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Justification of Civilian Use of Drones and International Security: Comparison between the The United States and the European Union

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ABSTRACT

In the midst of raising new technologies and robotic systems, the unmanned aerial vehicles (widely known as drones) ubiquitously operate in military and non-military missions. While the segment of the drones has experienced the most considerable growth and interest-driven primarily by the military motives, to a greater extent, currently it dominates civilian and public domain applications ranging from border security, disaster management to environmental monitoring. Recently, except for military applications dominated by targeted killings and counterterrorism operations, the civilian aspect not yet exploited academically and comprehensively. Taking the social constructivist and pragmatic sociology as a theoretical framework, we aim at analysing how a military-oriented technology into the civilian airspace has raised the interests to understand how the state and non-state actors justify the drone use for the non-military tasks, what is acceptable from an ethical and legal point of view". Under this motive, there are on-going practices, and efforts to regulate and integrate the drones into non-segregated airspace. This study concerns the complex regulation international of a technological product -drones-conceived and realised in the first instance a purpose of war and then used for multiple purposes and civil purposes, both for health missions, social, both for recreational, artistic, journalistic use. Besides, there are also many controversies - resolved differently in the various national contexts - about the rules that were needed give to the liberalisation of use an object that can be easily transformed into a powerful instrument of control of the private sphere of individuals. Under this context, by implementing a comparative approach on the United States and the European Union, we consider the integration of these technologies is significantly affecting the human-technology relationship on the not on the battlefield but now on the society in general. This perspective will provide a detail view for better understanding both the strengths and limitations of drones and challenges ahead of the regulatory process in both sides of the Atlantic.

INTRODUCTION

In the realm of new technologies, no topic has been so controversial than the use and implications of drone technology. The increased reliance on drones by particularly the United States for attack missions in Pakistan and Yemen has generated intense debate in legal and military communities over the legal and ethical implications of these systems. However, throughout these debates, the civilian use and the regulatory process has remained unexamined.

This dissertation seeks to analyse the question of "How the drones- which are considered as autonomous weapons–are justified to use for civilian (non-military) missions and what implications can generate for international relations? "the question of what is just, the question of justice or justness of the situation can be raised. It becomes possible to justify certain associations while others can be deemed unjustifiable. Starting from the tension between absolute war and real war; between a philosophical principle of war and the chaos of the battlefield, a place of contingency and uncertainty, Clausewitz sets out to deal methodically with testing by a fire with "engagement" which is the mode in which the war is experienced. He seeks to show internal logic behind the "art" of choosing one's objective in the heat of combat " the faculty of using judgement to detect most important decisive elements in the vast array of fact and situations. We shall draw out all the possible consequences from the fact that states and any social actors need to justify their decisions and actions, which they seek to carry out in such a way that these can withstand the test of justification. Being essential to keep in mind that the justification that (non-) state actors develop in speech and in action, to see that social science must take this phenomenon into account, must reckon with the fact that ordinary course of life demands nearly constant efforts to maintain or salvage situations that are falling into disarray by restoring them to order.

It is important to point out that the thesis focuses on analysing civilian drone use and the regulatory practices which help to resolve issues of compliance and accountability. Drones must distinguish between civilians and the purpose of the task they are assigned to conduct; they may not cause disproportionate damage, and so on. Defining the bounds of permissible conduct more precisely via regulation can minimize these concerns. It matters to pay attention to how different uses of drones can be regulated under the same common framework.

In this study, the theoretical framework lies between pragmatic sociology and International relations. In the face of perspectives of social influence that see in technology an instrument whose effects depend on the choices and decisions made by the actors and the type of relationships between the social, economic and political forces relevant in the various cont ext.

The study also shed more light on the relationship between human control and technology as an autonomous entity, an independent agency that escapes in many ways to human control to impose evolutionary change. The theoretical-conceptual distinctions that this thesis has tried to unravel in the theoretical debate on the role of technology are in its hypothesis particularly important for reconstructing and analysing the arguments used to regulate the civil use of drones, with specific reference to the European context. It should also be noted that the main interest has oriented the theme of drones and their regulation is also linked to a theoretical-philosophical framework that has characterized as multidisciplinary.

This study employs an interdisciplinary approach through sociology, philosophy, international relations and political science. Taking the qualitative analysis of historical and contemporary literature directly or indirectly focuses on unmanned systems, the study compares the practices and regulation of the EU and the USA on using drones on the military and civilian domain to envision how they justify their acts to use a military technology for non-military missions. This examination contributes to the scholarly debate surrounding the role of society and (non)state actors in dual use of drone and how they generate justification for their acts. Chosen Comparative and critical qualitative approach was chosen as the methodology of the thesis. Firstly, the qualitative approach allows having deeper into topics such how to apply the context of a situation to a study, the process of how events happen and what events could take place based on the research (Ratner, 1997). This approach allows a researcher to gain perspective and move beyond the numbers to address the text with a thick, detailed description (Berg, 1998). Qualitative research provides deeper connection to the text through the combination of social and political factors thus allows variety of interpretations to develop a multidisciplinary perspective.

There is a number of studies that examine the unmanned systems as of military weapons technology, the integration of artificial intelligence into weapon systems, human-robot interaction and additionally, there are numerous scholarly works about the relationship between humanity and technology that address the philosophy of technological autonomy, the power politics associated with control of weapon technology. Besides, there is growing attention to comprehend how they can be used and diffused for non-military domains and the possible way of countering unmanned system threats. However, there is currently no study that specifically examines the regulation of civilian use of drones at European level through the social constructivist and pragmatic sociological perspective.

One cannot consider drone technology without referring to the autonomous weapon system. Besides autonomous weapon systems even though taking "autonomous" as a general attribute might be misleading since it can serve very different capabilities in different systems. Autonomous Weapons Systems (AWS) have sparked wide-ranging debates that target core concerns of International Relations (IR): the question of the legitimate use of force, as well as possible modes of regulation of warfare and violence through International Humanitarian Law (IHL). AWS differ from traditional weapons systems in their capacities to make use of a variety of sensors to gather data about their surroundings, and then algorithmically process such data for the sake of identification, tracking, prioritizing, cueing, and engaging of targets. The current technological state-of-the-art already enables systems such as drones or anti-missile systems to execute these tasks without human intervention. The literature on artificial intelligence, robotics, and machine ethics – broadly speaking on the opportunities and challenges that advanced algorithmic processing, in conjunction with physical engineering brings with it – is already vast and growing. And while much of this literature offers valuable insights for the topic at hand. AWS, broadly defined here in line with Human Rights Watch (2012: 2) as "machines that have the power to sense and act based on how they are programmed", come in many different forms and sizes. Large portions of the debate surrounding AWS have thereby been kindled by the increased use of Unmanned Aerial Vehicles (UAV), in surveillance and military operations (di Nucci and Santoni de Sio, 2016; Elish, 2017). UAVs, varying widely in size, armament, reach, flight altitude, etc., today present the arguably most advanced type of AWS, as high space is comparatively easy to navigate, aerial imagery is relatively easy to analyse algorithmically, and identified targets could be directly engaged. Besides, AWS can be defined in terms of human-machine relation "'autonomous weapon system' as 'a weapon that, once activated, can select and engage targets without further intervention by a human operator" (2) Legal aspect "'autonomous weapon system' as a system that is 'capable of understanding a higher-level of intent and direction. From this understanding and its perception of its environment, such a system can take appropriate action to bring about the desired state. It is capable of deciding a course of action, from a number of alternatives, without depending on human oversight and control, although these may be present" It can also be considered meaning a weapon that can select (i.e. search for or detect, identify, track) and attack (i.e. intercept, use force against, neutralize, damage or destroy) targets without human intervention. Regarding its capabilities, it can be described as a system that is 'capable of understanding a higher-level of intent and direction in an unexpected environment. From this approach and its perception of its environment, such a system can take appropriate action to bring about the desired state. It can decide a course of action, from some alternatives, without depending on human oversight and control, although these may be present. The transition from theoretical concept once thought to be pure fiction (like manned flight) to an operational reality (like aircraft) has been accomplished many times and in throughout history, and the evolution of autonomous weapon systems is no exception. The idea that robotic weapons could become completely autonomous once belonged to the realm of science fiction; however, fully autonomous weapons appear to be coming to fruition in the modern U.S. military, as evidenced by the progress being made in unmanned weapon systems like the X47B. This evolution toward complete autonomy can be seen with clarity by technological determinists who examine the U.S. military's current research, development, and deployment of unmanned and near-autonomous weapon systems.

Usually, UAVs are remotely controlled, meaning that either their movements can be steered directly by a human operator from a command and control centre, or they move autonomously, but identification and engagement of targets will involve a human operator, based on visual material and other information provided by cameras and sensors mounted on the UAV. Different application domains that fall into the category of marine and land vehicles, as well as anti-missile systems, turrets, and other protective measures that are already in use around the globe. As Scharre and Horowitz (2015) pointed out a few years ago, "at least 30 countries have defensive systems with human-supervised autonomous modes that are used to defend military bases and vehicles from short-warning attacks, where the time of engagement would be too short for a human to respond." Under the assumption that the current trend will uphold and the number of operable AWS around the globe will continue to increase in the near future, a vivid ethical, legal, and policy debate concerning the needs and possibilities to regulate the manufacturing, proliferation, and use of AWS on an international level has emerged (Bhuta et al., 2016; Bode and Huelss, 2018; Singer, 2009). Ethics, law, and policy should thereby not be regarded as isolated dimensions, but rather as intimately intertwined aspects.

The significant feature of drones—which unnerves people—is that they are uninhabited. This means that, unlike a tank, submarine, or fighter jet, no human person is located inside the drone. Often drones are described as unmanned systems. This can be misinterpreted as suggesting that there is no human involvement in drone operations. Unmanned weapon systems that feature some autonomy in their critical functions—that is, they can autonomously search for, detect, identify, select, track or attack targets[1]. Most military systems that reportedly feature an autonomous navigation capability are arguably not genuinely independent in the sense that they rely on 'waypoint navigation': the system merely follows a series of geodetic coordinates that are entered by a human operator. Some systems, notably newer systems such as the MQ-4C Triton, an

[1] A 'weapon system' is understood to be a system that may consist of multiple physical platforms, including carrier and launch platforms, sensors, fire control systems and communication links needed for a weapon to engage a target

unmanned aerial system (UAS) developed by Northrop Grumman for long-term ISR missions, can autonomously plan a route, but the general navigation parameters (e.g. speed, altitude and mission objective) are still set by a human operator. However, all the data that is captured must be monitored and assessed by human analysts off-board—a set-up that is labour-intensive and requires robust and reliable communication broadband. Hence, an emerging feature among new-generation unmanned systems that are specifically aimed at ISR missions is the inclusion of image data processing software that permits systems to autonomously find information of interest and relay that information to human analysts for disambiguation. The tension of the debates initiates considering the level of human control over the system. There is recognition of the importance of maintaining human control over selecting and attacking targets on the battlefield but also the execution of although there is less clarity on what would constitute 'meaningful human control'. Autonomous weapon systems operating under human supervision are likely to be of greater military utility due to the military requirement for systematic control over the use of force.

Although the debate about such systems has grown significantly since the publication of the US policy document entitled "The Role of Autonomy in the Department of Defense Systems", autonomous weapons have been around for more than a century. During the First World War, aerial torpedoes were developed. These were ground-to-ground guided missiles which, after launch, were utterly autonomous. During the Second World War, the development of guided missiles continued, and today weapons with a high degree of automation, or self-guidance, can be found in the inventory of most States[2]. Now, these systems reach a point where the decreased level of decision making from a human operator and the advancement of artificial intelligence have been the critical source of superiority on the military missions.

Throughout these debates, three prevalent policy options can be identified: (1) to ban the use and proliferation of drones entirely; (2) to regulate the use of drones so that they can be used in non-military missions and national security tasks or (3) not to do anything at all, assuming that current regulation would be sufficient to tackle any new challenges raised by drones.

The ban position regards the use of force by any autonomous weapon as inherently evil, as there would be no way that mechanic decisions on the use of force could ever be brought together with the principle of dignity that provides a cornerstone for human rights and humanitarian law (Asaro, 2013; Heyns, 2016: 11; Human Rights Watch, 2012). Proponents of a rigorous ban in this sense

[2] Hough, Kenneth. 2013. "Aerial Torpedoes, Buzz Bombs, and Predators: The Long Cultural History of Drones," Origins: Current Events in Historical Perspective, 6(11). Online at: http://origins.osu.edu/article/aerial-torpedoes-buzz-bombs-andpredators- long-cultural-history-drones

argue that drone could not be reconciled with forms of the legitimate use of force, as throughout history, use of force was always tied to human actors and their decision-making and ensuing responsibilities. Moreover, the drone would pose an unacceptable risk in terms of false positives. A complete ban would however arguably be difficult to negotiate in the international arena, and just as difficult to enforce, as basically any weapons platform could be equipped with sensors and software and thereby rendered partly or fully autonomous. Vice versa, any independent transport or mobility platform (such as vehicles or robots) could also be equipped with weaponry. These dual-use issues generally, coupled with technological progress, thus pose seemingly insurmountable challenges for a complete ban of unmanned systems.

In the second case, the assumption here is that drone and their use would need to comply with existing regulatory standards. The problem with this assumption lies however in the construction of the legal system that is predicated upon the fact that so far it only had to deal with humans, and that these humans, in turn, can be held responsible for the consequences of their actions. Humans, so the underlying premise, are capable of volitional decisions, and this volition is the very reason why individual responsibility for actions can exist in the first place.

Machines, by contrast, regardless of their degree of operational autonomy as they strictly operate according to formal logic and can therefore not be held responsible for their actions in the traditional legal way. As Welsh (2018) summarises the difficulty for the status quo position, “humans accused of crimes are typically taken to be morally responsible for their actions and condemned and punished for their wrong actions. The actions of robots, by contrast, are determined by rules in their cognition and symbols grounded in data from their sensors. Such rules might be locally stored but ultimately are of extrinsic origin. The robot is a puppet on symbolic strings: an artefact of cause and effect. Its actions are determined, not free”. Mechanic decisions are in this sense always the product of human engineering or machine learning – whereas the latter is also a product of training data and learning instructions provided by humans. Thus, while machines can be autonomous in the technical sense of the term (i.e. they can operate without human input for an extended timeframe), they cannot be autonomous in the philosophical sense of the term that frames human autonomy in terms of agency and the capacity of self-constitution. The existing legal system, to determine responsibility, however, presupposes phenomenological consciousness and deliberate decision-making in the sense of “the ability of a ‘self’ to choose the principles that ‘rule’ its conductor indeed ignore them by its own intrinsic valuing” (Welsh, 2018). This “free will” is inherent to humans and cannot be found in machines, never mind how “intelligent” or “smart” or “autonomous” they allegedly are. Drone systems could thus not be held responsible in the ways that humans could by the account of a legal system that has been created without the possibility of drones in mind in the first place. In the end, there is a fundamental difference between the concepts of autonomy in engineering and robotics on the one hand, and in humans, on the other hand, creating an "accountability gap" that is difficult to overcome by the current legal toolbox. For drones, this means that although they could be technically being able to discriminate targets, assess proportionality, necessity, and humanity of the use of force according to algorithmic rules, they would be able to do so in a meaningful way that includes non-computable factors such as volition. As a contribution to this debate, Walzer (2016[3]) argues that the drones are discriminative machines in their nature, this can be the result of diffusion in the hands of various actors-states or nonstate actors; officials, insurgents, or terrorists–either benign or malicious way. Secondly, the political will, not technological determinism leads to discriminative actions drones show. Besides, he claims that it will be problematic to regulate new technologies like drones since it is not well known even how to regulate the use of guns. Sparrow (2016[4]) indicates that discrimination is a political act is not bound to the drone, which is not capable of taking autonomous decision whereas for some scholars the autonomous and discriminative acts of drones can be improved with parallel to the improvement in the technology. Moreover, the approach to the act of justification remains limited to the context of warfare. Any advantages or the superiority of drones in the war zone do not constitute the base for justification only targeted killings under some tough constraints can be justified even if it is not universally accepted. It argues that drone technologies, as socio-technical assemblages, create a regime of "violent dehumanisation and non-differentiation" of people and have the potential to "further militarise activities and government agencies" (Wall and Monahan, 2011[5])

As mentioned before, the regulation debate on drones is mostly related to their use as a weapon. J.Lewis (2014[6]) discusses the regulation of fully autonomous weapons in the military domain. He argues that drones are unlike some weapons that have been banned by the international community, like non-detectable fragments and blinding laser weapons, which cause unnecessary suffering no matter how they are used[7]. He disagrees with the suggestion of the total ban of this technology

[3] Walzer,M. (2016) Just & Unjust Targeted Killing & Drone Warfare, Daedalus 2016 Vol. 145, 12-24, https://doi.org/10.1162/DAED_a_00408

[4] Sparrow, R. (2016). Robots and Respect: Assessing the Case Against Autonomous Weapon Systems. Ethics & International Affairs, 30(1), 93-116. doi:10.1017/S0892679415000647

[5] Wall, T., & Monahan, T. (2011). Surveillance and violence from afar: The politics of drones and liminal security-scapes. Theoretical Criminology, 15(3), 239–254. https://doi.org/10.1177/1362480610396650

[6] Lewis, J. (2015), The Case for Regulating Fully Autonomous Weapons. The Yale Law Journal. 124:130. https://www.yalelawjournal.org/pdf/n.1309.Lewis.1325_m2jm7kow.pdf

[7] Burrus M. Carnahan & Marjorie Robertson, The Protocol on "Blinding Laser Weapons": A New Direction for International Humanitarian Law, 90 AM. J. INT'L L. 484, 485-87 (1996).

which would not be effective as it is expected. Because autonomous weapons will represent the biggest advance in military technology[8]. Others argue that it would be unrealistic to expect major world powers to ban drones altogether, especially if some states refused to sign on and continued to develop them. Drones may have significant military utility, and in this respect, they are unlike many other weapons that the international community has banned[9]. Even if a ban were successful, moreover, nations might interpret the terms of the ban narrowly to permit further development of drones or violate the prohibition in ways that escape detection[10]. The better approach to ensure compliance overall would be to establish minimum limitations on autonomous technology and specific rules governing use.

It can be asserted that drones may have the ability to patrol an urban area and seek out the targets in the future. In either case, the need for clear guidelines is not an argument for an outright ban. Rather than prohibiting drones, international law should recognize that in some circumstances, they may permissibly be used—bolstering the case for regulation.

Johnson and Axinn (2014[11]) support the argument that autonomous weapons must be banned because: (1) Such a robot treats a human as an object, instead of as a person with inherent dignity. (2) A machine can only mimic moral actions; it cannot be moral. (3) A machine run by a program has no human emotions, no feelings about the seriousness of killing a human. (4) Using such a robot would be a violation of military honour. According to their judgement, morality must be considered in the process of taking a decision rather than the act of the robots itself, so based on this distinction it can be decided what kind of tasks autonomous robots should not be allowed to do, based on what must be moral decisions.

In contrast to critics on total ban, Docherty (2018)[12], in the Human Rights Watch report argues that the preemptive ban on the development, production and the use of autonomous weapons because they would fail both prongs of the test laid Marten Clause, which states that when no existing treaty provision specifically applies, weapons should comply with the "principles of humanity" and the

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[8] John Pike, Coming to the Battlefield: Stone-Cold Robot Killers, Washington Post (January,2009). http://www.washingtonpost.com/wp-dyn/content/article/2009/01/02/AR200901020 2191.html.

[10] Kenneth, A. et al. (2014). Adapting the Law of Armed Conflict to Autonomous Weapons Systems, International Law Studies. 90 (386). Stockton Center for the Study of International Law.

[11] A. M. Johnson and S. Axinn, (2014). "Acting vs. being moral: The limits of technological moral actors". IEEE International Symposium on Ethics in Science, Technology and Engineering, pp. 1-4. doi: 10.1109/ETHICS.2014.6893396

[12] Docherty, B. (2018). Heed the Call: A Moral and Legal Imperative to Ban Killer Robots, (August). https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots

"dictates of public conscience".[13] The Martens Clause serves as a measure to ensure that an unanticipated situation or emerging technology does not subvert the overall purpose of humanitarian law merely because no existing treaty provision explicitly covers it[14]. States, international organizations, and civil society have invoked the Martens Clause about unregulated, emerging technology[15].

The problems identified for the ban position and the status quo position render the last position – to regulate drones in novel ways – as the most promising among the debates which include the deployment for civilian (non-military missions). It assumes that distinctions between their "lawful" and "unlawful" uses could and should be made in the first place, thereby drawing attention to technology and design as much as to application context. To be able to distinguish lawful use from unlawful uses, there would however need to be some form of control that ensures that the latter forms would be outlawed and sanctioned. Some have therefore proposed to distinguish between offensive and defensive weapons. Others have however objected that such distinctions could not be meaningfully maintained if one takes into consideration the dual use potential that most modern weapons platforms offer (Sparrow, 2009). As detailed above, the variety of systems that are debated under the label of AWS, as well as technological innovation and design make it difficult to determine generic rules. The main issue debated within the regulation position is however whether they could be subjected to meaningful human control (Sharkey,2016). As Heyns (2016) summarizes, "if there is such control, there are not any special objections; if there is not such control, there is a strong case to be made that such weapons and their use should be prohibited."

The idea of control is thereby geared towards the re-establishment of human responsibility into a chain of action that would otherwise be partly or entirely executed without the mobilisation of human agency, thus potentially causing the legal and moral frictions outlined above. It might however not be as easy as just putting a human back into/onto the loop at some point and time. On

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[13] https://www.hrw.org/news/2018/08/22/why-we-need-pre-emptive-ban-killer-robots, https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-killer-robots

[14] A Moral And Legal Imperative To Ban Killer Robots | Hrw. (n.d.). Retrieved from https://www.hrw.org/report/2018/08/21/heed-call/moral-and-legal-imperative-ban-k

[15] ICRC, "Ethics and Autonomous Weapons Systems: An Ethical Basis for Human Control?" p. 6., CCW Protocol on Blinding Lasers (CCW Protocol IV), adopted October 13, 1995, entered into force July 30, 1998, art. 1. For a discussion of the negotiating history of this protocol and its relationship to discussions about fully autonomous weapons, see Human Rights Watch and IHRC, Precedent for Pre-emption: The Ban on Blinding Lasers as a Model for a Killer Robots Prohibition, November 2015, pp. 3-7.
https://www.hrw.org/sites/default/files/supporting_resources/robots_and_lasers_final.pdf

the question of drone warfare, Elish (2017) has for instance demonstrated how practices of drone operations, and specifically the different forms of labour division between humans and systems, have historically been contingent upon technical development as much as upon cultural and organizational contexts (such as military strategies throughout particular wars), and require the mobilization of large amounts of resources and coordination.

Understanding drone technologies as proposed by Science and Technology Studies (STS), as socio-technical systems that form a mutually constitutive and dynamic entity that includes both humans and machines (Barry, 2001; Jasanoff and Kim, 2015; Latour, 1991; Law, 1991; 8 Woolgar, 1987), makes it possible to reconsider the very idea of agency in terms that are neither predicated upon human nor non-human autonomy, but engage the variegated modes of interaction between humans and machines (Latour, 2005; Pickering, 1993; Rammert, 2008; Suchman, 2007). As Elish (2017: 1122) argues in this sense, "by paying attention to the divisions of labor and reconfigurations of human agency as it is transposed within human-machine networks over time and space, we can begin to shed light on the every day and often invisible structures of contemporary war." Acknowledging that "agency is about the most difficult problem there is in philosophy" (Latour, 2005: 51), and complicating this problem further with the insight that "things might authorize, allow, afford, encourage, permit, suggest, influence, block, render possible, forbid, and so on" (Latour, 2005: 72), STS scholars have proposed to study the distribution of agency between humans and non-humans (e.g., artefacts, animals, machines, computer systems) empirically and context-dependent. The basic assumption thereby is that action must not be looked for in one single location, but that it is fundamentally dislocated among multiple actors, be they human or otherwise. In the words of Latour (2005: 46), "action is borrowed, distributed, suggested, influenced, dominated, betrayed, translated", thus implying the central question whether action need necessarily be predicated upon an idea of human agency in the liberal sense (i.e. conscious, volitional decision-making, and ensuring execution of this decision).

