Research on Network Intelligent Joint Operations

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Abstract. Since the US military proposed the network-centric war, all countries in the world have focused their military theoretical research on the intelligence of the network. In view of the fact that the world has entered the era of information and networks, the joint operational model based on network intelligence will have a great impetus to the revolution and development of military theory. Introduce the theory of network-centric warfare, analyze the capacity of network intelligent warfare system, study the great potential of network intelligent joint warfare system, propose the development potential of network intelligent warfare network, and provide science for combat troops to build network intelligent warfare network. Theoretical support.

Keywords: Network; information; intelligence; joint operations.

1. Introduction

The world has entered the era of information and network, and intelligence represents wisdom and ability. Intelligence based on network empowerment will give great impetus to social progress. Intelligent network has triggered the fourth industrial revolution. The fourth industrial revolution is the extensive application of network in factory production, in order to realize the great development of factory productivity, and at the same time to realize the intellectualization of some product applications. With the rapid development of network technology and weapon technology and the need of joint operations, network intelligence is also promoting a new military revolution in the world. Network-centric warfare first appeared in the United States. In April 1997, U.S. Navy Secretary of Operations Johnson first proposed that "Network Centric Warfare (NCW) is the most important revolution in the military field in the past 200 years. The change from platform centric warfare (PCW) to network centric warfare (NCW) is a fundamental change." In its report to Congress on July 27, 2001, the U.S. Department of Defense pointed out that the operational capability of cyber-centric warfare forces would be greatly improved. The operational capability of troops equipped with existing systems can be increased several times, and the operational capability of network-centric warfare can be increased by several orders of magnitude in the report of the U.S. Department of Defense to the U.S. Congress on network-centric warfare. In order to greatly improve the combat capability of combat forces, it is necessary to make operational networks such as sensor networks, information networks, command and control networks, weapon control networks and integrated support networks, which are related to combat capability, especially those of joint operational systems, meet the requirements of network intelligence so as to maximize the combat support capability of combat networks, so as to substantially improve the force's combat capability. Operational capability. Network intelligent joint operation system is a superior and complete joint operation system in the world today, and is a better way to strengthen the army.

The theory and technology of network intelligence have been widely applied abroad. For example, the United States uses Network Centric Warfare (NCW), Netherlands uses Network Centric Warfare (NCO), Britain uses Network Enabling (NEC), Switzerland uses Network Defense (NBD), Germany uses Network Command and Control (NCC), France uses Information Centric Warfare (ICW), Australia uses Network Enabling Warfare (NEW), NATO uses Network Enabling (NEC), and Russia uses Network Centric Command Automation System (NC. ACS).

2. Network Centric Warfare

2.1 Analysis of Advantages and Disadvantages of Commonly Used Evaluation Methods

Network Centric Warfare (NCW) can be defined as a military operation realized by the network of troops in the context of war. The U.S. Navy first implemented the transformation from ship platform centric warfare to network centric warfare. The concept of cyber-centric warfare was adopted by the U.S. Department of Defense. In its report to the US Congress, the US Department of Defense put forward the complete conception, concept and plan of cyber-centric warfare. Network-centric warfare (NCW) in the United States is not only a new operation, but also a new theory of military theory. It has become a military transformation of the United States Department of Defense with NCW as its main theory, expecting to improve the combat capability of the United States forces by an order of magnitude. Network centric warfare (NCW) occurs simultaneously in four fields: physical domain, information domain, cognitive domain and social domain.

Physical field is the field of traditional warfare. Physical domain elements include combat personnel, support personnel, command and control institutions, main combat weapons, support weapons, combat support systems, rear bases, front battlefields, etc. Operational activities include strikes, defenses and maneuvers occurring on the ground, in the sea, in the air and in space. All elements of the force are seamlessly and reliably networked.

Information domain is the field of information generation, processing and sharing. It is the field of promoting information exchange and communication among combatants, the information space of military operations, the field of command and control transmission in modern army, and the field of communicating commander's intention in the field of information. The army has the ability to collect, acquire, share and protect information in order to establish and maintain information superiority over its opponents. The army has the ability to cooperate in the field of information so that it can improve its information status through relevant integration and analysis processes.

Cognitive domain is in the minds of combatants and supporters. Cognitive domain is the understanding of commander's intentions, rules, tactics, techniques and processes, the existence of sense, knowledge, beliefs and values, and the decision-making field based on rational knowledge. In the cognitive field, the army has the ability to generate and share high-quality situational awareness, and the army has the ability of combat self-synchronization.

Social domain is a newly proposed field. It is the process and field of interaction and exchange of information, sharing of perception and understanding, collaborative decision-making and social cognition between people and organizations. The social domain is also the cultural domain. Culture is the common attitude, values and beliefs of people and organizations. It is the basis of social interaction and has a great impact on the interaction between people and organizations.

Physical domain, information domain, cognitive domain and social domain are also the source of combat capability of troops. Network-centric warfare activities in the United States include military activities at all levels from tactical to strategic level.

3. Network Intelligent Operational Network

Network Intelligence is the goal and process of information and network as the core, giving full play to intelligence ability, and building a combat network that can greatly improve the combat capability of troops. If we say that in the past, the command system can increase the combat capability of the army several times, then the combat capability of the network intelligent army can be increased by several orders of magnitude. Network intelligence involves the change of military activities at all levels from tactics to strategy. In its report to Congress on "Network Centric Warfare" on July 27, 2001, the U.S. Department of Defense believed that network centric warfare absorbed the essence of modern warfare theory. The main theoretical basis of network intellectualization is the theory of modern army construction, and referring to the theory of network-centric warfare of the U.S. Army, the combat capability of network intellectualized forces is not only contained in four fields (physical city, information domain, cognitive domain and social domain), but also in the people, economic law

foundation, science and technology, network enabling, comprehensive support, etc. The battle network constructed by network intelligence is called network intelligence battle network.

