# Common Features of Killer Apps:
## *A Comparison with Protégé*

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# Killer Apps!

- What are they?
  - Highly transformative technologies that create new markets and wide spread patterns of behaviour
- The term “Killer App” was first used in the mid-1980s to describe Lotus 1-2-3, once demand for it become the major driver for buying IBM PCs

# Semantic Web Killer App?

- A very common question:
  - ***Where is the Killer App for the SW?***

- Many suggestions have be made:

What about Adobe that supports RDF?!

It's all about the connections stupid!

The semantic web IS the killer app!

Is your SW KApp

Winners of Semantic Web Challenge must be KApps right?

FOAF-a-matic

Nooo! It's Haystack

Integration, integration, integration

foafCORP is neat!

No it's the integration idiot!

I think SW Services are the SW KApps!

# Understanding Killer Apps!

- Killer apps don’t need advertising!
- Not any application can qualify as a killer!
- Applications must fulfil some requirements or possess some features to have the chance of becoming a Killer App
- Understanding those requirements and features might help building more successful applications
- A peek in the worlds of business and economy might help finding out what those features are

# Features of Killer Apps

- Most of the features we found are pretty obvious! But it's surprising how most applications ignore them!
- Protégé is used as an example of a successful application
- We compare between some of the general features of KillerApps, and those of Protégé
- Protégé is not a KillerApp for the Semantic Web, but it's certainly a KillerApp for ontology editing

# Superiority

- Must provide higher service quality (eg email vs snail mail, broadband vs dial-up)
  - What will your semantic web application give me that I can not get elsewhere?
  - How is this better?
- Must show clear advantage over competitor products
  - Can I get the same functionality using other, cheaper, technology?
  - Can you demonstrate how difficult, if not impossible, it is to build this service using more traditional technologies?
  - Is the cost of migrating to this technology well justified?
- Protégé
  - Competitors include OntoEdit, Ontolingua, WebOnto, OilEd, KAON, etc
  - Comparison reported in Ontological Engineering, Springer 2004, showed many superior features of Protégé

# Cost vs Benefit

- Cost-benefit analysis is essential
  - Cost of construction, conversion, maintenance, etc.
- KApps tend to be cheaper than alternative products. The more affordable it is, the more users it will attract
  - How costly it is to use this technology in the short and longer term?
- Many examples of free KApps; eg web browsers, search engines, chat software. They rely on their large user communities to generate value (eg from online ads, subscriptions to advanced services)
  - How can you generate value from your service/application?
- Protégé
  - Absolutely free!
  - For users, it helps to bring down costs of ontology editing and maintenance
  - For developers, apparently not much income has been generated

# Community of Practice

- Metcalfe's law: *utility of a network equals approximately the square number of its users*
  - Explains value of networked applications such as telephone, email, chat software
  - Core to the SW
- Must have potential to create a community of users
  - How can our application encourage community building?
  - How do you support, interact with, and listen to your users?
- Protégé
  - Over 27k registered users so far
  - Well attended conferences and busy mailing lists
  - Very good technical support for its user community
  - Users can build and share plugins

# Open System

- A system draws additional value from other systems when its open to direct interaction with them
  - Reduces cost of data conversion and technology transfer
  - Propose supporting technology, rather than alternatives!
- Openness is at the heart of the SW
  - Will your application help to bring more RDF to the SW?
- Protégé
  - One of Protégé's main advantages is its extendibility
  - Open source
  - Great value is added to Protégé from external, free, contributions (plugins)

# Ease of Use

- Easy to use, non complex apps gets used more than others
  - No steep learning curves (imagine if you cant use the Web before learning HTML!)
  - Don’t expect users to know RDF or anything about ontologies

- Protégé
  - Ease of use is one of the main focuses of Protégé
  - Graphical interface
  - Not much knowledge of RDF or OWL syntax is required
  - Important to facilitate OWL editing even further (eg ezOWL)

# Personalisation

- Users are more royal to customisable services
  - But it has to be done properly!
  - Many of today's killer apps have some level of personalisation (eg Amazon, AutoTrader, rightmove, eBay, pogo)

- Protégé
  - Customisable data entry forms
  - Some personalised settings are stored
  - What more can be offered?


