

**ACTOR NETWORK THEORY ANALYSIS OF THE UNITED STATES GOVERNMENT  
WEAPONS PROGRAM**

A Research Paper submitted to the Department of Engineering and Society  
In Partial Fulfillment of the Requirements for the Degree  
Bachelor of Science in Engineering Systems and Environment

By

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March 25, 2021

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 rise of interconnected devices, called the Internet of Things (IoT), has led to an equal growth in a systems' security issues such as privacy, authentication, and secure storage of data (Conti et al., 2018). As the IoT continues to expand in the future, everyday items could become key components of a personal security breach, leading to stolen identities, credit cards, and passwords.

This paper addresses an STS research project that is tightly coupled with a technical research project. The technical topic consists of three parts: an analysis on the research and development of hypersonic glide bodies in the United States, a risk assessment of the deployment of bidirectional charging systems, and an overall evaluation of IoT devices in logistical systems. Both the hypersonic glide body and bidirectional charging network research have a focus on the security of the systems and outline the largest threats to each, allowing the technical research group to draw conclusions to the current state of security in IoT devices for the third part of the technical project. The STS topic is tightly coupled with the analysis of hypersonic glide bodies and discusses how the United States government weapons program interacts with different aspects of American society. Specifically, the STS research aims to answer the question of "how American citizens can better influence the research and development of new weapons produced by the United States Military." This research stems from the technical work done on hypersonic missiles since they are nearing the end of the research and development phase and are moving towards the production phase, meaning many of the issues discussed in this paper might affect the outcome of the devices the technical research group worked on. Actor Network Theory (ANT), initially introduced by Bruno Latour, Michael Callon, and John Law, is used to discuss the current system along with develop a new system to give citizens more influence on the future development of weapons (Latour 1996).

## **SOCIETY AND GOVERNMENT WEAPONS PROGRAMS**

### **BACKGROUND OF WEAPONS PROGRAMS**

Since the technology boom of the 1990s, the general population has not stopped to think about the countless hours that go into planning a launch of a new technology. Whether it was the iPhone's data security software or the safety mechanisms in the new F-22 Raptor fighter jet, society often takes the final product for granted without thinking about the potential risks that come with using it. The back end of these technological systems has dozens of prioritized mechanisms that take into account things like what data should be private, how often the performance dips below the standard, and how resilient the system is to a malfunction (Hassler et al., 2020). For example, the risks of designing and developing a product include company strategy, competitiveness compared to similar products, and the social impacts of releasing the product (Tulenheimo, 2015, p.475), something that many consumers fail to think about when making a purchase. These notions can be carried into the government side of American society too. Just like publicly owned companies, the American government produces technological products that have complex logistical processes and risks that come with use. The government contracts companies to produce anything from computers to missiles and while these contracts are clear and specific in requirements, single contracts are often used for years and can easily run over budget. For example, Systems Planning and Analysis, one of the sponsors of the technical team's work on hypersonic glide bodies, has a multi-year contract with the government on the research and development of hypersonic weapons. If Systems Planning and Analysis does not complete the job agreed upon in the contract in the given time period, the United States Government is likely going to extend the contract instead of finding a new company to complete

the work. This implies that the timetables and budgets of contracts are not definite and can be increased, leading to more money being poured into the development of military supplies.

This paper will aim to describe how the United States government weapons programs currently influence society, along with proposing an alternative way to set up the network so that American citizens influence the weapons programs by comparing the current system of weapons development to a new and revised system outlined in this paper. For the future, hopefully citizens can start to understand the risks that are taken to deploy a weapons program, along with the security protocols that are inside the system (Awerbuch, 2000, p.1025-1027).

### **THE PROBLEM WITH THE CURRENT NETWORK**

The current system can be seen through the lens of Actor Network Theory (ANT), a social theory that “makes use of some of the simplest properties of nets and then adds to it an actor that does some work” (Latour, 1996, p. 371). By grouping people with similar traits and calling them actors, these groups can exert their influence on a network. Applying Actor Network Theory to a system like the United States weapons network can be helpful in providing a visualization of the interactions different actors have and how those interactions influence the final product. Figure 1 shows four actors in a government weapons network. As each actor only influences one other actor sequentially, it can be shown as a linear network.

