

Class Project

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Class Project

→ Project Goals

- ↳ Practice using architectural design rationale to motivate architectural changes

→ Deliverables

- ↳ Rationale models (April 11, 20, 27)
- ↳ Project Report (May 5, 5:00 p.m.), including
 - Phase I questions and answers
 - QOC model
 - CBSP models
 - Discussion of major project issues (see below)
- ↳ In-class discussion at end of project (May 2 and 4)

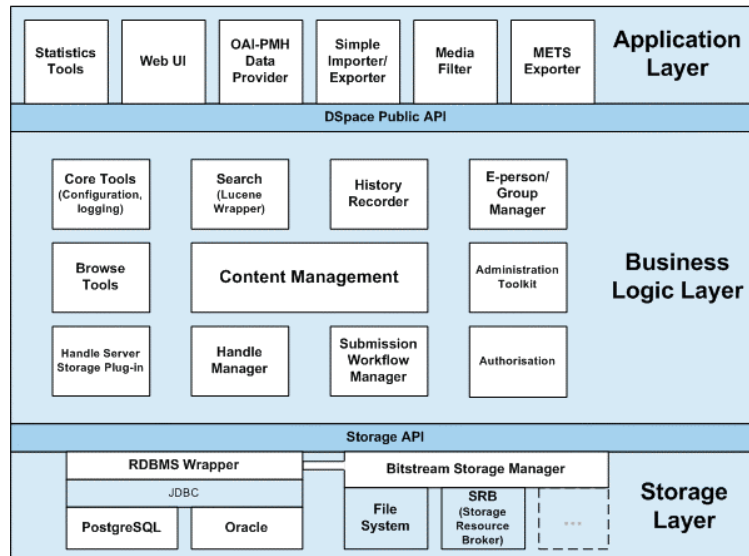
Project Overview

- For the remainder of the class project, project teams will use QOC and CBSP
- Object: Design architectural changes needed to add support for document subscriptions to DSpace
 - ↳ Design issues & refinement
 - ↳ Design rationale & refinement
 - ↳ Architectural model
- QOC (Questions, Options, Criteria) [L14]
 - ↳ Design issues & refinement
- CBSP (Component, Bus, System, Property) [L16] [CBSP]
 - ↳ Design rationale
 - ↳ Rationale refinement
 - ↳ Architectural model

Project Overview

- Goal: Add commercial paid subscription capability to DSpace
- Purpose: Enable organizations to control access to documents stored in DSpace based on subscription status (e.g., subscription level, subscription up-to-date, etc.)
- Teams will:
 - ↳ Evaluate different design options for adding subscription support to DSpace
 - ↳ Develop rationale models for required architectural changes
 - ↳ Use rationale models to propose architectural changes to DSpace

DSpace Architecture



Project Report - General Guidelines

- Document the *rationale* (reasoning) behind design decisions
- Document proposed *architectural changes* to DSpace
- Document each step of the *process* followed
- For each project phase, be sure to capture and document any team experiences, observations or other information pertinent to discussing the *major project issues* (see below) in the project report
 - ↳ Teams are encouraged to include discussions about other related issues in the project report, as long as the report adequately covers the 7 required issues

General Guidelines (cont.)

→ Remember...

- ↳ This project is designed to give you the opportunity to practice using architectural design *rationale* in a team setting, not to test your architectural design *skills*
- ↳ As you work through the remaining project steps, keep the following "3 D's" in mind for the project report:
 - *Develop* models of design rationale and architectural change by following the specified QOC and CBSP processes
 - *Document* the resulting *models*, the *process* followed, and the team's *experiences and observations* during the modeling process
 - *Discuss* the *major project issues* in the context of the team's experience

Major Project Issues

→ Major issues to be discussed in the project report:

- ↳ Did QOC and CBSP help organize the design issues involved in architectural evolution?
- ↳ What information was useful in evaluating design options and criteria?
- ↳ What information was missing?
- ↳ How did rationale assist in evaluating the impact of change?
- ↳ How was the process of information recovery from the DSpace documentation used to identify design issues?
- ↳ How useful would formal statements of rationale be?
- ↳ Describe the level of effort required to build the rationale models.

