Software Engineering Institute Acquisition Support Program Architecture Product Update

Software Engineering Institute
Carnegie Mellon University
Pittsburgh, PA 15213

Author Peter Capell
Date April 3, 2008

QUASAR

Quality Assessment of Software-Intensive System Architectures and their Requirements

- Last Year's GSAW Conference, presented details of the QUASAR method in a tutorial session
  - Included our experience base applying QUASAR on the Joint Strike Fighter (F-35) program
- Status:
  - Work is continuing particularly in the area of developing a light-weight approach to re-examining areas already assessed using QUASAR
  - QUASAR training and training materials are available
  - *Transactions of the SDPS JUNE 2007, Vol. 11, No. 2, pp. 15-31*
  - The handbook V1.0 is available http://www.sei.cmu.edu/publications/documents/06.reports/06hb001.html

QUASAR$_2$

A method for assessing the architectures of systems and subsystems against quality requirements defined in terms of quality characteristics and attributes

Based on architects making quality cases (similar to safety cases)

- Claims that architecture adequately supports quality requirements
- Arguments justifying belief in claims (architectural decisions, inventions, tradeoffs, assumptions, and associated rationales)
- Evidence supporting the arguments (documents, models, etc.)

Places primary responsibility for the development, maintenance, and integrity of the architecture on the system architects themselves

Reports of the system architects and engineers form the backbone of data used to provide the assessment

$QUASAR_3$

Have applied (and re-applied) QUASAR assessments to several Joint Strike Fighter subsystems: Mission Systems, Air Vehicle, Training Systems, and Autonomous Logistics System

QUASAR well received resulting in follow on work to create a lighter-weight method of providing follow-up assessments on subsystem architectures already evaluated

MFESA: Method Framework for Engineering System Architectures

Systems, Projects, Organizations, Contracts, and Stakeholder vary greatly in many ways.

No Single Common System Architecture Engineering Method is sufficiently flexible to meet the needs of all architects.

Method Framework is needed to provide both flexibility and standardization.

Really new: Auerbach publisher

- ~ 570 pages
- Comprehensive step-by-step method framework enabling production of appropriate, project-specific system architecture engineering methods
- Foreword by Barry Boehm
- Tutorial materials are available from SEI ASP web page
- On shelves: Probably by August-September 2008

$MFESA_2$

Motivation: By popular demand based on QUASAR, we decided to pursue the proactive side of architecture development for software-intensive systems

MFESA is a method framework designed to enable system architects to develop their own system-specific architecture engineering methods:

- Ontology defining architecture engineering concepts and terminology
- Metamodel defining fundamental types of reusable method components (architectural workers performing architectural work units to produce architectural work products)
- Repository of reusable method components (such as architectures, architectural representations, architectural tasks and techniques, architects, and architecture teams)
- Metamethod helping architects to select and tailor reusable method components to produce appropriate, project-specific system architecture engineering methods

MFESA also addresses:

- Challenges facing system architects
- Principles to guide system architecture engineering
- Numerous architectural guidelines and descriptions of pitfalls to avoid and mitigate
- A quality model of quality characteristics and attributes to drive architecture engineering

Questions?

FYI

Peter Capell / Don Firesmith
Senior Member of Technical Staff
Acquisition Support Program
Telephone: +1 412-268-5800
Email: info@sei.cmu.edu

U.S. mail:
Software Engineering Institute
Customer Relations
4500 Fifth Avenue
Pittsburgh, PA 15213-2612
USA

World Wide Web:
www.sei.cmu.edu
www.sei.cmu.edu/contact.html

Customer Relations
Email: customer-relations@sei.cmu.edu
Telephone: +1 412-268-5800
SEI Phone: +1 412-268-5800
SEI Fax: +1 412-268-6257