Letter from executive board

Dear delegates, welcome to indian institute of techfest world mun'22 and the the disarmament and international security committee (disec)! We are more than happy to be able to simulate one of the most important committees existing today in order to be able to discuss one of the most important global issues occurring globally. As your executive board member, we promise to do our best to bring you a fruitful and efficient committee simulation. We believe that you are resilient delegates who will be able to make the most of their own experience and, most importantly, have fun while doing just that! Please keep in mind that we are discussing a very crucial issue in our world today and it requires your utmost care and dedication. Remember that you are the leaders of tomorrow! Research as much as you can in order to be able to write the best possible resolution you can throughout the conference. We believe in you, and we cannot wait to meet you soon!

All the best,

Chairperson, disec

Introduction to the agenda

From the simple use of the spear, bow, and arrows to modern high tech weapons and ammo, warfare has come a long way. The development and use of nuclear weapons, space weapons, stealth aircraft, missiles, laser-guided weapons, submarines, drones, and other weaponry have all been made possible by technological advancements. Over time, both weapons and ways to use them have changed. In former times, sneaking up on an enemy and shooting an arrow into him or hurling a spear at him was normal practise. As time went on, armour and shields diminished the effectiveness of bows and arrows, which prompted the development of other weapons. Soldiers fought in formations where they might harm the opponent the most until the nineteenth century. Later, as firearms were used more frequently, the men were given guns and deployed in multiple ranks. The enemy could be quickly and easily killed by a bullet fired from a gun. But initially, such weapons were not very accurate. The accuracy of the weaponry increased over time as the firearms got better. Machine guns, grenades, and cannons quickly gained popularity with the troops and were employed in battle. High level casualties were caused by the increase in frequency and accuracy of explosive shells that killed a group. The military has been more exposed to it as bombs' radii have grown larger and more powerful. Assault helicopters, naval gunfire, fighter jets, artillery, and naval gunfire were the next advanced warfare technology employed in waging war. Technology has always played a role in the creation and evolution of military equipment. They had a big impact on how the battle was waged. The ways in which war is fought have changed more than ever as a result of ongoing technological improvement. Technology is getting more accurate and dangerous today. The relevance of cruise missiles, which have a pinpoint accuracy, has increased recently. Warfighting technology today is so cutting edge that it is impossible to even envision how battles will be fought in the future. Since there are more weapons of mass destruction on the market, the necessity to create equipment that is smaller, faster, and more evasive in order to evade adversary detection has increased. It wouldn't surprise me to see weapons technology that leverages satellite imagery to target people on the surface of the earth. By using specialised photos, missile silos can be located and relayed to attacking units. Additionally, innovations like remote-controlled aeroplanes can have a lot of benefits. Therefore, when utilising such equipment, one should not be concerned about the loss of a pilot even if it is shot down. This is undoubtedly more manoeuvrable and capable of combat than a piloted aircraft. The precision of spy satellites will rise as satellite technology for military purposes is developed, making it simpler to destroy aircraft. While many things may

alter and militants may get more accurate when battle moves into space, there may also be an increase in the possibility of mass disaster. Even while it's all still theoretical and hasn't been implemented, or maybe even most of it hasn't been fully developed, current technology trends are moving in this direction. In order to reduce the risk to friendly forces, greater automation and more sophisticated weapons are being developed. Many new weaponry have altered how wars are waged. The size of the battlefield grows as more weapons are introduced into the conflict. Warfare in the twenty-first century is always changing and getting more complicated

History perspective

Over the centuries, warfare has progressed from primitive wars between tribal Societies to warfare between societies based on an agrarian economy and Further, to warfare between industrialized societies. Mankind has progressed Successively from fighting with bows and arrows to rifles, guns, tanks, aircraft And missiles. Scientific and technological advances, though slow and gradual in The 18th and 19th centuries, were dramatic in the 20th century.

