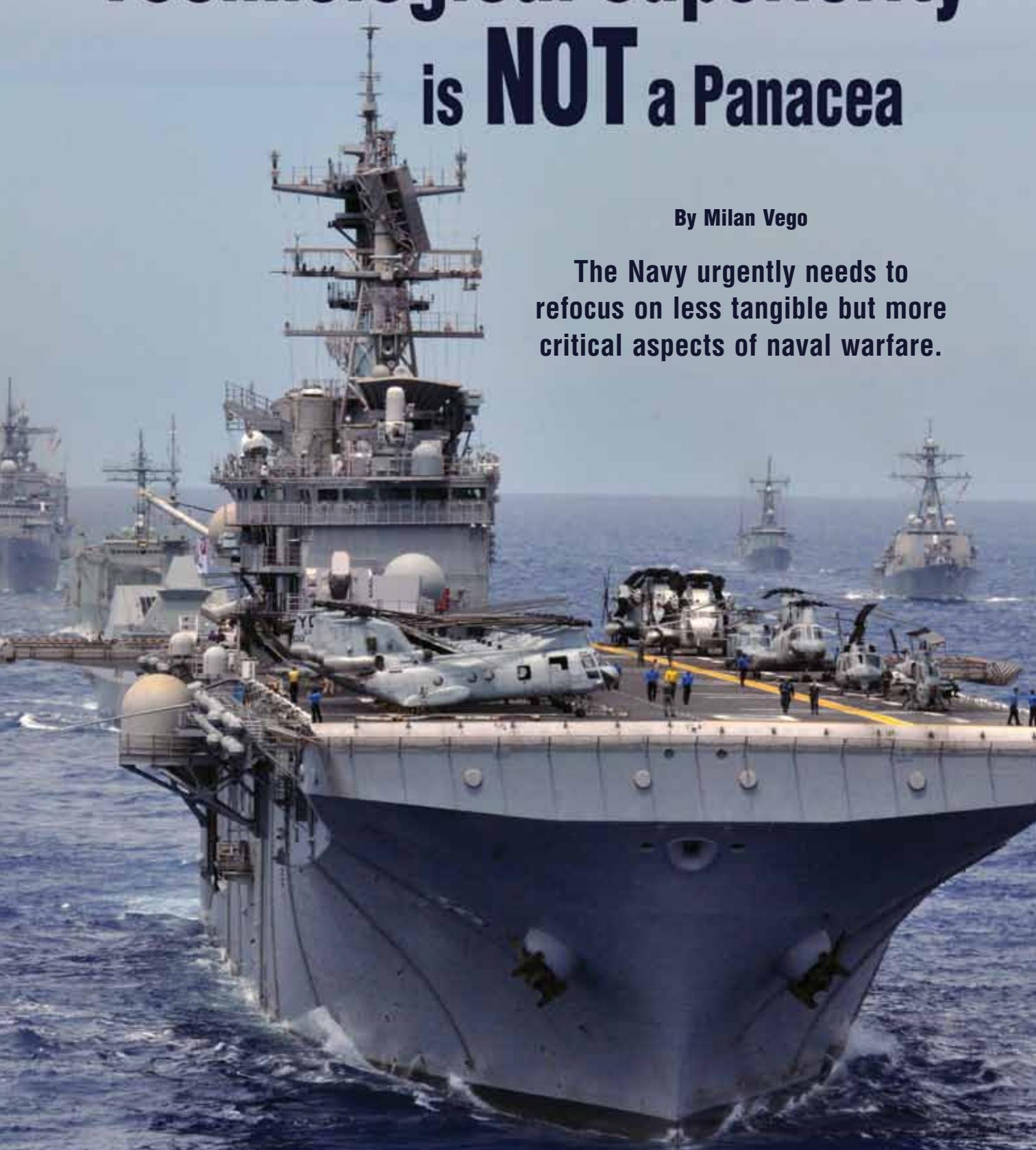


Technological Superiority is **NOT** a Panacea

By Milan Vego

The Navy urgently needs to refocus on less tangible but more critical aspects of naval warfare.





Traditionally, navies put more emphasis on materiel than do armies. This is because naval warfare revolves largely around platforms and their weapons and sensors. Superior technology is only one among several other critical factors for the successful conduct of war at sea; by itself, it has never been sufficient to fight a relatively strong and skillful opponent. Yet the U.S. Navy has become almost exclusively focused on the value and importance of advanced technologies.

This nearly obsessive reliance is the main reason for the lack of a balanced battle force, coherent naval theory and sound doctrine for the operational level of war, and the steady erosion of the importance afforded the human factor in naval warfare. Management and business models are more highly valued than are leadership and warfighting.

