

Building a Virtual Military Force for National Security, Stability and Development of Sri Lanka

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Abstract- The aim of this research paper is to explore the novel interpretations for building a Virtual Military Force for National Security, Stability and Development of Sri Lanka. The Virtual Arms Room, as a battle learning system, provides secure, distributed version control and data management empowered by AI on cloud platforms. The research discusses the importance of developing demanding interpretations and vital concepts to build a Virtual Military Force. The study was conducted in a qualitative approach in reviewing of 64 research papers by meta-synthesis method followed by Meta - Thematic Synthesis and Critical Interpretive Analysis. It reveals that, Virtual military capabilities will ensure that the Army is gained the competitive advantage to win the real wars over its contemporary adversaries. The results also suggest synergistic effects of building a Virtual Military Force for National Security, Stability and Development of Sri Lanka is important due to it guarantees the national interest, freedom and the preservation of our way of life, formidable for future. Moreover, it demonstrates that Virtual War is the more strategic, enduring and powerful form of conflict as it is capable of creating affective overmatch, which enables the exploitation of human cognitive behaviour. This paper analyses various concepts and develop novel interpretations future scopes of significant as the practical application that vital to build a Virtual Military Force for National Security, Stability and Development of Sri Lanka.

Keywords— *virtual, digital, war, military, weapons, learning, training, synthetic-immunity, artificial intelligence, machine learning*

I. INTRODUCTION

The human affairs have grown over past three centuries vibrantly with the invention of the internet and world wide web and its impact on virtual

revelation in recent past (Avinadav, Chernonog and Khmelnsky, 2021). Its effect on developing a massive data transaction over the big data annualizing, high-tech heuristics and internet of things (IOT) forces the mankind to learn, communicate, and decision make under the phenomenon global technology structure (Haubenwaller and Vandikas, 2015). Furthermore, the ungoverned flow of mega-data is compelling the world's data management giants, primarily the US and China to race in becoming the new world Super Powers (Wang and Gao, 2021). Incidentally, the global virtual colonization directs the tech giants to compete themselves to power lift in data collection and processing powers to digitally weaponized to deter the geo-political influences in the behaviour of world affairs. Meanwhile, the new phenomenon empowers with the freedom of action to state actors to outmanoeuvre the competitive political advantage while indirectly enable non state actors to create fraud and deep fakes (Kun, Tong and Xiaodan, 2019), by manipulation of information related to millions of connected humankind around the world.

The goal of this paper is to present Virtual Military and its learning concepts that can help the Sri Lanka Military to win the real war notwithstanding for a primarily designed ideal war. Winning the real war will guarantee the national interest, freedom and the preservation of our way of life, formidable for future. The profound definition of Virtual War is: use power of invisible efficacy to direct human behaviour for profit or positional advantage. This is signified by the global efforts taken by the states and mass scale high tech non state actors (informational enterprises) over other states actors and adversaries over strategic deception weapons and operations over past three centuries. Meanwhile, the US and China and their tech giants possess a large scale virtual combat power (Instrumenting the national power in informational strategy) that had developed in bond of massive civilian technology enterprises in

compared to other states. These realities are producing security threats in global economic, social, governance. Likewise, the Middle Kingdom is exercising an informal means of state control through the digital enforcement of acceptable cultural norms and values in example as, is using biometric scanning to digitally grade its citizens and to gain state social control. Besides, it governs social standards citizen and rewards or punishments accordingly to achieve global social control, through the enforcement of its centralized digital societal parameters and effect to digital monetary transactions, global currency in future by authoring monetary networks to indirectly achieve the global social control end game they desire (Liu, Wang and Woo, 2019).



Figure 1. Virtual Primacy over Military Domains

Source: Author

A. The Nature of Warfare

According to Clausewitz, the nature of warfare today is evolved with the experience of what human consisted with primordial violence, hatred, and enmity and it constantly evolves (Waldman, 2014). The westernized military culture has historically taken an direct approach on application of military power but the nature of warfare changes quickly and indirectly as per the common agreement of the military practitioners. Similarly, adversaries to a nation use indirect approach of military power application in many forms. This confirms that a military not to see the real war in direct sights and demand themselves to prepare for engagement that go beyond the staff college's doctrines (Angstrom and Widen, 2018). Beyond, it makes a platform for leaders and soldiers to make decisions and prompt action in time and space, at the inputs assisted by Artificial Intelligence and Machine Learning (AI &

ML) (Pennington, 1988). The winners of the real war are determined by the accuracy and reliability provided to information with above technological advancements.

