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14. ABSTRACT

The recent introduction of unmanned and robotic systems into counterinsurgency (COIN) operations has created marked advantages at the tactical level of operations. Despite tactical advantages created by increasing capabilities and presence on the battlefield, unmanned and robotic systems produce a collective operational impact that increases risk. The operational risk assumed by commanders charged with conducting COIN is a result of unknown variables and side effects generated by the interaction of unmanned and robotic systems with the populace. The significance of the risk incurred is its impact on the information operations logical line of operations (LOO) that is considered the decisive LOO in current doctrine. This paper defines the forces that are driving the trend towards more capable and autonomous systems and their potential impact to COIN operations. It explains the importance of doctrine to COIN and offers long term and short term solutions that can mitigate the risks associated with unmanned and robotic systems employment in COIN.

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Counterinsurgency and Robots: will the means undermine the ends?

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

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Contents

Abstract

Counterinsurgency and Robots: Will the means undermine the ends?

The recent introduction of unmanned and robotic systems into counterinsurgency (COIN) operations has created marked advantages at the tactical level of operations. Despite tactical advantages created by increasing capabilities and presence on the battlefield, unmanned and robotic systems produce a collective operational impact that increases risk. The operational risk assumed by commanders charged with conducting COIN is a result of unknown variables and side effects generated by the interaction of unmanned and robotic systems with the populace. The significance of the risk incurred is its impact on the information operations logical line of operations (LOO) that is considered the decisive LOO in current doctrine. This paper defines the forces that are driving the trend towards more capable and autonomous systems and their potential impact to COIN operations. It explains the importance of doctrine to COIN and offers long term and short term solutions that can mitigate the risks associated with unmanned and robotic systems employment in COIN.

The anxious gunmen peer out of the front windows at the armed robot approaching the front door. Their hostages are silent; the only sound is the grinding gravel under the robot's treads and its electrical motors. The gunmen train their weapons on the robot and prepare to place well aimed fire on the portions that seem most vulnerable. It's clear that the negotiations have taken a turn, but the implications of a robot armed with a machine-gun are unclear. The robot stops, a heavy tension fills the air as the gunmen try to ascertain the robot's next move. Suddenly it's too late. A special operations team had entered the building from the back, surprising the gunmen and rescuing the hostages without a shot fired.[1] The robot employed was the Special Weapons Observation Remote Direct-Action System (SWORDS) and it has been in service in Iraq since June of 2007.[2] The implications for the modern battlefield are that man no longer holds a monopoly on the conduct of war.[3]

In many ways the change has been subtle. The same technology that has created slight changes in our day to day lives has enabled tremendous change on the battlefields of Iraq and Afghanistan. As demonstrated by the employment of armed unmanned ground systems (UGSs) in Iraq, a future where men and robots fight side by side is no longer science fiction. As part of the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 Congress mandated that by 2010, one third of the aircraft in the operational deep strike force should be unmanned, and by 2015 one third of the Army's Future Combat Systems (FCS) operational ground vehicles should be unmanned.[4]

P.W. Singer, the Senior Fellow and Director of the 21st Century Defense Initiative at the Brookings Institute notes that U.S. forces began Operation Iraqi Freedom in 2003 with only a handful of unmanned aerial systems (UASs), but by the end of 2008 U.S. forces were employing over 5330 in a variety of mission sets.[5] Singer goes on to reveal a similar trend in unmanned

ground systems (UGSs) with none being employed tactically in 2003, and over 12,000 in use by the end of 2008.[6] The spur towards the use of unmanned systems will be matched by the forecast drive of state and non-state entities towards complex irregular war.

According to the *Joint Strategic Assessment 2006-2026*, the predominant forms of warfare in the foreseeable future will be irregular, catastrophic, disruptive or a combination thereof.[7] The future enemies of the United States will not seek a large scale conventional military conflict, but will instead attack in a manner that exploits the weaknesses of a conventional force. The conflicts of the next twenty years will require U.S. forces to be proficient throughout the range of military operations (ROMO) and will require the capability to rapidly transition from one portion of the operational spectrum to another. A critical capability required to fight and win complex irregular war is the ability to successfully conduct counterinsurgency (COIN) operations such as the ongoing conflicts in Iraq and Afghanistan.

