Final Paper: Cybersecurity Internship

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36 Intelligence Squadron, US Air Force

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Table of Contents

Introduction

I am currently employed a Us government civilian working for the US Department of War (DoW), specifically with the 36 Intelligence Squadron of the US Air Force at Joint Base Langley-Eustis, Hampton, VA. I obtained approval from ODU and the 36 IS to fulfill my cybersecurity internship with the 36 IS prior to the spring 2026 semester. I have been a targeting analyst with the 36 IS for two years and intend to remain here for the foreseeable future. Prior to this I was enlisted in the US Army as an all-source intelligence analyst and served overseas in Afghanistan. I completed my term of service in the US Army and became a defense contractor, with several more deployments overseas in support of the US military. I transitioned to the 36 IS in 2024 to maintain a more stable work life balance and to stay within the local Hampton Roads area, where I've lived for 11 years.

The 36th Intelligence Squadron (36 IS) focuses on providing targeting intelligence products to the various combatant commands, such as United States Indo-Pacific Combatant Command (USINDOPACOM). Using multiple intelligence disciplines, such as geospatial intelligence (GEOINT), human intelligence (HUMINT), and signals intelligence (SIGINT), analysts within the 36 IS follow the joint targeting cycle described in Joint Publication 3-60 – Joint Targeting (JP 3-60) (Joint Staff, 2018). This publication describes each of the various functions, requirements, and standards for the US armed forces when conducting joint operations to target an adversary's threat systems. Each service branch of the US armed forces has their own targeting guidance. For the Air Force this is Air Force Doctrine Publication 3-60 – Targeting (AFDP 3-60) (US Air Force, 2021). However, the nature of modern warfare in the 21st century means that most operations are conducted in concert with other branches (i.e. the navy supporting the army, or the army supporting the air force, and so on), which turns these into joint operations. This is why JP 3-60 takes precedence over the individual services' targeting standards. Analysts within the 36 IS train to AFDP 3-60 standards during their initial entry into the Air Force, but once they are assigned to the 36 IS they will train to JP 3-60 standards.

A lieutenant colonel (O-5) leads the 36 IS, and there are several subordinate flights of made up of officers, non-commissioned officers (NCOs), enlisted airmen, and other DoW civilians. For operational security reasons, I will not reveal the full layout of the 36 IS, but I will describe my role within one of the flights later in this paper. The superior unit of 36 IS is the 363 Intelligence, Surveillance, and Reconnaissance (ISR) Group, which is led by a colonel (O-6). The 363 ISR Group maintains oversight for several other intelligence squadrons that are made up of active duty, air force reserve, and air national guard units located across the US. The 363 ISR Group helps to manage the overall mission and production assignments that the 36 IS is expected to produce on an annual production cycle.

The DoW civilians within the 36 IS do not have command authority over the airmen or other active duty personnel when it comes to their active air force duties (such as physical fitness training and uniform inspections). However, the DoW civilians are expected to act as subject matter experts in intelligence analysis and production. DoW civilians also help provide training and guidance to the airmen of all experience levels in different analytic methodologies and research tools available to them. The 36 IS military leadership recognizes and values the skillsets and expertise that the civilians provide to the squadron, and this relationship has been a key strength of the unit since I've arrived here.

My Internship Learning Objectives with the 36 IS are:

1. Conduct intermediate-level research, analysis, target identification/prioritization and dissemination in support of air component operational planning.

2. Work towards turning critical vulnerabilities and key system relationships into objects to enrich the data, especially intermediate target development
3. Expand research and analysis beyond the facility level and incorporate virtual, equipment, and organizational targets.
4. Engage in internal (flight and across squadron) and external collaboration with IC partners.

I did not have to complete any additional onboarding with the 36 IS for my internship since I've already been with the unit for two years. My initial entry and hiring process with the unit was a straightforward if lengthy process in early 2024. I was hired under federal authority; therefore, my application was submitted through USA Jobs online. The application and hiring process took approximately three months from the time I submitted my application, completed the virtual hiring interview, passed a background check, and onboarded with DoW as a new government civilian.