The traditional warfare was based on what things physically seen on battle space, but the modern warfare has created every citizen a virtual fighter who are vulnerable through use of internet is fixed to a (JSTOR, 2021; US Army Publication, 2021; Moving ahead in the virtual battlespace, 2021) Virtual Weapon System. A person's location, identification, monetary and intellectual property are threatened for a potential attack on cyber space. In instance, virtual battle space is now earmarked homes, commercial data centres, offices complexes as vulnerable points.

B. B. Ideal War Vs Real War

The "On War" of Clausewitz explains, that "Ideal war - philosophical abstraction - a logical fantasy" (Waldman, 2014). Modern ideal - attrition warfare as what militaries are employed to fight. Contrariwise, Clausewitz describes that real war is constrained by political motives and tactical ground limitations of human nature, time and space (US Cyber Directive, 2011) where many militaries are dislike to be fought with. Any military force that wish to fight a real war need a different learning system and to be equipped with a new radical weapon system.

The Sri Lanka Military Force is confidence at projecting kinetic military operations, yet another portion of the military is capable of employing informational combat power. The projection of equal levels of competencies will only be possible to fight a real war in Sri Lankan soil. The current binary military should focus to recruit and train a potentially blended military force for Sri Lanka that holds soldiers who are able to operate both kinetic and virtual weaponries, as they manoeuvre in physical and virtual battlefields when confronting with adversaries of Sri Lanka. Virtual warfare sets (DCDC, 2014) conditions for a successful physical war. Virtual War is becoming more strategic by providing an overwhelming endurance for the force projection in capable of exploiting the human cognitive behaviour that enduring strategic value while, retaining the prominence of temporal tactical effects (Moving in VB, 2021) of physical war, that still eminence over virtual war in the context.

C. Art of Military Learning in Modern Warfare

Militaries need to timely change its within learning strategies with the excellence and effectiveness in military learning systems to dynamically adjust learning systems to control the competitive advantage. Reconceptualising the art of learning when the enemy at gate is dare to win wars. Moreover, War on the Rocks, (2021) and Crivellaro and Leavenworth (2013) mention the militaries employ the kinetic weapons for each spectrum of war, even under realization of possible negative outcomes. The militaries and national allies must re-imagine the learning strategies in changing the functions, forms and logics of modern warfare.

The authority, power, decision making, and mission/task oriented planning are mechanics of a military learning system Bynum (2013) and Labib (2016) which have got challenged due to technological advancements in military and commercial that hierarchical armies struggles to remain sustainable, mission command and decision-making increase the military values and norms.

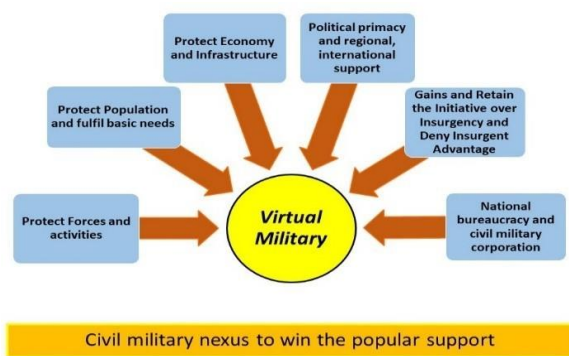


Figure 2. Virtual Military Domination

Source: Author

1) The Triple Loop Military Learning Solutions

The Military uses a single and double loop military learning strategy that be inherent in triple loop military learning system (Bynum, 2013 and Labib, 2016). Single circle learning portrays the sort of exercises that take put when the objective is to fix technical issues inside the current context. The Single loop military learning ensures militaries do right things relative to assigned military tasks under existing conditions and standards Bynum (2013) and Labib (2016). The hypothesis behind the single loop military learning is to make efficiencies but not to organization transformation. Double loop military learning system ensures that, organizations are doing

the correct things with a changing form within the existing organization paradigm. As Bynum (2013) and Labib (2016) argues the Triple loop military learning system marks a vital change forms within and externally in any of the existing organization paradigm, by implementation of reborn governing mechanics and principles for organizational sustainability in long run. The Triple loop military learning is premeditated to unravel complex versatile issue circumstances and to form progressive organizational change.

