Issues with the Implementation of New Defense Programs and the Threat of Failure

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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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Introduction

Technological change occurs consistently throughout the military, and its impacts on military organizations are quicker to appear and proliferate than impacts on society (Verdugo & Babin, 1990, p. 1). A technology to be integrated into the military soon is the light attack aircraft, an introduction that will alter how the military utilizes current technology and require cohesive decision-making between Congress, the Air Force, and Special Operations command in order to succeed. A light attack aircraft is a "rugged, highly maneuverable plane" built for close-air support and targeting in austere terrain (Waltz, 2019, n.p.), and the technical project team is challenged with creating a unique design that fulfills the desired criteria for the aircraft's mission. The impacts that follow the implementation will undoubtedly include issues that could threaten the success of the program. According to a technical report from the U.S. Army Research Institute, the issues fall into the categories of manpower, training, and human factors, but as it is discussing technology in general, it is not clear which issues will be most relevant to aircraft or if there are additional issues that are not discussed (Verdugo & Babin, 1990). Additionally, the report claims that "the military is one of the few societal institutions where manpower, training, and technology come together in a single forum, and must be well integrated for the organization to accomplish its mission" (Verdugo and Babin, 1990, p.1).

The involvement of the government, Air Force, and Special Operations command-only intensifies the intricacies of the military's decision-making process, and encountering issues throughout the acquisition of light attack aircraft will cause further delays as the web of organizations attempts to fix the issues. In order to understand the impacts that may occur following the introduction of light attack aircraft, research papers from accredited institutions

can be compared to expert opinions from defense magazine articles to study the ways in which each source describes the impacts of and the motivations for light attack aircraft.

In this paper, I provide an analysis of similarities and differences in the perspectives utilized by research reports versus articles with expert opinions. The technical reports provide an objective overview of the issues that occur after the introduction of new technology into the military, while the defense magazine articles provide strong opinions about the shortcomings of defense programs and their likeliness to fail. Comparing the ways in which the sources frame the light attack aircraft will provide insight on the issues that will arise and how society will respond to the acquisition of light attack aircraft.

The Incentive for Light Attack Aircraft and the Threats to Its Success

The incentive for the addition of a light attack aircraft fleet to the U.S. military occurred after special operations forces on the ground were ambushed in an austere location in Niger in 2017, an event that could have been prevented by close air support (Tadjdeh, 2020). Air Force Special Operations Command realized that this additional air support was necessary to properly support troops on the ground and called for the acquisition of a new fleet of aircraft specifically built for close air support, intelligence, surveillance, and reconnaissance missions (Tadjdeh, 2020). In the ongoing search for a standardized design of light attack aircraft and the advantage they would provide over the enemy, the American Institute of Aeronautics and Astronautics released a request for proposal and challenged undergraduate teams across the nation to submit a unique design that fulfills all of the competition's criteria for light attack aircraft. The technical team's preliminary design for the competition is shown in Figure 1 below.

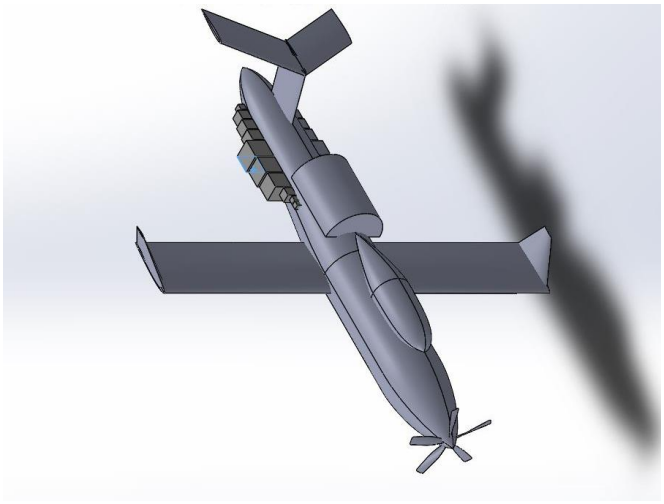

Figure 1: Preliminary design of the technical team's light attack aircraft (Created by Author).