What becomes foregrounded in the STS literature is in that sense the dynamism that is produced within socio-technical systems and the ensuing difficulties in possibly disentangling intentions and pinpointing responsibility for action at different locations and specific actors. Latour (2005: 62) summarises the prevalent questions that need to be considered when it comes to researching agency from such a perspective as follows: "Which agencies are invoked? Which figurations are the endowed with? Through which mode of action are they engaged? Rammert (2008) in this vein suggests concrete ways to locate agency in socio-technical systems by looking precisely at "where the action is". He, therefore, distinguishes three types of agency that can occur between human and non-human actors. The first one, “interpersonal action” – the subject of the social sciences in a traditional sense – can be found in the social world which “is populated by human actors, expectancies and communications; it is structured by institutions, social systems and cultural meanings” (Rammert, 2008). As the interpersonal sphere is predicated exclusively upon social characteristics, technology plays no part in this type of agency. Technology, in interpersonal action, instead becomes side-tracked as a neutral tool or means.

These considerations further complicate the question of whether significant control over autonomous systems can be exercised. The answer to this question thereby arguably hinges primarily on two sets of factors. First, where is the human positioned vis-à-vis the machine, and at which point and how can intervention be exercised? And which degree of autonomy is built into the processes and sub-processes of specific drones? Human-Computer Interaction (HCI) literature, which primarily deals with the computers’ ability to speech recognition, gesture sensing and eye tracking, to a large extent avoids using the term “autonomy” in the first place, and rather speaks of “levels of automation”, as what we are looking at in socio-technical systems is in the most cases not machine autonomy, but varying levels of automation that incorporate human action at different levels and times. Building on the idea that machines execute certain tasks better than humans, HCI is concerned with the question of how to best integrate mechanic capacities into systems where humans and machines work together. The seminal work of Sheridan and Verplank (1978) has specified ten levels of automation that differentiate how much workload is delegated to automated processes within the system, ranging from no assistance whatsoever to a fully automated system that completely ignores the human operator. The bottom line here is that “autonomy”, as currently used within debates surrounding drones, can mean many things – but seldom the special kind of autonomy (i.e. a system that fully operates without human intervention), and never in the philosophical sense of autonomy (i.e. volitional and self-conscious decision-making).

Moreover, it has become clear that as Sharkey (2016: 26) has it, “to say that there is a human in the control loop does not clarify the degree of human involvement.” For political debates on the potential regulation of drones, this implies at least two important intermediary conclusions. First of all, the regulatory debate must almost by definition become a more empirical one. It will be virtually impossible to draft regulatory proposals based on the condition that “a human must be in the loop” without specifying precisely where and how this must be done. As Sharkey (2016) has put forward in this sense, “we need to map out exactly the role that the human commander/supervisor plays for each supervised weapons system,” even if this is a time-consuming and challenging quest.

Secondly, as Klein et al. (2004: 94) argue, there is a "fine line between two views of AI: the traditional one that AI's goal is to create systems and technologies that emulate human capabilities, versus the non-traditional human-centred computing goal – to create systems that extend human capabilities, enabling people to reach into contexts that matter for human purposes." The former is certainly more suited to end up in scenarios where "killer robots" fight wars entirely without human intervention or control – but it might also be one that is conceptually outdated and politically undesirable. The latter form, however, is one that we already find in many application contexts and throughout all kinds of everyday domains. Engaging drones from a more nuanced socio-technical perspective should in this sense be helpful to inform the regulatory debate on drones and beyond.

Under this given context, the concerns over the human-machine relationship and their role in the regulation of drones take the existing drone research as an empirical site; it is shown that there two main overlapping camps to perceive drone are prevalent for the society and the state. The primary one considers drone as apolitical, flawed, material objects that need to be fixed and controlled to create more security and the protection of privacy. From the second camp takes them as a political tool in the hands of social/ state actors without considering technological possibilities and risks. In two between we can arrive at a third side which can bridge the gap, that is a technology the embodiment of societal knowledge.

While the first two stances towards drone technology based on material vulnerabilities and the socio-political view are to some extent interconnected with each other in terms of their common interest, on the other hand, the third approach constructs a ground in which technological and political knowledge can be combined analytically with each other. Furthermore, it comes with an exciting focus on social practices, much in line with and speaking to the practice turn in critical security studies (Bueger & Gadinger, 2014). Importantly, neither the technical nor the political lens should be given precedence over the other, at least analytically speaking. Preferably, the socio-political determines the functional, and the mechanical identifies the socio-political and both spheres should always be considered as closely intertwined. As an example, consider the limits to the *"interpretative flexibility"* of drone technology/ unmanned systems. "Interpretative flexibility" is a term from STS used to highlight that the interpretations and uses of any technology vary across time and between different groups (Woolgar, 1991, p. 30). However, the underlying material insecurity of drone-technologies is not open to social interpretation. There are vulnerabilities (such as flight level of task performance, the resistance to cyber attacks, cost and other financial concerns, formation of knowledge/manipulation of knowledge via media), which are developed through the sense of human-machine interaction and they can be exploited through unmanned counter technologies or through influencing the public and state perception by taking media sources or social engineering. On the other hand, knowledge of these vulnerabilities combined with the right capabilities allows certain actions in specific contexts, but are restricted by the characteristic of the weakness and its technical environment.

Vulnerabilities broadly offer themselves an exciting concept around which drone technology policies and practices converge. In drones, weaknesses become more apparent at the point where the human-robot interaction debates dominate the concerns of the state, non-state actors and policymakers. The third way of thinking makes us focus on unmanned systems as a social practice apart from the political or military method. The social method can be achieved and sustained through the circulation of knowledge about these vulnerabilities. At this point the questions to be considered as such: what kind of incidents become visible and why? Why do some make it into the news, while others remain obscure or potentially invisible? In what form is this knowledge made available? Are there conflicting accounts? How does learning about vulnerabilities travel between and across different boundaries and with what effects? In what ways is knowledge about weaknesses and their exploitation used to make political attributions? In what ways is this knowledge mobilised for political action?

Expectations, as a real-time representation of future technological situation and capabilities, can play a central role in policy making and changing of norms. As it has been mentioned vulnerabilities on drone technology can lead some distrust and uncertainty about their deployment and efficiency for the non-military operations as in the case of peacekeeping missions. At this point, expectation can help mobilise the resources at the macro level. Along with the positive hopes and capabilities, these vulnerabilities, assigned risks, and fears are parallel features of these kinds of dynamics[16]. Both positive expectations and concerns of danger—though different and having different dynamics—can be seen to have considerable influence on the discussion of technological change. Expectations and their transition from a purely subjective to an intersubjective dimension are seen as tools for orientation, thus reducing the variability of behaviours and increasing the conformity between the expected and actual action, in terms of both consequences and motivations. It can't be ignored the fact that the actor and the actor's anticipatory knowledge are not immune to the uncertainty which is raised from the vulnerabilities of the drone system.

First and foremost expectations are 'constitutive' or 'performative' in attracting the interest of essential allies (various actors in innovation networks, investors, regulatory actors, users, etc.) and

[16] M. Sturken, D. Thomas & S. J. Ball-Rokeach (Eds), Technological Visions. The Hopes and Fears that Shape New Technologies (Philadelphia, PA, Temple University Press, 2004).

in defining roles and in building mutually binding obligations and agendas. At the most general level, we can understand expectations to be central in brokering relationships between different actors and groups. Indeed, it would be hard to picture the formation of technology developments and innovation without shared, though flexibly interpreted, cluster of guiding visions. Also in more concrete situations, formulating an expectation, say about the usefulness of a tool or a procedure, can be read as an implied warrant to others that they should use that tool or the system. Expectations are, in this sense, obligatory and open up the potential for present-day promises to be held to future account. The point not to be ignored is that the expectation at the very early stages of the technology becomes most intense towards their implementation. However, this assumption does not validate as a general rule of thumb. In the case of unmanned systems, their capabilities have been debatable in the sense that it is either a disruptive technology.

In science and technology studies (STS), the word "expectation" is used to comprehensively include hopes, fears, desires, visions and promises, and, in general, anticipatory claims regarding science and technology. In general, expectations have been defined as "real-time representations of future technological situations and capabilities" (Borup et al.,2006). future-oriented representations "give direction to search and development activities" (Geels and Raven 2006) and, as such, "make things happen in the present day, real-time" (Chiles,2013). As the states have developed their drone capabilities and policies in response to their perception of current and future security challenges, this individual development reflects both the changing global security context, and the regional security challenges facing the EU and its member states. So, the expectations from the drone deployment on security mission are likely to influence the motives for seeking justification even though they invade the privacy of information and the protection of human rights.

Moreover, as expectations and uncertainty vary among different groups, people would attach a different level of trust to the expectations and the motives to justification. For example, many of the technical uncertainties of bench and exprementail science are often invisible to the broader public worlds of policy and entrepreneurship. Considering the drone technologies, the lack of knowledge and concerns against the drones among the society lead some obstacles when the decision makers determine to utilize them for the civilian purposes such as observation, protection of critiicial infrastructure e.t.c.

In this pont, it can be said that the distinctions between the technical scientific and the social must be broken down. The social analysis should attend to the content of technology scientific knowledge. The role of the great individual engineer, inventor scientist, discoverer must be seen in social context. Technological scientific] growth can no longer be thought of as a linear accumulation of artefacts facts, each extrapolated from an existing corpus of technical achievement.In short, technology science involves process as well as product, and technological artefacts scientific facts are to be understood as social constructs.

Examining the civilian use of drones and how they are justified, requires first of referring to their utility in military domain which essentially dominates the debates on drones but also blurs the line with the civilian use. To this point, the bulk of studies and other literature surrounding drones show focus on the ethical and moral implications of drone deployment in threatres of war without giving the equal and in depth attention to non- military utilization.

The thesis is structured as follows: the first chapter provides the research question of this thesis, its relevancy to the argument and the methodology. Besides, the conceptual discussion on drones and different classification are given. Then, it is followed by the overview of drone market and literature review on the drone related studies. The second chapter addresses the theoretical framework and the contribution of thesis . Chapter three and four focuses on the case studies from United States and Europe explaning their civilian and military use of drones as well as their regulation for the civilian airspace. Final chapter critically examines the findings in the light of theoretical framework based on particular social and technological determinism and Boltanski's pragmatic sociology.

CHAPTER I

1.a. Definitional Issues and Classification

In this chapter the various definitions of drones are presented to clarify the differences and proper understanding on this technology so that we would explain how we refer to this technology throughout this thesis. In literature and in practice, there are many other terms that refer to drones (UAV, RPAS. etc). The different terms do not always have exactly the same scope and different stakeholders prefer using different terminology.

The most often used terms interchangeably are Unmanned Aerial Vehicle (UAV) and Unmanned Aerial System (UAS). The UAS is the generic term that defines the totality of the components of an unmanned aircraft, together with the other necessary components including all equipment, networks and personnel. The term UAV focuses on the flying platform whereas the latter is a more general term to refer to both the flying platform and the ground station that controls the platform. Nevertheless, in practice, the terms UAV and UAS refer to the same aircraft as the term drone (i.e., unmanned airplanes and helicopters, but not, for instance, rockets and jetpacks). The terms UAV and UAS are used mainly in official documents, including legislation. Although UAS is the preferred term in a military environment, there are occasions when such a generic term is unhelpful. The term "unmanned" can cause confusion or uncertainty over the actual level of human control and has led to safety, ethical and legal concerns being raised, particularly with regard to the employment of weapons and flight in non-segregated airspace. These concerns can be addressed in part by using terminology that better describes the level of human control of such aircraft as being equivalent to that of piloted aircraft; the pilot is simply physically remote from the aircraft itself.

From military point of view, this technology might be also perceived as a platform which is the common terminology used through both Air Force and Joint U.S. military doctrine to define aircraft, ships, and vehicles. Remotely Piloted Aircraft (RPA) alone represents a major military innovation in platforms, which is critical to understanding the difference between strategic and tactical RPAs for both use and proliferation. A platform's utility as a military capability is dependent on its payload, its weapons, and its support infrastructure. Without any of these components, the RPA platform would be potent as a coercive tool but unable to target individuals, significantly altering its utility. For this reason, many authors also speak of RPAs in terms of the system, calling them UASs for Unmanned Aircraft Systems. This somewhat might be problematic because of the 'unmanned' reference, especially when emphasizing the system as a whole which is heavily manned.

At the international level, Chicago Convention Art. 8 (Pilotless aircraft) is the only provision explicitly concerned with drones:

'No aircraft capable of being flown without a pilot shall be flown without a pilot over the territory of a contracting State without special authorization by that State and in accordance with the terms of such authorization. Each contracting State undertakes to ensure that the flight of such aircraft without a pilot in regions open to civil aircraft shall be so controlled as to obviate danger to civil aircraft'[17].

The wording "aircraft capable of being flown without a pilot" is not very specific. It could suggest either that there is simply no pilot aboard the aircraft or that the aircraft is flown entirely without any pilot intervention, not even from a remote location. The control of the flight is also the main idea of fully autonomous drones, as they do not fly randomly through the air but are only reasonable if their flight is controlled, even if the aircraft itself is not controlled by a pilot in real time while it is flying. Secondly, safety has been the main reason for the restrictive provision of Art. 8, as those 'pilotless aircraft' were not subject to any specific regulation and international standards at that time.

[17] Chicago Convention, supra note 38, at art 1.

To help avoid confusion and prevent misunderstanding, the U.K. Ministry of Defence has presented a Joint Doctrine Notes[18] which outlines the UK military terminology and classification that is to be used when working with NATO and other international partners. According to this report, the term UAV is not aligned with NATO (uses the term RPA) thinking in the interests of interoperability. Thus, the MOD believes it is more appropriate to use the term RPA to describe such aircraft, and Remotely Piloted Aircraft System (RPAS) to describe the entirety of that which it takes to deliver the overall capability. So, the UK opted for the RPAS in their statements and analysis (Herlik; 2010 and Fishpool,2010[19])

According to Birmingham Policy Commission (2014) the phrase UAV has been common place but this usage is now seen as misleading since there is still a pilot, although on the ground not in the air. The general public is less familiar with these terms, especially when the abbreviations are used. As a result, people may have few or none associations with these terms. Moreover, RPAS (Remotely Piloted Aircraft Systems), unlike the two other terms, assumes that there is a pilot, whereas this is, strictly speaking, not necessarily the case for drones and UAVs. All RPASs are UAVs, but not all UAVs are RPASs. The term RPAS refers more to radio control airplanes and helicopters and excludes fully autonomously flying aircraft. It emphasizes the reality that a trained professional pilot is in control of the system. As such, the term RPAS can be perceived as subcategory of drones. While RPAS is generally used in policy documents and media in Europe and the UK, it can be described as such: “RPAS is the sum of the components required to deliver the overall capability and includes the Pilot, Sensor Operators RPA, Ground Control Station, associated manpower and support systems, Satellite Communication links and Data Links[20]”. However, the UK seems to lack

[18] Joint Doctrine Note (JDN) JDN 3/10—Unmanned Aircraft Systems (UAS): Terminology, Definitions & Classification : JDN 2/11—The UK Approach to UAS

[19] Fishpool M (2010), International military and civilian Unmanned Aerial Vehicle Survey, Socolofi Research; Herlik E. (2010) Unmanned Aerial Vehicles for commercial applications. Global Market & Technologies Outlook 2011-2016.

behind the U.S in its UAS/UCAS developmental philosophy[21]. While there are no equivalent UK UAS roadmaps in the public domain, UK's MOD is also looking at a range of options for its future combat air power; a part of the Future Combat Air System programme is a France/ UK study, which is considering the potential use of UCAS as a replacement for some currently manned platforms[22]

Similarly, EASA defines UAS as An Unmanned Aircraft System (UAS) comprises individual system elements consisting of an "unmanned aircraft", the "control station" and any other system elements necessary to enable flight, i.e. "command and control link" and "launch and recovery elements". There may be multiple control stations, command & control links and launch and recovery elements within a UAS. European Aviation Safety Agency (2009).

According to the one definition given by U.S. Department of Defence (DoD) (2007[23]): "A powered vehicle that does not carry a human operator, can be operated autonomously or remotely, can be expendable or recoverable, and can carry a lethal or nonlethal payload. Ballistic or semi-ballistic vehicles, cruise missiles, artillery projectiles, torpedoes, mines, satellites, and unattended sensors (with no form of propulsion) are not considered unmanned vehicles. Unmanned vehicles are the primary component of unmanned systems".

Then U.S. DoD (2013[24]) has introduced more specific definition on drones. "UAVs are defined as powered aerial vehicles sustained in flight by aerodynamic lift over most of their flight path and guided without an on-board crew. They may be expendable or recoverable and can fly autonomously or piloted remotely". The National Council of State Legislatures provides another definition: "Unmanned aircraft systems (Team), also commonly called unmanned aerial vehicles (UAVs) or drones, have many applications for law enforcement, land surveillance, wildlife tracking, search and rescue operations, disaster response, border patrol and photography among

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[24] Introduction of the Unmanned Aerial Vehicles (UAVs), 2013, para 1

others". This definition includes potential uses for UAVs, but it does not provide a clear description of the vehicle. Another definition states, "Today, the term UAS is used to emphasize the fact that separate system components are required to support airborne operations without a pilot on-board the aircraft" (Roadmap, 2013, p. 7).

Apart from these acronyms mentioned above, there is also so called Unmanned Combat Air Systems (UCAS) terminology which is rarely used compared to the precedents. It is described as 'an unmanned military aircraft of any size which carries and launches a weapon, or which can use on-board technology to direct such a weapon to a target[25]. Colin Wills (2015) perceives UCAS as weaponised UAS, utilising a level of automation/ autonomy – which may also be capable of Intelligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) tasks – and designed to survive in highly contested airspace.

Among the different types of definitions, Newcome (2004) finds out that the distinction made by the FAA in using the term "aircraft" instead of the more universally applied term "vehicle," can be problematic. Because the institutions or actors select the terminologies based on their area of interest or responsibilities. For instance, Federal Aviation Administration (the FAA) has opted for using the term "aircraft" because it noted that it was responsible for regulating "aircraft" and not "vehicles". Consequently, the FAA defines drones as "aircraft capable of flight beyond visual line of sight under remote or autonomous control for civil (non-DoD) purposes. A UAV can not be operated for sport or hobby and does not transport passenger or carry crew."[26]. Equivalently, The Civil Aviation Authority (the CAA) in the UK calls the drones as "small/larger aircrafts[27]". While

[25] For example, see a brief from Brent Nave and Robert McWhorter, 'Third Party Targeting of SLAM-ER Weapon in Flight via Link-16 Surveillance Messages' (2011), slides 7–10.

[26] FAA Draft Advisory Circular, "Unmanned Air Vehicle Design Criteria," Section 6.j, 15 July 1994, noted in Matthew T. DeGarmo, Issues Concerning Integration of Unmanned Aerial Vehicles in Civil Airspace, at 2 n.2 (Nov. 2004) at http://www.mitre.org/work/tech papers/tech papers 04/04 1232/04 1232.pdf.

[27] https://www.caa.co.uk/Consumers/Unmanned-aircraft/General-guidance/Information-for-the-public-about-drones/

the perspectives of the given authorities reflect the strict responsibility understanding on drone regulation, the current state of drone application, that is their use invalidates the above definitions.

Moreover, the U.S use of drones for targeted killings outside the context of traditional battlefield as well as lack of transparency about the conduct of operation and civilian causalities have aroused the debates over the application of this technology but also undeniable non-consensus on how to call this system. Although the terminology drone was firstly used in 1935, the currently developed and diffused unmanned technology requires more clarified description both military and civilian field. It can be said that state/non-state actors who evade to pick the term drone try to lower the fear and anxiety which have been formed through media coverage on the deployment of drones for military operations or the incidents caused public damage or violate privacy. Thus, they are assumed to carry a hostile connotation and do not reflect how drones are being used. This context overshadows the many civil and commercial uses of drones, including the monitoring of natural gas pipeline, agriculture remote sensing, and aerial cinematography[28].

Likewise, this uncertainty on conceptualizing the drone signifies that by accepting technology as the only way forward and not defining clearly the relationship between human and machine, the dominant approach to living involves the unending progress toward newer and better technology, which shuts down any critique or observations that question this march as irrational (Habermas,1971[29]). Thus, as the new technology erases the line between what is practical and technical. Information gains, as well as changes in language, based progress only through the prism of technology (Habermas,1971). This focus on technology creates a social distance and an information distance from those in power versus those without power (Habermas,2001). This lack of social engagement with social policies creates an environment and the context for important

[28] Kelsey D. Atherton, Keeping up with the Droneses: The Week in Drones, POPULAR SCI., http://www.popsci.com/category/popsci-authors/kelsey-datherton
[29] https://www.caa.co.uk/Consumers/Unmanned-aircraft/General-guidance/Information-for-the-public-about-drones/

opportunities for the public sphere to develop and influence social change for the rest of society. Accordingly, in the formation of proper definition for drones, narrative has played a key role in the depiction of the social construction of reality. For instance, drone strikes continued to be the important part of the Obama administration's foreign policy objective. While the use of drone strikes can differ wildly in duration and location, the importance of them as tool for military objectives remained a key action in the USA TODAY coverage. The USA TODAY coverage focused on the war in Afghanistan, with the drone strikes as another tactical measure used to help coalition forces against mostly Taliban and on occasion, Al Qaeda forces whereas little or no news has been provided on their coverage. The term "drone" has been loaded with a hostile connotation and could not reflect properly how UAS are actually being used domestically. Many view the use of the term 'drone' as inaccurate and misleading, as it fails to capture either their purpose or degree of technological sophistication. So, when the drones are referred in the media, they are usually meant large military drones such as Predator or Reaper type that are used in overseas operations.

This concern has been also highlighted during the testimony of Retired Col. Martha McSally of the Air Force during Senate's examination of the legality of drone strike in Yemen and the effects and consequences of the Obama's administration's drone program in elsewhere:

"…I use the term "remotely piloted aircraft," which is my first point, instead of drones because I think that is part of the challenge. There is an information operations campaign by Al Qaeda going on against us. The word "drone" actually has a connotation that we've got these autonomous vehicles flying around and striking at will without a whole lot of oversight and scrutiny to them. The military is now using the term Remotely Piloted Aircraft (RPA) for the types of UAVs that require a pilot to be actively flying the platform, but from a remote location. So, the military does use the term "remotely piloted aircraft" to explain and to try and paint the picture that it actually takes 200 individuals to keep one of these aircrafts airborne for a 24 hour orbit and that 200 individuals include the operators, the intelligence personnel, the maintenance personnel. the equipment people, the lawyers, and, also, part of the process you have literally hundreds of other personnel that are involved in the process on the military side when you are conducting one of these operations. So, I will be using RPA throughout my testimony and that is certainly one of the points to make."[30] (The hearing "Drone Wars: The Constitutional and Counterterrorism Implications of Targeted Killing", 2013)

Worried that public perception could lead to drones being "brought under increased scrutiny, perceived to be illegitimate, openly resisted or undermined," the NSA suggested in a report "'drone strike' should never be uttered, calling it 'a loaded term.'". As detailed by the Washington Post: "Drones connote mindless automatons with no capability for independent thought or action," the report said. "Strikes connote a first attack, which leaves the victim unable to respond. Other phrases employed to evoke an emotional response include 'Kill List,' 'Hit Squads,' 'Robot Warfare,' or 'Aerial Assassins.[31]'?"