The drive for, and reliance on unmanned systems by U.S. forces has created both advantage and risk. U.S. commanders conducting COIN operations must account for the employment side-effects of tactical unmanned and robotic system force integration if they are to mitigate risk and maximize advantage. Currently there is no established and promulgated doctrine that can be used as a guide for the employment of unmanned systems. The importance of doctrine increases proportionally with the capability, utility and presence of unmanned systems on the battlefield. Despite a lack of doctrine, commanders charged with conducting counterinsurgency (COIN) operations can create effective operational guidelines for unmanned systems use by integrating unmanned force employment considerations into their campaign design at the operational level.

The Unmanned Force: Increasingly armed and autonomous

As of 2006, Coalition UASs had flown almost 400,000 sorties in support of combat operations in Iraq and Afghanistan.[8] UGSs had responded to over 11,000 improvised explosive device (IED) missions and unmanned maritime systems (UMS) had successfully contributed to port security operations.[9] The trend of increased utilization of unmanned systems is paralleled by their evolution from purely reconnaissance to multi-mission roles. Unmanned systems are being weaponized to increase their utility in combat operations. An example is the evolution of the Predator Unmanned Aerial System.

The Predator began its service in the United States Air Force (USAF) as the RQ-1 reconnaissance drone. Due to advances in its sensors and ability for a limited weapons payload, the Predator became an armed system. Once armed with the AGM-114 Hellfire missile the Predator became a persistent intelligence, surveillance and reconnaissance (ISR) platform that could not only observe time sensitive targets, but could attack them as well. On 1 February 2002 the RQ-1 Predator was re-designated as the MQ-1 by the USAF.[10] With a slight change in designation from reconnaissance "RQ-1" to multi-mission "MQ-1", the Predator spawned a new generation of unmanned systems geared towards ISR and precision guided munitions (PGM) delivery. The latest multi-mission unmanned system is the MQ-9 Reaper, an unmanned aerial system larger than the Predator with an ordnance payload of up to four GBU-12 laser guided five hundred pound bombs, or fourteen Hellfire missiles.[11] With a PGM payload of 2000 pounds the Reaper is a prime example of armed and increasingly capable unmanned systems.

Along with the trend of being armed with PGMs, unmanned systems are being designed to have increased autonomy. One of the driving factors behind greater autonomy is a desire for unmanned systems to do what the *Office of the Secretary of Defense Unmanned Systems*

Roadmap 2007-2032 terms as the three "D"s; dull, dirty or dangerous. The term dull within the three "D"s refers to complacency, or shortcomings in human attention and endurance. Unmanned systems can typically outlast platforms designed to be flown, driven or sailed by human operators due to advantages in weight to power ratio, long lasting power sources, and if remotely controlled from remote stations, the ability to swap out operators throughout the duration of the sortie.[12] The intent of unmanned systems use in this case is to "give operators normal mission cycles and crew rest."[13] Dirty refers to jobs that must be done in environmental conditions that are hostile or damaging to humans such as chemical, biological or radioactively hazardous conditions. Unmanned systems would be used in this situation in order to "increase the probability of a successful mission and minimize human exposure."[14] The only description of a dangerous job or environment offered by the *Office of the Secretary of Defense Unmanned Systems Roadmap 2007-2032* is explosive ordnance disposal (EOD), but most situations in a COIN environment are dangerous. The aim of using unmanned systems in dangerous environments is to reduce the political risk and human cost of mission accomplishment or failure.[15] As proven by SWORDS, semi-autonomous or autonomous unmanned and robotic systems will be used in current and future COIN operations.