The development of ironclad ships in the 1860s, the machine gun in the 1890s, The manned aircraft and the tank in the 1920s-1930s, the aircraft carrier and Radar in the 1930s-1940s, and nuclear weapons in the 1940s-1950s are some of The important signposts in the evolution of military technologies. Each of these Developments had revolutionary effects on the conduct of warfare. Alvin and Heidi toffler postulated that “the way we make war reflects the way we make Wealth.” Technology has always been exploited to make wealth as well as to Make war. The industrial revolution launched the second wave of historical Change in the form and nature of warfare. Mass production was accompanied By the raising of massive armies loyal to modern nation states and the mass Production of weapons. Technology was put to use to make new tools of war. Wars, in turn, accelerated industrialization. The principle of standardization was Applied to military training, organization, and doctrine as well. Written orders Replaced oral orders, giving rise to the development of general staffs. Mechanisation in warfare with new kinds of fire power vastly enlarged the scale Of military operations. The aim of war was the destruction of the enemy's main Forces on the battlefield. The concepts of total war and mass destruction were Seen in world wars | and il, and they carried on to the cold war.

The advent of nuclear weapons in the 1940s-1950s added the ultimate in Destructive power. War scenarios between the north atlantic treaty Organization (nato) and warsaw pact forces envisaged the ultimate war of

Attrition. Thus, mass destruction came to play the same central role in doctrine
As mass production did in economies. The evolution of all these concepts was a
Direct outcome of the impact of technology on land warfare.

The gulf war is widely accepted as a transitional point that contained elements
Of the past, i.e. Industrial age warfare or second wave form of warfare, which
Stressed on mass destruction (e.g. Fleets of us aircraft carpet-bombed iraqis in
Their bunkers, in villages, and everything was destroyed), and elements of a new
Kind of war. This new war was fought with precision weapons with minimal
Collateral damage and with vastly improved means of real-time information, the gulf war demonstrated a number of high-tech weapon systems,
Surveillance and target acquisition systems, and command and control
Systems. Historically, men have always attempted to extend the range and
Lethality of their weapons. In the post-modern age, technological
Breakthroughs are being achieved with increasing frequency and rapidity. The
Impact of advances in technology on the conduct of warfare can be
Characterized by a number of dominant trends, namely, the quest for the
Extension of the range of weapons, the volume and accuracy of fire, system
Integration, the concentration of maximum firepower in smaller units, and
Increasing transparency on the battlefield.

Characteristics of modern warfare technology

Some of the characteristics of modern warfare technology are given in Succeeding paragraphs :- military organizations that can adopt and promote New technologies clearly have a critical edge in “modern” warfare. Adapting the Technology developed in the civilian world, such as radios, to military uses was Not enough. They had to take the next step and actually foster the development Of technology, knowing from experience gained in wartime that this Development would be essential technology is something that can be Deliberately and consciously developed by human beings working within Complex organizations new technology is useless to military organizations Unless their members “formulate a doctrine to exploit each innovation in Weapons to the utmost.”

Militarily significant technologies are often developed almost simultaneously in Different nations. A classic example of this phenomenon is radar, which was Under development as a military technology in eight countries (france, the Netherlands, italy, the united kingdom, germany, the united states, the soviet Union, and japan) before world war il. Current versions of this same Phenomenon are the ubiquitous personal computer and wireless phone. Given The often rapid spread of new technology, the question then becomes, “who Can best use it as an instrument of war?”

There is no guarantee that a new technology, once developed in the laboratory Or even in prototype form, will receive adequate funding to become an Operational capability. Radar’s historical development also illustrates this point. The development or refinement of one technology may complement the Development of another and lead to results that no one had anticipated. An Example is the development of the small, reliable cruise missile in the early 1970s. Adding digital processors to radar seekers and radar altimeters gave Improved accuracy, stealthiness, and reliability to this new generation of cruise Missiles powered by the smaller, more efficient engine. There are many other

Cases of such synergy in the historical relationship between technology and Warfare. Just having a technology, however, is not enough. Military service also Needs access to an industry that can produce the equipment embodying that Technology in sufficient numbers ossessing a technology, even in quantity, is no Guarantee that it will be decisive in war. With nightvision devices—infrared Detectors or visual light magnifiers—modern ground forces can fight around the Clock. The availability of these devices, however, does not guarantee that they Will be used effectively.

