

*Research Article***Assessing the Legality of Autonomous Weapon Systems: An In-depth Examination of International Humanitarian Law Principles**

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ABSTRACT

The use of autonomous weapons systems (AWS) to select targets and attack them without human intervention poses a real legal dilemma. What heralds the urgency of the issue is the emergence of some unofficial reports talking about AWS entering the battlefield in recent armed conflicts. Previous literature has been inconclusive on the legitimacy of AWS. This is what prompted us to do this research, which deserves to be investigated in more depth to help reach an international consensus within the international humanitarian law (IHL) framework. The article uses a combination of both doctrinal and non-doctrinal methodology to provide a more comprehensive understanding of the issue. The methodology focuses on analyzing AWS through the perspective of IHL principles because it is the most related law by which the legitimacy of AWS can be assessed. The data collected were secondary and analyzed using quantitative data analysis to shed light on the contradiction between public sentiment and the actual trajectory of AWS development. The results show that military necessity and humanity are two concepts inherent in the true principles of IHL that do not accept measurement or compromise. The article concludes that although artificial intelligence (AI) has not yet reached a threshold that allows reliable deployment of AWS, However, the acceleration of its development indicates that AWS will be able to comply with true IHL principles in the near future.

Keywords: Autonomous weapon systems; Humanities; International humanitarian law; Military necessity; Principles.

A. INTRODUCTION

The uses of technology are no longer limited to the commercial sphere (Wilona, Latifah, & Purwadi, 2021) or legal practices (Alincia, & Sitabuana, 2021). Many leaders of technologically advanced countries are paying great attention to developing AWS rapidly. On 21 December 2020, Russian President Vladimir Putin said one of the priorities of his country's army was to work on developing an AI-based weapon system; in addition to saying that such weapons "In the near future will largely determine the outcome of a

battle" (Russian News Agency, 2020). The United Nations opposes this trend, and many countries, including non-governmental organizations such as Human Rights Watch (HRW). In 2018, UN Secretary-General António Guterres called for banning AWS as politically unacceptable and morally repugnant (UNODA, 2023). Moreover, in 2013, HRW launched the "Stop Killer Robots" campaign.

AWS is called by many names, such as killer robots and lethal autonomous weapons

systems (LAWS). Countries found developing AI-based weapon systems an essential step in preserving their soldiers and reducing the danger to their lives as they improve the quality of military operations and make targeting more accurate. AWS can identify and attack targets without additional human intervention (Leveringhaus, 2016). Furthermore, AWS has exceptional capabilities that enable it to process an infinite number of calculations in seconds by algorithms. However, these weapon systems are criticized for their lack of human intelligence and lack of feeling (Altmann, 2019). Some advocates may see these unique qualities as positive because they do not base their decisions on emotion and do not rape.

AWS pose a major legal challenge to protect civilians and comply with IHL principles (Leveringhaus, 2016). There may be confusion between drones and AWS, as the former is controlled remotely while the latter has no role for humans in its missions after it is programmed and initially operated. Moreover, according to ICRC, such a weapon system undoubtedly constitutes a new version of the forms of war when machines replace humans in combat (ICRC, 2020) that must be understood through study and analysis. Although there is no official evidence yet of the full use of AWS against humans, there are many unofficial reports of its use with different degrees of autonomy and lethality in many modern wars. The latest was the Russian-Ukrainian war (Dawes, 2023). IHL does not explicitly regulate AWS within its rules. However, according to the API to GCs, states must review new weapons,

methods, or means before use and comply with the IHL principle (McFarland, & Assaad, 2023). Nevertheless, the conventions and rules of IHL were established decades ago to deal with human combatants.

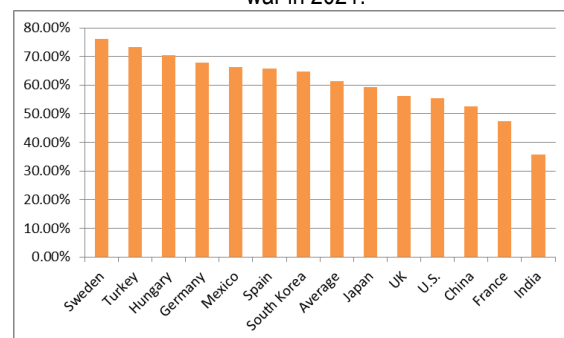
No treaty or custom in international law refers explicitly to AWS. As a result, imagining a scenario where AWS operates in a legal absence would undoubtedly impose its subjection to current international law (Acquaviva, 2021). Assuming the application of international law, including IHL, the rules established long ago, constitutes a real challenge. However, in practice, it is tainted by a lot of ambiguity and differing opinions. However, the absence of human decision in this type of weapon and leaving the decision to launch attacks on the battlefield to algorithms and AI techniques is a problematic matter. The issue of compliance of AWS with IHL raises many questions and challenges, such as the ability of AWS to distinguish between civilian and military objects, especially when used in populated urban areas (McFarland, 2023; Farhat, Nurdin, & Basir, 2022)). In addition to the extent of the capability of weapon systems to launch attacks that do not cause significant losses to civilians compared with anticipated concrete and direct military benefits in compliance with the principle of proportionality, which is called collateral damage. as well as the extent of this robot's ability to decide to stop the attack if it turns out later that the target is civilian and not military according to the precautionary principle (Garcia, 2016).

