Adjusting Interaction Levels in a Speech Translation System for Healthcare

Mark Seligman
Mike Dillinger
Spoken Translation, Inc.
mark.seligman@spokentranslation.com
Introduction

• Converser for Healthcare
  – Intro
  – Demo

• Kaiser Permanente pilot project
  – Needs and setup
  – Kaiser’s evaluation (with numbers!)

• System revision
  – Especially ... *adjustment of interaction levels*

• Future need for adjustment of interaction
  – Telepresence
  – Emergency response
  – Law enforcement
  – Military
Converser for Healthcare: Intro

- Patented verification and correction of translation
  - Reliable Retranslation™
  - Meaning Cues™
- Customizable Translation Shortcuts™
- Bilingual transcripts
Kaiser Permanente Pilot

• Three departments at San Francisco Medical Center
  – Pharmacy:
    • Consulting or Drop-off use case
      – Shortcuts: Consultation: Typhoid Vaccine
    • Pickup use case
    • Greeter use case
  – Inpatient Nursing
    • Shortcuts: IV, External Catheter, Pain Assessment
  – Eye Care
    • Shortcuts: Informed Consent for Cataract Surgery
Kaiser’s Goals

Problem Project is Solving:

• Members’ language needs remain unmet in many situations throughout the KP organization.

• Since the needs vary from situation to situation, no single solution can be expected. Different interpretative solutions need to be tested and analyzed to determine their best fit on multiple variables such as setting, situation, type of patient, etc.

• Accuracy of translation and member/patient acceptance of technology-based interpretive services vs. in-person interpretation need to be assessed.
Equipment (1): EliteBook Setup

- **Good points:**
  - **EliteBook:** Fast; has touchscreen; runs standard image; foldable for portable use; has own keyboard
  - **Wacom Pen Display:** no handing computer back and forth
  - **TableMike:** excellent noise cancellation; hands-free operation; on-signal; easy to switch between staff and patient

- **Drawbacks:**
  - Too much equipment for crowded areas

- **Conclusions:**
  - Best for roomy over-the-counter situations with infrequent movement of equipment
Equipment (2): Motion Computing F5v Setup

- **Good points:**
  - All functionality contained for one-handed portability
  - Liquid-tight for leak-proof sanitation

- **Drawbacks:**
  - Sound volume too low for noisy settings
    - Aux speakers are unwelcome extra items
  - Docking station heavy, so stationary
  - Peripherals (keyboard, etc.) connect thru clip-on dock
  - Standard image not yet available

- **Conclusions:**
  - Upgrade to MC J3500
    - Twin speakers for added volume
    - Portable clip-on keyboard: no need for dock
    - Touchscreen: minimize stylus use
<table>
<thead>
<tr>
<th>+</th>
<th>△</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The system was described as:</strong></td>
<td><strong>GUI too complicated (need larger buttons, crowded screen, …) – 6 mentions</strong></td>
</tr>
<tr>
<td>• “cool”</td>
<td>• Literacy issues: some immigrants can’t read or write – 6 mentions</td>
</tr>
<tr>
<td>• Useful – 5 mentions</td>
<td>• Font size too small - 3 mentions</td>
</tr>
<tr>
<td>• “looks good” “well done”</td>
<td>• “Too technical for me” “I don’t like computers”: family say elderly can’t use – 8 mentions</td>
</tr>
<tr>
<td>• Would help</td>
<td>• Quality of Sound/Volume issues – 6 mentions</td>
</tr>
<tr>
<td>• Good tool – 2-3 mentions</td>
<td>• Handwriting didn’t work – 6 mentions (Note: usage limited)</td>
</tr>
<tr>
<td>• I would recommend it</td>
<td>• Worries about quality of translation – 2 mentions</td>
</tr>
<tr>
<td>• Even if translation was not 100%, it was always understood</td>
<td>• Keyboard issues (hard to use, pen is faster …) – 5 mentions</td>
</tr>
<tr>
<td>• “Perfect and clear” – 2 mentions</td>
<td>• Problems with English voice – 2 mentions</td>
</tr>
<tr>
<td>• Saving time – don’t have to wait for an interpreter</td>
<td>• System slow or froze – 6 mentions</td>
</tr>
<tr>
<td>• “I like it”</td>
<td>• Hard to use tablet in hospital – 1-2 mentions</td>
</tr>
<tr>
<td>• “I like the idea of it”</td>
<td></td>
</tr>
</tbody>
</table>
General Member Comments

• Training (for users) would be needed – **4 mentions**

• Product would be “ideal” with voice recognition – **4 mentions**

• A lot of mixed comments – they like the system but worry others (elderly, less literate) will struggle with it (these comments came largely from partial or full English speaking members).

