

Amazon.com Delivery Options: Repaving the Last Mile
(Technical Paper)

U.S. Military Utilization of Video Games and Digital Media in the Modern Era
(STS Paper)

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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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Prospectus

Introduction

Video games have long captured the hearts and minds of almost every age group and have seen an increase in popularity in the last decade. Around 1980, the valuation for the arcade and console game industries at their peak was \$39B and \$20B respectively. In 2020, valuation for the mobile gaming market alone was \$85B, with the total video game market estimation being at \$165B (Wallach, 2020). As the games industry has evolved, so has its place in American society, becoming one of the main examples political and media personalities cite when asked about the cause of mass violence that occurs at the hands of young adults. While a divisive issue for some and an easy decision for others, there is one group that has long embraced the idea of violence in video games: the United States military. Since the beginning of video games' emergence into the societal spotlight, the U.S. military has put in a massive number of resources to utilize the video game medium to its advantage. From developing and publishing their own line of realistic combat games to shifting the way recruitment commercials portray modern warfare, the military has always seen opportunity where some have seen a point of criticism. In recent years, the various branches of the military have completely reinvented their recruiting process around the gamification of elements surrounding warfare. Such revitalized aspects include targeted ad campaigns, bonus incentives, and an overall de-emphasis on the realism associated with the U.S. military in general (Fadel & Morris, 2019). This reinvention is compounded by the shift in target recruitment demographic due to the multitude of paradigm shifts society experienced since the beginning of the Covid-19 pandemic, which was truly the catalyst that caused the U.S. military to change. The proposed STS project in this prospectus will further examine the military's gamification metamorphosis and how it has impacted society.

The second proposed project in this prospectus examines a different facet of society. Amazon.com and its associated services have had an unimaginable impact on the way consumers operate. As with any form of software, Amazon's retail website is in a constant state of metamorphosis to optimize the user experience. The project I completed over the course of my summer internship at Amazon was a small part of a whole wave of revitalization to the checkout functionalities of the site. While I was an intern, my project's scale far extended past the time of my role's expiration, serving to relieve severe pain points for my team and the checkout functionalities of Amazon.com as a whole. The technical project will address the process of creating and adopting this new checkout workflow in detail.

Technical Topic: Revitalizing Amazon.com's Delivery Options

The checkout page of Amazon.com is built on antiquated architecture due to the inefficient and illegible nature of the old codebase. Rebuilding the workflow architecture for the way in which delivery options were retrieved and rendered for the customer through various remote-render proprietary systems provided promising results. By compartmentalizing several operations into two distinct backend components of the new codebase, the process of generating eligible delivery options followed by retrieving the frontend structure for said delivery options was simplified. To accompany the separation of operations, it was imperative that new architecture was written in a malleable fashion, such that the code could easily be modified in the future. The project proved to be a success, as the old delivery option widget was switched with the newly remote-rendered widget without any difference to the end consumer. As the old architecture is phased out, the newly completed codebase can be further expanded upon by other Amazon teams.

My team is a small part of the category known as the Last Mile at Amazon—encapsulating any team working on the processes that must occur after a customer has added their desired items to their cart. I had the task of taking the lead on an effort that had been abandoned the summer prior due to time constraints. The problem is: How can we fundamentally change the architecture from which delivery options are retrieved and rendered such that it makes the old architecture obsolete? Even further, the nature of the problem required that the newly implemented workflow of rendering delivery options be completely seamless from the eyes of the customer. That is, the *only* visible difference in the site that the end-user should notice will be a decrease in page loading time. The opportunity to build the new workflow from the ground up for a part of the site that millions of people use every single day is an exciting prospect. From the beginning it was clear that I would need to approach this task with three tenets in mind—operational speed, adaptability, and logical flow.

Amazon teams own certain services that make up the larger retail site, with my team owning what we will call the Checkout Webapp. The workflow of my project is classified into three parts: retrieval of the proper delivery options, processing delivery option data, and rendering delivery options. Prior to the completion of my project, the retrieval and processing portions of the workflow were done on Amazon's old architecture. My solution began with handling delivery option retrieval in the Webapp, which required significant design considerations and retooling. The data processing aspect involved the integration of an entirely different service. Finally, the processed data was rendered from another service outside of Checkout Webapp such that my team had complete control of the content the end-user is presented. A final report detailing my design, implementation, and testing processes will go in depth onto each aspect of the project.

STS Topic: U.S. Military Utilization of Video Games

Research Question: How has the U.S. military utilized the popularity of video games and the gamification of modern warfare to influence recruitment?