It must be pointed out that the definition of AWS is controversial. Although AWS has no universally accepted definition, it is essential to distinguish between fully autonomous and semi-autonomous ones (Schmitt, 2012). The term "autonomy" is used in various senses to refer to the ability to accomplish necessary tasks without direct human supervision and make independent decisions (Williams, & Scharre, 2015). The International Committee of the Red Cross (ICRC) defines AWS as "any weapon system with autonomy in its critical functions, that is, a weapon system that can select and attack targets without human intervention." (ICRC, 2016) According to the degree of human involvement in the acts of autonomous robotic weapons, they are categorized into three groups by HRW: (i) The "Human-in-the-Loop" Weapons with the ability to choose targets and utilize force only when given human orders, "Human-on-the-Loop" weapons with a human operator in control who may overrule the robot's decisions, and "Human-out-of-the-Loop" weapons that can choose targets and use force without the involvement of an operator (Horowitz, & Scharre, 2015). The following is the definition provided by the US Department of Defense: "A weapon system that, once activated, can select and engage targets without further intervention by a human operator (Sayler, 2023)."

Both the literature and public opinion reflect a widespread reaction of AWS. The majority of voters believe that the use of these weapons is immoral and violates the principle of the law.

In Chart 1, we delve into the position that reflects the prevalent disapproval of AWS. The data was collected from a diverse sample of 14 advanced countries in AWS development between 2020 and 2021. Therefore, that illustrates the proportion of adults in each nation expressing their opposition to using AWS in wars. These statistics reveal a consensus of dissatisfaction and strong opposition among adult populations across the surveyed nations.

Chart 1: Statistics of adults who oppose the use of AWS in war in 2021.

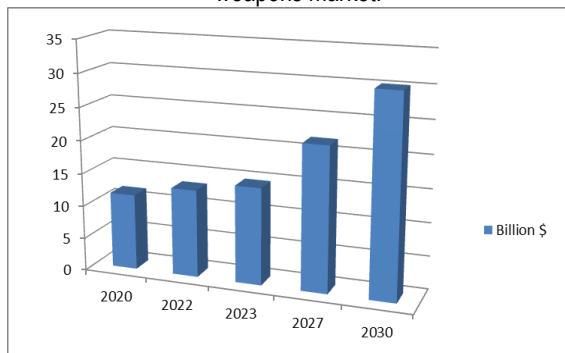


Source: Ipsos, Human Rights Watch Campaign to Stop Killer Robots.

However, despite the widespread disapproval evident in both academic discourse and public opinion, the reality reveals a contrasting scenario. The accelerating pace of growth in the global market size for AWS. That accompanies already use of AWS in recent wars, although it has not yet been officially proven, which highlights the urgent need to address this reality. This dissonance emphasizes the necessity of engaging with the issue in a pragmatic manner, focusing on making the use of AWS more compliant with IHL rather than a futile call for an outright ban. In navigating this complex landscape, it becomes necessary to find solutions

and common grounds between countries that reduce the intensity of disagreement, thus ensuring the legal deployment of AWS in the future. In conjunction with the data presented in Chart 1, it is imperative to consider the broader context of the AWS landscape. Chart 2, titled "The global growth rate of the autonomous military weapons market," provides insights into the expanding development of AWS by countries, shedding light on the contradiction between public sentiment and the actual trajectory of AWS development.

Chart 2: The global growth rate of the autonomous military weapons market.



Source: Allied Market Research.

Chart 1 has already established that there is a prevailing global sentiment against the use of AI for offensive military purposes, with the majority expressing disapproval. However, Chart 2 introduces a compelling dynamic by revealing the substantial growth in the global market for AWS. Despite the widespread votes against the utilization, the data illustrates a tangible increase in spending, indicating a proliferation of these advanced technologies.

The figures in Chart 2 emphasize this trend. In 2020, the global market for AWS had a total expenditure of \$11.56 billion. By 2022, this

spending had increased to \$13.3 billion, which indicates slight growth. Further, in 2023, the spending reached \$14.68 billion, signifying a continued upward trend in market expenditure. Looking ahead, the projections anticipate a substantial increase in spending, reaching \$21.81 billion in 2027, and an overwhelming increase in 2030, reaching \$30 billion.