2) Triple Loop Military Learning Solutions - Model Example

Figure 3 illustrates how, the Sri Lanka Military stands in relation to its military learning theories, since the independence. Mainly, the Sri Lanka Military employed UK defence doctrines against the terrorism in Sri Lanka. It included assigned military tasks under existing standards for periodical conditions to warfighting against terrorism in single loop military learning. The humanitarian war approach made vast different in learning strategy by reframing the logics of conducting of warfare and application of COIN Doctrine and indigenous tactics developed within the militaries. This is an example of double loop learning where the Sri Lanka Military changed decisiveness of winning the war. The Military began to use information and cyber combat space, to protect the political interests of warfighting as a nation. Winning the "Humanitarian War" highlighted the significance of triple loop military learning in "Real War" made the Sri Lanka Military, to deal with multifarious solving of problems demands by a Virtual War.

D. Scope and Significance of the Study

National Security, Stability and Development can be achieved by an effective and efficient military modernization of a country. As a main entity of Sri Lankan government, Sri Lanka Armed forces also faces the challenge of playing a major role in ensure national growth and security in an innovative way. Sri Lanka Military must re-imagine on changing the forms, functions and logics of warfare (Labib, 2016) in order to learn and adapt in advance to adversaries. Virtual Warfare has become more strategical in fields of military capability to apply mixed paradigms of war to realize of adversaries' acts in mixed (physical/virtual) battlefields (Kearns, 2015). Modernizing of Sri Lanka army that struggles to remain sustainable needs firm decisions to cater virtual military paradigm in comparing to contemporary militaries. The modernization of the military in to a sub section of

virtual military would require a series of concepts and frameworks in a theoretical background to find the feasibility of applying such innovations for Sri Lanka Armed forces in effect to National Security, Stability and Development. How does the Sri Lanka Armed Forces to decide when modernizing a military to a virtual spectrum in its feasibility and effectiveness? This study is aimed for unveiling such theoretical concepts should involve in Building a Virtual Military Force for National Security, Stability and Development of Sri Lanka.

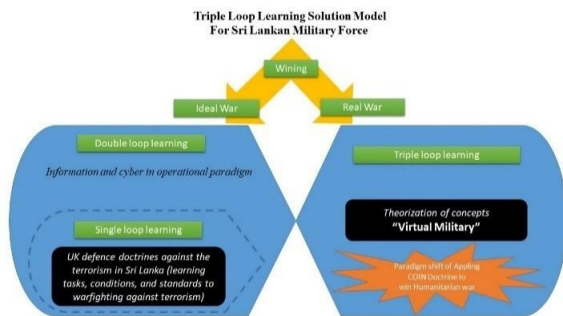


Figure 3. Triple Loop Learning Solution for Sri Lanka Military

Source: Author

II. METHODOLOGY

Building a virtual military is a strategic long-term decision to an organization that requires high-level evidence for research and knowledge transfer. Therefore, authors worked on three specific objectives to: (1) theory building; (2) theory explication; and (3) theory development based on meta-synthesis method and followed by Meta - Thematic Synthesis and Critical Interpretive Analysis. The theories explore the main conceptual factors that Sri Lanka Armed forces must address to decide on modernization towards virtual military. Building a virtual military should process includes reconceptualising of the findings and then interprets them to create new insights that may include generating new theories, developing conceptual models, identifying gaps in research, adding breadth of understandings to existing knowledge, providing evidence to current state of knowledge, etc. A whimsical decision to move to the virtual military will ensure pathway for National Security, Stability and Development of Sri Lanka.

A. Analyse the literature by Meta-synthesis method

The aim of this research is to practise a meta-synthesis method for analysis and synthesis of previous published studies and theories for a virtual military concept in building for National Security, Stability and Development of Sri Lanka. Meta-

