

A Framework for Harmonizing Systems Engineering and Off-The-Shelf Procurement Processes

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Abstract. Systems engineering, as a discipline, has been utilized since the middle of the twentieth century to successfully execute numerous complex system developments. Many of the practices and standards utilized are perceived as being biased towards new development systems. With the changing imperative to deliver _to market_ quicker and cheaper, many programs are placing a higher reliance on the use of Off-The-Shelf (OTS) components in the final system solution. Integrating this strategy into traditional systems engineering practices has led to challenges in the past. This paper describes a framework successfully utilized on the Royal Australian Navy (RAN) Air Warfare Destroyer (AWD) Program to integrate an OTS procurement strategy into a System Architecting and System Engineering environment. The framework highlights the benefits of integrating the stakeholder, System Architect, Systems Engineering and Program Management communities to form a _collaboration_ to jointly work to rapidly ameliorate risk in the early phases of the program. Latent gaps between input needs and the emergent OTS capabilities are concurrently analyzed and the Technical Integrity Risk successively estimated. System architecting methodologies are employed to help hide unnecessary detail in the early concept definition phase to help support rapid alternate _trial_ architectures to be effectively analyzed from a total risk point of view. The use of this risk based strategy from early program inception provides the mechanism to manage and minimize risk and in addition, predict the confidence in program success.