Management environment at the internship

The DoW civilians within the 36 IS do not have command authority over the airmen or other active-duty personnel when it comes to their active air force duties (such as physical fitness training and uniform inspections). However, the DoW civilians are expected to act as subject matter experts in intelligence analysis and production. DoW civilians also help provide training and guidance to the airmen of all experience levels in different analytic methodologies and research tools available to them. The 36 IS military leadership recognizes and values the skillsets and expertise that the civilians provide to the squadron, and this relationship has been a key strength of the unit since I've arrived here. There is a squadron senior intelligence analyst (SIA) who maintains command and control (C2) over every civilian within the squadron. There are also flight SIAs who manage the civilians within the individual flights. I am a study lead within my flight, which means I maintain C2 over the airmen and other civilians assigned to my study. Overall, this hierarchy is very simple to follow and helps to ensure everyone knows who their direct supervisor is within the unit.

My recent experiences as a targeting analyst have shown me the value of near real-time intelligence when making decisions that affect the joint targeting cycle. I have impressed upon my team of analysts to constantly check and re-check the latest sources of information regarding the target sets that we've been assigned. This serves multiple functions: 1) helps to ensure we are not wasting assets/capabilities on a target that has already been affected; 2) helps the enterprise to stay up to date on the status of a target system; and 3) enables the team to better prioritize the target system during later targeting cycles. In my internship role, I continue to highlight the importance of being able to quickly and efficiently analyze target sets for future action. I also provide additional training on tools and methods to make sure my team can complete this task on time so we can inform key decisionmakers.

The 36 fosters a culture of following the Air Force core values for those in uniform and the DoW civilians. The Air Force core values are integrity first, service before self, and excellence in all we do. Integrity first means doing the right thing, even when no one is looking and taking accountability for your actions. Service before self means that professional duties come before personal desires, and this leads to discipline and self-control. Excellence in all we do means that members of the Air Force strive to improve in their capabilities to be prepared to meet any challenge or complete any mission.

In addition to the work they do, the 36 IS provides a positive culture that encourages being brilliant at the basics, taking care of yourself and your wingmen, and being mentally and

physically fit. Being brilliant in the basics allows analysts to tackle more complex processes with greater ease in the future. The Air Force is an important part of a larger team, and we are only as strong as our weakest link. Mental and physical fitness enables the members of the 36 IS to maintain a state of mission readiness for whenever the time may come for them to forward deploy in support of a joint operation anywhere in the world.

Major work duties, assignments, and projects

My flight is responsible for producing target systems analysis (TSA) and target vulnerability studies (TVS). Both products have lengthy production timelines and demanding standards for final publication. TSA can typically require anywhere from eight months to a year to complete, depending on the target system being analyzed. TVS are usually shorter and can take from four to six months to complete. Additional duties the civilians are assigned include providing periodic training on structured analytic techniques and research tools and methods. Furthermore, the civilians are looked to as experts who can reach out to other members of the intelligence community (IC), and this has led me to develop working relationships with external agencies in the IC that specialize in different intelligence disciplines and/or geographic areas of responsibility. Intelligence analysis is a constantly evolving process, and the tools we rely on often change or get updated depending on available technology and databases available to us.

The main thing I've learned about during this time is the joint targeting cycle (JTC) and the process for getting a target vetted, validated, and nominated for action by a combatant command (COCOM). For operational security reasons I won't say specifically how I've implemented the joint targeting cycle to support the US military, but I will speak in broad terms available in Joint Publication 3-60 – Joint Targeting (JP 3-60) (Joint Staff, 2018).

According to JP 3-60, there are six phases or steps to the JTC (Joint Staff, 2018). Phase 1 starts with strategic guidance from the President, Secretary of War (SecWar), and the joint forces commander (JFC) on what the desired end state is for a conflict or major combat operation. This will include targeting priorities, critical targets, time sensitive targets, target acquisition and identification criteria, actions authorized against targets, and so on. These inputs provide a framework for how different components such as the Air Force will develop their own targeting priorities and operational planning for a campaign.

