Internationalizing a Conversational Platform

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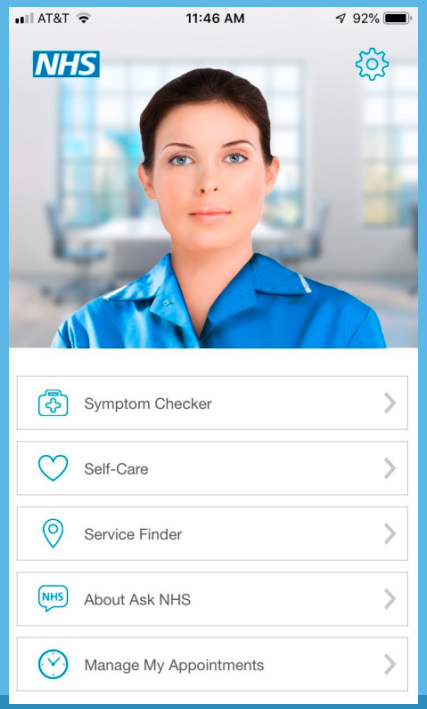
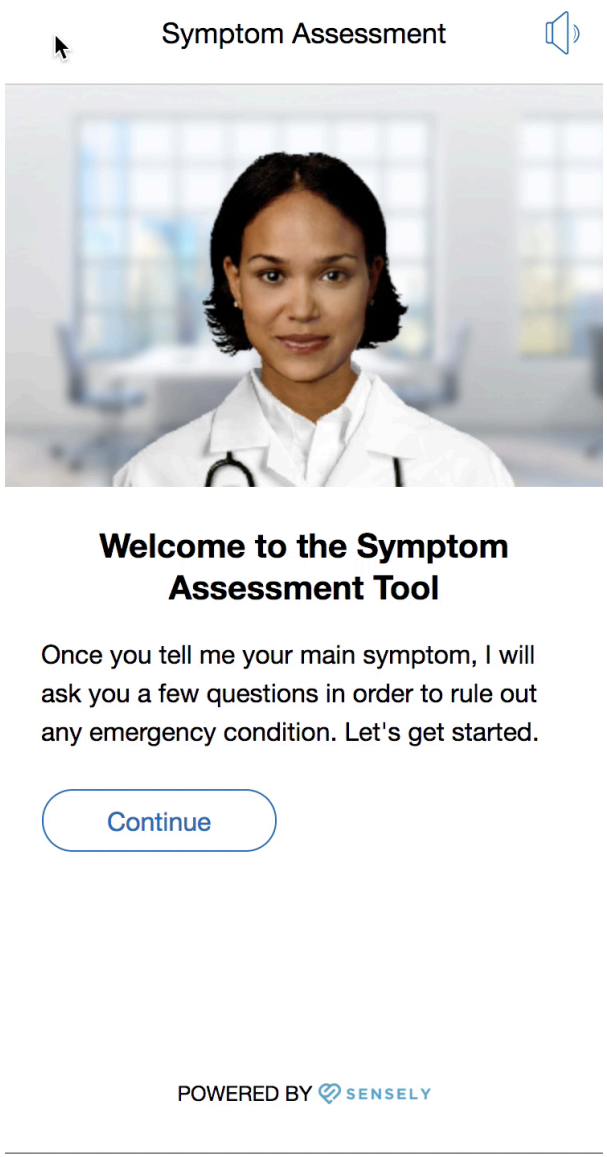
SENSELY



What SENSELY does

- Multimodal conversation (avatar, voice, text)
- Managing healthcare/ insurance tasks



What SENSELY does

- Conversations in many languages, e.g. Arabic

Translation and localization

- Translation:
  - Costs $$
  - Requires content management infrastructure
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    - Questions about traveling “outside the US”

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- Regulatory variation
  - Variation in what qualifies as a medical diagnosis

Grammatical effects of non-English languages

- Gender agreement
  - Spanish: “Ready?” requires gender marking (“Listo?” vs. “Lista?”)
  - Arabic: “How are you feeling?” depends on gender of addressee
    - انتَ (anta) for men and انتِ (anti) for women

Grammatical effects

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  - Arabic: “How are you feeling?” depends on gender of addressee
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- Templatized content may fail for other languages
  - “Show me the ____” (assumes “the” is constant regardless of word in blank)
  - German: “Zeigen Sie mir das Geld” or “Zeigen Sie mir die Ware”,
    - Grammatical gender, number, case