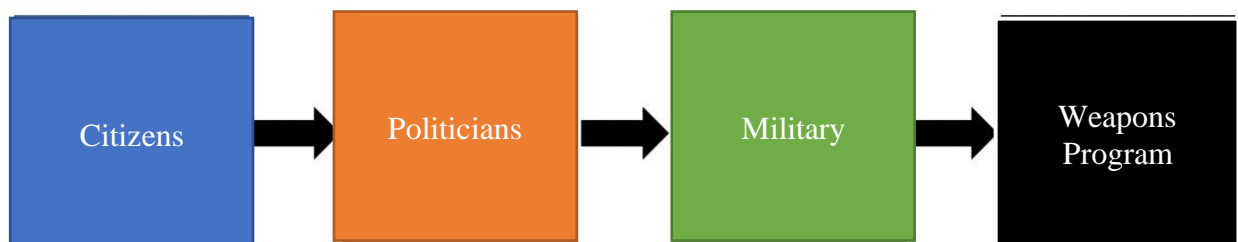


Figure 1: ANT Applied to Government Weapons Programs. A depiction of the four actors, citizens, politicians, military, and weapons program, who influence the final product. (Koch, 2020).

In this figure, the American citizens delegate decision making to politicians by electing them. Once in office, politicians delegate the military to make weapons and defense decisions through a multitude of ways and can limit the military by cutting their budget. Once the military has their funding, they delegate the production of weapons systems to government contractors by applying goals and limitations. While this might appear to be a good system, Miller, a University of Virginia scholar who studied technological innovation in cars, brings up the point that “a worthwhile goal should be to output a device that is sufficiently superior to the pre-existing condition” (2020, p.7). Currently, the United States military is only making incremental upgrades to their weapons arsenal, costing America billions of dollars. This is because the design and production process of advanced weapons takes years so by the time an advancement comes out, it’s already almost obsolete given the five years it took to produce.

An example of the United States military not making sufficiently superior updates to their weapons is the F-35 fighter jet. The F-35 was supposed to replace the F-16, a jet that was first developed in the 1970s, and be a fighter jet that is capable of doing everything the F-16 could do and more. Unfortunately, the F-35 is now running two years behind schedule and more than one billion dollars over budget with no real plan of fixing either of these issues (Roblin et al., 2017). While some might argue that the costs are necessary to develop the most advanced fighter jet on the planet, a government report in 2015 came out describing the F-35s simulations and how they were worse in dogfights than the older F-16s (Lockie, 2017). Because the F-35 is worse than the F-16, running over budget, and behind schedule, it is just one of the many mishaps that the current system allows to happen.

## **THE IMPORTANCE OF THE PROBLEM**

Currently, the United States is not involved in any wars that require excessive weaponry. Along with this, President Joe Biden has promised to put America back in nuclear and peace treaties that will further ensure no large-scale wars happen in the coming years. With no current and immediate threat to American security, why do we continue to pour money into the development of new weapons? As of September 2019, the United States spends more on its military than the next ten countries combined, indicating an overcommitment to defense resources without any plan of a budget cut (“U.S. Defense”, 2020). For example, the United States government spent almost 600 billion dollars on the military compared to only 70 billion on education, a space where a 10 percent increase in spending could lead to about 8 percent higher wages per person (Jaeger, 2016). Even through different presidents with different political affiliations, the military budget continues to grow while more and more stories are arising about budget cuts to schools. Other areas that could be updated with cuts to military funding include raising the minimum wage, restructuring social security, and lowering taxes. Being a democracy, the United States is in a unique spot to create change with their ability to vote and if there was a proposal of a new system for citizens to vote on to better influence how government money is spent, society could see an increase in quality of life in different sectors outside of the military.

## **THE REVISED NETWORK**

As technology advances, the weapons produced by first world countries become more and more autonomous. While Asaro (2019), an artificial intelligence and robotics professor at The New School, refutes ANT and follows the ideas of Social Construction of Technology (SCOT) by believing that autonomous weapons will influence society no matter what they decide, a change to the current view of the network can potentially be important in giving society a chance to reject autonomous innovation. Even if it is inevitable that weapons become fully

autonomous in the future, society should at least be able to influence the path that technology takes more than they currently can. While a majority of the population will not know the elaborate workings of weapons technology, the internet and mainstream media can run informational pieces and articles to better inform the public about the whole development process from prototypes to deployment. Figure 2 on Page 7 shows a revised network in which the American citizens elect a committee to influence the production of military weapons. While the need for secrecy in the development of these weapons is understood, the committee can go through the process of getting top secret clearance to see everything that is being worked on and can release information to the public about non-secret developments, allowing the citizens to be better informed of what is going on. Much like the current way the United States goes about electing Presidents or politicians, the citizens can understand each member's general decision process and stance on the weapons program and then after the committee is elected they are trusted to stay true to their process and make the best decisions for the people, even if the decisions are not allowed to be made public.

