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PHILOSOPHICAL TRANSACTIONS.

February 19. 16$\frac{71}{72}$.

The CONTENTS.

A Letter of Mr. Isaac Newton, *Professor of the Mathematicks in the University of Cambridge; containing his New Theory about* Light *and* Colors: *sent by the Author to the Publisher from Cambridge, Febr.* 6. 16$\frac{71}{72}$; *in order to be communicated to the* R. Society.

SIR,

TO perform my late promise to you, I shall without further ceremony acquaint you, that in the beginning of the Year 1666 (at which time I applyed my self to the grinding of Optick glasses of other figures than *Spherical*,) I procured me a Triangular glass-Prisme, to try therewith the celebrated *Phænomena* of

Colours. And in order thereto having darkened my chamber, and made a small hole in my window-shuts, to let in a convenient quantity of the Suns light, I placed my Prisme at his entrance, that it might be thereby refracted to the opposite wall. It was at first a very pleasing divertisement, to view the vivid and intense colours produced thereby; but after a while applying my self to consider them more circumspectly, I became surprised to see them in an *oblong* form; which, according to the received laws of Refraction, I expected should have been *circular*.

They were terminated at the sides with streight lines, but at the ends, the decay of light was so gradual, that it was difficult to determine justly, what was their figure: yet they seemed *semicircular*.

Comparing the length of this coloured *Spectrum* with its breadth, I found it about five times greater; a disproportion so extravagant, that it excited me to a more then ordinary curiosity of examining, from whence it might proceed. I could scarce think, that the various *Thickness* of the glass, or the termination with shadow or darkness, could have any influence on light to produce such an effect; yet I thought it not amiss, first to examine those circumstances, and so tryed, what would happen by transmitting light through parts of the glass of divers thicknesses, or through holes in the window of divers bignesses, or by setting the Prisme without so, that the light might pass through it, and be refracted before it was terminated by the hole: But I found none of those circumstances material. The fashion of the colours was in all these cases the same.

Then I suspected, whether by any *unevenness* in the glass, or other contingent irregularity, these colours might be thus dilated. And to try this, I took another Prisme like the former, and so placed it, that the light, passing through them both, might be refracted contrary ways, and so by the latter returned into that course, from which the former had diverted it. For, by this means I thought, the *regular* effects of the first Prisme would be destroyed by the second Prisme, but the *irregular* ones more augmented, by the multiplicity of refractions. The event was, that the light, which by the first Prisme was diffused into an *oblong* form, was by the second reduced into an *orbicular* one with as much regularity, as when it did not at all pass through them. So that, what ever was the cause of that length, 'twas not any contingent irregularity.

PHILOSOPHICAL TRANSACTIONS.

