

**Project: Architectural Standards**

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Discuss March 8, due April 26

**Assignment Description**

The objective of this assignment is to provide you with an opportunity to investigate a commercial or open source architectural standard, framework, or product from the list below. You will analyze one of these based on what you have learned this semester.

<b>Product or Architectural Standard</b>	<b>Organizing Body</b>	<b>Main Features</b>
.NET	Microsoft	Comprehensive web-services platform allowing applications to communicate and share data over the Internet.
Android	Open Handset Alliance and Google	Open mobile operating system
BACnet	The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)	A data communication framework for building automation and control networks.
iphone SDK	Apple	A software development environment for building applications for the iphone platform
OSEK	Consortium: BMW, Bosch, DaimlerChrysler, Opel, Siemens, Volkswagen, and the University of Karlsruhe.	Open systems and interface standard for automotive electronics (Offene Systeme und deren Schnittstellen für die Elektronik in Kraftfahrzeugen).
AUTOSAR	Jointly developed by automobile manufacturers, suppliers and tool developers.	AUTomotive Open System ARchitecture) is an open and standardized automotive system software architecture.
Open SOA Collaboration	Informal group of industry leaders who are trying define a framework for building SOA oriented systems	The Open SOA Collaboration is a set of vendors who wish to innovate rapidly in the development of this programming model and to deliver Royalty Free Specifications to the SOA community for implementation. When mature, this work will be turned over to a standards body for maintenance.

To carry out this assignment you must gain a thorough understanding of the framework, standard, or product. You may use the Web and the campus libraries at your disposal. Based on the information you discover, answer the following questions regarding the standard or product:

### **Part 1 – Introduction:**

Briefly introduce the standard and its history.

- For what purpose (domain and/or business context) was the standard created?
- Describe the stakeholders: Who created it? Who (domain or community) uses it? How do they use it?
- Are there other related and/or competing standards? If so, list them and briefly explain how they differ from the standard you are analyzing.

### **Part 2 - Documentation:**

As part of the description of the standard, critique the existing documentation of the standard.

- Outline the nature of that documentation.
- Describe its strengths and weaknesses.
- In what ways could the documentation be improved? Be specific – note that comparative examples where you show improved documentation (before and after) can be helpful in illustrating ways to improve it.

### **Part 3 – Description of the Standards:**

Describe the basic architecture of the standard.

- What styles/patterns does it utilize? Use the terminology presented in the course to describe the architecture.
- Are there semantics for using the framework, product or standard? How are they enforced and what are the consequences of violating them?
- What variability mechanisms are built into the framework, product or standard – how does it meet different needs of the various stakeholders and/or the business contexts the framework, product or standard might be used in?

### **Part 4 – Analysis of Properties, Tradeoffs, and Applicability:**

Analyze the standard with respect to the following:

- Describe the architectural drivers (quality attributes in particular) that the framework, standard, or product is trying to maximize and how these are related to the business context, domain, and/or stakeholder community.
- Discuss the structures of the system and explain how the structures support the key goals and architectural drivers as discussed in the previous question.
- What architectural drivers (quality attributes in particular) are inhibited and why? What tradeoffs does it seem that the developers made?

- Are there any architectural drivers that the standard does *not* seem to explicitly support? Should they be addressed or do they not matter (support your answer)? Can you analyze how well these architectural drivers supported (or not supported) by the artifacts and design descriptions you were able to find?

### **Assignment Guidelines:**

**Report** - Your report should be *12 pages or less* in length – while there is no minimum length, 12 pages is a HARD upper limit.

**Presentation** – Prepare a presentation that summarizes your paper, and dry run it for *15 minutes* – this is a HARD upper limit.

**Sources** - Be sure that you credit all sources and references. Do not simply copy information from the web (or any other source). You will be evaluated on how well you *summarize* and *synthesize* the information that you find. *Again, we strongly recommend that you consult multiple sources to support your research and analysis.* Include a list of references at the end of your document.

**Composition** - Use good documentation practices shown in class for all architectural diagrams that *you create*. Grammar and correct use of English is important and will count toward your grade.

**General Hints** - Note that your analysis may be challenging. It is supposed to be a realistic assessment of an existing standard that you be thinking of utilizing in a product or system – a very practical and realistic situation encountered in practice. You should utilize multiple sources to support your research and your analysis. Note that some of the frameworks, products, or standards may have weak design documentation – you will have to interpret what you can find to the best of your ability. You may discover that there are a suite of products or standards – exercise care with respect to the scope of your analysis. If you limit the scope and/or detail, be explicit about this and be consistent in your analysis with scope and the level of abstraction. Some standards may be unclear in describing the design and how technologies and specific implementation structures (code, data) map to the standard or framework. Again, interpret what sources you can find to the best of your ability. An important aspect of this assignment is to recognize what is missing, poorly specified, and poorly documented. Stick to the language and concepts of the course – avoid buzzwords and assumption that buzzwords are interpreted the same way by everyone. These frameworks and standards differ from a traditional system in that they are intended to support multiple contexts. If this is the case, be sure to explicitly consider variability as an architectural driver and identify the mechanism (or lack of mechanisms) to support this variation. *This is intended to be a realistic assignment that represents a task that is common to an architect in industry. The idea is to provide a context in which you can apply concepts from the class to the analysis of a real, practical architectural framework, product, or standard.*

### **Grading Criteria:**

The grading will reflect the technical detail of parts 1-4, as documented in both your report and presentation, and on clear and well organized report and presentation:

- Parts 1, 2, 3: 15 points each
- Part 4: 20 points
- Report: 20 points
- Presentation: 15 points