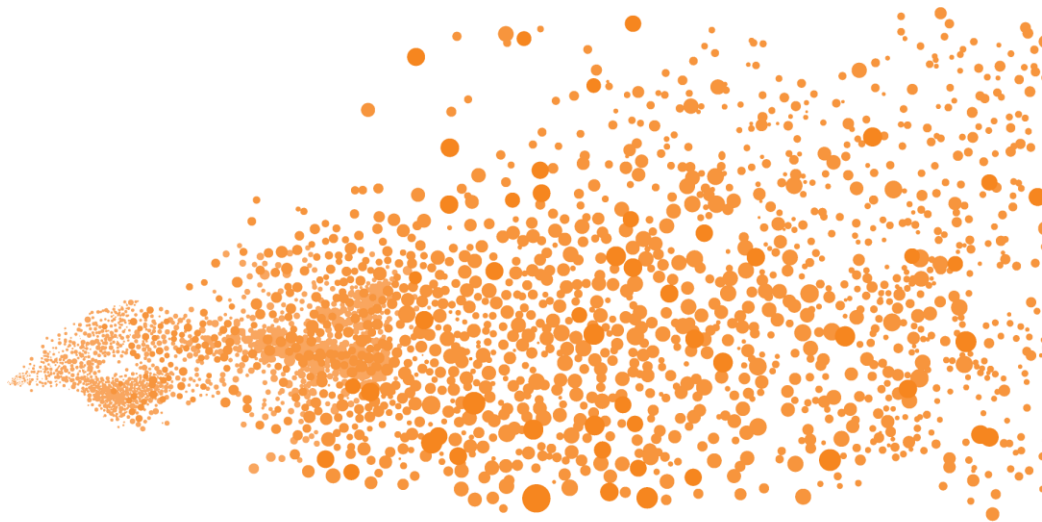




MOLTO WP12 : GF Adoption within Be Informed



be informed



Safe Harbor Statement

The following is intended to outline our general product direction. It is intended for information purposes only, and may not be incorporated into any contract. It is not a commitment to deliver any material, code, or functionality, and should not be relied upon in making purchasing decision. The development, release, and timing of any features or functionality described for Be Informed's products remains at the sole discretion of Be Informed.

Overview

- **O** : State of affairs, goals and challenges
- **I** : Adaption of GF in product
- **II** : 3D architecture for conceptualization and modularization
- **III** : Eco System : covering challenge tradeoff of high precision and coverage
- **IV** : Integrated Demo and Evaluation results :L Language (likelihood) and Engineering (D2.3)



Context: Be Informed Use Case

- Be Informed offers **ontology** driven support throughout policy lifecycle
 - Business processes, products and decisions, registrations, interaction
 - Drafting, choosing, communicating, executing, evaluating
- **Multilingual**, because
 - Customers are offering multi lingual services (for example: immigrations, Dutch government in the Caribbean)
 - Customers are sharing international models (for example: Europe, emission trading)
 - Be Informed is developing international business





Welcome

If you come to the Netherlands to live, work or study, you are likely to have some questions about the arrangements you need to make. This site will guide you to the government organizations you may have to deal with.

What can you do?

If you fill in your profile, you will see a list of subjects that are relevant for you, with links to information from the organizations concerned. You can also choose a subject directly.

Your profile

What is your age?

Make your choice ▾

What is your nationality?

Make your choice ▾

Length of your stay?

Make your choice ▾

The purpose of your stay?

(You may give more than one answer)

- work in Holland
- study in Holland
- live in Holland

Create my checklist

Subjects

-  Education
-  Employment
-  Permits and visa
-  Social security
-  Taxes
-  Vehicles

