

Natural language options in customer service



William Meisel
TMA Associates

“Natural Language Understanding”

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



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?

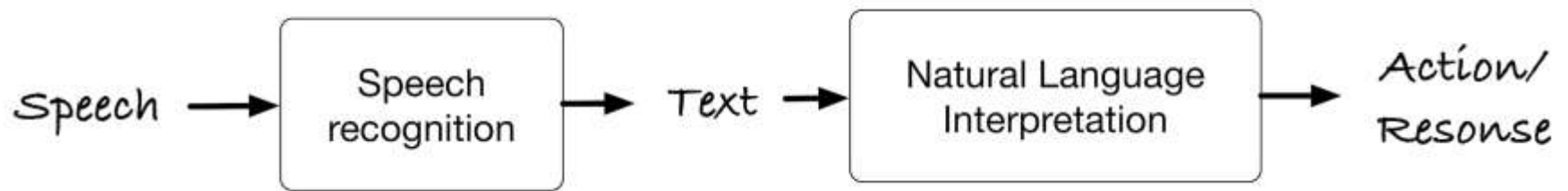
Modality

+ 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



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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- + Assist automated system when it is having trouble
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 - + Can handle difficult cases such as email addresses
- + Defaults to an agent can be used to improve automation
- + 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
- + Specialized: “Digital Assistants,” “Intelligent Assistants,” “Virtual agents,” “Avatars,” “Skills,” “Actions,” “Chatbots,” “Bots”



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”

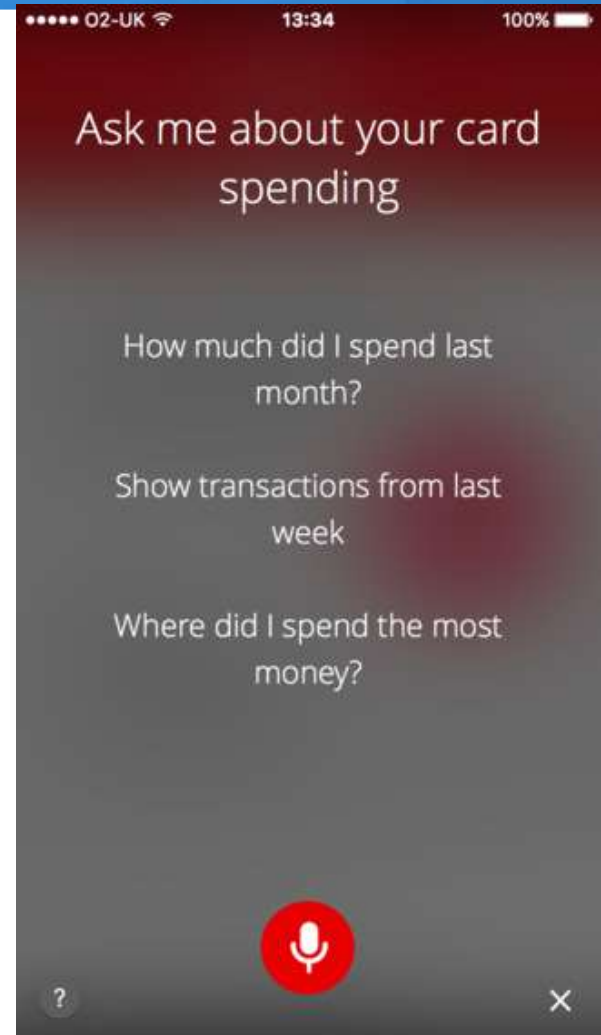
- + Facebook Messenger “bots”
 - + Over **33,000** launched so far
 - + The Facebook Messenger Send / Receive API
- + Microsoft Skype “bots”
 - + Microsoft claims **30,000** developers are developing Skype bots
 - + More than 1000 launched
- + Google Allo (new messaging service)
 - + Expected to accommodate 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



*Increasing
involvement*

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

can i apply for a student loan

do you offer home loans ?

how do i apply for a car loan ?