“Violent video games” as a generalized game genre has existed since video games themselves have been around (Wallach, 2020). Violence in entertainment media sells, as on average American youth will witness 200,000 violent acts on television before age 18 (*Violence in the Media and Entertainment (Position Paper)*, n.d.). Video games are no exception, with the first controversial video game, “Death Race”, being pulled off store shelves in 1976, only five years after the very first arcade video game was released (“A Timeline of Video Game Controversies,” 2022). While many are aware of the popularity of violent video games in recent years, others may not know that the U.S. Army has an officially released game series of their own for almost two decades. On July 4th, 2002, the U.S. Army released their first game, *America’s Army: Recon* (“*America’s Army*,” 2022). The game was branded as a strategic communication device designed to allow Americans to virtually explore the Army at their own pace and allowed them to figure out if becoming a soldier suits their interests. The release marked the first large-scale use of game technology by the U.S. government as a platform for strategic communication and recruitment and was the first use of game technology in support of U.S. Army recruiting (“*America’s Army*,” 2022). The *America’s Army* series continued to grow, with three more major releases before the final game in the series, *America’s Army: Proving Grounds* (released on October 15, 2015) went offline in May of 2022 (*Steam*, 2022). While it is impossible to know the exact recruitment numbers generated by the series, it’s likely inspired thousands given the government support of the game for two decades. The most influential factor in *America’s Army* success is attributed to its unique business model not really seen in the

gaming industry around the early 2000s – the game was free to play, allowing all who had an internet connection to play (“How This Video Game Was One of the Best Army Recruiting Tools,” 2019). For a group with the target audience of young adults who are already interested in video games, the Army found remarkable success in building an active player base with a direct line of communication to the Army themselves.

As with all forms of warfare, the U.S. Military and its branches have been deeply tied in political discussion. Similarly, technology becomes more integrated into our society with the political conversations surrounding technological devices growing louder every day. It follows then that the military uses society’s link with technology for its own gain. Therefore, the STS theory I will be using to analyze this discussion is Political Technologies. The Political Technologies framework provides the opportunity to inspect various technological artifacts and discuss the internal or external factors which politically charge the artifact. For example, a park bench with elevated seat dividers could spark a political discussion surrounding whether the bench as a technological artifact makes a statement of anti-homelessness. A focused artifact via the framework could also be examined as a tool which introduces new aspects of political conversation into societal discussion. In that vein, the military aims to change the power relationship in society between themselves and their target recruitment demographic and thus the conversations surrounding the politics of violent video games. Furthermore, *America’s Army* alone aims to include the group of people who want to join or associate with the military, with little care for anyone outside of those groups. Of course, the military is not *forcing* anyone to view or play their products but playing their video game series specifically certainly conveys an enhancement to American freedom by empowering the army. As a framework, Political Technologies has some logical gaps, such as the argument that could be made for the politics

generated by a technological artifact being entirely subjective. Like politics themselves, Political Technologies exist on a spectrum and can thus be dramatically different (and consequently, viewed as better or worse) in the eyes of the user. To mitigate and account for these shortcomings of the framework, I will draw political conversations from all sides to try and completely capture the full story. I will also be sure to follow each subjective source with objective adjacent facts to ground the analysis in a more neutral manner. The most interesting lens to view this research topic is how the targeted groups of society interact with military-produced technologies even when the targeted group *knows and understands* their relationship with the military. Such a lens will allow for a unique utilization of the Political Technologies framework in which the politically subjected population has knowledge of what power they are facing.

Research Methods

To answer my research question, I will explore the military's past, present, and future interactions with the video game medium and what trends it has created on the military's recruiting abilities. To accomplish this research, I will use both primary and secondary sources, focusing mainly on documentary research. Firstly, I will establish the background required to establish the power relationship between the military and its target audience. I will be utilizing several books that go deeply into this topic and what the state of the recruitment field was like before the military used modern technologies. The research for providing the necessary background will consist of secondary sources from different viewpoints in order to craft a complete and unbiased glimpse into the complex power relationship. Secondly, I will be using testimonials from various developers of the *America's Army* games as to what specifically the game does to include only certain groups of people. These testimonials will be mostly primary

sources straight from peoples with close relationships to the creative design process of the *America's Army* games. Further, I will examine the online community that has been created around *America's Army*, and the community that has evolved alongside the army's differing recruitment tactics outside of *America's Army*. Since the online community is spread worldwide, I will need to search popular internet forums for specific keywords that associate members of the community with *America's Army*. To gather the academic papers and articles containing relevant statistics and observations, I will utilize the University of Virginia's massive library of digital academia portals. Keywords for this aspect of my research will include "military recruitment", "military gamification", "*America's Army*", "violent video games and war", with my top priorities for source selection being an evenly distributed collection of works from the time of video games' inception to the last few years.

