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Web-based ontology analysis and partitioning tool

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Agenda

- Objective
- Organization
- Solution
- Challenges
- Demo
- Q&A

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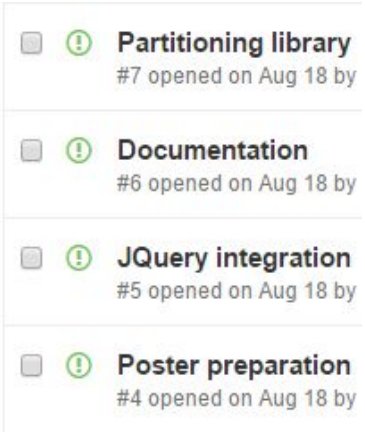
Objective

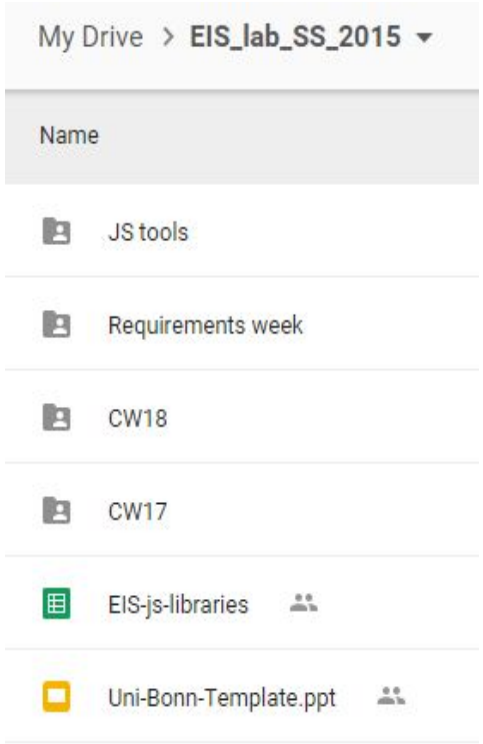
- Decompose large ontologies into smaller modules.
- Support the comprehension of an existing ontology and improve the process of ontology (modular) reuse and interlink.

Organization

- **Weekly*** team meetings
  - with mentors on Wednesdays
  - with team on Sundays

- **Github** for managing code/tasks
- **Google Drive** for managing files





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Solution

- Programming language: Javascript
- Environment: Windows, Mac Os
- Tools: SublimeText, Atom, GitSCM

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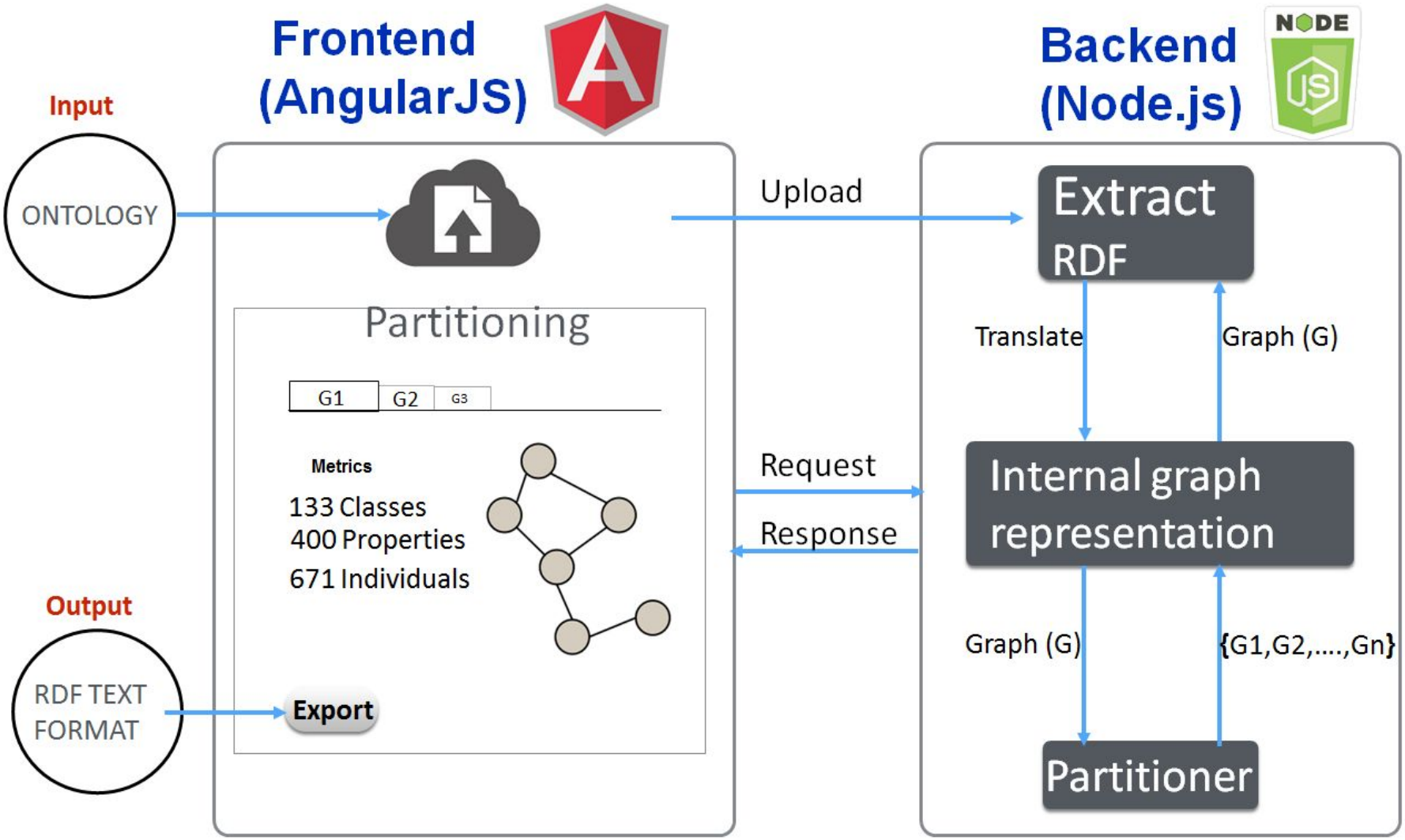
Tasks