This dichotomy between public disapproval, as illustrated in Chart 1, and the escalating investment in AWS, as highlighted in Chart 2, demands a nuanced approach to address the reality at hand. It accentuates the importance of recognizing the pragmatic challenges associated with AWS deployment. It calls for strategic measures to ensure a legitimate use within the framework of IHL. As the global market for AWS continues to grow, navigating this landscape becomes crucial to strike a balance between technological advancements and laws.

Many studies have been conducted to evaluate the legitimacy of AWS from an IHL perspective, but the issue is still thorny.

Nicholas W. Mull conducted his research to evaluate the legitimacy of AWS. In which much of the attention was given to the dimensions of the Martens' Clause. He boils down the issue to a question about the extent to which humans can trust AI work, such as a judge or a doctor. With his analysis of the principles of IHL, he was positive regarding the principle of distinction which can be fulfilled by AWS. The author indicated that it is impossible to carry out proportionality analyzes by AWS. What the author

concluded; humanity cannot be other than a principle that requires fulfillment with the rest of the IHL principles. The author concludes that AWS is illegal. In fact, we see treating humanity as a separated measurable principle, will be undermining the freedom of combatants by the use of force in war (Mull, 2018).

Meanwhile Afonso Seixas-Nunes's position was more advanced. He recognized that humanity and military necessity were the pillars of the IHL. The author indicated the first two steps were to examine the legality of AWS itself and he determined that it does not pose a threat to the values of IHL. The second is the prior legal guarantee through review, which we see constitutes, an obstacle due to the lack of commitment by all countries. The author adopted the opinion of HRW that proportionality should not be based on a quantitative but purely qualitative basis. We also did not agree with his proposal that the concepts of humanity and military necessity are principles (Seixas-Nunes, 2022).

The study by Alexander Blanchard & Mariarosaria Taddeo used the concept of necessity as a guiding principle in IHL to evaluate the deployment of AWS. The authors stressed the existence of this principle to ensure the ethical factors in the use of AWS. It concluded that AWS could not fulfill it because it could not guarantee the use of minimum force. The authors acknowledged that these challenges were thorny and profound, so they called for more research to reach a clearer understanding. We see that the mechanism in analysis, considering necessity as

a principle that can replace positive rules, is inaccurate, and this is what our research will address (Blanchard, & Taddeo, 2022).

In a recent report conducted by experts Laura Bruun, Marta Bo and Netta Goussac, at the Stockholm International Peace Research Institute (SIPRI). Part of this report discussed the legitimacy aspect of AWS, where the analysis was broad by following two paths for evaluating legitimacy. What concerns us is the path that corresponds to our research, that is, the evaluation through the principles of the IHL to find common legal ground. Experts also acknowledged the difficulty of abstract legal discussion that is embraced by political actors. They argue that compliance with IHL requires understanding the context. The experts recommend that countries use scenario exercises, but this is extremely difficult in terms of binding and implementation. The results were not conclusive enough to end the controversy. The report criticized IHL's lack of rules regarding predictability and called for more research to enable countries to find a common understanding about the legitimacy of AWS (Bruun, Bo, & Goussac, 2023).

Finally, in the study entitled "Regulating lethal autonomy" weapon systems: Exploring the challenges of explainability and traceability". The authors emphasize the importance of the IHL principles as a mechanism for evaluating the legitimacy of AWS. They also considered that humanity and military necessity are two principles that can be measured against. The opinion of the

article was positive that AI is more competent than humans in respecting the principle of humanity. Despite the above, the article leans towards what it describes as the lack of a clear future vision for the possibility of AI's ability to comply with the principles of IHL. He recommended an evaluation of the IHL principles in alignment with the use and development of AWS, which is what we are basing our research on (Christie et al, 2023).

This unique study provides an in-depth analysis of the principles of IHL based on the recommendations of recent previous research. The purpose of this research is to build common ground that brings closer destinations and will help reach a radical solution by mitigating the severity of the international disagreement and popular condemnation, thus putting an end to the problem. The goal is to find common ground on what these principles should be, leading to a convergence of opinions among states and, thus, an optimal legal evaluation of AWS.