# Protégé: Further Issues

# Scalability

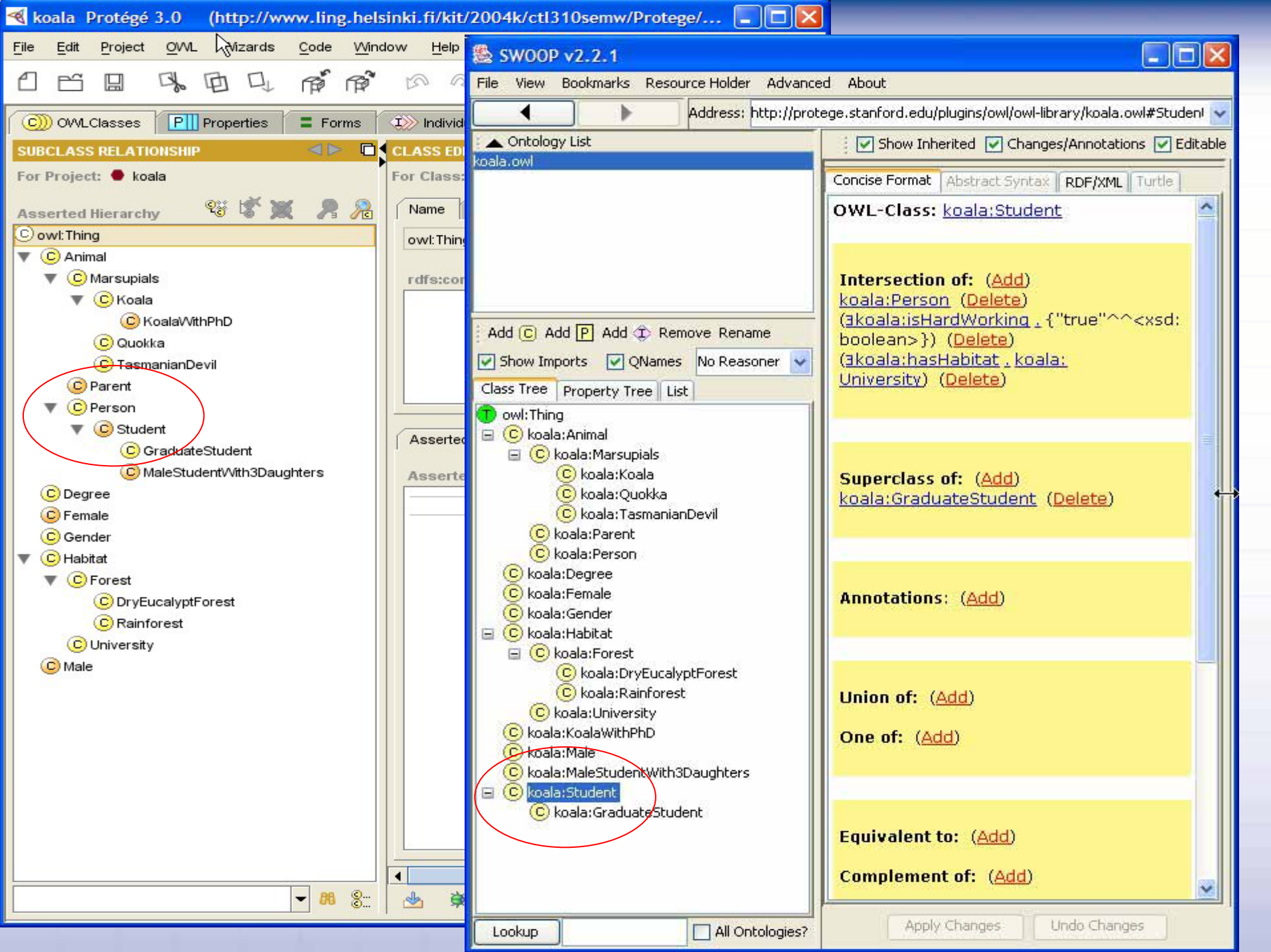
- We are starting to see systems with small ontologies, but with a large number of instances
  - Eg CSAktiveSpace, winner of 2003 SWC, around 80 concepts, 25M triples
  - Flink, 2004 SWC winner, FOAF-like ontology, 35M triples

- Protégé
  - Main design goals were interoperability and ease of use
  - Some triple-stores are designed for scale; eg 3tore, Sesame, and Kowari
  - We often see users building their ontologies in Protégé, then migrating them to another triple store for deployment
  - Could we have the best of both worlds in one system? Or get a better integration of Protégé with such stores?