The Value of Technology

In general, a navy with superior technology has much greater chances of success than does a numerically stronger, but technologically inferior, opponent. Highly capable ships and aircraft provide more options in the employment of naval forces and highlight the need for a force highly educated in their use. Advances in these areas also affect, though not to the same extent, naval strategy, operational art, and tactics.

Yet no matter how advanced it is, technology cannot replace operational art, as some net-centric warfare (NCW) enthusiasts have asserted. It only considerably impacts the *character* of war at sea, i.e., those transitory, circumstantial, and adaptive features that account for different periods of warfare throughout history.¹

In addition to technology, the character of war is primarily determined by prevailing international relations; domestic politics; and economic, social, demographic, religious, legal, and other conditions in a given era. Also, despite the claims of NCW proponents in the early 2000s, technology cannot change war's nature—the constant, universal, inherent qualities that define it throughout the ages. These include the dominant role of policy and strategy, violence, hatred, irrationality, uncertainty, friction, fear, danger, bloodshed, and luck.²

War Is More Complicated Than Tech

The Navy's overemphasis on technology greatly intensified in both scope and depth in the late 1990s, with almost uncritical acceptance of the benefits of information technologies. It was even claimed that they represented a new theory of war.³

The most vocal NCW proponents claimed that the new American way of war had emerged due to the adoption of network-centric operations.⁴ However, there is

a great difference between these two. Theory of war pertains to a certain era in human history, transcending national and ethnic boundaries. It encompasses a detailed description of war, its elements and their mutual relationships.⁵ It is based on empirical evidence from many conflicts, not only those fought recently. In contrast, a national way of warfare is a product of a given political and military culture and society.

The U.S. Navy's strong bias toward technological solutions is clearly on display in its battle forces, composed almost exclusively of large, highly capable and expensive aircraft carriers, surface combatants, amphibious ships, and submarines. It is also reflected in the content of the Navy's various posture and vision statements, and in its techno-centric vocabulary. For example, *Seapower 21*, the Navy's strategic vision unveiled in June 2002, focuses essentially on future capabilities in terms of new technologies and tactics. Similarly, the Chief of Naval Operations annual posture statements to the U.S. Congress predominantly address force-planning issues.

Theory Is Critical for Success

One of the most serious consequences of this excessive focus is a lack of comprehensive theory of naval warfare. Many U.S. naval officers distrust theory in general. For them, only practice matters. They also firmly believe that superior technology is the key for victory at sea. This is perhaps because they lack an understanding of what naval theory is, and its real purpose.

Naval theory is narrower in scope than that of war, because it pertains mainly to the employment of naval forces. Properly understood, it describes the main components and elements of naval warfare and the relationships between them. It also explains the effect of nonmilitary aspects on the preparation and conduct of war at sea.

Sound naval theory is essential for both understanding past wars and successfully conducting future ones. It provides officers with badly needed broader and deeper knowledge of all aspects of using naval forces in combat. A naval commander armed with a solid theoretical education has a more solid grasp of sudden changes in a situation and acts with greater certainty and speed to obtain an advantage over the opponent.

No sound doctrine can be written without fully understanding all aspects of warfare at sea based on both history and technology. At the same time, a comprehensive knowledge of naval theory greatly helps an officer to appreciate strengths and weakness of naval doctrine.

A lack of naval theory has negatively navies' performance in combat. For example, by 1914, rapid technological advances had led to a general ascendancy of the so-called "materiel" school over the "historical school" in most of major navies of the day.⁶ In the Royal Navy, both the theory and the art of warfare at sea were neglected, and a similar situation existed in the German and the French navies. Hence, none of the major navies performed very well during World War I.

U.S. NAVY (STEPHEN M. VOTAW)

The U.S. Navy's strong bias toward technological solutions is evident in its preference for large, highly capable vessels including aircraft carriers and amphibious ships; here the USS *Bonhomme Richard* (LHD-6), participating in July in the annual Rim of the Pacific multinational exercise.



U.S. NAVY (DANELLE A. BRANDT)

No navy can exercise continuous sea control—even with assets such as those of the USS *George Washington* (CVN-73), the Navy's forward-deployed aircraft carrier. Here, an electronics technician pauses to marvel at the ocean's vastness while performing maintenance on an OE-82 antenna.

Operational Art Also Applies to the Sea

Despite all the experiences, too many U.S. naval officers believe either that operational art is valid only for wars on land, or that it has little, if any, utility in war at sea. However, the gap between strategy and tactics is too large to be bridged by physical combat alone. Hence the need for that intermediate field of study and practice—operational art—to orchestrate naval tactical actions to achieve operational and ultimately strategic objectives in a given maritime theater.

