The General Ontology Evaluation Framework (GOEF) &
the I-Choose Use Case

A Proposed Infrastructure
for the Ontology Development Lifecycle

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General Ontology Evaluation Framework (GOEF)

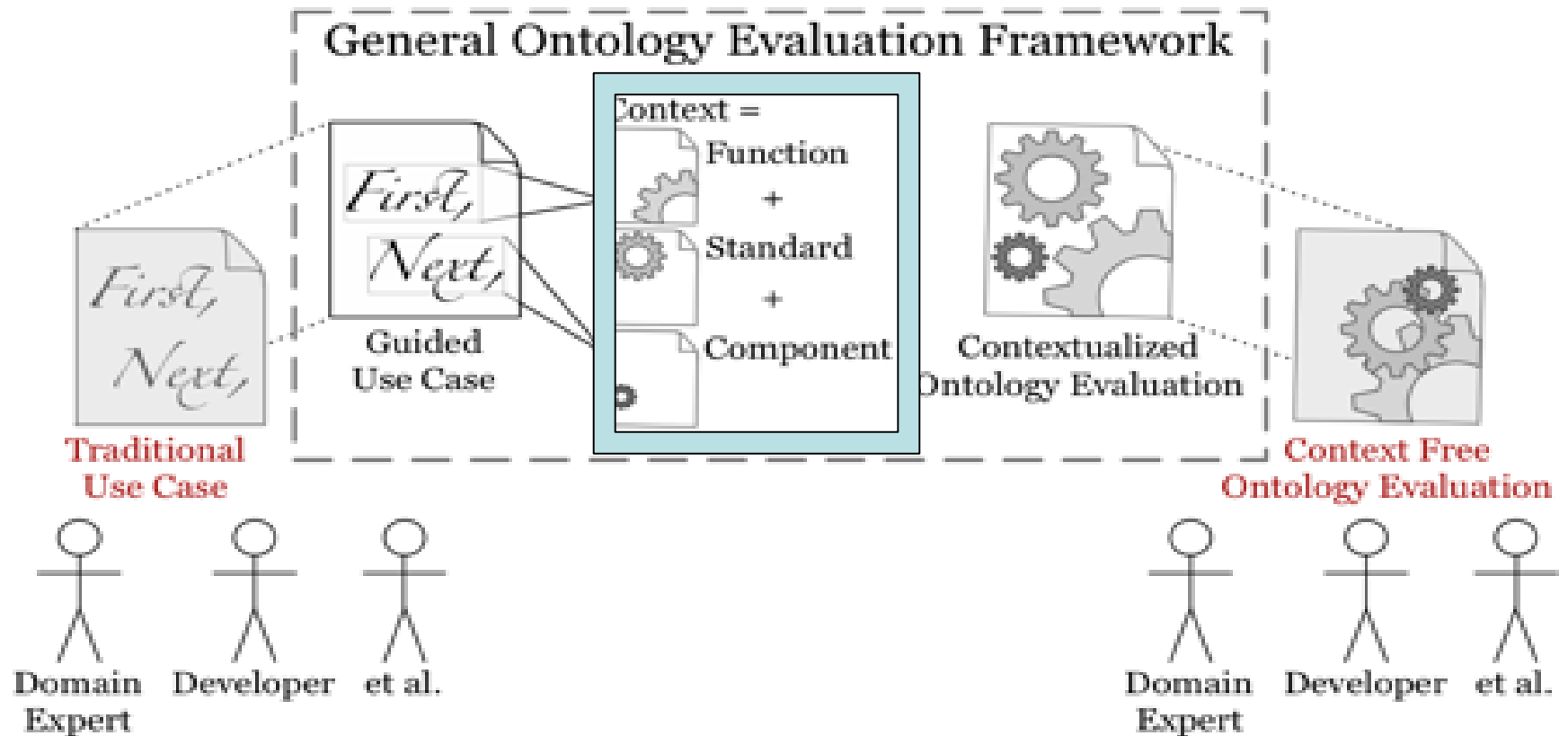# Semantic Web Development Methodology

GOEF Approach

Two stages:

- Recast use case into its components:
  - Functional objective
  - Design objective and requirements specification
  - Semantic components required to achieve above

- Evaluate components using objective metrics
  - Place existing evaluation methods in context by utility

Novel Approach

Three Levels of Evaluation

General Ontology Evaluation Framework

Context =
Function
+
Standard
+
Component

Traditional Use Case · Guided Use Case · Contextualized Ontology Evaluation · Context Free Ontology Evaluation

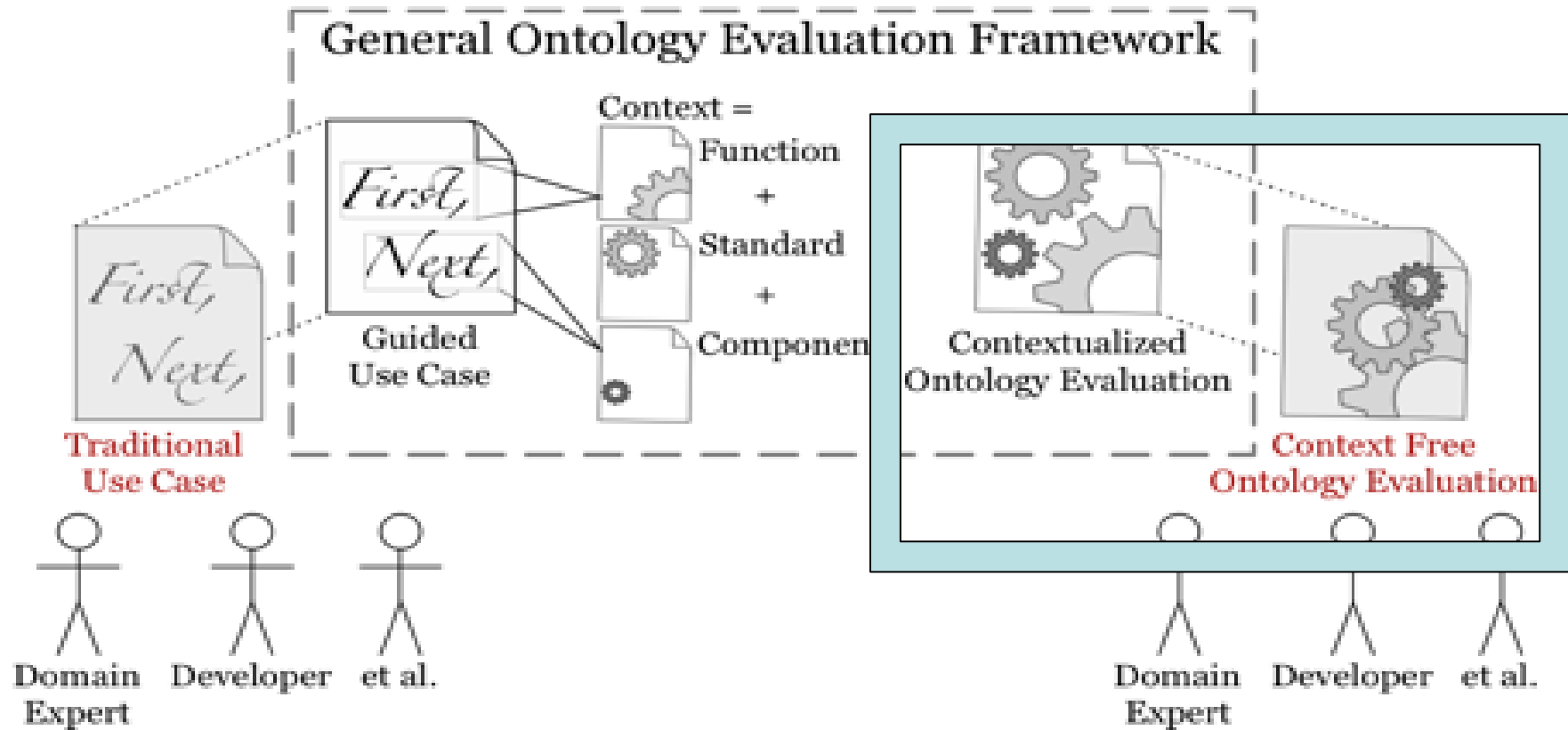Domain Expert · Developer · et al. · Domain Expert · Developer · et al.