Project Due Dates

- **April 11: QOC model**
 - ↳ Top-level questions, options, sub-questions/options (See QOC class presentation [L14])
- **April 20: CBSP relevance profile**
 - ↳ CBSP decomposition by category (see [CBSP], Fig. 4)
 - ↳ Full list of requirements available by April 11
- **April 27: CBSP refinement**
 - ↳ Full refinement and relations (see [CBSP], Fig. 5)
- **May 5 (5:00 p.m.): Final project report**
 - ↳ Full CBSP model including architectural elements
 - ↳ Include all prior submitted models
 - ↳ Discuss major project issues and any other issues that arise

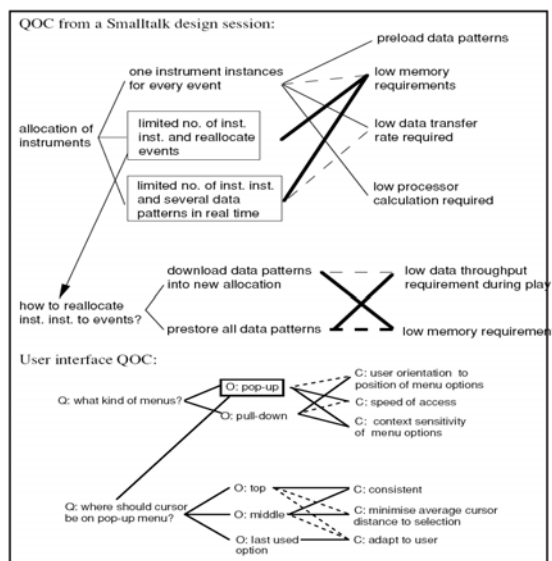
QOC Model (Apr. 11)

- Your team should meet and produce a QOC model of the following issues related to adding document subscription support to DSpace, plus any other high-level design issues the team decides are applicable:
 - ↳ Subscription level support in a document subscription system
 - ↳ Storage mechanism for a DSpace-based document subscription system (e.g., existing in DSpace, new, etc.)
 - ↳ What part of the system should handle security and authentication
 - ↳ How subscription renewal/rebilling should be handled (e.g., manually by billing dept., automatically by system, etc.)
 - ↳ Any other relevant high-level design issues
- ❖ **Don't forget to record your team's experiences and observations for the project report**

QOC Model

- *QOC Model = Question → Options → Criteria (→ Q → O → C)*
- **High-level Issues**
 - ↳ Discuss the given high-level issues, plus any additional high-level issues the team may discover (model at least 5 high-level issues altogether)
- **Questions**
 - ↳ Create at least one top-level question for each high-level issue
- **Options**
 - ↳ Develop design options for each top-level question
- **Criteria**
 - ↳ Document any significant criteria for each design option
- **Sub-questions and options**
 - ↳ Develop sub-question(s) and options for at least one design option under each top-level question
- **Model Diagram**
 - ↳ Diagram the QOC model using the graphic software of your choice (e.g., MS Word, Visio, etc.)
- **Additional information**
 - ↳ Refer to class lecture notes [L14], pp.6-8, for more information and a QOC model example

QOC Model Example



CBSP Relevance Profile (Apr. 20)

- This project deliverable uses the **Subscription System Requirements** (slides 14-15)
- You will essentially be following steps 1-3 in [CBSP], pp.240-241
- Refine requirements into more specific CBSP elements
- (Generalize or merge requirements into more general CBSP elements if necessary)
- Classify requirements according to architectural relevance using the CBSP taxonomy
- Identify and resolve classification mismatches
- The deliverable for April 20 is a set of CBSP Relevance Profiles (see [CBSP], Fig.4, p.241)
- ❖ Don't forget to record your team's experiences and observations for the project report

