ADVANCED USER INTERFACES FOR SMART ASSISTANTS

DAVID ATTWATER,
SENIOR SCIENTIST
ABOUT ENTERPRISE INTEGRATION GROUP

A Conversational Interaction Design Company
Specializing in Customer Service
International professional services corporation
Established in 1993
Vendor neutral
Design, human factors, and engineering specialists
Strategy, Design, Training
Offices in US, UK and Switzerland
EIG PARTIAL CLIENT LIST
AGENDA

What is a Smart Assistant?
Why Conversational Interaction?
How are they Different from IVR?
What are the Key User Interface Challenges?
WHAT IS A SMART ASSISTANT?
THE INTERNET OF THINGS

Photograph: Peter Menze / The Human Face of Big Data
THE INTERNET OF THINGS
AN EXPLOSION OF CONNECTED POSSIBILITY

Source: The Internet of Things – Infographic The Connectivist Based on Cisco data
INTELLIGENT SPEAKERS

Google Home  Apple Home Pod  Amazon Alexa
HOME AUTOMATION

Show me the baby’s room

Lock the door

Turn off the living room light

Set the living room to 20 degrees
AN EXPLOSION OF ACCESS POINTS
AN EXPLOSION OF ACCESS POINTS

Vobot

Triby

Nucleus

Echobee

m-voice
AN EXPLOSION OF ACCESS POINTS

BMW
Ford
Seat
Skoda/Volkswagen
Lexus
WHAT IS A SMART ASSISTANT?

“A smart assistant is a ubiquitously accessible, situationally aware, personalised agent”
CONVERSATIONAL INTERACTION
What is unique about conversation?
### VISUAL VERSUS VOICE-ONLY USER INTERFACES

<table>
<thead>
<tr>
<th>Visual</th>
<th>Voice Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistent</td>
<td>Ephemeral</td>
</tr>
<tr>
<td>High Information Rate</td>
<td>Low Information Rate</td>
</tr>
<tr>
<td>Not Taxing on Memory</td>
<td>Taxing on Memory</td>
</tr>
<tr>
<td>Multi-Modal</td>
<td>Uni-Modal</td>
</tr>
<tr>
<td>Multiple/No Goals</td>
<td>One Goal</td>
</tr>
<tr>
<td>Stable to error</td>
<td>Unstable to error</td>
</tr>
<tr>
<td>Bounded in Scope</td>
<td>Unbounded in Scope</td>
</tr>
</tbody>
</table>

These distinctions dominate the user interface design and explain why voice is often second choice for user interaction.
SO WHY ARE CONVERSATIONAL INTERFACES USEFUL?

No need to constrain the user
Rapid reference to things that cannot be pointed to
Describe problems rather than express actions

What films star Johnny Depp?
What debits went out this month
How much interest have I paid in the last year
Do you offer any benefits on this account if I pay a little extra
How do I set up the email on my Android?

For films starring Ben Affleck press 1, Johnny Depp, 2, Jennifer Annisten, 3
WHY ARE VOICE USER INTERFACES SO USEFUL?

It’s all about practical things

- Hands-free / Eyes-busy
- Does not need a physical device
- Can be used on a very small device
- Not limited by keys available
- Sometimes faster than typing

Tell Debs I’m not going to make our breakfast meeting
Add a new destination to my journey
Turn up the temperature in the kids bedroom
ARE SMART ASSISTANTS RELEVANT TO CUSTOMER SERVICE?
ARE SMART ASSISTANTS RELEVANT TO CUSTOMER SERVICE?

1. Agent Matching
2. Self-Service
3. Identification
4. Frequent Queries

Smart Assistant
ARE SMART ASSISTANTS RELEVANT TO CUSTOMER SERVICE?

Online and telephone banking 24 7 365 | first direct
www1.firstdirect.com/1/2/

first direct is the UK's most recommended bank and offers many services including online banking, insurance, mortgages, investments and share dealing.

Online Banking
Online Banking with first direct is simple, straightforward and ...

Contact us
If you want to contact first direct, there are a number of ways you ...

Ways To Bank
Online Banking - Branch facilities - Mobile app - Phone Banking

More results from firstdirect.com »

Regular Saver Account
The first direct Regular Saver Account is designed for longer ...

Current Accounts
1st Account from first direct - award winning Internet Banking from ...

Switch to first direct
Switch current accounts with first direct - the UK's most ...

Mortgage Comparison, Compare Mortgages | first direct
https://mortgages.firstdirect.com/compare-mortgages

Compare our range of mortgages and find the right mortgage to suit you.

Our Mortgage rates | first direct
https://mortgages.firstdirect.com › Mortgages › Mortgage rates and fees

Here's a list of all the mortgages we currently offer – and their different rates. You should bear in mind that mortgages can be withdrawn and interest rates can change at any time. You can see which ones
DIFFERENCES FROM IVR
Users are highly motivate to engage
Can be situationally
Can be personalised
All the same challenges as IVR

“Smart assistants have highly motivated users but you can still build terrible user interfaces”
USER INTERFACE DESIGN
KEY USER-INTERFACE CHALLENGES

Discoverability
Stability To Error
Turn-Taking
Narrative Voice
Supporting Visual Channels
DISCOVERABILITY WITH AN AUDIO INTERFACE
BEST PRACTICES FOR DISCOVERABILITY

Users learn by exemplars
Users remember by doing not hearing
Failure is an opportunity to shape behaviour
One hint at a time
Never forget the visual channel

If you want to know about our conference rooms use the ‘room-facility’ command
To book a room say something like ‘book room six on Thursday afternoon’
Here’s a list of our rooms: Room one, room two, the butterfly suite, the ball-room, and the executive room.
The rooms available on Thursday are on your screen. Please select one. You can swipe is sideways to get more details.
SUPPORTING VISUAL CHANNELS
STABILITY TO ERROR
BEST PRACTICES FOR STABLE USER INTERFACES

Never assume that the recogniser is always right
Use unexpected results to stabilise the interface
Don’t over-confirm but do so for critical things
Let the user self-diagnose failure
Consider command and control with defaults

Alexa. Make a call
To make a call say something like ‘call bob on his cell phone’

Alexa. Call joe
Calling john’s echo dot’

Alexa. Stop
Alexa does not support interruption well
- No control over pausing
- No interruption without the ‘Alexa’ keyword

Design with this in mind
- Let the user go first
- Expect users to interrupt and then re-present
- Aim for short phrases without embedded pauses
Best practices for Narrative Voice are still unclear

Alexa. Open EIG Bank

This is EIG Bank. Your balance is two hundred pounds over-drawn

<John! we’re overdrawn. Did we get paid yet?>

What else can I do for you. If you aren’t sure you can always ask for your choices.

What’s my overdraft limit?

<Alexa terminates EIG Bank>

What’s my overdraft limit?

<Alexa is listening for keyword>

Alexa. What’s my overdraft limit?

According to Wikipedia, an overdraft limit is…
Smart Assistants are Potentially Revolutionary

To reach their full potential they will need to be

- Ubiquitous
- Personalised
- Situationally Aware
- Mediate Privacy and Security
- Supported by Visual Feedback
- Platform independent
- Device independent
- Much better support to advanced speech features
- Much better support for user interface stability and encapsulation
CONTACT INFORMATION

Enterprise Integration Group, Inc.
Post Office Box 153
San Ramon, California 94583
1-925 735 1700 or 1-888-EIG-4-IVR

EIG (Europe) Limited
36 Rawlinson Road
Southport, UK PR9 9NE
+44 797 124 4038

http://www.eiginc.com

david@eiginc.com
rex@eiginc.com