In contrast to Army and joint doctrine, the Navy still has not embraced the theory and practice of major naval operations—a series of related naval tactical actions aimed at accomplishing an operational objective, guided by a common idea. Experience shows that by themselves, qualitative technological and numerical superiority along with brilliant tactical performance are inadequate. A coherent maritime strategy must be combined with operational excellence. This has been the key to winning wars in the past and will remain so in the future.

The U.S. Navy's official views on what constitutes sea control and sea denial are often explained in contradictory terms. Many in the service often believe the Navy has sea control in peacetime by virtue of the forward presence of powerful carrier strike groups and amphibious forces. Yet

forward presence only allows the Navy to obtain control of selected parts of the world's oceans more quickly after hostilities break out. As is too often forgotten, the struggle for sea control starts *only* with the opening of hostilities.

Until quite recently, the Navy made numerous public statements that claimed it was capable of exercising global sea control. This is absurd. The world's ocean is so vast that no navy, no matter how large and advanced, can possibly exercise such control, even in a single maritime theater.

The new *Naval Operations Concept 2010*, issued in May 2010, finally admitted the impossibility of achieving global sea control. Instead, its focus is on establishing "local sea control" to protect "critical sea lines of communications, and projecting and sustaining combat power overseas."⁷

Yet no thought is given to the fact that the service might be forced, even if only temporarily, to conduct sea denial if faced with two strong opponents at sea or in the initial phase a major regional war. The authors state that the new concept does not "prescribe Naval Service *tactics*, nor is it *doctrine*," but serves as a "*precursor to the development of both*."⁸ Note that operational art is not even mentioned.

Ignorance or neglect of operational art has invariably been the main cause of defeat in wars at sea, as illustrated by the Imperial Japanese Navy in 1941-45. That navy's

entire tactical doctrine revolved around planning and preparing for a decisive battle with the enemy's main battle force. The Japanese neglected both strategy and operational art.⁹

The battle of Midway in June 1942, the struggle for Guadalcanal from August 1942 to February 1943, and the battle for Leyte in October 1944 show a lack of operational thinking by the Japanese naval operational commanders. They also almost exclusively embraced the spirit of offensive action, grossly overlooking antisubmarine warfare and the defense of maritime trade.¹⁰

The Human Factor

One of the most pernicious effects of all this is a general neglect and underestimation of the role of people. A similar situation prevailed in the U.S. Navy in Admiral Alfred Thayer Mahan's time. For most naval officers then, war was a type of managerial exercise, a mathematical equation, or an engineering principle. Hence, studying war was considered unimportant.¹¹

In the Navy today, most proponents of net-centric warfare pay only lip service to the human element, contending that information technology offers the potential to shift from large forces fighting sequential battles (attrition warfare) to near-simultaneous precision attacks by smaller forces. The technological bias is shown in the way the service describes humans' role in its command and control. For example, the new networked system, dubbed FORCENet, is described as "the operational construct and architectural framework for naval warfare in the information age which integrates warriors, sensors, networks, command and control, platforms, and weapons into a networked, distributed combat force, scalable across the spectrum of conflict from seabed to space and sea to land."¹²

But technical systems such as FORCENet are meant to assist—not control—the decision-making process. Humans are not the machines that are integrated into technical systems; they are in full control of them. The Navy seems to have forgotten that humans, not technology, are the key factor for achieving victories at sea. Materiel represents the means, not the ends, in naval warfare. Human nature has changed little, despite vast technologi-

cal changes. Navies that have ignored the importance of leadership at all levels have not performed well in combat, as shown by the catastrophic defeats of the Italian Navy at Lissa in 1866, the Spanish Navy in 1898, and the Imperial Russian Navy in 1904-05.

