

Domain Ontology for Grounded Theory

@aleadorjan



Research Question

RQ: How to model **qualitative research** Grounded Theory methodology ? An **Ontology approach**

Adorjan, A., Vargas-Solar, G., & Motz, R. (2022, December). Towards a human-in-the-loop curation: A qualitative perspective. In *2022 IEEE/ACS 19th international conference on computer systems and applications (AICCSA)* (pp. 1-8). IEEE.

Methods

Interview with Domain Experts **Participant Observation** in the Field Modelling and **Prototyping**

Adorjan, A. (2023, August). Towards a Researcher-in-the-loop Driven Curation Approach for Quantitative and Qualitative Research Methods. In *European Conference on Advances in Databases and Information Systems* (pp. 647-655). Cham: Springer Nature Switzerland.

Adorjan, A., Vargas-Solar, G., & Motz, R. (2022, December). Towards a human-in-the-loop curation: A qualitative perspective. In *2022 IEEE/ACS 19th international conference on computer systems and applications (AICCSA)* (pp. 1-8). IEEE.

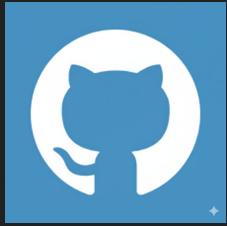
Use Case

Prácticas de **estudio** y de **lectura** de
estudiantes de la **Licenciatura en**
Comunicación de la Facultad de
Información y Comunicación, Uruguay

Adorjan, A. (2023, August). Towards a Researcher-in-the-loop Driven Curation Approach for Quantitative and Qualitative Research Methods. In *European Conference on Advances in Databases and Information Systems* (pp. 647-655). Cham: Springer Nature Switzerland.

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Qualitative Research: Grounded Theory

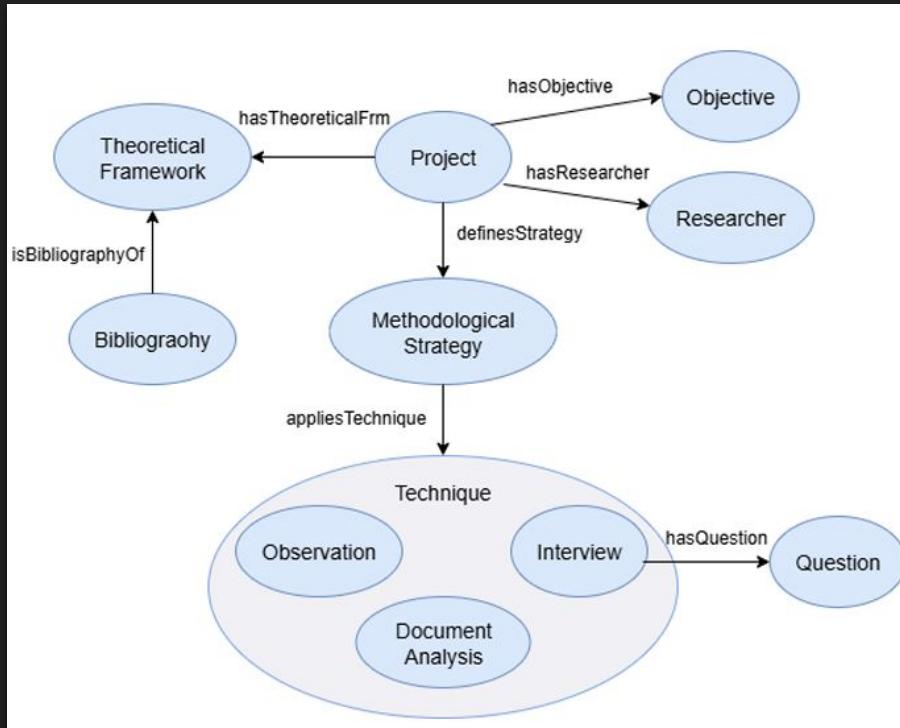


Generated Artefacts
Ontologies Development

Protégé: A free, open-source ontology editor and framework.

