

# Usability Issues for Commercial SLT

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## Commercially successful applications for SLT?

- Yes! But...
- Spoken Translation, Inc (Mark Seligman, CEO)
  - Focus on *integration and ergonomics* of SLT systems
    - **Optimizing components**
      - “Temporary” solutions
      - *Please put us out of business!*
    - **User modelling + user knowledge**
  - Use-case scenario: Healthcare
    - Nurses, aides, clerks, doctors <> patients, family
    - Admissions, Pharmacy, PT, OB-GYN, ...
    - Emergency, Ambulance, First responders, ...
    - Spanish <> English, but...

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## Commercially successful applications for SLT? 2

- Target Users
    - Technologists
    - Educated bilinguals
    - Educated monolinguals
    - Uneducated monolinguals
- } Commercial success
- Target physical settings: very varied
    - Standing at pharmacy counter
    - With glass partition
    - Face-down on massage table
    - Demonstrating exercises
    - In traction
    - In ambulance



## Optimizing Speech Input

- Issues
  - Varied physical settings: noise, barriers, movement
  - Sick, elderly, illiterate patients: indistinct pronunciation
  - ASR is hardware sensitive
  - Error rate
- “Temporary” solutions
  - Lower error rate
    - Dictation-class ASR (Dragon Naturally Speaking)
      - Advantages: better accuracy, more careful speech, **auto-adapting user profile**
      - Disadvantages: training time, form factor, \*accuracy
  - Minimize speech input
    - Translation Shortcuts®
      - Seamless auto-complete function
      - Navigate: browse by category/role, search
      - **Accumulate user preferences: personal shortcuts**
    - Handwriting input



## ASR/MT coupling

- Issues
  - Input error rate, consequences for MT
- “Temporary” solutions
  - Make the coupling *interactive*
  - Visual monitoring and correction of input
    - Display ASR or handwriting input
    - Spell checking for typed input
    - Important!
  - Advantages: much better input accuracy
  - Disadvantages: interaction time, \*literacy requirements



## *interactive* MT

- Issues
  - Coverage, multiple domains
  - Word sense disambiguation in MT analysis
- “Temporary” solutions
  - Visual monitoring and correction of *Word Senses*
    - **1. Display [semantically controlled] Back-translation**
      - Difficult to control with any MT system
      - Reuse parse + WSD from forward translation
        - » approximates interlingua-based checking
      - **MT with marked-up input**



## *interactive MT 2*

- **2. Meaning Cues®**
  - Synonyms, definitions, etc. in SELECT
  - **Accumulate users' word-sense preferences**
- Use rule-based MT
  - **Coverage (~300K wds/language), accuracy, control, interactivity**
- Advantages: mission-critical MT accuracy, user confidence
- Disadvantages: interaction time, \*literacy requirements



## Commercial SLT: Converser®

- **Hands-free operation**
  - Bilingual multimodal interface
  - Next: automatic turn taking
  - Next: eyes-free operation
- **Multiple input modes**
  - Speech, handwriting, touchscreen, typing
  - Seamless mixing/changing of modes
- **Translation options**
  - Seamless transition between Translation Shortcuts and MT
- **Complex user modelling**
  - Speech profile, word meanings, translation shortcuts, gender, input preferences, usage transcripts
- **Tablet PC for handwriting and touchscreen**
  - Monitoring other hardware options



## Next steps

- **Put us out of business!**
- Assume uneducated, illiterate, monolingual users -- corpus?
- Robust noise cancellation
  - Less sensitivity to microphones
- Dictation-class ASR
  - More accuracy, self-correcting
  - With little or no training time
    - **Dynamic adaptation to users**
  - Better mobility, eg, on a PDA (cf. IBM's MASTOR)
- “Controllable” SMT
  - With interactive correction
- More expressive TTS
  - E.g., issues with Question intonation



## Questions?

- REBECCA: [and it] happened on BART,  
... and it's almost a carbon copy of [2your case2].
- RICKIE: [2Well I've2] made two,  
... one a year from,  
... almost a year from the,  
... uh police report.
- REBECCA: I saw that in your report.  
I haven't seen the other re[port].
- RICKIE: [Yeah],  
I made that one through=,  
(H) matter of fact it was just .. over the phone,  
and they never called me back or anything,  
and a year later it happened again,
- REBECCA: [Okay].
- RICKIE: [(H) a]=nd,  
then that's when they made the report,  
and said they were gonna do something about it (Hx).
- REBECCA: .. Okay.

