SPACE SYSTEMS SYMPOSIUM (D1)
System Engineering Tools, Processes & Training (I) (3)

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RISK MATRICES AND MEGA PROJECT

Abstract

To convey risk in an easily understandable manner, many organizations and projects have come to employ risk matrices that display risk via a grid that displays risk as a function of likelihood of occurrence and consequence if it does occur. However, this is a static representation. Risks change over the lifetime of the project and yet this is seldom tracked with enough fidelity to determine if the overall project risk is increasing, decreasing, or staying the same. In addition, the risk matrices chosen can often present a misleading view of the risk. Therefore, without careful consideration and preparation, these risk matrices could be misleading. In this paper, we evaluate several NASA projects from the mid 1990's up to present that have both risk programs and cost data to determine the following; 1. Are project consequences and probabilities independent? If the two are independent then it will be possible to evaluate errors more clearly 2. Does actual cost performance over time correlate to the risk posture of the project? If so, it will be possible to utilize the cost data as a surrogate for the overall risk that the project experienced. 3. Are there factors related to the ignorance associated with irrelevance (risk items that the project will not assess because they are taboo or considered irrelevant). These can be considered as an apriori error term in the cost analysis that must be handled separately. Given the above, it should be possible to identify the level of uncertainty a project can expect at various phases, an assessment of errors due to 'ignorance', the type of distribution most likely to be experienced for each risk and the biases and possible factors that should be considered when assessing risk elements. We provide some initial attempts.