Model

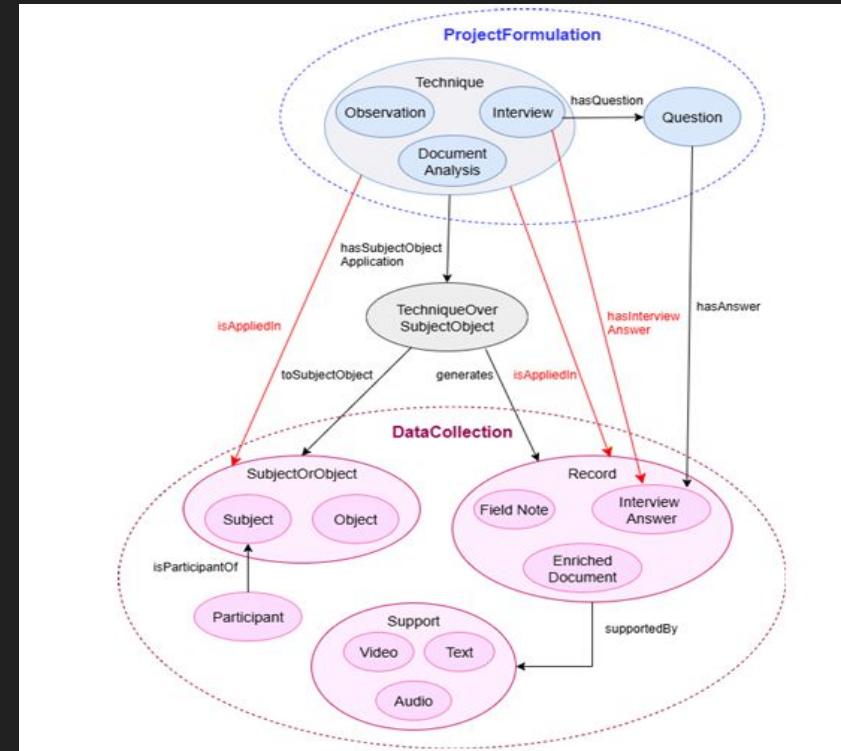
Project Formulation



Rohrer, E., Motz, R., Sandín, J. P., Méndez, E., Fleitas, F., & Pérez, A. (2025, September 10–12). *Domain ontology for grounded theory qualitative research: Bridging interpretation and structure in digital humanities* [Paper presentation]. FOIS 2025 Satellite events co-located with the 15th International Conference on Formal Ontology in Information Systems, Catania, Italy

Model

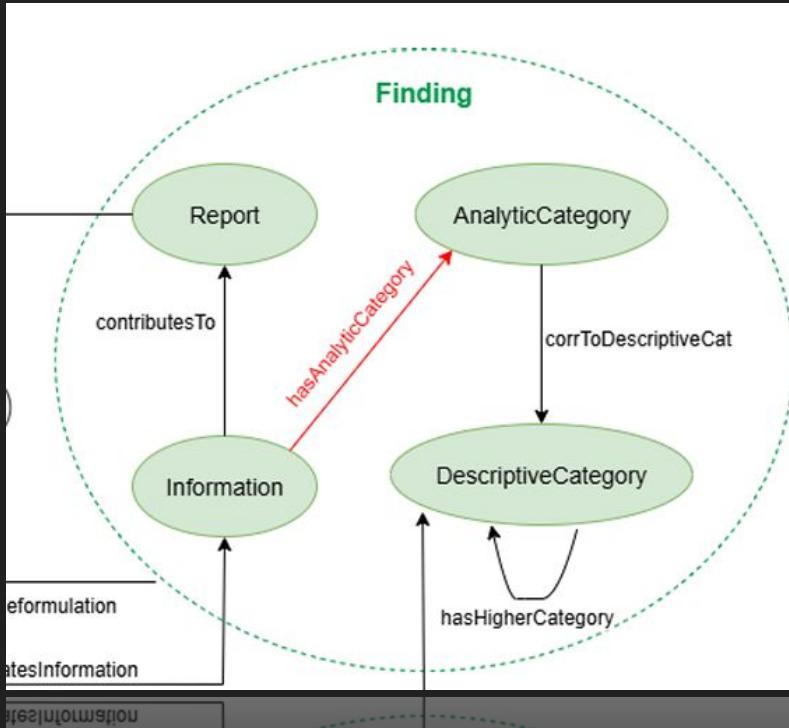
Data Collection



Rohrer, E., Motz, R., Sandín, J. P., Méndez, E., Fleitas, F., & Pérez, A. (2025, September 10–12). *Domain ontology for grounded theory qualitative research: Bridging interpretation and structure in digital humanities* [Paper presentation]. FOIS 2025 Satellite events co-located with the 15th International Conference on Formal Ontology in Information Systems, Catania, Italy