B. RESEARCH METHODS

In this study, the authors followed a combination of two methodologies, doctrinal and no doctrinal, to provide a more comprehensive understanding of the issue (Osbeck, 2012). The aim of this research is to provide solutions that constitute a common ground that brings countries together. The endless dispute over the legitimacy of AWS is in light of a reality that indicates popular opposition to its use in wars, as well as from several countries and non-governmental

actors, and the significant growth of the market is witnessed in the production and development of AWS. In the non-doctrinal methods, the data was collected to analyze the contradiction between public sentiment and the actual trajectory of AWS development. So, it shows the reality of the adult people's opinion of AWS use in future wars in the most advanced countries in AI, and the data also analyzes the growing market in developing such weapon systems. The above pushed us to realize how necessary it is to find an agreed point to solve this problematic issue by going deeply into the IHL principles using the doctrinal method to analyze if AWS use will be legal or not. We also discussed the academicians' opinions in this field and the relevant legal documents to come up with a clear and effective legal solution

C. RESULTS AND DISCUSSION

1. AWS and IHL principles

The issue of whether AWS is compliant with IHL has been left unresolved—possibly on purpose—in the absence of a clear-cut regulatory stance (Hayir, 2022). However, technological advances in autonomous weapons continue, and States are getting closer to using offensive AWS in conflicts even while the regulatory discussions persist. While "The member states of the UN have not made major progress in discussions of AWS, when the nature of war is changing rapidly" (Haner, & Garcia, 2019). Relying on the anticipation of a ban, introducing a new protocol, or any other new regulation is no longer viable.

We must determine whether the utilization of AWS aligns with the existing framework of IHL.

The approach to do this is to divide the layers of law, study them, and examine the problem regarding AWS compatibility with the IHL principles. Analyzing the principles that are considered the law's core may provide a reliable guide to identifying the nature of the problem. It is necessary to identify the IHL principles since they are not enclosed in an inclusive list (Yusliwidaka, Roisah, & Setyono, 2022). The International Court of Justice (ICJ) listed the four fundamental principles of IHL in nuclear weapons: proportionality, distinction, military necessity, and the prohibition of needless suffering (ICJ, 1996). According to the UK Ministry of Defense, "the law of armed conflict rests on.... military necessity, humanity, distinction, and proportionality" (UK Ministry of Defense, 2004). New Zealand Defense Force provides "non-discrimination" in addition to the foursome. Academics contribute their different takes on the issue. For example, Kolb contends that principles like "distinction, precaution, and proportionality" are crucial. At the same time, Droege believes that "the core rules of IHL.... distinction, proportionality, and precaution.". At present, we have consolidated these lists into an initial, provisional shortlist consisting of the following elements: (a) humanity, (b) military necessity, (c) distinction, (d) proportionality, and (e) precaution We will now look closer at these ideas' potential to be 'principles' and if AWS could comply with any of them.

a. Humanity and military necessity

We begin by examining both military necessity and humanity. The Additional Protocol I (API) to the Geneva Conventions (GCs) is the most appropriate text concerning the humanity concept, as it states that at all times, "civilians and combatants remain under the protection and authority of the ... principles of humanity" (Art. 35, API, 1977). The Hague Regulations 1907 addressed military necessity when it prohibited: "to destroy or seize the enemy's property unless such destruction or seizure be imperatively demanded by the necessities of war" (Art. 23, Huga Convention, 1907). Regarding these statements and the many of them in a similar context, it is evident that humanity and military necessity play a significant part in IHL (Melzer, 2009). The authors believe there is a basic misapprehension of the precise meaning of these notions. More specifically, they lack the fundamental merits to be legal principles.

Dworkin conducted inventive research on 'principles' and made two essential findings. The first finding was that distinct principles must have different significance for one to prevail over the other in the event of a conflict, and more specifically, that the resolution relies on the relative importance of each" principle "when principles intersect" (Dworkin, 1967). Nevertheless, the rigorous balance with the notions of humanity and military necessity ensures that IHL functions correctly; hence, neither concept can outperform the other. IHL is "predicated on a subtle equilibrium between ...

military necessity and humanitarian considerations" (Dinstein, 2016).

The second point Dworkin raised about the principles' features is whether they can be substituted with positive rules; at the same time, he argued that when principles form the head of any system, they must maintain their balance (Dworkin, 1967). Usually, all rules are subject to all principles and can be superseded by any of them. Nonetheless, that does not apply to IHL because humanity and military necessity cannot be a substitution for positive rules. For example, regarding military necessity, API forbids soldiers from using prisoners for medical purposes (Art 11(2)(b)., API, 1977). When the commander needed a kidney transplant, but the suitable person was one of the captives, the military necessity could not simply "surpass" this rule. The protection provided by the IHL would be severely eroded if the positive rules were susceptible to the influence of military necessity in this manner (Ólafsson, 2015). In reverse, the same would apply to humanity. The right of combatants to conduct war may be compromised if humanity were to be used as a principle. Therefore, neither humanity nor military necessity fulfills the "preference" or "supersedeure" norm. As a result, they are not principles for the IHL. Even if not explicitly stated, it is likely that factors like these contributed to the ICJ's decision to exclude "humanity" from its roster of "fundamental principles" and the academic decisions of scholars like Droege and Kolb to exclude either "humanity" or "military necessity" from their

compilations. Rather, those notions supply the balanced structure that supports IHL rather than expressible as independent principles. The result is that they must be regarded as "pillars" for the legal regime, which are represented by the three real IHL principles of distinction, proportionality, and precaution and its rules (Marchant, 2020).

