

GSAW 2016 Tutorial I:

Beyond Open Architecture: Issues, Challenges, and Opportunities in Open Source Software Development (OSSD) for Aerospace and Defense Applications

Length: Half day

Overview:

This tutorial serves to introduce and educate software developers, system architects, project managers, program managers, and others in the state of the art in open source software development processes, work practices, and project community dynamics. The focus is to examine and review results from empirical studies of OSSD that have appeared in the past five or so years. These include studies that examine OSSD projects within both commercial and non-profit environments, as well as those that produce embedded or mission-critical applications, software development and dispersed teamwork collaboration tools. They also include review of recent government policies and initiatives within the DoD community that encourage the acquisition, development, and deployment of mission critical software systems that embody “open architecture” (OA) concepts that include the integration of OSS systems/components. Overall, this tutorial will help establish a foundation for identifying issues, challenges, and opportunities that can arise when engaging OSSD processes, practices, and project communities.

The remaining topics for presentation and discussion on the proposed tutorial will be drawn from the following unordered list.

1. Case studies in OSSD in commercial or non-profit environments
2. OSSD versus software engineering, CMMI, and outsourcing
3. Understanding when OSSD is faster, better, and cheaper than software engineering, and vice-versa.
4. OSSD, OA and software product lines
5. Composing OSS components and licenses into an OA with proprietary and/or legacy components
6. Observations on the evolution patterns of long-life OSS systems
7. Alternative OSSD business models and project management regimes
8. Developing a corporate strategy for OSSD
9. Areas for future R&D in applying OSSD in commercial environments

In addition, the proposed Tutorial will address related questions, such as:

1. How would you decide whether to pursue OSS components rather than any of the alternatives?
 - How do you evaluate OSS components?
 - What are the risks of OSS (relative to COTS? to in-house developed software? to outsourced software?)
 - What are the benefits of OSS (relative to COTS? to in-house developed software? to outsourced software?)
 - What is important to know regarding liability and ownership?
2. What are the issues with combining OSS components and licenses into a ground system with proprietary and/or legacy components?

- Comparison to COTS integration
- Liability
- Ownership
- Concerns related to code developed by foreign contributors in US Gov. Systems (or any secure system)
- Additional testing requirements (security)

Instructor: Walt Scacchi, Institute for Software Research

Biography:

Walt Scacchi is senior research scientist and research faculty at the Institute for Software Research, and also research director of the institute for Virtual Environments and Computer Games, both at the University of California, Irvine. he received a Ph.D. in Information and Computer Science from UCI in 1981, and was on the faculty at the University of Southern California from 1981-1989, before joining ISR in 1999. Dr. Scacchi research interests include free/open source software development, computer games and virtual worlds, acquisition and electronic commerce, software/business process (re)engineering, and computer-supported cooperative work environments. He is an active researcher with more than 170 publications, including 70 addressing OSS research topics. he has developed and directed more than 65 externally funded research projects, and has consulted for dozens of firms on a regional, national and international basis. He currently serves as Principal Investigator on a research project with funding from the Naval Postgraduate School Acquisition Research Program focusing on how best to achieve better buying power through the acquisition of open architecture software systems, in collaboration with The MITRE Corporation and the C3CB Office within the OUSD (AT&L).

Description of Intended Students and Prerequisites:

Intended participants for this tutorial include software developers, system architects, project managers, program managers, and others who anticipate the acquisition, adoption, implementation, or integration of OSS systems, components, processes, practices or project communities in current/future system development efforts.

What can Attendees Expect to Learn:

1. The state of the art in OSSD processes, work practices, and project community dynamics, based on review of empirical studies of OSSD
2. Understand the roles and relationship of OA and OSSD