These contrasting definitions at state and industry level. At the centre of this issue is the industry's lack of a singular legislative and military policy for drone testing, development, integration, and deployment. Thus, the inconsistency of the regulatory framework creates an artificial distinction between military and non-military use of the drones. Besides, it shows that there is an ambiguity to describe a drone succinctly, accurately, and consistently, which highlights systemic problems on perceiving this technology. Firstly, the ongoing debate about whether drones are disruptive technology, or they are just modified/upgraded version of previous systems. From one aspect they can be transformative since they can lower the cost of waging war and human cost by replacing the man power. They can revolutionize how state and non-state actors can use the violence as source of

[30] The Committee hearing entitled "Drone Wars: The Constitutional and Counterterrorism Implications of Targeted Killing" Subcommittee on the Constitution, Civil Rights and Human Rights (April, 2013) https://www.judiciary.senate.gov/meetings/location-change-and-time-change-drone-wars-the-constitutional-and-counterterrorism-implications-of-targeted-killing

[31] https://www.washingtonpost.com/world/national-security/us-documents-detail-al-qaedas-efforts-to-fight-back-against-drones/2013/09/03/b83e7654-11c0-11e3-b630-36617ca6640f_story.html?utm_term=.aebf06482927

threat (Zegart,2015[32]). In similar vein the UN special rapporteur Christof Heyns noted that "drones make it not only physically easier to dispatch long-distance and targeted armed force, but the proliferation of drones may lower social barriers in society against the deployment of lethal force and result in attempts to weaken the relevant legal standards."[33] Being diffused quickly at international level they can disrupt the security environment and it increase the tension between manned aircrafts and drones[34] (Sayler 2015; Kreps 2016; Horowitz et.al. 2016). Thus, drones are prone to be banned in these cases. From other aspect, the drones are just another technology, replicates capabilities that many modern technologies already possess[35]. Therefore, they cannot lead serious than manned aircraft such as F-16 can lead to. Still, drones do not win wars, cannot hold territory, and have not produced decisive victories for the state either tactically or strategically[36]

Secondly, there are the special difficulties associated with criticizing the widely popular but deeply problematic characterizations of technology as equipment or as applied science. Nevertheless, as technology philosopher Don Ihde (1993) states that "definitions are not neutral," and therefore gives technology a "middle-sized" definition, insisting that the definition contain three components; *First, we shall insist that a technology must have some concrete component, some material element, to count as technology. And, second, a technology must enter into some set of praxes-'uses'-which*

[32] Amy Zegart, "The Coming Revolution of Drone Warfare," Wall Street Journal, March 18, 2015, http://www.wsj.com/articles/amy-zegart-the-coming-revolution-of-drone-warfare-1426720364.
[33] https://www.theguardian.com/world/2013/oct/17/un-rapporteur-heyns-drone-strikes-yemen-pakistan
[34] Kelley Sayler, "A World of Proliferated Drones: A Technology Primer" (Washington, D.C.: Center for a New American Security, 2015), http://www.cnas.org/sites/default/ªles/ publications-pdf/CNAS%20World%20of%20Drones_052115.pdf. / Sarah Kreps, Are Drones Transformative? It Depends on the Battlefield Context, Horowitz, Sarah E. Kreps, and Matthew Fuhrmann 'Separating Fact from Fiction in the Debate over Drone Proliferation, International Security, Vol. 41, No. 2 (Fall 2016), pp. 7–42, doi:10.1162/ISEC_a_00257
[35] Charli Carpenter and Lina Shaikhouni, "Don't Fear the Reaper: Four Misconceptions about How We Think about Drones," Foreign Policy, June 7, 2011, http:// foreignpolicy.com/2011/06/07/dont-fear-the-reaper/; Megan Braun, "Predator Effect: A Phenomenon Unique to the War on Terror," in Peter L. Bergen and Daniel Rothenberg, eds., Drone Wars: Transforming Conºict, Law, and Policy (Cambridge: Cambridge University Press, 2014), pp. 253–284; Mark Moyar, "Drones—An Evolution, Not a Revolution, in Warfare," Strategika, January 2014, pp. 11–13; and Lynn E. Davis et al., "Armed and Dangerous? UAVs and U.S. Security" (Santa Monica, Calif.: RAND Corporation, 2014)
[36] Michael Horowitz, Sarah Kreps, and Matthew Fuhrmann, "Separating Fact from Fiction in the Debate over Drone Proliferation," International Security, Vol 41, No. 2 (Fall 2016), 7-42; 16.

humans may make of these components. And third, we shall take as part of the definition, a relation between the technologies and the humans who use, design, make, or modify the technologies in question.[37]

Thus, in addition to the application of knowledge in creating an artefact for practical purposes, his definition emphases undeniable relationship between humanity and technology in the application of science or knowledge to create a capability for a specific, usually practical, purpose. Therefore, assuming that there will be a relationship of some kind between the human and the technology created, the definition of technology used for this study is as follows: Technology is the application of knowledge that produces an artefact or provides a capability for practical purposes.

If there will be a relationship of some kind between the human and the technology created, unmanned systems should be regarded as application of knowledge that produces an artefact or provides a capability for practical purposes. The official term used by the Department of Defense when referring to a craft in the air without a pilot onboard is unmanned aircraft (UA), which it defines as "an aircraft that does not carry a human operator and is capable of flight with or without human remote control" (U.S. Department of Defense Joint Publication (JP) 1-02 2010, 252). All the associated technology needed to operate a UA is termed an Unmanned Aircraft System (UAS), which is officially defined as "that system whose components include the necessary equipment, network, and personnel to control an unmanned aircraft" (U.S. Department of Defense JP 1-02 2010, 252). A UAS that is used as a military weapon system is called an unmanned combat air system (DARPA 2004, 1; U.S. Navy 2014, 1). Other terms often used by the DOD, other services, organizations, and agencies to refer to UA and UAS technology include: drone, optionally piloted aircraft, remotely operated aircraft, remotely piloted aircraft, remotely piloted vehicle, unmanned aerial system, unmanned aerial vehicle, and unmanned combat aerial vehicle[38]

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[37] Ihde, Don.(1993). The Philosophy of Technology: An Introduction. New York: Paragon House

[38] Autonomy for this study is initially approached ontically in order to provide a working definition

According to Berkowitz (2014), there are three misunderstanding about drones. Firstly, widespread technological ignorance, those who are unaware of how algorithms empower drones to simulate intelligence, the human-like behaviour of drones is mysterious. Secondly, as it has been mentioned before, that drones have been confused with their infamous military exemplars and thirdly. It is a mistake, however, to use the term “drone” to refer only to these much-publicized military devices. Drones, more precisely understood, are intelligent machines that—possessed of the capacity to perform repetitive tasks with efficiency, reliability, and mechanical rationality—increasingly displace the need for human thinking and doing. Plus, he underlines a concern about the changing perception about the presence of human on the technology. Since drones are different from other technological innovations, and the reason drones pose a danger to the humanity of the human condition is that they are specifically capable of reducing the need for human judgment, human creativity, and human thought. He even goes further by claiming that drones mimic human action and human judgment and also offer a mechanical albeit importantly seductive ideal of human behaviour so that they transform the meaning of humanity.

Since human control is one of the main interests on defining and implementing drones, the term “autonomous” and “autonomy” must be underlined as well since it creates some concerns among certain sectors of the military and media, with the belief that the use of autonomous UAS would not be acceptable in some scenarios. Automation has been a reality in a number of weapons systems for the past century, and is in fact directly related to the Information Revolution, for just as the Industrial Revolution automated mechanical processes, the Information Revolution has automated decision-making processes. The perception of autonomy as a catch-all for the evils of the computers taking over, however, hinders the debate on advancements of RPAs in combat. The debate over the meaning of autonomy is ongoing. According to the UK MoD, defines an automated system as a

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that focuses on autonomous weapon systems as technologies that are real, currently exist, and are used in the United States Department of Defense This definition focuses on the concept of self-governance as applied to technological autonomy and the ability of a machine to use artificial intelligence in order to operate independently from human control.

system 'in response to inputs from one or more sensors, is programmed to logically follow a predefined set of rules in order to provide an outcome. Knowing the set of rules under which it is operating means that its output is predictable[39].

This is not in the sense that adversaries' actions can be predicted; but it does mean that 'systems' will follow a set of rules, defined within pre-programmed matrices, while manned systems will use tactics and procedures that are constrained by the laws of physics and convention.

For the US Office of Naval Research defines autonomy as: 'The capacity to operate in the real-world environment without any form of external control, once the machine is activated and at least in some areas of operation, for extended periods of time.'[40] Autonomous action is meant to be the unmanned aircraft has sensors and an on-board data processing capability to make decisions to attack according to a computer program. That's why the pilot's output should be predictable. As defined by the DOD's Defense Policy Review Board, "Autonomy represent a set of capabilities that enables a particular action of a system to be automatic or, within programmed boundaries, 'self-governing (The Role of Autonomy in DoD Systems, 2012).'" Critical to this definition is the phrase 'a particular action,' noting that automation does not refer to the entire system at all times. At some level, all systems will be controlled by human operators, and as a result the DoD task force recommended that "instead of viewing autonomy as an intrinsic property of an unmanned vehicle in isolation, the design and operation of autonomous systems needs to be considered in terms of human-system collaboration (Ibid., pp. 1-2)." The real question for the future of RPAs is not whether or not they should function autonomously, but which aspects of their missions should be automated and to what extent terms of human-system collaboration (Ibid., pp. 1-2)."

[39] Birmingham Policy Commission (2014). Security Impact of Drones: Challenges and Opportunities for the UK.
[40] C. Wills (2009), Unmanned Combat Air Systems in Future Warfare : Gaining Control of the Air. Palgrave Macmillan

Table 1: Levels of Automation[41]

Maybury Classifications	Sheridan & Verplank Level	Automation Description
No Autonomy	1	Computer offers no assistance: human does the whole job up to the point of turning it over to the computer to implement.
Partial Autonomy	2	Computer helps by determining the options.
	3	Computer helps determine options and suggests one, which the human need not follow.
Supervisory Autonomy	4	Computer selects action and the human may or may not do it.
	5	Computer selects action and implements it if the human approves.
	6	Computer selects action, informs the human in plenty of time to stop it.
Full Autonomy	7	Computer does the whole job, tells the human what it did.
	8	Computer does the whole job, tells the human what it did only if the human explicitly asks.
	9	Computer does the whole job, tells the human what it did if it decides he should be told.
	10	The computer decides whether or not to do the whole job. If it decides to do the job, it can determine whether or not to tell the human about it.

A 1978 article by Thomas Sheridan and William Verplank represents one of the first efforts to define a spectrum of autonomy, rather than defining platforms as either autonomous or not. This spectrum pertains to the extent of involvement and control for human operator so that it could be automated. Mark Maybury, building on this foundation and placing it in the context of RPA development, refined these levels of automation into four broad categories: no autonomy, partial autonomy, supervisory autonomy, and full autonomy. Table 1 shows these two systems for classifying levels of autonomy, with a corresponding description of each level. The levels of automation identified in Table 1 provide a useful and easy to understand methodology for comprehending automation in RPAs. However, several recent reports have questioned their overall utility in advancing the argument for the need for greater autonomy for RPAs. The Defence Science Board, in their report on automation, recommended moving away from a levels approach to understanding automation and toward a three facet framework to assist program managers and acquisitions officers in shaping programs, designing future technologies, and evaluating future systems. Alternatively, levels of analysis recommended by Caitlin Lee is one that breaks out the

[41] Table modified version of table originally appearing in Embracing Autonomy (Lee C. H., 2011), derived from Human and Computer Control of Undersea Teleoperators (Sheridan & L.Verplank, 1978), modified to include current Air Force definitions of autonomy as well-

levels of automation across two additional dimensions, mission complexity, environmental complexity and human independence can be considered to compare the requirements of various circumstances. Regardless of the analytical lens for understanding autonomy, the key takeaway is that the RPA represents a complex platform which performs multiple processes, all of which will be subject to different levels of automation.

In summary, this study consider the term "autonomous" as the system which use pre-programmed instructions, however complex these may be, aided by Artificial Intelligence (AI) software so emphasize that, although various functions of RPAs can operate autonomously, they are ultimately under the control of a significant team of operators and analysts, and the ultimate decision to use offensive force rests with a manned operator. Pathologies of drones, who affects and who is affected is remained unquestioned while defining / finding the proper definition for this technology.

When the drones are deployed for the military purposes, some officers perceives little or no political and moral concerns compared to the others (Wills, 2015). The industry is claimed to 'have no moral concerns, however, society has a way to go before accepting an autonomous war-fighting/killing. Also, civilian interviews in his study emphasized less importance for ethical and political implications for this technology. Moreover, while not providing proof that drones could conduct all counter-air roles by 2040, the responses support the hypothesis that it is at least worth investigating the potential for drones that are capable of gaining control of the air.

Considering these thoughts on the implementation of UAVs, it can be said that diffusion of these technology and normalization of their use beyond the battlefield has been also formed the ground for justification to deploy them in different contexts. They need to overcome fear and anxiety that the technology is being used for unlawful and senseless killing or that local law enforcement agencies will abuse the use of drones and violate privacy if they can purchase and operate drones.

Attempting to confirm that humans are still involved in the operation of UAS, the terms RPAS and RPA have been adopted by the Royal Air Force (RAF) and the United States Air Force (USAF) as well as by the policy makers and state (non) actors. The reasons for this are valid; however, there appears to be no consistency at all within the wider military and academic community. Even the term UAV seems to evade a consistent definition, with a recent RAF Chief of the Air Staff (CAS) referring to a UAV as an Uninhabited Air Vehicle, and another senior RAF officer using the term Unmanned Air Vehicle. None of these terms are incorrect; however, it can be said that an accurate definitions and consistency are important. In this study we will evade to use the various acronyms instead "drone" and drone/ unmanned technology will be used interchangeably. Here unmanned technology refers to more general category covering any type of drones (land, sea and air).

Seeing that not all drones are equal in capability and consequence for their use, they can be categorized as such[42] : (1) hobby drones (2) midsize drones (e.g. ScanEagle) (3) large military-specifc drones (e.g. Heron, Global Hawk) (4) stealth combat drones (e.g. Lockheed Martin's RQ-170, Sentinel and Northrop Grumman's RQ-180).

In addition to this categorization, there is also tactical and strategic drones which in essence are used in military contex. Drones in this category fill the gap between mini-drones and long-range, higher-endurance drones Existing tactical and tactical-small drone are designed for ISR-only applications. Demand for tactical and tactical-small drone will be mostly from emerging markets, in other words from countries that are newly acquiring capabilities. Due to their relatively low cost and characteristics, tactical and tactical-small drones are best suited for civil applications.

While the relevancy of each drone is defined by a military and national security perspective and their capability to fulfill the policy response, mid-size military and commercial drones stay as the main focus while limited reference to hobby drones are included in this study. These drones,

[42] Sayler (2016), A World of Proliferated Drones : Technology Primer. A World of Proliferated Drones Series | June World of Proliferated Drones Series, 06/2015. Center for New American Security.

ranging in cost, from tens of thousands of dollars to no more than a couple million dollars, are available for purchase by states as well as industry plus non-state actors with limited infrastructure. They are capable of serving verios missions ranging from spraying crops in large field to monitoring disaster zones and delivering humanitarian assistance. [43]

1.b.Global Outlook- Civilian and Military Drone Market

This chapter presents general outlook on the initial development of drone market and how the relationship among military, civilian, governmental and private bodies have been evolved. As it has been mentioned before drones do not represent a radically new technology, rather they have been one of the strands in airpower and the idea of using self-guiding aircraft to minimise the human risk, collect intelligence has been ongoing debate on the past decades. Only difference is that they are demanded more and increase competition in the market, which is a consequence of uneven distribution of past military innovations such as aircraft carriers, nuclear weapons and on nations' abilities to fund and adapt to these changes (Horowitz, 2010[44])

Initial phase on the integration on drone market can be dates back to 1920s when the American Defence Preparedness Association (ADPA) was created by the industry with the goal of 'increasing weapons technology, improving defence management, and maintaining a strong science-industry defence team which would be continually responsive to all needs of the development, production, logistics, and management phase of national preparedness' (National Defense Industrial Association 2013[45]). However, the investment modern drone technologies have started through 1980s. DARPA concentrated on the promotion of Ronald Reagan's Star Wars initiative in what has been called the Second Cold War. In the 1990s and early 2000s it was to develop technologies of digital

[43] http://drones.cnas.org/wp-content/uploads/2016/03/CNAS-World-of-Drones_052115.pdf

[44] Michael C. Horowitz, The Diffusion of Military Power: Causes and Consequences for International Politics (Princeton, NJ: Princeton University Press, 2010), pp. 3–5.

[45] Abigail R. Hall & Christopher J. Coyne (2014) The political economy of drones, Defence and Peace Economics, 25:5, 445-460

surveillance in close alliance with the NSA, along with military drone technology.[46] Wide deployment of drones for surveillance type applications has emerged largely due to the development of drones are military and potential civilian applications. Reducing the human factor drones can garner a large amount of intelligence without putting human life in danger. This has been the strongest motivation for the rapid development of drones. Plus, the advances in the power train technology in other areas such as automotive and aerospace have made their way into the world of robotic aircraft (Forest& Sullivan, 2014).[47]

According to the forecast, the value of military unmanned aerial vehicles will reach $ 5.26 billion by 2022 ($3.87 in 2013) and the defence sector will be one of important beneficiary of this technology. Recently, at least 90 nations and non-state groups are known to operate drones, including 10 countries with armed drones. An additional 20 countries are supposed to have armed drone programs in development. As this technology continues to proliferate, it becomes easily available to state and non-state actors such as Hamas, Hezbollah, ISIS and Libyan rebel groups have used drones to conduct tactical surveillance.[48]

Although U.S. military possess the world's largest drone fleet- it is reported that by 2015 the Pentagon has some seven thousand aerial drones, compared to fewer than 50 decades ago[49]- it is followed by Asia-Pacific ($ 7.95 billion), Europe ($ 6.06 billion), Middle East ($ 2.12 billion). The regions expected to see increased drone missions, in addition to the Middle East, include Europe and Asia-Pacific. Drones are also considered to be effective tool for fighting piracy off the coast of Africa. For instance, in European Union Naval Force's (EUNAVFOR) Operation Atalanta, Spanish

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[46] Hafner and Lyon, Where Wizards Stay Up Late, 14-21,255; L. Parker Temple III, Shades of Gray: National Security and the Evolution of Space Reconnaissance (Resten, VA: American Institute of Aeronautics and Astronautics, 2005), 132-33, 142, 146,192-200,208-18,233,242.

[47] Frost-Sullivan (2014) . Innovations in Unmanned Vehicles–Land, Air, and Sea (Technical Insights)

[48] Ewers,Elisa et. Al (2017) Drone Proliferation: Policy Choices for the Trump Administration. CNAS

[49] Understanding Drones, The Friends Committee on National Legislation. (Year-Unknown) https://www.fcnl.org/updates/understanding-drones-43

Navy vessel has deployed a ScanEagle drone for intelligence, surveillance, target acquisition, and reconnaissance (ISR) purposes.

In terms of cost and the approval of sales, the US. drones are credited to be exacting technology even for the allied countries such as Italy and the UK. In this setting, Asia-Pacific region constitute alternative markets for drone sales. As the leading country in the region, From China supplied only 0.9% of total UAV exports, compared to Israel with 60.7% and the US with 23.9%. (1985-2014). Up until recently, Chinese UAVs are attracted attention among the Middle Eastern and some African countries along with Iraq, Saudi Arabia, Egypt and the UAE have reported their imported armed drones from China, the Caihong model of UAVs, mostly known as CH-3 and CH-4 which carries similar characteristics of MQ-9 Reaper but an affordable to prices as well as quick approval process of Chinese sales.

Market projections have predicted that, in the following decade, the Aviation Industry Corporation of China, will produce $5.76 billion worth of UAVs through 2023, making it the world's largest manufacturer. By comparison, the second largest projected producer, America's Northrup Grumman, is only estimated to manufacture $2.58 billion in that same period. Additionally, the Defence Science Board highlights that Beijing's drone push "combines unlimited resources with technological awareness that might allow China to match or even outpace US spending on unmanned systems in the future.[50]"

Technological advances stimulated by military uses and new challenges ignited the interest in unmanned civil aviation in the 1990s, which rapidly generated a multitude of applications. For instance, the NASA and the Aero-environment Corporation developed solar-powered aircraft, e.g. 'Pathfinder' and 'Helios', for scientific operations, in particular, environmental monitoring, which

[50] Stewart, Phil. "Chinese military spending exceeds $145 billion, drones advanced: U.S." Reuters. (June, 2014) <http://www.reuters.com/article/2014/06/06/us-usa-china-military-idUSKBN0EG2XK20140606>.

could operate at high altitudes for weeks.[51] In the agricultural sector, for example, Japan entered the arena in 1986 with the development of unmanned helicopters for the spraying of crops and is now the most extensive user of civil UA for these purposes[52].

Aircraft used by the military and other public entities, e.g. police or border control, are considered 'state aircraft' by Art. Three of the Chicago Convention and therefore fall outside the scope of ICAO' authority. It is however not always possible to draw a clear line between 'public' and 'civil' applications. Dependant on the State in question, some applications may require public authority, while in other States the same operations could be performed as 'civil'. Hence, the following examples include some applications which could be performed by either
civil or state UAS.

Regarding the commercial market, the investment will reach $ 13 million between 2016-2020 (Goldman Sachs[53]) and this trend has increased the awareness and understanding the drone technology which turned into a business tool. They are widely implemented for construction, farming to the weather forecast. For instance, the Nano unmanned aerial vehicle "Black Hornet", BBC 2013) and are used for a variety of purposes: from killing people on the basis of their abstract behaviour ("signature strikes") in Yemen to filming wedding ceremonies in churchyards—and everything in between, for example, peering into hurricanes (e.g. NASA Global Hawk, Gannon 2014), supporting construction site planning and mapping cemeteries (Crowe 2015). They are used for commercial and non-commercial purposes. Governments use them to execute "adversaries" in remote areas of the planet and for search and rescue operations; and corporations employ them to deliver pizzas or parcels (DHL and Amazon being at the forefront of this game, see Hern 2014 Amazon 2013). Drones are used for "registering" data (by looking, measuring, smelling or

[51] The 'High Altitude Solar (HALSOL)' UA of 1983 was one of the famous predecessor of 'Pathfinder' and 'Helios'; Matthew T DeGarmo, Issues Concerning Integration of UAV, supra note 9 at para 1.2; Laurence R Newcome, Unmanned Aviation History, supra note 9 at 117.

[52] Whereas the first UA helicopters were remotely controlled, later models performed most of their operations autonomously, Brendan Gogarty & Meredith Hagger, "Laws of Man over Vehicles Unmanned" supra note 21, at para 2.1; Laurence R Newcome, Unmanned Aviation History, supra note 9 at 127,

[53]

otherwise sensing airborne chemicals, pathogens and radioactive materials, or for reconnaissance) and for carrying payloads (letters, medicine, blankets for refugees or bombs). They can fly alone or in swarms (D'Andrea 2013). They can keep track of anything or anyone equipped with a radio frequency identification tag (wildlife, livestock, a suspect's vehicle) and, increasingly, also anything or anyone without a tag, based solely on "smart" vision. In conflict zones, they are served as transportation of blood from one place to another[54]. Possible civilian UAV applications include scientific research, search and rescue, emergency response, traffic control tasks.