Autonomy enables machines to make use of their inherent advantages on the battlefield. The Oxford English Dictionary defines autonomy as self government or the freedom of action.[16] Autonomy is considered a critical capability for unmanned systems to be able to do their assigned missions within the three "D"s. Many of the three "D" missions are extremely complex, requiring high situational awareness (SA) and human-like capabilities. For dull jobs autonomy is required by definition; without autonomy an unmanned system would not be able to compensate for human complacency or shortcomings in human attention or endurance. Robots

would be would be inefficient without autonomy, for example a Predator UAS takes six people to operators to accomplish a single mission.[17]

In order to transcend the limitations of their human operators and reach their potential effectiveness, robots will continue to become more autonomous. Artificial intelligence will be required in order for unmanned systems to gain the degree of autonomy required react to and learn from their environment. The integration of artificial intelligence into unmanned systems will cause a tremendous increase in capability, but may not be recognized as a revolutionary event due to the proliferation of unmanned systems throughout the battle-space. Unmanned systems are perceived to be life saving force multipliers, and therefore their evolution has been rapid with integration being driven from the tactical level up.[18]

Reducing tactical risk to America's servicemen conducting COIN operations has been a driving factor behind unmanned systems procurement. As unmanned systems become more capable and prolific throughout the battle-space, they create a collective operational impact to the information operations portion of the COIN campaign plan. The operational impact of artificially intelligent unmanned systems is significant, and therefore should be driven from the top down thorough doctrine as well as from the bottom up with tactical requirements. The collective impact of an increasingly unmanned and autonomous COIN force creates unknown variables that, unless mitigated, will generate unnecessary risk to COIN information operations and therefore COIN mission accomplishment.

Time: The pace of change

A major reason why U.S. doctrine has not established the role of unmanned systems in COIN is due to the exponential rate of change at which their capabilities and utility are changing. Exponential changes in capability compress the time available to evaluate the applicability of

emerging capabilities. The relationship between the capabilities of unmanned systems, their assigned missions and presence on the battlefield is proportional. As their capabilities increase so will the other two factors, leading to a greater number and diversity of unmanned and robotic systems on the battlefield. The need to understand their overarching operational effect will increase relative to the growing proliferation of unmanned and robotic systems on the battlefield.

The Merriam-Webster Dictionary defines a robot as a machine that looks like a human being and performs various complex acts.[19] It also defines a robot as a device that automatically performs complicated often repetitive tasks or is guided by automatic controls.[20] The Oxford English Dictionary defines a robot as a machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer.[21] Both definitions suggest a machine that closely resembles the unmanned systems in use by the U.S. today. The *Office of the Secretary of Defense Unmanned Systems Roadmap 2007-2032* defines an unmanned system as "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 non-lethal payload."[22] Unmanned systems with few exceptions all began as unmanned vehicles, but as technology advanced so did their capability to do more than just fly or drive around. They became systems that could perform certain tasks on the battlefield in a manner that made them suitable and advantageous. The *Office of the Secretary of Defense Unmanned Systems Roadmap 2007-2032* states that "unmanned vehicles are the primary component of unmanned systems."[23] What this suggests is an evolution of UASs from basic systems into increasingly complex and capable robots.[24]

The evolution of robots can be seen in the Predator and SWORDS, which began as unmanned vehicles and developed into unmanned systems. Although by definition the

SWORDS and Predator can be considered robots in many ways; they are semi-autonomous and lack the human-like qualities of a robot required by the Merriam-Webster definition. The rapid pace of technologic change creates a very real chance that the capabilities and autonomy of unmanned and robotic systems will outpace the capability of U.S. forces to properly integrate them into the force. A key driver in the time available to plan for how to integrate robotic systems is the exponential rate at which technology is advancing.

In April of 1965 Mr. Gordon Moore published an article in *Electronics Magazine* that predicted the rate at which computer chips would develop.[25] His analysis was based on the exponential rate at which the number of transistors that could be put on a silicon computer chip would increase. What became known as Moore's Law predicted that the number of transistors, and therefore the computing power of silicon chips would double at regular intervals for the foreseeable future.[26] The interval he predicted was every two years, a rate that has been steadily maintained for 44 years and is forecast to continue. The exponential advance of computer chips will allow for more capable and powerful unmanned systems and processors capable of artificial intelligence (AI).[27] Future unmanned systems will be faster, stronger, smaller and able to react and learn from the environment around them. Moore's Law threatens to create systems designed to perform battlefield duties before the military has suitable doctrine for their employment.

