Adjusting Interaction Levels
in a Speech Translation System for Healthcare

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SPOKEN
Translation Traducción Übersetzung Перевод 번역 翻訳

Introduction

- **Converser for Healthcare**
    - Intro
    - Demo

- **Kaiser Permanente pilot project**
    - Needs and setup
    - Kaiser's evaluation (with numbers!)

- **System revision**
    - Especially … <u>adjustment of interaction levels</u>

- **Future need for adjustment of interaction**
    - Telepresence
    - Emergency response
    - Law enforcement
    - Military

Converser for Healthcare: Intro

- **Patented <u>verification and correction</u> of translation**

    – Reliable Retranslation™

    – Meaning Cues ™

- **Customizable <u>Translation Shortcuts</u>™**

- **Bilingual <u>transcripts</u>**

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 <u>needs remain unmet</u> in many situations throughout the KP organization.

• Since the needs vary from situation to situation, <u>no single solution can be expected</u>. 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.

• <u>Accuracy</u> of translation and member/patient <u>acceptance</u> of technology-based interpretive services vs. in-person interpretation <u>need to be assessed</u>.

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
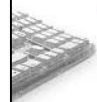
Equipment (2): Motion Computing F5v Setup

- ***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

Member/Patient Evaluation Comments

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The system was described as: • "cool" • Useful – **5 mentions** • "looks good" "well done" • Would help • Good tool – **2-3 mentions** • I would recommend it • Even if translation was not 100%, it was always understood • "Perfect and clear" – **2 mentions** • Saving time – don't have to wait for an interpreter • "I like it" • "I like the idea of it" • Good for emergencies – **2 mentions**	• GUI too complicated (need larger buttons, crowded screen, …) – **6 mentions** • Literacy issues: some immigrants can't read or write – **6 mentions** • Font size too small - **3 mentions** • "Too technical for me" "I don't like computers": family say elderly can't use – **8 mentions** • Quality of Sound/Volume issues – **6 mentions** • Handwriting didn't work – **6 mentions** (Note: usage limited) • Worries about quality of translation – **2 mentions** • Keyboard issues (hard to use, pen is faster …) – **5 mentions** • Problems with English voice – **2 mentions** • System slow or froze – **6 mentions** • Hard to use tablet in hospital – **1-2 mentions**

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

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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 DragonNaturallySpeaking 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, <u>slow processing</u>, 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

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

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
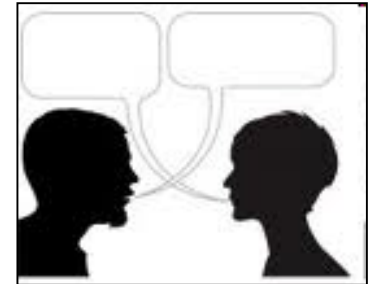
- **Interface, training:**
  - ➢ Improved English<>Spanish switching
  - ➢ Large fonts for all windows
  - ➢ Eliminate in-person training
  - ➢ No-check Mode: can bypass MT verification

Converser 4.0 Features (2)

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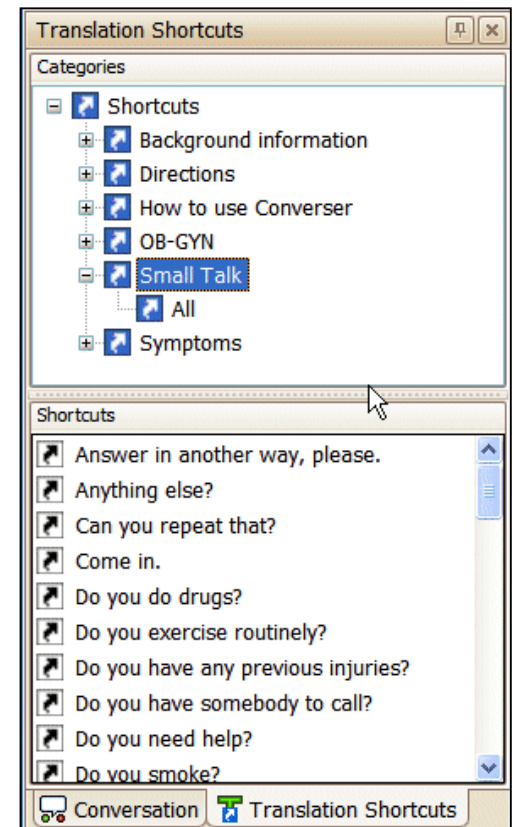
Converser 4.0 Features (3)

- **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

Verification Controls

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

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

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

Translation
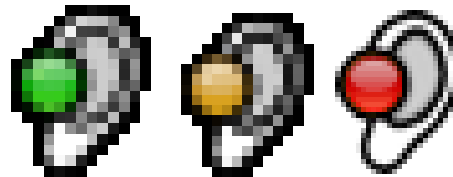
Speech Recognition

Future Need for Adjustment Tools

- **Beyond healthcare …**
- Telepresence
  - e.g. for business
- Emergency response
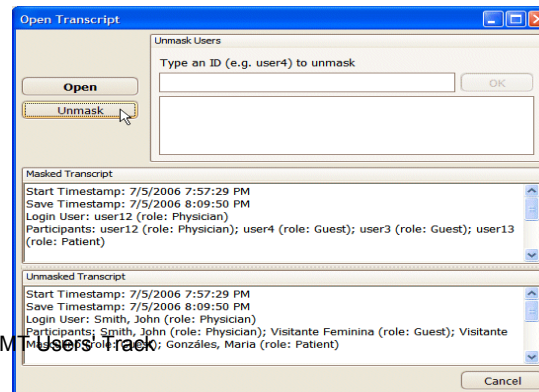- Law enforcement
- Military

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

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