# Language Support

- Support for Semantic Web languages, such as RDF and OWL is crucial

- Protégé
  - Has always been amongst the first to provide support for such languages
  - Some Protégé-specific RDF syntax has been added for more detailed representations
  - As for OWL, some parsing incompatibilities can be spotted against Jena and SWOOP


koala Protégé 3.0 (http://www.ling.helsinki.fi/kit/2004k/ctl310semw/Protege/...
File Edit Project OWL Wizards Code Window Help
OWLClasses Properties Forms Individ
SUBCLASS RELATIONSHIP
For Project: koala
Asserted Hierarchy
owl:Thing
Animal
Marsupials
Koala
KoalaWithPhD
Quokka
TasmanianDevil
Parent
Person
Student
GraduateStudent
MaleStudentWith3Daughters
Degree
Female
Gender
Habitat
Forest
DryEucalyptForest
Rainforest
University
Male
SWOOP v2.2.1
File View Bookmarks Resource Holder Advanced About
Address: http://protege.stanford.edu/plugins/owl/owl-library/koala.owl#Student
Ontology List
koala.owl
Show Inherited Changes/Annotations Editable
Concise Format Abstract Syntax RDF/XML Turtle
OWL-Class: koala:Student
Intersection of: (Add)
koala:Person (Delete)
(∃koala:isHardWorking . {"true"^^<xsd:boolean>}) (Delete)
(∃koala:hasHabitat . koala:University) (Delete)
Superclass of: (Add)
koala:GraduateStudent (Delete)
Annotations: (Add)
Union of: (Add)
One of: (Add)
Equivalent to: (Add)
Complement of: (Add)
Add Add Add Remove Rename
Show Imports QNames No Reasoner
Class Tree Property Tree List
owl:Thing
koala:Animal
koala:Marsupials
koala:Koala
koala:Quokka
koala:TasmanianDevil
koala:Parent
koala:Person
koala:Degree
koala:Female
koala:Gender
koala:Habitat
koala:Forest
koala:DryEucalyptForest
koala:Rainforest
koala:University
koala:KoalaWithPhD
koala:Male
koala:MaleStudentWith3Daughters
koala:Student
koala:GraduateStudent
Lookup All Ontologies?
Apply Changes Undo Changes

# Publishing and Access

- Online access to knowledge is essential for the Semantic Web
- Sesame, 3Store, and many other triple stores are designed for online querying and access using latest SW query languages such as RDQL and SPARQL
- Protégé
  - No direct support to these querying languages
  - No easy method for online access to knowledge base
    … that I know of!

# Semantic Web Challenge

- Currently mainly focussing on the use of core SW characteristics
- Future calls might wish to include some of the KApp features discussed here

A Semantic Web Application has to meet the following minimal requirements.

1. First, the information sources used
   - should be geographically distributed,
   - should have diverse ownerships (i.e. there is no control of evolution),
   - should be heterogeneous (syntactically, structurally, and semantically), and
   - should contain real world data, i.e. are more than toy examples.
2. Second, it is required that all applications assume an open world, i.e. assume that the information is never complete.
3. Finally, the applications should use some formal description of the meaning of the data.

Besides the minimal criteria,a number of desires are formulated. The more desires are met, the higher an application can score. The desires are:

- The application uses data sources for other purposes or in another way than originally intended
- Using the contents of multi-media documents
- Accessibility in multiple languages
- Accessibility via devices other than the PC
- Other applications than pure information retrieval
- Combination of static and dynamic knowledge (e.g. combination of static ontologies and dynamic work-flows)
- The results should be as accurate as possible (e.g. use a ranking of results according to validity)
- The application should be scalable (in terms of the amount of data used and in terms of distributed components working together)

# In Summary

- It's difficult to predict where new killers will come from

- However, the history of killer apps makes it likely that any SW killers will have to provide:
  - a service that is not possible or practical under more traditional technologies
  - some clear benefit to developers, data providers, and end users with minimum extra costs
  - an application that becomes indispensable to a user-base much wider than the SW researchers community


# El Fin!

Leave you with some *fun*ding ideas ….


