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“There is sometimes considerable skepticism in the value of applying systems engineering methods to ITS projects”



Rob Jaffe assesses the role of SE in developing ITS projects

Systems Engineering (SE) is a formal set of processes that works with traditional project management to identify defects in the various stages of design and construction soon after the defects are created, when the defects are still inexpensive to repair. In this way projects should avoid the risks of schedule and cost overruns and/or avoid the risk of not meeting/providing some (or all) the needs/services originally intended for the project. SE is most valuable where projects have inherent risks of complexity that challenge the skills of those implementing the projects (or where stakeholders are unsure in some ways of what they want). The fundamental idea of SE is that if you detect a defect late in the project, the defect then either costs extra money and/or time to fix, or if uncorrected the defect results in a project that doesn't work as originally intended.

Considerable emphasis and resources are invested in the application of SE to ITS projects in the United States through formal policies of the USDOT that flow down to the states and regions. Furthermore these policies have been adopted and adapted in many other countries worldwide. While there has been considerable research documenting the benefits of SE in the defense and IT sectors, there is little specific data to support the policy for ITS

projects, although it's not a big stretch of the imagination to see that ITS projects may have a lot in common with those in the IT and defense spheres. After all, one definition of ITS is “the application of computers and data communications to surface transportation.”

In my experience developing many regional and national ITS architectures, as well as training ITS project sponsors, project managers and project stakeholders in SE methods, there is sometimes

To undertake this research project IRF member volunteers will interview willing former project sponsors or managers to collect information about specific ITS projects that they are very familiar with. In these interviews we will collect basic information about the type of ITS project (user services intended to be provided by the project), the level and type of risks in the project, the level of resources and schedule planned for the project and the actual resources and schedule

interviewees, and results will be reported in aggregate. We hope over time to collect data for a variety of SE investments in ITS projects so that we can measure the correlation (if any) on cost/schedule overrun and final project quality as a function of investment in SE for projects with a variety of risks.

To begin this project, we invite experienced ITS project sponsors or managers, or those familiar with specific ITS projects, to visit myself or my senior technical staff at the

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considerable skepticism in the value of applying SE methods to ITS projects.


The International Road Federation – Washington Program Center's ITS Committee has discussed this challenge and has agreed to undertake a project to assess the value of SE applied to ITS projects with respect to 1) the impact on cost/schedule overrun for a given level of SE effort relative to the total project cost; and 2) the impact on final project quality (assessed by the extent to which the ITS project meets the original needs intended) for a given level of SE effort relative to the total project cost.


consumed by the project as well as the success or failure (or something in between) of the final ITS project with regard to providing the originally intended services.


A basic tenet of this research project is that all results will be reported without identifying specific projects or


ConSysTec booth (1872) at the ITS World Congress where we can either interview you there and then, or schedule a face-to-face or telephone interview at a convenient time. Interviews should take about 30 minutes. Volunteers will be the first to see the results of this research project. ☺

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