synthesis attempts to integrate results from several different but inter-related qualitative studies. The technique has an interpretive, rather than aggregating, intent, in contrast to meta-analysis of quantitative studies. Literature on Virtual, Digital, War, Military, Weapons, Learning, Training, Synthetic - Immunity, Artificial intelligence/ Machine learning related papers were searched and reviewed. For develop this theoretical concept, authors reviewed 64 research papers from published journals, concept papers and conference proceedings. The virtual military concept extracted from these papers are classified to related sub-categories and categories. Then, the theoretical and conceptual substantial for a virtual military are developed. It includes four main concepts engaged with virtual military in a sub-category. By providing a systematic approach for researchers, meta-synthesis method explores new and essential concepts through synthesizing qualitative research. Meta synthesis method creates a comprehensive and wide spread view toward the problems in addition to promote the current knowledge. It also is a method of reinterpreting and reshaping existing qualitative findings (McClellan and Shaw, 2005). A qualitative meta-synthesis is a technique that combines results from a variety of studies with a common theme. Per se, -The sample for a meta-synthesis, then, is made up of individual qualitative studies selected on the basis of their relevance to a specific research question posed by the synthesis (Zimmer, 2006).

III. RESULTS AND ANALYSIS

Using Meta-synthesis analysis followed by Meta - Thematic Synthesis and Critical Interpretive Analysis:

JSTOR (2021), US Army Publication (2021), Moving in VB (2021) states that modern warfare has created every citizen is vulnerable to combat in a virtual battlefield when or once connected to internet to be potentially attacked by virtual weapons. Similarly, some authors such as Gen E- Dempsey (2013); U.S. Army, (2015) streamline the contribution of virtual military to a successful accomplishment of Virtual-Military Mission-Essential Task-Lists assigned to a unit. In early search, based on keywords we found 478 related articles. After investigating the title, it is determined that most of them are related to other research fields of cloud computing and 163 articles are selected for review. After studying the abstracts, 100 articles are chosen for full content review. After a full review of content, 36 articles are rejected and finally 64 articles are obtained for in Meta-synthesis

analysis (see Table 1 for major synthesis). The number of selected papers with separate years of publishing, relevant databases and search engines and also the process of searching and selecting appropriate articles are shown in (see Table 1 for major synthesis). The major interpretations models are shown as figure 1, 2, 3 and 4 respectively.

A. Meta-synthesis analysis on Building a Virtual Military Force for National Security, Stability and Development of Sri Lanka

1) Statistical Data Analysis from the Questionnaire.

Table 1. Meta-synthesis analysis – Interpretations.

Authors	Virtual Military Paradigm
JSTOR, 2021; US Army Publication, 2021; Moving in VB, 2021 (DCDC, 2014)	The traditional warfare was based on what things physically seen on battle space, but the modern warfare has created anyone a virtual fighter in internet with digital weaponry systems Virtual war strategies design required conditions in physical war
Rocks on War, (2021) and Crivellaro and Leavenworth (2013)	The Military is apply kinetic weapon even by knowing the negative results
Bynum, (2013) and Labib, (2016)	The Triple loop military learning makeover possibilities in and out of an organization with new governing principle for sustainability
JSTOR (2019); Ichimasa et al., (2011)	The VMAR is a classified and clouded service to facilitate military learning and management systems with virtual military weapons that required for military use
Gen E Dempsey (2013); U.S. Army, (2015)	The availability of an grands options of machines and information platforms accomplishes Virtual Military Mission-Essential Task-Lists
FM, (2003); Kearns, (2015)	These VAR services learn in advancing on categorizing, interrogating and indexing the identified, existing and new virtual military weapon systems
Thomas and Ziring, (2015); Warren, (2016)	Unclassified/ Classified VMAR networks will enable users to access and use information/data that support projected Virtual Militaries under authorized protocols across security networks
US Army, (2019); Synthatic Biology; Wassung, US MoD, (2015)	The Synthetic Battle Immunity System (SBIS) is a concept to protect men in Virtual Warfare which designed as human immune system
Hannay et al., (2015); Angstrom and Widen, (2018)	The VAR's cloud services provides conditions to train virtual tactical manoeuvres in virtual military training ranges in global proximity avatars

Source: Authors

2) Mata - Thematic Synthesis.

The research is re-synthesized to generate high-level evidence for research and knowledge transfer in several approaches developed to synthesize qualitative studies by meta-ethnography and qualitative cross-case analysis followed by thematic synthesis.

3) Critical Interpretive Analysis.

The authors aimed to move beyond summaries and to offer novel interpretations of findings from primary studies in meta-synthesis. It is a method for integrating the results of (phenomenological) studies by understanding the existing knowledge in nature of qualitative meta-syntheses are exploratory-descriptive an interpretative, broaden the understanding of a phenomenon and associations with current interpretations postulations through integration of several inter-related qualitative empirical findings.