*advertising with Protégé ….*

eBay Protégé 3.0 (file:\C:\Program%20Files\Protege_3.0_beta\examples\eBay\eBay.pprj, OWL Files (.owl or .rdf))

File Edit Project OWL Wizards Code Window Help

protégé

OWLClasses | Properties | Forms | Individuals | Metadata

## SUBCLASS RELATIONSHIP

For Project: eBay

Asserted Hierarchy

- owl:Thing
  - Bid
  - Feedback
  - Item
  - Member

## CLASS EDITOR

For Class: Member (instance of owl:Class)

Name | SameAs | DifferentFrom

Member

rdfs:comment

Member of eBay. Could be an individual person or a group (eg organisation, company).

Annotations

| Property | Value | Lang |
|---|---|---|

Asserted | Inferred

Asserted Conditions

NECESSARY & SUFFICIENT

NECESSARY

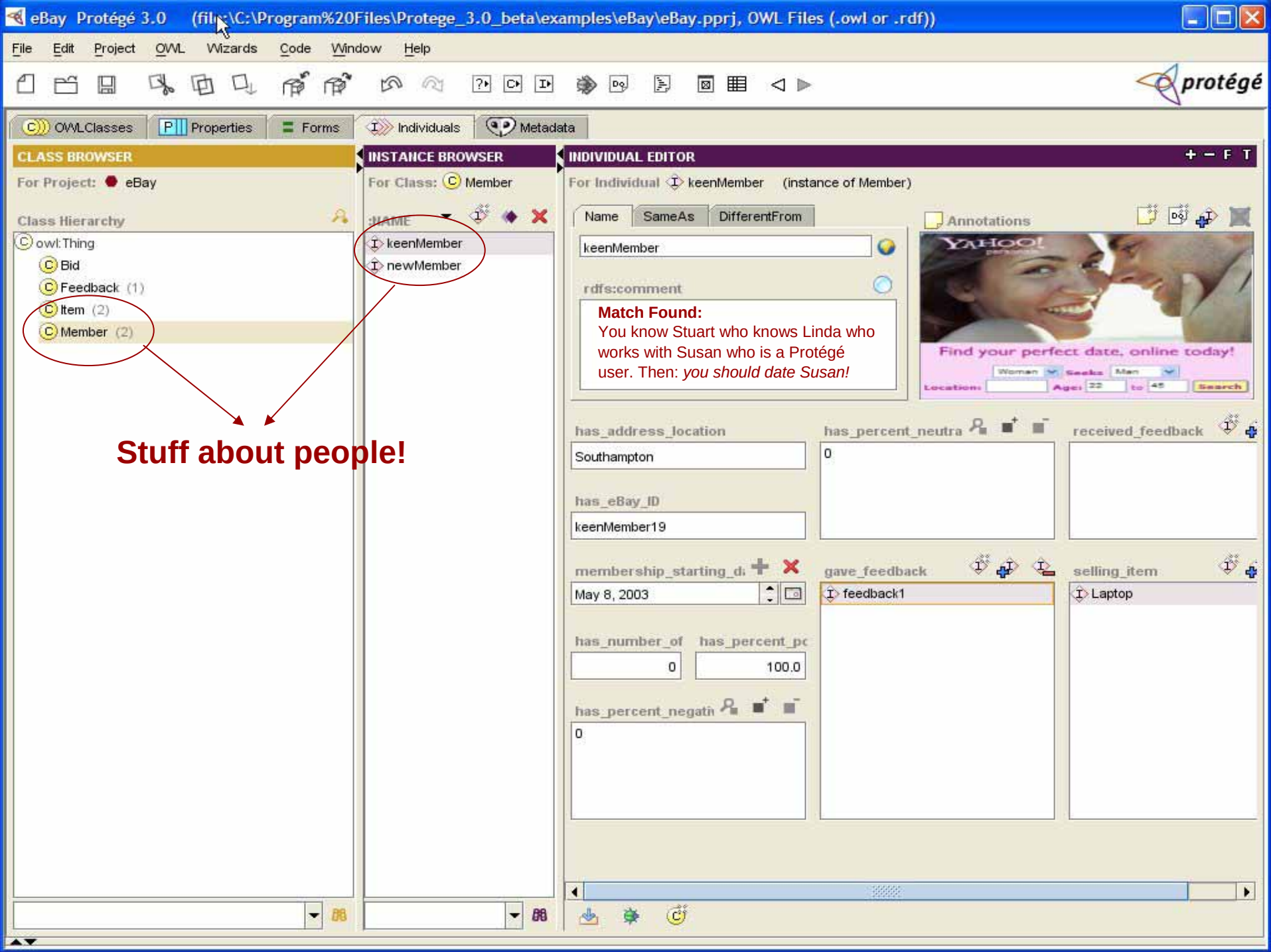
owl:Thing

Properties

- gave_feedback (multiple Feedback)
- has_address_location (single String)
- has_eBay_ID (single String)
- has_number_of_negative_feedbacks (single i
- has_percent_negative_feedback (multiple Stri
- has_percent_neutral_feedback (multiple String
- has_percent_positive_feedback (single float)
- membership_starting_date (single date)
- received_feedback (multiple Feedback)
- selling_item (multiple Item)