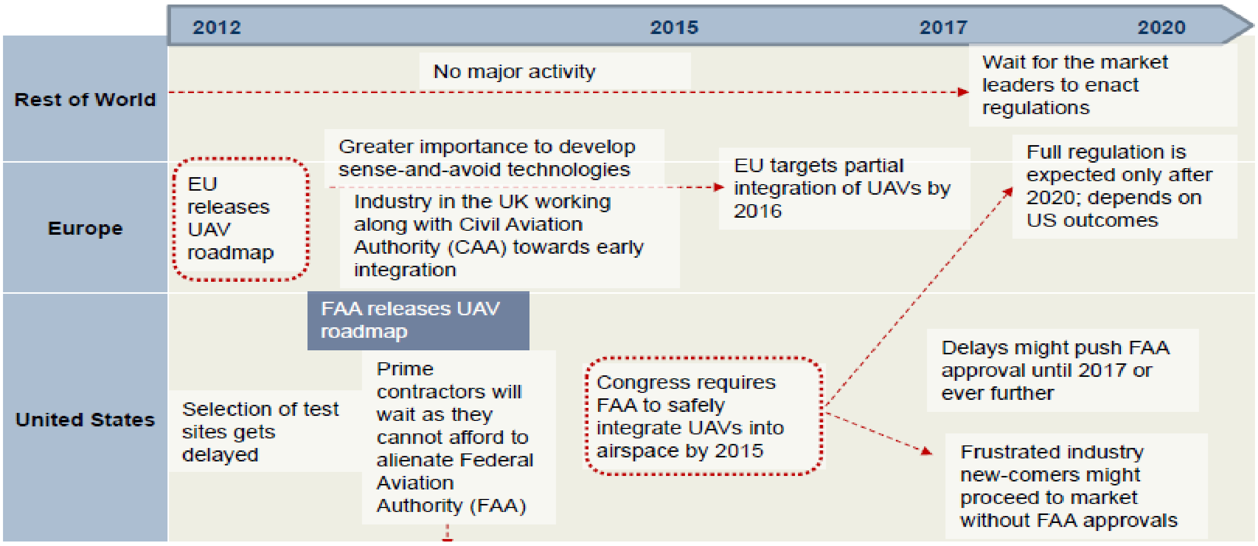
Table 2[55]: Commercial Uses for Drones (Frost& Sullivan 2013)

Fish and game monitoring/research	Aerial video/photography	Radiation measuring/atmospheric sampling
Oil pipeline inspection	Traffic/crowd monitoring	Search and rescue
Electrical wire monitoring	Small package delivery	Tunnel detection
Infrastructure inspection	Terrain mapping/surveying	Protection from MANPADS at large airports (Project CHLOE)
Searching for natural resources	Construction site survey/monitoring	Charging wireless devices
Wildfire detection/suppression	Environmental monitoring/protection	Airborne Wi-Fi
Storm/natural disaster damage assessment	Archaeology	Communications relays and temporary communications during outages
Man-made disaster damage assessment (e.g., oil spills)	Volcanology	Coastal/beach monitoring
Environmental change detection (floods, ice flows, erosion)	Atmospheric monitoring and measuring	Mineral detection
Flood potential monitoring	Hurricane monitoring/prediction	Avalanche monitoring/rescue
Meteorological study	Environmental rule compliance	Mining applications

Nevertheless, all these benefits can be fully achieved when there is effective rules and regulation are implemented for their use in terms of safety, security and privacy. As it is mentioned on Riga Declaration on Drones (2015)[56]: "A basic regulatory framework should be put in place without delay, in order to help the private sector to take well-informed investment decisions, and to provide a basic set of rules for the many operators who are increasingly eager to begin providing services."

[54] https://www.digitaltrends.com/cool-tech/delivery-drones-blood-sample/
[55] Frost& Sullivan (2013) Global Commercial UAS Market Assessment. A Regional Discussion of Companies Well-positioned to Exploit the Commercial UAS Market. December
[56] https://ec.europa.eu/transport/sites/transport/files/modes/air/news/doc/2015-03-06-drones/2015-03-06-riga-declaration-drones.pdf

Graph 1[57]: Overview on the Development of Global Civilian Drone Market (2012-2020)



Current major efforts are trying to put in place general harmonization rules for UAV operations within civilian or controlled airspace with each state responsible for its own air regulations. Several regional efforts have been launched to draw up guidelines for UAV use in controlled airspace. Although the United States is one of the leading states with well-developed regulation, the integration of drones into the National Airspace System (NAS) lags behind the other regions such as Europe and several countries in the Asia-Pacific (APAC) region, including Australia, New Zealand, and Japan, have well-established regulations and procedures for certifying drones and pilots for commercial operations[58].

[57] Frost& Sullivan (2008), Strategic Analysis of The Emerging European Market for Civilian and Commercial Unmanned Aerial Vehicles. August.
[58] Ibid.

1.c. Literature Review

This chapter consists of two sections. The first part includes a review of the literature used in this thesis. It summarises the existing studies particularly the topics which are discussed regarding non-military use of drones. Interdisciplinary nature of this study draws from the fields of philosophy, science, sociology, and political science and international relations. The review addresses the scientific, technological, and humanities perspectives of unmanned systems, artificial intelligence, autonomous weapons and robotics by primarily evaluating the writings of leading experts in these fields serving in academia, government, and industry. It also addresses the philosophical perspectives of technology, autonomy, control. The second part consists of presenting the theoretical frameworks which are selected for analysing the research question. It addresses the philosophical perspectives of technology, autonomy, control, and technological determinism through the writings of critical thinkers and philosophers who have written about technology such as Heidegger, Virilio. Besides, it highlights the arguments on human-robot and control interaction. Critical theory of technology and constructivist approach to science& technology permit to comprehend drone technology as a social construct. Social science studies of technology also provide an interdisciplinary perspective from a number of disciplines, including, for example, sociology, political science and economics (Klein and Kleinman, 2002; Otway and Winterfeldt, 1982; Pinch and Bijker, 1984; Williams and Edge, 1996). In addition to the primary works of literature referenced in this chapter, the bibliography presented at the end of this work contains additional documentation related to this topic that was included or consulted during the research and writing phase.

It is important to note that this study is only limited to unmanned air systems and does not take into account unmanned ground, surface, and subsurface systems, all of which have unique characteristics, and presumably unique circumstances and problems, that could have been considered and may have impacted the outcomes and findings regarding to non-military application; control systems and human involvement. For this reason the studies related to these subjects are not included. Moreover, only the military research, development, and acquisition processes and the civilian efforts related to military programs are taken into consideration. The similar efforts in the academic and commercial industrial environments such as law enforcement, agriculture, energy, emergency management, sports, media etc. are not addressed in detail.

When looking at the publications about drones in social-scientific studies, the initial works centralise around drones in a military conflict (e.g. Chamayou, 2013; Gregory, 2011,). Majority of the scholarship on UAVs tends to focus on the legal or ethical implications of drone use (American Civil Liberties Union 2011, Arkin 2010, Dipert 2010, Jenks 2010, Sharkey 2010, Singer 2009, Strawser 2010). Others provide a historical account of UAV use, examine various technical aspects of drones, or look to provide a cost and benefit analysis of the technology's use in combat or other missions (M. Boyle 2013, Byman 2013, Cronin 2013, Kreps and Zenko 2014, Lyon 2004, Miller 2012, Newcome 2004). Some other studies approach the drone use from the industrial and political economy perspective (Hall, 2014; Buchanan 2014, Hall& Coyle 2014).

Hall (2014) expresses the assumed relationship with the public interest discourse and drone policy. He concludes that drone technology is not being developed and utilised in a way which entirely fulfils the public interest. The current institutional structure in which policymakers and particular attention interact does not precisely align the interests of the public with the interests of policymakers. It is suggested that policies regarding UAVs are subject to the special influences of a variety of actors. It demonstrates how, even faced with ethical or technical challenges and inefficiencies, policymakers might take actions which would contradict public interest. This argument complies with the presumption on "politics of visibility" (Klauser& Pedrozo, 2015[59]) which reflects the power dynamics springing from the technologies visual capabilities and also vulnerabilities. That is, not only the presence of policymakers (state and non-state actors) but also the interaction between human and non-human (social and technical entities) matters in the civilian

[59] Klause and Pedrozo, (2015). Power and Space in the drone age. A literature review and politico-geographical research agenda.

deployment of drones. From the technical point, there have been scientific analyses to find out if there have been relevant a modular architecture for autonomous robots so that they can act morally (e.g. Urzelai et al. 1998[60] ; Muller 2016 [61]; Ziemke 1998[62]; Berns et al.,2017[63]).

Bellaby (2007) has argued on the term "public acceptability", which contains different meanings. From one side, it is based on utilitarian perspective and economic opportunities for individual or government. As the technologies may have unpredictable consequences, the governments should seek to avoid society to such risks. From the other side, it means that technology is acceptable to the public. However, he doesn't clearly specify what the acceptability is and how it can be prospered. Either historical comparison or cultural differences in accepting the technology might be an effective method.

In their studies, Gupta et.al (2011[64]) have taken the social psychological approaches to understand societal responses to technology (study includes only nuclear technology, information and communication technology (ICT), mobile phones, chemicals used in agriculture, genetic modification, genomics, cloning, hydrogen technology, radio frequency identification technology (RFID) and nanotechnology). They have found out that the public acceptance of new technologies occurs in the post-commercialization period. As in the case of nanotechnology, public negativity has been before the application of this technology. So, perceived risk; trust; and perceived benefit are considered as the essential determinants for the acceptance of the technology. Although it is not known the extent to which such information will be used for specific application of given technology, in respect to drones, the expansion of their civilian application in various domains can be perceived as a strategy to develop public acceptance in societies. At this point, the proactive

[60] Urzelai et.al (1998). Incremental Robot Shaping. Conference paper published in the proceedings of the Genetic Programming Conference, Madison, Wisconsin, 1998.

[61] Muller, V. (2016). Autonomous killer robots are probably good news. PhilPapers, https://philpapers.org/archive/MLLAKR.pdf

[62] Ziemke (1998). Adaptive Behavior in autonomous agents, Presence: Teleoperators and Virtual Environments 7(6), p.564-587

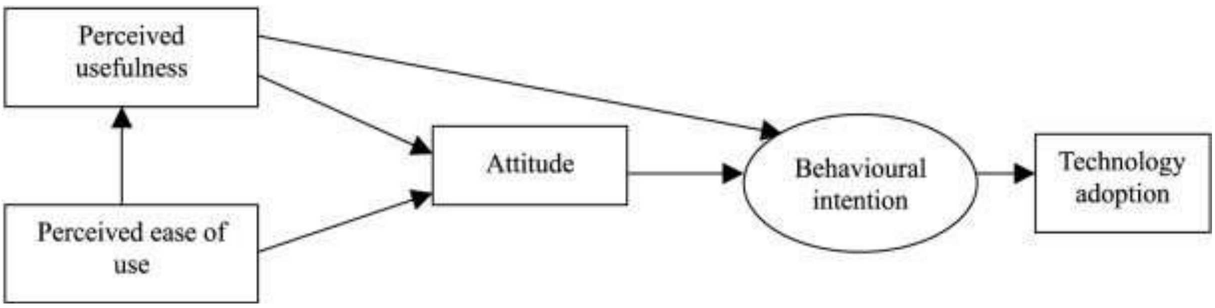
[63] Berns et.al (2017) Unmanned Ground Robots for Rescue Tasks. http://dx.doi.org/10.5772/intechopen.69491

[64] Nidhi Gupta, Nihdi, Fischer, Arnout R.H. and Frewer, Lynn J (2011), Socio-psychological determinants of public acceptance of technologies: A review. Public Understanding of Science 21(7) 782–795

efforts among government and industry for identifying the public opinions and concerns on drones demonstrate this assumption. The current empirical studies look into the relationship between society and drones permanently are immersed with this issue.

So-called "The Technology Acceptance Model "which provides a theory of how an individual will accept a specific technology can be implemented to understand "acceptability". As proposed by Venkatesh and Davis (2000), it assists in the implementation of new technologies. It shows how the public's perception of technology can move to the adoption of that technology using its attitude and behavioural intentions. The survey based on this model has revealed that respondents show more trust to the manned aircraft rather unmanned since they might be biased towards preconceived notions of what an unmanned aircraft looks like and have a lower acceptance rate due to visual appearances. An unmanned aircraft that looks visually identical to a manned aircraft could have a higher acceptance rate than an aircraft which appeared to be "different" in the eyes of the public[65]

Graph 2[66]: Technology Acceptance Model



This condition is likely to play an important role in the integration of drones into the National Airspace System (NAS). Because there is a missing link in terms of technology that prevents these aircraft from getting unrestricted access to the NAS due to the terminological and misperception conflict on unmanned systems. Despite these problems, many countries have established preliminary operational guidelines that allow limited operations in their respective NAS. Current

[65] Cameron, Eric (2014) - Unmanned Aircraft Systems: Factors That Affect the Acceptance of Unmanned Aircraft Usage Within the United States National Airspace System- Master Thesis, North Dakota

[66] Venkatesh and Davis (2000), A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies, Management Science, 46 (2), pp. 186-204

regulations have been prepared in preparation for the development of a complete regulatory framework. In cooperation with industry and academia, national aviation authorities and international organizations are preparing roadmaps, airworthiness and design standards as well as policy.

Stewart (2016) in his paper, discusses the possible dangers posed by the increasing use of drones regarding the persons and the property on the ground in Australia. According to his claim, both the conceptual understanding of the drones and their proliferation recreationally, commercially and by government provide an opportunity for the existing laws to be tested and refined. To mitigate privacy, safety and regulatory risks, public awareness is a necessity. So, he suggests that companies should collaborate to make people, especially decision makers, aware of drones' benefits. As justification of this claim, a survey conducted in Australia shows that the public held a relatively neutral attitude toward drones. In the literature and public polls, the safety is only given one of many factors influencing public acceptance and in turn the uptake of new technologies.

Studies discussing the non-civilian use of drones, the debates mostly revolve around their social impact and possible risk imposed upon society. As it is also reported at Roadmap proposed by the European RPAS steering group, liability (including issues like enforcement, impact of automation), insurance, and protection of data, privacy and security, public acceptance of RPAS applications: benefits, acceptable risks/safety, demonstrations etc. are considered as might be important to highlight RPAS impact. Luppicini & So (2016) elaborated in their paper, which mainly focuses on the techno-ethical perspective on commercial drones. By taking a systematic review on the materials exploring critical areas of social and ethical concern connected with safety, ethics and morals, legality, privacy, air space, informational integrity, humans versus machines. Their methodology reveals that protection (21.24%) and law and regulation (25.66%) are the most frequently cited concerns in connection with commercial drone use following human& machine debate and privacy between 2010 and 2015. Fischhoff et al. and Otway and Winterfeldt state that the assessments of risk are one of many factors influencing public acceptance of technology together with privacy, control, fear/dread, newness, operational impact (such as the magnitude of fatal injury), regulation and economic impact. Clothier et al. (2015) have found out that risk and safety are not of significant concern to the public.

Similarly, perceptions of the benefits and the overall acceptability of the technology are also neutral. The neutrality of the responses suggests that the public has yet to form an opinion about drones. In respect to drones, the broader issues of privacy, security, liability, and the ethics associated their use are likely to be influential in the widespread acceptance of the technology.

According to Jennifer Urban (2018), the privacy gap created by drones can be fulfilled by appropriate regulations and complete ban of drones would not bring any effective solution even ban UAS operations, it would hamper both technology and business, which would have further negative implications, such as economic loss. Also, if some countries ban drones and others do not, the gap widens between technologically advanced countries and those that are already being left behind. However, she does not propose any practical solution other than supporting a regulation focusing on the limitation of the data sharing, their usage and transparency.

Respectively, in the mainstream academic view international relations the arguments on unmanned system fall into the analysis of revolution of military affairs and changing norms, military technology, how spreads easily and quickly and globalization—along with the information, communication, and technology (ICT) revolution—further accelerates and facilitate this process.

Approaching the way that the military technology spreads quickly and easily along with the other technological innovations, the scholars from international relations promote the economic incentives, level of technical capabilities and state power and globalization as the main reasons of the diffusion (Richard A. Bitzinger,1994; Emily O. Goldman and Richard B. Andres, 1999; Grissom 2006). For instance according to hegemonic stability theory, less developed countries can build advanced military technologies because of their higher rates of economic growth and of the diffusion of technological knowledge[67] As Robert Gilpin (1981) notes, "there is a historical tendency for the military and economic techniques of the dominant state or empire to be diffused to other states in the system."[68]

According to Gilli& Gilli (2016[69]) the assumption that military technology diffuses quickly and easily lacks empirical and theoretical support. Since there is no evidence to prove that conjecture and their claims disprove the literature in economics, economic history, management, and sociology. Part of this failure can be attributed to the fact that IR scholars have primarily underestimated the technological challenges of designing, developing, and manufacturing combat-effective military platforms. Some scholars like Jonathan D. Caverley, Eugene Gholz, and Stephanie G. Neuman have discussed these aspects[70]. While Gilli& Gilli perceives the material support which is required to adopt military innovation they ignore the lack of knowledge, level of resistance to change due to the uncertainty caused by the new systems.

The growing international use of this emerging technology to achieve military or civilian objectives surpasses the development of a shared understanding of norms of behaviour and thus increasing the prospects for miscalculations and escalation at international level, which develop a ground for seeking justification for the actors' decisions and actions (Clapper, 2013). The use of such new security technologies has led states to propose novel interpretations of the law of self-defence and engage in new practices, such as those concerning the "unwilling or unable" formula (Bode,2017). However, the significance of these interpretations and practices cannot be captured using legal terminology or logic, such as customary international law, as they remain far from "a general practice accepted as law" (ICRC 2010)

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[67] David E. Bloom, David Canning, and Jaypee Sevilla, "Technological Diffusion, Conditional Convergence, and Economic Growth," NBER Working Paper no. 8713, National Bureau of Economic Research, Cambridge, MA, 2002.

[68] Gilpin, War and Change in World Politics, Cambridge: Cambridge University Press, 1981.

[69] Andrea Gilli & Mauro Gilli (2016) The Diffusion of Drone Warfare? Industrial, Organizational, and Infrastructural Constraints, Security Studies, 25:1, 50-84, doi: 10.1080/09636412.2016.1134189

[70] Gilli, Struggle for Military–Technological Superiority, Stephanie G. Neuman (1984), International Stratification and Third World Military Industries," International Organization 38 (1): 167–97; Caverley J.(2007), United States Hegemony and the New Economics of Defense, Security Studies 16(4): 598–614; Gholz,E. (2007) Globalization, Systems Integration, and the Future of Great Power War, Security Studies 16 (4) 615–36

Taking the norms of nuclear weapons as an example, normative tradition against the use of nuclear weapons was developed and influenced by the "logic of consequences"—a realist and rationalist argument regarding self-interest and the negative outcomes nuclear weapon users would experience and the "logic of appropriateness" which reflects the fact that the nuclear norm itself actually influenced states' identity and was reinforced and deemed appropriate through iteration over time. While both pure realists and constructivist advocates of the role of non-material normative factors in international relations have difficulty quantifying the comparative explanatory power of norms—the example of norms for nuclear weapons demonstrates that they have some impact. The norms for weapons and warfare generally affect four general activities or functions: weapon development or possession, testing, use, and transfer or proliferation facilitation and besides, the norms are viewed differently depending on the international relations theory employed

While the inconsistency or lack of regulation between the existing and emerging technologies does not allow the full integration of new systems, the coherence would be achieved when some of the factors of norms diffusion theory are implemented or realized (Mazanec, 2015[71]) such as actors' interest (the more actors are involved, the more likely the norm emergence will occur): mechanisms such as state distribution of power, prevailing levels of technology, availability of human resources, and persuasion/negotiation mechanisms of the actors.

Nevertheless, the current debate over autonomous weapons exhibits two important shortcomings of unmanned systems. First, it is important to examine autonomous weapons from the legal and regulatory perspective, however it can fail to capture the reality that unmanned systems, and the practices associated with their development and deployment, can alter norms themselves. For example, practices surrounding drones can produce new understandings, outside and beyond international law, of when and how using force is appropriate. As Herbert Lin has mentioned

[71] Mazanec, B.(2015) The Evolution of Cyber War: International Norms for Emerging-Technology Weapon, Potomac Books. United States

(2017)[72], the unrestricted submarine warfare has undermined the common norms about the conduct of war; other such examples are not hard to find. Secondly, when there is a discussion on autonomous weapons' game-changing potential in international relations and security policy, they often overemphasise the technologically sophisticated autonomous weapons of the future".Thirdly, the potential of impact of these new technologies can also affect the way to reform the norms and seeking for justification for the reasons to deploy these systems. An important category of norms to consider in this context is "procedural norms." These norms, which apply in confined organisational settings such as militaries, provide standards for appropriate ways of doing things. They are based on specific objectives and expectations that are often associated with efficiency and effectiveness. Where weapons are concerned, greater levels of professional autonomy produce improvements in reaction time, systemic reliability, endurance, or precision (in contrast to unmanned and remote-controlled aerial vehicles, which do not necessarily deliver such improvements). Because autonomous weapons confer advantages where procedural norms are concerned, their deployment is more likely. That is, autonomous weapons provide procedural incentives to remove human decision-making, in temporally proximate terms, from the use of force. As one US Marine Corps lawyer puts it, "from an operational perspective, [human decision-making] might … prove counterproductive in the event of a future conflict with a near-peer competitor." Autonomous weapons pose severe challenges in the realms of ethics and accountability, but they highly score when it comes to fulfilling procedural norms (Bode& Huelss, 2018).

Another subject that invariably is discussed in the literature is the ethical aspect of drone application. While there is a scientifically and practically rise of interest on the non-military deployment of drones, what is remained less analysed/ discussed is the ethical issues related to this issue. Issues of surveillance and privacy; safety and restriction; hobbyist and professional operators; and ethics, rights, and duty notwithstanding, there is little scholarly research on commercial drones

[72] 'Will artificially intelligent weapons kill the laws of war?', Herbert Lin (2017), Bulletin of the Atomic Scientists, https://thebulletin.org/2017/09/will-artificially-intelligent-weapons-kill-the-laws-of-war/

except data from the secondary sources (reviews, magazines, and newspapers). Most of the data also originated from North America, but the findings could be valuable to other countries using commercial drones. Singer acknowledges drones as a robot which gather and stores information to operate correctly. He (2012[73]) mentions that *"The issues of domestic "drones" all seem futuristic but notice how none of the examples that were explored in this article was from the distant future. The questions they raise are fundamental policy questions of today. We can ignore them, or we can embrace and engage in the opportunities and dilemmas of these exciting times. "*

Ravich (2014[74]) remarks that there is a disconnection between current aviation regulation and UAV technology. While the danger of drone is growing, the FAA's justification of its actions in the name of safety and its de facto role as the arbiter of the First and Fourth Amendments by eliminating the private commercial right of gathering information aerially, is more menacing.

What is more, while the prospect of civil UAV operations raises constitutional and privacy-related questions that are concerning, actual lack of rules by rule-makers is at least as troubling. To determine an appropriate analytical framework that courts might use to solve Fourth Amendment search and seizure issues arise from the use of drones domestically, Sullivan (2013) implements so-called "mosaic theory" which is supposed to balance legitimate security concerns with fundamental civil liberties. According to this theory, the courts are required to consider the government conduct as a collective whole rather than as isolated steps. Taking the ALPR as a case, the scholar proposes that using purely the initial ALPR picture, the government could only determine what route and at what time the individual was travelling. With the subsequent tracking, however, the government could ascertain the final destination of that individual, including who he was with and how long he stayed. While likely not "searches" if viewed in a vacuum, courts using the "mosaic theory" would analyse these events together, and conclude that there is a violation of that individual's right to be

[73] Singer, P. W. (2012, December 11). The Robotics Revolution: What it means and what to watch for next. Canadian International Council. Retrieved from http://opencanada.org/features/the-think-tank/essays/the-robotics-revolution/

[74] Ravich, T. (2014), Commercial Drones and the Phantom Menace, Journal of International Media and Entertainment Law.

free from unreasonable searches. Thus, the Fourth Amendment would provide broader privacy protections against surveillance technique. In existing studies, there is a lack of adequate discussion on the relationship between the military, or weapon systems technology, and humanity, which is assumed to reflect into the possible use of the drones in a non-military context.