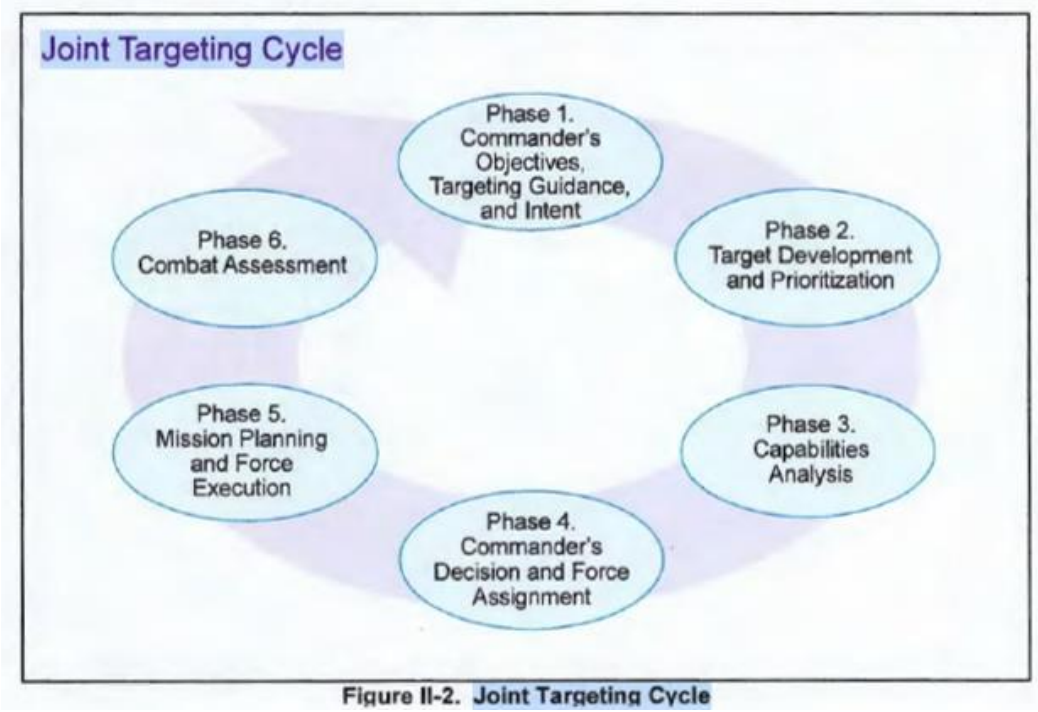

Figure II-2. Joint Targeting Cycle

In Phase 2, Target Development and Prioritization, my role as an intelligence analyst requires me to examine an adversary from a systematic perspective. Target systems analysis takes an adversary target system, such as their air defenses, and breaks it down into smaller parts (target elements) that delineate the critical requirements (things), critical capabilities (actions), and critical vulnerabilities (things or actions) of that target system. Using the example of an adversary's air defenses, there are several critical requirements and capabilities for the adversary to effectively defend their air space. They need sensors such as radar to detect, identify, and track aircraft. They also need command, control, and communications (C3) systems to relay that information between air defense units. Finally, the air defense units need to be able to engage aircraft, such as surface-to-air missiles (SAMs) or air defense artillery (ADA). Removing their sensors means the adversary can't detect our aircraft. Removing their C3 means the sensors can't tell their shooters where aircraft are active. Removing their shooters means they can't affect our aircraft. My job as an intelligence analyst is to identify the best way to prioritize, develop, and nominate these different target elements to best affect the larger target system. Once we've identified the most important and efficient way to affect the system, we've identified their critical vulnerabilities.

Several strengths that I have brought to the Air Force in this role are my attention to detail and my ability to thoroughly research a target system quickly and efficiently using all sources of information. There is a great deal of data out there on our adversaries, and sometimes it can feel overwhelming to even know where to begin. Fortunately, Phase 1 of the JTC lays out where we need to prioritize our efforts. Phase 2 is where I can focus my talents.

During Phase 3, the components will conduct a capabilities analysis to determine how they can best affect the targets we've nominated. They can be through kinetic means such as through bombs and missiles. It could also be through non-kinetic means such as information operations, cyber operations, or psychological operations. It's up to the components operations cells to find the best capability to affect each target.

For Phase 4, the JFC will decide how the components will execute their missions and with what capabilities. This could be through an extended bombing campaign, blockade operations, or through sustained information operations targeting the adversary's will to fight.

In Phase 5, the component then takes guidance from the JFC to plan and execute the mission. Finally, in Phase 6, the components will conduct combat assessments to determine whether the mission had the desired effects or not. If the target was successfully engaged, then we as intelligence analysts will move on to the next target. However, if the adversary's target system hasn't been destroyed and affected enough, then we will renominate those targets for re-engagement, and the whole JTC starts over again.

How did the ODU curriculum prepare you (or not prepare you) for the internship?

Critical thinking is often an undervalued skill in everyday life, but in the US intelligence community it's constantly emphasized as a significant skill that everyone should develop. As with just about everything in the US Department of Defense, there is a method to how critical thinking is done and taught depending on the setting and desired outcomes of the mission. For intelligence analysts, one of many tools to help with critical thinking are what's called structured analytic techniques (SATs).