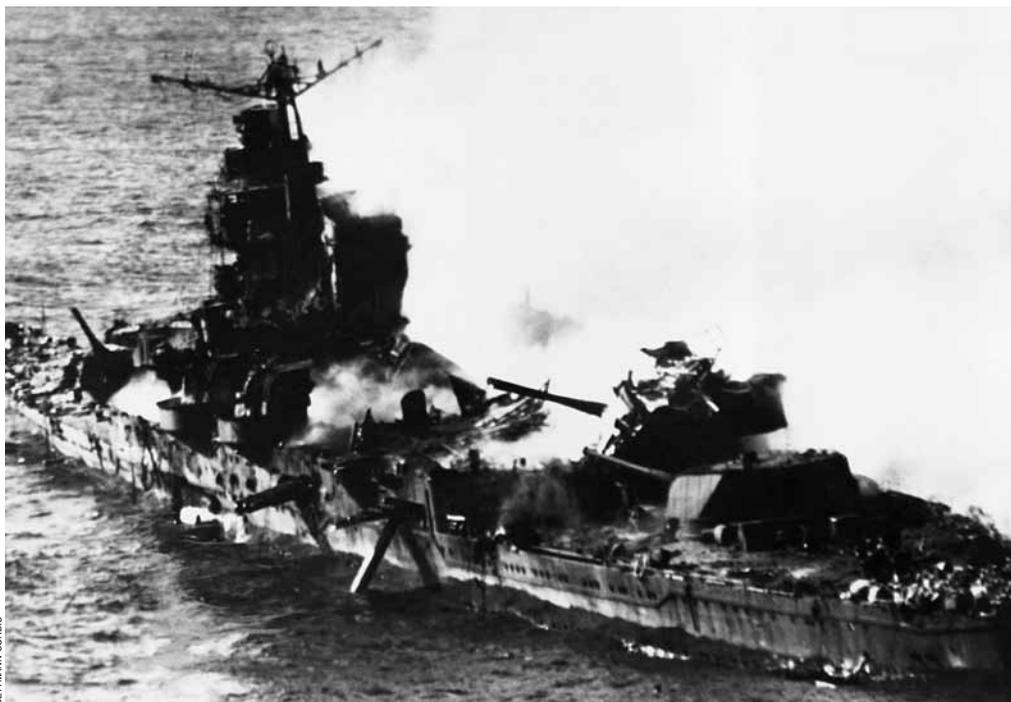
Naval warfare, like warfare in general, is shaped by human nature. This means the complexities of behavior and the limitations of physical conditions. The material and psychological aspects of war form an organic whole; they are inextricably linked.¹³

Short Shrift for Naval and Military History

Naval and military history is the main source for acquiring a broad, deep understanding of the nature and character of war in general and naval warfare in particular. Studying it is the best and proven way to impress upon naval officers that warfare is not a science but largely an art. It shows the advantages as well as the limitations of technological superiority in naval warfare.

The study of this history is critical to properly understand the complex interplay between tangible and intangible elements in the conduct of war at sea. Yet for all its proven value, its study in U.S. naval educational institutions is sorely overlooked. Moreover, too many naval officers uncritically accept the view of new technologies' leading proponents that there is really nothing to learn from past experiences.

A similar situation prevailed in the U.S. naval officer corps in the late 19th century. Mahan wrote that a typical U.S. naval officer believed it was more important to "know how to build a gun, design a ship, understand the strength



The Imperial Japanese Navy neglected operational art in World War II, adhering to an almost purely offensive doctrine to its detriment. The heavy cruiser *Mikuma* was sunk at the Battle of Midway in June 1942, after a pummeling from planes of Task Force 16.

of materials, observe stars through a telescope, be wise in chemistry and electricity, than to have ingrained in him knowledge about the laws of war or understand tactical handling of his weapons or be expert in questions of naval

and further enhance its qualitative superiority; it should. However, it should also urgently redress the negative effects of its rather single-minded pursuit of ever-more capable machinery to the great detriment of less tangible but far more critical aspects of naval warfare. ❄



The technological and psychological aspects of war are inextricably linked. Here, Sailors assigned to Navy Cyber Defense Operations Command monitor and analyze unauthorized activity in Navy computer networks. The Navy should enhance qualitative superiority by using technology to assist the human decision-making process—not drive it.

policy, strategy, and tactics.” He found that most officers wanted slick, quick answers to the world’s most complex events. Many believed (and still do today) that war was essentially a technical problem that could be harnessed by mechanical means.¹⁴

In the early decades after 1945, the Navy had a relative balance between technical and humanities graduate education. This was achieved more by default than by any coherent plan.¹⁵ However, with the advent of the nuclear era and strong influence of Admiral Hyman G. Rickover, future naval officers’ training became heavily tilted toward engineering, math, and science.¹⁶ Even after Rickover left the service in 1982, his impact remained.¹⁷

The current Naval Academy curriculum is heavily geared toward engineering, weaponry, math, and science. Within the humanities, there are only a few courses on naval or military history. Of about 48 history courses offered in 2010-11, only 3 deal with naval history (1 is obligatory); 2 with military, and 2 with both military and naval history.¹⁸ Clearly, the number of these courses offered to future officers is totally inadequate. Moreover, there are no courses on ancient naval history, naval wars in the 19th century, or naval warfare in both world wars. This cannot but have a negative effect on their professional education.

For all its great importance and value, there is great danger in overemphasizing technology and thereby losing sight of the broader framework in which wars at sea are fought. This does not mean that Navy should not maintain

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