U.S. forces can maximize advantages and avoid unnecessary risks, by integrating unmanned and robotic systems employment guidelines into COIN doctrine. Without a thorough understanding of the operational and strategic impact of unmanned systems to COIN, U.S. forces will assume operational risk. The operational risk to the COIN mission is spawned by the side-effects and unknown variables produced by unmanned and robotic system interaction with the populace. The unknown variables created from populace and robot interaction pose a direct and

significant risk to the decisive COIN logical line of operations (LOO), information operations (IO). Former Assistant Secretary of Defense Larry Korb states that COIN operations "must include some part of trying to sway people...If the U.S. does not handle robotics right, it will undermine [our] moral standing, and the U.S. can't be a global leader without such standing."[28] In order to capitalize on the tactical benefits created by unmanned and robotic systems in COIN, the U.S. must take the time to create a coherent and widespread doctrine that integrates them into the force.

Space: The American way of war and the human factor of COIN

The American way of war is a driving force behind how and why unmanned systems are integrated into U.S. forces. As described by Max Boot there are two concepts of the American Way of War. [29] The first is a concept of total war in which Americans seek to create war that "annihilates the enemy; war that relies on advanced technology and massive firepower to minimize casualties among U.S. Forces; war that calls on legions of citizen soldiers; war that results in total victory."[30] The second concept of the American way of war is "a tradition of fighting small wars."[31] The most recent wars fought in Iraq and Afghanistan can be thought of as using technology to blend these two concepts. The resulting synthesis of the American way of war is a small war, or complex irregular war that is fought by a professional force relying on technology and firepower to minimize casualties and achieve total victory. Although small wars are more limited in scope than large conventional wars the complexity is often greater, incorporating military and non-military aspects of national power.[32] According to the United States Marine Corps Small Wars Manual, the term small wars has an intentionally vague definition encompassing the modern terms of complex irregular war and COIN operations.[33]

COIN doctrine has been a weak point in the recent history of the U.S. military.[34] According to John Nagl in the recently released *U.S. Army and Marine Corps Counterinsurgency FM 3-24/MCWP 3-33.5*, the Army "...had not published a field manual on the subject in over twenty years, since the wake of the El Salvador campaign."[35] The *U.S. Army and Marine Corps Counterinsurgency FM 3-24/MCWP 3-33.5* also clearly establishes that in order for U.S. forces to be successful in COIN, a clear and current doctrine that provides guidance and insight into the myriad complexities must be accepted, promulgated and followed.[36] The "game-plan" that is outlined in the *U.S. Army and Marine Corps Counterinsurgency FM 3-24/MCWP 3-33.5* establishes several basic and clear tenets designed to break down COIN operations into manageable pieces.[37] A key portion of the logical progression of preparing for COIN operations is the concept of campaign design and force planning.[38] These two steps work from large to small and are applied at the operational level of war. In the campaign design portion of the planning process the commander determines his vision and intent for how the COIN operation is to be accomplished.

The force planning step takes the commander's vision outlined in the campaign design, and applies specific time, space and force data to the plan. What requires closer examination with the advent of unmanned systems is the force at the disposal of the commander. As a result of demand the number of unmanned and robotic systems provided for tactical operations is rapidly increasing. As stated by the *Office of the Secretary of Defense Unmanned Systems Roadmap 2007-2032,* component commanders are demanding unmanned systems throughout the entire spectrum of roles adopted by COIN forces to perform tactical and operational tasks.[39]

The human dimension of space is an environmental aspect that has a dominant role in COIN. COIN expert David Galula contends that successful COIN operations "...can be summed

up in a single sentence: Build (or rebuild) a political machine from the population upward."[40] The *U.S. Army and Marine Corps Counterinsurgency FM 3-24/MCWP 3-33.5* echoes this in its concept of the populace as a center of gravity for COIN operations, and in its description of the logical LOOs required for success.[41] The five LOOs described in the *U.S. Army and Marine Corps Counterinsurgency FM 3-24/MCWP 3-33.5* can be grouped into two basic categories, security and political/economic.[42] The security group of logical LOOs involves creating security through combat operations/civil security operations, and training/employing host nation (HN) security forces.[43] The political/economic category of logical LOOs consists of the establishment/restoration of essential services, the support of economic development, and the development of better governance.[44] The last and most important logical LOO is the conduct of effective information operations (IO).[45]