· These combine to form the context for evaluation.

Formalizing Use Cases
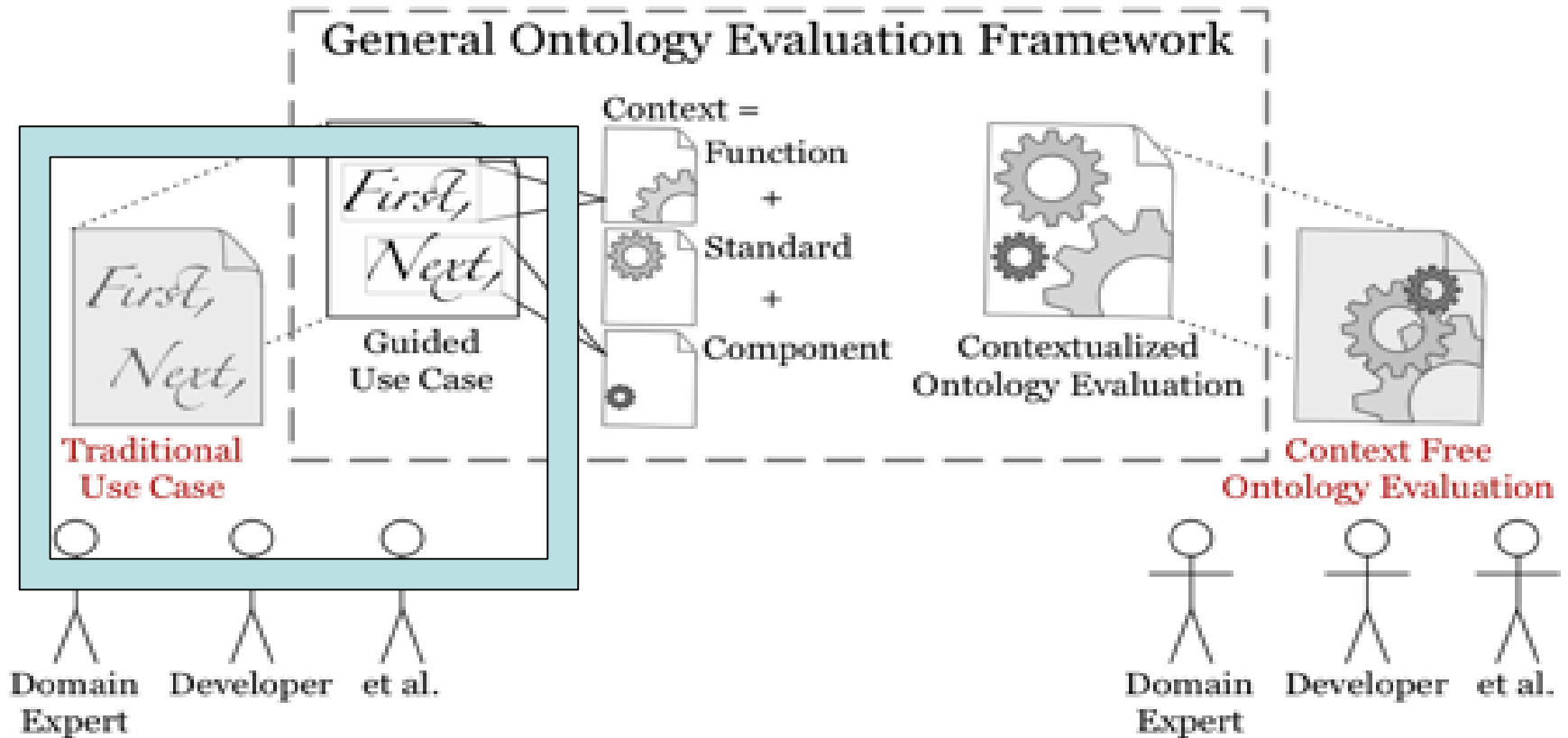
- · Methodology for formalizing use cases still needed.
- · Development – based around 3 level evaluation.

