What?

http://bioinformatics.ua.pt/COEUS
Next Generation Semantic Web Application Framework

Rapid Application Deployment

Data Integration Platform

Advanced Data Exploration Framework

“SEMANTIC WEB IN A BOX” FOR BIOINFORMATICS
Why?

http://bioinformatics.ua.pt/COEUS
IMPROVE BIOMEDICAL APPLICATIONS DOMAIN

(Among others...)
SEMANTIC WEB + LIFE SCIENCES

perfect benchmark
awareness from bioinformatics developers
common intertwined graph relationship structure

BUT...

Semantic Web is still underused in the life sciences domain

transition/migration is very difficult
complex application deployment
learn a whole new batch of technologies (again!)

You are notable exceptions!
How?

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KNOWLEDGE SEED is a single app, an instance
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KNOWLEDGE GARDEN links multiple seeds

Federation Garden
INTEGRATION
Data in = Connectors
CONNECTORS = CSV + XML + SQL + SPARQL

load everything

flexible format support
map external data into a seed’s model

any predicate matches data from selectors

csv columns
xml XPath results
SQL table columns
SPARQL query variables
Data out = APIs

EXPLORATION
API = SPARQL + REST + Java + LinkedData

code your own apps
in any programming language available
for desktop, web or mobile

one seed, multiple apps and/or multiple seeds, one app

federate to existing apps
access with REST or SPARQL
distributed knowledge network
Setting it up...

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CONFIGURATION

Where’s everybody?
CONFIGURATION = JS FILE + (ONTOLOGY * SETUP)

local app configuration

JSON object in JavaScript file
defines application properties (name, version, environment...)

define seed ontology then setup resources

seed ontology
based on COEUS ontology
your app data model

resource setup
resource connectors configuration
ontology mappings
Getting data together...

BUILDING
SEMANTIC WEB TRANSLATION

triplify data

app setup + data = triples

subject - predicate - object

subject
created at runtime

new Item individual

predicate
configured in app setup

foaf:name
dc:title
rdfs:label
owl:versionInfo
swat4ls:link

object
resource data

CSV column
SQL table column
XML XPath
SPARQL variable
Plugin...
INTEROPERABILITY

**SPARQL**
- Perform SPARQL queries
- Get data in multiple formats

**REST**
- GET requests for all data
- .../api/<concept>_<id> for relationships
- .../api/sub/pred/obj/<format> for specific content

**Java**
- Abstracted from Jena's methods

**LinkedData**
- .../resource/<concept>_<id>
Where?

http://bioinformatics.ua.pt/COEUS
Drugs App Here!

Knowledge Here!

Whatever App Here!

Knowledge Here!

Knowledge Here!

Knowledge Here!

Knowledge Here!

Knowledge Here!

Knowledge Here!

Knowledge Here!
INTEGRATION
Connectors CSV, SQL, XML, SPARQL

+

EXPLORATION
API Java, REST, SPARQL, LinkedData

= “SEMANTIC WEB IN A BOX”

http://bioinformatics.ua.pt/coeus
THANK YOU!

Questions and Feedback are (very) welcome!

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