As this new fleet of aircraft would be an entirely different aviation technology for the military than what is currently employed, issues are expected to appear throughout the implementation process. The benefits of this aircraft fleet seem obvious, but “having sophisticated equipment does not guarantee synchronization. Planning, understanding capabilities and coordination of activities is essential” (Centric, Wampler & Salter, 1998, p. 3), which means that without proper implementation or preparation, the integration of the new fleet will fail.

According to the technical report commissioned by the U.S Army Research Institute, the issues that commonly arise in the military due to the introduction of new technology can be sorted into three categories: manpower, training, and human factors (Verdugo & Babin, 1990). When a technological change occurs in the military, problems with acquiring manpower are unavoidable due to the changes the in level and specificity of entrance requirements. With the current pilot shortage in the military, the addition of light attack aircraft will be problematic if there are not enough pilots to operate the new fleet (Tadjdeh, 2020). Additionally, acquiring new, mission-specific aircraft will require training for all of the operators, increasing military spending and demanding resources such as instructors and equipment. The final category of

human factors refers to the how the military will have to ensure that the “systems are designed incorporating the skills of those service men and women who will be operating and repairing them” (Verdugo & Babin, 1990, p. 11). If operators are not equipped with the knowledge and tools to service the aircraft, combat efficiency will greatly decline once the aircraft are employed in combat.

While it is highly likely that some of the issues outlined in the technical report will occur upon the introduction of light attack aircraft, it is not fully understood which of the issues will be the most prevalent or if there are additional issues that were not discussed in the report. Additionally, since the report discusses new technology as a whole rather than the impacts of new aircraft specifically, it is not clear how relevant each category of issues is to light attack aircraft or if there are certain impacts that new aircraft tend to have on the military. The dysfunctional cooperation of the government, Air Force, and Special Operations command will not only increase delays caused by issues as they try to fix them, but also threaten the success of the integration of light attack aircraft. Failure is not rare in the defense industry, in fact, “defense programs fail spectacularly all the time” (Roblin, 2021, n.p.). The F-35 joint strike fighter program began much like the light attack aircraft program, intending to replace several fighter jets with a more affordable model, but turned into a program that “has been dysfunctional across two decades” (Mizokami, 2021, n.p.). Consistent funds have been poured into the F-35 program in an attempt to remedy the endless stream of problems and the government and military are in far too deep to call it off. With light attack aircraft, the question is whether it is better to try and prevent issues before they arise or to prepare for the imminent failure of the program. As stated in the NBC News article about the F-35, “for a low-cost replacement to truly succeed, then it must be allowed the possibility of failure” (Roblin, 2021, n.p.).

The technical papers regarding the implementation of new technology in the military solely provide information on the areas that are at risk and how they could be affected. News and defense magazine articles provide more opinions and insights on the state of the light attack aircraft acquisition and programs that have failed in the past. The varying perspectives in the sources represent the different frames in which the light attack aircraft are viewed. These different views provide insight on how the implementation process is going and if the program can be successful in the future. The research reports seem to believe that the issues that may occur are preventable and should be treated as such, but the articles portray the idea that the issues are inevitable and yet another defense program failure is looming. The striking contrast in each source's attitude towards defense programs and new aircraft in particular displays the difference in public versus private sector opinions. It is expected that government funded research and government organizations would have a more optimistic approach toward new defense programs and that independent journalists would speak their minds freely on the topic at hand, but it should be questioned whether the articles are being realistic or needlessly dwelling in the past.

The sources were analyzed using two different approaches in order to fully encapsulate all aspects of each perspective. Understanding the analogies that each source utilizes to describe the emerging technology of the light attack aircraft is the first approach. These analogies create frames of reference for each group that represent the values and beliefs of the source, and the way that the analogies are used can either enhance or restrict the imagination of the reader. This analysis will reveal the varying perspectives on the introduction of the light attack aircraft and the cultural implications that are associated with it. The second approach deals with the balance of public and private sectors in society and the organizational structure surrounding new

technology. The difference between private and public perspectives will portray how these sectors will deal with the introduction of light attack aircraft and the impact they can have on the success of this new technology.

