
PREFACE

The costs of military aircraft are coming under increasing scrutiny in the post–Cold War threat environment because of the decreasing size of the budgets of the military departments, particularly the procurement portions of these budgets. As part of this focus, the Department of Defense (DoD) established a number of studies and cost reduction initiatives during the 1990s to control or reduce the cost of the weapon systems planned, under development, or in production. Under the umbrella of the concept of “Acquisition Reform,” such initiatives as Cost as an Independent Variable (CAIV), the Lean Aerospace Initiative (LAI), and the use of integrated product teams (IPTs) were established.

At the same time, manufacturers claimed that the package of new tools and techniques known as “lean production” would enable them to produce new weapons systems at costs below those predicted by historical cost estimating models. Lean production is a manufacturing system deriving from the Japanese Toyota automobile production model, where closely coupled manufacturing systems characterized by very low inventory and first-time quality remove much of the non-value-added work. The application of “lean” as a descriptor of manufacturing activities has many interpretations and varies somewhat from organization to organization. Generally, lean production involves a reconceptualization of the entire production process as a closely interconnected system from which buffers are removed. All the different activities that are part of the production process must be carefully coordinated to maximize the benefits of lean production. The associated organizational and coordination requirements make implementing lean production a

difficult and complex endeavor. Liker and Wu (2000) define “lean” as “a philosophy of manufacturing that focuses on delivering the highest-quality product at the lowest cost and on time.” A systematic and continuing search for non-value-added activities and sources of waste concentrates the focus on quality and cost. New tools and techniques are incorporated as part of the continual effort to cut costs and improve quality and to enable reduced inventories and other lean practices.

As part of the increased scrutiny of costs, DoD decisionmakers began insisting on better forecasts of weapon systems costs, so cost growth could be minimized. However, DoD cost estimators faced the task of how to assess the impacts of both of these phenomena in their estimates for future aircraft systems. Many of the DoD decisionmakers and some professional cost analysts believed that use of historical cost data as the basis for estimates of future systems was analogous to “trying to drive a car while looking through the rear view mirror.” The basic questions were whether the historically derived cost estimating methodologies should be modified and, if so, how to do it.

This report (one of a series on estimating future aircraft costs) was undertaken in Project AIR FORCE’s Resource Management Program for the Assistant Secretary of the Air Force (Acquisition) to determine whether current cost estimating tools for new aircraft could be adjusted to account for lean production impacts. It should be of interest to all DoD acquisition personnel. It assesses the extent of lean implementation in the military aircraft industry and claims of savings and offers insights and issues for the government cost estimators to consider when incorporating new production processes into aircraft cost estimates.

Project AIR FORCE

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