



Elmo

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Presenter: James Leigh, Toronto

Workbrain 5: Total Workforce Management

Extending market leadership in the enterprise WFM market

Typical Client Profile

- Leading enterprise organization
- Geographically dispersed
- Complex pay requirements
- Dynamic scheduling requirements

Comprehensive solution for:

- Improved operational efficiency
- Enhanced visibility and control
- Lower operating costs



Align Long Term Labor Planning with Workforce Execution



Elmo

Maps Sesame repository to Java Beans
and implements common RDF utility operations



Statements and Values

```
Resource me = new URIImpl("urn:me");
CloseableIterator<Statement> knows;
CloseableIterator<Statement> iter;
knows = repository.getStatements(me, FOAF.KNOWS, null);
while (knows.hasNext()) {
    Resource friend = (Resource) knows.next().getObject();
    iter = repository.getStatements(friend, FOAF.NAME, null);
    out.print(iter.next().getValue());
    out.print(" has mailbox ");
    iter = repository.getStatements(friend, FOAF.MBOX, null);
    out.println(iter.next().getValue());
}
```



Java Beans

```
Person me = factory.getBean("urn:me", Person.class);
for (Person friend : me.getKnows()) {
    out.print(friend.getName().iterator().next());
    out.print(" has mailbox ");
    out.println(friend.getMbox().iterator().next());
}
```



Why Use Elmo

- Higher level API for Sesame developers
 - Development on the Ontology level, not at the RDF model level;
 - Increased efficiency through query expansion and caching;
- Compatibility with other persistent layers
 - Compatibility with Spring BeanFactory;
 - Model Classes are defined as abstract interfaces that can be shared with other implementations;



Friends Example Application

Create a simple application using basic J2EE technologies and Elmo.



Augur Repository

- Auguring:
 - To predict from signs or omens; foretell.
- Reduces round trip to the underlying repository
 - Tracks repository traffic and anticipates requests;
 - Only retrieves requested predicates;
 - Expands `getStatement()` requests to retrieve other relevant information;
 - Expands request by including Subjects from parent requests;



ElmoBeanFactory

- Spring BeanFactory interface.
- Can determine Java Bean class based on loaded packages;
- Accepts explicate Bean class or interface;



ElmoRepository

- Internal API to access repository.
- Converts Statements into Java Objects.
- Can be used to retrieve properties not included in the model class.



ModelClassFactory

- Converts Sesame Resources and Literals to Java Beans and Objects.
- Has pluggable Converter interface.
- Combines Java interfaces into concrete subclass corresponding to `rdf:type` description.
 - Generated class support Java instance of operations.



RSS Example Application

RSS example application demonstrates how much more natural manipulating a Java Bean is.



model.rss.Channel

```

@rdf("http://purl.org/rss/1.0/channel")
public interface Channel {
    @localized
    @rdf("http://purl.org/rss/1.0/title")
    public String getTitle();
    @localized
    @rdf("http://purl.org/rss/1.0/title")
    public void setTitle(String title);

    @rdf("http://purl.org/rss/1.0/link")
    public Set<String> getLink();
    @rdf("http://purl.org/rss/1.0/link")
    public void setLink(Set<String> link);
    @rdf("http://purl.org/rss/1.0/link")
    public void addLink(String link);
    @rdf("http://purl.org/rss/1.0/link")
    public void removeLink(String link);

    @functional
    @rdf("http://purl.org/rss/1.0/items")
    public Seq getItems();
    @functional
    @rdf("http://purl.org/rss/1.0/items")
    public void setItems(Seq items);

```

:



Ontologies Shipped with Elmo

- Ontologies are only used, if loaded by a ClassLoader.
- Ontologies included with Elmo:
 - RDF, RDFS, OWL, DC;
 - FOAF;
 - RSS;
 - OWL-S, SWRL, DRS, SWRC;



Creating Your Own Ontologies

- Adding `@rdf` annotation to your methods.
- Jastor Template.
- DynamicClassFactory
 - Simplifies usage for Velocity, XPath, and other Object Graph Navigation Languages.

