The Impact of Low-Cost Aircraft on Military Strategy and Socio-Political Environments

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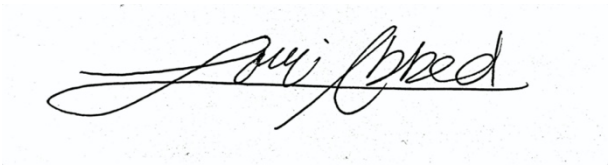
On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments



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The United States' reliance on its overwhelming military capability and technological advantage as a core defense strategy is being called into question. For decades, the United States has been at the forefront of technological advances in military research and development. Throughout its history, the United States' military strategy evolved in tandem with the progression of its weapons development. The inception of increasingly advanced weaponry, such as machine guns, tanks, and militarized aircraft, created new niches in the execution of warfare in the battlespace of the time. The latest and expanded battlespace, where today's wars are fought, includes air, land, sea, information, and cyber realms. (Battlespace, 2021, para. 1). This report will study the category of militarized aircraft that operate within an increasingly important layer of today's modern battlespace: a class called light attack aircraft.

Unlike the large-scale wars of the past, modern warfare includes a new type of war; low intensity conflicts encompassing smaller regional conflicts, guerilla warfare, and terrorist insurgencies. These conflicts triggered the development of more cost-efficient aircraft that excel in low and slow flight envelopes. The United States Government's deployment of troops to fight other nations' conflicts generates concern for some United States citizens, as it is seen to continuously put troops at risk. Increased pressure from American citizens, along with a changing political dialogue, have created a strong social desire to reduce that part of the U.S. defense budget allocated to fighting wars overseas. Some people think this money could be better utilized to fund domestic shortfalls at home such as inadequate housing, failing infrastructure, poverty, and climate change. In addition to the socio-economic pressures influencing public opinion, there is political pressure to avoid sending troops overseas to fight "endless" wars. It is through these perspectives that I researched the manner in which light attack

aircraft have emerged to satisfy the operational and strategic requirements of irregular warfare, while also taking into consideration the advent of new socio-political demands (Glossary, 2015, para. 32).

Methods and Theoretical Perspectives

Multi-level Perspective (MLP) Framework:

The world is made up of many different socio-technical systems, which are the interactions between humans and technology. These systems are comprised of people and their actions with technology in society, and how people's behaviors are influenced by social norms and technology advancement. To better understand socio-technical systems, one can consider the theory of Social Construction of Technology (SCOT), which defines that human actions shape technology. Specifically, SCOT maintains that "new weapons are less a product technological forces than they are of institutional and socio-political factors" (Mosser, 2010, p. 95). "MLP accommodates several core notions of SCOT" (Geels, 2019, p. 4) while adding a "more layered sensitivity" to SCOT institutional and socio-political factors (Geels, 2019, p. 5). The MLP theory of how society changes and develops is a basis from which to understand the socio-technical systems and their transitions by categorizing these technological forces and institutional and socio-political factors into three different levels. It is not only important to look at the technical innovations that support these socio-technical systems, but also the gradual influence on human behavior based on politics, culture, as well as the immediate, impact on humans affected by these systems. MLP has the ability to look at innovations that are changing both radically and incrementally (Geels, 2019, p. 1).

MLP is based on three levels of the system: landscape, regime, and niche. Each of these levels within MLP are influenced by each other while creating changes in corresponding levels

simultaneously impacting changes within its own level. The landscape level is trends and changes among society and the globe that impact the way people think and react. The regime level can be best described as mainstream activities and structures that support a socio-technological system. The niche level includes the new technologies and ideas that are developed by people that bring new products or processes to fill a window of opportunity created by the regime and change the way things are done. An example of how each of these different levels influences another level is when a new niche technology is developed--it changes the way people in the regime conduct business. Changes in the regime can also be influenced by changes in the landscape as people's social norms are altered through public awareness and their desires put pressure on regimes to modify the way they conduct business (Geels 2019, p. 1). There are countless interconnections within the levels all effecting and simultaneously being affected by each other.