Disjoints

Logic View | Properties View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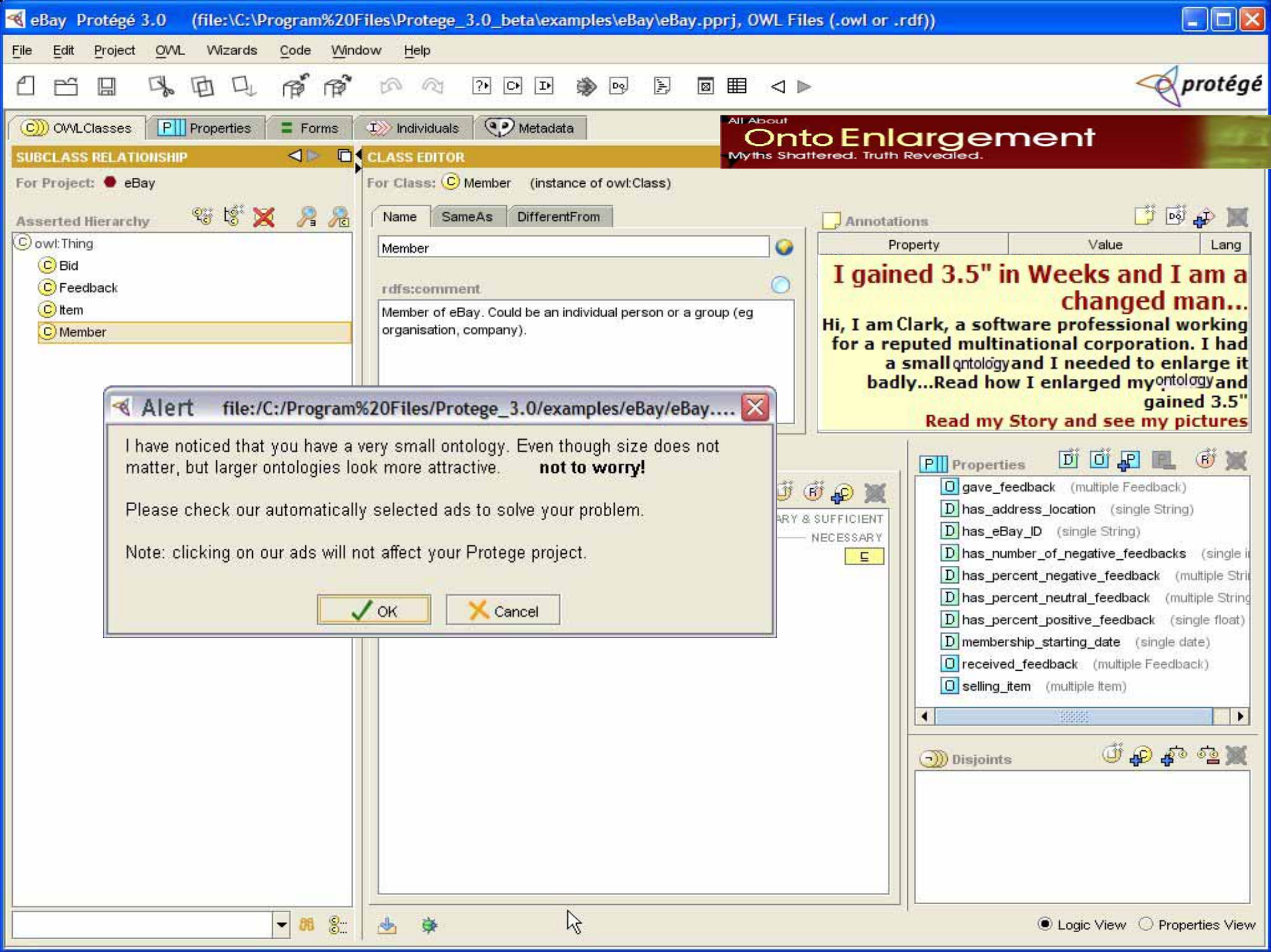
File Edit Project OWL Wizards Code Window Help
protégé
OWLClasses Properties Forms Individuals Metadata
CLASS BROWSER
For Project: eBay
Class Hierarchy
owl:Thing
Bid
Feedback (1)
Item (2)
Member (2)
INSTANCE BROWSER
For Class: Member
:NAME
keenMember
newMember
INDIVIDUAL EDITOR
For Individual keenMember (instance of Member)
Name SameAs DifferentFrom
keenMember
rdfs:comment
Match Found:
You know Stuart who knows Linda who works with Susan who is a Protégé user. Then: you should date Susan!
Annotations
Find your perfect date, online today!
has_address_location
Southampton
has_eBay_ID
keenMember19
has_percent_neutra
0
received_feedback
membership_starting_d
May 8, 2003
gave_feedback
feedback1
selling_item
Laptop
has_number_of
0
has_percent_pc
100.0
has_percent_negati
0
Stuff about people!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protégé
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All About
Onto Enlargement
Myths Shattered. Truth Revealed.
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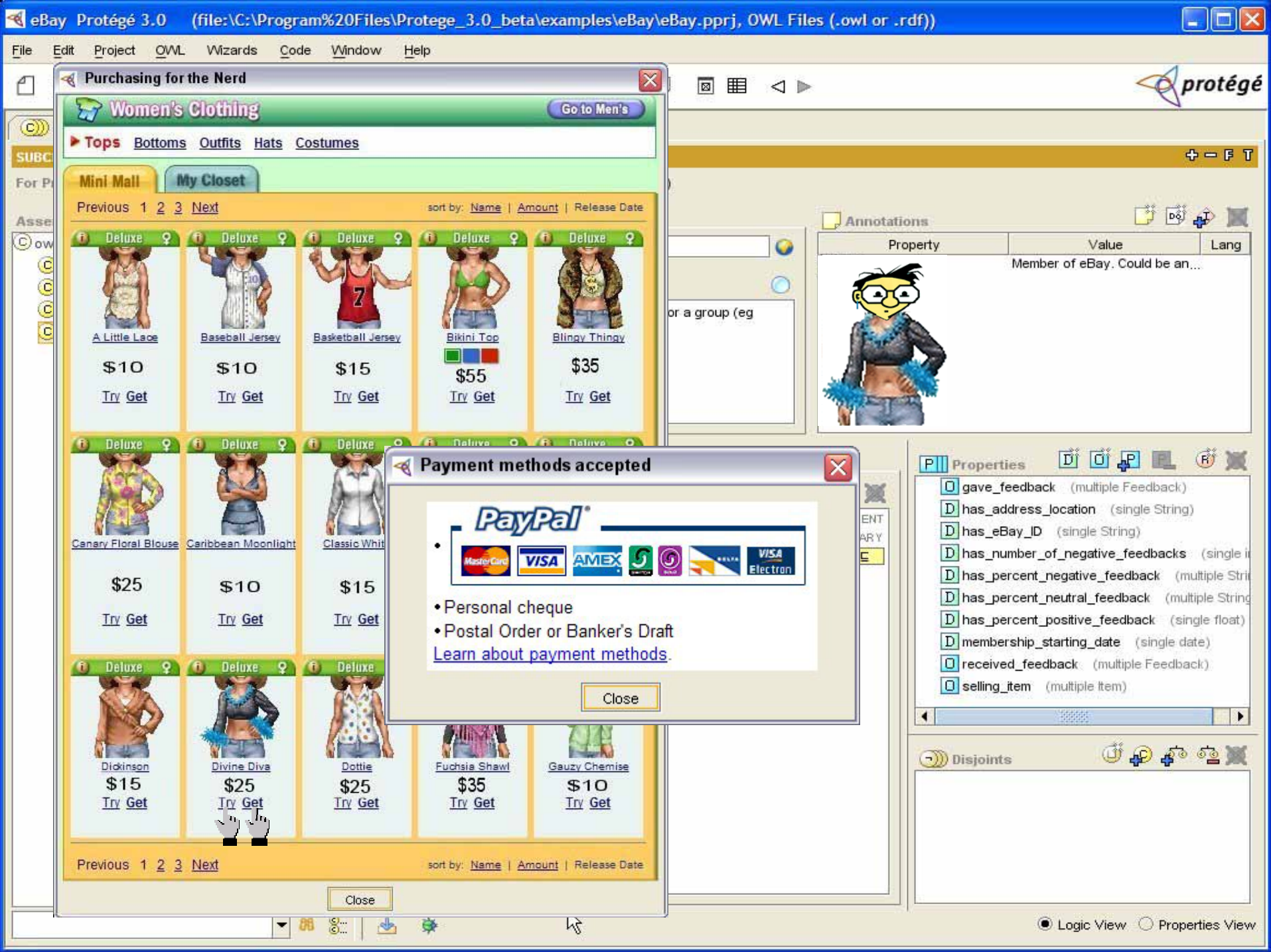
CLASS EDITOR
For Class: Member (instance of owl:Class)
Name SameAs DifferentFrom
Member
rdfs:comment
Member of eBay. Could be an individual person or a group (eg organisation, company).
Annotations
Property Value Lang
I gained 3.5" in Weeks and I am a changed man...
Hi, I am Clark, a software professional working for a reputed multinational corporation. I had a small ontology and I needed to enlarge it badly...Read how I enlarged my ontology and gained 3.5"
Read my Story and see my pictures
Alert file:/C:/Program%20Files/Protege_3.0/examples/eBay/eBay....
I have noticed that you have a very small ontology. Even though size does not matter, but larger ontologies look more attractive. not to worry!
Please check our automatically selected ads to solve your problem.
Note: clicking on our ads will not affect your Protege project.
OK
Cancel
Properties
gave_feedback (multiple Feedback)
has_address_location (single String)
has_eBay_ID (single String)
has_number_of_negative_feedbacks
has_percent_negative_feedback
has_percent_neutral_feedback
has_percent_positive_feedback (single float)
membership_starting_date (single date)
received_feedback (multiple Feedback)
selling_item (multiple Item)
Disjoints
Logic View
Properties View