The general purpose of SATs is to help analysts find the best way to go about solving an intelligence problem and giving them the ability to thoroughly weigh the strengths and weaknesses of any analysis being conducted (Defense Intelligence Agency, 2008). SATs help to mitigate cognitive biases and force analysts to consider or disregard potential pieces of information they normally would or would not otherwise encounter. SATs are also meant to be an interactive and repeatable process so that others may revisit a problem later if new information is available. There are dozens of approved SATs that can be applied to nearly any situation, but I will focus on three SATs that have been very useful during my internship with the 36 IS: Sorting, Link Charts, and Weighted Ranking.

Sorting is perhaps the most easily understandable and straightforward SAT (Defense Intelligence Agency, 2008). It's something we do every day without really thinking about it. The essential task is to take all relevant pieces of information and bin them into different categories that are relevant to a problem set. The sorting method can vary greatly. It can be done on a geographic basis, such as sorting locations for enemy bases or defensive positions. It can also be done temporally, such as when an adversary conducts certain activities at different times of the day, week, month and so on. It can also be done by the source of the intelligence or intelligence discipline the information is derived from. For example, binning all human intelligence together and signals intelligence together. Sorting is usually the first step in conducting analysis since it helps to get everything gathered into clear and concise categories for later use. One pitfall of sorting is that it doesn't inherently call out important pieces of information and can obscure key bits of information, depending on how the information is being gathered and indexed.

Surprisingly, one of the courses at ODU that helped further prepare me to complete this SAT was my biology course (BIO 105) from the fall 2024 semester, which helped me to learn taxonomy and classification systems for forms of life. Turns out there is also a "targeting taxonomy" that I had to learn while conducting analysis for the 36 IS. Going from large to small, the targeting taxonomy teaches us that the largest form of target is the overall adversary or threat (examples include Russia, China, Iran, or North Korea), then the target system (air defense forces), target system component (radar network in northern half of a country), followed by

target (radar facility #1 in sector #1), and finally target element (radar dish and communication building at XXX location of the radar facility #1). This type of classification system was difficult for some airmen to learn at first. However, it was so similar to the multiple levels of biological taxonomy (kingdom, phylum, class and so on) I learned at ODU that the concept was quick for me to comprehend and implement at the 36 IS.