MLP looks at technologies as socially constructed rather than developing according to internal technical requirements. MLP recognizes that social movements and activists have an impact on the landscape. Also, studies using MLP have looked at "effects of new technologies on marginal groups, underdogs, laypeople, and the poor" (Geels, 2019, p. 5). As with other systems, like the energy sector or housing sector, the battlespace sector also affects these marginalized groups -- refugees.

MLP as a framework looks at socio-technical transition as evolutionary processes. Through the interactions between the landscape, regime, and the influences of niche technologies, MLP recognizes that these socio-technical transitions can be contested and conflicted processes.

How is MPL used in the low intensity conflict battlespace:

The world is made up of many different socio-technical technology systems, one of which is the low intensity conflict battlespace. This battlespace system can be divided into landscape, regime, and niche components. These MLP systems are large, complex, and multi-faceted. As illustrated in Figure 1 a complex story made up of myriad actors representing the landscape, regime, and niche in the light attack aircraft MLP system is detailed.

Light Attack Aircraft MLP System	
Landscape	Pro and anti-war factions
Regime	Air forces, armies, manufacturers, labor unions, and the civilian population
Niche	Evolutionary developed light attack aircraft

Figure 1

The regime component is composed of mainstream activities required to fight in the low intensity conflict battlespace. These activities include reconnaissance, ground troop support, land attack, and escort. The regime is also composed of the mainstream structures to support these light attack aircraft which include the aircraft, hangars, airfields, supply depots, and repair stations. Finally, the regime will also include the manufacturing plants that build these light attack aircraft as well as the armies and air forces that use them.

The niche level component of MLP for low intensity conflict is the light attack aircraft. This new technology has evolved over time and fits a unique requirement for a cost-efficient aircraft that can fly slow and low to support ground troops. The landscape for the low intensity battlespace is the society's trends and changes in expectations with regards to warfare. These trends can be from stakeholders that advocate for the use of low attack aircraft to stakeholders

who oppose the use of light attack aircraft due to the proliferation of war. These stakeholders will have an influence on how light attack aircraft will be utilized in support of a country's military requirements. The landscape of the battlespace is influenced by various combatant stakeholders from the countries themselves to the non-state belligerents.

Secondary stakeholders impacting the landscape are the anti-war protesters, congressional members of both left and right political parties, defense manufacturing companies, and labor unions. Although these secondary stakeholders do not have direct impact on the battlespace conflicts, they provide support, which influences the dialogue about low intensity conflicts and provides a political perspective that can alter public opinion. A perspective from combatants who are actively engaged in the conflicts and are directly involved in hostilities can also impact the landscape.

Socio-Technical Transition from Clausewitzian to Low Intensity Conflict

Need for Light Attack Aircraft:

All countries deserve the ability to defend themselves against a myriad of enemies from hostile nations to terrorists and insurgents. Due to the severe economic impact of wars, countries need to manage defense budgets to fund other domestic needs. Highlighting the cost of light attack aircraft provides a unique insight into how affordability can create opportunities for countries to defend against conflicts that might otherwise have been too expensive. As irregular warfare becomes the new default for conflict types, new maneuvers arise for military aircraft to consistently perform. Extensive research of the cost of light attack aircraft, shows that these cheaper alternatives have offered countries empowerment and self-sufficiency (Gady, 2018, para. 7). However, the introduction of inexpensive and technologically advanced aircraft has

potentially opened the door for more conflicts due to the proliferation of light attack aircraft around the world.

The light attack aircraft provides a simple solution to a low intensity conflict niche need. The light attack aircraft is an incremental approach to developing a new weapon system that takes the mainstream fighter aircraft regime and reduces cost while maintaining its basic war fighting capability, to a certain extent. By being an incremental innovation, light attack aircraft are easier for government officials to accept since they do not have to change many of their procedures in their current regime. This is different from the more radical development of drones, which are unmanned, require more support, and different protection protocols to control the aircraft, which militaries may not be experienced in operating.