Evaluation Metrics

Development of metrics (to be developed or used) will follow from formalization of use case design.

Overview of I-Choose
& I-Choose Use Case

What is I-Choose

- I-Choose is a transnational project funded by NSF Interop program and CONACYT in Mexico

- One particular objective of the project is to create an:

  - *Ontology of ethical certification systems*

- Certification systems, such as "Organic" or "Fairtrade", conduct evaluations of production processes based on a number of criteria (ethical or otherwise).

What is I-Choose

- How could we use an approach such as GOEF to evaluate an ontology of ethical certification?

Motivating Example:
I-Choose Use Case - Child Labor & Child Protection

Use case description:

Consumer advocate wants to verify child labor and child protection evaluations used in a particular certification process.

Motivating Example:
I-Choose sustainable consumer choice

Function:

Enable retrieval of specific criteria evaluations that occurred during a certification process of a particular product.

Design objective:
Satisfy set of criteria by generally accepted convention

Semantic components:

Compliance Criteria
a) Minimum age under 15
b) Minimum age under 18
c) Ensure school attendance
d) Ensure safety work environment
e) Legal guardian supervision

Standard
a) FairTrade International
b) ILO convention on Child Labor
c) ISO 65, 14000, 24000

Product
a) Coffee

Certification Body
a) Flo-Cert

Motivating Example:
I-Choose sustainable consumer choice

Correctness:
· General logical/syntactical validation
· Match information provided in certification ontology to known Standard

Completeness:
· All child work criteria, and necessary characteristics included
· Ability of ontology to distinguish compliant vs. non-compliant criteria

Utility:
· Consumer Advocate Questions Satisfied

Suggestions from Hackathon Clinic

Expert Panel:

Ken Baclawski, Leo Obrst, Peter Yim and Mike Dean

Comments:

- Check "ontology of use case"
  - Participants (Ken) explained how the OOR use case ontology functions and may be useful for goals of GOEF

Suggestions from Hackathon Clinic

- Leo suggested that a focus here may be on formalized "attributes" that an ontology evaluation method may recur to.

- Leo also commented on the issue of domain vs. application. Same domain may have different applications, which generate different use cases.

Suggestions from Hackathon Clinic

- Formalizing the use case is one of the first steps to be able to evaluate it.

- GOEF had proposed by dividing use case into: *function, design objectives, and semantic components.*

- Ontology of use case already provides a framework to achieve most of this, specially stipulating function and semantic components

Suggestions from Hackathon Clinic

- The difference, perhaps, is that GOEF is looking to work at a more general level. It suggests that the overall ontology should fulfill some larger (though contextual) purpose.

- Use case ontologies seem more useful for the micro validation of specific components (such as attributes) and very specific functions.

Suggestions from Hackathon Clinic

- Objective metrics

- One of problems with evaluating ontologies is finding objectives metrics; many semantic units are not so easily measured.

- The comments on "attributes" – and the potential library of these – may allow a certain formalization of degrees (e.g. bushiness of trees; how many times something was tried; levels of danger; etc)

Suggestions from Hackathon Clinic

- GOEF has proposed that a "minimum necessary" measure of completeness be included.

- In the case of I-Choose, for example, there may be a "minimum necessary" number of evaluations to obtain a certification.

Suggestions from Hackathon Clinic

- Ontology team of both projects need to think further on how to use ontology of use case into the GOEF framework

- Attention to this, and OOR in general was very helpful at the clinic.

Acknowledgement

Special thanks to: Ken Baclawski, Leo Obrst, Peter Yim and Mike Dean for their comments and inputs during the Hackathon Clinics

To the I-Choose project team for permission to use the project's data and information

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