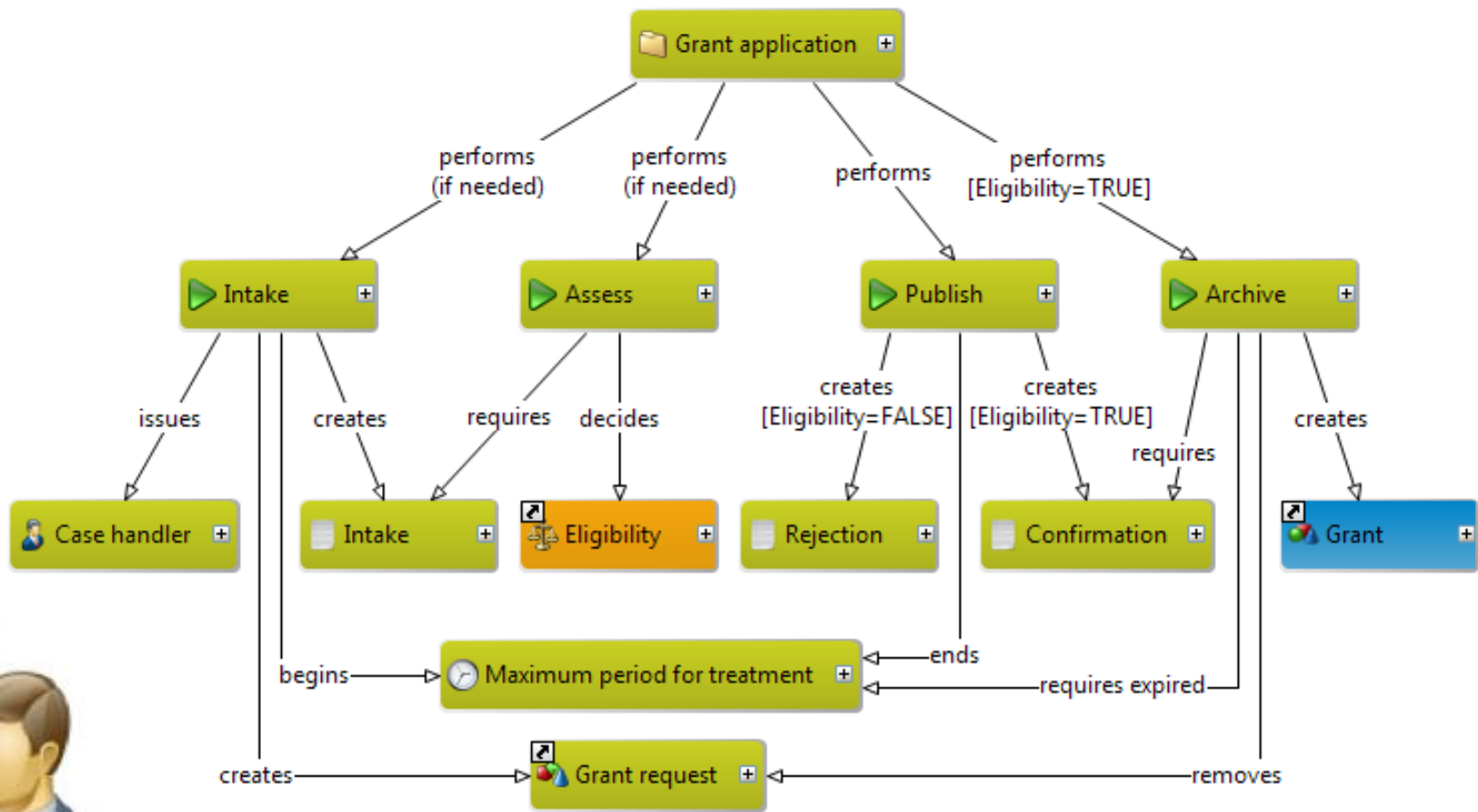


See also

- [Employers \(dutch\)](#)
- [The forum \(dutch\)](#)


- Leveraging LT for Policy Lifecycle
 - Business Applications Platforms
 - Artefacts like business rules, enterprise models and complex configuration capture business policies
 - Audiences for business policies
 - Business Analysts : policy design choices
 - IT : implementing and maintaining derives business processes
 - Users, customers and citizens : participating in the processes
 - Natural language for representing policies (interacting, collaboration, sharing, publishing) proven to be intuitive are providing common grounds for all audiences.





