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Australia's Loyal Wingman Program and its ethical dilemma on future warfare

Warfare has evolved rapidly since the beginning of The Great War. In the past, wars were fought traditionally, meaning minimal technology assistance and close combat action between hundreds of thousands of soldiers. Technology has affected the accuracy and risk of many strategic decisions, making every action more calculated and precise. Tactically, a military's objective is to inflict damage to their opponents with the least amount of risk to their own soldiers. The purpose of technology in the military aims to remove the decision maker from the actual act of violence as much as possible, minimizing the loss of life and cost from their side. The majority of current conflicts relate to the war on terror, which is unlike other past conflicts. The battlefields are often established within civilian zones and are fought through sparse skirmishes, unlike crowded trench warfare. Drone technology is proposed as the primary method to engage in this tactical context that avoids personnel casualties in the most cost-efficient method. Although it is believed that these requirements are accomplished within safe margins, critics have questioned their effectiveness as well as raised concerns regarding the ethics that surrounds them.

In September of 2021, Boeing Australia announced it would design and build a new military aircraft in Queensland for the Australian Defense Force (ADF), a first in Australia for over 50 years. The Boeing Airpower Teaming System (ATS), also known as the "Loyal Wingman" project is a stealth, multirole aircraft that provides additional support to a mission that utilizes artificial intelligence to carry

out important strategic decisions, superior to those of a human [1]. Its purpose will be to assist pilots and commanders on missions that require large data processing. Although its current primary capabilities relate to reconnaissance and surveillance, the vehicle can be converted into a weapon system, providing no limits to the armament it can accommodate. Its greatest breakthrough is the fully autonomous option that is expected to have a superior performance to that of human pilots, without the need of a controller. The loyal wingman has captured the attention of defense forces around the world, encouraging for further investments in artificial intelligence technology in the military. Military enthusiasts consider greatly the advantages this technology introduces. The risk of personnel casualties is most likely non-existent and the cost per vehicle is projected to be only a fraction of its crewed counterpart. To put into perspective, the newest 5th generation F-35A stealth aircraft costs at minimum $79 million per unit, while unmanned aircraft and drones of similar capabilities range between $2 million and $20 million. [2] Thus far, the investment in this new technology is favorable tactically and financially. However, critics have raised concerns regarding the loyal wingman's ethics on the battlefield. A pilot or operator will no longer be necessary for certain missions, therefore, target acquisition and decision to fire will be left on the machine's control. It is believed that it is unlikely an autonomous aircraft will make the same, if not, better moral decisions when engaging in a conflict. While drones have a long history of tactical victory, there is little evidence that they are an effective morally under the current laws of war. Autonomous drones may cause relentless strikes without considering any of the after effects and possible reactions. Since humans will not be the decision makers, the question of who is responsible raises uncertainty on the possible ethical scenarios that are violated by the machine. By analyzing different ethical theories, a more definite opinion will be considered to better assess the motives behind the development autonomous aerial vehicles in the battlefield.

Utilitarianism is the ethical theory that promotes the satisfaction of the majority in order to ensure the maximum levels of satisfaction. Consequentialism is the component of Utilitarianism that it

determines the morality of the act based on its consequences. Moreover, Hedonism determines morality based on the act's happiness levels. Merging these two components the third and last one is formed, Aggregation. Utilitarianists would propose that the Loyal Wingman program would satisfy the majority, therefore, it is considered moral to develop it. Sending fewer military personnel to the battlefield and resolving conflicts with economical alternatives is arguably regarded as the ultimate solution to war and peace.

Kant's theory of Deontology does not focus on the consequences, but rather the intentions behind an act. The categorical imperative is the deontological philosophy that promotes absolute moral duty that is not bound to personal motivations. Kant also states that always act in such a way that you respect people by making sure that they fulfill the requirements of justice by treating them as ends in themselves and never as mere means. Deontologists would disagree with the Loyal Wingman's development. As far as we are concerned with current advancements in general artificial intelligence, autonomous aircraft can possibly perform sophisticated moral decisions with their advanced sensors, but they are unable to measure the aftermath and the collateral damage once an attack has been executed. This is very similar to the "fire and forget" behavior of self-guided air missiles. The loyal wingman cannot measure suffering or satisfaction; therefore, it is impossible to act rationally. Deontology focuses on the important of humans and their rational decision-making, which is a concept that we have not yet clearly defined as quantified parameters.

John Rawls' Justice as Fairness philosophy encompasses the utmost liberty and justice for everyone independent of their identity, interests and intentions. The first principle states that everyone should have liberty as much as possible without interfering with other's liberty. The second principle agrees on certain disparity in the condition that it benefits everyone else. The original position and veil of ignorance components focus on reasoning without the assumption of an identity or a first-person perspective. John Rawls would argue that the Loyal Wingman would maximize fairness and justice due

to the lack of a legitimate identity. It does not act based on personal intentions or interests, but on structured orders that follow the two principles rules of justice. Each target is equally a threat based on the same schema and one target is a higher risk based on the advantage it brings to the lower ones.