Comparing Perspectives on Defense Programs Through Schwarz-Plaschg's Analogies and Mesthene's View on Organization

The source that inspired this research paper is the technical report from the U.S. Army Research Institute titled *The Impact of Advanced Technology on the U.S. Military* and written by Verdugo and Babin in 1990. This report provides research on how technology impacts manpower, training, and human factors in the military, and spurred interest in how these impacts have evolved as it was published over 30 years ago. In a report on *The Military Decision-Making Process (MDMP): A Prototype Training Product* by the U.S. Army Research Institute in 1998, the effects of implementing this new technology and ways in which they can be mitigated are discussed, further supporting the idea that the issues caused by new technology can be prevented once they are understood. The fact that the government and military are consistently trying to understand the impacts of emerging technologies in order to prevent the negative effects is clearly portrayed in the reports from the U.S. Army Research Institute in conjunction with the report from the Congressional Research Service about *Emerging Military Technologies: Background and Issues for Congress*. It is clear that these institutions claim their attitude towards new technology to be one of anticipation and prevention, even though their actions can appear contradictory. While researching light attack aircraft for the technical project, countless defense magazine articles appeared that discuss the integrity of the light attack aircraft program and question whether it will succeed or end disastrously. These strongly opinioned pieces portray a

new, stark perspective on the introduction of technology compared to the research and technical reports and the differences create a very interesting comparison.

With these two completely different types of sources, there are two approaches that proved to be useful for analysis. The first utilizes Schwarz-Plaschg's "The Power of Analogies for Imagining and Governing Emerging Technologies" to understand how the light attack aircraft is portrayed by each source and why it is portrayed that way. This framework proposes that the analogies comparing a new emerging technology to an old technology represent the frame in which groups view the technology and the values and beliefs that make up that frame. Each analogy and frame can be used to either restrict or enhance the reader's imagination regarding the new technology and these different paths of thought can be seen in the visualization below.

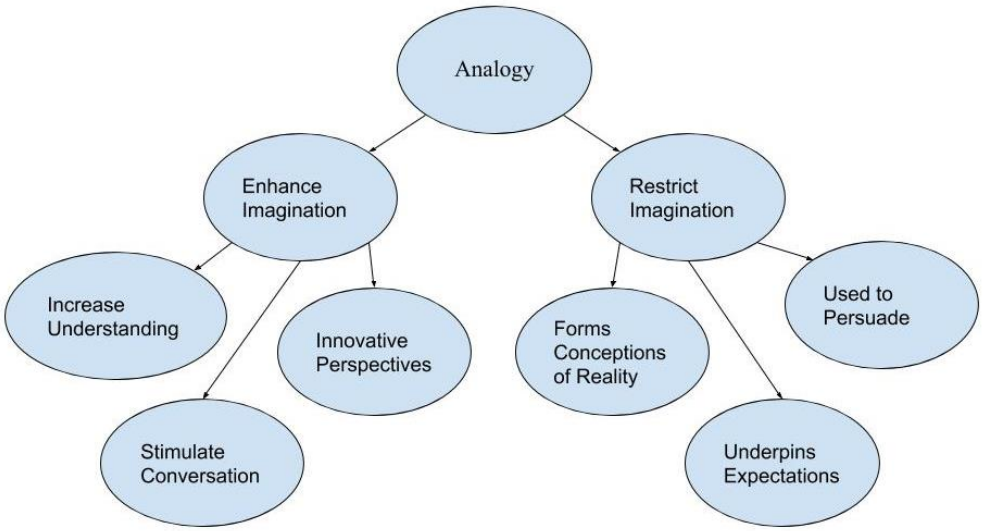

Figure 2: Flowchart representing Schwarz-Plaschg's model of analyzing analogies and the ways in which they are utilized to discuss emerging technology (Created by Author).

