

The Problem

- Patients with Limited or No English (PLONEs)
- multiple communication difficulties and barriers when accessing healthcare services
- hospitals and GP surgeries unable to meet appropriate language and cultural needs
- expressive *and* receptive communication difficulties
- patients may be unable to
 - describe their symptoms
 - understand the diagnosis and treatment
- resulting in frustration, anxiety, and dependence on others
- Problem recognized, but solutions so far inadequate, e.g.
 - Homolingual GP or linkworker
 - Telephone interpreting
 - Multilingual phrasebook or phrase cards
 - Use of untrained interpreters (esp. family members, e.g. children)

Language technology may be able to help

What is Language Technology?

Any computer-based technology to do with language, including

- intelligent keyboard
 - auto-completion when typing (predictive)
 - typing with reduced key-set, as on mobile phone (interpretive)
- speech synthesis
 - based on recordings, or digitized speech
 - explicitly generated
 - text-to-speech (e.g. can read out a web-page to blind or illiterate person)
- speech understanding/recognition
 - like in telephone call centres
 - more sophisticated: speech-to-text dictation systems
 - still a bit flakey, but can work in limited (controlled) circumstances

- information retrieval
 - e.g. WWW search engines (Google) retrieves documents (web sites) in response to search terms
 - may need to interpret search terms intelligently
- question-answering
 - like IR but provides answers (not documents)
 - much more complex as systems must ...
 - understand questions (which may be interrelated)
 - understand the domain
 - understand (model) the user's needs
- translation
 - all of the above have to be in the PLONE's own language
 - translation may be appropriate
 - some applications may work better wholly in the other language
 - spoken language translation is a particularly difficult task

Added Problem

Language technology is well developed for "majority" languages – English, French, German, Spanish, Italian, Portuguese, Russian, Chinese, Japanese, Korean, Arabic – but less developed (or not even started) for many "minority" languages (even including widely-spoken languages) which are of less economic interest to big business. Often these coincide with the languages spoken by the most vulnerable: recent immigrants, asylum seekers, etc.

Pilot Project

(CAMELS – Computer Assistance for Minority Language Speakers) focusing on asthma – Somali, Urdu or Sylheti



Fitting Technology to Need

Different aspects of the patient's pathway to healthcare imply different technologies of varying complexity, for example...

- Information leaflets with medication, equipment etc.
 - one-off translation
- Instructions printed with prescriptions
 - variable combinations of fixed phrases
- FAQs concerning symptoms/treatment
 - computer-based self-help facility like Google or Ask Jeeves
- Patient history
 - computer-mediated interview
- Consultation with GP or other healthcare provider
 - Multi-modal dialogue system
 - Use of speech, text, symbols, touch screen, menus
 - Different interface for doctor and patient
 - Needs to be robust, but ...
 - Evidence suggests disadvantaged users are very tolerant of imperfect technology if it improves their situation

Multi-modal DPI System

Some of the Problems

- Consultation is a task-oriented cooperative dialogue
 - To a certain extent it is somewhat predictable
 - So we can store in advance some of the questions
 - And we know what sort of answers to expect
- Different interfaces for doctor and patient
 - Doctor probably used to mouse and keyboard
 - Patient may not be
- Doctor's interface
 - Intelligent menu-driven interface based on domain knowledge for "standard" questions
 - Typed free text with auto-completion otherwise
- Patient's interface
 - Drop-down menu
 - Touch screen
 - Use of symbols
 - Speech input and output