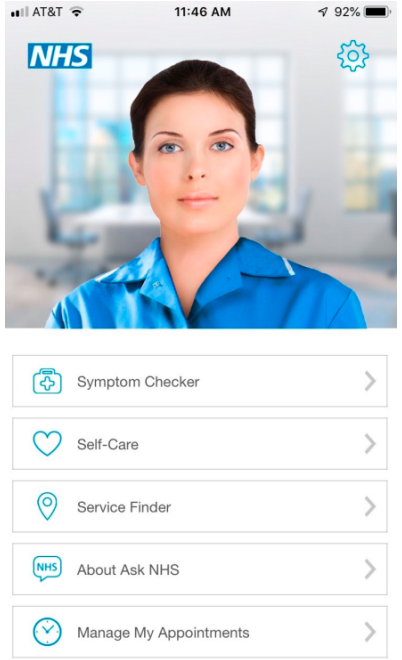
This translation involves engineering, not just content.

Handling foreign scripts

- Character encoding: ASCII vs. Unicode
  - SQL types: text, varchar, nvarchar
  - Does your app render required encodings?
- Copying content may change it (e.g. PHQ-9)
  - Japanese dakuten separated from base character
    - が vs. か゛ (sounds wrong, looks wrong)

Avatar

- Branding opportunities for international partners
- Localized to international markets



TTS (text-to-speech)

- Quality varies across language/dialects
- Speaking vs. reading
  - Some languages need different strings for reading vs. speaking by a TTS engine, e.g. Arabic, Cantonese

Which of the following best describes how or when the low back pain started?

For reading:

أي مما يلي يوضح بأفضل شكل
كيف أو متى بدأ ألم أسفل الظهر؟

For speaking:

أَيٌّ مِمَّا يَلِي يُوَضِّحُ بِأَفْضَلِ شَكْلٍ
كَيْفَ أَوْ مَتَى بَدَأَ أَلَمُ أَسْفَلِ الظَّهْرِ؟

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For reading:

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كيف أو متى بدأ ألم أسفل الظهر؟

Speech rec and NLP

- Quality varies across language models
  - Choose model for your audience (e.g. UAE Arabic)
- Natural language processing conditions change
  - Tokenizing in English may depend on word boundaries (spaces). BUT, Chinese and Japanese don’t have spaces!
  - A user says “my back hurts”
    - English: “back” AND “hurts”
    - Chinese: “胸部疼痛时有时无” -- where are the word boundaries?

More NLP

- Natural language processing conditions change
  - Supporting variants:
    - English: “hurts” may include hurt/hurts/hurting.
    - Arabic: could have 20+ variants (masc/fem, singular/dual/plural, 1st/2nd/3rd person, perfect/imperfect mood)
  - Punctuation characters: For example, the period “.” in English is “。” in Japanese. If any of your functionality depends on specific punctuation characters, that functionality could be affected as a result.
    - Mandarin: 欢迎使用康语虚拟健康助手。我的名字叫小语。
    - Japanese: チェックインへようこそ。チェックインへようこそ。

The user interface

- See anything wrong with this picture?

The user interface

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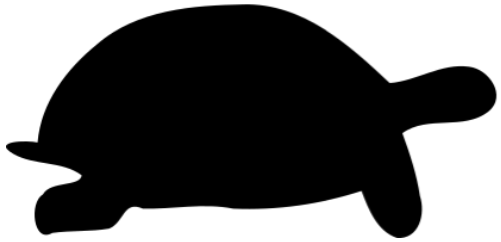
Arabic reads right-to-left, and should be right-aligned.

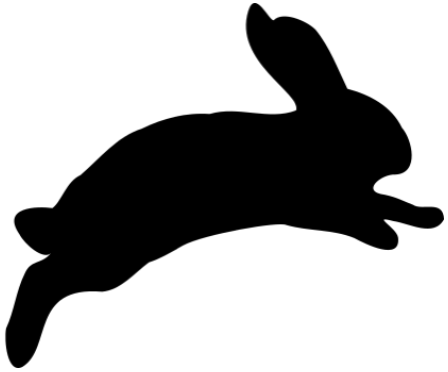
The user interface

- Right-aligned text
- Vowels removed for reading
- UI elements flipped in nav bar

Performance

- Deploying around the world can slow things down
  - Use local servers
  - Pre-load content in app
  - Fetch new content ASAP (e.g. while avatar is speaking)





Going international

- Opens up new markets.
- Creates new challenges.

Thank you for listening!

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