Lesson Proper for Week 3

INTRODUCTION

The system/subsystem requirements reviewed by program and project personnel ensure accurate and complete understanding of the restrictions of systems design and applied work products. If program or project plans include reusable software interfaces; requirements are identified and evaluated for use. The term *reusable software* is commonly used in military and aerospace programs or projects. External software interfaces are defined as part of derived software requirements. To support systems design, graphical representations are prepared and take the form of data flow, collaboration/communications, and component diagrams.

DEFINITION OF SYSTEM DESIGN

The requirements for a system design definition are reviewed with applicable users to ensure an accurate and complete understanding of the restrictions of a system or subsystem that affect work products. The external software interface is defined at those levels and verified for completeness. The program and project plans at times include reusable software and identify interface requirements for use. The external interfaces based on software architecture definitions also are identified as part of derived software requirements.

SYSTEM ENGINEERING PLAN

The systems engineering team for programs and projects is responsible for the development of software requirements and analyzes the system architecture and design and allocates system requirements. A systems engineering plan (SEP) can be written to establish system-level technical reviews that could be conducted for military and aerospace programs and projects. The major technical reviews and audits affecting software and systems include:

- Initial requirements (IR)

- Incremental design review (IDR)

- Final design meeting (FDM)

- Test readiness (TR)

- First-article inspection (FAI)

- Functional configuration audit (FCA)

- Physical configuration audit (PCA)

The main purpose of the SEP is to address upgraded processes from a systems engineering point of view.

This plan is organized into three main sections: systems engineering, technical program processes, and engineering integration. The systems engineering team describes an orderly and structured approach to the overall system design, software design/development, required formal reviews, and audits. It is important to have such a plan to document and provide the technical expertise to execute activities throughout a software design/development life cycle. Using the plan also enables performance to be more effective and productive and enables technical planners to spend more time planning, ensuring the customer will have greater assurance and satisfaction in addressing the technical challenges that lie ahead.

SOFTWARE ARCHITECTURE EVALUATION

The purpose of software architecture evaluations is to provide a common approach to developing the work product architecture. This evaluation applies to the implementation of enhancements for change or corrections to existing software architectures. This evaluation provides the feasibility and effectiveness of software architecture definitions to be applied for software work products.

Conflicts in requirements, architecture, or program and project plans should be reported to affected product teams for resolution. The objectives of the software architecture are operational scenarios and system or subsystem requirements. The scope of the software architecture does use interface requirements to analyze operational designs, software risks, and plans to determine the objectives of the architecture.

The development of the software architecture is identified during development and made available and understood before beginning a software design/development life cycle. The program and project plans or schedules are analyzed to determine the impacts on architecture development.

Continual evaluations provide:

- The operational scenarios to be reviewed

- The defined system and subsystem requirements to be analyzed

- The defined system/subsystem interfaces for analysis

Architecture requirements allocate software to gain a complete understanding of the requirements and the capabilities of software architectures. The system or subsystem architecture requirements determine impacts that would include:

· The impacts to quality factors

· The required functional requirements for the determination of the software architecture

The trade-offs between quality performance and the modifications are prioritized and identified outside system or subsystem requirements and reviewed to determine if requirements are to be modified. The evaluation of the software architecture does show how well the architecture meets objectives, constraints, and quality attributes.

The results of software design for architecture changes are examined to determine appropriate design methods to ensure problems are always addressed. One approach to consider is the quantitative technique for the assessment of quality attributes for designs, which are dictated by analysis and considerations and by using your brain.

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