Towards a Community-Driven Controlled Natural Languages Evolution

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Agendum

1. Problem statement
2. Inspiration: IAL, pidgins, OSS development
3. Proposal – process of a community-driven CNL evolution
4. Motivating Use-Cases
   – Information retrieval: semantic similarity of documents based on CNL abstracts
   – community-MT „Le Petit Prince“ from UNL into CNL-Est & CNL-*
5. Discussion, call for the community
Problem statement

Business opportunity: exploit CNLs in software (SW) applications

Problem 1: SW developers / CNL experts

Problem 2: methodology for a CNL design component for SW development is needed

Research question: How to lower the barrier of incorporating CNL-components in a SW development projects?

Solution: to reglement the development of a CNL component in SW applications

➢ maturity, must ensure outcome/delivery
➢ reuse
<table>
<thead>
<tr>
<th>Attribute</th>
<th>Creole and pidgin languages</th>
<th>Planned languages</th>
<th>CNLs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nature</td>
<td>Simplified languages</td>
<td></td>
<td></td>
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<tr>
<td>Purpose</td>
<td>Communication between humans across language-barriers</td>
<td></td>
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<tr>
<td>Creation</td>
<td>• <em>Unconsciously</em> born&lt;br&gt;• environment <em>spontaneously</em> gives birth&lt;br&gt;• practical situation&lt;br&gt;• <em>community driven</em></td>
<td>Created <em>consciously</em></td>
<td></td>
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<tr>
<td>Creators <em>vrs</em> speakers</td>
<td>• creators = speakers&lt;br&gt;• no “The ONE”. Web2-style&lt;br&gt;• creation while using</td>
<td>Person/coherent project team =&gt; <em>draw</em> a group of speakers to learn</td>
<td></td>
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<tr>
<td>Outcomes</td>
<td>“Creolization” of some pidgins has given us several lingua francas</td>
<td>No viable language has emerged</td>
<td></td>
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<tr>
<td>Examples</td>
<td>洋泾浜英语, <em>Lingua franca of the Mediterranean</em> or <em>Sabir</em></td>
<td>Esperanto, Volapük, Latino sine flexione, Interlingua de IALA, Lojban</td>
<td></td>
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Inspiration:
Open/Community

CNL engineering – a subfield of SW engineering?
(Zachmann’s approach)

Open Source SW Development Methodology

- In the past: unstructured, no clear development tools, phases, etc., every project had its own phases.
- More recently there has been much better progress, coordination, and communication within the open source community.
Task: Adjusting the properties of the CNL


Disciplines: CNL component

| Relationships |
|---------------|------------------------------------------------|
| Roles         | Primary Performer:                              |
|               | • CNL Expert                                    |
|               | Additional Performers:                          |
|               | • Product Owner                                 |
|               | • Domain Expert                                 |
| Inputs        | Mandatory:                                      |
|               | 2. Motivating use cases                         |
|               | 3. Corpus of text samples                       |
|               | 4. Sociolinguistic profiles, abilities and      |
|               |   requirements of the user                      |
|               | Optional:                                       |
|               | • None                                          |
| Outputs       | • CNL dimensions in the Wyner framework         |
Process Steps

Task 1: Attracting the attention (CNL’s business value).

Task 2: Elaborating motivating use cases (OpenUP process framework).

Task 3: Initial human-authored corpus of text samples.

Task 4: Composing the sociolinguistic profiles, abilities and requirements of the user.

Task 5: Adjusting the properties of the CNL. (Wyner et al).

Task 6: Selecting reusable components from a CNL repository.

Task 7: Customizing these components to the needs outlined in steps 2-5.
Discussion topics

Wyner 2010/09/13: “... every CNL project starts from a scratch”

1. Establishing a repository for collecting reusable CNL components:
   — use-case descriptions
   — test-data
   — software
   — linguistic assets, etc.

2. Elaborating a “open-source” process description for creating/ customizing CNLs.
   — EPFWiki?, ..
Motivating-UCs

UC1. Information retrieval (IR) based on semantic similarity.

UC2. Tagging of digital items.

UC3. Machine translation
   • Localizing (open) software

UC4. Communication with a smart environment.

UC5. Management of (controlled) vocabularies.


UC16. Creation and management of BPMN
MUC1 – Information retrieval based on semantic similarity

• **Main idea**: document abstracts and (wiki) article summaries are written in a Controlled Natural Language,
  – enabling semantic search and article recommendation based on the semantic distance of CNL abstracts

• **Applicability**: search engines, recommendation engines, wiki engines, Electronic Document and Records Management Systems, etc.
MUC1 – estimating semantic similarity (of scientific articles, documents, ..)

• Encoding a document in a vector is a very crucial step for any vector space model based IR system.

• In traditional document representation methods, a document is considered as a bag of words.
  – The fact that the words may be semantically related is not taken into account.
  – The feature vector representing the document is constructed from the frequency count of document terms.

• Improvement – preprocessing > RI/LDA/...
  – Generating feature vectors using the semantic relations between the words in a sentence.
  – The semantic relations are captured by the Universal Networking Language (UNL) //could be another CNL.
Motivating-UCs

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    • Localizing (open) software

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UC16. Creation and management of BPMN
Call for Participation in the Project LPP

The UNDL Foundation is extending the set of funded languages in the UNL Programme. Financial support will be initially granted to freelancers participating in the project Le Petit Prince (LPP). Any language is eligible, except those already funded by the UNDL Foundation (namely English, French, Arabic, Russian, Spanish, Portuguese and Armenian), which should be pursued in the project MIR.

Contributions are paid through PayPal according to the UNL code system. Tasks are distributed upon availability and will be carried out in a distance-working environment through a specific web interface. Candidates are not required to have any previous experience in natural language processing but are expected to have some acquaintance with descriptive Linguistics and a good knowledge of English. Undergraduate and graduate students of Language Studies and Translation Studies from minority and less-resourced languages are especially welcomed.

- Freelancers participating in the project Le Petit Prince (LPP)
- Any language is eligible.
- Tasks are distributed upon availability and will be carried out in a distance-working environment.
Questions?
Comments?

Thank you!

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