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Emerging Trends in Weapon Technology

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ABSTRACT: The military apparatus across the globe is undergoing notable changes and is capitalizing on technological advancements to enhance its capabilities. The Internet of Things (IoT), robotics, and artificial intelligence (AI) are key developments that will improve military effectiveness and defense operations. Hybrid tactics that incorporate cyber warfare and other frontiers are gradually replacing conventional warfare in the modern era. Four characteristics of the battlefield are evolving as a result of emerging trends in military technology: connectivity, lethality, autonomy, and sustainability.

KEYWORDS : Military Revolution, Cyber security, weapons, Technology, security.

I. INTRODUCTION

“Emerging technologies” are of great interest to scholars and practitioners not just in the sphere of international security, but also in economics and business. Emerging technologies are said to have the ability to change “the rules of the game,” whether that “game” be the balance of military force between security actors or the balance of competitive advantage between incumbent enterprises and new entrants in a market.

II. EMERGING TECHNOLOGIES AND MILITRY

The rise and fall of numerous civilizations and political systems are documented throughout history over several centuries. If we look for the root of this "rise and fall," we discover that wars, which determine the strength of a particular political entity, either win or lose. It would not be difficult to comprehend the scientific and technological advancements connected to military leadership, again advancing this idea of victory and defeat. Thus, it is clear to see that warfare is a synthesis of the advancement of scientific knowledge and its application in the development of new technologies, along with the brilliance and maneuvers of the commander. Greek dominance during the "Age of Valor" is noted in western military history; this was made possible by the SARISSA in conjunction with their sturdy formation. But as soon as the 'Roman Legion' developed the smaller spikes in conjunction with their mobile formation, the Greeks were routed in the battle of PYDNA, and the Romans came to be recognized as an unstoppable force.

Therefore, we assume that the military revolution will be brought about by scientific and technological advancement. Let's examine what a military revolution is. The character and conduct of conflict are fundamentally altered by a military revolution, which "occurs when the application of new technologies into a significant number of military systems is combined with innovative operational concepts and organizational adaptation." Four components make up a military revolution:

- (1) Technological Change
- (2) Systems Development
- (3) Operational Innovation and
- (4) “Organizational Adaptation”

The new model Army created by Adolf Hitler combined the Air Force. Utilizing infantry, light armored vehicles, and tanks, the "Blitzkrieg" turned into a vampire for countries like France. Which was regarded as unbeatable in Europe prior to World War II as the United States was both during and following the War. Following the plane attack on the Pentagon and World Trade Center on September 11, 2001, France is in a similar predicament to the United States. Historical revelations imply that the techno-military union produced wonderful progeny. Before moving on to the current and future forms of warfare, it becomes necessary to list a few of them. However, predicting how warfare will develop in the future is very difficult. Especially in the 21st century, which has given rise to a vast array of

technological systems like the microwave, LASER, and C4I2SR. Weapons downsizing, space mines, anti-radar missiles, space conflict, etc. With this background, let us see some historical techno-military impacts:

After the Greeks and Romans, it is necessary to move on to the second millennium; otherwise, I won't be able to express what I want in a limited amount of time or space. The battles of Crecy (1346) and Laupen (1339) demonstrated the value of infantry while reducing the use of cavalry. The Swiss Pikemen and English Archers were to blame. The importance of artillery is highlighted in the fifteenth century, when it was used to besiege castles, cut off their supplies, and fatally damages them with powerful firepower. The evolution of artillery and its integration with ships revolutionized maritime conflict. In 1494, France was the first country to mount cannons on ships. By 1650, mounted cannon warfare at sea was the norm.

By 1550, pikemen, who had earlier threatened the cavalry, were easily dispatched by musket and artillery fire, demonstrating the diminishing importance of muskets. The Swedish Gustavus Adolphus, who achieved outstanding victories at the battles of Brietenfeld, Lutzen, and Wittstock as well as Jankov, surpassed all previous innovations. Again, in honor of Frederick and Napoleon, who are regarded highly by the military for their brilliance, operational innovations, and organizational flexibility, it is now necessary to quickly scan the developments of the 20th century.

Nuclear energy, wave warfare, alliances, adaptations, and other technological advancements made during the 20th century heralded a new era in warfare and international security in the 21st. A nation like ours, which aspires to have a permanent seat on the UN Security Council while also having to contend with issues like fighting terrorism, maintaining a strong military, and providing for a population of one billion, is compelled to adopt new technological advancements and to implement these advancements into its forces; otherwise, its very existence would be in jeopardy.

III. NEW TECHNOLOGIES AND INDIAN SECURITY

India, the most populous country in the world, is surrounded by neighbors like China and Pakistan. It has the third largest scientific community, a long oceanic desert plane, mountainous snow-capped peaks, and lush green borders. Less commentary on our neighbors' behavior would be preferable. India will need to arm itself with modern weapons in order to maintain national security. In short our current and future requirements of weaponry could be counted as follows:

- I. C4I2SR
- II. Thermal -Imaging Device
- III. WLR's (Weapon Locating Radars)
- IV. BFR's (Battlefield Radars)
- V. Mine proof vehicles
- VI. Frequency Hoppers
- VII. UAV's (Unmanned Aerial Vehicles)
- VIII. UGS (Unattended Ground Sensors)
- IX. AWACS (Airborne Warning and Control System)
- X. Anti Radar Missiles
- XI. Space Mines
- XII. Stealth Technology
- XIII. LASER (Light Amplification by Stimulated Emission of Radiation)
- XIV. Anti- Satellite Weapons
- XV. Bunker Busting Guided Bombs
- XVI. Supersonic and Hypersonic Weaponry
- XVII. Low Flying Gunships
- XVIII. Bio-Weapons
- XIX. Nuclear Weapons and Missiles
- XX. Artificial Intelligence in warfare

Currently, it is very difficult to predict the likely outcome of a future war given the description of the aforementioned weaponry system. But speaking in this manner would be foolish. We'll need to comprehend their potential. India will need to be resilient in order to guarantee its national security in the current strategic international environment as modern weapons accumulate in our neighborhood.



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