Some LT supported examples









General case Des Definition Of Business Process Models


 **Housing benefit application**
Veldweg 24a

Overview | **Updates** | Documents | Appointments

Updates



All updates ▾

-  The activity **Publish the application** is completed by **Astrid**
 -  The document **Rejection letter** is created
 - 10 minutes ago
-  The appointment **Customer visit** is edited by **Kees**
 - 1 day ago
-  The activity **Accept the application** is completed by **Kees**
 -  The document **Acknowledge letter** is created
 -  The time limit **Acceptable response time** is triggered
 -  The appointment **Customer visit** is scheduled
 - 1 day ago
-  The activity **Submit the application** is completed by **Anonymous**
 - 6 days ago



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Activities

-  **Veldweg 24a**
 - ✓ Submit
 - ✓ Accept
 -  **Assess**
 - || Publish
 - || Archive

- Adoption of GF in Be Informed

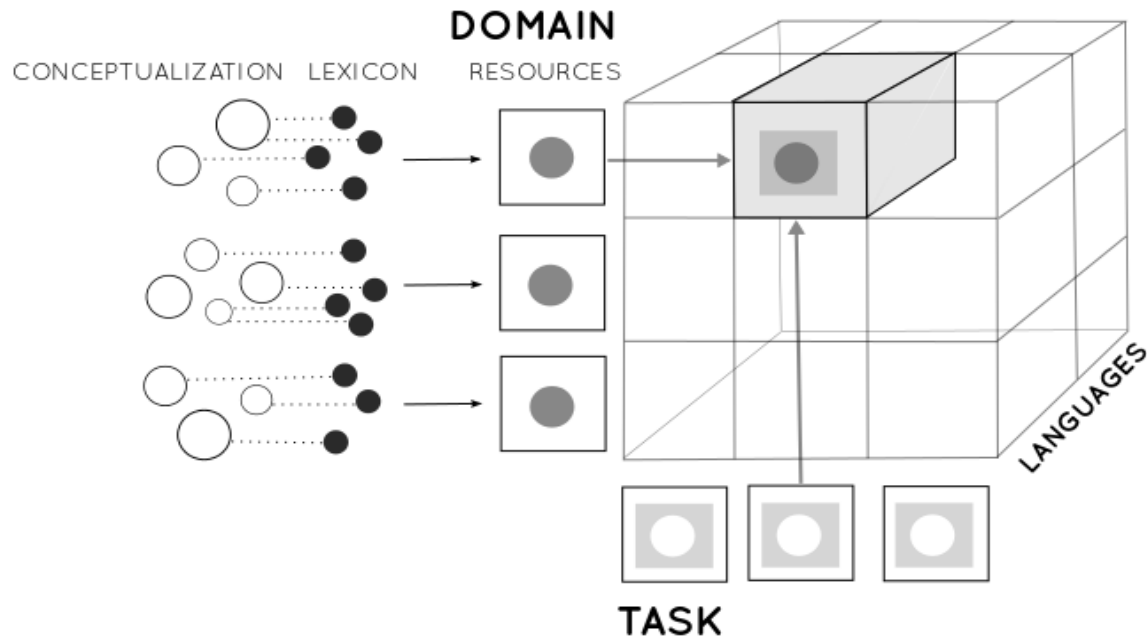
- Highlights

- Requirements Analysis for adoption GF in Be Informed Business Process Platform
- Replaced verbalization component based on Velocity template with GF based
- Developed multiple methods for GF with adoption in cooperation with Molto and Monnet partners.
- Carried out evaluation comparing baseline (Velocity) to newly adopted methods