JSTOR Mission

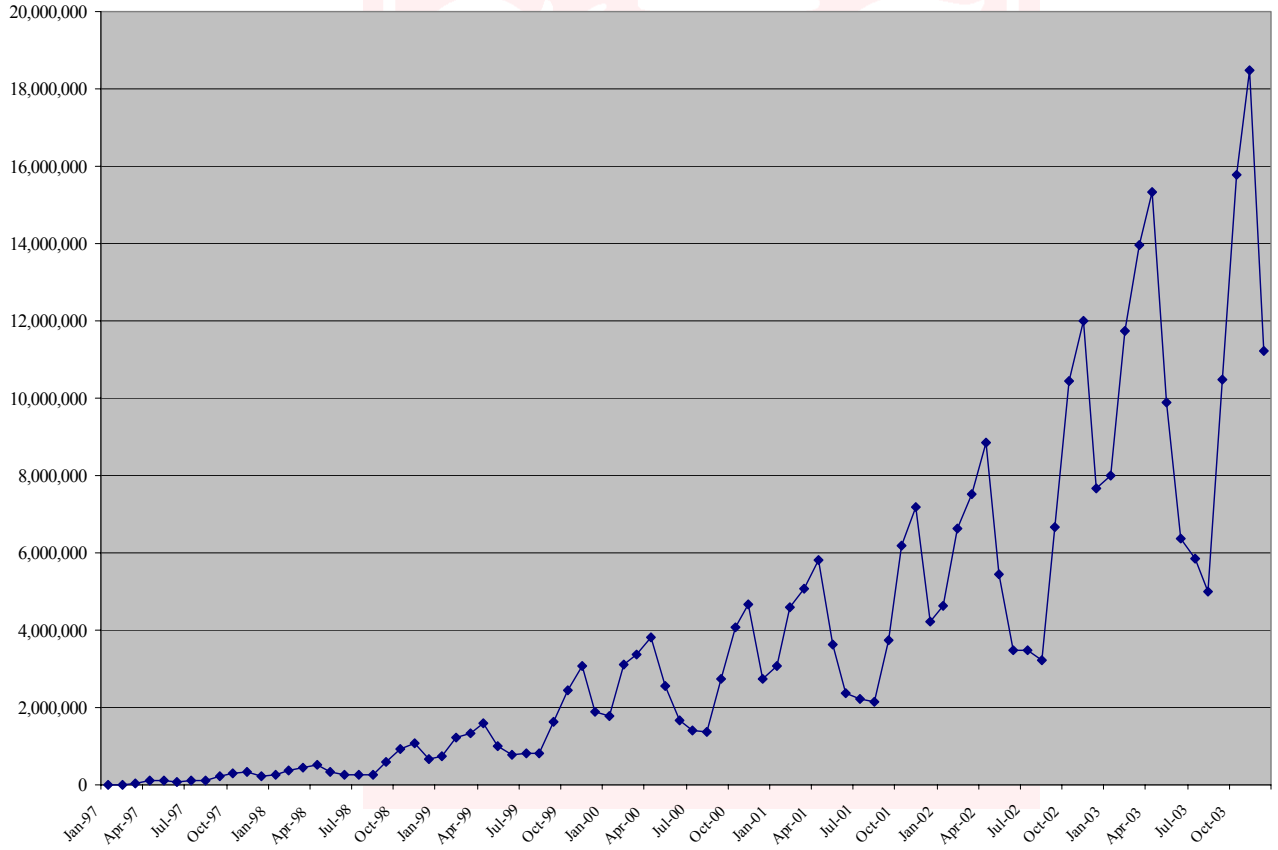
- JSTOR is a not-for-profit organization with a mission to help the scholarly community take advantage of the advances in information technology. This includes: (1) building a reliable and comprehensive **archive** of core scholarly journals, and (2) dramatically improve **access** to this scholarly material
- In pursuing its mission, JSTOR takes a system-wide perspective, seeking benefits for libraries, publishers and scholars

Currently

- Over 1,000 U.S. Participating Sites
- Over 700 International Participating Sites
- Over 200 Participating Publishers
- Over 300 Publications
- Broad coverage of disciplines
- 14 million pages scanned (and counting)
  - (average 10,000 pages per day)

Monthly Usage

Meaningful Accesses



OAI-PMH Project Background

- JSTOR has shared metadata for some applications
- However we use proprietary data formats and transmission methods
- OAI-PMH had the right characteristics
- But, we are re-writing our system
- Gave us a chance to learn new techniques
- Forced the separation of server from data

Purpose of this Presentation

- Overview of JSTOR OAI-PMH System
- Constraints
- Process
- Design
- Sharing our observations

