

## **Thesis Project Portfolio**

### **Web Application Development: Outsourcing Software Engineering to Improve Outdated Government Applications**

(Technical Report)

### **How the History of American Intervention in Latin America has Impacted the Agriculture Sector of Guatemala**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science  
University of Virginia • Charlottesville, Virginia

In Fulfillment of the Requirements for the Degree  
Bachelor of Science, School of Engineering

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Spring, 2022

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## **Sociotechnical Synthesis**

Civilian involvement with the military exists and has existed in many forms and for a very long time. For the technical project, I worked as a civilian for a company contracted by the military to complete a necessary tool. The research on the history of American involvement within Guatemala could not have been done by large corporations alone. The goal of completing a deep dive into the history of interference in Guatemala and the effects it had on present-day Guatemala is to highlight the negative outcomes of technical fixes chosen by American corporations and governments. The agriculture sector in Guatemala can serve as a case study for similar future endeavors. The primary objective of completing the internship experience with Expression Networks was to gain first-hand experience as a software engineer and apply those skills to future employment.

Over the summer of 2020, I completed an internship as a software developer intern at Expression networks. Expression Networks is a government contracting company and the team I was a part of worked primarily on creating a web application based off of legacy code of a preexisting government application. Throughout the 12 week learning experience I was able to gain valuable skills that would be transferable to the workplace once I established my career. The team of 6 worked using the agile methodology to separate the workload needed to be completed into two week sections of progress, or sprints. By my completion of the internship, I was able to improve my general output over a fixed time as well as increasingly tackle more difficult tasks which I would code and take individual lead on. The primary motivating factor for working as an intern was to be able to improve on my technical skills as well as my team working skills in a more technical setting, both of which I was able to achieve. By my completion date, I was able to add important features necessary for the upcoming version release and received overall positive

feedback for my contributions to the team. The application would ultimately be used by the military as a crucial online reporting system.

Banana Republic is more than just a catchy name for a clothing store, the name hides behind it a reality worthy of an award-winning movie full of blood and betrayal. The history behind American globalization and what expansion entails is explored by detailing the existence of the United Fruit Company and its influence in Guatemala. From this history, the outcome and impacts had on Guatemalan agriculture are able to be explored with an appropriate context. Guatemala as a whole, including the people, is analyzed to tackle the complexities between the Guatemalan-American relationship. Possible solutions to the issue involving Guatemalan agriculture and the role the United States has been playing within the country are analyzed using wicked problem framing. The impact intervention has had on small farmers is considered further to highlight the disparities within the country. Current issues like immigration and their connections to past decisions are exemplified as negative outcomes of the solutions which were ultimately chosen to solve various wicked problems. The network built between both countries and all the actors involved had problems and solutions for those problems, in order to reach a goal. Whether the goal was profit for big corporations or subsistence for family members, each actor involved had their own interests to protect. Exploring these issues will allow more foresight into how applying certain short term benefits might not always lead to long term benefits, especially when considering issues that can be deemed wicked problems. Engineers and scientists are often the people who are tasked with providing solutions, therefore knowledge of past decisions and their impacts can help yield better results, specifically within agriculture and globalization in Latin America.

Completing both projects exemplifies that not everything is done with malicious intent and that there are often valid reasons for groups or individuals to do certain things, although consequences for those actions should still be considered more deeply. Many interns might work for a company which they do not know much about, but who can go as far as having a lasting effect on an entire country. Therefore, engineers and scientists in charge of creating a better future must really consider who they are working for and in general what contributions to society they are a part of. The experience of performing research on American intervention and completing an internship working primarily for the American government shows that many of the opportunities someone might be involved in can be a wicked problem. Doing the internship independently would have not led to me being more cognizant of which company I would be okay with being employed at. Completing the research on its own would also not put into perspective just how easy and mindlessly it is to end up working at a place that could be having a negative impact somewhere in the world. Engineers are often just trying to create an innovation that could change the world or complete a job without having to consider too deeply the profound effects that could occur. The research on Guatemala details how actors, most of whom are not engineers, are able to create a network strong enough to completely change the path of many individuals across a whole industry.