Model

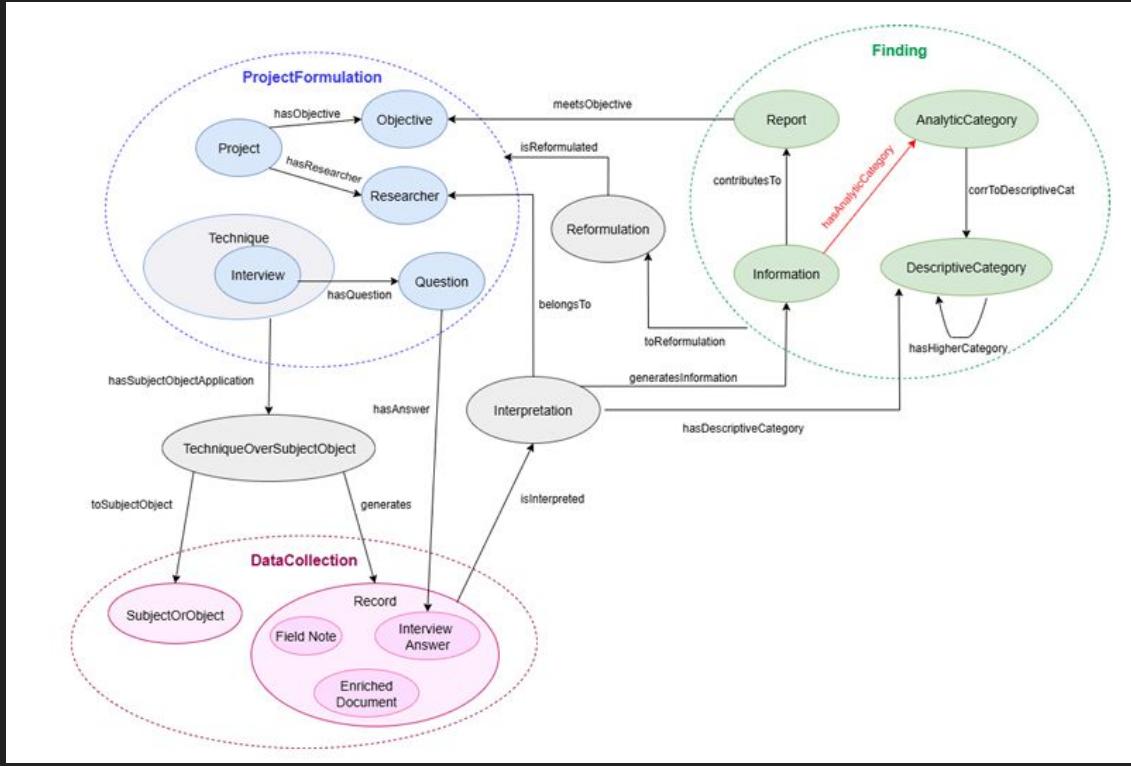
Findings



Rohrer, E., Motz, R., Sandín, J. P., Méndez, E., Fleitas, F., & Pérez, A. (2025, September 10–12). *Domain ontology for grounded theory qualitative research: Bridging interpretation and structure in digital humanities* [Paper presentation]. FOIS 2025 Satellite events co-located with the 15th International Conference on Formal Ontology in Information Systems, Catania, Italy

Model

Final Model



Rohrer, E., Motz, R., Sandín, J. P., Méndez, E., Fleitas, F., & Pérez, A. (2025, September 10–12). *Domain ontology for grounded theory qualitative research: Bridging interpretation and structure in digital humanities* [Paper presentation]. FOIS 2025 Satellite events co-located with the 15th International Conference on Formal Ontology in Information Systems, Catania, Italy

Open Source tool



Protégé Project

255 followers Stanford, California https://protege.stanford.edu protege-dev@lists.stanford.edu Follow

Popular repositories

- protege** Public Protege Desktop Java 1.2k 259
- webprotege** Public The webprotege code base Java 698 260
- protege-distribution** Public Build files for the protege distribution that includes 3rd party plugins 139 41
- cellfie-plugin** Public Protégé plugin for creating OWL ontologies from spreadsheets Java 113 29
- swrlapi** Public Java API for working with the SWRL rule and SQWRL query languages Java 101 41
- mapping-master** Public Library that supports the Mapping Master DSL for mapping spreadsheets to OWL ontologies Java 58 10

People

A row of circular profile icons representing the project team members.