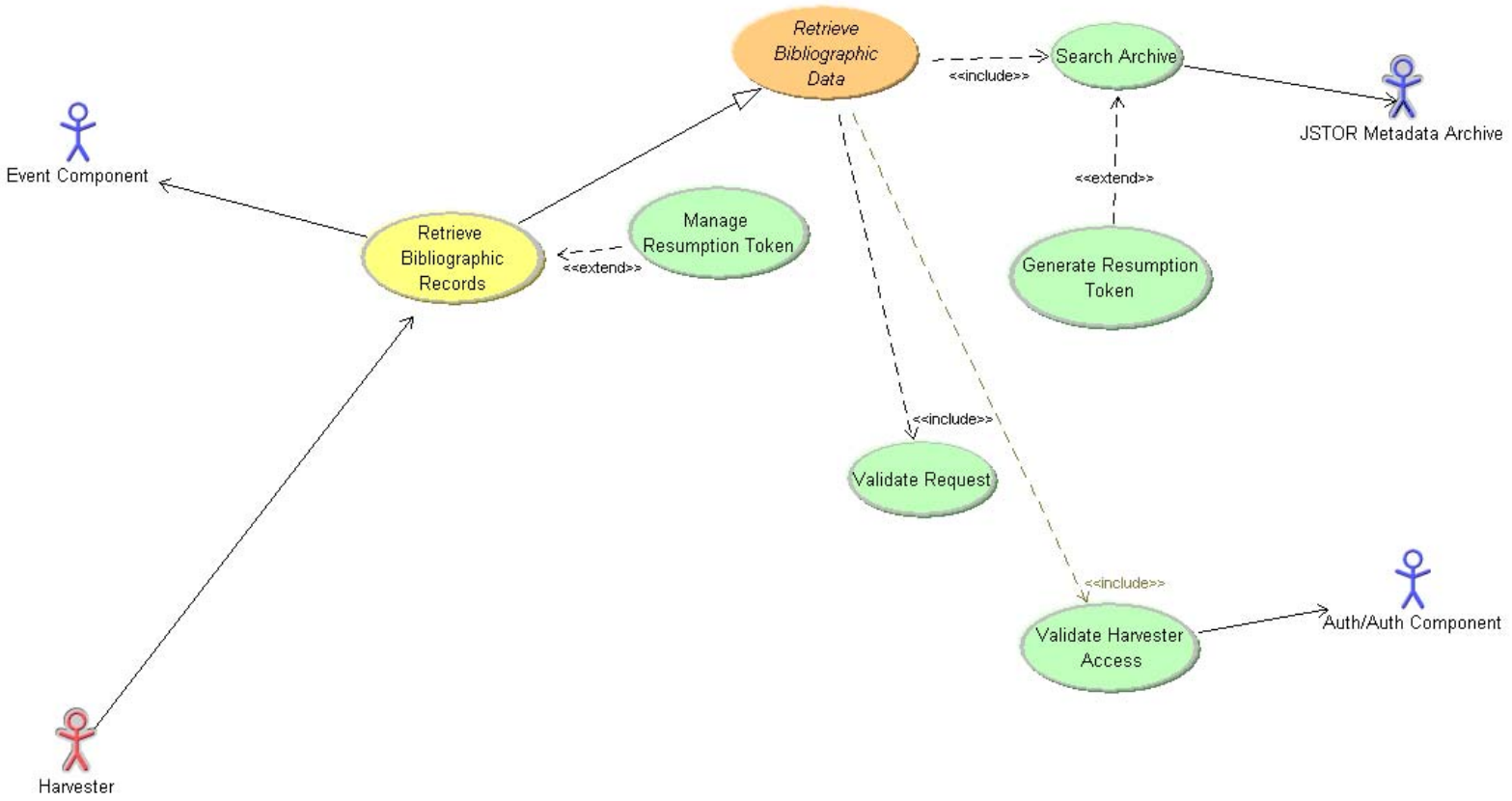
Constraints

- Large amount of data (2.5 million articles)
- Content restricted by subscription
- Authorization System in transition
- Metadata store in transition
- Code must be sharable with others, in Java
- Lots of uncertainty!

Process

- Initial Requirements Gathering
  - No existing software for our needs
  - Current JSTOR System inadequate
- Unified Process/UML
- Outside advisors (Object Insight)
- Create pluggable parts to handle uncertainty

