

On the Valid Comparison of Systems Engineering Approaches

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Abstract. There is no doubt that systems have become more complex and therefore increasingly more difficult to design—massive cost overruns and delays are common-place. It has also become common to place the failure of such system developments at the feet of what is often disparagingly referred to as the ‘traditional’ systems engineering approach. The inference from proponents of ‘modern’ approaches such as model-based design and value-based (driven) design is that adoption of such practices will avoid the failures associated with ‘traditional’ requirements-driven approaches. Unfortunately the problems associated with complex developments cannot be addressed so simplistically. While continued effort is certainly required to refine and develop tools and techniques to complement and enhance those used within a systems engineering framework, systems engineering approaches (traditional or otherwise) are not the reason why large complex systems take far longer to develop and cost far more than is originally estimated. Before making any valid comparison of systems-engineering tools or techniques, therefore, it is useful to examine what relationship such tools and techniques actually have to project failure. As with any systems development, the principal risks are at the interfaces—which, in this case, are largely beyond the reach of any systems engineering approach.