Successful information operations are critical to establishing legitimacy, gaining and maintaining the support of the populace. As described by Major General Mattis in his vision for COIN operations in Al Anbar Province Iraq, in 2004-2005, all LOOs must be conducted concurrently and be encompassed in an overarching "bodyguard" of information operations.[46] Information operations are critical because the popular perception of the military and its conduct in COIN operations is as important as reality. There are COIN logical LOOs that the military will only be able to support for example the political and economic logical LOOs. The military may not be able to win COIN operations on its own, but it can certainly lose the effort on its own. Any tactical action that calls in to question the legitimacy of the COIN force or the political process it is attempting to restore will undermine the operational and strategic effort.

The operational importance of the conduct of military personnel is the driving concept behind the Marine Corps Strategic Corporal mindset. The Marines recognize that the modern

and future COIN environment demands that every marine be prepared to make time critical decisions that align with the operational and strategic intent of the mission. Greater autonomy will create unmanned and robotic systems capable of employing lethal force. The ability or inability of an unmanned or robotic system to correctly decide when, where and how to apply lethal force in keeping with the operational and strategic must be considered. Of particular importance is the impact that the decisions of semi-autonomous or autonomous unmanned equipment will have on the populace.

Despite all advancements, a robot charged with conducting COIN is very different than a human soldier or marine charged with conducting COIN. It is clear that the host populace would not interact with robots or unmanned systems in the same manner as they would a human. Although the introduction of robots into COIN forces would reduce the risk for individual servicemen tasked with the dangerous work of COIN operations, there is no doubt of the increased risk to COIN operational and strategic success. Connecting to the populace in order to restore the political process requires cultural aptitude, language skills, patience, and above all ethical conduct. At the heart of the issue is trust. A machine designed to support COIN operations must foster trust in the populace through the guidelines created by doctrine, training and experience.

Commanders conducting COIN operations must integrate robots into the COIN plan without an accepted baseline of understanding. By determining how, where and when to employ unmanned and robotic systems independent of a doctrinal foundation, commanders charged with COIN operations assume risk. Due to the sensitive nature of the COIN environment a tactical failure can have a strategic impact. Therefore the risk assumed at the tactical and operational level of COIN also jeopardizes the strategic level of COIN.

Recommendation: The long term and short term

A long term solution to the doctrinal challenges presented by robots is the adoption of a theoretical model for their integration and control. According to Peter Singer there are three basic theoretical models available for robot integration. The "mothership" model refers to a single control entity, like a ship or command center, that coordinates the actions of many different autonomous robot systems.[47] This is the theoretical model currently being pursued by the U.S. Navy with the Littoral Combat Ship. The "mothership" model would provide the command center with a collective picture of the environment and allow for centralized control of the robots at its disposal.[48] The "mothership" would provide adequate control of the autonomous robotic systems, but would also restrict the robots from reaching their full combat potential due to communications and signal requirements required to link to the "mothership". In contrast is the "swarm" model which is founded on a decentralized control concept.

Once committed to a task, the "swarm" theoretical model would not need further communication, guidance or control until the mission was accomplished.[49] The "swarm" would disperse and collect in a given area depending on its ability to detect and close with a given target or objective.[50] Through simple commands and programmed logic the swarm would react almost instantaneously, allowing little time for enemy reaction.[51] The same efficiency created by the "swarm" throughout the ROMO would make it unsuitable for COIN operations because of unwanted psychological side-effects. The true measure of its effectiveness in COIN, which would require in depth analysis, is how a populace would react to a swarm of robots. If the analysis indicated that a swarm alienated the populace to the COIN effort, the efficiency created by the "swarm" model would be counterproductive. A final theoretical model is based on decentralized control, and will likely mesh well with existing doctrine.