Deploy:

[Qualitative Research Ontology - Summary | TechnoPortal](#)

Qualitative Research: Grounded Theory

Actual Tools for Ontologies Development



1

Deploy:

[Qualitative Research Ontology - Summary | TechnoPortal](#)

AI Tools to Generate Ontologies



<https://cursor.com/>

The screenshot shows the CURSOR AI tool interface. At the top, there's a navigation bar with icons for Agents, Editor, and a review status of "grounded_onto". Below the navigation is a search bar for "Agents" and a "New Agent" button. A progress bar indicates "+673 -5 · Auto".

The main area displays a "Download GitHub repository to Desktop" step with a "Review" button. It includes a "push to remote" section with a "given this ontology create a protege project with all details" instruction and a "To-dos" list:

- Create OWL ontology file with all classes from the diagram
- Add all object properties and their relationships
- Create Protege project structure and documentation

Below this is a code editor showing the generated OWL file: `<?xml version="1.0"?><rdf:RDF xmlns="http://www.semanticweb.org/grounded_research_ontology#" xml:base="http://www.semanticweb.org/grounded_research_ontology" xmlns:owl="http://www.w3.org/2002/07/owl#" xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#">`

At the bottom, there's a "Creating a Protege project file and documentation:" section with a "Keep All" button. The footer contains a command-line interface for "Plan, @ for context, / for commands" and various agent configuration options.

On the right side, a terminal window titled ".gitmessage" shows a partially visible git commit message:

```
! .gitmessage × ↴ PR ...
< 1 of 6 Files > Undo File
1 # Conventional Comm...
2 #
3 # Format: <type>(<se...
4 #
5 # <body>
6 #
7 # <footer>
8 #
9 # Types:
10 #   feat: A new ...
11 #   fix: A bug ...
12 #   docs: Document ...
13 #   style: Change ...
14 #   refactor: A code ...
15 #   perf: A code ...
16 #   test: Adding ...
17 #   build: Change ...
18 #   ci: Change ...
19 #   chore: Other ...
20 #   revert: Revert ...
21 #
22 # Examples:
23 #   feat(api): add ...
24 #   fix(parser): re ...
25 #   docs(readme): u ...
26 #   refactor(utils). ...
27 #
28 # Subject line:
29 #   - Use imperative ...
30 #   - Don't capital ...
31 #   - No period (.)
32 #   - Maximum 72 cha ...
-- ...
33 #   - Use imperative ...
34 #   - Don't capital ...
35 #   - No period (.)
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39 #   - No period (.)
40 #   - Maximum 72 cha ...
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44 #   - Maximum 72 cha ...
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99 #   - No period (.)
100 #   - Maximum 72 cha ...
```

<https://cursor.com/docs/agent/overview>

AI Tools to Generate Ontologies

<https://antigravity.google/download>

Protegé

Protegé

Protegé is an open-source platform for creating, editing, and managing Web Ontology Language

The screenshot shows the Protegé interface with several panes:

- Class hierarchy:** Shows the class hierarchy for 'Field Notes'. The tree includes owl:Thing, Analytic Category, Bibliography, Code, Descriptive Category, Field Of Study, Grounded Theory, Interpretation, Method, Interview, Method Over Subject | Object, Record, Enriched Document, Field Notes (selected), Interview Transcript, Reflexivity, Report, Research Objective, Research Project, Research Question, Researcher, Subject | Object, and Theoretical Framework.
- Annotations:** Shows annotations for 'Field Notes': rdfs:label (Field Notes) and rdfs:comment (Field notes as a type of record).
- Description:** Shows the description for 'Field Notes': Equivalent To (Record), SubClass Of (Record), General class axioms, SubClass Of (Anonymous Ancestor), Instances (Field Notes - Observation Session 1), Target for Key, Disjoint With, and Disjoint Union Of.