Understanding the perspectives that different groups have on the introduction of light attack aircraft will ultimately reveal the cultural aspect associated with the aircraft and the implications that its implementation will have on society. To supplement the first framework, the second

approach stems from a chapter from Mesthene titled “Economic and Political Organization” that discusses society’s balance between private and public. Where this balance lies on the spectrum of private and public affects how well society deals with the new technology. This framework focuses on the organizational aspect of the light attack aircraft, which is critical to the success of the light attack aircraft program. Because the program relies so heavily on the organizations that are involved, using this model to further understand the opinions of the public research institutions along with the private expert opinions will provide a well-rounded picture of the organizational structure. The analysis from the two frameworks will develop both the cultural and organizational aspects surrounding light attack aircraft, completing the context of the problem frame when combined with the technical knowledge from the design project. The figure below demonstrates how the technical, organizational, and cultural aspects fit together to provide a greater understanding of the light attack aircraft program.

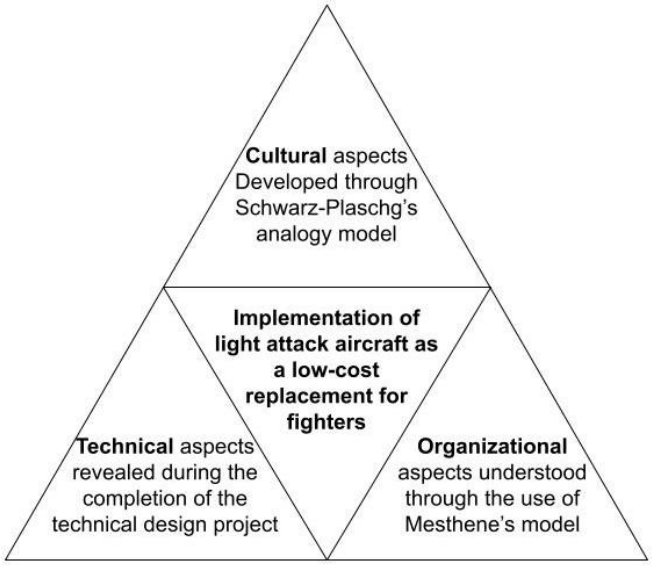

Figure 3: Triangle displaying the three aspects of the problem frame and how each of them was developed to create the full picture of the research method (Created by Author).

The sources that were analyzed for this research paper can be divided into two categories: research papers commissioned by the government and articles containing expert opinions from news or defense magazines. Each source discusses the introduction of a new technology in the military whether it is about technology in general, light attack aircraft, or the F-35 joint strike fighter program which is similar to that of the light attack aircraft. In the articles about the F-35, journalists discuss how issues have followed the program for two decades, but the "program is literally too big to fail and must succeed" after the amount of funds spent and aircraft it has replaced (Mizokami, 2021, n.p.). As the light attack aircraft fleet is also intended to replace a massive number of aircraft currently in service with a more affordable model (Losey, 2018), looking at the course of the F-35 programs could lend insight into what may happen following the implementation of light attack aircraft. Utilizing the analogy framework to analyze the defense and news articles will expose the perspective on light attack aircraft that is portrayed in the media and allow for comparison against how the government portrays new technology. Additionally, separating the sources into those from public research institutions and private individual experts will bring further understanding to the difference in how these separate public and private entities view technological advancements in the military and why.

The Division Created by the Course of Defense Programs Throughout History

Thorough analysis and comparison of the sources uncovered the differences in the way the two categories portray defense programs and their problems. Articles from defense magazines hold a pessimistic view on the success of defense programs and light attack aircraft in particular and consistently ridicule the organizations in charge of implementing them. This attitude is displayed through the utilization of analogies to compare new emerging technologies to those of the past. For example, an article discussing whether light attack aircraft are a major

risk to pilots compares the new aircraft fleet to the A-1 Skyraiders that were utilized in the Vietnam War and how “they took a lot of casualties, for predictable reasons… it’s low, it’s slow and vulnerable, and the air defense environment has become a lot more sophisticated” (Losey, 2018, “Low-cost capability”). Although former Air Force Secretary Heather Wilson claimed that light attack aircraft will only be used in the missions that they are designed for, the similarities to the A-1 Skyraider are enough to be a reminder of the 266 aircraft lost during the Vietnam War (Losey, 2018).

