

Thesis Project Portfolio

Improving Student Health Through Digital Therapeutics Applications

(Technical Report)

Using Firefighting in the United States as a Case Study for Technical and Social Cooperation

(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, 2020

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Sociotechnical Synthesis

Both my technical and my STS projects involved the supporting mechanisms critical to volunteer fire departments. My technical project consisted of designing personnel management software which could aid in the overall organization and scheduling of a regular volunteer fire department. The STS aspect of my project was primarily concerned with using volunteer fire departments as a useful case study to explore and understand the relationship between the technical and social components of a volunteer firefighting organization.

Within the confines of the United States alone, there has been a notable drop in the number of volunteer firefighters. Since these volunteer departments and their volunteers play such an important role in communities across the US, this was the primary concern that both my technical and STS projects attempted to address. In order to properly analyze the apparent lack of interest in such a large and decentralized volunteer organization, this project had to pivot from the typical challenges that firefighters face (such as physical harm and unusual schedules) to the challenges that are more unique to volunteering. What behooved me to pursue this in particular was an incident where a friend, being a professional firefighter, had to work several weekends in a row. Such schedules are difficult for even the most determined professional to keep, and even more so for those who volunteer their time.

Though volunteers are widely praised for their actions and often will get a sympathetic ear when they mention their part-time occupation, the challenges they face are on both an economic and a time-management front. My STS research project puts forward an analysis of this issue, and how this difficulty meshes with the socio-technical network which both volunteer and paid firefighters find themselves in. However, as is often the case, in order to gain a better

understanding at a particular level, the practice of taking a look at the larger picture proved to be useful. Drawing on a large quantity of evidence from organizations around the world, my STS research project indicated that to a large degree, volunteer departments need a healthy amount of support from centralized agencies that also ensure balance between the numbers of volunteer and paid departments.

At the local level, volunteer fire departments often suffer from a lack of centralization and a continual less-is-more approach to management. Such approaches can lead to a laissez-faire department where volunteers are forced to exhibit much initiative. However, it can also lead to a strict dictatorship on the part of the local scheduling officer, straining the responsibilities of a single administrative role. My technical project aimed to rectify this by providing general personnel management software designed particularly for clarity and accountability within the department. While most professional departments and even some volunteer departments already utilized similar software, there was a lack of development when it came to the particular needs of the necessarily decentralized volunteer department. The result was a lightweight but adaptable software which gave those organizing volunteer departments significant flexibility and gave volunteers a high degree of visibility into an otherwise opaque system.

The selection of my STS project and my technical project was highly intentional, as both feed into the regularly overlooked plight of volunteer firefighters. While the challenges that face these volunteers on a daily basis are not likely to ever disappear overnight, it is necessary for a greater amount of understanding and cooperation to exist between the public and volunteers. A unanimous result of these projects has been an indication that the apparently simple decrease in volunteer firefighters is due to a combination of factors. Only a comprehensive effort on the part

of local and worldwide communities will ensure that this keystone of the community will not slowly fade away.