The relationship of modern technology and warfare is that the military's initial Experience with a new technology can reveal problems with making the new Capability operational. Over time, as the technology is better understood, the Number of systems needed (both experimental and operational) to work out The bugs will decline. This means that a military service may have to invest in a Number of 511 prototypes, or even in numbers of different types of operational Models, before the technology is proven in operations.

The result of several decades of experimentation and production can be Thought of as a funnel, with many options in the beginning (the mouth of the Funnel). Gradually, through tests and the evaluation of actual operations, some Technological possibilities are abandoned and others matured. The result is a Narrowing of options (the throat of the funnel) and the eventual production of Large numbers of standard but sophisticated designs.

High energy physics

The specific area of high energy physics that promise the maximum pay off is Laser technology. Laser travels at the speed of light, has a range, which is Theoretically infinite in vacuum, and it being mass-less photons of light, has the Possibility of solving the complex logistics problems of modern warfare at a Stroke. These three factors are sufficiently important for serious considerations To be given by defence technologists to the role of directed energy weapons in The future, especially for the destruction of satellites, missiles and aircrafts.

Material sciences

The contribution this branch of science has made in the sphere of fighter Aircrafts and helicopters manufacture is immense, specifically through Discoveries of high strength, low alloy steels and polymers that have allowed for Significant reduction in their weights. Its application in armoured fighting Vehicles has resulted in real tanks having something in common with today's Toy tanks, in that they are both being made of plastic. The areas that hold the Maximum potential in defence 512 in the years to come is in the realm of nano-Technologies, i.e. Technologies associated with manufacturing processes at the Molecular level. One of the areas where nanotechnology is used is in micro Electronics mechanical systems (mems), where small groups of atoms are Manipulated by microscopic machines to produce, say, a data storage facility Wherein 500 encyclopaedia brittannicas would fit on a one sq cm chip. This Technology has also resulted in the advent of "army ants" - a class of micro-size Mobile robot that perform physical tasks and takes co-operative decisions as a Coordinated, homogenous team. They derive their usefulness from their group Action. Their use in the armed forces are manifold - from clearance of mine-Fields to carrying out damage control action in a hazardous environment to Identification and transportation of inventories in large ammunition or Ordnance depot.

Bio technology

Besides its obvious use in bio warfare - it takes only rs 2000 to produce enough Anthrax spores to de-populate an area of one square kilometres (for the same Damage, a chemical weapon cost would be rs 5 lakhs), it has a wide range of Application. Another exciting area in biotechnology is bio-molecular Electronics. The ability to design protein molecules that are organised in pre-Determined threedimensional structures gives the prospect of growing circuits. With semi-conductor molecules included in the protein framework, the bio-Chip could be self reproducing, regenerative and of high capacity. Militarily, the Added advantage could be resistance to emp effects, as well as a very compact Size for a given capacity. In addition, biotechnology would be harnessed to Manufacture very sensitive and selective biosensors, which would be Engineered to act as rapid and cheap bio-chemical agent detectors. Bio-Technology also promises break-through in the exotic area of non-lethal Technologies.

Sensor technology

If miniature devices can detect, process information, move and communicate, They can provide a very fine battlefield sensor network. Some predict the Development of small robots, a few inches in size, scattered across the battle Space to provide continuous, real time surveillance. Others foresee the Development of ‘surveillance dust’, a cloud of microscopic airborne sensors that Could gather and report data for extended periods over large areas. At the Extreme, some writers envision ‘fire ant warfare’, with the battlefield dominated By millions of small machines networked together, recognizing friend from foe, And able to make large areas impassable to enemy troops.