B. Building a Virtual Military Force for Armed Forces Sri Lanka based on complementary findings

1) Virtual Military Arms Room for Sri Lankan Military Force

The firm confidence on the information as a weapon in battle space domains the Sri Lanka Military now experience a paradigm shift. The research introduces the vital concept of designing a "Virtual Military Arms Room" (VMAR) to cater new military learning challenge. The VMAR is the centre component bundle of any Virtual Military Force (Ichimasa et al., 2011) and makes a new military learning system to support any soldiers' survivability in actual battlefield. The study identifies that, the VMAR is a classified, cloud hosted information software system to host connections to access of military learning and management of military virtual weapon bundles (A Case against Virtual Nuclear Testing on JSTOR, 2019; Ichimasa et al., 2011) which provides the backbone services to host networks, security and analytics, developer solutions and AI/ML services that progress to design, categorize and employ in virtual battlefield of Sri Lankan military context.

Software management and extreme data processing are latest weaponry that virtual soldiers could employ on battles. The results of the study are discussed that, the bulk information flow of military only will not win wars but the military men should be able to perform digitally assisted for search and learn computer code inventories, platforms and data servers to accomplish of missions effectively. The

study identifies that, developing a military man demand end learning protocols to create synthetic battle immunity of modern warfare to access in securely via the VMAR (USArmy, 2019) and create discovery searches via revelation looks through digitalized colleagues fuelled by AI integrations to search the most validated digitalized military weaponries to employ.

All levels of Sri Lankan military commanders should integrate tactical capabilities could effectively influence mixed Warfields. As stated by Gen E Dempsey (2013); U.S. Army, (2015) the availability of an array of IOT and information platforms in accomplishment of Virtual- Military Mission-Essential Task-Lists of units. The study identifies that, the new domain in Virtual War Drills can be developed through by executing digital functions, using daily by Soldiers. Operating in cross-domain virtual environment is essential for each Service sub units for determine to operate virtual military weaponry in future (Gen E Dempsey (2013).

2) *Digital Military Weapon Rack for Sri Lankan Military Force*

The soldiers' immediate information support requirement is enabled though a Digital Military Weapon Racks (DMWRs) by an automated search using software system and data of AI/ML. As a result, in each task is executed by AI assisted environment with deep learning and voice command algorithms. As mentioned by (FM, 2003; Kearns, 2015) these VMAR services advances in categorizing and indexing of the available and new virtual weapons with. Soldiers' wearable devices access the virtual scenarios via command, keyboard to receive AI assisted recommendations for employable virtual weapons. To emphasize, DMWRs use an UI to automatically categorize virtual military weapons in the VMAR (Kearns, 2015). The findings of the study are discussed that; it uses the same mechanism of automated decision-making as ongoing competition of machine assistant capabilities in web based retail shopping enterprises.

Moreover, Thomas and Ziring, (2015); Warren, (2016) describe that Unclassified/Classified VMAR systems to network users with information/data that integrates the future Virtual Militaries under authorized protocols across security networks. Advancement of security platforms with AI services will dominate the use of ML and cloud infrastructures in time and space up to mile-seconds in creating conditions of a Strategic authoritative for

future Virtual Militaries to manoeuvre decisively on virtual battlefields.

3) *Synthetic Battle Immunity System (SBIS)*

The Synthetic Battle Immunity System (SBIS) is a concept in protecting men in Virtual Battlefield in designed parameters of human immune system. (US Army, 2019; Synthatic Biology; Wassung MoD, 2015). The study identifies that, SSIS is a construct of three-layer protection system conceptually bears three digital layers of battle protection for combat survivability in modern battlefields (Labib, 2016). The first layer is an Innate Immunity that endure digital external barriers of defence vulnerabilities used to locate and to target a combatant. The Active Battle Immunity (medium layer of protection) is designed via AI/ML and delivers digital viruses to hinder threat detection possibilities and distract targeting systems of adversaries in the means of EW and electromagnetic fields and imagery systems - for physical contractions (US Army, 2019). The research also lend support to findings, The Passive Battle Immunity is capable to generated information via external sources and defensive malware from externalities for military specific specific duration vulnerability of Soldiers. The study identifies that the periodical advancement of the SBIS, equipmenting and training is a military capability requirement of modern battlefields today (Kearns, 2015).