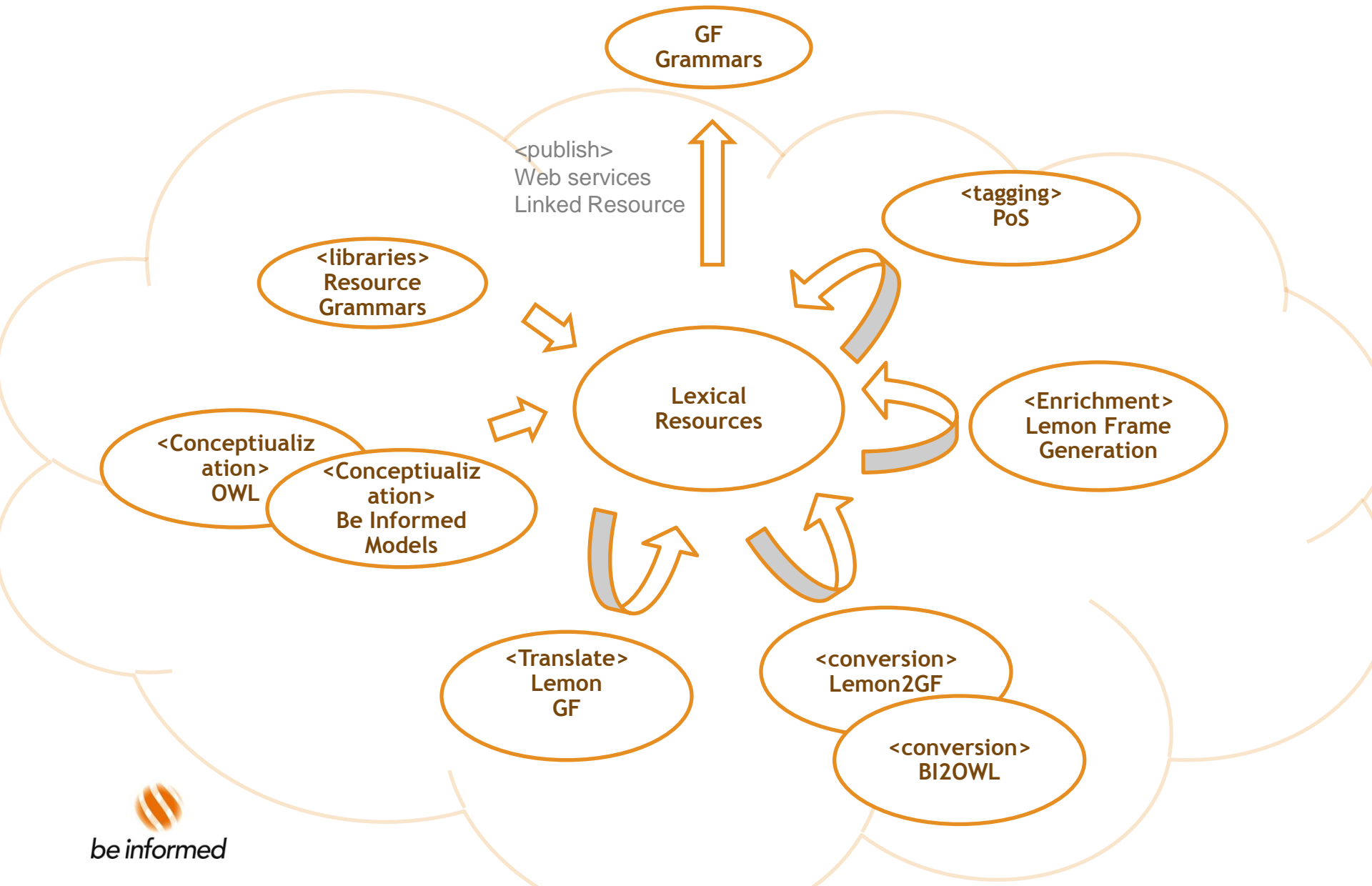
- Challenges for LT adaption in Businesses
 - Generic applications of LT prevent targeted solutions
 - Needs specific expertise usually not found in companies : Costly!
 - LT tooling often trade precision for coverage and v.v.
Companies need reliability and predictability as to ensure the quality of underlying services.

- **Business Driven Approach based on GF**
 - **Conceptually scoped** based on the application to enable tailoring and limiting of interpreted and generated language.
 - **Generation** and conversion of lexical resources. Decreasing need for LT expertise.
 - **Modularize** creation and use of resources by introducing 3 dimension creating separate modules: lanugage, domains and tasks. Higher return on investment by re-use of modules.