The light attack aircraft program has striking similarities with a very controversial program, the F-35 joint strike fighter program. Both programs began with the desire to create a lighter, more affordable aircraft to replace fleets that have been in service for decades and require a lot of funding, and the F-35 became a disappointment early on when its implementation began three years later than promised (Mizokami, 2021). The intentions for the F-35 design were clear and explicit, but after “over 20 years of R&D that lightweight replacement fighter got heavier and more expensive… [becoming] the very problem it was supposed to solve” (Axe, 2021, n.p.). Since 1992, the F-35 has consistently run into issues such as delays and excessive costs, but it is so relied upon that there is no other alternative and must stay in service. Finally, in February of 2021, the Air Force admitted to the public that the program has not fulfilled its initial criteria of affordability and wants to once again search for a cheaper lightweight fighter (Roblin, 2021).

The research reports utilized in the paper are all examples of how the government and military have attempted to avoid disastrous implementations like the F-35. A technical report published only two years before the F-35 program began claimed that “the military provides an excellent arena for learning about the broad array of impacts of advanced technology on military organizations,” (Verdugo & Babin, 1990, p.1), but it appears as if what was revealed about the

effects on manpower, training, and human factors in the report has not been taken into account. In addition to the increased difficulty in recruiting at a higher level, the military has been experiencing both a pilot and maintainer shortage, and the addition of a light attack aircraft fleet will only exacerbate these issues (Losey, 2018). Training required for the pilots of the new fleet will greatly increase costs and consume more time than expected, as rushed and wrongly timed training is inefficient and has been proven to lead to confusion (Centric, Wampler, & Salter, 2018). An issue that arises often with emerging technologies is "the level and stability of funding" approved by Congress, and when costs begin rising for a new defense program like they did for the F-35, the allocated funds will quickly diminish and threaten the success of the program (Sayler, 2020, p. i). The extensive research committed to understanding the implications and effects of new technology in the military displays the organizations' attempts at preventing them from occurring.

The approaches of the two different types of sources display very dissimilar perspectives on the implementation of new defense programs. The magazine and news articles utilize what they know about previous aircraft technologies to enhance the readers imagination, encourage contemplation, and instigate dialogue surrounding the acquisition of light attack aircraft. The way in which journalists create clear analogies between light attack aircraft and previous unsuccessful aircraft programs is common with new technology as people "often seek to grasp its meaning and relevance by identifying similarities with better known phenomena" (Schwarz-Plaschg, 2018, p.1). Journalists study what occurred with the A-1 Skyraider and the F-35 and create expectations for the future of light attack aircraft based on past events. The technical reports influence their audience by presenting research on the impacts of new technology with the intent of mitigating or preventing the negative outcomes. This restricts the audience's

imagination and is used to persuade people that the issues that may arise upon implementation are preventable, attempting to negate the idea that the issues will occur regardless. As people associate research with evidence and results, their expectations are set to see a change occur in the success rate of defense programs. The sources expose a great divide between what the articles and research reports want their audience to believe with regards to the course of new defense programs in the United States. This divide is due to the differing analogies that are utilized, and the two diverging paths are shown in the figure below.

