

Thesis Project Portfolio

IT Learning Management System: A Digital Test-Taking System to Improve Conceptual IT Knowledge

(Technical Report)

The Geopolitics of Sociotechnical Systems: America's Digital Colonialism and China's Isolated Internet

(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
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In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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Sociotechnical Synthesis

Modern human society has been transformed by digital technologies as they continue to become more integrated into daily life. The computing power of these technologies provide opportunities for software developers to create more efficient solutions to the problems of end users. Database systems are able to easily store large amounts of user statistics, which can then be used to help end users track progress and inform effective decision-making on how best to solve their problems. Human society has also become increasingly more globalized and connected as a result of the popularization of the internet. Such connectivity has also opened up additional avenues for dominant technological powers to exert their influence onto weaker nations.

The technical thesis documents the development of an online, database-driven, test-taking system titled the Information Technology Learning Management System (IT LMS). The IT LMS's goal was to provide software developers with a forum to test themselves on IT concepts so that they could effectively maintain a knowledge base. The thesis covers the design philosophy of the project, before diving in-to the technical aspects of the system's implementation, including backend database and user interface design. The project successfully utilized the power of databases to store user metrics in order to help users track their progress and identify areas for improvement, illustrating the additional functionality software solutions can enjoy by harnessing the storage and computational power of information technologies.

The STS thesis explores how control over digital technologies allows countries to better exert their influence on the global stage. The thesis analyzes the internet of the United States, and the methods in which it uses its dominance over global telecommunications technologies and internet platforms in order to punish or influence foreign countries. The paper then pivots into a

look at the internet of the U.S.'s foremost geopolitical rival, China, and how its isolated internet design allows it to maintain technological sovereignty. The research illuminated how digital technologies have been used to support imperialistic goals, contextualizing why certain countries outside of the imperial core implement a restrictive internet design.

Both projects gave me great insight into the applications of information technologies. The technical project allowed me to appreciate the capabilities of databases, while providing me with a greater understanding of how software is created in the private sector. The STS research allowed me to explore the politics of control behind these information technologies and taught me the various methods in which a digitized society can be exploited in order to further imperialist goals.