• Would rather have an in person interpreter – **4-5 mentions**
### Staff Evaluation: 10 staff provided feedback

<table>
<thead>
<tr>
<th>+</th>
<th>–</th>
</tr>
</thead>
</table>
| The system was described as:  
• Good for short interactions  
• Writing is easier than talking  
• Typing was easier than talking  
• You can verify translations better vs. Language Line – 2-3 mentions  
• I would use it if no other options  
• Portability is good | • Occasionally missed a sentence  
• Computer literacy of members is a real issue – 3 mentions (also elderly can’t double click fast enough)  
• User Interface – buttons crowded  
• Translations were a bit odd  
• Slow  
• Hard for patients to write on the tablet, in bed – 2 mentions  
• Takes (valuable) time for the system to process |

- Training of patient’s voice for Dragon Naturally Speaking would be needed.  
  - But time is limited already (i.e. no time in visit to train patients) – 4 mentions  
- Training for staff and providers needed – 3 mentions  
- This product is really (more) needed for Cantonese/Mandarin here in San Francisco.  
- The system needs a formal introduction (so system can describe itself, for English provider to use it with Spanish member)
Summary of Member/Patient & Staff Evaluations

• High praise for the “idea.” Higher than the actual experience of it.
• Translation quality definitely “good enough” as rated by Members/Patients.
• Limited English speakers (who can get along) would still use to verify the conversation and ensure completeness
• Issues of literacy and computer literacy impact applicability.
• Even though the system had issues (low to fair GUI, slow processing, lack of recognition of voice etc.), members partial or full English speakers thought it was “cool.”
• Most people, and especially those who lacked English skills, preferred an in-person interpreter. Although one person noted it saves time waiting for an interpreter, and a provider commented it saved the wait for Language Line.
• Good for emergencies
• Hard for members to use tablet in the hospital
• A number of patient declined to use in hospital but lacking data as to why.
# Member/Patient Evaluation Summary

<table>
<thead>
<tr>
<th>Member/Patient Evaluation</th>
<th>% answered question*</th>
<th>Rated (5) Completely and (4) Most</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did this meet your needs?</td>
<td>79%</td>
<td>94%</td>
</tr>
<tr>
<td>Was it accurate?</td>
<td>79%</td>
<td>90%</td>
</tr>
<tr>
<td>Was it easy to use?</td>
<td>72%</td>
<td>57%</td>
</tr>
<tr>
<td>Prefer handwriting question</td>
<td>67%</td>
<td>68%</td>
</tr>
<tr>
<td>Prefer using keyboard</td>
<td>67%</td>
<td>17%</td>
</tr>
<tr>
<td>Prefer to use handwriting and keyboard</td>
<td>67%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Includes input from all settings: Outpatient Pharmacy, Hospitalized Patients, Outpatient Optometry.

Total of 61 interactions observed. Some patients declined to answer the question or were not asked the question.
Converser 4.0 Features (1)

- **Speech recognition:**
  - *Training-free* speech for both sides!
  - Spanish speech input enabled!
  - On-screen push-to-talk button

- **Interface, training:**
  - Improved English<>Spanish switching
  - Large fonts for all windows
  - Eliminate in-person training
  - No-check Mode: can bypass MT verification
Converser 4.0 Features (2)

- **Translation Shortcuts:**
  - Many new categories
    - Emergency Room
    - Nutrition
    - ...
  - New *Introducing Converser* Shortcuts
- **Text-to-speech:**
  - Speed controls for TTS
Converser 4.0 Features (3)

• **Handwriting:**
  - Improved correction interface

• **Typing:**
  - Onscreen keyboard with larger keys
  - Text entry by finger

• **Centralized installation, maintenance:**
  - Web-based delivery
  - Eliminate in-person maintenance
New Interaction Tools

- Earring Icon (green)
- Traffic Light Icon (green)
- Rewind Button
- Mic Button

Back-translation in Transcript

Example translation: "San José es una ciudad agradable"
Verification Controls

**Green:** Full speed ahead! (Don’t pre-check … but transcript shows back-translation!)

**Yellow:** Proceed with caution! (Do pre-check.)

**Red:** Stop! (Lock to prevent accidental use.)

Translation

Speech Recognition
Future Need for Adjustment Tools

• Beyond healthcare ...
• Telepresence – e.g. for business
• Emergency response
• Law enforcement
• Military
Future Features

• **Converser 5.0:**
  - Mobile delivery: e.g. iPhone, iPad
  - Other languages
    - E.g. English<>Chinese (Mandarin, Cantonese)
  - Transcripts:
    - Direct download to EMR
  - Personal, shared Shortcuts
Sendoff

Mark Seligman

- mark.seligman@spokentranslation.com
- spokentranslation.com