Natural language options in customer service

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“Natural Language Understanding”

- Interaction with digital systems through human language
- “Just say or type what you want” WITHIN CONTEXT

Fidelity Bank. How can I help you?

I’d like a pepperoni pizza.
The use of natural language a fundamental trend in user interfaces

“Instead of us having...users learning new shell constructs, downloading icons after icons, and screen after screens of apps, what if all you did was speak or text and you were able to get the work done. That’s the world I think you can create...You are going to build these bot interfaces that understand human dialogue. And, it’s going to be a pretty profound shift in how computing is experienced by everybody.”

Microsoft CEO Satya Nadella, May 2016
A challenging diversity of options in delivering conversational customer service

+ Modalities
+ Channels

What is common among these options?

How can you simplify the challenge of dealing with this potential complexity?
Modality

- Text
- Voice
NLI operates on text
When a Visual User Interface is available
Voice-only

Home devices

Call center

Automobiles
Amazon’s Alexa on devices other than the Echo

- Amazon Fire TV
- Lenovo Smart Assistant Speaker
- LG Refrigerator
- Belkin’s Wemo Dimmer Switch
- Mattel Aristotle Baby Monitor
- In the automobile (Volkswagen, Ford)
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You develop specialized “Skills” that Alexa makes available (over 8,000 so far)
Your customer service assistant can be reached through multiple channels

- Microphone/speaker-equipped devices
  - E.g., Amazon Echo, Google Home, third-party devices using Alexa
- Telephone calls (e.g., customer service lines)
- Web site (Anywhere a browser is available)
- Applications/Apps (Mobile and PCs)
- Called through the general digital assistants
  - E.g., Cortana “Skills,” Google Assistant “Actions”
- Called through messaging apps
  - E.g., Facebook Messenger “bots,” Google Allo, Microsoft Skype
- Text with a bot through SMS text messaging
Customer service telephone lines

- Open-ended prompt vs. a decision tree of layered menus
  - “How can I help you?”
  - “Please state briefly why you are calling. For example, you can say…”
Call center example

Example from interactions
simply better understanding
Human assistants in the background

- Assist automated system when it is having trouble
  - Can make system nearly perfect
  - Can handle difficult cases such as entering new email addresses
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- Interactions calls this option “Adaptive Understanding”
  - Other vendors provide this option
Digital assistants

- General “personal assistants”: E.g., Apple’s Siri, Microsoft’s Cortana, Amazon’s Alexa, Google’s Assistant, Samsung’s Bixby

The general personal assistants as portals to the web and your company or service

- Browsers → Apps → Digital assistants
- Smartphone users spend over 85% of their time on the phone in apps rather than web browsers (eMarketer, Sept 2016)
- Microsoft CEO Satya Nadella: “Bots are the next applications.”

Your branded company digital assistant as your new web site and customer service option
Messaging service “bots”

- Facebook Messenger “bots”
  - Over 33,000 launched so far
  - The Facebook Messenger Send / Receive API

- Microsoft Skype “bots”
  - Microsoft claims 30,000 developers are developing Skype bots
    - More than 1000 launched

- Google Allo (new messaging service)
  - Expected to accommodate third-party bots
Mobile apps

+ Independent mobile apps (digital assistants) fully under your control

Santander Bank uses Nina platform from Nuance Communications
Engaging the customer

- Recent chatbot “character” advertising a movie had average engagement time of ten minutes
- Rising as high as two and a half hours
Approaches to the development of natural language customer service options

- Work with a full-service vendor
- Use tools and services that isolate you from details of the technology
- Use tools that allow you more control over pieces of the technology
Natural Language Processing development at the core

- Basic elements of NLP extrapolate across tools and platforms
NLP requires human understanding of goals and context

- Specifying “intents” in a natural language inquiry
Intents

+ Basic *general context*
  + E.g., interaction with a bank

+ *Reduce that context* by determining the specific *intent* implied by the natural language request

+ E.g., Is the customer calling about:
  + Account Balance
  + Questioning an item on a statement
  + Transfer between accounts
  + ...

+ Is the customer asking a question you can answer, e.g., the interest rate on money in the account?
  + *Intent:* getting current interest rates
Variations in language defining intent added by tools

“Small data” tools allow providing only a few examples of how each intent might be said – Then extrapolate

Example from Nuance Experience Studio

- can i apply for a student loan
- do you offer home loans?
- how do i apply for a car loan?
- i'd like to apply for a loan
- i'm looking for a student loan
- i need a housing loan
- i need to take out a mortgage
Once you know the intent

+ Determine information necessary to answer a question
  + “Transfer $100 from my savings to checking account”
    + Intent: Transfer between accounts
  + Extract from request variables you must know to satisfy the request
    + Amount: $100
    + From_account: Savings
    + To_account: Checking
  + Variables called “Concepts,” “Entities”
Facebook’s wit.ai NL tool

- Facebook Messenger “bots”
- The wit.ai Bot Engine enables ongoing training of bots using examples

Intent Parser

Your users give us voice or text, you get back structured data. It’s that simple

Set the temperature to 70° in my bedroom

Did you try... Remind me to feed the baby tomorrow at 7am ☺

intent = heating control
temperature = 70°F
where = master_bedroom
Conventional software works with intents and entities.

Big data using machine learning

Small data using tools that extrapolate from examples
Aspect Omni-Channel natural language self-service
Skype messaging service “bots”

+ Microsoft Skype “bots"  
+ Bots can be added as contacts in the messaging application
Amazon Alexa “skills”

“A collection of self-service APIs, tools, documentation and code samples that make it fast and easy for you to add skills to Alexa. All of the code runs in the cloud--nothing is on any user device.”
Cognitive customer engagement

Watson Virtual Agent

Help your customers help themselves. Provide them with instantaneous, personalized support - wherever and whenever they need it.

Starting at $265.00 USD per month per subscription

Free 30-day trial  View pricing and buy
Vendors

- My recent market study on Specialized Digital Assistants and Bots
  - 172 companies with at least a part of the solution
  - 39 companies that can support a complete natural language solution (a “digital assistant”) in at least one channel
Knowing what you can automate limits the interaction

- Starting from what you can answer and what actions you can take is a powerful development strategy
  - What *intent* signals a specific answer or action?
  - What *concepts* are required to provide a specific answer?
- Your data
  - Frequently Asked Questions
  - Web site
  - Guidance for customer service agents
  - Other documentation
Make your software accessible directly with deep linking

- Getting directly to a feature of your app without launching the app
  - More than 1,000 apps—including Facebook, Pinterest, and Instagram—have created more than 100 billion deep links

- Google Assistant, for example, supports “deep linking”
  - “Ask Instagram to display my latest photo”
Testing

+ Careful staged deployment will increase natural language and speech recognition coverage
The bottom line

- Natural language interaction is a fundamental trend in interacting with digital systems
  - Companies must understand how this impacts their interaction with customers
- You don’t need a massive research investment to be part of this trend
  - Developing a specialized assistant is eased by its limited objectives
  - A range of tools can support you
- Once you understand intents you can deal with, they translate to most channels and tools
Thanks for your attention!

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