

Technological Advancements in Military Science with special reference to Artificial Intelligence: A Deep Review

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Abstract:

Military Science is the study of methods, techniques, and tools that are required to carry out proper functioning of a military organization. Military is one of the most important resources that a country needs in order to protect itself from other challengers. The development of a country is generally these days is judged by how advanced the military is and in this modern era technology is as the most powerful weapon. Here the study aims to focus on the challenges faced and the solutions to the problems. Usually, the challenges faced these days are majorly solved by the use of technology. Technology itself is a huge industry thus its divided into many segments therefore, the main objectives here will be to explain the technological advancements as well as the use of technology related to the military.

Keywords: Military Warfare Communication, War Defense Automation, Radar Satellite, Navigation

INTRODUCTION

The world of modern time has provided us the possibility to computerize and automatize anything possible but how far this advancement has led us in the field of military and warfare? Currently, this power rests in the hands of supnation and many organizations and is used at a large scale but how are they using and managing it? How do they make changes and development on the systems they utilize?

All these computers and machines that we use are or can be considered something very new and fresh technologies revealed very late to the public although the fact is that these technologies were early invented and utilized by the military beforehand countries such as France, USA, Russia have a very advance computer technology to be at least 40-50 years ahead of the current time. That means that the computers the military use now may be highly advanced and powerful by this time.

To be precise the evolution of all technologies and electronic advancements were highly boosted just because of military advancements and competition between countries. Majorly during the era of world wars I and II during the economic boom, there was a huge competition between countries who could make good and better military tech and this military tech would require the best technology and computers to perform best in the war, therefore, this competition would bring up many RnDs, experiments, program in order to invent the many computer related devices for warfare, navigation, communication, etc. all these would require many electronic devices and computers that must be compact, durable, and fast.

Literature Review

The use of technology in the military and warfare is nothing new it was being used up since the era of the first world war let it from a walkie-talkie to massive bombers all these used computer systems for working. Many countries demanded computer scientists and researchers to make their warfare better and more advanced than other countries. There were many complex code-breaking computers and devices such as the enigma which was a complex and hard-to-make code-cracking device that saved millions of lives during the world war. Usually, communication was a big issue during those days those who had well-established communication always had an upper hand in war always excellent communication led to a good outcome and the world today is built on the hands of communication the phone, the internet is part of communication. The military now has the best possible communication that works in all terrain during the worst conditions as well. Therefore, a lot of work was put into establishing technological advancements for communication-related warfare.

According to High, J. (2020), rapid developments undertaken by a variety of bold and fearless Queenslanders square measure summarized by Major Thomas physiologist in his article 'Flying in Queensland: Early Difficulties', a typewritten manuscript in Queensland Museum's Thomas physiologist Queensland Aviation assortment. Writing on seven Sept 1919, physiologist mirrored on his and others' initial experiments with craft in Queensland, noting that 'flying at this day has been to this point advanced by the expertise gained throughout the war'. Macleod's article, together with alternative images and documents housed within the archive named in his honour, offer a big summary of the event of aviation in Queensland. This paper presents an outline of several aviators, events, and connections mentioned by physiologists and portrayed within the assortment from 1910-1919. additional investigation can provide an outline of people and activities throughout the subsequent decades.

According to Dasch et. al (2016), modularity in vehicle style is usually thought about as a positive attribute that promotes ability, resilience, and value savings. the advantages and burdens of modularity are thought about by finding out historical programs geological dating back to war II. employing a taxonomy developed at the U.S. armored combat vehicle Automotive analysis, Development, and Engineering Center, vehicles were thought about supported horizontal modularity, vertical modularity, and distributed modularity. Examples

got for every sort, together with the foremost in-depth try at horizontal modularity in the 1980s, referred to as the Armored Family of Vehicles.

According to Kirchner et. al (2017). The purpose of this paper is to explore how branches of the USA military conduct leadership development of their members to make on existing information of effective approaches. The military, usually attributable for its ability to develop leadership competencies, has been unmarked and offers a brand-new context for thought in coaching. coaching methods given might provide organization leaders new insight into enhancing current leadership development programs. A review of the accessible military school of thought in recent decades was conducted to see leadership development methodology for doable fungibility into the trade. The military's numerous views on service member leadership development offered perceptive strategies for application in business coaching. Four development methods were known, and the square measure was mentioned. The purpose of the military is exclusive from non-military organizations and, as such, every of the leadership development coaching approaches might not be applicable or possible for ancient staff. more exploration of leadership development within the United States of America military is needed to raise perceived the impact of the coaching.