The practical implication of this conclusion for AWS is that states are not required to recognize humanity or military necessity as distinct, stand-alone, independent notions within IHL. Instead, these factors will be achieved spontaneously if real IHL principles and rules are considered. For example, in the distinction, military objectives may be targeted because it is required as a (military necessity), and civilian objects may not be targeted due to (humanity) considerations. The meaning is that both humanity and military necessity are fulfilled once the distinction is fulfilled implicitly and not separately. The conclusion that humanity and military necessity do not necessitate separate implementation sustains the primary argument of this paper. Thus, that gives the ability to talk more freely and confidently about the ease of AWS compliance with IHL compared to ever before anti-AWS studies. Furthermore, the interpretation behind this is that avoid directing efforts to translate the concepts of (humanity and military necessity) into calculations based on a precisely defined algorithm as this complex process is one of the critical obstacles to the development and use of AWS.

b. Distinction

The possibility of AWS adhering to IHL's principle of distinction is next for discussion. The API rule states that one must "distinguish between the civilian population and combatants ... direct ... operations only against military objectives" (Art 48., API, 1977). Undoubtedly, human beings are historically in charge of distinguishing who is a friend and enemy on the battlefield. For instance, they determine if someone is an enemy belligerent based on his clothes, carrying gear, or whether he surrendered (Art 41(b)., API, 1977).

The concept of distinction is essential on the battlefield because soldiers are a fair object of attack if they are qualified and ready to fight or oppose capture (Winaldi, & Setiyono, 2022) Human beings use distinction considering various elements; several signals suggest surrender or can be noticed through the general appearance of an adversary who is incapacitated from fighting or seems collapsed. Of course, AWS would conduct the distinction if they were deployed. As the paper has previously said, AWS would need highly developed observation and recognition and advanced decision-making abilities to do this. Vigorous evaluations for making distinctions can be done only after fulfilling all three skill sets.

First, Raytheon, a US military manufacturer, has recently been working on improving robots' capacity for observation. 'Mapping autonomous drones' to completely understand their surroundings has been created by Raytheon and Exyn Technologies (Exyn

Technologies, 2020). The drones made by Exyn are automated surveyors that can be navigated into challenging or dangerous environments, such as abandoned buildings or mines, to map them and efficiently create 3D virtual samples. According to the manufacturer, robots can "observe" more quickly than humans (Exyn Technologies, 2020). Second, it has been shown that robots are more adept at recognizing than humans are. For Instance, this is manifested when using Patriot One's "Patscan" system operated by an automated security guard, when necessary, alerts the listed for some inputs after recognizing them as risky. Where the "Patriot One" system can recognize the existence of hidden or apparent weapons (Dempsey, 2020). Although this technology is now only utilized in commercial environments, it is simple to see it being transformed to be employed for military purposes. Therefore, it is undeniable that robots have recognized skills, at least on the same level as humans.

Since persons might convert from legal targets, such as (combatants) to unlawful targets, such as (civilians), or conversely, without changing their outward appearance, Judgment is essential regarding the distinction in IHL. For instance, an individual may be in a battleground with a machine gun while wearing army fatigues. That individual would undoubtedly be labeled a "combatant" based on observation and recognition. However, the individual will become an unlawful target if they become hors de combat because of being incapacitated, captured, or

surrendered (Art 41(2)., API, 1977). Humans are often reasonably adept at interpreting these contextual factors, but robots find it challenging to do so owing to their complexity.

The system has a margin for errors because of the challenges raised by contextual variables. That would be okay at the level of food manufacture, but in a battlespace scenario when human lives are at risk, it would not be acceptable. Therefore, AWS cannot comply with the distinction principle at this time. Of course, that may change over time. It is impossible to predict with certainty if or when AI will develop to a level that will enable it to make context-sensitive decisions.

Regarding the forecast for the development of AI, Mueller and Bostrom surveyed AI experts. The respondents were asked about high-level machine intelligence; according to the respondents, there were 10%, 50%, and 90% values, respectively. The median answers were, respectively, 2022, 2040, and 2075 (Müller, & Bostrom, 2016). By 2062, according to Walsh (Walsh, 2018), another expert, the robot would have "human-level" cognition. According to this data, AI is anticipated to develop to a point where it can handle a wide range of distinction judgments between 2040 and 2062.