*bring back the Nerd!*

*and create the Nerd's Mini Mall ….*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File Edit Project OWL Wizards Code Window Help
protégé
Purchasing for the Nerd
Women's Clothing
Go to Men's
Tops Bottoms Outfits Hats Costumes
Mini Mall
My Closet
Previous 1 2 3 Next
sort by: Name | Amount | Release Date
Deluxe
A Little Lace $10 Try Get
Baseball Jersey $10 Try Get
Basketball Jersey $15 Try Get
Bikini Top $55 Try Get
Blingy Thingy $35 Try Get
Canary Floral Blouse $25 Try Get
Caribbean Moonlight $10 Try Get
Classic Whit $15 Try Get
Dickinson $15 Try Get
Divine Diva $25 Try Get
Dottie $25 Try Get
Fuchsia Shawl $35 Try Get
Gauzy Chemise $10 Try Get
Previous 1 2 3 Next
sort by: Name | Amount | Release Date
Close
Payment methods accepted
PayPal
MasterCard VISA AMEX Electron
• Personal cheque
• Postal Order or Banker's Draft
Learn about payment methods.
Close
Annotations
Property Value Lang
Member of eBay. Could be an...
Properties
gave_feedback (multiple Feedback)
has_address_location (single String)
has_eBay_ID (single String)
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membership_starting_date (single date)
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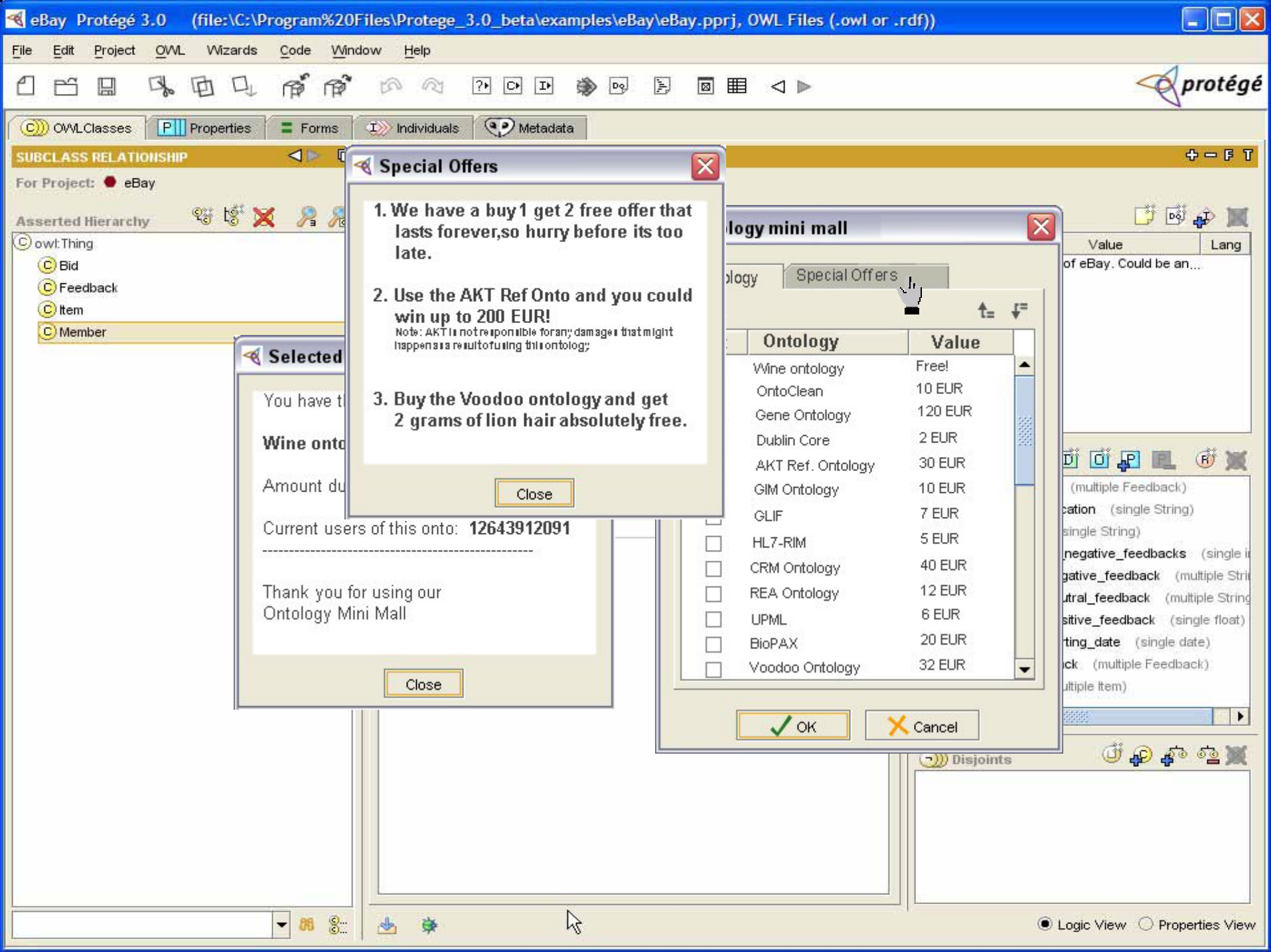
Disjoints
Logic View
Properties View