CHAPTER II

2.a. The Contribution of the Thesis

As it has been highlighted in the previous section, the proliferation of drones on both military and non-military domains make policymakers and the scholars devote much attention to so-called 'meaningful human control', and the ethical and legal arguments on the regulation of drone use have been revised accordingly. Besides, taking the control the drone use in civilian airspace, Both US and the EU countries work on establishing common regulatory framework applicable to small and medium-size drones. While the US has the largest and well-developed civilian drone industry, the EU struggles to foster common and more coherent rules under the fragmented framework. Although national safety rules apply, there are differences among the countries in terms of their approach to drone use. Thus, the quick diffusion of drones, and blurring lines between civil and military applications, the growing body of the literature is focusing mostly on the military deployment and its ethical, legal and moral implications, robotics and artificial intelligence, drone warfare and targeted killing operations which are mostly conducted by U.S. In addition to these, limitedly humanitarian potentiality and real practices However, the existing studies do not include in-depth academic approach to civilian aspect and justification of their use in both side of the Atlantic. In the book "the Future use of drones (Bart Custers, ed.2016[75]), it has been argued about the social, ethical and legal effects of drone technology relate to privacy, trust, equality and possible chilling effects resulting from drone use. The establishment of a valid regulation of civilian use can

[75] Custers, Bart (ed.) (2016). The Future of Drone Use: Opportunities and Threats from Ethical and Legal Perspectives. T.M.C. Asser Press.

be facilitated by theoretical analysis of drones' potential rather than only taking technical prospect into consideration. These analyses call attention to the advantages the drones possess, and these advantages might be realized in practice. As a part of the regulation process, it is important to reach a common understanding about drones and how they are used. As it appears in practice and theoretical debates, the motives of drone use seem remarkably to be influenced by enthusiasm for military technologies, on the one hand, and opposition to machines that feel intuitively uncomfortable, on the other. These are somewhat weak reasons for supporting or opposing drones since the full capability of this technology is still unknown regarding technical, moral and ethical aspects. In other words, the motives which cannot withstand a proper analysis may lead us to underestimate drones' potential for misuse or neglect their capacity for reducing violence or providing benefit for the society. From this point of view, the study aims at observing the justification and regulation of drone use in the civilian domain, and its implication for the international security which has not been analysed before. Moreover, there is no literature or empirical study that takes comparative analysis on the EU and the U.S about the civilian adoption of drones through social constructivist and pragmatic sociological perspectives.

The studies on drones have centralized on the morality of the machines, the values and perception of the actors attached to that technology in their deployment. It is reasonable to engage with those debates because drones' military and civilian implications rest on the perception and the interest of the actors, that are irrevocably the part of political considerations surrounding the drone use. It can be assured that the drones are not a value-neutral form of military power but rather one that is shaped by the kinds of moral judgments and values that realists seek to exclude from their accounts of international security.

The misuse of a justifiable drone does not provide grounds for prohibiting it but only for condemning and possibly punishing their user. For example, it may be possible to imagine some legitimate applications of chemical, biological, and nuclear devices, though the extent to which they shift the user's scope of action toward immoral conduct provide grounds for prohibiting all uses of these weapons. In a similar vein, the benefits or risks the drones might impose on society strongly depend on someone's perspective. For instance, one person may value the opportunity drones provide to make beautiful pictures of their neighbourhood whereas someone else in the same neighbourhood may consider the same drone as a violation of their privacy and a nuisance due to the noise the drone generates.

2.b. Theoretical Framework

Based on the identified knowledge gap on the issue, this study confirms with multiple theories. Particularly touches upon on philosophy of technological determinism, pragmatic sociology and critical theory of technology, which are shed more light on the relationship among human, robot and control mechanism. It has been proposed that to understand how criticisms and justifications are generated from particular type of practices, in other words, facing a kind of practical conditions that the actors have to manage. This judgement leads pragmatic sociology to have investigated practices and, more precisely, to have to reconstruct the contradictory logics of practice that are the source of the critical activity of the actors[76]. In addition to these, Boltanski's pragmatic sociology; his notions on the methods of justification and critique are acknowledged to analyse the arguments controversial with which the decision-making process on the regulation that is "justify" or "condemned" one or more elements involved in using the drones for civilian missions. According to Quéré and Terzi (2014[77]), an important aspect of Boltanski's 'pragmatic sociology' is his idea of the limitations of capacities of practice based on his linguistic pragmatics and the conception of reflexivity. His ideas on pragmaticsm is relevant to the study regarding action and uncertainty. Boltanski claims that the study of action has to be connected with the analysis of situation. . From such a point of view, one of the main characteristics of action is the uncertainty the carrier of action

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[76] Dans cette perspective et à propos d'objets très différents, Doidy (E.), « (Ne pas) juger scandaleux. Les électeurs de Levallois‑Perret face au comportement de leur maire », Politix, 71, 2005; Lagneau (É.).

[77] Quéré,L.,&Terzi,C.(2014) Did You Say 'Pragmatic'? Luc Boltanski's Sociology from a Pragmatist Perspective. In Susen,S.&Turner,B.„The Spirit of Luc Boltanski Essays on the 'Pragmatic Sociology of Critique", Anthem Press. London.

faces.It implies other actors' interpretations or what they believe and value. Moreover, as he indicates, the social world is taken as the scene of a trial in which actors in a situation of uncertainty proceed to investigations, record their interpretations of what happens in reports, establish qualifications[78]. Thus, Boltanski's sociology does not focus upon the material world, natural environments. While he is primarily concerned with the process of justification, agreements, about what constitutes justice will function as a legitimation of society, social actors become indignant about injustice and then lead to asking questions about how injustice could ever by justified. Carrying his claims into the arguments and practices on the civilian use of drones, the qualification and capabilities which are promoted towards this technology fundamentally shaped by the political actors and policymakers whose ideas through reports and public analysis. It makes the actors and society to question how a military technology can be justified in the civilian practices.

Furthermore, in the existing literature on unmanned systems, one of the unmentioned aspects is the nature of technology itself and the level of influence and control it has on society. At this point, the objects of social and technological determinism bring fruitful views regarding the relationship between technology and humanity, particularly as it relates to control. The argument on human and technology is relevant in understanding the justification of drone use. Because, the source of discussions on three stances towards the drones (total ban, semi-control, and no control) are influenced by the debates on autonomous weapons which brings concerns over accountability, human rights and responsibility sharing[79]. Regarding the fact that the drones are mainly categorized as lethal or autonomous weapons, most of the current debates are generated around the used of armed drones in military conflict even though not all the drones are designed to be weaponized, it imposes remarkable influence, particularly on the society, when it comes to using for the non-

[78] Boltanski, Luc (2011 [2009]) On Critique: A Sociology of Emancipation, trans. Gregory Elliott, Cambridge: Polity.
[79] Barthe et.al (2013). Sociologie Pragmatique : Mode D'emploi. Politix, Volume 26 - n°103/2013, p. 175-204. https://www.cairn.info/revue-politix-2013-3-page-175.htm

military purposes. At this point, the discourse of “meaningful human control” have engrossed the discussion on the regulation of drones.

The figure of denunciation is however far from being the only way through which the actors strive to produce and to make each other's interests clear[80]. The reference to interests is also engaged in a not denunciator but claiming, to build alliances, change positions or "enlist" other actors in the service of a cause by making them understand that it is precisely their interest. In this type of situations, the identification of interests and, what goes hand in hand, their reformulation are operations that allow the actors to define each other, creating either distance or rapprochement). From this point of view, state and non-state actors express their point of view, interest and expectations on drone use and their regulation through conferences and meetings so that they help them to build alliances with each other.

There are far too many viewpoints and related variations to examine all of them in any single study; therefore, this examination focuses on arguments regarding technological determinism and the relationship between human control and technology. To grasp the context of technological determinism and its contribution to our study, it is worth to explaining the arguments of social determinism, which argues that technological development, and the subsequent changes to society brought about by the use of technology, is the product of human decision-making and activity, i.e., humans are in control, ultimately determining the direction of technology and the effects of its impact on social change. In other words, social determinists take a pragmatic approach, seeing the humanity-technology relationship instrumentally; technology is only a neutral instrument or tool manipulated by humanity. The power, control, and influence associated with technology are not properties of its autonomy but rather the by-products of “power relations and the decisions of elites, or groups of people in power” (Ihde,1993). Social determinists take a pragmatic approach, seeing the humanity-technology relationship instrumentally; technology is only a neutral instrument or tool manipulated by humanity, and the degree of power it has is directly proportional to the strength and

[80] Ibid.

power of its user. One of the leading scholars who takes the technology as an instrument of society, Habermas (1970) analyses the relationship and differences between technology and human social life, explaining the impacts of technology on advanced industrial society as the result of social interests and human decisions, not independent, autonomous technological advancements. He argues that "the pace and direction of technical development today depend to a great extent on public investments: in the United States Defence and Space Administrations are the largest source of research contracts…. As little as we can accept the optimistic convergence of technology and democracy, the pessimistic assertion that technology excludes democracy is just untenable[81]." In other words, he highlights the more human and social influences creating multifaceted human-technology relationship, which denies the idea that technology is an independent force. In parallel to this argument, McDermott (1997[82]) sees technology not as an autonomous force, but as an "institutional system" of control that one group of people in society uses to control another. Using the Vietnam War as an example, he states that the greatest threat to society is not autonomous technology, but an elite group of people who manipulate and use technology to achieve the political goal of maintaining control such that one group exercises control over another by using technology as a manipulation tool.

Winner (1993) affirms that inner workings of the given technology and their historical development display what actually takes place while using the technology. While the different meanings can be attached to the same artefacts, it is remarkable to identify the relevant social groups that are involved in the developments of these artefacts and how these groups act towards them.

The social construction of technology (Berger& Luckmann,1966) is one of the approaches that enhances our understanding the nature of technology. It questions whether commonly held perceptions and understandings of the world and of how it is structured reflect the "true" nature of things; it gives the social process in which ideas or practices secure a genuine setting through

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[81] Habermas, Jurgen. Toward a Rational Society. Translated by Jeremy J. Shapiro. Boston, MA: Beacon Press, 1970.
[82] McDermott, John. "Technology: The Opiate of the Intellectuals." In Technology and the Future, 7th ed, Albert H. Teich, ed. New York: St. Martin's Press, 1997

repetition or the involvement of more social groups into the selected groups and these entrants internalize the practices through socialization[83]. Thus, “social construction of technology” fundamentally stands both for the technical change in society and for the development of technology in relation to society. Taking into account the term ‘interpretive flexibility, the technology through the eyes of different social actors yields different insight and different form of the technologies thus there is not one item but many versions. However, Winner (1977) criticizes that social constructivist by saying that social constructivist ignores the social consequences of technical choices such as ‘texture for human communities, distribution of power in society. [84]

The social construction of technology holds more critique approach to technological determinism which is taken to comprise two elements: (1) technology develops autonomously, and (2) technology determines to an important degree societal development.

Apart from social determinism, the technological determinists’ argument that technology is an autonomous entity, or independent agent, outside of human control. It begins with an overview of the development of various philosophical perspectives on technological influence and control, focusing on select philosophers who have made significant contributions to the philosophy of technology, particularly the technological determinism argument. The humanity-technology relationship is then examined as it applies to the evolution of technology and the state of being of technology, particularly ideas that view technology as an independent entity or agent. As mentioned in chapter one, it is important to make a distinction between viewing technological autonomy instrumentally, as purely the operation of a machine or tool under human control, and viewing it ontologically, as a non-instrument or metaphysical entity or agent that exists independent of human control. This distinction is important because it has a significant impact on the arguments related to the control of technology and how it has become the source of justification for different uses. The

[83] Berger, P.L. and Luckmann, T. (1966) The Social Construction of Reality: A Treatise in the Sociology of Knowledge. Doubleday & Company, New York.

[84] Winner, Langdon. Autonomous Technology: Technics-Out-of-Control as a Theme in Political Thought. Cambridge, MA: MIT Press, 1977

debate over humanity's ability to control any autonomous military technology focuses on the theory of technological determinism which is related to the issue of amount of influence and the control that technology can have over humans. Thus, this theory is more concerned with whether technology leads to change on society or the reverse is true.

Moreover, in the face of perspectives of social influence that see in technology an instrument whose effects depend on the choices and decisions made by the actors and the type of relationships between the social, economic and political forces relevant in the various contexts .When it comes to technological determinism, philosopher and historian scholars of technology do not share common grounds whether and how technology brings about social and cultural changes. Nevertheless, as Misa (2009[85]) has emphasized, the military technologies are often significant examples in assessments of the power of technology, provide the ground to explore and assess the dilemmas of determinist accounts of technology.

To understand how the states, justify their motives to utilize a military tool for the civilian purposes, we layout social constructionists view knowledge as constructed as opposed to created. This paper discusses how social constructionists construct knowledge and argues that social constructionism is concerned with the nature of knowledge and how it is created and as such, it is unconcerned with ontological issues. Meaning is shared, thereby constituting a taken-for-granted reality. Grounded theorists understand knowledge as beliefs in which people can have reasonable confidence; a common sense understanding and consensual notion as to what constitutes knowledge. A second moment occurs with the 1999 debate between David Bloor and Latour about the strong program and its critics. From a wider perspective, one of the most significant moments in the discussions and debates over social constructionism is the emergence of the "science wars" in the mid1990s. There are other moments that ground this story, but we do not address them all to the same extent. These moments include Harry Collins's (2006) defense of a weak sociology of science, the Sokal affair,

[85] In "Jan Kyrre Berg Olsen (Editor), Stig Andur Pedersen (Editor), Vincent F. Hendricks (Editor)" A Companion to the Philosophy of Technology, Blackwell Companions to Philosophy, 2009.

and the science wars (e.g., Segestrale, 2000a), Langdon Winner's (1996) views on social construction and the politics of technology, and debates over actor-network theory (e.g., Law & Hassard, 1999). Concisely, analysing our research question through this theory affirms can affirm that postmodernism has not undermined our capacities to reach truth but rather enhanced them even while complicating them.

Referring to the “growth of the new technique of industry” and the impact on society, Dewey underscored human control: “Modern states, in other words, are regarded less as divine, and more as human works than they used to be; less as necessary manifestations of some supreme and overruling principals, and more as contrivances of men and women to realize their own desires” (Dewey 1920, 43-44[86]). Refuting Freyer’s argument of autonomous progress and Schlesky’s thesis that technological potentialities “command their own practical realization, Dewey claims that technology is always the tools of society so there is no autonomous technological force that could shape the society. In parallel to this, Habermas (1970) is also argues that technology could not operate outside of human control*: “It is clear that this thesis of the autonomous character of technical development is not correct. The pace and direction of technical development today depend to a great extent on public investments”*[87]

Habermas admits that new technological capacities can arise and develop without human preparation, as a by-product of technology, but he states that the “direction of technical progress is still largely determined today by social interests,” i.e., society (Habermas 1970, 60). While Habermas describes the relationship between technology and humanity as intertwined, he is clear that technology is not an independent, autonomous agent acting upon and controlling humanity. Thus, if the technology is neutral by itself then it is necessary to consider the interaction and network among the group of people, who manipulate and seek political benefit from these systems

[86] Dewey, John (1920) Reconstruction in Philosophy. New York: Henry Holt and Company.
[87] It is this experiential world of humanity that Habermas asserts influences technology, and is influenced by technology, but is not controlled by technology.(Habermas 1970)

and the shape their production and rules according to their interests in order to maintaining control (Mc Dermott, 1997)

On the other side, for the hard technological determinist, the idea of technology evolves to a point surpassing humanity. One particular philosophical approach that is a chief proponent of this view is known as technological singularity. According to this idea, once machines began to think they would one day intellectually surpass humans, and therefore “we should have to expect the machines to take control (Turing, 1996). The speed of evolution is a key factor affecting human-technology. So,considering the drones and autonomous system, if they evolve beyond the human control how they can be regulated and how their use can be justified in the eyes of society. Similar to Heidegger’s discourse Virilio (2008) highlights the mysteriousness of technology, describing it as a riddle over which humanity has no control, with the products of technology—i.e., the inventions and the creations of science—as expanding with lightning speed, further widening the field of the uncontrollable unknown. So, from this perspective the production and the purpose of the use of the drone technology can’t be overlapping with each other.

Thus, technological motives to implement drones from military to non-military are shaped by political incentives and related to two senses, as Winner mentions. The one technologies can be designed, consciously or unconsciously, to open certain social options and close others. Second, Winner argues that not only can particular design features of technologies be political, but some technologies in their entirety are political. Even if it is mistaken to see technologies as requiring particular patterns of social relations to go along with them, some technologies are, in given social circumstances, more compatible with some social relations than with others. Second, Winner argues that not only can particular design features of technologies be political, but some technologies in their entirety are political. Even if it is mistaken to see technologies as requiring particular patterns of social relations to go along with them, some technologies are, in given social circumstances, more compatible with some social relations than with others[88]. Moreover, from technological determinist point of view if it can be thought that technology just changes, either following science or of its own accord, promotes a passive attitude to technological change. It focuses our minds on how to adapt to technological change, not on how to shape it.

Now the instrumental perspective on technology implies that the value that is at issue in the design process viewed as a process of rational decision making is not the value of the artefacts that are created. Those values are the domain of the users of the technology so created. They are supposed to be represented in the functional requirements defining the design task. Thus, the initial development. As Pinch & Bijker (1987) demonstrate "that technological artefacts are culturally constructed and interpreted; interpretative flexibility of a technological artefact by this mean not only that there is flexibility in how people think of or interpret artefacts but also that there is flexibility in how artefacts are designed"

Following the arguments of Pinch and Bijker, this study merges "sociology of knowledge" and "sociology of technology" in analysing our research question. As Latour (2005) and Callon (1986) stated studying the social was not enough, technical artefacts also matter how they shape the society. They can embody norms of behaviors, moral values or set of other imperatives that would constrain further human action.

The detailed understanding on transformation of drones from military to civilian requires to us to consider this technology not under "surveillance" but rather to adopt Virilio's term (2000) "vision machines" which can give more insight to involved players in the planning, development and operation of particular drone systems.

A critical theory of technology - as Feenberg remembers - derives from the critical theory of the Frankfurt School (Adorno, Horkheimer, Marcuse, Habermas), applying marxism to the culture and the cultural artifacts, and from the Mannheim's perspective on ideology, refusing the supposed 'neutrality' of technology, since it highlights the interests interconnected with the production of knowledge and form knowledge to the technological application and uses. A more pragmatic but critical perspective is derived from constructivist approach of Boltasnki Aaron Cicourel, David Bloor; it invites to identify the actors, the relationships and the arguments of controversies, the interests and the situations where they act, in order to understand the process of production of technology and innovation in practice, not neutral nor completely 'chaotic', but enacted by this or that dimension or factor or actor. One example of this model, even though somewhat functionalist-constructivist - can be derived from the idea of the "arenas" and their dimensions and criteria of "selection", proposed by Hilgartner and Bosk in their paper on "social problems".

When thinking about the concept of “autonomy” there needs to take competing philosophical aspects into consideration related to human-technology relationship. Understanding the utilization of unmanned systems in different domains and operations relates to the spectrum of viewpoints on the essence of technology and how the human-robot relationship have developed. In other words, the discussions over humanity’s ability to control autonomous military technology such as the unmanned combat aerial system centers on the theory of technological determinism and is associated with one particular aspect of the problem: the amount of influence and control technology has over humanity. On one side, it is believed that technology is and always will be under the control of human beings and society; this falls within the broader philosophical category of social determinism. The scholars in this camp (e.g. Martin Heidegger, Jacques Ellu and Mumford) which hold continental philosophies of technology tend to reflect their suspicion towards Enlightenment conceptions of reason and of the scientific and utopian attitude toward that technology. As a result, they do not clearly reflect the distinction between what technology is (in terms of its logic and “essential” structure) and questions about its value. As Jonas Hans’ (1973) distinction between “formal dynamics” and “the substantive content of technology, modern technology differs from premodern technology insofar as the former was “an enterprise and process,” where the latter is more of “a possession and a state”, and he highlights the fact that because modern technology is driven by consciously developed plans and ideas, its innovations tend to build upon one another sequentially and spread rapidly across the globe. In this way, a concept of technology as involving genuine progress – a concept in which invention and change that are superior to those of the present or past – replaces the older idea of using technology to reach an accommodation with a static and stable natural order[89].

Whereas the opposite side of the arguments affirms the view that humans never had and never will possess the ability to control technology, this position lies within the realm of the philosophical side of technological determinism. As the technology of modern warfare contributes to a new kind of dehumanization in warfare, a kind where some of the humans are completely removed from the environment and the machinery of warfare altogether, and a kind of dehumanization where humans seem to be losing control.

In his paper, Malloy (2010) analyses the regulatory practices traditional regulation has incited the diffusion of numerous existing technologies throughout a variety of industry sectors. However, this way of construction conceptualizes traditional regulation as generally applicable performance standards based upon the best practices used within the relevant industry sector.

Thus, a traditional rule typically sets out a performance standard such as integration into non-segregated airspace. This performance standard is set by reference to one or more technologies or operating practices—often called the "reference" technology—used by the best performing firms in the relevant sector. In achieving that integration individual facilities may choose an alternative to the reference technology so long as that alternative achieves the performance standard. Seeing that drone technology is unknown from political, technical, social and legal aspects, it is less likely to conceive existing technologies since social dynamics would be more different and complex to be compared.

[89] Jonas, Hans (1973), Technology and Responsibility: Reflections on The New Tasks of Ethics. Social Research, 40(1), pp. 31-54.

CHAPTER III: United States: Civil/Military Use of Drones and Regulatory Practices

The drones have been used by the U.S. military in some capacity since WWII and UAVs were used extensively for surveillance missions abroad throughout the Cold War. But 9/11 and the War on Terror campaign have been the triggering events that caused the most dramatic increase in the use of drones (Hall and Coyne 2014[90]). In addition to reconnaissance, drones are now used as a means of conducting offensive strikes (Sifton 2012). Between 2004–2008, the United States held about 50 drone strikes outside the context of the armed conflict in Iraq and Afghanistan, escalating to more than 400 between 2009–2013.2 President Barack Obama admitted in May 2013 that the United States had come to see armed drones 'as a cure-all for terrorism[91]'. While several criticisms have arisen from non-governmental and international organizations that question the legality of strikes (Amnesty International, 2013; United Nations, 2013), there was a common belief that Obama was correct to imply that the policy has been inoculated from criticism among the broader public, because support for drone strikes has generally remained high (Pew, 2013)

The use of drones has become a central feature of American counterterrorism policy (Singer, 2013). Micah Zenko, from the Council on Foreign Relations, told the National Journal that 'the responsiveness, the persistence, and without putting the personnel at risk. Cost and lower the human resources have been the main motive of justification for the use of drones. According to the Defense Department's Autonomy Community of Interest report (Bornstein 2015), the main drivers of the Department's science and technology research are efficiencies that "reduce human footprint and personnel cost" .The Air Force's vision for automation includes the development of remotely operated and autonomous platforms and the capability to strike targets from long range, which the

[90] Abigail R. Hall & Christopher J. Coyne (2014) The political economy of drones, Defence and Peace Economics, 25:5, 445-460, DOI: 10.1080/10242694.2013.833369
[91] Flying Under The Radar: A Study Of Public Attitudes ... (n.d.). Retrieved from http://journals.sagepub.com/doi/pdf/10.1177/2053168014536533

service hopes will "decrease the size of the necessary expeditionary force" and result in a more diverse workforce (Department of the Air Force 2015).

He added, 'When other states have this technology if they follow U.S. practice, it will lower the threshold for their uses of lethal force outside their borders. So they will be more likely to conduct targeted killings than they have in the past'[92].Thus, in his view, the availability of drones changes the behaviour of states, increasing the likelihood of doing the kinds of things that the US has been doing with drones in the types of numbers that are reasonably unthinkable by any other means (conventional bombing, assassins, special forces raids, etc.) in the military scenarios short of war, such as in Pakistan, Yemen and Somalia, but also perhaps in the insurgencies that the wars in Iraq and Afghanistan rapidly collapsed into[93]". Seeing that drones are a core component of U.S. military operations and their use has controversial implications both domestically and abroad (Miller 2012, Boyle 2013).