Example 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

Example from
Nuance
Experience
Studio

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

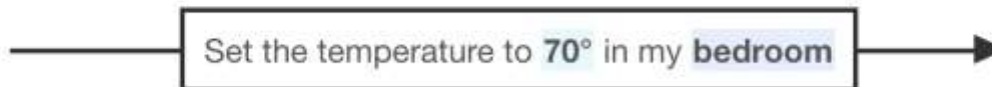
Intent Parser

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
```

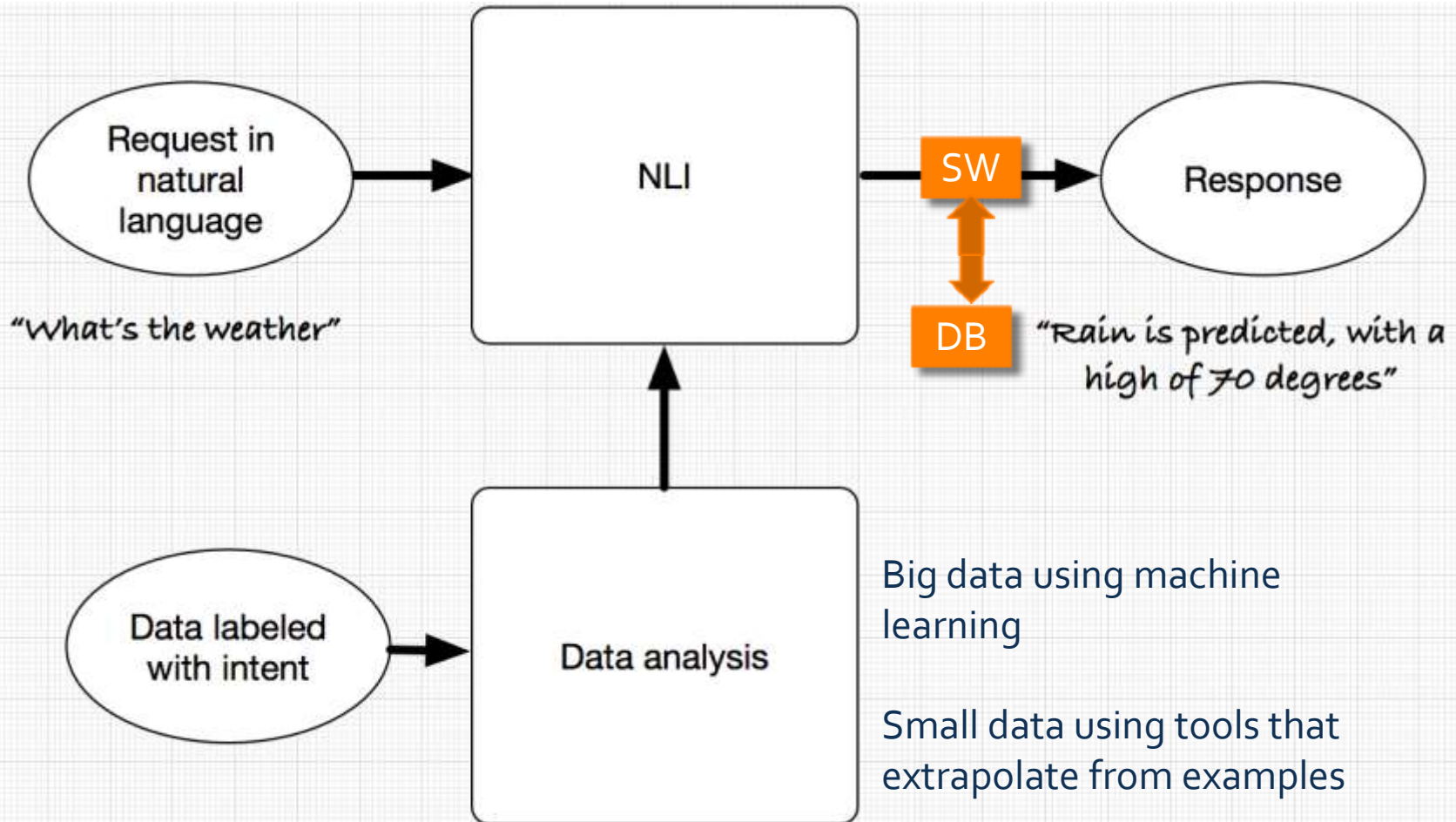


Your user

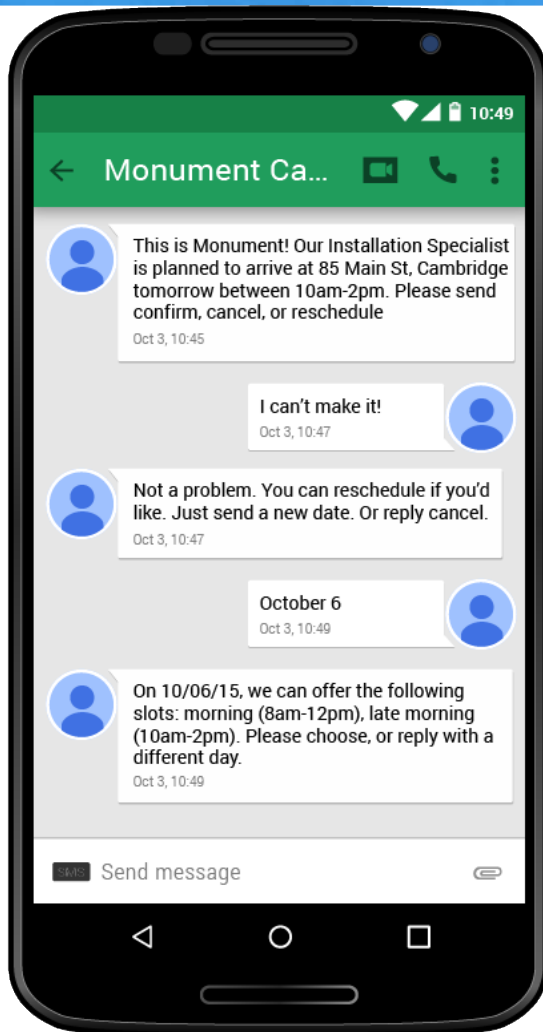
Wit.ai

Your app

Conventional software works with intents and entities

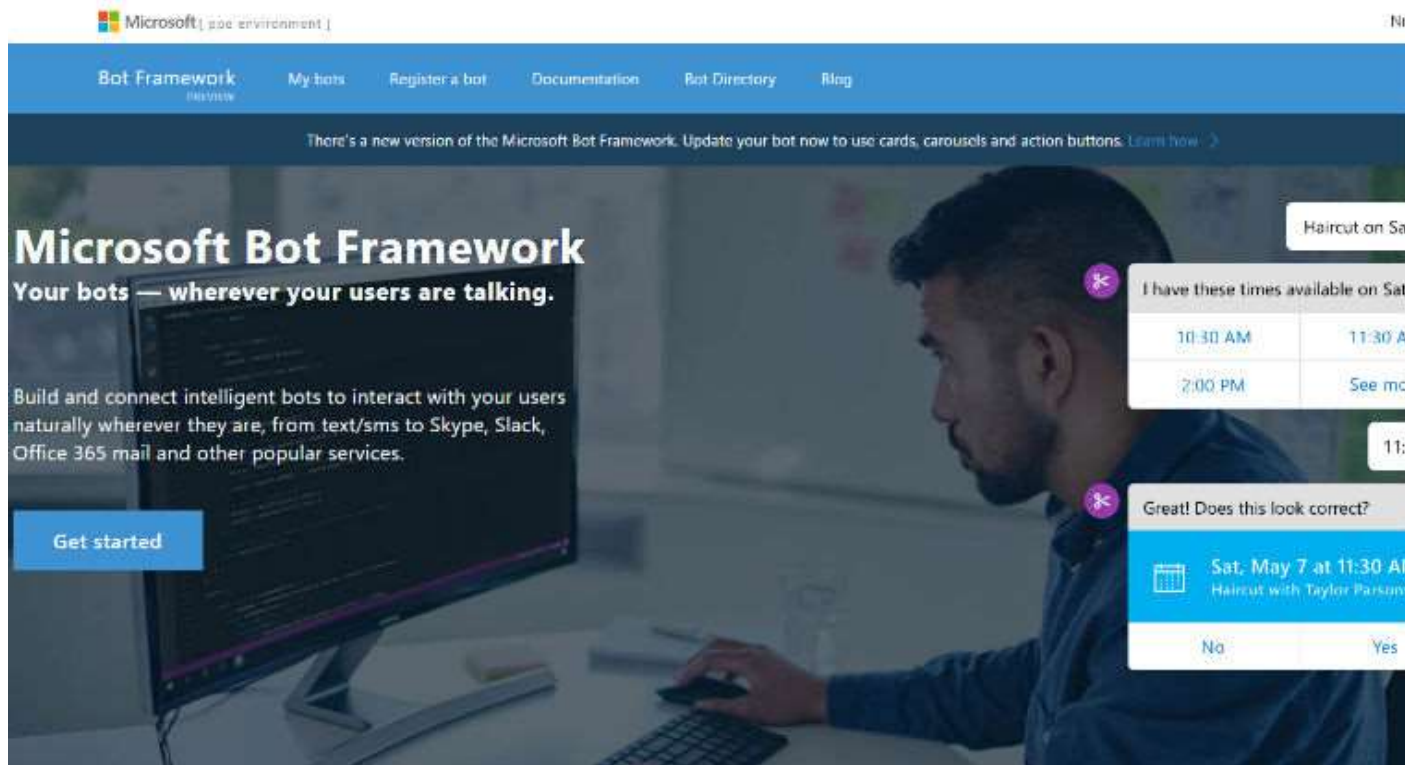


Aspect Omni-Channel natural language self-service



Skype messaging service "bots"

- + Microsoft Skype "bots"
- + Bots can be added as contacts in the messaging application



The screenshot displays the Microsoft Bot Framework website. At the top, there is a navigation bar with links for "Bot Framework", "My bots", "Register a bot", "Documentation", "Bot Directory", and "Blog". Below the navigation bar, a banner reads: "There's a new version of the Microsoft Bot Framework. Update your bot now to use cards, carousels and action buttons. [Learn how](#)".

The main heading is "Microsoft Bot Framework" with the sub-heading "Your bots — wherever your users are talking." Below this, the text states: "Build and connect intelligent bots to interact with your users naturally wherever they are, from text/sms to Skype, Slack, Office 365 mail and other popular services." A blue "Get started" button is positioned at the bottom left of the main content area.

On the right side of the image, a chatbot interface is overlaid on a background image of a man working at a computer. The chatbot shows a message: "I have these times available on Sat" followed by a table of times:

10:30 AM	11:30 A
2:00 PM	See mo

Below the table, there is a confirmation message: "Great! Does this look correct?" and a calendar card for "Sat, May 7 at 11:30 AM Haircut with Taylor Parkins". At the bottom of the chatbot interface, there are "No" and "Yes" buttons.

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.”

A recent IBM option

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
 - + <http://www.tmaa.com/specializeddigitalassistantsandbots.html>
 - + 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!



Contact Bill Meisel at wmeisel@tmaa.com