*Or a mini mall for ontologies ….*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protégé
OWLClasses Properties Forms Individuals Metadata
SUBCLASS RELATIONSHIP
For Project: eBay
Asserted Hierarchy
owl:Thing
Bid
Feedback
Item
Member
Special Offers
1. We have a buy 1 get 2 free offer that lasts forever,so hurry before its too late.
2. Use the AKT Ref Onto and you could win up to 200 EUR!
Note: AKT is not responsible for any damages that might happen as a result of using this ontology;
3. Buy the Voodoo ontology and get 2 grams of lion hair absolutely free.
Close
Selected
You have t
Wine onto
Amount du
Current users of this onto: 12643912091
Thank you for using our Ontology Mini Mall
Close
logy mini mall
logy
Special Offers
Ontology
Value
Wine ontology Free!
OntoClean 10 EUR
Gene Ontology 120 EUR
Dublin Core 2 EUR
AKT Ref. Ontology 30 EUR
GIM Ontology 10 EUR
GLIF 7 EUR
HL7-RIM 5 EUR
CRM Ontology 40 EUR
REA Ontology 12 EUR
UPML 6 EUR
BioPAX 20 EUR
Voodoo Ontology 32 EUR
OK
Cancel
Value
Lang
of eBay. Could be an...
(multiple Feedback)
cation (single String)
single String)
negative_feedbacks (single i
gative_feedback (multiple Stri
utral_feedback (multiple String
sitive_feedback (single float)
ting_date (single date)
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ultiple Item)
Disjoints
Logic View
Properties View