

# **Thesis Project Portfolio**

## **Software Engineering: Custom Date-Picker Component**

(Technical Report)

## **Venezuela's Socio-Political Dynamics: Rethinking Oil Dependency for Economic Resilience**

(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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## **Table of Contents**

Sociotechnical Synthesis

Software Engineering: Custom Date-Picker Component

Venezuela's Socio-Political Dynamics: Rethinking Oil Dependency for Economic Resilience

Prospectus

## **Sociotechnical Synthesis**

(Executive Summary)

### *The Shaping of History by Government and Technology*

The interplay between technology and government is not new and technology has always played a part in U.S. politics, beginning with televised speeches beginning in the 1940s. In the 21<sup>st</sup> century, technology has taken the form of entire campaigns being launched on YouTube, but now it is slowly shifting in its role in connecting constituents to government. For my technical project, I worked on a software that increases the accessibility of local and state government. From this experience, I gained an interest in how technology impacts governments and thus shapes societies. Additionally, I have family from Venezuela and knew of their controversial political climate, consisting of an illegitimate president and subsequent rampant protests, which made me interested to see how technology played a role in the country's current state. As such, my STS research examines the relationship between Venezuela's political institution and the oil industry under the backdrop of the current climate.

For the technical portion of my thesis, I detailed my work as a software engineer intern for a company that produces government software. The software increases the transparency and accountability of governments and fosters a closer connection between constituents and their governments by making data accessible via the cloud. Specifically, the product I contributed to during my internship allowed government officials to create customized forms and constituents to fill them out and receive direct feedback on an online portal. I coded custom components, such as a date-picker. Features of the date-picker included date input with a button that launched a

keyboard-accessible pop-up calendar. This component was a substantial undertaking that taught me a lot about computer science principles and coding decisions. As a result of my work, the date-picker component was integrated into additional products and eventually became company-wide.

In my STS research, I examined the connection between Venezuela's political institution and its oil industry. I found interest in Venezuela specifically because of my familial connection, wherein my great uncle raised his family there, but has immigrated to the U.S. in recent years due to the danger associated with the political climate. Initially, my prospectus aimed at finding a connection between technology and trust in government; I wanted to see how increased use of technology in government could positively impact Venezuela. However, as I conducted my research, I found more evidence that technology is not a universal remedy, with Sarewitz and Nelson demonstrating that "not all problems will yield to technology" (2008), and Venezuela is a clear example of this. As Venezuela's primary economic driver, the oil industry has a pertinent role in the country's history, and as a complex sociotechnical system, it has impacted society as a whole. In my subsequent research, I aimed to get a comprehensive overview of the country's political history and compare it with the timeline of the oil industry. In contrast to my original thesis, it became clear to me that a better solution would be a decreased reliance on the oil industry, as a negative correlation to the autocracy of the political institution can be made.

While my technical project encapsulates a very specific use of technology in government, my STS research analyzes a much more complex technological system in the context of an entire country's history. Together, my thesis emphasizes the narrow and broad implications of technology on society and government and politics specifically. Through the Sociotechnical Systems Theory, I was able to consider both the human and non-human entities, such as

politicians and policies, respectively, and how they form a symbiotic relationship that enacts change in society. By considering these diverse elements, it is possible to gain a greater understanding of how technology and technological systems shape society and to a greater effect, history itself.