Using Protégé in a Domain-Driven Software Product Development Process

Andrew Trice, Ph.D.
Director, Product Analysis & Interface Design
Agenda

• HR / Compensation Planning Domain
  - Figuring out what raises to give people is simple, right?

• Use of Protégé on key Workscape project
  - Extensions and customizations

• Benefits
  - “We know what an ontology is now, and...”

• Challenges
  - How can we get beyond “this is cool...”? 
Workscape Overview

Workscape provides benefits administration and workforce management solutions designed to be used by your company’s workforce that readily adapt to your company’s business processes.

- Comp Planning key piece of Workforce Management
- Focus on larger companies (10K Employees+)
- Workscape itself has about 500 Employees
### Representative Workscape Clients

<table>
<thead>
<tr>
<th>Category</th>
<th>Clients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Automotive</td>
<td>GM, DAIMLERCHRYSLER</td>
</tr>
<tr>
<td>Financial Services</td>
<td>National City, USAA, BANK ONE, UNION BANK OF CALIFORNIA</td>
</tr>
<tr>
<td>Health/Insurance</td>
<td>Lilly, CIGNA, Aetna, AMGEN</td>
</tr>
<tr>
<td>Technology</td>
<td>Sun microsystems, IBM, EarthLink</td>
</tr>
<tr>
<td>Consumer/Retail</td>
<td>TARGET, THE HOME DEPOT, WHOLE FOODS, STAPLES, AHOLD USA</td>
</tr>
<tr>
<td>Manufacturing/Distribution</td>
<td>TYCO, SQUARE D Schneider Electric, Honeywell</td>
</tr>
<tr>
<td>Transportation</td>
<td>FedEx, YELLOW (YES WE CAN)</td>
</tr>
<tr>
<td>Telecommunications</td>
<td>CABLEVISION, T Mobile, NOKIA</td>
</tr>
<tr>
<td>Government/Defense</td>
<td>UNITED STATES POSTAL SERVICE, NORTHROP GRUMMAN</td>
</tr>
</tbody>
</table>
Comp Plan Components

Organization

Employees

Employee Flex attributes

Groups can be based on Hierarchies

Groups have query builders that access Employee attributes

1 Employee can exist in several hierarchies

HR Employee Hierarchy

Org. Hierarchy

HR Employee

Approval Workflow

Program

Element Type

Element Type Attributes

Eligibility

Guidelines/ Thresholds

Dates

Calculations

Performance Ratings

Nomination

WFE integration

Multiple Budget Groups per Budget

1 or more Elements per Program

Organizational Rollup

1 Employee can exist in several hierarchies

Programs can be based on Hierarchies

Groups have query builders that access Employee attributes

1 or more Elements per Program

Organizational Rollup

1 Employee can exist in several hierarchies

Programs can be based on Hierarchies

Groups have query builders that access Employee attributes
Sample Comp Planning Screen
Project Goals

• Better support “the way you work”
  - Easily accommodate complex, variable compensation programs
  - Integrate program configuration and program planning
  - “Nail the domain”

• Move product from
  - Custom-coding to configuring planning solution
  - 1 hierarchy to multiple hierarchies
  - Element customization to element templating
  - Hard-coded budgets to flexible/modeled budgets
  - Customizing the planning UI to (partially) generating the UI
Customizations / Extensions for Project

- Modeled key comp planning domain concepts
- Created a metaclass to trace Protégé model classes back to the functional areas of the product and other requirements gathering tools
- Experimented with Modeling UI constructs in Protégé classes to create forms showing more aggregated data
  - Would like to experiment with Owl Wizard as well
- Graph Widget used to model hierarchical relationships
Domain Model Metrics

- 177 Classes
- 267 Slots
- 595 Instances
- 1040 Frames
Benefits of Using Protégé on Project

- **Product Mngt/Dev**
  - Structured Domain Model
  - Classes, Slots/Attributes
  - Relationships
  - Allowed dependencies between comp concepts
  - Enabling program templates

- **Product Mngt/Dev**
  - Allowed dependencies between comp concepts
  - Enabling program templates

- **Domain Experts**
  - Creating/Copying Instances
  - Representing (Static) Scenarios

- **Product Mngt/Dev, +..**
  - Structured Domain Model
  - Classes, Slots/Attributes
  - Relationships

- **Bounding**
  - Domain
  - Product Mngt/Dev

- **Validating**
  - Scenarios
  - Product Mngt/Dev
  - Domain Experts

- **Defining**
  - Vocab
  - Product Mngt/Dev

- **Feeding**
  - Design
  - Product Mngt/Dev

- **Prototyping**
  - UI/UX
  - Product Mngt/Dev
  - Product Architects/Designers

- **Product Architects/Designers**
  - Export or Repurpose Domain Model and supplement with behavior model, conceptual design, prototypes?

  - Create/Customize Forms, Widgets
  - Assemble “Views” from Forms
  - Medium fidelity, some interaction
Challenges to Getting Benefits From Protégé

• Incorporating “yet another tool”
• Integration with Rational Rose perceived as incomplete
• Insufficient time allotted to allowing product managers and engineers to digest and “own” the model
• One champion is not enough to institutionalize use of the tool
• Prototyping, requirements clarification was a success, transition to implementation model less so