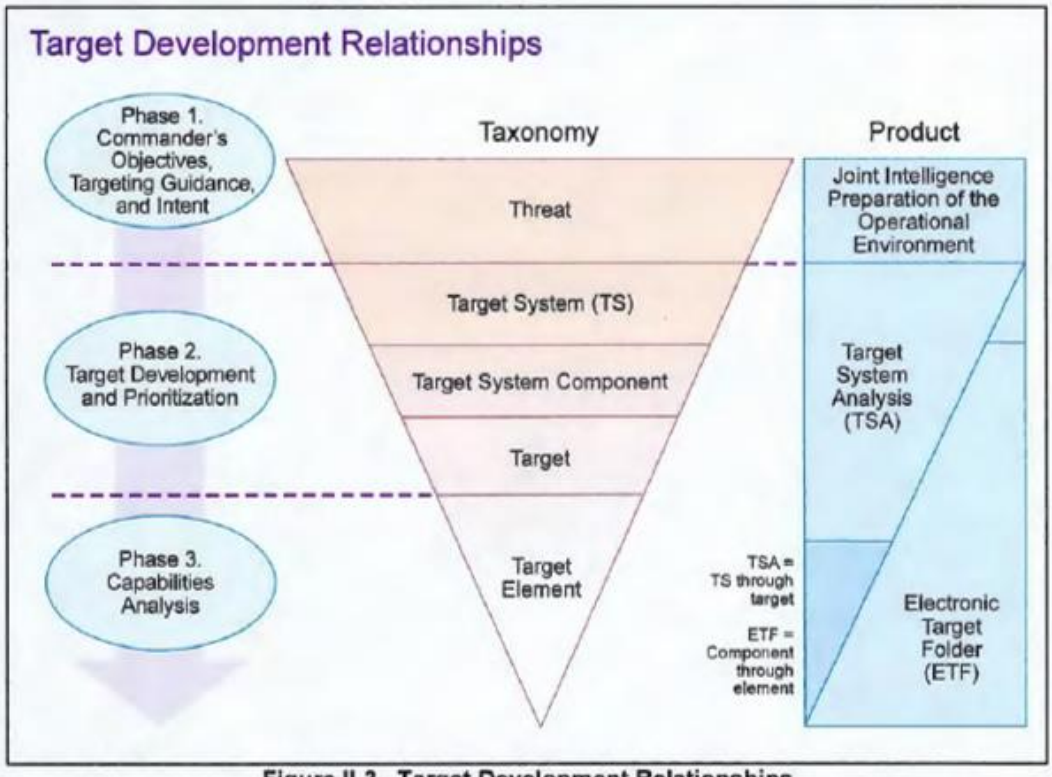

Figure II-3. Target Development Relationships

Sorting information according to target taxonomy was a huge asset during target identification/prioritization and dissemination in support of air component operational planning. Many time during my internship I would come across interesting information on a target system. Ultimately, this information was either too vague or not relevant to the air component's priorities for operational planning. Being able to quickly and efficiently sort through large data sets helped to cut down the amount of time wasted on researching targets that were not a priority for my unit and helped me to move on to the next target.

Link charts are another great SAT that I've used during my time with the 36 IS. Link charts are a great way to take all of those pieces of information we've sorted and to visually depict the data. Analysts can start creating linkages between the people, places, events, and things from the information we've gathered. Soon enough data will be linked together to reveal patterns of who, what, where the critical links are within an organization or unit. This SAT can help analysts who are more visual learners to identify those key nodes in a complex system. One downfall is that link charts can create false impressions of who/what is in command of an organization. For example, the key leader of an organization could have a deputy or communications cutout that relays information on their behalf, and the link chart could cause analysts to incorrectly assess the deputy as the leader based on their connections to the rest of the network. Several courses at ODU have taught me about the Open Systems Interconnection (OSI) model and the seven layers of computer networks. The knowledge I learned from my Cybersecurity Fundamentals course (CS 462) from the fall 2025 semester about the network

layer specifically translates very well to completing link charts. The routing of data packets from sender to receiver is exactly the kind of information that can help inform creation of link charts for targeting analysis (Kurose and Ross, 2017, Joint Staff, 2018). There are other ways to find information to link a physical facility to another facility within a target system, such as through identifying virtual connections in cyberspace, common types of equipment in use at each facility, or organizational ties. My network layer knowledge combined with the link chart SAT helped fulfill another of my learning objectives: Expand research and analysis beyond the facility level and incorporate virtual, equipment, and organizational targets.

