Thesis Project Portfolio

THE FUTURE OF A MASTER'S IN SYSTEMS ENGINEERING
(Technical Report)

FINANCIAL AID EQUITY IN PROFESSIONAL EDUCATION
(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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Sociotechnical Synthesis

My capstone project for this technical focus is to define the current state of Systems Engineering (SE) education and propose a revised curriulumn for its future, via a Master's Degree in Systems Engineering. The problem addressed with this is the overall lack of innovation that SE education undergoes amidst its rapidly developing industry applications. SE is trapped by definitions from the 1980s and early 2000s, where many of them have since been replaced by big data analytics, automation, decision aided modeling software, increased cultural advocacy, and a holistic technology redirection. This Master's Degree in Systems Engineering will bring core Systems concepts together with entreprenuerial thinking, innovation-based iterating, social awareness, hybrid learning structures, and an intentional balance between academic professing and robust recounts from industry experts. With such a powerful degree, the human and social dimensions for the future of SE must be understood, as well. This is because SE is called upon to direct the future of technology and business intersections, so without a clear, innovative, and empathic foundation for problem solving, there is little hope at making large changes to the systemic structures facing against our human world. An Actor Network theory of analysis plays a monumental role in indentifying revisions for the future of SE education considering many of the influencers studied are humans, academic content, learning delivery methods, and other intangible features of Master's education.

My STS research involves a literature review study on financial aid distribution methods and to what extent they are truly equitable. This research uses an Ethics of Care framework of analysis to understand the implications of systematic financial distribution systems, cultural pressures in the face of such large amounts of money, and where empathy is needed in the process of allocating financial aid to be most equitable. The expectation is that shortcomings in

the financial aid office environment will be identified, with the prediction that many shortcomings involve decision making in a vacuum setting, where financial aid officer expertise is too narrow or selective to understand the communities it attempts to serve. Implications of financial efficacy are also expected to surface in this research as much of the systemic problem identification has roots in middle and high school economics education, and in childhood households.

A Master's Degree in SE and the ability for its program to offer equitable financial aid is a balance natural to one another. Optimizating for such a versatile new deree program can alter the future of the technology and business landscape dramatically. By ensuring such a program is truly accessible to all who are interested in professional and socio-financial mobility is all the more promising for an equitable and systemically-sound world.