According to Chapman, G. (2003), The thought of a "revolution in military affairs" has become such a pervasive topic of discussion among security consultants that it is currently nonheritable the shorthand of its initials—RMA—as the illustration of a large vary of loosely connected ideas and approaches in security policy. there's contestation over whether there has been, is now, or will be a revolution in military affairs, or what constitutes an amendment in security that may deserve such a reputation. there's extraordinarily little doubt that upheavals like powder, airpower, and nuclear weapons have marked true revolutions in military affairs, however, there is no accord on whether the recent changes in military instrumentation and strategy created attainable by advances in info technology ought to be referred to as a revolution

OBJECTIVES

- To know how computers are used in military and tactical warfare.
- To analyze how systems work in different perspectives fields such as Army, Air force, Navy, and space?
- To contribute different ideas and improvements in this technology.
- To understand the importance of communication in Military.
- To analyze the implementation of Artificial Intelligence with Military Science.

DISCUSSION

Computers are unit employed in the military for communications through radio detection and ranging, controlling missiles, etc. They are additionally used for coming up with missions.

Navy and service cash in on Computers for attack calculations and dominant large weapon gadgets. In sports, they are employed in high-speed cameras for capturing minute details. Knowing how this is helping modern humans and how effective it is for the upcoming era.

In the previous few decades, technology has progressed at a staggering rate. Smartphones, the net, cloud computing, and many different inventions area unit ever-changing each side of our lives. Communication, business, government, travel, fundraising, and even agriculture is affected. however, regarding our brains? Is all this recent technology an ever-changing North American nation on the inside? several assume, therefore, together with scientific discipline professionals. As scientific discipline nowadays says, "There is ... very little doubt that every one of the new technologies, junction rectifier by the net and digital technology, area unit shaping the manner we expect in ways that obvious and delicate, deliberate and unintentional, and advantageous and prejudicious."* whereas analysis into this field continues to be in its infancy and there aren't any scientifically agreed-upon conclusions, their area unit many areas wherever trendy digital technology is actually moving the manner we tend to act with the planet and also the manner our children's brains develop.

Navigation plays a significant role in the military and navigation requires very sophisticated computers and radars. These computers are in the forms of Satellites, Aircraft, Radio towers, etc. they trace or locate the coordinates of land and position them collectively.

Utilizing superb features such as GPS that allows the weapons such as bombs or missiles to precisely target certain locations of objects, Utilizing the satellites to offer an exact location on Earth. The computers are needed by the military not only to run the system but also to offer that information at the ground level to combat leaders.

Airforce uses a variety of computing devices moreover air force is considered to utilize maximum computing power as it is related to positioning, locating, and aerial supporting tasks also in many countries it is assigned to public and private aeronautical firms such as managing airspace, air traffic control, etc. These tasks heavily depend on computers and without the use of computers doing these tasks is now impossible. The air force's core functions are using Drone and fighters where the computers are the most useful, moreover, the drone is nothing else but a computer that runs remotely or by the help of AI. Fighters, on the other hand, require manual power but without the help of well-designed computers, they would be impossible to operate.

Army The fact that newer and safer ways of engaging in wars are being sought may mean that the use of computers in the army is likely to increase in the future. For instance, Guided missiles depend on computers for functioning and control, and a wide range of weapons also depend on the use of computers to function. The suits of soldiers are also computerized in order to provide them with more and more field-related information so that they can be aided all the time.

SOF assets gain marked blessings by identifying and creating use of pre-existing structures inside the EO and guaranteeing the roles these systems play inside the EO support our objectives. As a military, we might not ignore or destroy a country's entire road system and then produce a replacement road network on that to work our vehicles. Nor would we tend to plan to conduct a lodgment while not exploiting existing ocean and airports. However, as a nation, we tend to try to support a fledging state in Iraq by disbanding its existing security equipment and therefore the Ba'ath party that had antecedently ran the daily functioning of the govt. In distinction, preserving, influencing, and strengthening the social, political, and economic infrastructure higher permits the United States to realize our aims and totally embraces the by, with, and through" approach that has created ARSOF thus productive. To debate however ARSOF could use these pre-existing parts of the OE, this text initial discusses the character of those parts, then explores some specific ways in which during which ARSOF and existing components of the OE could support one another.

The Navy also depends heavily on computers most of the systems used by the navy are computer oriented such as submarines, torpedoes, and Aircraft carriers they have a huge task of navigating and managing many tasks such as Identifying between different sounds from torpedoes, sonar, ships, and marine life. Analyzing and identifying radar signatures and interpreting them. Communicating with other ships in the fleet etc.

The importance of these systems contributes to different scenarios and aspects of war.

When and how did the implementation of computers in the military come into action?

