time. A second characteristic of the information economy is that it is *highly productive*.

A third characteristic of the information economy is the *change in the manner of obtaining profits*. Profits in the old economy came from economies of scale—long run of more or less identical products. Thus, we had factories, assembly lines, and industries. Now profits come from speed of innovation and the ability to attract and keep customers. Where before the winners were big corporations, now the winners are small, highly flexible groups that devise great ideas, develop trustworthy branding for themselves and their products, and market these effectively.

Setting up an IT structure is not enough. To maintain leadership in the new economy, the social position of knowledge professionals and the social acceptance of their values should be guaranteed.

The knowledge economy is also a networked economy. The concept stresses the important role of links among individuals, groups and corporations in the new economy.

It has been argued that networks have always been an ideal organizing tool due to their inherent flexibility and adaptability.

Integrating across the experiences of the firms that have emerged as dominant in their competitive domains, the following core themes are revealed.

- Information technologies enable firms to create a high level of competitive awareness within their organizations and extended enterprises;
- Networking is enabling the creation of new types of information-based relationships with and among organizations that are able to leverage increased competitive awareness;
- Time is being compressed and, as a result, the tempo of operations is being increased;
- The cumulative impact of better information, better distribution, and new organizational behavior provides firms with the capability to create superior value propositions for their customers and dominate their competitive space.

### 3. Military response to IT revolution

Two key realities dominate thinking about *command and control* (C2) in the 21st century. The first is the nature of the 21st century military mission space. This space is characterized by its extreme uncertainty. In addition to the high intensity combat operations that are traditionally associated with military operations, the 21st century mission space has expanded to include a wide spectrum of mission challenges, ranging from providing support to multi-agency disaster relief operations to complex coalition efforts within a political-military environment involving a large variety of military and non-military actors.

The second reality is the ongoing transformation of 21st century militaries, and for that matter, other 21st century institutions and actors from the Industrial Age to the Information Age. With this transformation comes the ability to leverage new information technologies. This has had, and will continue to have, a profound effect on how institutions manage themselves and how they can work with coalition partners.

These fundamental realities put the emphasis on *command and control* (C2), interpreted in its broadest sense to include acquiring, managing, sharing and exploiting information, and supporting individual and collective decision-making. In particular, more mature C2 includes the ability to recognize situational change, and to adopt the C2 approach required to meet that change-which we term *C2 Agility*.

What started out as a US-driven ‘Revolution in Military Affairs’ has developed into a broad-based evolution of military capability to embrace the potential of modern information technology (IT) and the internet. In the US, that revolution was named Network-Centric Warfare (NCW). In the UK, the concept developed into Network Enabled Capability (NEC). In the Sweden the concept was named Network-Based Defense (NBD).

The literature suggests significant differences between the US-originated concepts of NCW versus the UK adaptation of NCW as Network Enabled Capability (NEC) or Network Enabled Operations (NEO):

- NCW is considered to be resource driven, while NEC is resource limited.
- NCW considers the network to be the primary driver, while NEC views the network as an enabler only.
- NCW is considered a doctrine, while NEC is considered part of a gradual improvement in force effectiveness.
- NCW is a planned and structured development of technology roll-out, while NEC is expected to evolve through networking battlefield entities.
- NCW is limited, by definition, to warfare, while NEC is expected to be applied more widely to Operations Other Than War (OOTW).

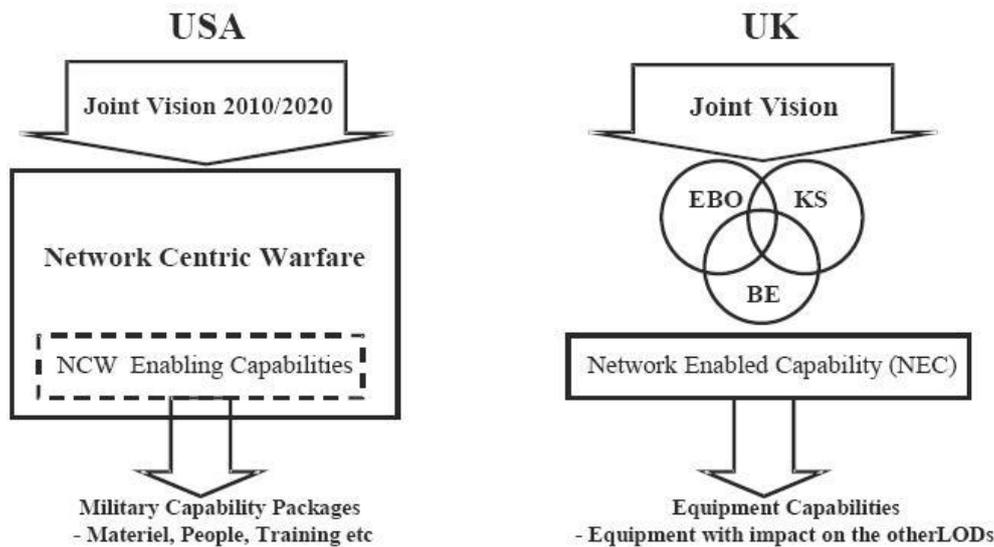


Figure 1: US NCW versus UK NEC

This difference plays a role in the assessment mechanisms of the two approaches. NCW based assessments tend toward more technical and interoperability assessments, while NEC based assessments tend toward cognitive factors and incremental technical improvements in capability. This manifests in the metrics the two concepts use for assessment.

Like the UK NEC concept, NBD ‘... is about managing defense resources as effectively as possible based on a common situational picture, simultaneously leading to the creation of new capabilities.’

Similarly, it focuses on the human as part of the network where ‘technology must comply with human behavior, never the other way round.’ NBD aims to enhance mission command and maneuvers warfare through information superiority provided by situational awareness.

The technologies, although an enabler, are considered to be only the first steps toward a mature capability solution. Developmental principles are included to shorten development cycles, ensure component/module re-use, and integrate with joint service specialists. NATO has identified Network Enabled Capability (NEC) as a high priority alliance goal. NATO is thus in the process of developing a maturity model related to improving force capability and transformation. Achieving this goal clearly depends on the development of an appropriate approach to NATO Consultation, Command, and Control and the identification of a corresponding Command and Control (C2) Maturity Model.

The Network-Centric Maturity Model was designed to suggest a strategy that organizations could adopt to improve network-centric capability with a set of milestones that represented significantly different levels of capability. These milestones were expressed as maturity levels. The network-centric maturity model provided, for the first time, a conceptual tool that could be used to understand and assess the emerging body of evidence related to the implementation of network-centric concepts.

#### **4. Conclusion**

For the first time in history a revolution occurred first in a business environment and after that was accepted in military organizations. When the mission space is extreme uncertainty the military response should be by agility.

A network organization is inherently flexible and adaptable. In a network organization time is also being compressed and, as a result, the tempo of operations is being increased (OODA loop). According to their cultural background each country has its response to IT revolution in military structures.

NATO has provided a conceptual tool that could be used to understand and assess the implementation of network-centric concepts.

## References

- [1] David Alberts: *Power to the Edge: Command... Control... in the Information Age*, CCRP publication series, 2005;
- [2] David Alberts: *Network Centric Warfare: Developing and Leveraging Information Superiority*, CCRP publication series, 2000;
- [3] Dr. Edward A. Smith, Jr.: *Network Centric Warfare: Where's the beef?* Naval War College Review, 2000;
- [4] Maj Dr. Eng. Laurian Gherman: *Warfare in the Information Age*, Journal of Defense Resources Management 1/2010;