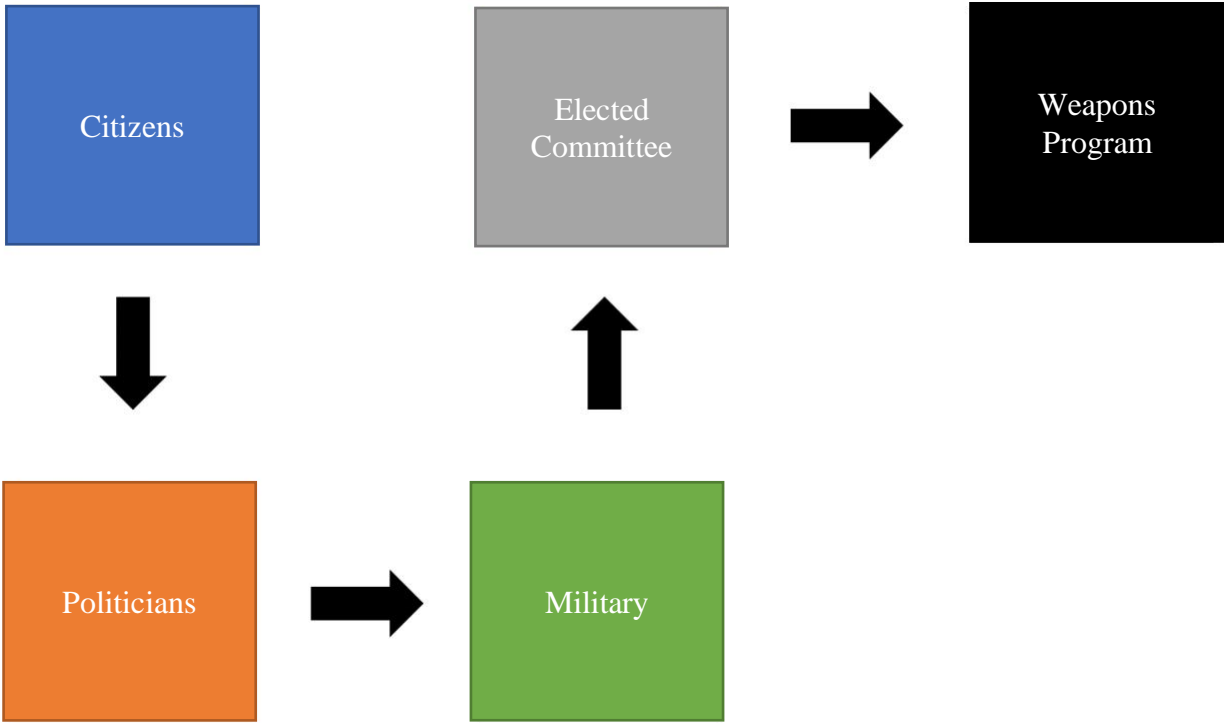


Figure 2: Revised ANT Model of Government Weapons Programs. A modified network where a committee elected by the citizens make final decisions on whether specific weapons programs should be funded. (Koch, 2020).

While moving the citizen actor in between the military and weapons programs was considered, it is still important for the population to elect politicians. Therefore, a new citizen-elected group is added as a buffer between the military and weapons programs to ensure the general population still has influence on the development of future weapons. The goal of this change is to better involve citizens in the overall process of the military and to get them to better understand what the military spends their money on, much like how elections allow the regular person to read about and decide on what they think is best for their country by voting. A question that was brought up during the creation of this network was about the difference between politicians and the new committee. Although both are elected in a similar manner, not a lot of politicians have their military budget ideas at the forefront of their campaign. Politicians are stretched so thin on so many different votes on policies that sometimes they have to cut out some



of their ideas to keep up with the rest of the government. By creating a new group to deal exclusively with the military weapons programs, traditional politicians can focus more on the other laws being passed without worrying about keeping the military in check. This will also allow a specific group of people to focus exclusively on weapons, allowing citizens to gain more information about this specific process.

Through changing the current way this network operates, the American citizens will greatly benefit in the long term. If the citizens decide the military is spending too much on weapons, they will now have the chance to stop a specific project or contract by electing the correct people to the committee. Through this, government funding to non-military operations could increase, meaning benefits to other operations like education could be worked out by politicians. On the other hand, if America finds itself in a tense situation with another country, the population could vote on committee members to allow more weapons to be created and prepare for the worst. Since it is imperative that the general population would need to be thoroughly informed before making decisions regarding the military, social media and traditional media sources could make vital information easily accessible, much like what they do before a Presidential election.

## **NEXT STEPS**

Adding a citizen-elected committee between the military and weapons programs will allow citizens to have better control on the military budget and in turn will learn more about what our nation's money is being spent on. The outcome of this paper will hopefully be further analysis into this new network and a continued discussion of how the current network can be changed or modified to better involve citizens in the decision making of weapons manufacturing. It would be interesting to see what politicians think about the new network and how they would

change their own policies knowing there is an extra check on the military. Future work could include public polling of citizens' thoughts on the new network or a real-world analysis if the United States or some other country decides to implement something similar to the network described in this paper.

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