<https://protege.stanford.edu/>

[Qualitative Research Ontology - Summary](#) |
TechnoPortal

Instances

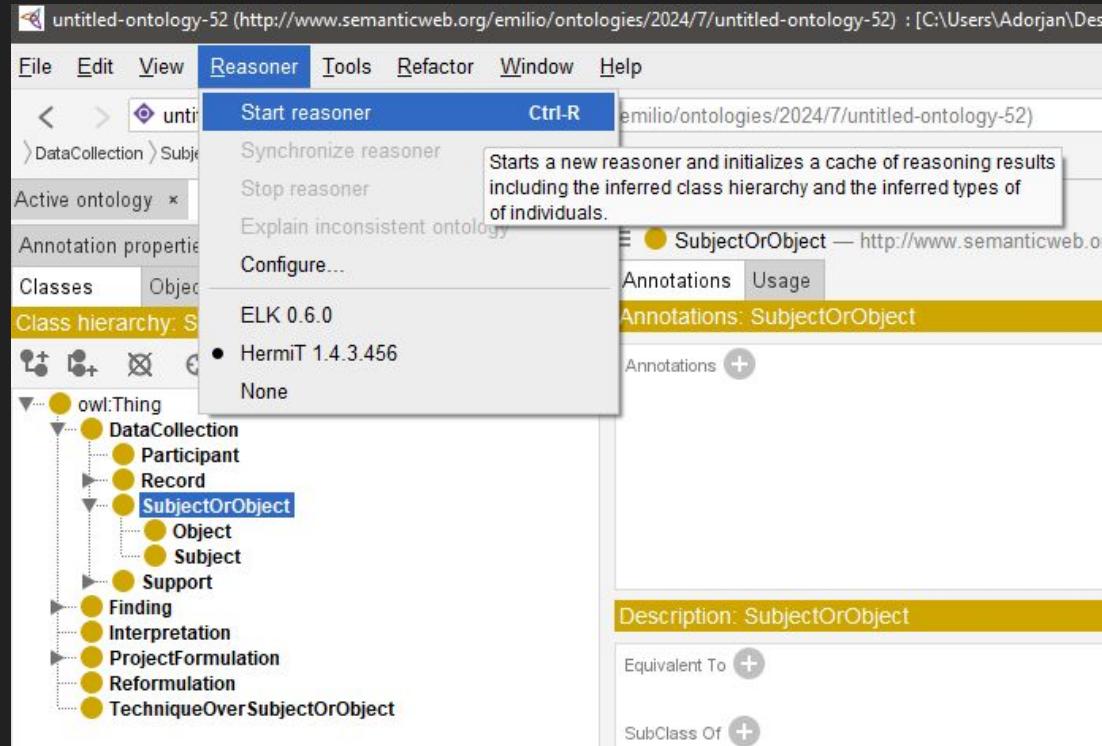
Protegé

The screenshot shows the Protegé interface with the following panels:

- Entities**: Shows the list of individuals under 'Qualitative Education Study'. The item 'Qualitative Education Study' is selected and highlighted in blue.
- Object Properties**: Shows the list of object properties used in the study.
- DL Query**: Shows the list of DL queries.
- SPARQL Query**: Shows the list of SPARQL queries.
- Annotations**: Shows the annotations for the selected individual.
- Usage**: Shows the usage of the selected individual across the ontology.
- Description**: Shows the description of the selected individual, indicating it is a 'Research Project'.
- Property assertions**: Shows the property assertions made about the selected individual, including:
 - hasObjective 'Understand Student Motivation'
 - hasTheoreticalFramework 'Grounded Theory Framework'
 - hasResearcher 'Dr. Smith'

<https://protege.stanford.edu/>

Protegé



Reasoner | Hermit

Protegé

The screenshot shows the Protegé interface with the following details:

- Menu Bar:** File, Edit, View, **Reasoner**, Tools, Refactor, Window, Help.
- Reasoner Submenu:** Start reasoner (selected), Synchronize reasoner, Stop reasoner, Explain inconsistent ontology, Configure..., ELK 0.6.0, Hermit 1.4.3.456, None.
- Active Ontology:** untitled-ontology-52 (<http://www.semanticweb.org/emilio/ontologies/2024/7/untitled-ontology-52>) : [C:\Users\Adorjan\Desktop]
- Class Hierarchy Tree:** owl:Thing → DataCollection → SubjectOrObject → Participant, Record, Object, Subject, Support, Finding, Interpretation, ProjectFormulation, Reformulation, TechniqueOverSubjectOrObject.
- Annotations Panel:** Annotations tab selected (yellow background). Description: SubjectOrObject. Equivalent To: +. SubClass Of: +.

Reasoner | Inference

Protegé

show: this different
Found 340 uses of eca1

- advanced_student_of_communication_sciences
 - DifferentIndividuals: bibliography1, E1, E11, E12, E17, E18, E19, E20, E21, E25, E3, E30, E31, E
- Bibliografia3
 - DifferentIndividuals: bibliography1, E1, E11, E12, E17, E18, E19, E20, E21, E25, E3, E30, E31, E

Description: eca1 Property assertions: eca1

Types +
AnalyticCategory

Same Individual As +

Different Individuals +
bibliography1, E1, E11, E12, E17, E18, E19, E20, E21, E25, E3, E30, E31, E32, E37, E4, m, studyStrategyResearch, res, researcher3, researcher4, descriptive_manual_of_Can, descriptive_manual_of_Mag, descriptive_manual_of_Sok

Object property assertions +
correspondsToDescriptiveCat ? @ × o
ecd11.2

correspondsToDescriptiveCategory ? @
ecd11.2.1

correspondsToDescriptiveCategory ? @
ecd11.2.2

Data property assertions +
value "Practices and representations regarding study habits."

ecd11.2.1 hasHigherCategory ecd11.2
correspondsToDescriptiveCategory o inverse (hasHigherCategory) SubPropertyOf: correspondsToDescriptiveCategory
eca1 correspondsToDescriptiveCategory ecd11.2

Sobre el uso de la inferencia en Protegé

Entities x Object Properties x DL Query x SPARQL Query x

Snap SPARQL Query:

```
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>

# Query 1: List all records
# Description: Returns all record instances regardless of type
SELECT ?record ?recordType
WHERE {
    ?record rdf:type ?recordType .
    ?recordType rdfs:subClassOf :Record .
}
ORDER BY ?recordType ?record
```

?record	?recordType
:Record_PublishedStudy1	:EnrichedDocument
:Record_FieldNotes1	:FieldNotes
:Record_Interview1	:InterviewTranscript
:Record_Interview2	:InterviewTranscript
:Record_FieldNotes1	:Record
:Record_Interview1	:Record
:Record_Interview2	:Record
:Record_PublishedStudy1	:Record

<https://protege.stanford.edu/>

Doc Navigation

Protegé

Ontologies Classes Object Properties Data Properties Annotation Properties Individuals Datatypes Clouds

Individual: 'Student Motivation Model'

Types (1)

- 'Grounded Theory'

rdfs:label

- "Final Research Report"

isReported

- '[Student Motivation Model](#)'

Usage (1)

- 'Final Research Report' isReported '[Student Motivation Model](#)'

rdfs:label

- "What factors motivate university students to engage in their studies?"

isReformulated

- 'Initial Analysis Reflexivity'

Usage (1)

- 'Final Research Report' isReported '[Student Motivation Model](#)'

rdfs:label

- "Field Notes - Observation Session 1"

Ontologies Classes Object Properties Data Properties Annotation Properties Individuals Datatypes Clouds

Individual: 'Contextual Factors'

Types (1)

- 'Analytic Category'

rdfs:label

- "Final Research Report"

isReported

- '[Student Motivation Model](#)'

Usage (3)

- 'Motivation Factors' hasRelativeAnalyticCategory '[Contextual Factors](#)'
- 'Motivation Dynamics' hasRelativeAnalyticCategory '[Contextual Factors](#)'
- 'Student Motivation Model' hasElaboratedTheory '[Contextual Factors](#)'

<https://protege.stanford.edu/>

A **Final Thought**

..is not about **technology** is about
methodology

Thanks !!

@aleadorjan

