
Futuristic Technologies and Weapon Systems of the 21st Century

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“Technology has forever changed the world we live in. We’re online, in one way or another, all day long. Our phones and computers have become reflections of our personalities, our interests and identities. They hold much that is important to us.”

—James Comey¹

Technology is the application of scientific knowledge for practical purposes that involves development, processing and management. Technology is dynamic and keeps on improving at a high speed. Currently, we are in the Information Age and a variety of advanced technologies are being used in our day-to-day life. For instance, in communications technology, today the phone can prepare a PowerPoint presentation, construction material are being fabricated on 3D computers, blood can be tested without samples, a guitar can be played using an application and learning can be done by Artificial Intelligence²—exemplifying the advancement under the use of technology.

In terms of nation building, technological empowerment leads to building of comprehensive national power. A nation’s standing in the world is directly related to its technological empowerment. For instance,

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the country that wins the highest number of Gold Medals in the Olympics is also technologically the most empowered nation in the world. More importantly, technology and doctrine are the important ingredients of military strategy, as exemplified by the use of atom bomb during the Second World War, and use of airpower and precision strikes during the Guld Wars.

Notably, network-centric warfare is the order of the day and all countries are structuring their forces to fight on this concept. To which, the Indian Army is also leaving no stone unturned to be digitised and fight a network-centric warfare. India has taken measured steps towards empowerment of technology. However, there is a need to examine the current state and the measures needed to optimise the technological usage in India.

It remains undisputed that technology and modern weapons are force multipliers for enhancing combat potential. The process of modernisation primarily results in infusion of technology to doctrine. An example of this would be the Chinese developing the DF-21 D Anti-Ship Ballistic Missile, which has a range of 1,800 km and is capable of accurately targeting warships on a Carrier Battle Group. Improvement of capabilities by this method would also enhance deterrence which is a mind game to avoid conflicts. The future battlefield as discussed will have the following features: (a) practically no warning with periods of high tempo and density; Transparency of Battlefield will be enhanced; Non-linearity of operations. Operations linked to Artificial Intelligence could commence with destruction of Satellites on Outer Space, Cyber Warfare, Operations by Special Forces, covert actions in depth areas followed by multiple intrusions and an offensive in one of the weaker spots of the enemy. Combat Zones for land warfare would be deeper and wider. The entire combat zone would be network-centric and would be to a large extent fed by autonomous systems. Future Warfare would be asymmetric in nature and to a large extent depend on flexibility of mind and equipment to deal with these conditions. Operations in the Indian subcontinent would be against a nuclear backdrop.

It would be interesting to note the critical technologies that would be important for the Indian Army. Development of these would lead to enhanced capabilities of the Indian Army. Critical technologies for futuristic requirement of the land forces which would be needed are that of: Nano Technology, Big Data, Quantum Technology, Bio Technology, Artificial Intelligence and Robotics, Micro-Optronics, Information Security, Radar and Microwave. Satellites, Rockets and Missiles, Material Science, Manufacturing, and Nuclear—all these technologies would lead to development of weapons which would be state of the art and capable of ensure soldiers are capable of attaining success.

Military combat has always led to exponential advances in technology. This is exemplified by the futuristic weapons, such as:³ BAE systems ADAPTIV Camouflage, that masks an object's Infra-Red signature and prevents detection by giving an appearance that it forms a part of the surroundings. This makes thermal imaging systems ineffective and ensures own equipment are offered some protection from quick detection. Applying this technology, CV90120-T Ghost (the Swedish T Ghost) is a camouflaged tank that makes it invisible to enemy thermal imaging systems and allows to strike without detection.

The other weapon systems like Magneto Hydrodynamic Explosive Munition (MAHEM) uses a magnetic flux generator to fire a projectile without the use of chemical explosives creating a more efficient and precise launch system; TASER Shockwave is a large-scale area denial system designed to assist with controlling mobs or stone pelters in a counter insurgency situation; and Modular Advanced Armed Robotic System (MAARS) is a robot that can be armed with a 400 rounds M 240B machine gun, a grenade launcher and possibly drag injured soldiers out of danger.⁴

The other advanced weapons include the Northop Grumman MQ-8C Fire Scout, an Unmanned Aerial Vehicle (UAV) designed to provide reconnaissance, aerial fire support and targeting for ground troops-

capable of carrying out all designated functions.⁵ Similarly, the Black Knight Unmanned Combat Vehicle is designed for high risk situations to avoid unnecessary danger to human troops and Extreme Accuracy Tasked Ordnance (EXACTO), a weapon essentially for snipers with the ability to home in on targets and even change course in midair to compensate for target movement or changes in wind speed. To add, the Obrum PL-01 Stealth Tank with its stealth technology is the first armoured vehicle that is practically invisible to both infrared and radar detection systems.⁶

The new-age weapons also include: Precision guided Fire Arms, used for target tracking, advanced fire control and heads up display technologies to guide a bullet to the target; Laser Weapon System (LaWS) that enables pin point engagement of targets by using laser; and Laser Avenger, an air defence weapon system that can be mounted on a vehicle and used to shoot down enemy Unmanned Aerial Vehicles.⁷

While in ‘guns,’ the new weapons include Personnel Halting and Stimulation Response (PHASR) rifle, a non-lethal incapacitation device designed to temporarily blind and disorient targets; electromagnetic rail gun with a capability to fire projectiles at over 7,200 km per hour and smashing through concrete structures 160 km away.⁸ The US, Russia, China and India are developing these weapons.

With such significant advancement made in weapons and weapon systems, the Indian Army is modernising and doing its utmost to induct future technologies applicable more than a decade from now to ensure that its troops become high-tech combatants and weapons with longer range and lethality are inducted.⁹ While India is the second largest importer of weapons in the world; however, the *Atmanirbhar* policy has given full impetus to indigenisation of defence products. The Indian Army must work out a pragmatic plan to induct state-of-the-art weaponry to undertake a two front war. This would be best done by the Army Design Bureau which should work closely with the DRDO, the private sector and the Academia, adopting a holistic approach.

The moot point here is ‘Know Why’. In this process, the MSEMES, duly funded in collaboration with companies abroad can get India the technology needed for building such futuristic weapons and weapon systems, thus offering a way forward for the Indian Army to modernise and improve its capabilities.

Notes

1. James Comey, “Quote on technology,” Brainy Quotes. Available online at www.brainyquote.com, accessed on October 8, 2020.
2. Karekha Ramney (2013), “What is Technology-Meaning of Technology and its use,” useoftechnology.com. Available online at <https://www.useoftechnology.com/what-is-technology/>, accessed on October 8, 2020.
3. Adrian Willings (2019), “28 incredibly futuristic weapons and modern fighting vehicles,” Pocket-Lint, June 17, 2019. Available online at <https://www.pocket-lint.com/gadgets/news/142272-28-incredible-futuristic-weapons-showing-modern-military-might>, accessed on October 9, 2020.
4. Ibid.
5. Ibid.
6. Ibid.
7. Ibid.
8. Ibid.
9. Shaurya Karanbir Gurung (2018), “Army looking at future technologies,” *The Economic Times*, July 14, 2018. Available online at <https://economictimes.indiatimes.com/news/defence/army-looking-at-future-technologies-for-better-combat-soldiers-aviation-assets-and-more-lethal-weapons/articleshow/56522747.cms?from=mdr>, accessed on October 9, 2020.