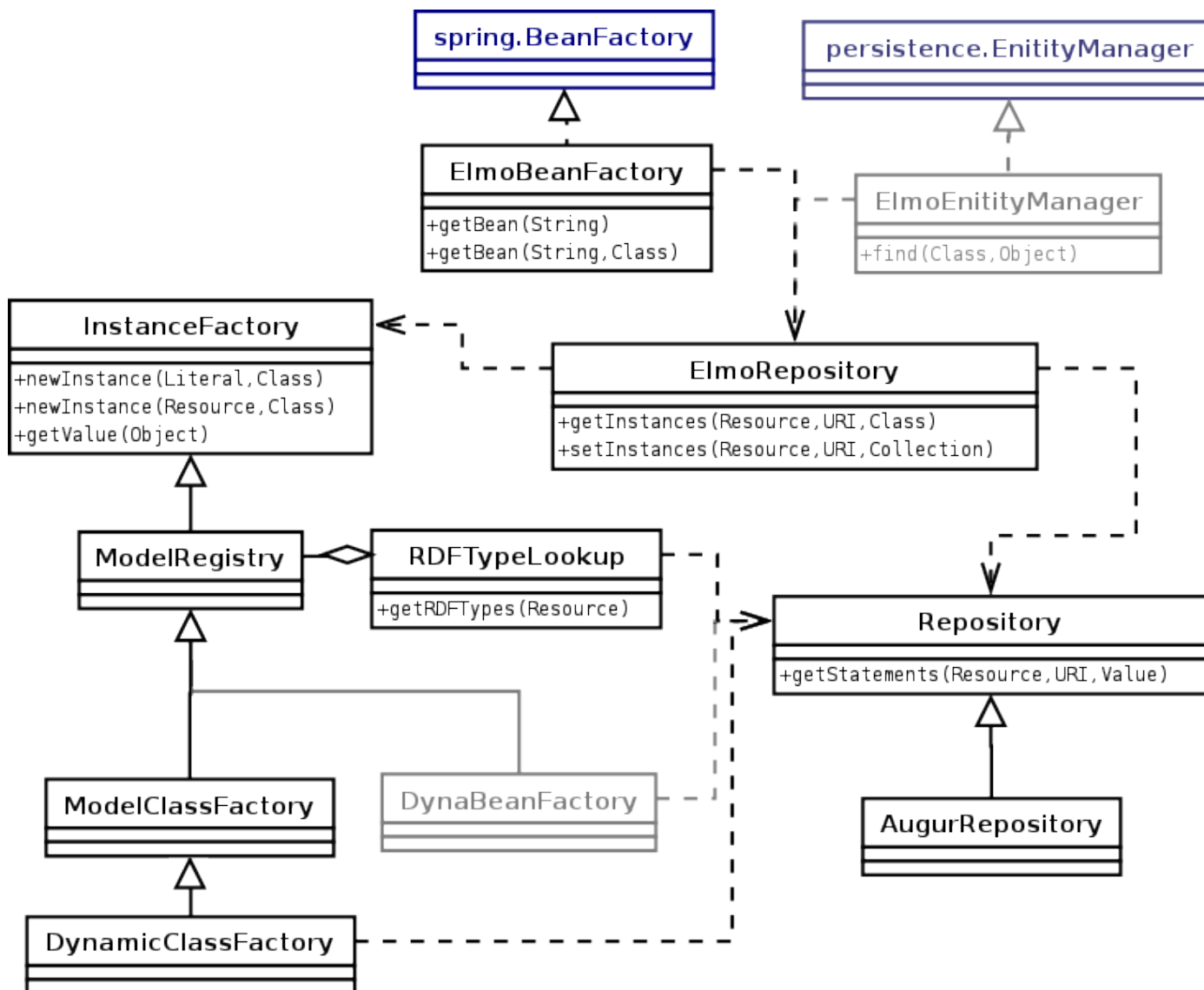


GEDCOM Example Application

GEDCOM example shows that Elmo can simplify your applications without Java model classes.



Architecture





Tools: scutter

- Task: crawling RDF data
 - Follows rdfs:seeAlso links used by e.g. FOAF
 - Doesn't follow arbitrary URIs (as mandated by httpRange-14) or owl:import statements
- Features
 - Persistent queue
 - Focused crawling
 - Auto-blacklisting
 - Storing provenance/timestamp
 - Restricting crawling by URL pattern
 - Preloading from search engine
- Servlet interface
- Native store is recommended as a back-end



Tools: smusher

- Task: finding duplicates in a dataset
 - e.g. multiple FOAF profiles of the same person
- Two implementations:
 - Compares every pair of resources
 - Slower, but cannot run out of memory
 - Based on custom defined comparators
 - Comparators for Person (based on name and email) are included
 - Compare all resources on a given property
 - Fast, but can run out of memory if the results of the query cannot fit in the memory
 - Based on mini-smushers that compare a set of resources
- Meta-smushers
 - DisjunctiveComparator/Smusher
 - IterativeSmusher
- Report matches using a Listener framework
 - Listeners provided for storing matches using owl:sameAs and for logging
- Servlet interface



More info

- Elmo lives at openrdf.org, the home of Sesame
- Use the forums at openrdf.org to ask questions, join the discussion on the development of Elmo
- Use the issue tracker to report bugs
- Download latest releases
 - LGPL license (like Sesame)
- Contribute!
 - Check out module elmo from the Sesame project CVS at sourceforge.net/projects/sesame