That would refute the HRW claim that AWS would be incapable of sensing or interpreting the distinction between soldiers and civilians if it were accurate. In conclusion, AWS can adhere to the principle of distinction in a few years. While it remains a theoretical scenario, the consistent

trend of rapid technological advancement over the past century, coupled with the consensus among experts, suggests that the crucial threshold of AI development may be achieved sooner rather than later.

c. Proportionality

The API forbids attacks that may result in collateral damage deemed "excessive in relation to the concrete and direct military advantage anticipated." This rule embodies the proportionality principle. Moreover, according to the IHL, in addition to complying with the distinction principle, AWS must also adhere to the principle of proportionality (Arts 51(5)(b) and 57(2)(a) (iii)., API, 1977).

According to HRW, this principle cannot be achieved through balanced arithmetic operations related to quantity only, as it believes that it is impossible to program a robot to replicate the human cognitive processes essential for evaluating proportionality in judgment (Wareham, 2023). In fact, HRW must be accurate in this case, where proportionality entails a numerical calculation related to quantity, although that is very difficult. In this situation, proportionality is merely a permutation of utilitarianism, which, in Bentham's words, is met by any action when the inclination to increase communal happiness outweighs any need to decrease it (Bentham, 1988). There is a clear connection between proportionality and utilitarianism. Similar to how utilitarianism is met when an activity produces more "happiness" than "unhappiness," proportionality is achieved when an attack

produces more military benefit than collateral damage.

Consequently, proportionality in IHL in all circumstances is a utilitarian notion. Therefore, the question arises: can AWS apply proportionality by balancing the military advantage and collateral damage against one another? The so-called "collateral damage estimation methodologies" (CDEMs) provide a place to start. CDEMs are intricate procedures. Using the US CDEM as an example, a five phase analytical framework is used to evaluate collateral damage relying on factors such as the area of effect of various weapon classifications, the demographics in the target area, and the influence of timing on the likelihood of civilian losses (Robinson, & Nohle, 2016). Relying on the Bentham-identified utilitarian framework may provide real significance that can be employed in this regard.

Furthermore, the next step is comparing the military benefits of an attack with the collateral damage. In the beginning, it may appear logical to make such a measurement. Some scholars presented methods that could be considered the beginning of a solution to the problem, such as doing the weight of comparable things and making proportionality more achievable.

For example, estimating the military benefits in terms of the lives that will be saved or the harms that will be averted using the aforementioned US model, which is established to compute the collateral damage by systematically assessing the military benefits and the lives

affected or the resulting harm. Then, a peer-to-peer comparison of these values may be made to provide a reliable proportionality evaluation.

The critical idea is that proportionality may be converted to sufficiently precise and comparable values to be carried out by AI. Undoubtedly, this is a challenging function; it needs a kind of advanced AI that is not currently available. However, the remarkable speed of AI advancement may lead to it being probable that AWS will eventually be able to comply with IHL principles.

d. Precautions

The principle of precautions in IHL consists of several factors: verification, proportionality, alleviating the means and methods of warfare used, and warning at the launch of the attack (Art 57 (n 58)., API, 1977). Therefore, AWS must have the ability to comply with all of the above factors when deployed to initiate any attack. When referring to proportionality and verification, what is meant is the procedural processes of both the principles of proportionality and discrimination. This part will discuss the warnings and work to reduce the means and methods used in war. Relating to the means of alleviation, any weapon indiscriminate in nature can cause unnecessary suffering or superfluous injury. Making a 'choice of means ... to avoid, and in any event to minimize, incidental loss of civilian life' is the precautionary duty in this case (Art 57 (n 58)., API, 1977).

For two primary causes, AWS have a higher chance than human combatants of executing means-based precautions. First, owing

to their almost limitless physical power, AWS might be equipped with various forms of combat, unlike human combatants. Thanks to this, they would have a more excellent range of options in each encounter. The more accurate the selection of the weapon and the farther it is from causing a sizeable explosive force, it leads to avoiding collateral damage when attacking (Walsh, 2014).

The second reason is that new weapons may have quite intricate specifications. They include topics including cover influence models, short radius, period of action, and penetrative competence. Even after extensive training, humans still find dealing with this specificity on the battlefield challenging. However, the machines can guarantee all these requirements and characteristics during the military operation and for a long time (Sparrow, 2016). Alleviating the means and methods of warfare is expressed in military tactics that will determine the time, height, and angle of attack. As for adhering to precautions, it is expressed by how to attack. Specific methods are chosen to minimize collateral damage and incidental civilian casualties, regardless of the method used (Art 57 (n 58), API, 1977). The US IHL addressed the timing issue in the attack by emphasizing that an attack on legitimate military targets should be avoided if there was a possibility of civilians being present, in which case it would have to wait until the residents had left. As for choosing appropriate angles for each attack, it has been addressed in HPCR. It selects a proper attack angle to

determine where the bomb should be dropped, using a specific tactic to avoid accidental losses.

