

# **Thesis Project Portfolio**

## **Powershare App Development Technical Report**

(Technical Report)

## **Comparison of Open-Source Software Release and Civic Hackathon Organizational Structures regarding Sustainability Factors**

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science

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Bachelor of Science, School of Engineering

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## **Sociotechnical Synthesis**

Civic technologies are information and communications technologies that connect citizens to other citizens and to public administrative bodies. For the technical project, my team and I developed a mobile application civic technology that enabled suggesting and sharing feedback with local elected officials based on citizens' residence locations. My STS research focused on drawing analogies between actors in organizational structures surrounding civic hackathons and open source software releases to assess the distribution of responsibilities' effect on sustainable hackathon outcomes.

During the technical project, an external stakeholder requested an application that allows citizens to submit and promote suggestions to their elected local representatives. The primary challenges were adequately translating the project requirements into actionable specifications, designing an extensible system, and creating a mobile interface that integrated with a cloud-based database and geolocation services. The team demonstrated proficiency in performing the stages of the software development lifecycle using an agile scrum software development methodology and presented a minimum viable product to the customer.

Despite the potential of civic technologies to drastically improve civic engagement, community engagement, and connect communities, most civic technologies have failed to be adopted by the public sector. My STS research uses open source software research as a foundation for examining an improper balance of responsibilities among hackathon actors. Using analogies to compare different roles within each organizational structure revealed that hackathon team members have too many responsibilities to execute within the short time frame of hackathons, and that hackathon organizers are best suited to redistribute the roles to other actors in order to improve civic hackathon sustainability outcomes.

My STS and technical research projects together demonstrate the challenges and benefits of pursuing civic technologies. They investigate and demonstrate how civic technologies can be developed in various software development environments. Additionally, they emphasize the importance of creating software products based on the real needs of stakeholders. I'd like to provide special acknowledgement to Kathryn Neeley, an associate professor of STS in the Department of Engineering and Society at the University of Virginia, for supporting me while writing this thesis.