Subscription System Requirements

- ❖ **Note: In these requirements, 'the system' refers to the new DSpace document subscription system you are designing**
1. The system must prevent non-subscribers from accessing archive documents, and must allow subscribers to access only documents included in their subscriptions
 2. The system must support subscriptions for documents from specific publishers, as well as for full archive access
 3. The system must support monthly and annual subscription renewal terms
 4. The system must accept payment by credit card
 5. The system must protect personal and financial information
 6. The system must support secure remote access

Subscription System Requirements

7. The system must be able to notify subscribers when documents or document types in which they are interested are updated or added to the archive
8. The system must allow only authorized authors or publishers to update documents or to add new documents to the archive
9. When new documents are added to the archive, the system must support an administrative review process
10. The system must enable administrators to manage subscriber and author/publisher user accounts
11. The system must interact with the current version of DSpace
12. The system must not change the hardware requirements of DSpace

CBSP Refinement (Apr. 27)

- Starting with the CBSP relevance profile (slides 13-15), and working through [CBSP] step 4, and as far as possible through step 5 (pp.241-248, Figs.5-6):
 1. Refine CBSP elements (see [CBSP], Fig.5, p.241)
 - Rephrase and split requirements that have overlapping CBSP properties and concerns
 - Remove requirements redundancies in the resulting CBSP model
 2. Identify and model any properties that don't fit into the element-based CBSP model (see [CBSP], Fig 6, p. 246 and the last paragraph in section 3.4)
 - properties that pertain to multiple requirements
 - multiple CBSP elements
 - the entire system
- The deliverable for April 27 is a CBSP Refinement Model
 - ↳ The two submodels described above may be done separately or combined into a single diagram
- ❖ Don't forget to record your team's experiences and observations for the project report

Final Project Report (5:00 p.m., May 5)

- The final project report should include 5 sections corresponding to numbered items 1-5 below, with an analytical introduction/discussion at the beginning of each section
1. Phase I results (& intro/discussion)
 2. QOC model (& intro/discussion)
 3. CBSP relevance model (& intro/discussion)
 4. CBSP refinement model (& intro/discussion)
- ❖ Each intro/discussion should discuss the following, based on your team's experiences with Phase I, QOC, and CBSP relevance/refinement models:
 - The **major project issues** (slide 8)
 - Any other pertinent issues, observations, problems, etc., the team encountered while working through the assignment or methodology, e.g., anything related to architectural rationale, intent, the QOC and CBSP approaches, etc.
 - ❖ Since some of the major project issues may be less applicable to the Phase I discussion, you can substitute more appropriate analysis as needed, e.g.:
 - Discuss how easy or difficult it was to answer the kinds of questions Phase I asks about the DSpace architecture, given the state of DSpace rationale/intent documentation
 - Suggest changes that would improve the situation, etc.
5. In a separate section, discuss the following:
 - What additional steps, if any, would be needed to finish designing the architecture of the new subscription system
 - The impact of the new and modified CBSP model elements and elements in the existing DSpace architecture

Project Questions

→ Matthew Hawthorne Office Hours (ENS 509B)

↳ Same as Dr. Perry (after class/before)

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Project References

- [DSpace] DSpace open source digital repository project
 - ↳ www.dspace.org
 - ↳ DSpace Resources links on class web page
- [L14] March 7 QOC class presentation, pp. 6-8
 - ↳ <http://www.ece.utexas.edu/~perry/education/382v-s06/L14.pdf>
- [L16] March 21 arch. rationale class presentation, pp. 1-5
 - ↳ <http://www.ece.utexas.edu/~perry/education/382v-s06/L16.pdf>
- [CBSP] (from reading list) Paul Grunbacher, Alexander Egyed, and Nenad Medvidovic. "Reconciling Software Requirements and Architectures with Intent Modeling". *Software and Systems Modeling*, Vol. 3 No. 3, 2004, pp. 235-253.
 - ↳ [http://www.springerlink.com.content.lib.utexas.edu:2048/openurl.asp?genre=article&id=doi:10.1007/s10270-003-0038-6](http://www.springerlink.com/content/lib.utexas.edu:2048/openurl.asp?genre=article&id=doi:10.1007/s10270-003-0038-6)