Synergy of technologies

An exciting system in the realm of converging technologies, currently under Development by the united states is the objective 514 force barrier system, an Individual soldier's integrated clothing. Research is being done on this subject By the us institute for soldier nano-technologies, which will emphasise Revolutionary materials research toward development of advanced soldier Protection concepts. This approach will integrate a wide range of Functionalities, including multi-threat protection against ballistics, sensory Attack, chemical and biological agents; climate control (cooling, heating, and Insulating), possible chameleon-like garments; biomedical monitoring; and Load management. The objective is to enable a revolutionary advance in soldier Survivability through the development of novel materials for integration into The objective force warrior system. Major influences of it, bio, nano Technology upon future warfare are :- ubiquitous miniaturized/networked Multi physics, hyperspectral sensors. Robotics/automatics “in the large”. Long Range precision strikeftargeting. Info/net warfare. Mini/micro/nano satellites, Cruise missiles, uav's. Binary bio weaponry. Miniature/ubiquitous “smart Mines”.

Future war scenario

The major significance of these emerging technologies is not that they Incrementally increase the capabilities of existing forces but, rather, that they Radically alter the traditional theories of military effectiveness. Since the gulf War, we have seen that forces equipped with precision munitions are able to Strike anything they can see. Advanced technologies are bringing smaller, more Rapidly deployable and flexible ground forces to conflicts. These forces would Benefit greatly by improvements in situational awareness. Soldiers could be Equipped with gps, video and real time interactive voice communications Linked to unmanned aerial vehicles (uavs). Images acquired by these sensors Could be transmitted in real-time to commanders up the 515 chain for them to Identify accurately the location of friend or foe, see the battle space from Numerous vantage points and respond appropriately. Convoys, subject to Ambush, could have uavs flying ahead to alert them to any problems. Precision Munitions linked to better situational awareness would allow for rapid and Surgical strikes that could engage targets while eliminating collateral damage. Increased force protection for our personnel will also be enhanced by emerging Technologies. Although situational awareness is a major contributor to force Protection, these emerging technologies promise much more. Soldiers can be Provided with ultra-light body armour and mine resistant vehicles. Lasers and Directional electromagnetic pulse weapons can destroy incoming surface-to-Surface, surface-to-air, and surface-to-ship missiles. The rapid introduction of New technologies will change the very nature of future conflict, and this change Will continue well into this century. A redeeming feature of these technologies Is that they would apply equally well across the full spectrum of conflicts Relevant today and as envisaged in the future.

Possible routes for solutions

Note to delegates:

These routes are essentially directions in the search for solutions. They are not The final solutions themselves. Assuredly, one of the two routes, or perhaps a Mixture of both, will undoubtedly become the ultimate direction and source of Guidance for the committee over the course of the conference.

Throughout history, technological advances have always created asymmetries That could be exploited in warfare. At the outset, rapid technological advances Usually favour the attacker, with defensive counter-measures lagging behind. As the pace of technological change accelerates, regional or global balances of Power could be radically transformed by a simple software update. Yet there is Little shared awareness and technical literacy of how these transformations will Inevitably and rapidly reshape security policies and military doctrine.

The world urgently needs a more informed discussion on how to manage the Development and application of innovations that have both civilian and military Applications. Approaches should come from across the diplomatic, legal and Regulatory field, and be informed by normative or ethical considerations. Before Such a discussion can happen, however, there is a need to demystify the issues And establish commonly understood definitions and shared narratives Autonomous weapons, bio-weapons and cyberwar are three areas where Greater literacy is urgently needed. While some of the applications described Below may seem as fanciful as their portrayals in popular culture, change can Happen quickly: not long ago, a situation where everyone has a small, always-Connected computer in their pockets would have seemed like science fiction Too.

Autonomous weapons

Last year, more than 3,000 scientists wrote an open letter calling for a ban on Autonomous weapons: machines which can be programmed to identify a Target and decide to open fire without needing to check with a human first. While the technology is not there yet, some 40 countries are estimated to be Working on developing autonomous weapons. Experts in davos stressed the Importance of moving fast to come up with international agreements related to This technology.