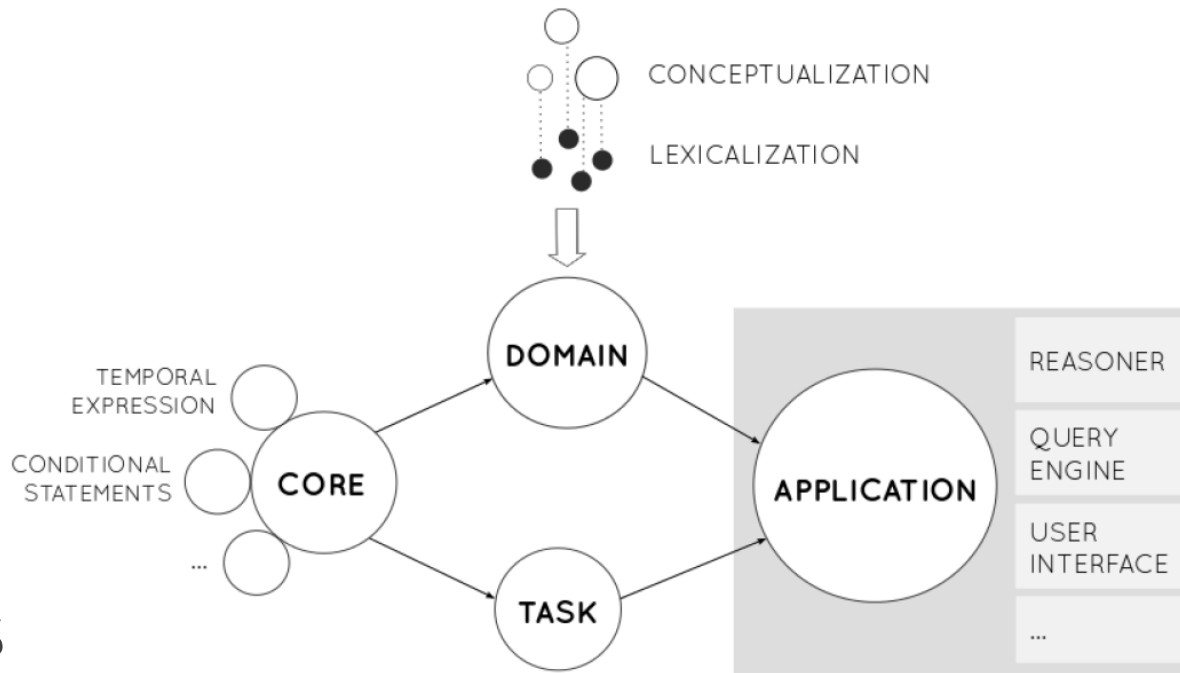
- 3D Framework for Modularization And Conceptualization of Lexical Resources



Eco system



Grammar Representation 3d model

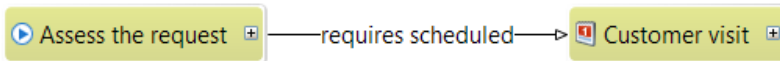


- Core: S
- Task: Handmade (validation, explanation, querying)
- Domain: Automatically created

Example

Be Informed

OWL



requiresScheduled
Scheduled
AssessTheRequest
CustomerVisit

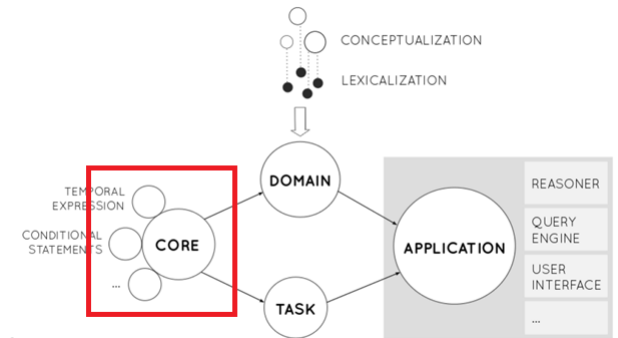
rdf:type	PreCondition
rdf:type	State
rdf:type	Activity
rdf:type	Appointment

Core grammars

Core

Class;
Individual Class;
Statement;

liftIndividual : (c : Class) -> Individual c -> Statement,
modifyIndividual : (c1,c2 : Class) -> Individual c2 -> Proposition;



OWLLibrary

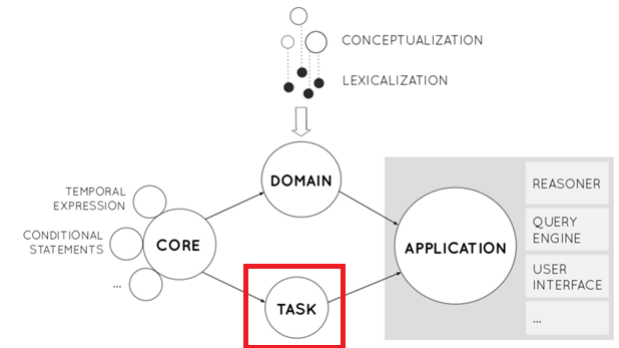
cat xsd_boolean;

fun owl_NamedIndividual : Class;

fun coerce : (c1,c2 : Class) -> Subclass c1 c2 -> Individual c1 -> Individual
c2;