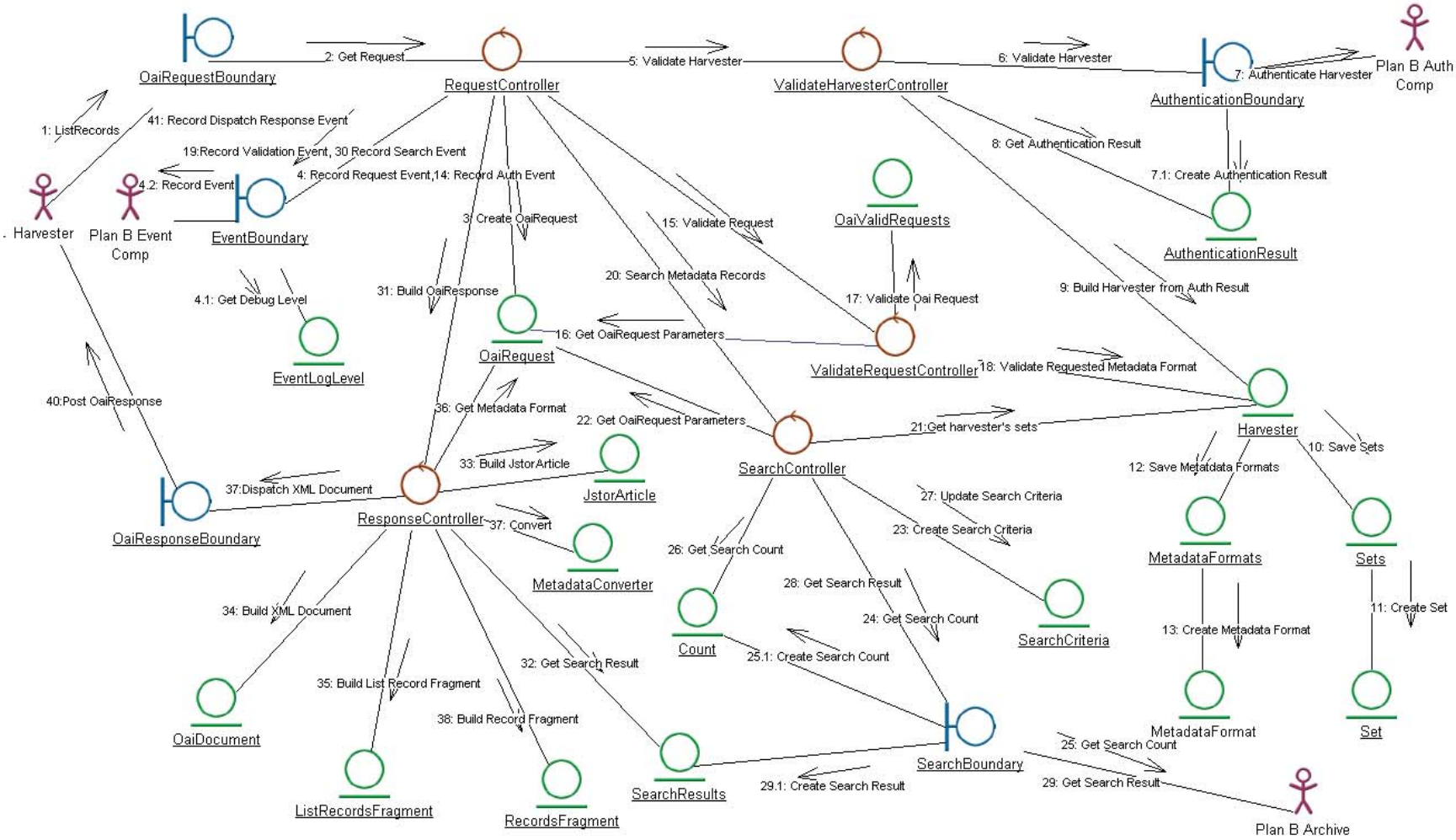
Use Case Diagram



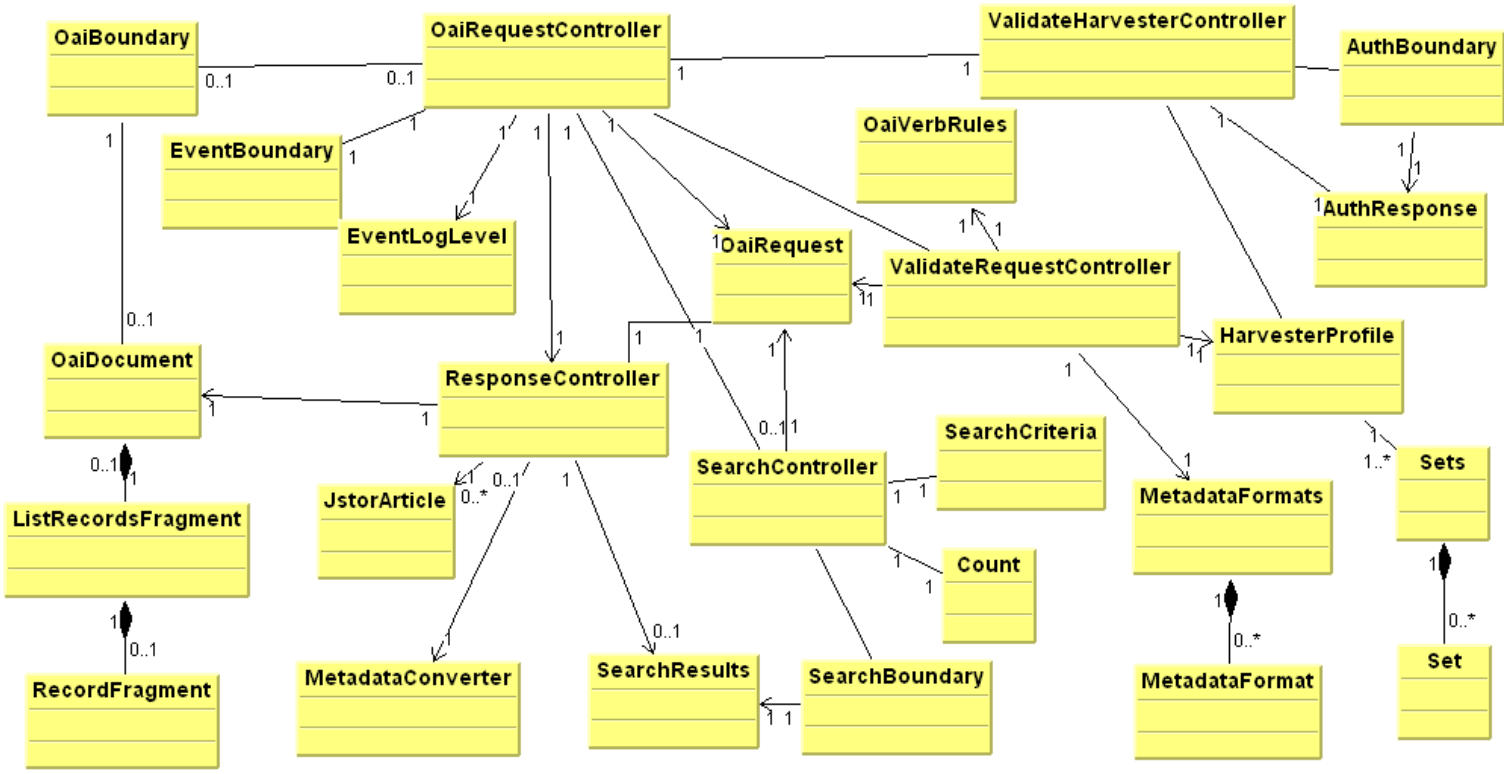
Initial Steps

- 'Retrieve Bibliographic Records' Use Case
- Use cases gave insight into Search/Auth requirements
  - Repository would have to handle increments,counts
  - Auth would have to know about harvester sets
- Use Case Analysis using Collaboration Diagram (MVC)

Retrieve Bibliographic Records Collaboration Diagram

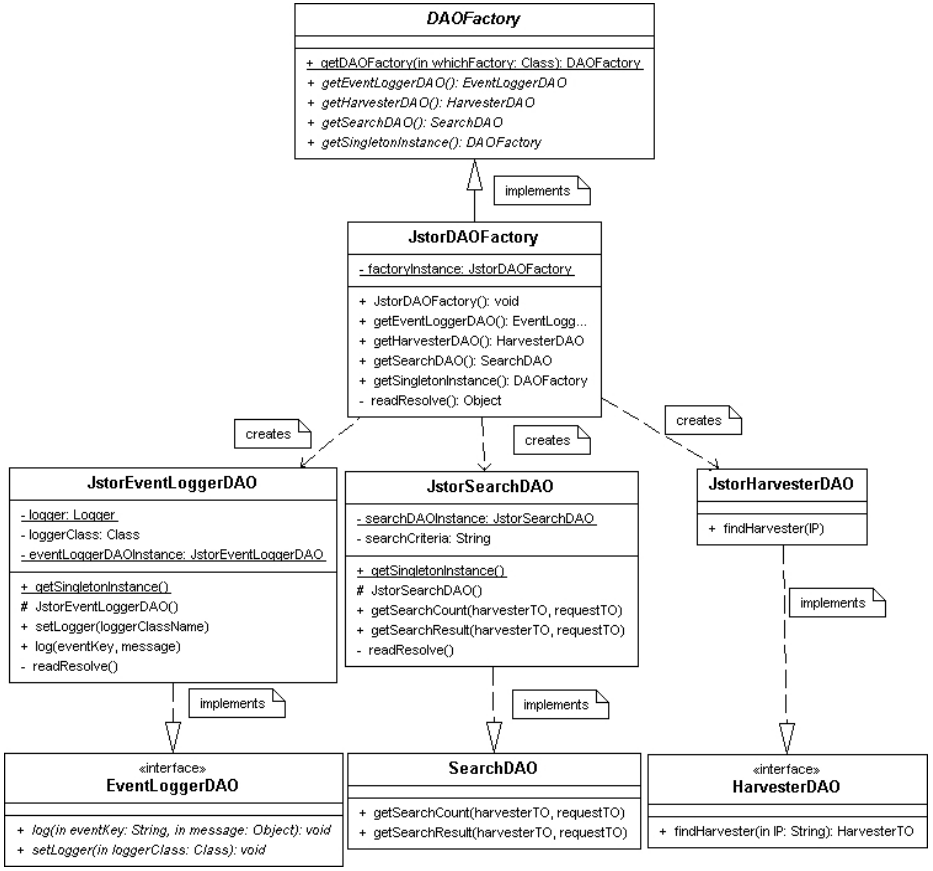


View of Participating Classes



Retrieve Bibiliographic Data - VOPC Class Diagram

J2EE Design Patterns



Current Issues, Questions

- What's “new to repository” vs. “new to subscription”
- Resumption Tokens
- Compression
- Associating metadata formats with types of objects returned from search
- Development nears completion

Conclusion

- Constraints, Process, Sharing our Findings
- Load Testing has been helpful
- Internal Use First
- How and when to introduce externally
- Possibility of sharing code, UML
- Need for a harvester, internally and externally
- Paper Available
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- Questions?