Bio-weapons

It would currently cost around $35,000 for an individual to construct a basic Biotech laboratory that is capable of manufacturing a bio-weapon such as a Virus that attacks only members of a specific racial group. Akin to a small Brewery, such a lab could be located in a home basement or garage. The Equipment is not sophisticated and all the necessary knowledge is available Online.

Cyberwar

With critical infrastructure, transport and communication systems increasingly Connected through the emerging ‘internet of things”, this presents new Vulnerabilities for cyberattacks to cause widespread damage in unpredictable Ways. Some experts believe it is now possible for a small group of private Individuals to replicate stuxnet, the best-known example of a state-sponsored Cyber weapon.

Furthermore, there need to encourage fresh thinking about the kind of Collaboration demanded by new forms of warfare. For example: when critical Infrastructure is privately owned and operated, from electricity grids to flight Control systems, how can governments and the private sector collaborate most

Effectively to improve its security? It is important to note that not all sub-state Actors are hostile. In 2015 chicago hosted a discussion on the foreign policy of Cities, so how long before they formulate a defence policy to go with it? With The capacity to attack becoming more and more decentralized, what are the Most effective ways to decentralize defence to the community or individual Levels?.

Conclusion

Though the conduct of warfare is changing, it still has some constant Determinants. The root cause of war are people, whether political leaders, Nation states or non-state actors; they will continue to be involved in wars or Conflict for fear, revenge, hatred, greed or other human emotions. It will still be A contest of wills accompanied by death and destruction. Ambiguity and Uncertainty, the fog of war, would continue to be its features. The artistic side of War will remain: creativity, intuition, leadership, motivation and decision Making under conditions of limited information.

Technology has changed the traditional thought processes on military Effectiveness. Increasingly, modern armed forces are endeavouring to obtain Superiority over the enemy by qualitative means by deploying advanced Technologies. The shift from “mass” and mobility to non-traditional methods of Enhancing relative combat effectiveness is being achieved by integrating a Number of evolving technologies. Developments in imaging, remote sensing, Night vision, sensors, precision guided munitions, stealth technology and above All digital communications and computer networks are compelling us to adopt New warfighting techniques. The current “silent” revolution in military affairs, However, has not been accompanied by an examination of its impact on our Force structures, organisational aspects, doctrines, quality of leadership, human Resource development and logistics. This is especially so in the indian context. The 20th century saw the face of warfare being changed by mechanisation, Aviation and communication; the 21st century would see, with the help of Evolving technologies, armed forces conducting knowledge-based warfare. In The indian subcontinent, future war will be a hybrid of the industrial age and Knowledge based warfare.

As van creveld says in his book technology and war, “the greatest victories that Have been won in war do not depend upon a simple superiority of technology, But rather on a meshing of one side’s advantages with the other's weakness so

As to produce the greatest possible gap between the two.” The vietham war Was one such example. We, therefore, need to understand the technology Driven changes and evolve doctrinal precepts to meet the challenges of warfare In the next century. Although technology is making great advances, human Beings remain the most effective systems for determining relevance and fusing Information. Technology will aid us in many ways, especially in helping offset Reductions in size, but technology will not solve all the problems associated With war. Conduct of war requires both science and art. Good leadership, Quality soldiers, cohesive units and streamlined organisation, are absolutely Necessary.

Guiding questions

1. Technology has changed the traditional thought processes on military Effectiveness. Increasingly, modern armed forces are endeavouring to obtain Superiority. What are the changes required, if any, to the existing un Resolutions in this regard?

2.what framework ought be drawn to provide for standardisation of Manufacturing and design of modern technology used in warfare?

3.what framework ought to be drawn for marking, record keeping and Tracing of modern weaponry?

4. What regulations can be introduced to ensure the safety and security in Light of modern technological weaponry?

5.what limitations and ethical boundaries ought to be drawn around the Utilisation of technology in modern warfare?

6.what guidelines can be carved out for public-private partnerships for the Production of such technology?

7.what are the joint and several responsibilities of states to maintain International peace in the light of such weaponry?

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