



## INFORMATION DOMINANCE

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### ABSTRACT

*The concept of information dominance is part of the US military objective of spectrum dominance. Information dominance is a state in which a nation has a higher degree of understanding of the strengths and weaknesses of an adversary's military than the enemy.*

*It simply means having more information than an adversary. It is a vital component of US foreign policy and military strategy. This paper presents a brief introduction to information dominance.*

**Key words:** information, dominance, information warfare

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### 1. INTRODUCTION

Transforming from the industrial age to information age has not been easy for the military. The information revolution has led the military to reconsider its strategy and organization. Throughout history, the army regards information as necessary and crucial for combat [1]. Information is the most important part of the decision-making process whether the decision is made by civilians or military officers. As Oliver Morton rightly said. "The most important weapon now is information." Information is employed for electronic warfare, military deception or propaganda, and computer network operations [2]. Each of the main branches of the armed forces (US Air Force, US Army, and US Navy) has embraced the idea of using information in fighting future battles. Warfighters universally need the right information, at the right place, at the right time.

Information dominance is a military term that implies the generation and use of information for the purpose of gaining military dominance and ensuring battlefield success, while denying the adversary the opportunity to do the same. Knowing oneself and the enemy's strategy is crucial to gaining advantage over the enemy. The phrase "information dominance" was coined by the Soviets in the late 1970s. Information dominance broadly involves

different fields including hardware and software engineering, data structure, communications technology, sensor technology, artificial intelligence, knowledge management, fusion algorithms, and encryption.

Information dominance led to the creation of Navy's Information Dominance Corps (IDC) in 2009. This provides a comprehensive capability for addressing the Navy's current and future information workforce needs. In achieving this vision, personnel resources and workforce development could be the major challenges. Information dominance represents an alternative to the current space control strategy. Achieving information dominance for information warfare is a new primary objective of the military.

## **2. SOURCES OF INFORMATION DOMINANCE**

Information dominance may be regarded as an operational advantage or superiority through the generation and use of information to afford its possessors military dominance. The Army established *Joint Vision 2010* which provided the term command, control, communications, computer, intelligence, surveillance, and reconnaissance (C4ISR) as a capstone concept for information superiority. The superiority can be analyzed in terms of three elements or sources: command and control, intelligence, and information warfare [3]:

- Command and control that permits everyone to know *where* they are in the battlespace, and enables them to execute operations *when* and as quickly as necessary.
- Intelligence that ranges from knowing the enemy's dispositions to knowing the location of enemy assets in real-time. The major role of intelligence is to inform commanders of the size, location, and intentions of opposing forces.
- Information warfare that confounds enemy information systems at various points while protecting one's own. This may involve intelligent-based warfare, electronic warfare, hacker warfare, command and control warfare, and psychological operations.

## **3. ACHIEVING INFORMATION DOMINANCE**

The technologies that will enable information dominance include low cost production, lightweight space structures, high speed signal processing, and high data rate communication networks [4]. These will enable information gathering using seamless, interoperable communication network. This is being achieved by the US Army's Battlefield Information Transmission System (BITS). Information technology will continue to revolutionize the way we operate, detect, and track our enemies in the battlefield. Technologies alone will not achieve information dominance.

Achieving information dominance has two aspects [5]. The first aspect involves developing situation awareness among friendly forces. This will allow them to control the battlespace, essentially dictating the terms and conditions of war. Controlling space is also important. The operational objective is to disrupt or destroy the adversary's space systems, which may include satellite systems [6].

The second aspect of achieving information dominance is being able to blind enemy's capabilities. Information dominance will only depend on ownership of the electromagnetic spectrum. Jammers will be used to deny the enemy the use of the spectrum [7]. Unfriendly information should be destroyed.



#### 4. CONCLUSION

Through the adoption of sophisticated information technology, the US military has long enjoyed information superiority over potential adversaries. Information dominance is the latest US military warfighting discipline. The US military aims to use information as a weapon to influence, deny, degrade, disrupt or destroy across the full range of its operations and achieve information dominance over enemy forces. Information dominance is now as crucial as occupying territories has been in the past. The United States will realize its goal of superiority in future military operations only by capitalizing on the capabilities of the information age.

#### REFERENCES

- [1] A. C. Firestone, "The revolution in military affairs 2.0," *Proceedings of IEEE Military Communications Conference*, 2013, pp. 348-353.
- [2] Y. R. Kamalipour and N. Snow, *War, media, and propaganda: a global perspective*. Lanham, MA: Rowman and Littlefield Publishers, 2004.
- [3] M. C. Libicki, "Information Dominance," *Strategic Forum*, National Defense University, no. 132, Nov. 1997.
- [4] G. D. Duchak, "Discoverer II: a space architecture for information dominance," *IEEE Aerospace Conference Proceedings*, March 2000, pp. 9-17.
- [5] M. Endsley and W. M. Jones, "Situation awareness information dominance and information warfare," *Interim Technical Report*, United States Air Force Armstrong Laboratory, Feb. 1997.
- [6] J. G. Lee, *Counterspace operations for information dominance*. Maxwell Air Force Base, Alabama: Air University Press, Oct. 1994.
- [7] R. F. Perricelli, "C412WS: The enablers of information dominance in the battlespace," *Military Technology*, 2002, pp. 64-66.

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