Thesis Portfolio

Employing Predictive Trend Analysis to Decrease Construction Schedule Delay
(Technical Report)

Cultural and Political Risks in International Construction Projects
(STS Research Paper)

An Undergraduate Thesis

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Diyar Rashid
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Department of Civil Engineering

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Sociotechnical Synthesis

In a globalized world, more construction companies are looking towards global markets to expand their portfolios, with "international revenue of the top 225 contractors [growing] from $106.5 billion in 2001 to $453.02 in 2011" (Kadry, Osman, & Georgy, 2016). With increased involvement of construction within international communities, there will be new uncertainties and risks that have not been encountered in domestic construction. An identified risk for international construction projects is a host country's political uncertainty (Maemura, Kim, & Ozawa, 2018). Political risk studies have been carried out since the 1980s, but these studies have not identified or addressed the root causes of political risks (Maemura, Kim, & Ozawa, 2018). Understanding the root causes of political risks will allow for better management of these risks. Less commonly identified in formal analysis are cultural issues, ranging from language and communication problems, to the contextual environment of the region (Chan & Tse, 2003). The stakeholders involved in construction projects are primarily contractors, subcontractors, and suppliers of materials and components (Tijhuis & Fellows, 2011). As a project's size increases, complexities increase due to technical inclusions, more diverse stakeholders, and scale (Tijhuis & Fellows, 2011). Project complexities are especially difficult to manage within the context of international projects, where several parties of different nationalities need to avoid conflicts relating to laws, regulations, contracts, and jurisdictional problems (Gad & Shane, 2017). This STS research paper will develop a deeper understanding of political and cultural risks through literature review and case studies from Nigeria and Egypt to reduce project schedule delays and disruptions. One benefit of understanding of these nuances can help with the selection of a proper dispute-resolution method clause in a contract (Gad & Shane, 2017).

While the focus of international construction improvements relies on the consideration of broader societal factors, domestic construction companies can reduce and prevent construction delays by focusing on technical factors, such as data analytics. Large projects typically take 20% longer to finish than scheduled and are up to 80% over budget (Agarwal, Chandrasekaran, & Sridhar, 2019). A Virginia-based construction firm, Hourigan, has provided data from multiple medium-large size construction projects. The following technical report will apply predictive trend analysis to the given data will allow for identification of which activities and change orders drove delays and cost overruns, analysis of impacts on specific subcontractors and interim milestones, and an understanding of where projects went wrong, who was responsible, and how well the schedules were built. The final technical report consisting of meaningful analytics and useful insight will help Hourigan manage, avoid, and overcome future challenges related to overruns, delays, and project risk issues.

The relationship between the STS research paper and technical report is a common goal of reducing schedule delays and cost overruns for construction contractors. What has been learned from the STS research paper and technical report is that while some risks can be reduced, there will never be a complete elimination of risk in construction, even when proper solutions are put into use.

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