The great role of network intelligent warfare network, just as intelligent network promotes the fourth industrial revolution, network intelligent warfare network promotes the new military revolution in the world. In order to improve the combat capability of the network intelligence troops by orders of magnitude, it mainly relies on the enormous combat support capability of the network intelligence combat network, which gathers many sources of the combat capability of the network intelligence joint operation system. Intelligent network provides a variety of operational support capabilities for joint operations.

3.1 Definition of Combat Capability of Network Intelligent Joint Operations System.

The operational capability of network intelligent joint operation system can be defined as the capability of network intelligent joint operation system to accomplish various operational tasks. Operational tasks include offensive operations such as ground-sea offensive firepower strike operations, air and space attack operations, defensive operations such as ground-sea defensive operations, air defense and anti-missile defensive operations, electronic, information and network offensive and defensive operations. The combat capability of network intelligent joint operation system is composed of several single combat capabilities. Each single combat capability is composed of multiple support capabilities. Individual operations refer to the operations carried out by a single military unit to accomplish a single operational task.

3.2 Combat Capability Source of Network Intelligent Joint Operations System.

According to the theory of network-centric warfare in the United States, combat capability comes from physical domain, information domain, cognitive domain and social domain. The fountainhead of combat capability and support capability of network intelligent joint operation system is much wider.

The power of the people's war under the correct political guidance. The just people's war has infinite combat capability. The country is in trouble and the people are responsible. The people consciously fight for the country, the nation and the survival. The forces of the people's war, including the regular army, the militia and the broad masses of the people who support the fighting, can defeat any enemy who commits crimes.

The economic and technological level is an important source of combat capability. The experience of the Second World War tells us that besides political factors and justice factors, economic and technological strength are very important factors in the victory of war. During the Second World War, the United States supported a large number of weapons and equipment of the world's anti-fascist countries with its strong industrial strength. The United States took the lead in technology in developing the atomic bomb, which deterred the fascist stronghold in Japan. At the beginning of World War II, the Soviet Union suffered heavy losses, forcing the military industry to move eastward. During the war, the Soviet Union produced 130,000 aircraft, 100,000 tanks, 480,000 artillery and 950,000 machine guns, which became an important combat force against German and Japanese fascists.

Mechanization and information transformation. Informatization is mainly manifested in two aspects: one is to develop a large number of integrated military information systems for the army, so that the combat capability of the army can be doubled and increased by orders of magnitude; the other is to informatization of weapons and equipment, which uses a large amount of information technology to enhance the combat capability of weapons and equipment. Despite entering the information age, there is still much room for development of mechanization in China. Only with turbofan engine cruise missiles can fly thousands of kilometers, with ramjet engines can have hypersonic air-borne weapons, and with high-thrust rocket engines can the payloads of tens or hundreds of tons be pushed into space. At the same time, mechanization is also developing towards high precision, miniaturization and miniaturization. Compared with European and American countries, the raw materials, mechanical

design and manufacturing of developing countries still lag far behind, which deserves more efforts from developing countries.

3.3 The Great Potential of Network Intelligent Joint Operations System.

Information network, sensor network, command and control network, weapon control network and integrated support network jointly form the whole army network, in order to greatly improve the combat capability of combat forces. In recent decades, the world has urged mankind to enter the information society and the network world with respect to technological revolution and military transformation. From the Internet, telecommunication network, financial network, commercial network, power supply network, energy network, transportation network, political network to combat network, people live and work in the network world, combat network has its unique development situation and huge combat potential.

Information and knowledge sharing. All the fighters can get the information they need. Not only commanders need information to make correct operational decisions. Combatants also need information to make operational decisions in their execution. Operational support personnel also need information in order to do a good job in all kinds of support and support work.

Multi-sensor information fusion. All information sources enter the network and share information sources throughout the network to improve the quality of information. Multi-sensor information fusion in sensor networks includes multi-sensor state fusion, multi-sensor recognition fusion, multi-information source situation estimation fusion and multi-information source threat estimation fusion.

Military Cloud Computing and Cooperative Operations. Military cloud computing network has the strongest processing and storage capabilities, data mining, fusion computing, decision-making and analysis capabilities, to produce high-quality information, and multiple access storage, with a strong anti-destruction ability and survivability. Combat mission coordination, space coordination and time coordination are carried out among the participating troops in the network. Unified command enables the participating troops to exert their maximum combat capability, which is conducive to contract operations and joint operations.

Weapon systems enter the network and network weapons. Unified command and control of all kinds of military exploration systems, give full play to the maximum lethality of all kinds of weapon systems. It can make multiple combat units and firepower units share weapons, such as network centralized anti-missile cooperative command, information sharing and weapon sharing. The ABM command post coordinates all the ABM forces. The capability of cyber weapons is comparable to that of weapons of mass destruction, and even much greater than that of weapons of mass destruction. Network weapons can destroy military networks, political networks, energy, networks and financial networks.

4. Summary

Since the new military reform, all countries in the world have focused on the intellectualization of network in military theory research. In view of the world has entered the era of information and network, the mode of joint operation based on network intellectualization will play an important role in the transformation and development of military theory. Constructing a network intellectualized operational system can greatly improve the combat capability of troops, with information and network as the core and network as the basis of network. Intelligence requires the construction of operational network systems, such as sensor network, information network, command and control network, weapon control network and integrated support network, to provide reliable theoretical support for information warfare.

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