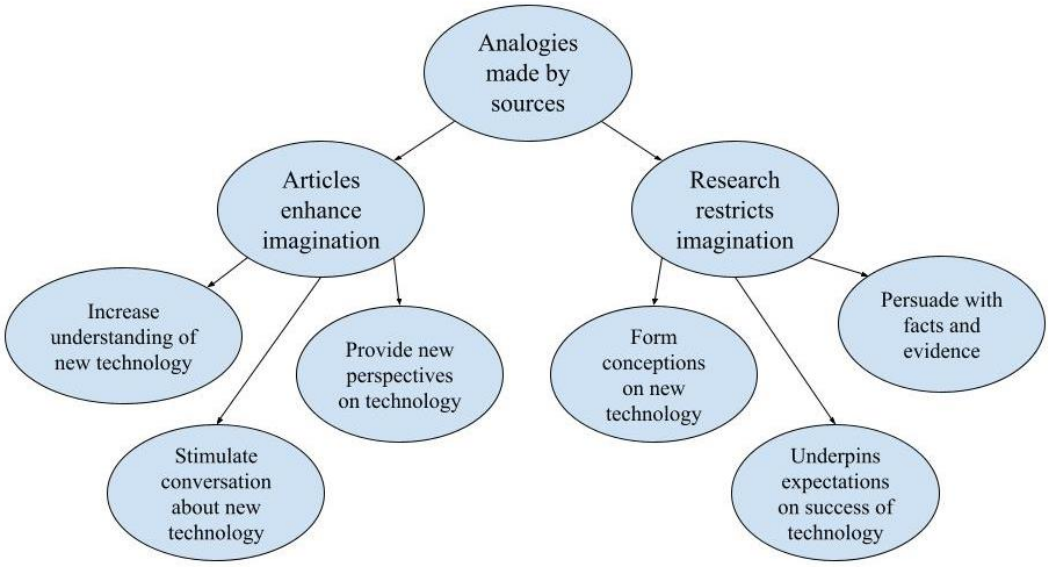

Figure 4: Flowchart displaying how the two categories of sources utilize analogies to portray emerging technologies in different ways (Created by Author).

Comparing articles written by journalists and experts to the research reports conducted by government agencies reveals a strange dynamic between private and public sectors. The private sphere contains articles that doubt the efficiency of defense programs and believe that their failure is imminent, questioning “whether the Air Force will ever succeed in developing a light, cheap fighter” (Axe, 2021, n.p.). Failure does not always refer to a catastrophic ending in this

case, but to the falling short of the initial goals of the program which leads to “an overly expensive defense platform with disappointing capabilities” like the F-35 (Mizokami, 2021, n.p.). On the other hand, the public sphere containing organizations such as the government, Air Force, and Special Operations command has communicated through its research efforts that the issues that follow the implementation of new technology can be prevented. It is clear that this belief is not supported by the mess of the F-35 program and the decades that the military spent trying to remedy its dysfunction, but if the organizations are able to work together more cohesively in the future then the success of defense programs could be greatly improved.

While these private and public spheres give off the impression that they are on opposing sides, it has become apparent that they are not mutually exclusive. Members of congress and military officials share their disdain for the shortcomings of defense programs within the magazine and news articles, distancing themselves from the opinions of their organizations. Congressman Adam Smith, the new head of the House Armed Services Committee, referred to the F-35 program as a “rathole” in which funds are disappearing (Mizokami, 2021). This “mixing-up” of the private and public sectors represents the “forging of new partnerships between governmental and nongovernmental forms, as all institutions in the society become aware of the increasingly public character of the problem they face” (Mesthene, 1970, p. 68). As the implications of new technology in the military affect both spheres, it is important they work together to improve the decision-making surrounding defense programs.

Conclusion

The introduction of new technologies creates a wake of impact that is “apparent in the military setting before it is felt through society as a whole” (Verdugo & Babin, 1990, p.1). Different sources encapsulate the varying ways in which the implications of these technologies

are experienced throughout the nation and provide insights into the success of their introduction. When viewed separately, the articles from defense magazines and newspapers portray consistent failure of defense programs and lack of trust in the decisions of the military, contrasting the research and reports from the government and military showing dedication in trying to prevent the issues that tend to occur in new defense programs. Analyzing these separate stances together constructs a frame in which the main actors are gathering and sharing information, but never taking action on the problem at hand. As military officials and members of congress express their disapproval for the way defense programs are being handled, the question becomes: why is nothing being done to change the process?

The connection between the articles and research is stronger than it appears and cooperation between the private and public sectors could create the momentum necessary to make a change. Altering the way in which these organizations interact would foster a greater understanding between the two sides and change the course of defense programs for the better. Communication between the government, military organizations, and society needs improvement and will take time and effort to accomplish, but the enhanced efficiency and success of defense programs alongside increased merit and trust from society is worth the investment.

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