Query grammar

Question;
Imperative;
WhPron;
WhAdv;



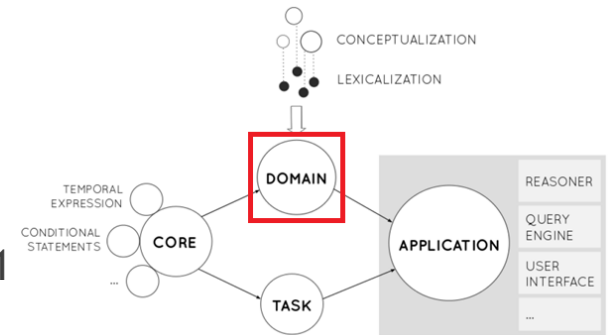
YesNo : Proposition -> Question;
queryInd : (c : Class) -> Individual c -> Question;
queryAdv : (c : Class) -> WhAdv -> Proposition -> Question;

Domain grammar

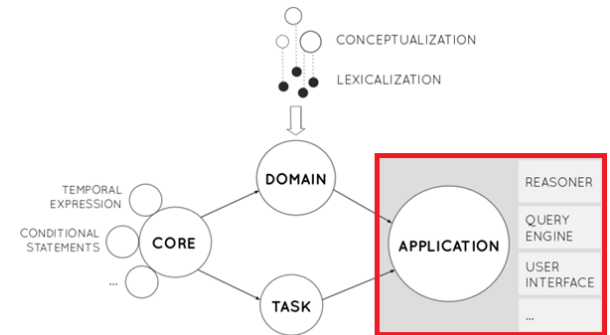
Activity : Class;
Appointment : Class;
Scheduled : Class;

requiresScheduled : (c1,c2 : Class) -> Individual c1
Statement;

AssessTheRequest : Individual Activity;
CustomerVisit : Individual Appointment;



AST generation



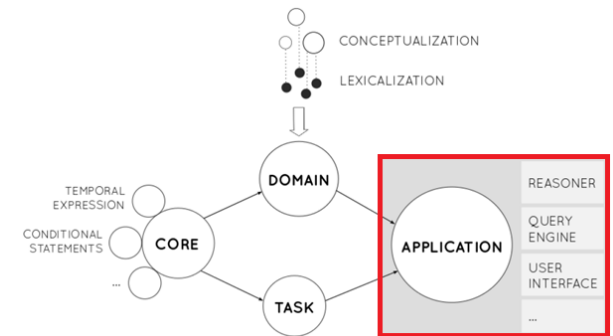
AST for Core grammar:

requires (liftIndividual Activity (mkBllIndividual Activity AssessTheRequest))
(modifyIndividual Scheduled Appointment CustomerVisit)

AST for Query grammar:

Yes/No(requires (liftIndividual Activity (mkBllIndividual Activity
AssessTheRequest)) (modifyIndividual Scheduled Appointment CustomerVisit))

Example linearizations



	Type	Example
Explain	Vanilla	"The request may be assessed when the customer visit is scheduled"
	Unless	"The request cannot be assessed unless a customer visit is scheduled"
Online Dialog	Question	"Did you schedule the customer visit?"
	Put / Assert	"We still require you to schedule the customer visit."
	2nd / 3rd person	"I would like to inform you that the customer visit has been scheduled."
Validation	Contradiction	"The assessment of the request does not require that the customer visit is scheduled."
	Logiscal emphasis	"The assessment of the request requires both a scheduled customer visit and an intake form."
	Generalize	"The assessment of the request requires an appointment."

Naïeve

- Classifies all entities as predefined lexical categories. No matter what the actual lexical information of the label is.
- Class = CommonNoun; NamedIndividual = ProperName; Relation = Function
- Has metamodel template to correct most of the relations
- Cannot deal with any form of label variance
- Cannot with verbs it does not know
- + Takes least amount of time to implement
- + Works for all languages implemented in GF



NaiveWithHeuristic

- Naive verbalizer, complemented with a lemmatizer to retrieve the infinitive form of a verb
- Contains an aggregation to concatenate sentences from which the ASTs begin with the same subject and relation
 - intake creates invitation
 - intake creates application form
 - intake creates invitation and application form.
- Cannot deal with any form of label variance
- Depends greatly on an untweakable lemmatizer
- + Creates concatenated sentences, which makes the output sentences seem more natural.