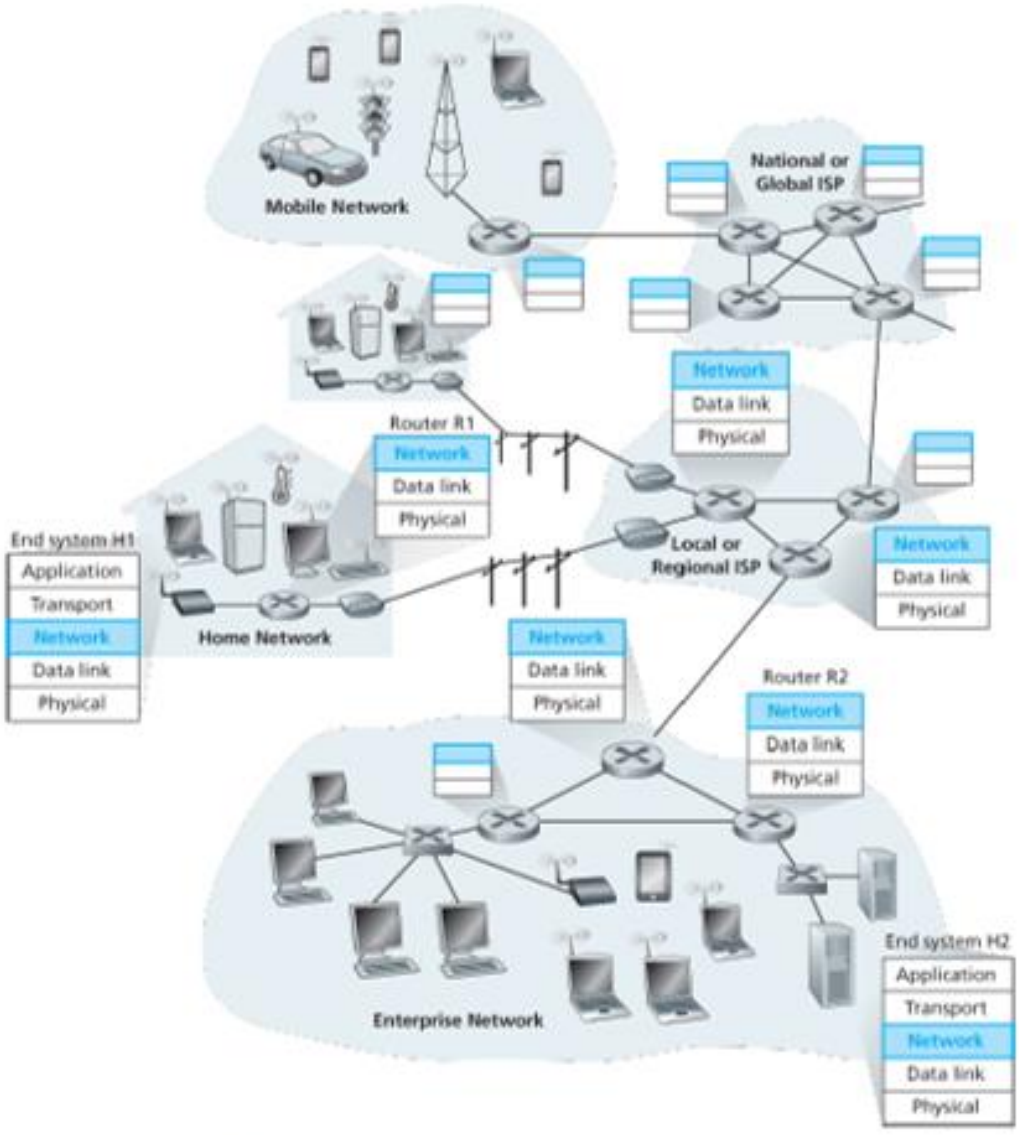

Figure 4.1 The network layer

The third SAT that I've used at the 36 IS is weighted ranking. There are many different variations of weighted ranking, but the one that we use is called the CARVER matrix. This acronym stands for Criticality, Accessibility, Recuperability, Vulnerability, Effect, and Recognizability Factors (US Army, 1991).

For each of the categories from the CARVER matrix, we will take all the components for an overall target system and apply weighted ranking (usually scored from 1 to 10 or 1 to 5) to

these components. Once a CARVER analysis is complete, we can then get a better sense of what components we need to prioritize and recommend for targeting or affecting during a mission or operation. The CARVER matrix is a great way to identify components that we may not inherently view as critical to an adversary's target system. However, CARVER analysis is a very time-consuming process and sometimes we don't always have the luxury of time to complete this thorough analysis to support ongoing operations. Again, my coursework at ODU in Cybersecurity Techniques and Operations (CYSE 301) during the spring 2025 and in Cybersecurity Policy and Strategy (CYSE 425W) helped prepare me for another one of my learning objectives: work towards turning critical vulnerabilities and key system relationships into objects to enrich the data. CYSE 301 taught me fundamental techniques on how to conduct penetration tests of computer networks and therefore identify more ways to find vulnerabilities in a target system. My coursework in CYSE 425W covered topics in risk management and helped to inform my perspective on how an adversary "plays defense". An adversary can only allocate limited cybersecurity resources to a given network for a nation's cyber infrastructure. Both courses enhanced my ability to apply weighted ranking methods such as CARVER to enrich the data.

There are many more SATs that 've learned and applied during my time with the 36 IS, but these are some of the more foundational and important SATs I've learned and mastered. I'd have to say the greatest utility I've identified from these SATs is how much they help my team to identify hidden pieces of information and challenge our own biases. The SATs are also an excellent way to "show our work" to our key leaders and decisionmakers when it's time to decide on what targets we want to action. Finally, SATs have been critical to making our analysis efficient and timely. Events are always changing and sometimes we don't have the ability to take weeks or months to analyze a problem set. Often, we have days or even hours to make our recommendations, and SATs have been invaluable in helping us to make these hard choices.

Describe the most motivating or exciting aspects of the internship.

I would have to say the most motivating aspects of the internship has been the opportunity to apply what I've learned at ODU in cybersecurity to conducting target systems analysis. Real world events overseas have meant many of the research and analysis I've conducted during my internship have directly informed operational planning and supported ongoing mission requirements. Again, for operational security reasons, I cannot point to specifics examples.