We can talk about three key determinants that play an essential role in U.S decision to adopt unmanned systems: (1) resource availability (2) status and (3) modernisation of the army, all of which reflect themselves in third offset strategy. Faced with the prospect of other countries challenging their superiority in the weapons systems, in 2014 the U.S has decided to implement so-called 'third offset strategy' in order to maintain its military-technology edge by harnessing new technologies and increasing its technological capabilities in the fields such as 'remotely piloted systems, artificial intelligence, robotics, autonomous operating guidance and control systems, visualization, biotechnology, advanced computing and big data'[94] It is not new that the U.S benefit from drone technology in military domain, for instance in 2015 only US Navy has operationally used remotely controlled submarine and the U.S Army has kept investing on this technology and

[92] Zenko, M. and Kreps, S. (2014) Limiting Armed Drone Proliferation, Council Special Report No. 69. Available at: https://cfrd8-files.cfr.org/sites/default/files/pdf/2014/06/Limiting_Armed_Drone_Proliferation_CSR69.pdf

majority of them have been deployed for ISR (Intelligence, Surveillance and Reconisan.). According to Fiscal budget 2018, The Department of Defense has requested to spend $6.97 billion for drone-related procurement, research and development, and system-specific construction including orders for 807 drones and for 2019, the proposed spending is expected to reach $9.39 billion for unmanned systems and associated technologies includes funding for the procurement of 3,447 new air, ground, and sea drones. Between fiscal years 2018 and 2019 and that aerial drones experienced the largest funding increase in the president's proposed FY 2019 budget at approximately $7 billion, followed by counter-unmanned systems at $1.5 billion and maritime drones at $1.3 billion.[95] Funding for the Air Force's MQ-9 Reaper, which remains the single largest drone budget item, grew by over $200 million, from $1.23 billion to $1.44 billion; more than $500 million boost to the Navy's MQ-25 Stingray research and development program is the single greatest contributor to the overall increase in drone spending[96].

Sharkey (2007[97]) mentions that the U.S. military has massive and realistic plans to develop unmanned vehicles that can strike from the air, under the sea, and on land. The U.S. Congress set a goal in 2001 for one-third of U.S. operational ground combat vehicles to be unmanned by 2015. More than 4,000 robots presently serve in Iraq, with others deployed in Afghanistan. The U.S. military will spend $1.7 billion on more ground-based robots over the next five years, several of which will be armed and dangerous.

Thus, the interest to improve the drone technology conforms to the DoD vision for these systems: '*Our vision for unmanned systems is the seamless integration of diverse unmanned capabilities that provide flexible options for Joint Warfighters while exploiting the inherent advantages of unmanned technologies, including persistence, size, speed, manoeuvrability, and reduced risk to human life.*

[95] http://www.executivegov.com/2018/07/auvsi-proposed-fy-2019-defense-budget-shows-funding-increases-for-drones-robotics/

[97] Noel Sharkey (2011) The Automation and Proliferation of Military Drones and the Protection of Civilians, Law, Innovation and Technology, 3:2, 229-240, DOI: 10.5235/175799611798204914

DOD envisions unmanned systems seamlessly operating with manned systems while gradually reducing the degree of human control and decision making required for the unmanned portion of the force structure.'[98]

From this perspective, the DoD perceives as a complementary force to manned systems rather than a totally-transformative, supplementary alternative. Moreover, the DoD's Unmanned Systems Integrated Roadmap FY2011–2036 suggests that this shift to autonomous systems represents not just a development of the existing information technology-driven RMA but could perhaps form the basis of the next RMA[99].

When it comes to the consideration on autonomous weapons, both the U.S holds the view that those weapons should not be banned, and the reasoning is grounded on the concrete examples of how past "autonomy-related" technologies have advanced civilian protection. For instance, the US. Authorities defend the humanitarian benefits of these systems on civilian protection. They have highlighted their opinion as such during the meeting of Certain Conventional Weapons (CCW) in Geneva:

'Emerging autonomy-related technologies, such as artificial intelligence (AI) and machine learning, have the remarkable potential to improve the quality of human life with applications such as driverless cars and artificial assistants. The use of autonomy-related technologies can even save lives, for example, by improving the accuracy of medical diagnoses and surgical procedures or by reducing the risk of car accidents. Particularly, the discussion of the possible options for addressing the humanitarian and international security challenges posed by emerging technologies in the area of lethal autonomous weapons systems and the consideration of how these technologies can be used to enhance the protection of the civilian population against the effects of hostilities. This is especially the case because "smart" weapons that use computers and autonomous functions

[99] Unmanned Systems Integrated Roadmap FY2011-2036 , United States Department of Defence (2011) https://fas.org/irp/program/collect/usroadmap2011.pdf

to deploy force more precisely and efficiently have been shown to reduce risks of harm to civilians and civilian objects'.[100]

Besides, it is claimed that by through collecting a large amount of data, AI not only improves the efficiency and accuracy of intelligence processes but also raise the awareness of the presence of civilians, objects under special protection such as cultural property and hospitals, and other civilian objects so that necessary precautions can be taken. In addition to these, the U.S stays rather cautious and vague in its position on autonomy.

In another report (Pentagon Policy[101]) the U.S points out that the weapon systems with autonomous functions could comply with International Humanitarian Law (IHL) principles in military operations, augmenting human assessments of IHL issues by adding the evaluation of those issues by a weapon itself (through computers, software and sensors). The law of war requires that individual human beings—using the mechanism of state responsibility—ensure compliance with principles of distinction and proportionality, even when using autonomous or semi-autonomous weapon systems. By contrast, it does not require weapons—even autonomous ones—to make legal determinations; rather, weapons must be capable of being employed consistent with IHL principles. The U.S. then points to a best practice for improving human-machine interfaces that assist operators in making accurate judgements since the system does not autonomously select and engage individual or specific target groups that have not been previously selected by an authorized human operator, thus the interface between people and machines for AWS should be readily understandable to trained operators; provide traceable feedback on system status; and provide clear procedures for qualified operators to activate and deactivate system functions. Instead of replacing a human's judgment of, and responsibility for, IHL issues, the U.S. contends that AWS could

[100] Humanitarian benefits of emerging technologies in the area of lethal autonomous weapon systems, UNOG (2018) https://www.unog.ch/80256EDD006B8954/(httpAssets)/7C177AE5BC10B588C125825F004B06BE/$file/CCW_GGE.1_2018_WP.4.pdf

[101] Too Early for a Ban: The U.S. and U.K. Positions on Lethal Autonomous Weapons Systems, Hayley Evans (April 2018) https://www.lawfareblog.com/too-early-ban-us-and-uk-positions-lethal-autonomous-weapons-systems

improve humans' ability to implement those legal requirements.[102] Though, the U.S. states the civilian protection must be assessed based on general state practice and common operational standards of the military profession. The accountability of the state would have relied on the decision-makers who would be judged based on the information available to them.

In the report, they accept the fact that the machines can be erroneous to harm the civilians, however, this vulnerability can be mitigated by programming measures that reduce the likelihood of civilian casualties. Autonomous functions could allow for increased operational efficiency and a more precise application of force. Taking this approach, the drones can be described as the "humane form of warfare" (Lewis, 2013[103]).

In addition to these points, the scale and the scope of the causalities can't be independent of human judgements so the decision to employ a weapon can be reviewed in real time by lawyers, intelligence analysts, and senior commanders without any concern that a hesitation to act may cost lives. Even more importantly, the operators themselves are not concerned for their safety, eliminating the possibility that the combination of tension, an unexpected occurrence, and a concern for personal safety leads to weapons being fired when they shouldn't be. Though, the incomplete understanding of the drone technology impedes to realise the interaction among drone, operator and human agent. According to DoD (2011[104]), the level of autonomy should dynamically adjust based on workload so that the integration and regulation of drones can be compatible with humans, that is more focused on the mission rather than working on the system. Nevertheless, in the report, they do not explain how and in what ways this can be achieved.

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[102] Autonomy in Weapon Systems, (2017)DoD Directive 3000.09, November 21, 2012; Incorporating Change 1(8) http://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodd/300009p.pdf

[103] https://www.theatlantic.com/international/archive/2013/08/drones-actually-the-most-humane-form-of-warfare-ever/278746/

[104] White House Locked Down, Man Detained For Trying To Fly ... (n.d.). Retrieved from https://www.nydailynews.com/news/politics/white-house-locked-man-fly-drone-repor

Thus, the U.S policies on autonomous weapons comply with Bergman (2015) argument which indicates that although drones have been humanised, for instance, by labelling them as 'killer-drones', they are still machines incapable of exerting moral judgment. Instead, he emphasises that it is humans, not machines that make decisions to use such systems- Consequently, drones are more likely to be adopted for malicious purposes which raise more concern and scepticism against them. Department of homeland security has published that threat from drones was increasing and was of concern to the White House[105] and drones are called to pose to America's critical infrastructure and government facilities as they could easily be used in chemical and biological attacks. And some incidents have taken place that confirms these warnings. For instance, a man who wanted to make a point about corruption in politics flew his drone into restricted airspace over Washington D.C. in April 2015 and landed it on the West Lawn of the Capitol building. The landing of the undetected drone on the lawn of the White House led to shutting down the U.S. Capitol for part of the day. The bomb squad did not find any hazardous material on the drone, and the operator was immediately taken into custody and arrested[106]. In May 2015, another man was detained by the Secret Service when he attempted flying a remote-controlled aerial device over the White House fence[107]. Correspondingly, the increasing diffusion of this technology has pushed more towards the regulatory approach to this issue. However, at this point, the dilemma appears when drones have been at the service of police and law enforcement agencies.

While there are no drones in the United States operating with these non-lethal weapon systems, this is not only possible but also becoming an inexpensive option for law enforcement.[108] There is a significant chance that drones will move beyond strictly surveillance uses and move into

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[108] Protecting Privacy From Aerial Surveillance, Stanley, J. and Crump, C. (December , 2011) https://www.aclu.org/files/assets/protectingprivacyfromaerialsurveillance.pdf

intervention in situations on the ground. Although crowd control is the most obvious use for a drones, it is possible to imagine cases where it could be applied to an individualised setting outside of a large crowd. Drones can allow investigating the scene quickly before an officer arrives at the place.

Nevertheless, it is not indeed known how a drone can be deployed for crowd control or individual arrest. For instance, NewYork Police Department still tests the drones as they want to be sure that they do not invade the privacy of civilians and not to track the innocents. Under the current regulation, the federal government has restricted law enforcement's use of drones out of concern for the safety of the airspace. However, there are limited deployments for instance police in Texas received a drone to help with security during the Super Bowl in 2011 and FAA permission to deploy it for "training and evaluation" purposes in unpopulated areas[109]. Besides, they are also interested in using drones for search & rescue, car crash investigations, crime scene documentation etc.[110]

Despite these, the domestic use of drones is under the control of the Federal Aviation Administration (FAA), whose permission is required to operate in the nations' airspace. The aircraft operators raise concerns about the safety, security and protection of privacy situation and argue that drones should be permitted to operate in national airspace unless they have the same ability as all other aircraft under visual flight rules. Whereas, on the other side, the industry, its allies and law enforcement agencies support the idea that the skies must open to drones and the regulation must be loosened. However, the increasing drone incidents make their demand less likely. According to

[109] Arlington, Texas hopes to keep aerial drone," Homeland Security Newswire, May 17, 2011, online at http://www.homelandsecuritynewswire.com/arlington-texas-hopes-keep-aerial-drone
[110] NYPD to deploy drone fleet, stoking fears of Big Brother, Dennis Romeo (December, 2018). https://www.nbcnews.com/news/us-news/nypd-deploy-drone-fleet-stoking-fears-big-brother-n943876

government data, drones experience an accident rate over 7 times higher than general aviation, and 353 times higher than in commercial aviation[111].

'Outside-the area of active hostilities', the vague definition of the locational context in which drones… It is forming another way of keeping its hegemony on the global system by shifting the use of a drone. The United States will need to use global military force to exercise its power. But its ability to do so is dependent, to some extent, upon the acquiescence of domestic humanitarian challenges. According to this model, the U.S. government is likely to comply with international humanitarian norms to achieve domestic legitimacy, but only when domestic humanitarian advocates have successfully mobilised and forced it to do so.

Nevertheless, Since the U.S.'s first combat strike by an armed drone in 2001, the use of armed drones has continued to rise- and this has been counted on the public opinion on drone strikes. The public in countries around the globe are broadly opposed to US-led drone strikes. Indeed, the evidence shows that nations of all shapes and sizes – even American allies, NATO members, and states impacted by foreign terror attacks far more than the US – stand together in opposition.

According to Global Attitudes Survey conducted by Pew Research Center (2015), for measuring the level of public opposition to US drone strikes on a country-by-country basis, that only 7 of the 44 countries surveyed predominantly approve of drone strikes, including the US, as where the vast majority of countries surveyed express extreme disapproval. Numerous US and NATO allies are opposed to drone strikes. This list includes Spain (86%), Turkey (83%), France (72%), Germany (67%) and the UK (59%). Not only are these countries US and NATO allies, but they have also experienced major terror attacks on their home soil – the type of attacks that the US drone program

[111] Statement of Nancy Kalinowski, Vice President for System Operations Services, FAA, before the House of Representatives Committee on Homeland Security, Subcommittee on Border, Maritime, and Global Counterterrorism on the Role of Unmanned Aerial Systems on Border Security, July 15, 2010, http://www.faa.gov/news/testimony/news_story.cfm?newsId=11599

is purportedly designed to combat. Japan (82%) and South Korea (75%), key American allies in Asia, are also strongly opposed to drone strikes.

Despite becoming a centrepiece of American foreign policy in general and counterterrorism policy in particular, the analysis of drones has generally been journalistic in nature, focusing on either the technology (Singer, 2009) or the bureaucratic basis by which the United States came to rely more on drone strikes than detention of terrorists (Mazzetti, 2013), or on legal or ethical debates about using drones for counterterrorism (e.g., Finkelstein et al., 2012; Strawser, 2013). The literature has tended to sidestep important questions about the determinants of public support for drone strikes, in particular whether the legal and ethical concerns that have been raised about drone strikes affect public attitudes.[112].

The American public, on the other hand, predominantly and consistently supports the tactic. While some cross-country variation is to be expected, the vast disparity between US opinion and most other countries in the world stands out as quite a problem. This combination of widespread international opposition and broad American support is what raises the central research question on what factors drive American public support for the US drone program, and relatedly, for drone strikes against foreign militants?. Despite the expansion of drone strikes as a counterterrorism tactic, only a handful of academic studies have explored the factors that drive public support for this strategy (Fair, Kaltenthaler, and Miller 2014; Kreps 2014; Walsh 2015; Williams 2010). Of course, this isn't always the case, but it's unquestionably true that elected officials are constrained by public opinion is they seek to maintain power. Given widespread agreement among modern political theorists that the public should be the primary determinant of policies in democratic societies, a paramount goal must be to understand the processes and variables that cause the public to think the way it does about important socio-political issues.

Other than public, the elites or in other words partisanship and so-called tribal allegiances influence public opinion and dominate the foreign policy debates the issues they raise in public forums, combined with the way regarding the problems and events that are distant to most people, such as military tactics and other foreign policies. Elites subconsciously and strategically steer public opinion by way of rhetorical strategies, speech acts, and an institutionalised relationship with the media that enables the former to exist as the primary tool of public persuasion. That brings us directly to the third player in the marketplace of ideas, which is the news media. John Zaller and Adam Berinsky, have made some of the most persuasive and comprehensive arguments about the role that elite cues play in public opinion formation, essentially claim that people's opinions are an outcome of their prior dispositions combined with the partisan balance of elite messages, which might refer to as a one-sided message or a mainstream model.[113]

The media is an intervening variable and information delivery system that transmits messages from elites to the public. There are causal mechanisms concerning the effect that media coverage has on what individuals think about and how they feel about things. These effects – known as agenda-setting and framing – have been frequently examined for decades and are now well-established across the social sciences. In addition to these effects, there's a structural relationship between the media and elites that manifests in the way journalists cover international news stories. In particular concerning my main argument, I'll focus on what the elite-media relationship looks like when there's a high level of agreement among elites, including across political parties – as is the case with drone strikes. Simply, drones make airspace more explicit and more available for social reflection and action, but it is also this very novel potential of societal co-production that makes airspace today an increasingly contested space in which, and through which, power is exercised in odd ways.

For the typical American, the word "drones" may conjure up images of raging battlefields, controversially targeted assassinations, or the inept amateur hobbyists that crash drones into your neighbour's backyard in attempts at high-altitude photography. Precisely because of such public perceptions, the current debates surrounding the use of drones are complicated by the American public's association of drones with controversial use in combat, police surveillance, as well as the general unease with considerations of privacy and safety presented by hobbyists' use of drones.

From one point of view, it is claimed that the US public's support for the use of drones has also remained consistently high throughout from 2002 to 2015. For example, in 2013, a Gallup poll reported that 65 per cent of Americans agreed with the U.S. government's decision to launch drone strikes against terrorists overseas[114]. In 2015 Pew public opinion poll reported that 58 per cent of U.S. adults approved of the use of drones to carry out missile strikes against extremists in Pakistan, Yemen, and Somalia[115] Yet despite the quantity of polling data available, relatively little is known about the strength of popular support for drone strikes and the conditions under which we might expect it to change in the future. If we think that US public opinion on the use of force matters – as research suggests it does – then it is essential to know what affects American support for drones[116]. From this point of view, Macdonald & Schneider (2016) have conducted a survey based on experimental scenarios what it has been found out that the U.S public is unable to differentiate between the manned and unmanned aircraft, which indicates that they do not perceive drones as a fundamentally different asset of military force. Over half of the respondents (54 per cent) were unable to identify the MQ-1 Predator correctly while 66 per cent were similarly unable to identify the MQ-9 Reaper as an armed, unmanned aircraft.

Further, a sizable fraction (21 per cent) of our respondents incorrectly identified the manned F-16 fighter jet as an unmanned aircraft, and 26 percent believed the Global Hawk, which is an unarmed, unmanned intelligence aircraft, was capable of launching air strikes U.S. public is more likely to support drone strikes when, first and foremost, there are civilians present or where there is little threat to air crew. It is believed to that unmanned systems are better in terms of crew and civilian safety. Secondly, domestic and international legal consensus play a significant role for the U.S. public support for air strikes and so may not increase its support for illegal air strikes simply because the platform is unmanned. Moreover, Fisk et.al (2018) brings a different perspective by claiming that when individuals are exposed to information about the threat of international terrorism, they experience negative emotions that, in turn, affect their support for drone strikes. However, the way in which emotions affect support depends on the particular type of negative emotion evoked. So when an individual reacts with anger to the threat of terrorism, they will become more supportive of drone strikes. While they may be less supportive of risky military engagement (Huddy, Feldman, and Cassese 2007; Huddy et al. 2005), drone strikes may provide a means of lowering perceived risk while still addressing the threat, such that fearful individuals are less opposed. We expect the emotional processes that underlie support for drone strikes to work similarly across country settings. This finding again resonates with existing work on video surveillance, which also identifies misconceptions among the public with regard to the extent of visual monitoring (Klauser, 2006).

These findings have confirmed the fact that there is general the lack of accurate public knowledge about the relative capabilities of manned vs. unmanned aircraft so that among the public there is an incorrectly over-estimation on the capabilities of drones compared to manned systems. In this case, the lack of knowledge towards the undesirable situations will increase the ethical risks and this uncertainty can't be diminished by acting through the probabilities (Hansson, 2013)[117] Besides, some researches also show that the less civilian casualties and more chance to get military success make public to give support to the use of technology (Singer, 2012, Eichenberg, 2005; Gelpi,

[117] S.O. Hansson, Ethical Analysis in an Uncertain World: the Ethics of Risk, Palgrave Macmillan Publishers Limited, New York, NY, 2013

Feaver, & Reifler, 2009; SSGartner, 2008) [118] Moreover, Some research suggests military UAV accidents are disproportionality higher than the rate of accidents for other type of aircraft. (e.g Brendan McGarry)[119]

These results highlight the importance of perceptions in driving preferences for uses of force among the U.S. public. On one hand, it can be considered that public opinion volatile and irrational (Almond-Lippman, 1955; Verba 1967; William Caspary 1970 etc). Nevertheless, as Page and Shapiro (1988) have articulated public capabilities, public opinion is rational in the aggregate, even if individual opinion is prone to error. Individual errors cancel out in the process of aggregation, and thus collective opinion conveys real and true information about people's preferences. Thus, it has been demonstrated that leaders are attentive to public attitudes when making decisions about the use of force (e.g., Holsti, 2004) in order to justify their vision and diffusion of unmanned systems in civilian and military use. For instance when the local law enforcement agencies in the U.S are planning to utilize the unmanned vehicles, public criticism of such operations are taken into consideration. In 2014, the Los Angeles Police Department announced that it received two drones from the Seattle Police Department. The unmanned vehicles became expendable when public backlash in Seattle dismantled the program saying that the public hearing on a proposed ordinance outlining restrictions for the department's drone program, which drew vocal opposition from the citizens concerned with intrusions into their privacy. The Police Department aimed at using drones during hostage situations and search-and-rescue operations and after following natural disasters, the bomb threats and the detection of "hot spots" in fires, or for the collection of traffic data. According

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[118] http://www.jamesigoewalsh.com/drone.pdf

[119] , Drones Most Accident-Prone U.S. Air Force Craft: BGOV Barometer, BLOOMBERG, June 18, 2013, available at http://www.bloomberg.com/news/2012-06-18/drones-most-accident-proneu-s-air-force-craft-bgov-barometer.html ("The Global Hawk has an accident rate of 15.16 per 100,000 flight hours, almost three times that of the aircraft it's designed to replace, the Cold War-era U-2 spy plane."). The industry's relative youth, not to mention the use of UAVs by countless numbers of regular citizens, means that the risks of crashes and incidents caused by UAVs in the national airspace are not precisely known. See generally Donna A. Dulo, Senior Mathematician, United States Department of Defense, Address Before University of Miami School of Law, "We Robot Conference on Legal and Policy Issues Relating to Robotics"

to The Los Angeles Times, the LAPD indicated the small UAVs were intended for use in "narrow and prescribed" circumstances (e.g., a hostage situation), and the agency would notify the public before deploying them. Nevertheless, there has been a significant concern among the general public due to misuse and the intrusions into their privacy.[120][121] Along with an investment in technology and crafting good policy, public perception is a critical factor that law enforcement needs to address. Furthermore, they found that when opinion shifts did occur they were usually precipitated by changes in the international environment as well.[122]

Moreover, at this point, it must be kept in the mind that the existing studies deal with exploring the perception of drones by the general public. Relevant studies are of variable quality and revolve almost exclusively around public attitudes towards armed drones deployed in military conflict (LaFranchi, 2013; Cohen, 2014; Kreps, 2014) and towards other state-driven drone practices (Ackerman, 2012). Apart from these, Walsh (2014) looks at how precision weapons contribute to a certain set of expectations about civilian harm among the public. Approaching the argument from psychological point of view, "counterfactual thinking" upholds that the public wishes to avoid civilian casualties if this is possible. Precision weapons make it easier to achieve this objective, and the public adjusts its expectations with this in mind. This suggests that civilian casualties should reduce support for the use of force when precision weapons are available and that attacks with such weapons that result in civilian casualties should result in heightened concern about such deaths compared to similar attacks using non-precision weapons or attack platforms armed with precision weapons that place military personnel at risk

Relevant studies are of variable quality and revolve almost exclusively around public attitudes towards armed drones deployed in military conflict (LaFranchi, 2013; Cohen, 2014; Kreps, 2014)

[120] https://www.envisagenow.com/drone-use-by-law-enforcement-requires-public-support/
[121] https://www.seattletimes.com/seattle-news/seattle-grounds-police-drone-program/
[122] Page and Shapiro, The Rational Public; Robert Shapiro and Benjamin Page, "Foreign Policy and the Rational Public," The Journal of Conflict Resolution 32, no. 2 (1988): 211-47; also see: Philip Converse, "Popular Representation and the Distribution of Information," in Information and Democratic Processes, eds. John Ferejohn and James Kuklinski (Chicago: University of Illinois Press, 1990), 369–88.

and towards other state-driven drone practices (Ackerman, 2012). Such accounts reduce the drone problematic to but one user category and to but one "family" of drone gazes. Although there are some notable exceptions to this (Miethe, 2014; Thompson and Bracken-Roche, 2015), an exclusive anglophone, if not North American, focus remains across existing literatures. Undoubtedly, the general unease and caution from the public are considered to reflect the FAA's delays in promulgating rules in paving a clear regulatory framework for the civilian use of drones in US territory.