Lemonaided

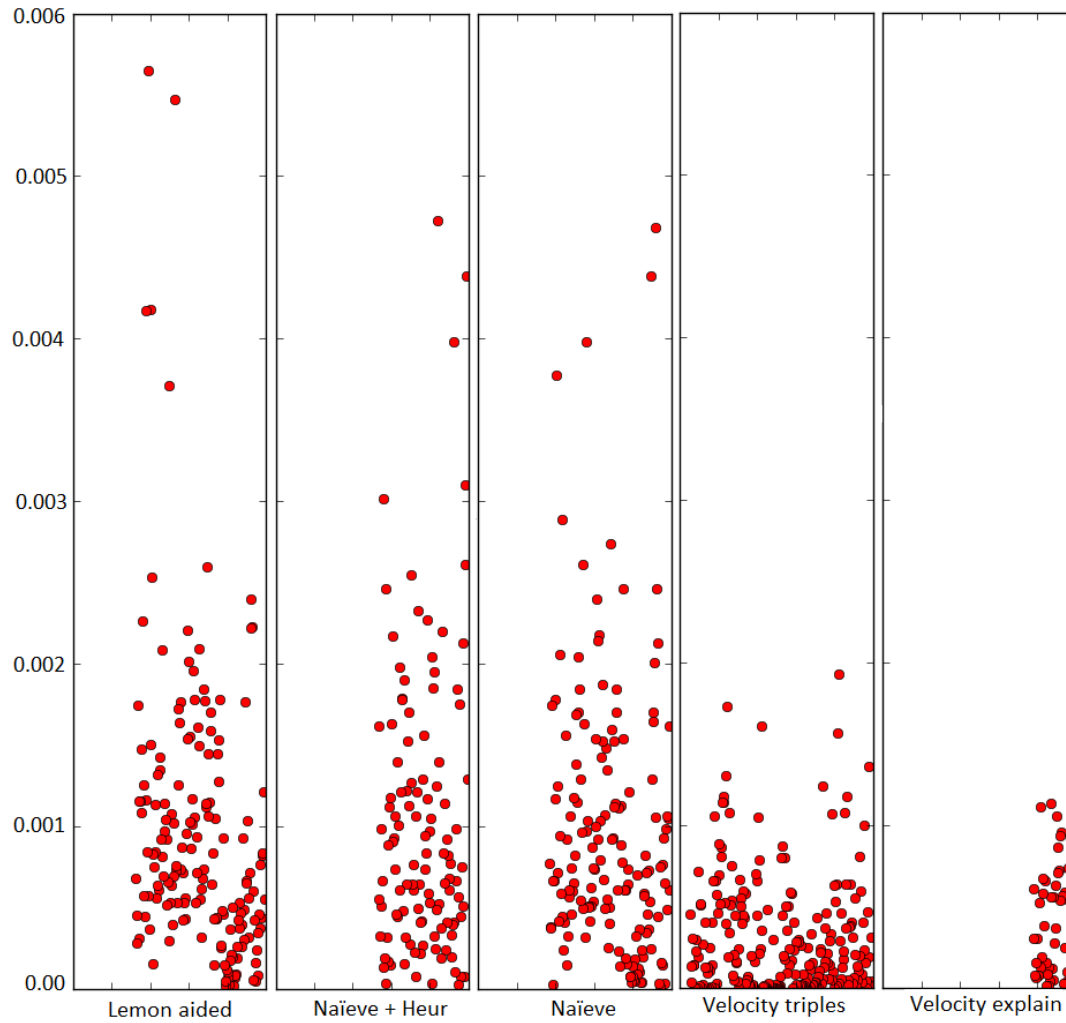
- Verbalizer that parses the labels, and uses this lexical information to add the right determiner and decides how to linearize the sentence in a given situation
 - The intake requires that the request is assessed
 - The activity where the request is assessed creates the assessment form
- Lemon patterns do not support any other frames than the 'Name' for the individuals at the moment
- Huge effort to create dictionaries and optimize them for a certain language and domain
- + Lexical information already makes it possible to deal with different labels differently (add determiners, check if label ends in preposition)
- + Much more possibilities to tweak, because we created the dictionaries ourselves



