



# PROCEEDINGS OF THE ELEVENTH ANNUAL ACQUISITION RESEARCH SYMPOSIUM

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## WEDNESDAY SESSIONS VOLUME I

Achieving Better Buying Power Through Cost-Sensitive  
Acquisition of Open Architecture Software Systems

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## Panel 7. Challenges of Software Development in an Open Architecture Environment

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Wednesday, May 14, 2014	
1:45 p.m. – 3:15 p.m.	<p><b>Chair: TBD</b></p> <p><b><i>Achieving Better Buying Power Through Cost-Sensitive Acquisition of Open Architecture Software Systems</i></b> Walt Scacchi, University of California–Irvine Thomas Alspaugh, University of California–Irvine</p> <p><b><i>Analyzing Quality Attributes as a Means to Improve Acquisition Strategies</i></b> Lisa Brownsword, Carnegie Mellon University Cecilia Albert, Carnegie Mellon University Patrick Place, Carnegie Mellon University David Carney, Carnegie Mellon University</p> <p><b><i>Combining Risk Analysis and Slicing for Test Reduction in Open Architecture</i></b> Valdis Berzins, Naval Postgraduate School</p>



# Achieving Better Buying Power Through Cost-Sensitive Acquisition of Open Architecture Software Systems

**Walt Scacchi**—is senior research scientist and research faculty member at the Institute for Software Research, University of California, Irvine. He received a PhD in Information and Computer Science from UC Irvine in 1981. From 1981–1998, he was on the faculty at the University of Southern California. In 1999, he joined the Institute for Software Research at UC Irvine. He has published more than 150 research papers and has directed more than 65 externally funded research projects. In 2011, he served as co-chair for the 33rd International Conference on Software Engineering—Practice Track, and in 2012, he served as general co-chair of the Eighth IFIP International Conference on Open Source Systems. [wscacchi@ics.uci.edu]

**Thomas Alspaugh**—is a project scientist at the Institute for Software Research, University of California, Irvine. His research interests are in software engineering, requirements, and licensing. Before completing his PhD, he worked as a software developer, team lead, and manager in industry, and as a computer scientist at the Naval Research Laboratory on the Software Cost Reduction, or A-7 project. [thomas.alspaugh@acm.org]

## Abstract

Our presentation focuses on our ongoing investigation and refinement of techniques for identifying and reducing the costs, streamlining the process, and improving the readiness of future workforce for the acquisition of complex software systems. Emphasis is directed at identifying, tracking, and analyzing software component costs and cost reduction opportunities within the acquisition life cycle of open architecture (OA) systems, where such systems combine best-of-breed software components and software products lines (SPLs) that are subject to different intellectual property (IP) license requirements.

The Department of Defense, other government agencies, and most large-scale business enterprises continually seek new ways to improve the functional capabilities of their software-intensive systems. The acquisition of OA systems that can adapt and evolve through the replacement of functionally similar software components is an innovation that can lead to lower cost systems with more powerful functional capabilities. Our research identifies and analyzes how software component costs and IP license requirements interact to drive down (or drive up) total system costs across the system acquisition life cycle. The availability of such new scientific knowledge and technological practices can give rise to more effective expenditures of public funds and improve the effectiveness of future software-intensive systems used in government and industry. Thus, a goal of this presentation is to support and advance a public purpose through acquisition research and results.





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