Although the primary reason for the required regulations on the international and national level has been to integrate drones into the National Airspace System (NAS) and to entail them operating harmoniously, side-by-side with manned aircraft, it actually shapes the way of justification for the expansion of drone use. Mitigating the military/ targeted killing perception on drones among the society by collaborating with non-state actors. In 2012, FAA has issued Arctic Modernization and Reform Act, which plans to expand the use of small unmanned aircraft systems in the Arctic for informing interested parties, and the FAA's plan to establish permanent operational areas and corridor routes (for access to coastal launch sites)in the Arctic for the operation of small Unmanned Aircraft Systems (sUAS). Through a NOAA/NASA collaboration called Sensing Hazards with Operational Manned Technology project (SHOUT), it is aimed at measuring hurricanes' energy, inner-core structures and behaviours through Global Hawk's Doppler radar and atmospheric sensors. In 2014, NOAA have deployed Coyotes (a P-3 Hurricane Hunter) off the U.S. East Coast, to take detailed observations where manned aircraft cannot safely fly, which has allowed to transmit that data directly to the National Hurricane Center so that it helped them for forecasting models, which could lead to the evacuation of a community. Correspondingly, while the usage of drones for scientific study has become increasingly popular (Curry et al.2004, Inoue et al.2007) restrictions on where and when these platforms can be operated, has limited their usefulness for advancing science. Taking this consideration into account, the U.S. Department of Energy (DOE) and the FAA has collaborated on the special-use airspace that allow more flexible operations of UAS (DataHawk) and TBS for Arctic climate research and collective work has been conducted between Evaluation of Routine Atmospheric Sounding Measurements using Unmanned Systems (ERASMUS) campaign, the U.S. Coast Guard Arctic Shield 2015 rescue training operations[123]

It is commonly known that in U.S. maintains a monopoly on defence and military technology however, with the diffusion of unmanned systems there has been undeniably growing presence of security and defence industry in the research and development, defence acquisition and regulation of airspace. Higgs (1987) and Smith, Wagner and Yandle (2011) emphasize that moments of real or perceived crisis encourage new interactions and expand previously existing linkages between state and non-state actors as the demand for political action breaks down traditional separations. The formation of Drone Advisory Committee by the FAA in June 2018 can illustrate this condition. The Committee aims at "helping them form drone regulations more quickly, with advice on key UAS integration issues by helping to identify challenges and prioritize improvements." The committee has consisted of manufacturers, major corporate drone operators, drone software providers, drone advocacy groups, manned aircraft representatives, airports, academia, and local governments. In such a variety of interest groups, the goals of the drone hobbyists, companies and safety advocates differ in some ways. Hobby groups are trying to peel back recreational registration rules, while airline pilots are pushing for more mandates that drone makers like DJI and GoPro put safety technology on machines. Amazon and Google, which want to use drones for delivery, are asking permission to test their technology. They agree, though, that the F.A.A. is due for fresh guidance on its approach to drone rules[124] The main concern/ doubts against this committee appears in terms of conflict of interest and the participation of private sector which extracts its own benefit.

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[123] https://eos.org/project-updates/unmanned-platforms-monitor-the-arctic-atmosphere

[124] https://bits.blogs.nytimes.com/2016/01/24/drone-lobbying-turns-to-captiol-hill/

However, according to Abizaid and Brooks (2013), it is assumed that political actors look to provide the best possible defense for U.S. citizens and have chosen drones as the means to achieve these goals. While offering number of alternatives to improve drone policies ultimately assume policymakers will look to fulfil the public's goals. Discussing future drones developments, they state policy should be geared toward advancing US national security interests in a manner consistent with the public's values."[125] Similar assumptions of public interest are observed elsewhere, "Protecting vital public interests and promoting innovations that stand to substantially benefit society requires…laws, policies, and regulatory frameworks" (Drones and Aerial Robotics Conference). From this assumption of public interest, one may derive two general conjectures, each with several subsidiary conjecture, regarding what drone policy should look like in practice.

It can provide more opportunities for scientific research, SAR, environmental analysis, fisheries, marine mammal observers, oil and gas leaseholders and maritime route planners. In this way, the more use of drones outside the battlefield expand as technologies and performance characteristics become better understood and integrated into drone operations. In the report unmanned system are defined as an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft weight less than 55 pounds; operate safely and efficiently in the national airspace system. And particularly, it is emphasized that type of the aircraft system (size, weight, speed etc) proximity to airports and populated areas, and operation within visual line of sight do not create a hazard to users of the national airspace system or the public or pose a threat to national security are crucial factors be to taken into consideration when allowing their use. Secondly, under Focus Area Pathfinder Program, three companies take initiatives to incremental expansion of UAS operations in the NAS. CNN (explores how UAS might be safely used for newsgathering in populated areas), Precision Hawk (explores how UAS can be used for crop monitoring in precision agriculture operations) and BNSF Railway (explores command-and-control challenges of using UAS to inspect rail system infrastructure)[126]

If we think the project in Arctic region, it can be assumed that a scientific reasoning has been offered to justify the intervention/intrusion into the sovereignty of another territory and the abuse of drones as a weapon to the insubstantial grounds thereby becomes a threat to international security.

The use of drones for civil purposes is becoming more and more popular and associated with a growing list of potential applications: law enforcement and policing activities; border patrols; global environmental monitoring and security related operations (GMES); fire services; traffic management and monitoring; fisheries protection; oil and gas pipeline surveying; coverage of large public events; agricultural management and crop monitoring; power line surveying; aerial photography; review and assessment of critical and physical infrastructure; missing person searches, etc. Furthermore, countries such as the UK, France, the US and Canada as well as others are developing guidelines and rules to enable the use of drones in civil contexts, although they are not yet widely deployed. Specifically, much of the delay around the deployment of drones is related to the significant privacy and ethical concerns they engender.1 Nevertheless, the conservative deployment of drones for civil purposes has not impacted research and development around drones, and their capabilities continue to develop, especially in the context of growing applications.

As it has explained in previous part, the much of the existing literature on drones in North America gives much attention to their military application and the perception and knowledge about them form positive support for their deployments even though they don't perfectly have the perfect information about the capabilities of this technology. In addition to these, the terminological definition of these technology also change the level of acceptance of this technology in the society.

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[126] https://www.faa.gov/uas/programs_partnerships/focus_area_pathfinder/

For instance, according to opinion poll survey of Office Fédérale de l'Aviation Civile (2016[127]) with 87% of the survey respondents indeed considering drones to be mobile CCTV cameras. Whilst this stance also reflects terminology deployed by official stakeholders such as the Swiss Federal Office of Civil Aviation, whose website and documentation both refer to "video surveillance by drones" (Office Fédérale de l'Aviation Civile, 2016[128]), there are in actual fact also important differences between CCTV cameras and drones in terms of how they monitor space from above – with drones being used in more sporadic, punctual, and flexible ways than fixedly installed surveillance cameras (Cogarty and Hagger, 2008:125[129]).

In the case of commercial drones, the Federation of Aviation Administration (FAA), the national aviation authority in the United States, has banned their use until new policies and regulations have been properly implemented [Braham 2013; Mehes 2013]. The FAA finally began enforcing a drone registration rule on December 21, 2015.

By January 22, 2016, the FAA reported that they had registered nearly 300, 000 unmanned aircraft owners. The flood of drone registrations in the United States in such a short space of time indicates that the implications of the positive and negative consequences of operating drones extend beyond registration, and this study addresses most of the other aspects. Key concerns noted are safety and privacy, which are also major issues in other countries like Canada and within the European Union.

In September 2013, selected federal authorities jointly released a comprehensive plan called for in the FMRA. The Plan set out several strategic goals for the phased-in integration of UAVs into the NAS, giving priority to "public" UAVs while laying the framework for eventual "civil" UAV integration by 2015. The Plan anticipated that UAS with visual line-of-sight would operate in the

[127] Office Fédérale de l'Aviation Civile: Les drones en Suisse: Un nouveau défi, Report, OFAC, Bern, https://www.bazl.admin.ch/bazl/ fr/home/bonasavoir/drones-et-modeles-reduits.html

[128] Office Fédérale de l'Aviation Civile: Vidéosurveillance par des drones dans le domaine privé, OFAC, https://www.edoeb.admin. ch/datenschutz/00625/00729/01171/index.html?lang=fr,

[129] Cogarty, B. and Hagger, M.: The laws of man over vehicles unmanned: The legal response to robotic revolution on sea,land and air, Journal of Law, Information & Science, 19

NAS without special authorisation by 2015, with "routine" UAS operations 2020. To that end, the Plan initiated a program for the establishment of UAS test ranges to "help inform future rulemaking activities and other policy decisions related to safety, privacy, and economic growth."[130] The FAA released its "Integration of Civil Unmanned Aircraft Systems (UAS) in the National Airspace (NAS) Roadmap" ("Roadmap").[131] The Roadmap anticipated an evolutionary transition from "accommodating" UAVs to "integrating" the technology within the NAS. It also outlined a broad timeline for implementation of the actions mandated by the FMRA.

The US military's pervasive and accelerating deployment of drones, and drones' centrality in US security policy show that practices indeed shape norms. Drones have become "preferred" security instruments due to specific rationales based on procedural norms. Autonomous weapons' versatility, the dual-use character of their main features, and the technological rivalry among major powers qualify them as very important instruments—and this makes their regulation more difficult. Whenever procedural norms prevail over legal and ethical norms, the latter category, unfortunately, is likely to yield or adapt.

In the USA, while 'privacy' has not been explicitly mentioned, the Fourth Amendment to the Constitution has been interpreted, in an established manner, to give such a right to privacy to its citizens.[132] The Fourth Amendment states, specifically: "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized." Importantly, this Amendment depends on an 'expectation of privacy' in an individual, the breach of

[130] Joint Planning And Development Office, Unmanned Aircraft Systems (Uas) Comprehensive Plan: A Report On The Nation's Uas Path Forward

[131] Fed. Aviation Admin., Integration Of Civil Unmanned Aircraft Systems (UAS) In The National Airspace (NAS) Roadmap, available at http://www.faa.gov/about/initiatives/uas/media/UAS_Roadmap_2013.pdf

which leads to a breach of the right to privacy[133]. Besides, the proposed regulations also carry the requirement for drone operators to enter into contracts with the FAA, which would stipulate each operator to have a detailed plan for use and retention of drone collected data, and also have a 'privacy policy'[134]

The Supreme Court has held that a two criteria test must be followed for the collection of data: "that a person have exhibited an actual (subjective) expectation of privacy" and "that the expectation be one that society is prepared to recognize as 'reasonable.' However, this would still be subject to State laws, such as those of Texas[135] and Oregon[136] which focus on the private use of drones. These statutes generally restrict usage of drones without written consent (Idaho), provide a blanket ban on list of uses but with a list of exceptions (Texas). In this manner, while there are no clear case laws yet specifically regarding the collection of data by drones, it can be stated that existing rules, regulations and court precedent could be

In terms of AI governance, the United States White House National Science and Technology Council Committee on Technology released a report with recommendations ranging from eliminating bias from data, to regulating autonomous vehicles, to introducing ethical training to computer science curricula (National Science and Technology Council Committee on Technology 2016). The Institute of Electrical and Electronics Engineers recently published a vision on 'Ethically Aligned Design' (IEEE 2016). Industry leaders have also taken the initiative to create a 'Partnership on AI' to establish best practices for AI systems and to educate the public about AI (Hern 2016)

Public perception on drones in the United States, While United States has been the main player of norm development and the export of unmanned system and it has been the first to initiate regulatory practices for UAS integration as well, which can be regarded as the way for justifying their use on the civilian purposes. In 2001 with the report of "High Altitude Long Endurance, HALE, UAV Certification and Regulatory Roadmap" has been aimed at forming a basis of discussion between the FAA, the industry and other stakeholders for establishing regulation for aircraft airworthiness, flight standards and air traffic that will allow safe operation of HALE UAS in the NAS. At the early stages of regulation, the FAA has taken a more cautious approach towards drone technology since there have been many uncertainties and technical challenges (such as sense and avoid system and communication) influencing the cost and public safety. In October of 2003, the FAA published Order N8700.25 as a response to inquiries it had received regarding UAS operations. Until that time the use of Certificates of Authorization (COA) for UAS operations had been limited for military operations based on an agreement between the FAA and the DoD. With this order, the FAA opened the door for non-military operations, mainly for proof-of-concept demonstrations. They initiated the define drones as "Unmanned Aircraft is a device that is used, or is intended to be used, for flight in the air with no onboard pilot"[137]. According to the FAA, this definition includes everything from small R/C model aircraft to sizeable full-scale aircraft and from remotely operated to fully autonomous systems. It was also made clear that it did not apply to model aircraft that can only be used in non-commercial, recreational applications.

[137] Federal Aviation Administration (2007) Unmanned aircraft operations in the national airspace system. Docket No. FAA-2006-25714, https://www.nps.gov/articles/unmanned-aircraft-in-the-national-parks.htm

CHAPTER IV: Europe: Civil/Military Use of Drones and Regulatory Practices

Although USA has been the leader and the most prolific user of drones in their operations abroad and for national security, other countries have already taken step to develop and use this technology. It is estimated that 87 countries have already 'used drones militarily'. Among them, European countries devotes growing attention on drone as a product of military-civilian technology transfer.

This is not the first time that drones have been the one main interest for European countries. Since 1990s, unmanned systems were included in the long-term objectives of European aviation market. Nevertheless, actual undertakings have initiated with the arguments on so called 'capability gap' between US. And EU which is assumed to hinder European countries from participating types of alliance operations and consequently weakens its independent decision-making power within the alliance and collective action (Coonen,2006[138]). As it is put by NATO Secretary Anders Rasmussen in his 2011 Annual Report: "During our operation in Libya, the United States deployed critical assets, such as drones, precision-guided munitions and air-to-air refuelling. We need such assets to be available more widely among Allies.[139]". It has been criticized that EU is falling behind in an area that may determine military aviation's future in the context of advanced C4ISR capabilities. None of the European countries is not able to achieve fully commitment to deployment of unmanned system/ ISR communication capabilities that link the national forces closer together and increase interoperability within NATO alliances. Planned and actual deployments are broader and advanced in some countries such as France and UK while the others lag this advancement. Thus, the European drone debate, from its beginning, has been unduly influenced by the US experience.

Thus, the dependency on the U.S drones have created some obstacles on obtaining of this technology. For instance, due to strict drone export policies of U.S, it took four years to confirm

[138] https://ssi.armywarcollege.edu/pubs/parameters/articles/06autumn/coonen.pdf
[139] (NATO, Secretary General's Annual Report 2011, 2012)

Italy's request to purchase armed Reaper drones even though the U.S has held an authorizing transfer to Italy[140] (also United Kingdom). In similar vein the substantial reliance on US on infrastructure located in Europe for its use of armed drones abroad can lead some challenges. For instance, to operate remotely operate platforms over other continents, the U.S uses a satellite uplink located at Ramstein Air Base in Germany[141] which creates number of legal issues related to a state's responsibility for communications involved in drone strikes that transit its territory if it they turn out to be against law. Likewise drone strikes launched from the territory of the EU directly (e.g. the Sigonella base in Italy) or directly reliance on intelligence from another state (e.g. data sharing debates in the Netherlands for US strikes in Somalia[142]).

Under such context the European Union has aimed at developing more common stance and creating their own independence on technological capabilities. This consideration has instigated to understand more how drones can best suit their own needs and how to make society to benefit from this technology.

Several European and international agencies such as European Aviation Safety Agency (EASA), EuroControl and European Defence Agency (EDA) encourage the research and development programmes exploring and preparing the transfer of drone technology from the military domain to the non-military one (Hayes et al. 2014[143]). Besides, together with national civil aviation authorities they work to adopt regulations allowing both the military and non-military application of drones. On the other hand, by cooperating closely with the industrial actors (e.g. Israel Aerospace Industries, Thales Group, or Lockheed).

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[140] Kington, "Italy Wins U.S. State Dept. OK to Arm Reapers."

[141] Whittle, R. (2014) Predator: The Secret Origins of the Drone Revolution, Macmillan.

[142] Modderkolk, H. and Effting, M. (2015), 'Somali victims of US drone strike take legal action against The Netherlands', de Volkskrant, 28 November 2015, https://www.volkskrant.nl/buitenland/somali-victims-of-us-drone-strike-take-legal-action-against-thenetherlands~ a4196845/

[143]

While European countries invest in technological applications, ranging from biometrics to databases in order to deploy an effective technological means to face the security threats allegedly coming from outside, drones are considered as complementary technology along with other technologies (such as sensor, radars and satellite systems) playing a role in the virtualisation and automation of surveillance of irregular migrants and in preventing and managing smuggling, trafficking, and terrorism or other related crimes. They are variably framed as EU's digital fix (Besters and Brom, 2010[144]), or transformation of Europe into a high-tech fortress, through militarization of border surveillance (Marin, 2011[145]).

Even though there is still limited use in practice, the testing and initial implementation in different civilian context has been expanding in Europe. For instance, Frontex has been keen to deploy drones as modular and cost-effective tool for securing the EU's frontiers in order to create so called "smart/ technological borders" (Dijstelbloem&Meijer,2011[146]; Hayes et.al. 2014; Marin& Krajčíková,2015). One of the actual cases of drone deployment for border security has been conducted during the operation of "Mare Nostrum" in Italy, which reflected more humanitarian purposes[147]. Predator drones, which were bought from the U.S, have been deployed for strengthening intelligence, surveillance and reconnaissance (ISR) capacity of the operation.

These collaborations have been motivated by the fact that inserting drones into existing security frameworks for internal security purposes could have unforeseen or negative consequences in both policing strategies and border control activities, dual-use drones requires more than ever the

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[144] Brom, F. W. A., & Besters, M. (2010). 'Greedy' Information Technology: The Digitalization of the European Migration Policy. European Journal of Migration and Law, 12(4), 455–470. https://doi.org/10.1163/157181610X535782

[145] Marin, L., "Is Europe Turning into a 'Technological Fortress'? Innovation and Technology for the Management of EU's External Borders: Reflections on Frontex and Eurosur", in M.A. Heldeweg and E. Kica (eds.), Regulating Technological Innovation: A Multidisciplinary Approach, Palgrave Macmillan, London, 2011, pp. 131-151

[146] Dijstelbloem, H. and Meijer, A. (2011). Migration and the new technological borders of Europe. Basingstoke: Palgrave Macmillan

[147] http://www.ansa.it/web/notizie/postit/specialepresidentedellarepubblica/2013/03/19/Quirinale-intesa-lontana-Berlusconi-teme-Prodi_8549488.html

maintenance of checks and balances to attain a critical and "reflexive relation" (Thomson 2000[148]) to biased military technologies such as drones that first originated in the battlefield. The EU's drone policy cannot be considered independently from its pragmatic approach on Security and Defence policies since the civilian drone market, and regulation policies have their roots in the formulation of military discourses in Military affairs. The military use of drones by European countries (notably France, Germany and Italy) predominantly have taken place in counterterrorism operations abroad:

France, who possesses five unarmed drones in their service (three MQ-9 Reapers and two French Harfang drones), deployed drones for the first time on Operation Serval for assisting the Malian government in counterinsurgency. Accordingly, in 2014 the Reaper drone was used in Operation Barkhane, the Sahel region in Northern Africa. The drone detachment has helped in the search for information and points of interest to prepare the operations, the observation of zones to detect and to monitor the suspicious activities of the targets[149].

Germany, which possesses Israel- made drones in their stock, which were consecutively deployed in Afghanistan and for the UN peacekeeping mission in Mali. In both operations, the drones gave German and local units to have better surveillance and information gathering capability in a large scale area, which is challenging to fulfil comprehensively and quickly with existing technologies (e.g. the German Heron drones in Afghanistan had completed more than 25,000 flight hours[150])

Nevertheless, European countries put effort to promote more the civilian use of drones through funding various projects and striving to introduce drone regulation which is applicable for all member states. Drones have been demanding tool especially or the border management in Europe which reciprocally bring many actors of interest together, thus on one side, the Member States and

[148] From the Question Concerning Technology to the Quest for a Democratic Technology: Heidegger, Marcuse, Feenberg," Inquiry 43:2 (2000), 203-16
[149] Sahel : des drones contre le terrorisme, https://www.francetvinfo.fr/economie/emploi/metiers/armee-et-securite/sahel-des-drones-contre-le-terrorisme_2847519.html (July, 2018)
[150] https://www.thelocal.de/20180614/german-military-to-get-its-first-ever-combat-capable-drones

their national bureaucracies, and, on the other side, the European agencies plus people of concern and society in general.

By 2017 more than €315 million has been spent in EU research funding on drone technology or drones geared towards a specific purpose such as policing or border control[151]. Recently under the project of OCEAN2020 which is regarded as the first cross-European military research programme, it is aimed at integrating unmanned platforms for maritime surveillance and interdiction[152]. According to a report by the European Parliament's Committee on Transport and Tourism, the EU holds a leading edge in the civilian sector, with 2,500 operators (400 in the UK, 300 in Germany, 1,500 in France, 250 in Sweden, etc.) compared to 2,342 operators in the rest of the world. It is estimated that within the next ten years the drone industry could be worth 10% of the aviation market, or €15 billion (about US$16.89 billion) per year[153]. The Aerospace and Defence Industries Association of Europe forecast that about 150,000 drone-related jobs will be created in Europe by 2050, excluding employment generated through operator services.

The increasing presence of the drones in civilian airspace cause risk and disruption on air traffic. In the UK the number of near misses caused by drones has been tripled since 2015, that is while there were 29, it reached 71 in 2016[154]. In a similar vein, in Germany, it has been reported 158 air disruptions resulted from drones in 2018 (an 80 per cent increase from 2017[155])

[151] EU 'spent £320 million on surveillance drone development' https://www.telegraph.co.uk/news/worldnews/europe/eu/10632262/EU-spent-320-million-on-surveillance-drone-development.html, Bruno Waterfield, 2014.

[152]

[153] Regulation Of Drones: European Union - Library Of Congress. (n.d.). Retrieved from https://www.loc.gov/law/help/regulation-of-drones/european-union.php

[154] https://www.theguardian.com/technology/2018/dec/20/how-dangerous-are-drones-to-aircraft

[155]Drones cause record number of air traffic disruptions in Germany https://www.thelocal.de/20190122/drones-cause-record-number-of-air-traffic-disruptions-in-germany

At the EU level, no consistent terminology is used to denote what is commonly known as drones. Different institutions call it with different titles based on their criteria. For instance, The European Parliament uses the term “civil drones” to differentiate civilian drones from those intended for military purposes. The European Commission prefers the term “remotely piloted aircraft systems” (RPAS) as the UK has emphasized in their policy reports. The European Aviation Safety Agency (EASA), an EU body established in 2002 with the mandate to issue implementing rules and approve airworthiness standards, defines drones as “unmanned aircraft . . . which includes any aircraft operated or designed to be operated without a pilot on board.” This term also includes machines that are normally not perceived by the general public as aircraft, such as flying toys, small tethered balloons, or kites. The EASA uses the term “drones” in all its communications to the public. The EASA’s definition of a drone is in line with the definition of “unmanned aerial vehicle” (UAV) provided by the International Civil Aviation Organization (ICAO), which oversees implementing the 1944 Chicago Convention on International Civil Aviation. The ICAO defines a UAV as “a pilotless aircraft, in the sense of Article 8 of the Convention on International Civil Aviation, which is flown without a pilot-in-command on-board and is either remotely and fully controlled from another place (ground, another aircraft, space) or programmed and fully autonomous.” While there are two further categories on UAVs one of which,) those that are remotely piloted by a human and hence are designated as RPAS is highly accepted by the EU the other category so-called ‘autonomous’ indicating the control directed by a computer without pilot intervention after take-off has been considered outside the scope of the EU’s regulation. This point reflects the EU’s stance towards the diffusion of armed drones and autonomous weapon systems. Secondly, it is related to the fact that many discussions focus on comparing the US and the EU approach to drone regulation. Even though regulation is still forming on both sides of the Atlantic, differences in the respective approaches are visible. Some described these differences in a way that EASA applies a risk-based approach whereas the FAA’s approach is more operation focused. The categorisation of EASA derives directly from the risks associated with certain types of drones, whereas the American approach firstly distinguishes between recreational and professional use. Nevertheless, both sides describe their approaches as both “risk based” and “operation-centred”. Some advocated that Europe should follow the American approach more closely to achieve a maximum level of harmonization on the global level. Others considered the American approach too restrictive and too close to the traditional aviation approach which could be harmful for the growth of the emerging drone sector. However the “educational approach” of FAA found a lot of support: FAA is conducting a “know before you fly” campaign reaching out to the general public to inform about important rules on safe operations for recreational drone users.