The "dog" model of robot theoretical integration portrays robots as "man's best friend". A robot would be paired with a human in order to compliment human capabilities.[52] According to Mr. Thomas McKenna of the Office of Naval Research, "the robots will do what robots do best. People will do what people do best."[53] In the "dog" model robots would be an extension of the combined arms concept. By integrating robots with humans on the individual level, many of the negative perceptions of a robot army could be avoided.[54] The "dog" model would mitigate risk to the IO logical LOO by ensuring that a robot supporting COIN operations would never be seen without a human companion charged with the same mission. The autonomous capabilities of robotic systems could be used in a decentralized but directly controlled manner. Direct accountability and supervision would be emphasized in the "dog" model, thereby minimizing risk to the COIN mission and capitalizing on the increased capabilities afforded by robots. There are benefits and risks associated with all of the long term theoretical models, but until a decision is made on which theory to adopt, commanders will have to decide on their own. A simple but effective manner for commanders to integrate unmanned forces into their operational vision is by incorporating them into their COIN campaign design.

A short term solution to the doctrinal challenges of unmanned and robotic systems integration is to incorporate their employment considerations into the campaign design step of the COIN planning process. The current concept of unmanned systems integration is based on their classification as equipment, which places them into the planning process at the force planning level. Force planning is dependent on the campaign design and is the application of the force or means designed to set the conditions or ways necessary to achieve an overarching strategic goal.[55] In COIN operations this step has a critical impact on mission success. Commanders conducting COIN operations will be influenced by the American way of war and a

casualty averse political process that will drive them to heavily utilize unmanned and robotic systems at the tactical level of COIN. Despite this pressure, commanders must consider the risks associated with unmanned and robotic systems employment based on how they will interact with the populace.

Commanders charged with conducting COIN operations must choose to either use unmanned systems or not. Currently this is a tactical decision, because unmanned systems decrease risk to soldiers and marines. However, the collective operational impact of unmanned systems can bring into focus a clear dilemma at the operational level of COIN. COIN is a distinctly human and political struggle in which the populace must decide between opposing political processes.[56] In this struggle perception is critical, and is the focus of the COIN IO logical LOO.[57] The sensitivity of the populace to the widespread use of unmanned and robotic systems at the tactical level can create a perception that the COIN force does not value the populace or political process enough to risk human life. Negative popular perception can create failure within the IO logical LOO and in so doing risk operational failure regardless of tactical victories enabled by unmanned or robotic systems.

In summary there are both theoretical and short term solutions that can allow commanders to minimize the risks associated with unmanned and robotic systems employment in COIN. Theoretical models on unmanned and robotic system control may provide the key to long term doctrinal integration. In the near term the risks associated with unmanned and robotic systems use in COIN must be harmonized with the IO logical LOO. Unmanned and robotic systems considerations must be integrated into COIN planning at the operational level through campaign design.

The case against the integration of robots into doctrine

It can be argued that the employment of advanced unmanned and robotic systems by the U.S. military does not require specific doctrine or inclusion into the campaign design phase of COIN planning. The advent of robots will not redefine operational art or change the operational foundation that is the basis for current doctrine. Current doctrine is written to provide a common language and a common understanding of how U.S. forces conduct operations.[58] According to the *Office of the Secretary of Defense Unmanned Systems Roadmap 2007-2032* robots are designed to complete tasks that are carried out by humans, specifically the "three Ds".[59] If robots are carrying out the same tasks as their human counterparts, they are already included in current doctrine. The addition of unmanned and robotic systems to the force will increase the efficiency and effectiveness of human roles that are already established in doctrine.

The U.S. military is pursuing the use of advanced unmanned and robotic systems because they can outperform their human counterparts. As stated by Gordon Johnson of Joint Forces Command on the topic of robot soldiers, "They don't get hungry, they're not afraid. They don't forget their orders. They don't care if the guy next to them has just been shot. Will they do a better job than humans? Yes."[60] What Mr. Johnson suggests is an unmanned system with human-like autonomy and the ability to apply lethal or non-lethal force without emotion or human limitations.