I personally agree with the utilitarianist perspective of the ethic dilemma the Loyal Wingman presents. The purpose of this technological advancement is to satisfy the majority by removing the fear and suffering the decision maker endures. A country will not have to worry logistically about its citizens, when a superior instrument can shield it from that. Deontology does not apply to a machine that can possibly correct human irrationality. Pilots can intentionally orchestrate war crimes, especially based on personal motivations and interests. Moreover, John Rawls' philosophy does not apply when a machine operates based on superior characteristics to humans. The Loyal Wingman can be programmed with an identity by its makers as well as form biased decisions. It won't hesitate to make personal decisions based on data collected from previous missions or programmed by its creators.

The Office of Technology Assessment (OTA) was established by the U.S. Congress to objectively study and assess the impact and after effects of technological innovations and provide solutions to the needs of the stakeholders. The OTA would thoroughly research possible legal considerations the Loyal Wingman would create. These include privacy, noise, occupational health and safety, environment and public liability [1]. "In Germany, strict aviation regulations contributed to the abandonment of a very expensive, autonomous, military drone project because the craft could not obtain approval to fly in civil aviation airspace due to safety concerns" [3]. The European Parliament Technology Assessment (EPTA) was a descendant of the OTA and its primary goal is to adapt components of OTA to fit local needs, especially when dealing with a technology that reaches global influence. This network facilitates the application of a technology on a global scale. Since the Loyal Wingman is made specifically for the Australian Defense Force, technological assessment reports only focus regionally, but due to Boeing's network, implications of this invention can be adapted to several of Australia's allies.

The Public Technology Assessment (PTA) bridges the gap the OTA creates by increasing the interaction and contribution of the public to discovering controversies over technologies and other technological developments. Assessments become more balanced when executives and the legislative are not the only bodies of scoping technological impacts. For example, the Board of Technology in Denmark developed a standard procedure to foster debate on the scope and implications of technology in the form of consensus conferences. [4] Applying autonomy to vehicles has been a long-term public concern and it cannot be resolved unless transparency, openness and regulation of artificial intelligence are debated amongst the public. In the case of such secretive military projects, like the Loyal Wingman, there is a certain threshold that can be assessed by the public or else the advantages it possesses against its foes are jeopardized.

The Constructive Technology Assessment (CTA) focuses on addressing the social problems surrounding a technological advancement prior to its development cycle. Consensus conferences are methods that ensure feedback regarding a technology's implications are understood without influencing its design process. The Loyal Wingman introduces a wide range of repercussions that cannot be overlooked. Autonomy in vehicles can possibly adjust our ethical principles as well as political circumstances between nations. Forming policies around its development cycle will improve on reducing the unforeseen social consequences.

It would make more sense to keep such an innovation secretive, just like any other top military projects. For every new weapon system that is publicly announced, decades have passed since its inception. Variations of the Loyal Wingman have been prototyped and developed since combat drones have been introduced into the battlefield. Since then, drones have been heavily criticized for their relentless collateral damage and the fear of the unknown they bring to society. Therefore, making the public aware of its general capabilities and implications can improve the development direction Boeing and the ADF plan for the Loyal Wingman. The CTA is the perfect match for ensuring public awareness

and keeping the design influence as secretive as possible. When the project was unveiled to the public, much hype and criticism surrounded it. Governments have reformed laws around it based on the public's feedback and reception of such innovation. When the satisfaction levels of all stakeholders (public, legislature and directors) are reached, the maximum levels of morality have been reached according to utilitarianism. Therefore, the CTA matches with my original agreement on the utilitarianist perspective for the development of the Loyal Wingman.

In conclusion, warfare will eternally evolve and become more strategic and cautious. Although it is arguable that wars have become more violent with industrialization and mass production of killer machines, it has forced us to think critically and protect all human identities. The Loyal Wingman is an autonomous drone that offers unique military capabilities that have not been developed to such extent: a one-in-all autonomous weapon system that is projected to outperform modern and future crewed aircraft and pilots through artificial intelligence. I believe the philosophy of utilitarianism and the Constructive Technology Assessment ensure that its creation will aim for the highest moral actions on the battlefield and serve the Australian Defense Force for the greater good. What is interesting about this project is the variety of cases that exist. Although the vehicle is planned to be completely autonomous, different variations will be developed as well: crewed version, remote controlled and a hybrid, depending on the mission objectives. This unveils a more complex moral analysis of the entire project that may change the initial stance I have on this case. Therefore, it is recommended for Boeing and the ADF to advance cautiously with the Loyal Wingman, learn from previous drone histories, consider the public perception and prepare for any future adversities. Although the project is being developed in record time, it can serve as a pitfall of irreversible actions in the future. The nature of war will change, and any mistakes may pose a huge risk for humanity's future.

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