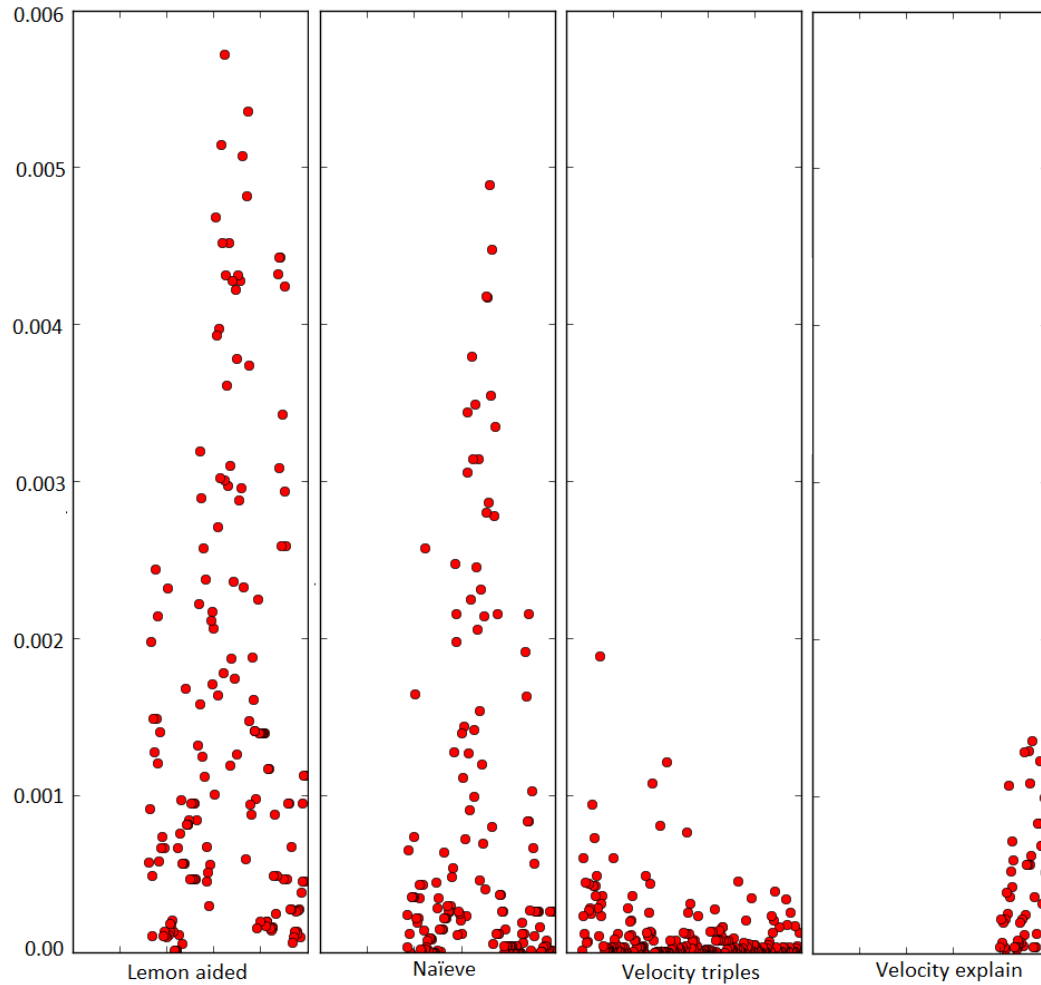
Evaluation

- Language model based on 100k sentences of the Europarl corpus
- Language model measures the likelihood of the occurrence of the sentence
- Finished: Dutch and English
- To come: French, Slovakian, Spanish, Turkish

Spread English



Spread Dutch



Discussion

- All GF grammars scored substantially better than velocity templates, our current verbalization component.
- The LemonAided verbalizer created, according to our evaluation method, while. not optimally used grammatically most likely sentences.
- Possibility to use different verbalizers for different languages or tasks.





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