In this case the focus was on engaging stakeholders' opinions on the degree of implementation and development of light attack aircraft. By using MLP to track the way in which this innovation goes from a relatively underutilized technology to potentially upgrading it to a major component in the regime of low intensity conflicts. The light attack aircraft companies are getting support from members within both governments and troops demonstrating the connections between niche and regime. Specifically in the United States, these groups push Congress to find new alternatives to police the globe by balancing efficiency and diminished risk to American troops. As with other parts of the socio-political landscape level, anti-war lobbyist and constituents with similar beliefs push Congress to limit American troops and government involvement in foreign conflicts. This allows for the niche level innovation of the light attack aircraft to have a "window of opportunity" to fill a new role in today's battlespace (Geels, 2019, p.1). This socio-political environment has a spider web of connections, which affect each other in different ways, all cultivating with their influence on the progression of light attack aircraft.

The landscape level also includes the impact of insurgencies and other adversaries around the globe involved in low intensity conflicts, driving the need for light attack aircraft. This evolving landscape level requires countries to develop military capabilities to combat these threats. The niche level that the light attack aircraft fills is the low-cost solution to effectively operate in this unique battlespace. It is the regime level's duty to listen to opinions and formulate legal regulations that reflect these views. As a low-cost solution, there is a wide desire from many countries to acquire this capability. The United States and other countries have developed these aircraft for both domestic and international sales to meet foreign military needs. In turn, these weapons and technology, although provided to allies to support battling a common threat, may in the future be used against nations that were previously partners or allies.

Historical Background:

Reviewing the historical background that led to the contemporary low intensity conflict battlespace, one can see how the development and use of the light attack aircraft has filled a unique niche. First, the emergence of the low intensity conflict battlespace arose from the regional instability around the world. Since the end of World War II and the Cold War, an increasingly complex and unstable international environment has led to global unrest predominantly centered in the third world. Analysts have counted from 500 to 1000 third world conflicts from the end of World War II to 1990. It has been noted that the United States' capability to engage in third world conflicts has been "criticized as inappropriate due to its dependence on a Clausewitzian Principle on warfare." The Clausewitzian Principle is a conventional war conducted between two or more nations (Tinder, 1990, p. 1). Instead, these conflicts are most likely to be conducted by insurgents, terrorists, or civil wars (Tinder, 1990, p. 2).

Many times, the U.S. involvement in these conflicts is due to the strategic location of the country and its critical resources in the global economy (Tinder, 1990, p. 8). The importance of location has led U.S. defense policy to respond with weapons for low intensity conflicts (Barnett, 2015, p. 35). These low intensity conflicts can have a negative impact on smaller countries due to the destruction of infrastructure such as roads, hospitals, schools, and dams, all of which are vital to life in these areas, and therefore inevitably causing harm to the local population (Barnett, 2015, p. 34).

Another contributing factor driving the increase in low intensity conflicts is the arms transfers to many of these countries. Since the end of World War II, the use of arms transfers has been a critical component of international politics. The share of arms transfers to developing countries is about 80% of the world market. The value of these arms transfers funded by military aid between 1961 to 1980 was $134 billion. During that same time period, the economic humanitarian aid to those same countries totaled only $48 billion (Maniruzzman, 1992, p. 734).

From a technological perspective, the development of the light attack aircraft has provided better support to ground troops with the ability to attack the enemy in close proximity to those forces. These aircraft also have a significantly lower price tag compared to the more advanced 4th and 5th generation fighter aircraft flown by many industrialized countries. In addition to the lower cost of acquiring light attack aircraft, operating costs on a per-hour basis is significantly lower, enabling countries with limited funds to have a capable aircraft to use in the low intensity conflict battlespace at an affordable cost. The final advantage of these light attack aircraft is that they are capable of carrying similar type weapon systems as a 4th and 5th generation advanced aircraft at a dramatically lower cost.

Landscape Level Clashing Opinions

Light Attack Aircraft Landscape Supporters Discussion:

Influencing the landscape are the people and institutions that support buying light attack aircraft in the hopes of stopping insurgencies and terrorism, while protecting their soldiers and airmen, and minimizing casualties among the civilian population. These stakeholders have different perspectives influencing the landscape on the use and proliferation of advanced modern weapons in the warfare regime, to include light attack aircraft. These perspectives span both public and private sectors expressing a variety of socio-political issues. From a socio-political perspective, during the past few decades Americans have become extremely concerned with protecting our troops during times of combat. With over two thousand U.S. troops killed during the Afghanistan War, the American people want their troops to come home ("Casualty Status", 2020, p. 2). The United States is supporting the Afghanistan Air Force to bring U.S. troops home, while preventing terrorists from coming back into power (Ybarra, 2011). As Defense Secretary Robert Gates stated, "Arguably the most important military component in the War on Terror is not the fighting we do ourselves, but how well we enable and empower our partners to defend and govern themselves" (Smith, 2013, p. 27). This socio-political perspective is supported by the niche technical capability of light attack aircraft. Ground troops are in need of a capable aircraft that has the following attributes: persistence, sustainability, responsiveness, spectrum target lethality, survivability, interoperability, and low cost per flight hour (Smith, 2013, p. 35).