The rise within the event of the computers via the military came with the development of the latest accumulation and instrumentation like target-hunting missiles, which required the computers to hone them in onto their target, another main development was the earth Positioning System or GPS. Utilizing marvelous decisions like GPS that permits the weapons like bombs the missiles to exactly target positive locations of objects, Utilizing satellites to produce an explicit location on Earth, the computers are required by the military to run the system however place along offers that information at the unbelievably cheap level to combat leaders. The computer literate troopers are necessary because of if not maintained & operated properly, because of new & broadened tasks, there's a requirement for an additional pc literate generation of servicemen and inflated employment within the pc skills, it's come-at-able that these computers might flip additional into a liability than but, once used properly, as they often are their advantage is alone.

The computers serve in an associative array of functions & capacities that, their beginnings were modest- within the main to assist certify the measurements and arithmetic however, they kind a core a part of about all sides or branch of the military, From the mundane to the tasks on the innovative of technology. The advantages of getting a military that utilizes the computers is varied & exponential, it is simple to mention that they turn out the military additional advanced, they speed the lines of communications, they permit the military leaders to appreciate faster information of what is happening around them & then communicate that to the opposite leaders. So, the essential information is disseminated faster, they provide the military leaders additional current & precise information that they have, whether that's mathematical/scientific information, or human intelligence, The computers encourage a much

bigger flow of data, since spreading that information may be a smaller quantity refined, So, in general, the military leaders will build additional enlightened picks.

The computer within the military & their roles can still become additional advanced & critically necessary as time goes on, the computers facilitate to witness what is happening presently, with current & developing technology like additional autonomous drones or smaller devices that the common field of honor soldier will use. There are several militaries & [*fr1] devices starting from wearable detector systems to physics & ruggedized computing systems, the necessity for inflated information & technique within the world is driving the demand for raised pc systems & the weather can get on my feet to extreme environments. The advent of a network-centric field of honor thereon all platforms are interconnected nodes to deliver mission-critical information to approved personnel once & wherever it's required is driving the necessity for innovative, rugged pc systems on the world of honor, rugged physics, whether hand-held & portable computer laptop computer computers or embedded computing solutions, are integral to mission success and, in several cases, survival. Rugged computing is additional relevant than ever before, Rugged computers will operate within the powerful usage environments & conditions, like sturdy vibrations, extreme temperatures and wet or dirty conditions, ruggedized & hardened computers share an equivalent vogue lustiness & usually these terms are interchangeable. Significant development work goes on in unmanned vehicles, notably in increasing their autonomy, which might usually mean associating aboard video capability, sending intelligence back to base, that information ought to be transmitted exploitation high-quality codecs that retain the foremost effective come-at-able image quality whereas minimizing metric use.

With the continued increase within the tactic power, communication metric & wireless communication capabilities, this can continue the trend for smaller, lighter & additional power-efficient systems, we'll see the necessity to manage power in systems the maneuver portable computer laptop computer computers do, having the ability to forestall operative elements that don't seem to be getting used & dynamically power them up skilled re nata. The computers designed for military applications with optimized size weight & power, each truly little kind issue pc company styles systems to do and do to satisfy cheap mark come-at-able throughout this regard, several fail to want into thought the two most vital factors, performance-per-watt of power and cooling. GMS will use multistage regulators to understand absolutely the best regulator potency and utilize cheap power, it is designed to work with each GMS product to cut back power consumption, although it is entirely a fraction of a watt, the opposite key distinction is that the cooling system.

Space is a field where without computers it is impossible to achieve anything, every satellite is nothing, but a computer and space organization also play a key role in military ware fare they provide real-time images, key Intel to the respective forces the equipment s they use contains very advanced and sophisticated computers. They are usually made with a lot of research and by scientists. They provide a key role in supporting the respective military force and whoever has them will always have an upper hand.

Secret and Intelligence services use technology that only a handful of people know about. Today a war cannot be only by force but by using intelligence and strategies knowing the action of enemies beforehand will always help in any situation and reduce a countless number of lives. Secret agencies such as RAW, CIA, FSB, Mossad, etc. have many advanced technologies which are used by spies and classified services to gather prehend information. Few technologies they use are mini drones, emps, Password crackers, Hidden transmitting devices etc. Usually, the tech used here is highly classified and made compact for hidden and safe use.

CONCLUSION

The modern world has offered us many possibilities and advantages by adding computing power to anything and any object it just makes it more powerful, but the outcomes are pre-decided as war and violence always leads to destruction. A weapon on its own is very destructive beforehand and then adding computing power and automating it will make it more harmful. In modern times to stop violence, we require violence, and this violence is expected to be in form of defence for ourselves. The computers used in the armed forces are obviously advanced and sophisticated, but it is expected that they maintain peace rather than aggression.

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