1. Technology stack
2. Upload
3. Parse
4. Metrics
5. Filtering
6. Visualize and modify
7. Partition and export
8. Document
9. Test
10. Research

Application flow



Technology stack

- MEAN
  - AngularJS
  - ExpressJS
  - Node.js
- Package managers:
  - Bower (frontend)
  - npm (backend)
- Libraries
  - RdfStore (backend)
  - VisJS (frontend)

Image credit: http://adrianmejia.com/blog/2014/10/03/mean-stack-tutorial-mongodb-expressjs-angularjs-nodejs/

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Upload

Local upload

- OWL file as input
- processed by NodeJS and RDFStore
- dedicated folder: *uploads*

URL upload

- custom code to add bonus metrics
- processed by NodeJS and RDFStore
- *no storage*

Output: triples (subject, predicate, object)

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Parse

OWL2VOWL

- local/URI upload
- generate JSON in VOWL format

RDFStore

- local/URI upload
- generate custom JSON of edges, nodes, graph

Output: REST endpoints

- nodes


```
[{"id":"family-ontology","label":"family-ontology"},{"id":"Alice","label":"Alice"},{"id":"Bob","label":"Bob"},
{"id":"Mary","label":"Mary"},{"id":"Ontology","label":"Ontology"},{"id":"ObjectProperty","label":"ObjectProperty"},
```


- edges


```
[{"from":"family-ontology","to":"Ontology","label":"rdf:type","arrows":"from","filter":["resource"]},
{"from":"hasChild","to":"ObjectProperty","label":"rdf:type","arrows":"from","filter":["object-property","resource"]},
{"from":"_:7","to":"Restriction","label":"rdf:type","arrows":"from","filter":["resource"]},
{"from":"Person","to":"Class","label":"rdf:type","arrows":"from","filter":["class","resource"]},
```

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Metrics

OWL2VOWL

- already available
- generate VOWL JSON

VOWL	
Name	**Count**
Class	3
Datatype	0
Object	1
Datatype property	0
Property	1
Axioms	15

RDFStore

- not available
- custom code to add bonus metrics

Rdfstore	
Blank node	2
Literals	2

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Filtering

- generate input for visualization
- process the nodes and edges
- add a filter to each edge
- Implementation:
  - Node.js using RDFStore

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Visualization

VisJS

- highlight
  - color
  - shape
- metrics
- add edit node
- add edge
- save
- export as image

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Partitioning

- Constructing weighted matrix
- Weight Normalization
- Neighborhood random walk distance method
- Silhouette: criterion function
- Agglomerative algorithm

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Export

Triplles generation:

<http://example.org/#spiderman> <http://www.perceive.net/schemas/relationship/enemyOf> <http://example.org/#green-goblin> .

Export as text file:

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Results

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Challenges

- technology stack: setting up the stack
- AngularJS and Node.js connection
- javascript libraries shortcomings
- converting JSON to OWL

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Q&A

Image credit: http://blog.mypermissions.com/new-study-shows-comprehension-rates-for-tos-of-googlefacebook-is-less-than-40/