The old mainstream regime way of buying and deploying advanced fighter aircraft "comes with a huge price tag" (Wagner, 2018, para. 1). "There is an existing void between mission value and suitable equipment which could be filled with less expensive weapon systems" (Wagner,

2018, para. 4). Light attack aircraft were deliberately created to fulfill these niche design characteristics and allow the United States to support its partners and allies.

Defense contractors are another stakeholder that support these weapons because it gives them a new product to sell during periods of defense budget cuts. For example, Textron Aviation/Beechcraft, the manufacturer of the AT-6 Wolverine, has been awarded numerous large contracts to sell light attack aircraft to foreign countries. Recently the Iraqi Air Force requested to purchase 24 AT-6 aircraft with the associated training and logistic support for approximately $790 million ("Iraq - AT-6C Texan II Aircraft", 2014). In addition to the individual contractors, the towns in which these companies are based, like Wichita, Kansas, benefit from the three-quarter billion dollar AT-6 program. This program would be a significant boost to the local economy by providing jobs for the residents and more tax revenue for the local government. The other manufacturers involved in this program are Lockheed Martin Mission Systems and Training located in Oswego, New York and Pratt & Whitney Corporation, the builder of the engines located in Bridgeport, West Virginia. These programs put pressure on the landscape by driving Republicans and Democrats to fund the military industrial complex. The military industrial regime has a relentless hold over the political and economic structure of this country. Military spending became crucial to the growth of the federal government during the Cold War, which "became known as military Keynesianism" (Brenes, 2020, para. 6). Looking into the future, the U.S. alone is expected to spend $2.5 billion over the course of five years on a Light Attack Aircraft program for the U.S. Air Force (Maven, 2020, p. 6). These stakeholders, in addition to those previously mentioned, hold different beliefs that affect the landscape of the light attack aircraft as a niche technological development.

Light Attack Aircraft Landscape Opposition Discussion:

The goal of the anti-war movement is to change the landscape to create an environment where Americans want to prevent light attack aircraft from being used to attack innocent citizens. Also, the anti-war movement strives to change public opinion to convince Congress to divert money spent on warfare to more humane endeavors like food and housing for the poor or money to combat climate change.

As we look at more of the actors and stakeholders there are varying degrees of political influence on the landscape. For example, during last year's Democratic primary debates, Democrats were faced with the question of whether the United States should be the world's police. Senator Bernie Sanders said "No", while other candidates offered varying degrees of support in reducing the United States involvement in overseas conflicts (Giglio, 2019, para. 3). John Hincklelooper stated: "if we completely pull our troops out of there we're going to see a human disaster that will startle and frighten every man, woman, and child in this country" (Giglio, 2019, para.11). Many of the candidates realized that after spending countless dollars on the wars in Iraq and Afghanistan the impact has meant "more dislocation, mass migration, and pain in the region" (Shinkman, 2019, para. 1). In addition, Republican Senator Rand Paul along with Democratic Representatives Alexandria Ocasio-Cortez and Ilhan Omar, called for the Administration to remove U.S. troops from Syria and to increase the focus on diplomatic efforts (Bailey, 2019 para, 1). Ultimately, they want a change in foreign policy which they feel has failed to make people safer and stop fighting endless wars against other countries. From a socio-economic perspective, politicians like Senator Bernie Sanders and President Joe Biden have advocated for American troop withdrawal from wars, such as Afghanistan. Senator Sanders believes that the money spent on warfighting could be diverted and used to deliver desperately

needed humanitarian aid. President Biden has stated that the troops should come home to allow Afghanistan and its neighboring countries to engage and negotiate a lasting peace ("The Presidential Candidates on the War in Afghanistan", 2019). The light attack aircraft reflects these socio-political, economical, and technological concerns. It is a smaller aircraft that can be operated and maintained by both large and small countries allowing them to protect their troops and people.