In addition, the US Constitution's First Amendment specifies that freedom of speech, religion, press, assembly, and petition are all rights guaranteed to every US citizen. These rights help form the bedrock principle that the US is a free country, but this freedom comes with a cost. There are state and non-state actors that refuse to recognize these rights for their own citizens and would also take these rights away from US citizens if given the chance. My service and internship with the 36 IS has given me the opportunity to help defend these rights for US citizens against our adversaries.

The dynamic nature of targeting analysis means that everyday has brought some new and unexpected problems for me and my team to help solve. Sometimes the answers have been easy to find but will require hours upon hours of solid research and communication with external partners to get the full picture. Other times the problems will go unsolved until a key piece of information is uncovered after several days of combing through data. These breakthroughs have been incredibly rewarding to experience.

Describe the most challenging aspects of the internship.

The most challenging aspect of the internship has been the long hours worked due to real-world events overseas and spending time away from my wife. I was not expecting to support 24/7 operations, but that is what has been required of me in my current role. These last several months have been very challenging on my mental and physical endurance, with 12 hour shifts at night being the norm. I'd be lying if I said this can't be a stressful environment, especially when warfighters' lives are on the line. Thankfully, I remind myself that I'm not alone in these efforts. I have an entire team behind me full of expertise and they're fully supportive of me and the mission.

Another challenging aspect of the internship has been how little of the work I've done can be shared with my peers and professors at ODU. Hopefully, I've been able to paint enough of a picture for them to grasp how much my coursework at ODU has enhanced my performance during my internship with the 36 IS.

Recommendations for future interns in this internship.

Intelligence Community Directive (ICD) 203 mandates both analytic standards and analytic tradecraft standards and is one of the key policy directives that informs my role as an intelligence analyst. JP 3-60 is also the targeting standard for the DoW. I would highly recommend any future interns within the DoW targeting enterprise read up and learn these doctrinal documents.

There is always more that we can do as targeting analysts, but sticking to a solid routine and making it as simple as possible can be highly effective. This helps to prevent burn-out and also manage expectations for the unit.

There is a common saying that flexibility is the key to air power, and being flexible is a soft skill I would highly recommend for anyone pursuing an internship in the DoW.

Conclusion

My analytic rigor during this internship has helped set the standard for how target analysis is being done to support current mission requirements at my unit. Our processes and methods are meant to be repeatable and replicable. This ensures that analysts at various levels of experience and expertise can execute this research with the proper training and guidance. I've also helped develop a template for our analysts to deliver their findings to decision-makers during briefings and working groups. This template has both written and visual components that complement each other and have been well received in support of ongoing mission requirements.

Overall, this internship with the 36 IS has been very successful and exciting. The analysis I am providing will assist in future planning to support contingency planning and training scenarios for real-world operations. My degree path at ODU will directly contribute to my future career as a DoW civilian. There are other positions more senior to mine that I will apply to, and my Bachelor of Science in cybersecurity makes me a stronger candidate for any potential positions I want to apply to going forward.

References

The Joint Staff. Joint Publication 3-60: Joint Targeting. U.S. Department of Defense, 28 Sept. 2018, www.esd.whs.mil/Portals/54/Documents/FOID/Reading%20Room/Joint_Staff/21-F-0520_JP_3-60_9-28-2018.pdf, Accessed 19 Apr. 2026.

Kurose, J. F., & Ross, K. W. (2017). Computer networking: A top-down approach (7th ed.). Pearson.

United States Air Force. Air Force Doctrine Publication 3-60: Targeting. U.S. Department of the Air Force, Nov. 2021, www.doctrine.af.mil/Portals/61/documents/AFDP_3-60/3-60-AFDP-TARGETING.pdf, Accessed 19 Apr. 2026.

U.S. Department of the Army. Appendix D: Target analysis process. Special operations forces intelligence and electronic warfare operations (FM 34-36), 1991, https://irp.fas.org/doddir/army/fm34-36/appd.htm, Accessed 19 Apr. 2026.

U.S. Defense Intelligence Agency. A Tradecraft Primer: Basic Structured Analytic Techniques. FOIA electronic reading room document (File ID 161442), Mar. 2008, https://www.dia.mil/FOIA/FOIA-Electronic-Reading-Room/FileId/161442/, Accessed 19 Apr. 2026.