4) *Training Sri Lankan Virtual Militaries*

Sri Lankan military commanders can project training atmospheres for real soldiers in "Net-Wars" programs by using "Remote Interactive Military Training". According to Hannay et al., (2015); Angstrom and Widen, (2018) the VAR's cloud accessibility facilitate trainers to project virtual military manoeuvre in global arena. Therefore, the training engagements can be developed and practiced in virtual systems that incorporate different command levels in mission scenarios (US Army, 2019). Undoubtedly, offline servers to be used for virtual military training exercises in fair cost by using computer models in cloud. New digitally capable weapons are emerged they can be exercised while categorized by VMAR, for future employability (Ichimasa et al., 2011). The research also lend support to findings, Information System engineers have an array of choices in term of industrial AI platforms that can be used to develop and train VMARs as; "Google Artificial Intelligent, SageMaker (Amazon), Microsoft Artificial Intelligent framework and BlueMix (IBM)". The study identifies that the AI

platforms continues to advanced by commercial Information Analysis market and VMAR provides a virtual military force with options invent and use in virtual military weapon inventories. Finally, study contribute future research possibilities in novel interpretations to designing a Virtual Military Force for National Security, Stability and Development of Sri Lankaby considering the factors resulted in this study.

IV. DISCUSSION

This primary theoretical framework is constructed directly based on the extracted concepts, sub-categories and categories. It could be noted in order to avoid probable misleading, it seems better that the readers should first consider the primary research design. Then, we improve theory development based on meta-synthesis method followed by Meta - Thematic Synthesis and Critical Interpretive Analysis. Based on complementary findings and add novel interpretations (categories. Finally, we clarify reconceptualization of virtual military in a systematic approach for researchers, meta-synthesis method explores new and essential concepts through synthesizing qualitative research. Theory building for Metasynthesis method creates a comprehensive and wide spreadview toward the problems in addition to promote the current knowledge.

Its paramount important to draw an executive analysis of key research findings related to building a virtual military with the data illustrated in data presentation. The results ofthe study are discussed related to the factors effecting the National Security, Stability and Development can be achieved by an effective and efficient military modernization of Sri Lanka and to bring out basic conceptual interpretations related to the study. The study was basically charged with the modernization of the military in to a sub section of virtual military would require a series of concepts and frameworks in a phenomenologicalbackground which is feasible for Sri Lanka Armed forces in aimed for unveiling such phenomenological concepts should involve in Building a Virtual Military Force.



Figure 4. Virtual Modernization for Sri Lanka Military

Source: Author

V. CONCLUSION

In conclusion, the character of the warfare and its effects on the quality of life of human evolves with the rapidly changing technology. What seen on battlefield is empowered with the information not seen to link the knowledge on indirectly employed combined military weapons in time and space of virtual battlefield manoeuvre capabilities of adversaries. Maintaining of the own freedom of action to retain the military superiority, the Reconceptualising the art of military learning encountering adversaries, with the potentials of critical paradigm of AI/ML to win real wars. The findings of the study are discussed that, train and employ a new versatile Sri Lanka Military Force that able to fight with multi weaponry (kinetic and virtual) in any domain of war, as a challenge in front of Sri Lanka Military Force.

This study investigated the factors that, the VMAR innovates new concepts and extractions of industrial best functions/practices to advancement of military capabilities to fight modern battles with virtual assets in several fields as, digital imagery, virtual avatars, composite computing, vocal/language processing, ML/AL, VR, military digital modelling, simulation and big data handling (Ichimasa et al., 2011). The Triple loop military learning is pathway of wining "Real War" that Sri Lanka military require to generate with new governing strategies, in/out of Warfield paradigm, in addressing the complex requirements integralwith Virtual that had kept a huge leap in tech sector. Finally, study contribute future research possibilities in novel interpretations to designing a Virtual Military Force for National Security, Stability

and Development of Sri Lanka by considering the factors resulted in this study.

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ABBREVIATIONS AND SPECIFIC SYMBOLS

The Synthetic Battle Immunity System (SBIS) Digital Military Weapon Racks (DMWRs) Virtual Military Arms Room (VMAR)

Artificial Intelligent/ Machine Learning (AI/ML)

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