The EU has not yet adopted any common public position on some of the most hotly debated issue associated with the deployment of UAVs for (non-)military missions. Individual member states hold different positions or making a slow expound clarify their positions on legal aspects of the debate on drone strikes abroad as well as their use for national security. For instance Particularly the targeted killings operation of US has brought the debates revolved around the legality and the way in which the US deploy them to target suspected the terrorists outside the battlefield conditions.

Calls for the EU to adopt a position on drones can most often be reduced to a clarification for the EU’s view on the legality and morality on these operations that do not directly cause a certain threat to their security. While the US force the boundaries by conducting the targeted killings without any clear legal base, the EU might take this condition as an opportunity to form international norms and correct standards for a practice that under the norms the US has acted cause significant confusion and violation of human rights.

The EU’s approach to drones in parallel to that autonomous system is mostly shaped by the Asimov’s laws which form the fundamental aspects for European Commission to draw up legal framework for the civilian use of robots. As it is indicated in the Parliamentary report, robotics and AI in the near future can overtake to handle many tasks by bringing the benefits of efficiency and savings, not only in production and commerce, but also in areas such as transport, medical care, education and farming, while making it possible to avoid exposing humans to dangerous conditions, such as those faced when cleaning up toxically polluted sites; whereas in the longer term there is potential for virtually unbounded prosperity.

As Oliveira& Backhaus (2015) claim, the reasons that the EU has not developed a clear view on the issue of (non-) armed drones are national security concerns and alliance dynamics. Security in Europe is still handled at national level. Secondly together with defence of borders, intelligence and robotics are arguably are the main policy issues where national sovereignty is mostly felt. Besides, member states loyalty to each other and other state/non-state actors co-exists with alliances with other countries outside the EU. Global surveillance group of Five eyes, which covers activities range from 'maritime domain' where the alliance monitors shipping traffic passing through strategic maritime areas, 'aerospace domain' which covers ballistic missile tests, foreign satellite deployments and the military activities of relevant air forces to the intelligence gathering on drone strikes has been one of the dynamics which transcend the EU's position of drones as well (Denmark, France, Norway and the Netherlands receives the name of 'Nine Eyes', and there is the 'Fourteen Eyes' which consists of the previously mentioned Nine Eyes plus Belgium, Germany, Italy, Spain and Sweden. However, the official name of the Fourteen Eyes is SIGINT Seniors Europe (SSEUR), and its primary objective is to coordinate the exchange of military signals amongst its members[156]).

This condition can be observable when European countries under European Defence Agency (EDA) supervision have decided to form so called Drone Club in 2013 to boost 'long-term and systematic defence cooperation and lessen the dependence on the UAVs of US and Israel. This has been the one of the most remarkable initiative which demonstrates the importance assigned to

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[156] The Five Eyes – The Intelligence Alliance of the Anglosphere, Vitor Tossini (November 2017) https://ukdefencejournal.org.uk/the-five-eyes-the-intelligence-alliance-of-the-anglosphere/

drones by European countries, but also in which civil and military sphere interacts with each other at European level to integrate this technology into the industry: 'EDA to harness synergies in the military and civil domains, maximise dual-use technologies generate economies of scale"[157]. Under this objective, eight EU states - Austria, Belgium, the Czech Republic, France, Germany, Italy, Spain and the UK - sign up to a second scheme, the "Joint Investment Programme on RPAS for Air Traffic Insertion," to enable drones to fly alongside civilian planes[158]

All these arguments exist in parallel with reasons on the position of EU on drones and any type of unmanned systems. Besides, within the EU government and parliamentary initiatives in Germany, France and Netherlands have aimed at clarifying the legal and ethical contours of the debate which the way is the drone technology has been deployed 'outside the battlefield' and non-international armed conflicts which raise legal and normative questions by the EU and pushes them to form normative imperatives. The arguments over the civilian use of the drones can't be considered independently from the debates on the deployment of armed drones on the missions abroad and counter-terrorism operations. It is proposed that in the near future, armed drones will constantly combine surveillance, endurance in discretion and the ability to strike, at the most opportune moment. While France joins the group of countries that already have this capability and other EU countries (particularly Germany, Italy).

The Commission, in its 2014 Communication, Opening the Aviation Market to the Civil Use of Remotely Piloted Aircraft Systems in a Safe and Sustainable Manner, explained its strategy to establish an EU aviation market in drones gradually and emphasized that such a market can only be fully developed if standards are adopted at the EU level and if the aircraft can fly in non-segregated airspace without affecting the safety and the operation of the wider civil aviation system. The Communication addressed the issues of third-party liability and insurance. In addition, it identified

[157] EDA, 'Remotely Piloted Aircraft Systems', 19 November 2013, http://www.statewatch.org/observatories_files/drones/eu/eda-2013-rpas-factsheet.pdf
[158] https://euobserver.com/foreign/122167

privacy, data protection, and security as critical aspects that must be safeguarded in order to ensure public acceptance and further development of a European market on drones. Furthermore, it announced the EU's intentions to support European drone industries. The Commission's latest Communication on an Aviation Strategy for Europe, adopted in 2015, reemphasized the economic significance of drones, especially for small and medium-sized companies in the aeronautical manufacturing industry, while at the same time stressing the need to establish a risk-based legal approach and address privacy, safety, security, and liability concerns. The Council of the EU, and specifically the transport, telecommunications, and energy ministers in charge of the aviation market, advocate a harmonized EU approach to civil drone use while emphasizing the need to take into consideration the experience gained in this field by the Member States, according to their comments at a public hearing. Most of the ministers opined that the EASA was the entity best suited to develop technical and safety standards, licenses, and certificates, and agreed on the gradual and progressive integration of drones into civil aviation.

Thus, The EASA has been the agency which provides opinions and formulates technical rules relating to the construction, design, and operational aspects of aircraft, and is also responsible for assisting the Commission by providing technical, administrative, and scientific support. Based on the technical specifications the EASA only regulates the drones whose weight above 150 kg excluding the various type of drones (such as macro, mini, tactical, close range, short range and even some type of medium range[159]). This is related to *Regulation 216/2008 on Common Rules in the Field of Civil Aviation which* only covers aircraft whose mass is above that size. So, other drones below the indicated mass are regulated at national level. States including Austria, the Czech Republic, Denmark, Germany, France, Italy, Poland, Spain, Sweden, and the United Kingdom, have already adopted national rules. Because of differing national rules on criteria and conditions for the operation of drones and related safety issues, operators must apply for a separate authorization in

[159] Classification used here based on the study of Source: van Blyenburgh (2006), P. van Blyenburgh, UAV systems: global review. Presented at the Avionics'06 conference, Amsterdam, 2006 / In UAV HANDBOOK

each EU Member State, which leads to duplication of authorization process while prevents the real benefits for industry and society[160]. In the report 'Concept of Operations for Drones: A Risk Based Approach to Regulation of Unmanned Aircraft' (EASA, 2015)

It is expected that, in general, unmanned aircraft will be beneficial for the society. From the EASA point of view this benefit can be attained with decreasing fatalities related to aerial survey and photography, agricultural observation. For instance, The use of unmanned aircraft in agricultural work or in inspection of industrial structures is likely to save lives as an accident with an unmanned aircraft will be limited to material damages. Also, the use of unmanned aircraft to inspect a building to find where fire is or to find where victims could be trapped, will limit risks to human operators compared to sending a team. The use of unmanned aircraft in disaster areas has also a significant potential to save lives because they are easy to deploy (search for survivors, deliveries of medications). So, overall aim is to a holistic view of unmanned aircraft services for the whole society through regulatory practices.

In terms of market surveillance, mass-produced unmanned aircraft that pose a very low risk would be subject to the existing market surveillance mechanisms provided in Regulation 765/2008[39] and Decision No. 768/2008. The national aviation authorities would remain indirectly involved, as the operational capability limitations that would be imposed (e.g., that the unmanned aircraft should not fly higher than, for instance, 50 meters to minimize risks) would have to stem directly from traditional aviation requirements. The market surveillance mechanism would rely on justified complaints filed from citizens or undertakings to detect noncompliant products. Findings of noncompliance in one particular Member State would then be communicated throughout the single EU market. The EASA, which would assume additional responsibilities, would not be responsible for the oversight of the market surveillance mechanisms. The Commission, in exercising its

[160] Concept of Operations for Drones: A Risk Based Approach to Regulation of Unmanned Aircraft' (EASA, 2015)

authority as the EU body in charge of implementation, would be authorized to verify if the Member States were fulfilling their responsibilities.

A study commissioned by the Committee on Civil Liberties, Justice and Home Affairs (LIBE) of the European Parliament addressed the privacy implications of the civil use of drones because of potential infringements on personal data protection. The study noted that drones normally carry video cameras to enable pilots to fly them or have other technological installations to record and store data that can eventually be uploaded on the Internet. Consequently, the private life and property of individuals may be interfered with and violated when drones capture images of people in their houses or gardens. Also, surveillance equipment installed on drones would make possible the gathering and processing of personal data and thus interfere with and potentially violate the right to privacy and data protection of individuals. The study urged that future regulation of the manufacturing and trade of drones, including the production, selling, buying, internal and international trade, and notice for buyers on risks and hazards, be designed in a manner to minimize any risks to citizens and their rights.

In his opinion on the Commission's Communication A New Era for Aviation, the European Data Protection Supervisor clarified that RPAS, being aircraft systems, do not on their own process personal data, but once they are equipped with other technologies may give rise to very diverse commercial, professional, law enforcement, intelligence, and private uses. The Data Protection Supervisor reached the following conclusions regarding the use of drones that involve the processing of personal data:

Such use in most cases constitutes an interference with the right to the respect for private and family life guaranteed by article 8 of the Council of Europe Convention on Human Rights and article 7 of the Charter of Fundamental Rights of the European Union, "as they challenge the right to intimacy and privacy guaranteed to all individuals in the EU and can therefore be allowed only under specific conditions and safeguards." When used by individuals for private activities, drones will normally be subject to Directive 95/46/EC requirements and only on rare instances will come within the scope of the household exemption. The processing of personal data by drone operators for commercial or professional purposes must comply with national legislation implementing Directive 95/46/EC. The mere publication of data on the Internet or in a newspaper without any aim to disclose to the public information, opinions, or ideas is not sufficient for it to fall under the journalism exception of article 9 of Directive 95/46/EC. Law enforcement uses of drones must comply with the right to privacy and be based on law, serve a legitimate goal, be necessary in a democratic society, and be proportionate to the purpose pursued. The use of drones for intelligence purposes must respect the principles of necessity and proportionality.

The Data Protection Regulation adopted by the European Parliament on April 14, 2016, which will take effect in the summer of 2016, will repeal Directive 95/46/EC and require any commercial operation that processes personal data to perform a Privacy Impact Assessment Study.[64] Moreover, the requirements of “privacy by design” and “privacy by default” will become mandatory. Under the privacy-by-design requirement, the controller will be required to implement appropriate technical and organizational measures to ensure that data processing complies with the proposal. Privacy by default means that, based on certain mechanisms used, only those personal data will be processed that were necessary for each specific purpose of the processing and such data will not be collected or retained beyond the minimum period necessary. Those mechanisms will be required to ensure that, by default, personal data are not made accessible to an indefinite number of individuals.

In addition, in its Opinion 01/2015 on Privacy and Data Protection Issues Relating to the Utilization of Drones, which was adopted in 2015, the article 29 Data Protection Working Party established by Directive 95/46/EC issued specific recommendations to policy makers; sector regulators, manufacturers, and operators; and police and other law enforcement authorities. To policy makers and sector regulators the Working Party recommended that a legal requirement be introduced at the

European and/or national level to only market small drones in a package containing enough information (for example, within the operating instructions) relating to the potential intrusiveness of these technologies on the privacy and personal data of individuals. To manufacturers and operators, the Working Party recommended that they embed privacy-friendly design choices and privacy defaults as part of a privacy-by-design approach. With regard to the use of personal data for law enforcement authorities, the Working Party urged compliance with the necessity, proportionality, purpose limitation, data minimization, and privacy-by-design principles, and with a strict and justified retention period. It also added that the use of drones for intelligence and law enforcement purposes must be subject to judicial review, in accordance with national law.

CONCLUSION

This chapter begins with some positive and negative societal and implications of autonomous drones and is followed by a critical examination of the technological and social determinists' arguments discussed in the light of artificial intelligence, autonomous weapons the integration of these technologies, and the introduction of artificial intelligence into the equation, as discussed in theoretical parts. Then following these arguments, the comparison between the U.S and the E.U will be presented regarding their justification and regulatory practices among social actors. A summary of the findings, which include technological, legal, political-military, and moral-ethical challenges for autonomous drone technology, are then offered to answer the research question. This is followed by some recommendations, areas for further research, and a conclusion that addresses.

The analytical framework of this thesis is composed precisely to better address the complexity of the topic. On the one hand we focus on the literature that generally addresses the issue of autonomous weapons in relation to the changing space of its social and political acceptance, and the diffusion of drones which are categorized as a form of autonomous systems-into the industry. On the other hand, Boltanski's pragmatic sociological approach orientates itself in the analysis of controversial arguments with which decision- making process on regulation of drones either 'justify' or 'condemn' the elements involved in the use. Here the elements are signified to the either factors such as safety, security, privacy, decreasing civilian casualties, increasing readiness, control, development of relationship between the industry and the society. In other words, here we consider on the liberal characteristics of the regulation of drones intrinsically connected to the possible manipulation of the boundaries of visibility of the private sphere. While drones are rightly interest to those involved in the peace and anti-militarist movements, the ongoing push towards domestic drone can raise some concerns among policy monitoring, civil liberties and data protection advocates. In the midst of regulation efforts and diffusion of drones into the civilian sphere, so called 'the Campaign to Stop Killer Robots' has brought attention to the fearful capabilities drones can impose on the society. Initiated by Prof. Sharkey's call on the autonomous robots in 2007, there has been growing debates for banning the deployment and use of ‘armed autonomous unmanned systems.’ While the U.S are more in favour of liberalizing this technology, European countries take more sceptical stance and declares a resolution which calls for the international ban of ‘killer’ robots. Unless there is ‘meaningful’ human control over the critical functions of the system, it would be important to prevent the production and diffusion of these systems. Although none of the weapons or weapon systems currently operated by EU forces are (lethal) autonomous weapon systems, not all the EU member states hold the same ideas in terms of regulation and integration of drones into the civilian airspace. Spain was one of state members that participated in ‘drone club’. However, State Air Security Agency (AESA[161]) declared that the commercial or professional use such as photogrammetry, intelligent agriculture, graphic reports of all kinds inspection of would be illegal and subject sanction. They have been only allowed to fly in "completely closed areas", such as "a factory or sports centre, a private home, etc". The Agency justified their decision to condemn the use of drones by referring to (1) lack of total knowledge about the capabilities of drones (2) lack of legal basis covering this technology (3) the view that security responsibilities among state authorities are difficult to clarify, With recently new regulation came into effect by 2018, Spain has accepted more relaxing rules, which allow drone to fly over populated areas (including accumulations of buildings and crowds) on the condition that carrying out aviation security analysis obtaining authorization from the Agency. So, seeing that as one case, the whole process is even more complex and duplicated at EU level. through EASA (European Aviation Safety Agency) is responsible for implementing a continent-wide UAV policy, even as some countries insist in having a specific regulation.

From military aspect, one of the main features that makes drones more preferable compared to manned aircraft is the removal of humans from the board and that they are anticipated to be able to react even quicker to various situations because the sensing systems will be able to process data and

[161] Spain clamps down on drones, TheRegister (7May 2014), https://www.theregister.co.uk/2014/05/07/spain_drones/

make local decisions faster than human pilots (Grabowski 2015). Through its target recognition system, dangerous and risky missions such as detection of radar, missile, aircraft, or other hostile threats can be carried out with no threat to pilot. Thus, even though there seems to be advantageous for the above-mentioned aspects, the removal of human presence while performing the mission substantially leads a distance between those who control the drones and those who are targeted to be killed or saved. Civilian casualties on the ground can't be discharged which entails concern and negative perception in the society. Stahelski (2005) describes a conditioning process that is used to distance people from each other and transition them into individuals who can kill others, a process that consists of the following phases: de-pluralization, deindividuation, dehumanization, and demonization.

In the first phase, de-pluralization, deals with removing an individual's identity with all other groups, a process that can be seen used by military organizations, and to greater and more negative extent by cults, gangs, and terrorists' groups (Stahelski 2005). The second phase, de-individuation, which refers to the removal of the personal identity of the enemy (Stahelski 2005). In the third phase, dehumanization, conditions a person to consider an enemy as nonhuman, preparing them for the final phase, demonization, in which the enemy is considered evil (Stahelski 2005). Among each stages stereotyping and perception building turn out to be an important element because it helps distance combatants from each other, creating barriers that prepare a person to demonize the other, subsequently providing the justification to deploy this technology. Accordingly, some countries have adopted policies that permit the use of targeted killings, including in the territories of other States. Such policies are often justified as a necessary and legitimate response to "terrorism" and "asymmetric warfare",but have had the problematic effect of blurring and expanding the boundaries of the applicable legal frameworks.

Particularly, the remote sensing capabilities in which human activities are diminished to pictures, symbols, pixels, or even spots of energy on a computer screen. The less human in appearance, the easier it is to suppress the reality that they are indeed human, potentially resulting in an experience of subtraction of judgement and decision-making process. In this way, like Virilio's 'sight machines' (1989), the drones act as ruling out the accident and surprises, generating a general system of illumination that allows everything to be seen and known, anywhere anytime. This context also creates the justification to the use of different context of non-military domains. Though as we have seen in the case of the U.S, the perception of the society towards the drones has played a critical role in the deployment of drones for military and non-military missions. The EU institutions and the industry responsible for the regulation and implementation of drone activities,

As it is articulated with 'interpretive flexibility' there are various types drones presented in the industry not with the fact that they can conduct different tasks like surveillance of the crowd, crop watering etc, since this technology has not been fully recognized in their potentials. But substantially the categorization of drones reflects the multifaceted interest of social actors. For instance, based on their technical specifications and the risk from ground or mid-air collision accidents, the classification of drones could be used to help differentiate existing systems and are supposed to have regulatory importance. Some of the measures such as weight, range, flight altitude and endurance (Van Blyenburgh,2006; Zeitlin 2009) have minimal effect on the safety performance requirements of the system. Secondly, one of the key principles within aviation regulation is the separation between regulation of the physical systems (airframe, engines, flight control software) and of the operation of the aircraft. Nevertheless, they are perceived to have credible role from commercial, legal, and possibly other points of view. As we have been mentioned before, it is questionable to truly realize how the numerical aspects can turn into the benefits and the service of the society. At this stage, looking deeply into the case reveals the hidden political agenda behind this process. EASA articulates that drones are similar in size and complexity to manned aircraft as well as small consumer electronics aircraft. Moreover, from social deterministic point of view, there is a missing aspect that hinders the proper development of drone regulation; the gap between the social and technical sphere, this finding demonstrates the claims of Winner that is, some social groups might be excluded from power and decision are not discussed or considered in terms of the benefits for whole society. Both in the U.S and the E.U, the regulatory bodies and advisory committees do not totally include academic bodies or labour unions in the decision-making process. Thus, the drone policies appear to be the symbolic report that the citizens can't understand. In this context the it reflects the (hard) determinist approach of the policy makers and regulatory bodies. Therefore, the aim at expanding the scope of the use of drones in various settings demonstrates the attempts to close this gap by winning the hearts and minds of the society—mention about the society as a scarce resource. In other words, for policy makers, drone constitutes a 'metaphysical object' in terms of its ability to construct and legislate a 'world' through the shaping effects of discourses, technological capabilities as well as vulnerabilities of this technology. Drones give politicians a feeling of control that they do not otherwise experience with other aerial assets. This control comes in many forms. First, the policy makers can conduct operations without having to secure forward basing permissions, thereby controlling the timing and tempo of operations absent interference from host nations. Second, the politician does not have to worry about incurring casualties during an operation, in effect allowing him a large degree of control over the debates in committees with the public over decisions requiring the use of force. Having control over these three areas may lead the politicians to believe that they can precisely control the outcome of an operations, the means of using them and how the society would perceive them.

The proper regulation of the use of drones can be only achieved with the involvement in and focus on the society, based on justice, public discussion which can ensure majority rule and the basic rights of citizenship are upheld. As shown in this thesis, drones technology will not likely evolve past a point of human control on its own; however, this is not the real issue that threatens humanity. The real issue will be lack of human involvement in the development and operation of this technology, a lacklustre commitment by humanity to stay engaged in the oversite and control of the drones. The critical point is this: If humanity loses control of technology, it is most likely because humans choose to allow it to happen by handing over control to machines. Consequently, this concern gives justification to European countries to support the campaigns for banning the autonomous weapon system and try to regulate the civilian use of drones. The various performances in display or are projected to be accomplish reflects the desire to develop control mechanism over this technology through the involvement with the total lifecycle of the drone technology—from initial concept design. This necessitates citizens, policy makers and any non-state actors work collaboratively to improve public awareness and acceptance this technology which is objected to be achieved with the regulation practices.

Taking Virilio's (2013) claim on technology, the drones can be perceived as "the existence of the paradox of being everywhere at the same time while being nowhere at all". So applying drones in different contexts both civilian and military are to be taken as a way to create different realities (or scenarios) which have to be controlled through common rules and regulation. 'The U.S. Air Force's Autonomous Horizons: System Autonomy in the Air Force—A Path to the Future, Volume I: Human Autonomy Teaming addresses' the significant potential advantages of developing unmanned systems and autonomous software to meet future challenges presented by potential high-tech adversaries. The report explains that the Air Force direction and guidance required to meet the challenges of developing autonomous systems for operations. An important aspect of the approach is the human-machine relationship, where autonomous technology works synergistically with airmen as a part of an effective human-autonomy team. In addition to this, very recently the DoD has announced to invest up to 2 billion $ for new research program in order to test and understand how the machines can learn adopt to the changing environments so that it can unveil how to regulate them and develop technological roadmap to follow. [162] Thus, the fear of losing control over drones or of malevolent drone takeover by terrorists not only reflects the fundamental

[162] https://www.washingtonpost.com/amphtml/technology/2018/09/07/defense-department-pledges-billions-toward-artificial-intelligence-research/?noredirect=on&__twitter_impression=true

misunderstandings the nature of the progress being made in the unmanned system development but also we largely thought of the social shaping of technology in terms of the influence of social relations upon artefacts. The problem with this formulation is its neglect of the valid aspect of technological determinism: the influence of technology upon social relations. The simple cause-effect technological determinism is not sufficient to explain the research interest of this study. To advocate that the relationship between technology and society is complex doesn't not signify that there is no effect between them but rather undermining that the notion that technologies are in themselves neutral - that all that matters is the way societies choose to use them.