The ability to correctly apply lethal and non-lethal force without emotion is seen as an added benefit of robots. Dr. Ronald C. Arkin, a computer scientist at the Georgia Institute of Technology and robotics advisor the U.S. Army contends "that intelligent robots can behave more ethically that humans currently can."[61] His thesis is that robots can make ethical decisions because they are not clouded by emotion, and can be programmed with Jus in Bello (Law of

Armed Conflict), the Geneva Conventions, rules of engagement and apply them all to a given scenario faster and in a more consistent manner than humans.[62] As an advisor to the Army on robotics Dr. Arkin believes that advanced robotics are the key to accomplishing military objectives without incurring risk caused by war crimes and collateral damage.[63] Dr. Arkin is basing the need for an ethical robot based on the findings of a 2006 survey by the surgeon general of the Army. The survey indicated that approximately 17 percent of the soldiers and marines serving in Iraq thought that civilians should be treated as insurgents; less than half of the servicemen thought noncombatants should be treated with dignity and respect.[64] Although Dr. Arkin does not assume that battlefield robots will always act in a perfectly ethical manner, he believes that they will do a better job than human soldiers or marines.[65] Consequently opponents of the development of new doctrine that addresses robot integration believe that current doctrine is sufficient. Efficiencies gained from the ability of robots to outperform humans mentally and physically will make existing doctrine more efficient and effective, not obsolete.

The power of doctrine

The British successfully employed tanks against the Germans in the Battle of Cambrai in 1917.[66] Although the attack was successful, the employment of tanks during this campaign did not represent how they could be most effectively used.[67] The Germans capitalized on the British invention and began to create doctrine that integrated tanks into a joint mechanized force. During the interwar years the Germans created their Blitzkrieg doctrine and then specifically designed and built tanks that fulfilled their doctrinal role.[68] The integration of the tank into German joint operational doctrine created a marked advantage for the German war machine as demonstrated at the outset of World War II.[69] Unmanned and robotic systems are similar to the tank in that they create psychological and performance advantages on the battlefield.

Robots outperform humans in many ways, but that does not mean that they are better suited to conduct COIN operations than humans. The current conflicts in Iraq and Afghanistan are social dilemmas where the civilian population is the center of gravity. The center of gravity is the source from which the insurgents draw their power in their efforts to tear down the current political process and rebuild their own.[70] The ability of unmanned systems to provide persistent ISR and on call fires has provided the U.S. with a marked advantage in COIN operations. However, it is the human application of the unmanned systems that has led to success, not the systems themselves. As Sarah Sewall states "the population waits to be convinced. Who will help them more, hurt them less, stay the longest, and earn their trust?"[71] What she implies is a requirement for a bit of salesmanship on the part of the COIN forces, they must "talk the talk and walk the walk" in order to establish credibility and respect. The population must be convinced, and although actions speak louder than words, clear and meaningful human communication is an important starting point.

The human element of warfare is more than just knowing the rules. Colin Allen a Professor of philosophy at Indiana University contends that an ethical decision requires more than just following rules of conduct, it requires emotion.[72] An example would be if a marine or soldier found himself in a situation in which the rules of conduct did not apply. By relying on a strong emotional and moral grounding humans can decide to break or bend the rules for those situations that would support the greater good or intent of their mission.[73] By placing the rules within the context of experience and emotions humans can make better ethical decisions than a robot.[74]

The significant investment of the Department of Defense in the rapid evolution of unmanned and robotic systems guarantees their presence on current and future battlefields.[75]

Despite the superhuman capabilities of unmanned and robotic systems throughout the ROMO, the nature of the COIN environment is unique and extreme. The complex, dynamic and strategic implications of COIN tactical operations makes it an environment that is too sensitive for bottom up unmanned and robotic systems experimentation. The employment of unmanned and robotic systems must be framed with regard to their impact to COIN IO by the commander in the campaign design portion of the planning process.

Conclusion

According to Secretary of Defense Robert Gates the U.S. Department of Defense is already behind in its vision of how to best integrate increasingly autonomous and armed unmanned systems.[76] The role and parameters of unmanned systems and semi-autonomous and autonomous robotic systems must be explored now before the exponential rate of technological development presents the military with systems that create risk through improper integration. The combination of further theoretical development, recent COIN experience and planning guidance can serve as the basis for doctrine that ensures IO harmony and a common understanding of force employment risks. In the near term commanders can mitigate mission risk through the integration of unmanned and robotic systems into the campaign design portion of COIN planning.

NOTES

[1] P.W. Singer, *Wired For War*, (New York: The Penguin Press, 2009), 300.
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