Achieving Better Buying Power through Acquisition of Open Architecture Software Systems for Web-Based and Mobile Devices

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**Report:**
Achieving Better Buying Power through Acquisition of Open Architecture Software Systems for Web-Based and Mobile Devices

**Abstract:**

Presented at the 12th Annual Acquisition Research Symposium held May 13-14, 2015 in Monterey, CA.

**Subject Terms:**

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Overview

- Recent trends in open architecture (OA) software systems
- Emerging challenges in achieving Better Buying Power (BBP) via OA software systems for Web-based and Mobile devices
- New practices to realize cost-effective acquisition of OA software systems
- Conclusions
Recent trends in OA software systems

- Multi-party acquisition and OA development ecosystems
- Shared development of Apps and Widgets as OA system components and capabilities
- Growing diversity of challenges in cybersecurity
- New business models for OA software component development and use
Multi-party acquisition and OA development ecosystems

Software component supply network for OA system components: Component IP license and cybersecurity requirements propagate from/to Producers, Integrators, and Consumers.
Multi-party acquisition of *assembled capabilities* within OA development ecosystems

**Mobile Reciprocity**

**Multi-Party Interactions**

Consumer/End-User Organizations seeking ways to reduce acquisition cost and effort through shared development/use of common OA software system components (proprietary/open source Apps, Widgets).
Shared development of Web-based Apps and Widgets as OA system components

Widget Framework for Web-based PCs
Shared development of Mobile Apps and Widgets as OA system components

Ozone Widget Framework for Mobile Devices
Assemble capabilities using Apps/Widgets from trusted parties via sharing agreements.

Widgets available within App Store.
Commercial Mobile Apps also being used
(enterprise middleware services, not shown)

- TouchDown for MacOS
- Meeting request Daniela Ferdico
- Agenda for Thursday Meeting Ben Rowland
- Ferret sitting Peter Jung
- Lunch at Benny’s Peter Jung

**Agenda for Thursday Meeting**

- 1 on 1 with Jessica Conference Room 302 9:00 AM - 10:00 AM
- Lunch Cafeteria or My Office 11:30 AM - 12:30 PM
- Conference Call with Germany Conference Room 2201 1:00 PM - 3:00 PM

**Meeting Request Location:** Benny’s Pizza S.
Enterprise-to-Mobile Middleware *IP Licenses* (for the NitroDesk *Touchdown* product)

* LGPL 2.1
* ical4j from Ben Fortuna
* Public Domain Declaration
* Apache 2
* The Legion of the Bouncy Castle
* Creative Commons BY

* Sony Mobile
* Jesse Anderson
* OpenSSL
* Apple Non-Exclusive
* SQLite
* Microsoft Public License
Multi-party acquisition and OA development ecosystems: *Multiple OA system evolution paths*

Current system

- Component replaced by newer version
- Component replaced by different component
- Same component accessed through different interface
- Connector replaced by different kind of connector
- Topological configuration changed
- Component license replaced by newer version
- Component license replaced by different one

Evolved system

IP and cybersecurity requirements will need *continuous attention!*
Shared development of Apps and Widgets as OA system components: 

Cybersecurity?

Ozone Widgets supporting “Bring Your Own Devices” (BYOD)?
Growing diversity of challenges in cybersecurity


New business models for acquisition of OA Web/mobile software components

- Franchising
- Enterprise licensing
- Metered usage
- Advertising supported
- Subscription
- Free component, paid service fees
- Federated reciprocity for shared development
- Collaborative buying
- Donation
- Sponsorship
- (Government) open source software
- and others
Emerging challenges in achieving BBP via OA Web/mobile software systems

- Acquisition program managers/staff *may not understand* how software IP licenses affect OA system design, and vice-versa.

- Software IP and cybersecurity obligations and rights propagate across system development, deployment, and evolution activities *in ways not well understood* by system developers, integrators, end-users, or acquisition managers.
Emerging challenges in achieving BBP via OA Web/mobile software systems

- *Failure to understand* software IP and cybersecurity obligations and rights propagation can reduce DoD buying power, increase software life cycle costs, and reduce competition.

- DoD and other Government agencies *would financially and administratively benefit* from engaging the development and deployment of an (open source) automated *software obligations and rights management system* (SORMS) for the acquisition workforce.
New practices to realize cost-effective acquisition of OA software systems

- Need to R&D *worked examples* of reference OA system models, assembled capabilities, and component evolution alternatives.

- Need *open source models of* app/widget security assurance *processes and* reusable cybersecurity *requirements.*
New practices to realize cost-effective acquisition of OA software systems

- Need precise **domain-specific languages** (DSLs) and **automated analysis tools** for continuously assessing and continuously improving cybersecurity and IP requirements for OA C2 systems composed from apps(widgets).
  
  - Need a **software obligations and rights management system** (SORMS) to streamline Web/mobile software component acquisition
Conclusions

- Our research identifies how new Web/mobile software component technologies, IP and security requirements, and new business models interact to drive-down or drive-up acquisition costs.

- Managing acquisition costs for OA Web/mobile software components will be demanding.

- Acquisition workforce will need automated assistance, else acquisition process costs will dominate development costs for OA Web/mobile software components!
Conclusions

- New technical risks for component-based OA software systems can dilute the cost-effectiveness of BBP efforts.
- Need R&D leading to automated systems (SORMS) that can model and analyze OA system IP licenses and cybersecurity requirements
  - SORMS will empower the acquisition workforce, and
  - Identify and manage cost-effectiveness trade-offs
Acknowledgements

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