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### Socio-technical Synthesis: Utilitarian Strategic Planning for Maritime Ports

My technical work and STS research paper are intertwined by the concept of economic efficiency. Economic efficiency is the concept that free exchanges are done and choices are made in a way that maximizes the value created in an economy. This concept is a key component in both my technical project and STS research paper. My technical project and research paper are different in how each discuss economic efficiency and utilitarian planning. My technical project explores opportunities for long term investment by the Port of Virginia and is utilitarian in that there are many stakeholders trying to maximize economic efficiency while representing the commonwealth, the maritime industry, and the nation. My research paper still has a focus on utilitarian systems, but is narrowed to the autonomous vehicle market and automobile consumers. Although both projects discuss economic efficiency differently, the theme of utilitarian values is consistently present.

My technical work is about finding long term investment opportunities and business strategies for the Port of Virginia that will increase port profitability, while also allowing the port to remain compliant with various government and quasi-government organizations. Throughout the semester, my capstone team did research on global ports that are leading in the implementation of new maritime technologies. My team compiled this research and determined recommendations to the Port of Virginia that were presented to the client on a monthly basis. The recommendations that my team made had an emphasis on maximizing sustainability, maximizing container throughput volume, and minimizing machine downtime at the port. The recommendations made by my team will be given to the executive team of the port with the goal

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of explaining best practices in the global port industry. My team hopes to aid the port in making sustainable and economically efficient decisions.

My STS research paper also highlights economic efficiency, but in a different way. My research paper discusses the first fatal accident involving an autonomous vehicle in the United States. My research paper uses a utilitarian lens to explore the impacts of decisions made by different actors which were either directly or tangentially involved in the accident. Jeremy Bentham's utilitarian framework is used to argue that Uber and Volvo are ethically justified in the way that they contributed to the accident while the supervising driver of the autonomous vehicle is the most unethical actor. The goal of my research paper is to bring discussion of the autonomous vehicle industry into a utilitarian frame and to drive that discussion toward the implications of using utilitarian ethics in the rapidly evolving technologies of autonomous vehicles.

Doing both of these projects at the same time was beneficial as both projects had a relation to autonomous and semi-autonomous vehicles. The work on my technical project included geographical information systems and autonomous trucking route platforms. Researching these two subtopics significantly improved my knowledge of how autonomous vehicles work, which helped me to write a more informed analysis in my STS research paper. Developing the analysis section in my STS research paper also impacted my recommendations to the port about how the port should monitor autonomous vehicles and how the port should still include human operators for machines even if the machines are very unlikely to fail. In conclusion, working on my technical project and STS research paper simultaneously enabled me to get a fuller view of economic efficiency as each project helped me to create the other.

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