Therefore, AWS is better able than humans to implement the obligations to mitigate attack methods. According to The US Handbook of Naval Operations, decisions to reduce methods must be based on the available facts that are clear beyond doubt. The availability of information for the AWS far exceeds that for the human soldier. The machines receive that information through sensors that are represented by data, it may come from the military or the archives. This collected information is quickly processed to give orders for when to launch an attack that will minimize collateral damage. The importance of these operations increases with the recent confinement of wars to areas densely populated with civilians. Any mistake in targeting will constitute a challenge and a great responsibility. Therefore, the possibility of an error occurring is forbidden (Melzer, 2014). It is known that the robot can handle infinite mathematical operations and overcome many difficulties on the battlefield to carry out the tasks to the fullest.

In addition, the AP I preserve the right of civilians to receive warnings before the start of the attack to enable them to escape and take safe places unless there is a circumstance that prevents the implementation of this (Art 57(2)(c), API, 1977). Warnings may be, for example, in the form of leaflets that are dropped from aircraft or by radio, according to the manual note of HPCR. As for the US did not specify a special form for warnings; it may be by informing the leadership of

the enemy country or sending to the population through information communication networks. There is no specific form or standard for issuing warnings. As for the time standard for warnings, it begins in the period prior to the attack. Although there is no specific form for the warning, it is imperative to maintain the general basics, which are determined by the circumstances accompanying each case. The adequacy of warning measures is determined by the longer they are taken before the start of the attack. According to Thurnher, a warning fulfills its requirements whenever the civilian population has time to take action to escape from danger to places of safety (Thurnher, 2018). There can be no doubt about AWS's ability to comply with the precautionary principle to a greater extent than humans. The reasons for superiority are the simplicity of the task, such as issuing warnings in the form of sounds that alert or inform that an attack is about to be launched. Furthermore, by assuming AWS is carrying out a mission of issuing warnings, the effectiveness of the mission can be ensured, which is reflected in the improvement of the ability to protect the civilian population.

In many cases, the issuance of warnings by human soldiers can be associated with exposing them to danger. The danger of human warning may be represented by contact with the enemy at the level of time or physical contact. However, using AWS ensures that these risks of losing soldiers' lives are avoided. Although the AWS may be lost, the mission is guaranteed to be

carried out in the worst circumstances: issuing a warning to enable civilians to take safe places (Wood, 2020).

The result is that the concepts of humanity and military necessity must be regarded as "pillars" of the legal regime, which are represented by the three real IHL principles of distinction, proportionality, and precaution and its rules.

This, therefore, supports the main argument of the study by avoiding further disagreement between countries. Fulfilling the distinction, proportionality, and precautions implies fulfilling the concepts of humanity and military necessity, which cannot be negotiable or measured, according to what the article discussed.

As for the principles of distinction and proportionality, although artificial intelligence has not currently achieved the full ability to fulfill them, the revolution in this field indicates the imminence of that stage.

This would spare countries from additional obligations, especially since the above two concepts are the origin and core of the disagreement always in the AI's inability to implement them.

e. Contemporary International Efforts over AWS and states response

In April 2013, HRW launched the "Stop Killer Robots" campaign. This prompted the United Nations to form the first meeting to discuss this emerging dilemma within the Convention of Certain Conventional Weapons (CCW) (Perlinski,

2018). The ICRC also has a major role in regulating and highlighting AWS's ethical and legal problems. ICRC held two meetings of experts regarding AWS in 2014 and 2016. In addition, in 2013, State Parties to the CCW held the first meeting after they agreed to consider CCW as the platform specialized in handling legal issues for AWS. The President of the CCW was authorized to convene an informal meeting of experts from the Member States to discuss the problems raised by emerging technology concerning LAWS, consistent with the objectives and mandate of the Convention (Meier, 2016). This introductory meeting was followed by meetings in 2014, 2015, and 2016, about which several reports emerged. The most notable highlight of the 2016 meeting was the decision to form the Group of Governmental Experts on Emerging Technologies in the Field of Lethal Autonomous Weapons Systems (GGE on LAWS), and since then, the meetings have become annual (Experts meeting, 2016). Moreover, the ICRC has continued its efforts by participating in the GGE meetings (Badell, & Schmitt, 2022).