Although there were many claims made during some of the primary debates about the morality of the conflicts in Afghanistan and Iraq, during congressional debates the concern over these wars were largely procedural and economic in nature (Cozzarelli, 2020, para. 2). Instead of addressing the death and destruction caused by these wars, Nancy Pelosi complained that former President Trump did not seek congressional approval for recent attacks. Elizabeth Warren claimed that the money for the military could be better diverted elsewhere. Neither individual spoke against the U.S. imperialism for political and military intervention around the world (Cozzarelli, 2020, para. 2).

On the opposite side of this political debate there are still those that want to fight these wars for political and economic reasons. Even though members of both parties and the Administration advocated for the withdrawal of American troops from Afghanistan, Congresswoman Liz Cheney amended the National Defense Authorization Act to stop the withdrawal based on allegations Russian's paid bounties to kill American troops (Anderson, 2020, para.3). This amendment would indefinitely extend America's involvement in the war in Afghanistan. By keeping American troops in Afghanistan this creates the need for light attack aircraft to support ground troops. Her amendment prioritized scoring political points over the safety of people directly involved (Anderson, 2020, para. 8).

Many stakeholders are impacted by the creation of light attack aircraft. From global players to local towns, some of these players push for an increase in light attack aircraft implementation. At different levels from taxpayers to government officials, these stakeholders desire different outcomes varying from political capital to economic capital. From an economic standpoint, while low intensity conflicts are small, they have been very expensive. The War in Afghanistan has cost the United States almost $1 trillion over the past 20 years (Amadeo, 2020, para. 1). With modern fighter aircraft, as part of the mainstream regime, costing hundreds of millions of dollars to purchase, finding a less expensive means to support ground troops is necessary. Therefore, government defense budgets welcome the light attack aircraft's affordability and niche development. Many of these light attack aircraft cost less than ten million dollars. From a soldier's viewpoint, this would help the United States take a step back from the frontlines of many international conflicts that do not directly involve it, and give countries the means and opportunity to defend themselves. Despite the doubts among some politicians and media commentators there is a growing movement to defund the military. Since the 1960s, various economists, policy makers, anti-war activists, and defense workers have advocated to transfer money away from defense to solve domestic problems from poverty to transportation to climate change (Brenes, 2020, para.3).

Although these light attack aircraft are helping many countries defend themselves, anti-war stakeholders like the VoteVets and Concerned Veterans for America protest endless wars created by these aircraft (Harpootlian, 2019, para. 15). Some believe that these aircraft, carelessly transferred to countries, may provide the ability to use these aircraft to create an escalation and proliferation of weapons, increasing the number of conflicts and casualties. Critics

claim that creating a new market for weapons diverts technology companies from researching advancements in other businesses like housing or renewable energy production.

Conclusion

Light attack aircraft have emerged to satisfy the operational and strategic requirements of irregular warfare, while also considering the impact of socio-technical landscape. Utilizing the framework of Multilevel Perspective Levels, the impacts of socio-political and socio-economical demands on the development and implementation of light attack aircraft are identified. The niche level represents the weapon systems of the light attack aircraft and the evidence demonstrated the niche level's symbiotic relationship with the geopolitical landscape and low intensity conflict regime levels. Today's low intensity conflict battlespace has created a need for a new technology that could effectively and efficiently perform military tasks and maneuvers at a lower cost. Light attack aircraft fill this space while balancing the views and opinions of both supporters and opposers across the landscape. With the development of light attack aircraft, countries with limited defense budgets are able to acquire inexpensive, but capable war fighting technology to defend themselves in today's regional conflicts and against terrorist insurgencies with the United States providing support.

The ethical dilemma of the potential proliferation of weapon systems is a concern that was addressed from different angles and levels; however, some ethical implications remain unknown since it is not possible to know or measure the true moral intensions of light attack aircraft users. Without access to information on all missions and use of the light attack aircraft systems a complete multi-level perspective framework cannot be fully invoked.

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