

Specifying Affordability

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Abstract. Improving design methods for affordability has become a necessity in the DOD. The concept of affordability can seem straightforward. The difficulty arises when an attempt is made to specify and quantify the affordability of a system. This is significant when writing a specification or when comparing two affordable solutions to conduct an affordability trade study or award a contract based on affordability. This paper examines affordability, its contextual dependence and suggests a method for specifying affordability. We start from a Department of Defense (DoD) perspective because of the large amount of effort expended by DoD and its support contractors in trying to resolve these problems. All of the DoD affordability activities performed during system development have direct analogues in non-DoD environments. The foundation for this paper is the DoD and commercial definitions of affordability, as well as, the Dr. Ashton Carter's, Undersecretary of Defense for Acquisition, Technology, and Logistics (ATL), affordability directives which formed the basis for the DoD thrust into this area. Using this as a basis, it is shown that: 1) affordability is dependent on the context in which it is evaluated with a distinction being made between Program and System affordability; and 2) affordability must be evaluated over the entire life cycle of the System of Interest (i.e., both the Primary System and the Enabling System). From this foundation a method of specifying affordability is derived and a specification resulting from this method is shown to: 1) support affordability comparisons between two systems; and 2) fit affordability trades into the standard trade study framework. Thus, it is demonstrated that affordability is not just an abstract concept but has real applicability in the development and life of systems and must be incorporated into Systems Engineering.