What distinguishes the work of the GGE is that it is not limited to the State's Parties to the CCW; rather, all States, NGOs, and international organizations can participate. Regarding issues adopted by the meetings for research and discussion, the most prominent focus was on the nature and description of AWS. The characterization builds a basis for a common understanding of the concepts and characteristics of these weapons systems, consistent with the

objectives of the CCW. The problems raised by emerging technology in the field of AWS on IHL required the study of the interaction of humans and machines. Especially since the deployment and development of AWS have multi-faceted humanitarian, military, security, and legal implications that must be discussed. Moreover, although there is no internationally agreed definition yet, as we mentioned previously, at the 2019 meeting, the GGE reached 11 guiding principles (Beltran, 2020). Nevertheless, although these principles are not binding, we must consider the most important step the meetings have reached.

Without mentioning all the principles, the most important principle in this study is that IHL is considered the only law applicable to AWS in use and development. This was also confirmed by the GGE 2021 meeting at the Sixth Conference, considering that all weapons that cause unnecessary suffering or superfluous injury are prohibited (Christie et al, 2023). Moreover, AWS must be subject to review under Article 36 of the API.

The 2023 meeting resulted in a need to look at the future of AWS. The experts emphasized the role of countries in monitoring the development and use of AWS in compliance with IHL at all stages (Watts et al, 2023). The team also entrusted the states with the task of organizing the temporal and geographical operations of the potential participation of the AWS. Ensuring the availability of high-level training for the people entrusted with operating

tasks. In addition, when there is a suspicion that AWS cannot comply with international law, it must stop deploying it.

It is interesting to see how countries have responded to these efforts. There was complete agreement from all countries to implement IHL during all phases of AWS. This was not completely taken for granted, as countries considered advanced in AI, led by the EU countries, as well as Russia and China, expressed that the issue of AWS classification is unclear (Nadibaidze, 2022). While the US opinion was more advanced, it believes that ambiguity regarding the classification should not constitute an obstacle to moving forward with the discussions (Biontino, 2016). Developed countries such as Germany insist that emerging non-binding political agreements that seek to find common ground between countries would be an effective solution. Developing countries believe that such political agreements should not go beyond being an initiative towards a binding legal instrument. In a completely different view, the State of Estonia believes that any new legal instrument would be unnecessary as long as the IHL is sufficiently developed to deal with the problems that emerging technology may raise (Estonia, 2018). As we saw in our research, individuals oppose any use of AWS in future wars. Many countries and non-governmental organizations are of this opinion and are looking for the ban. The reason, in their opinion, is the difficulty of complying with the IHL and the resulting problems in attributing responsibility.

Many countries oppose any talk about a ban because such a decision would be premature and unfair, so AWS needs further verification (Wood, 2022). Meanwhile, countries such as Portugal and Brazil have not yet decided on their position. It is no secret that there are decisive positions that have truly recognized the legitimacy of AWS, and at the forefront of these countries are Russia, the UK, India, and the US. Finally, the above indicates the importance of this problem, which prompted us to do this research to propose solutions that would mitigate the disagreement and serve as a common ground on which countries can build a future agreement.

D. CONCLUSION

The deployment of offensive AWS in modern warfare is just around the corner if it has not already been deployed. This emerging technology cannot replace humans on battlefields without real examination and international agreement on its legitimacy. This problematic danger cannot be solved without persistent and innovative efforts, as waiting for any binding agreement under the umbrella of the CCW is nothing but a waste of time. After failing to achieve an international consensus on banning or regulating AWS and the increasing growth of this emerging technology, the article saw that the only solution was to examine its legality through the true principles of IHL. The article limited the real principles to distinction, proportionality, and precautions and considered military necessity and humanity as two concepts embedded in those

principles, per the interpretation adopted by the ICJ. Moreover, The article presented a new vision that could help mitigate the dispute and serve as a basis on which countries can build through our in-depth analysis of AWS from the perspective of true IHL principles. Considering humanity and military necessity as non-negotiable concepts, because of their characteristics, there cannot be a place for measurement and negotiation. An assessment of the legitimacy of any emerging event must be subject to the relevant law. It is a fact, as we explained that any legal system is subject to the principles and rules that govern it. On the part of IHL, we conclude that the problem always centers on the ability to comply with humanity and military necessity. The conclusion of the article is that these are concepts that fall within the true principles of distinction, proportionality, and precaution. They are not principles separate from the rest of IHL. This problem has long been a source of disagreement. The above supports the goal of the main article, which is to seek consensus within the IHL framework on its merits as the law most relevant to the AWS issue. As we have seen, though, the ability of the current AI to mimic or possess human characteristics to comply with the provisions of a legal system initially created to regulate hostilities waged by human soldiers is difficult. However, the article finds that the accelerating AI revolution heralds AWS's approaching compliance with IHL. And the ability to implement discrimination, proportionality, and

take precautions if the pace of development continues as rapidly as it is now.

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