Conclusion

The final deliverable for my capstone project is an overhauled back-end workflow for displaying delivery options to the end user on the retail website. The final deliverable for my STS project will be a thorough dissection of how the U.S. military has utilized video games to gain an upper hand on getting young adults to enlist. For my deliverable for Amazon.com, the result is expected to alleviate pain points for developers and provide for a faster experience for the end-user. My expected outcome for my STS project will be leaving the reader with a newfound perspective on the U.S. military, one that is rarely acknowledged whenever arguments about the ill effects of video games arise.

References (STS Research)

- A Timeline of Video Game Controversies. (2022, October 3). *National Coalition Against Censorship*. <https://ncac.org/resource/a-timeline-of-video-game-controversies>
- Allen, R. (2017). *America's Digital Army: Games at Work and War*. Nebraska.
<http://ebookcentral.proquest.com/lib/uva/detail.action?docID=4862204>
- American Military News (Director). (2019, November 11). *U.S. Army ad campaign, 'What's Your Warrior'—60 second version*. <https://www.youtube.com/watch?v=4KPBUdRufOE>
- America's Army*. (2022). In Wikipedia.
https://en.wikipedia.org/w/index.php?title=America%27s_Army&oldid=1116990790
- CNBC (Director). (2022, August 26). *Why The U.S. Military Faces A Growing Recruiting Crisis*.
<https://www.youtube.com/watch?v=H7S1Oweqto0>
- Del-Moral, M. E., & Rodríguez-González, C. (2020). War Video Games: Edu-communicative Platforms to Develop Critical Thinking against War? *Journal on Computing and Cultural Heritage*, 13(4), 1–13. <https://doi.org/10.1145/3404196>
- Fadel, L., & Morris, A. (2019, January 6). After Falling Short, U.S. Army Gets Creative With New Recruiting Strategy. *NPR*. <https://www.npr.org/2019/01/06/682608011/after-falling-short-u-s-army-gets-creative-with-new-recruiting-strategy>
- How this video game was one of the best Army recruiting tools. (2019, January 29). *We Are The Mighty*. <https://www.wearethemighty.com/mighty-gaming/americas-army-video-game/>
- Maradin, N. R. (2013). Militainment and mechatronics: Occultatio and the veil of science fiction cool in United States Air Force advertisements. *Ethics and Information Technology*, 15(2), 77–86. <https://doi.org/10.1007/s10676-013-9316-3>

Martino, J. (2021). *Drumbeat: New Media and the Radicalization and Militarization of Young People*. Routledge. <https://doi.org/10.4324/9781315173245>

NPR. (2010, March 2). “America’s Army” Blurs Virtual War, “Militainment.” *NPR*.
<https://www.npr.org/2010/03/02/124216122/americas-army-blurs-virtual-war-militainment>

Payne, M. T. (2016). *Playing War: Military Video Games After 9/11*. New York University Press. <http://ebookcentral.proquest.com/lib/uva/detail.action?docID=4098436>

Resolution on Violent Video Games. (n.d.). 3.

Riocampo, S. L. (2019). Virtual Interactive System Based on Gamification for Basic Military Training in the Area of Management of Weapons. *2019 International Conference on Virtual Reality and Visualization (ICVRV)*, 167–171.
<https://doi.org/10.1109/ICVRV47840.2019.00039>

Steam: America’s Army: Proving Grounds :: Hotfix Notes 5.3.22. (2022, May 3).
<https://store.steampowered.com/news/app/203290/view/3218394923829002227>

Violence in the Media and Entertainment (Position Paper). (n.d.). Retrieved December 5, 2022, from <https://www.aafp.org/about/policies/all/violence-media-entertainment.html>

Wallach, O. (2020, November 23). *50 Years of Gaming History, by Revenue Stream (1970-2020)*. Visual Capitalist. <https://www.visualcapitalist.com/50-years-gaming-history-revenue-stream/>

Widener, L. (2019, November 11). (Video) Here is the U.S. Army’s brand new national ad campaign, “What’s Your Warrior?” *American Military News*.
<https://americanmilitarynews.com/2019/11/video-here-is-the-u-s-armys-brand-new-national-ad-campaign-whats-your-warrior/>

References (Capstone)

Blog | Ex-Amazon IT manager shares how they migrated from a monolith to SOA - Toro Cloud.

(n.d.). Retrieved October 30, 2022, from <https://www.torocloud.com/blog/amazon-monolith-to-soa-migration>

Why Amazon Retail Went to a Service Oriented Architecture—High Scalability -. (n.d.).

Retrieved October 30, 2022, from <http://highscalability.com/blog/2016/7/13/why-amazon-retail-went-to-a-service-oriented-architecture.html>