Toward self-sustaining community-driven online terminology development

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Outline

1. Introduction

2. Related works

3. First results
   - Workshop experiment
   - Commuterm crowdsourcing tool
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**Background**

- **Principal obstacle for teaching and tutoring computing and information technology (CS&IT) in isiZulu is the lack of isiZulu language terminology on the whole, and fragmented knowledge of the existing isiZulu words in the fields of CS&IT even among isiZulu speakers.**

- **Other language areas (e.g., German, Spanish, Italian):** gradual development over past 70 years, national bodies enforcing new terms.
  - E.g., in 2013: Académie Française instituted *mot-dièse* for ‘hashtag’ and Real Academia Española instituted *whatsappear* as verb for using the WhatsApp application.

- **For isiZulu:** Google’s localization, using, e.g., *isilungiselelelo* for settings (fine) and *idrayivu* for the Google drive (not fine).
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Terminology development

- Terminologies, such as thesauri and structured controlled vocabularies, and broader use, including glossaries
- Pure linguistic approach; e.g., the “conceptual blending” (compounding) for creating new isiZulu terms (Buthelezi (2008))
  - Creating new words by combining existing ones
  - E.g., for CS: 'programming' as _ukwakhuhlelo_, contracting _ukwakha_ (‘to build’) and _uhlelo_ (‘arrangement’ or ‘grammar’)
- Traditional/typical approach: time and resource-consuming workshops with stakeholders; e.g.:
  - Stellenbosch University for isiXhosa: but not CS&IT, and for payment
  - Department of Arts and Culture of South Africa (2005): 135 terms, in the 11 official languages in SA: 76 reasonably within IT computer literacy
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Historically, politically, and economically, it is urgent to develop scientific terminology. Has to occur in a much shorter timespan than occurred with some other languages.

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⇒ In a manner that terminology development is by the people for the people.
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Proposal

- Rapid terminology development using “games with a purpose”
- Crowdsourcing to obtain input from a large group of isiZulu speakers
  - Test the new method with development of a computer science terminology in isiZulu
  - Verify the method in another subject domain
- Generalise the new method to any language, any domain
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Crowdsourcing

- Crowdsourcing: a wordplay outsourcing where there is another “pool of cheap labor: everyday people using their spare cycles to create content, solve problems, even do corporate R & D” (Howe (2006))
- Now part of a general-purpose problem solving method of mass collaboration systems on the Web (Doan et al. (2011))
  - Early examples: SETI@home (Korpela et al. (2001)) and ESP game (Ahn & Dabbish (2004))
- Wide range of tasks: from protein folding to collaborative and distributed algorithm development
- One language-related: DuoLingo (http://www.duolingo.com) for translations of major languages
- None on crowdsourcing terminologies
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Crowdsourcing and mass collaboration

- Different types of ‘mass labour’ online, based on, a.o. (Good & Su (2013)):
  - Volunteer labour (ESP game) vs. forced labour (ReCAPTCHA)
  - Microtasks (gene and photo annotations) vs. macrotasks (protein folding with FoldIT!)
  - For ‘fun’, payment by game, payment for best solution

- Requires different design choices regarding recruitment, retention, evaluation user contributions, calculations on solution of task

- How to handle malicious users
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Methodology

- State of the art: literature and a poll (tbd due to localization of survey software)
- Workshop experiment (completed)
- Crowdsourcing experiment for CS (launch within 2 weeks)
- Crowdsourcing experiment for another subject domain
Workshop experiment set up (summary)

- Participants: 10 students with isiZulu as home language (3rd year and honours students in computer science or computer science & information systems)
- Duration: 2 hours
- Incentives: the honour of being at the forefront of this endeavour, and pizza and softdrinks afterward
- For each term provided by the RAs, note term, consensus or not, synonyms
Results (snapshot)

- 15 students participated; 9 CS or IS honours students, and the remainder in their final year BSc CS; gender distribution: 5 female, 10 male
- Typically, meaning of the term was discussed before reaching an agreement on possible alternatives
- 37 entities in CS, focussed on programming and networking, beyond computer literacy
- Among others: indlela yokwenza for ‘algorithm’, ukushintsha ufuzo for ‘overriding’, amalungu ohlelo ahlelekile for ‘formal parameter list’
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Workshop experiment
Discussion (snapshot)

- Overlap of 5 English terms with the Dept. of Arts & Culture (DAC) list, with an empty intersection
  - E.g.: database – *inqolobane* (our experiment) – *ulwazi olugciniwe, ulwazi olulondoloziwe, imininingo egciniwe* (DAC)
  - DAC wrong regarding the *ulwazi* (knowledge), because database $\neq$ knowledge base

- Real transformations of the underlying meaning, not simply zulufying English
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Design

- Software development methodology: roughly, an iterative version of the waterfall methodology
- Doan et al. (2011)’s ‘four questions that all MC systems have to answer’
- Based on that, game requirements (using Good & Su (2013)’s categorisation) and system requirements engineering
- System development: database with web-based front-end
- Terminology list development, with definitions, source, level
- Implementation
- Currently in the testing phase
Demo

- Screenshots in this set of slides – demo at the presentation
- Note: this is an alpha version
- Note: the live version of the user interface of the game is in isiZulu (not English, as in the following screenshots); current screenshots just to give a general idea regarding functionality
Commuterm crowdsourcing tool

Back-end: adding entities
Commuterm crowdsourcing tool

User login screen
Commuterm crowdsourcing tool

Some user activity choices
Snapshot of a game

Translation Two Player Game under way.

Question Number 1

"cryptography"

You isiZulu translation

Translate

Skip

Vote
References


Thank you!

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