

Smart Home Communication

An Independent Informal Research Study

This study is an independently conducted brief done by Kate Glazko. The purpose of this study is to find out whether people prefer specific mediums of communication to others when interacting with smart devices. This study is not affiliated with any organization in any way.



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Executive Summary

136 participants were asked a short series of questions relating to voice control of smart devices and the Amazon Echo. Individuals were self-selected, and the survey was distributed through electronic channels to a group composed mainly of college students and graduates. All participants who engaged in the survey completed the survey, making it a particularly successful sample. 5 focus interviews were carried out to gain depth on the results.

The results from the survey are summarized below:

- 46% of those surveyed prefer to interact with their smart devices through an app interface.
- 40% of those surveyed prefer to interact with their smart device through a voice interface.
- 14% of those surveyed prefer to interact with their smart device through a non-verbal messaging interface.
- Preferences amongst communication methods varied significantly across age groups, with app interaction remaining the most popular method across all groups.
- 19-25 year olds had the closest split between preferring an app or voice for communication, with a less than 3% favor for app communication.
- Users who preferred the voice method were more interested in wanting to purchase the Amazon Echo than other groups.
- 18% of those surveyed definitely want to buy an Amazon Echo.
- The majority of the group who indicated interest in non-verbal messaging as a means of interacting with a smart device has heard of the Amazon Echo.

Results

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The results of the survey showed that there is a need to continue investigation into communication mediums relating to voice. It is premature to assume whether one medium is better than the other.

Likewise, the survey shows that even unconventional mediums of interaction with devices such as non-verbal messaging may acquire a group of interest amongst respondents who both are and are not familiar with popular industry alternatives.

More in-depth analysis and focus groups needs to be done with different age groups and backgrounds to better understand how people want to communicate with their devices.



Introduction

Interacting with objects in ones' home has been a primarily tactile endeavor. Light switches, coffee machines, and remotes all have buttons and switches than must be touched in order to produce a correct response. The emergence of smart devices unleashes the potential of these devices to be controlled remotely or completely hands-free, as in the example of voice interaction.

In my research of voice-controlled smart homes objects and devices, I often found the argument that voice is the most natural of mediums of interaction. I found this an interesting and complex statement. In the current day, voice as a medium is on the decline in day-to-day life among people- for quick tasks, we fire off an email or send a text message. Voicemail, likewise, has seen a decline in usage. Classes in "how to have a conversation" are beginning to emerge. Perhaps, I thought, as pondering this, not everyone communicates in the same way? Or perhaps, for some people, "natural" is different than for others?

I decided to conduct a research study to better understand how people want to interact with potential smart devices. I wanted to see whether age would impact how people want to interact with their smart devices. I also wanted to see what the age and preferences of people who had heard of and desired the Amazon Echo were. The Echo was used as the target product because it is the current leader in voice-related products.

My hypothesis in conducting this study was that the preferences of peoples' desired mediums to interact with smart devices would vary. I wanted to force people to choose only one medium of communication with a smart device (although in reality, I am sure most would prefer a combination of mediums) to see what communication medium people would default to. I chose three categories: Voice, App, and Non-Verbal Messaging as the options and had hypothesized an even split between the three.



Research Methodology

- Survey sent electronically to recipients through Facebook
- Recipients included current students and alumni of the University of Southern California, members of the Hackathon Hackers Facebook group- which is a group with members from around the world, members of the Mozilla Interns group, and a minor group of recipients who included close friends and family of the surveyor.
- The survey received 134 responses, all which were complete responses.
- The survey is not random, and is composed of self-selected individuals who chose to take the survey.
- There were only 16 participants from the 13-18 year old age groups, which indicates that more effort will be required to gain a better understanding of that demographics' preferences. My observation here is that Facebook is less popular amongst this age group, and perhaps Snapchat or Instagram would've been a better medium to distribute this survey to that particular age demographic.
- Some focus-depth interviews were conducted to further gauge insights on these results.



Results of Research

The question responses can be found in chart for in Appendix A.

- The results show the Voice (40%) and App (46%) are the most popular mediums for communication.
- There appears to be some desire for a non-verbal messaging interface, primarily among the 25+ age group (24%, compared to 19% for 13-18 and 8% for 19-25).
- The group that had the closest split between voice interaction and app interaction, with 47% preferring an app interface and 45% preferring a voice interface.
- 60% of the pool consisting primarily of college graduates has heard of the Amazon Echo (which likewise means that 40% of the pool has not).
- Of the people who have heard of the Amazon Echo, only 18% indicated that they definitely wanted it. 57% of survey takers expressed uncertainty in their desire to own the Amazon Echo.
- The group who preferred non-verbal messages interestingly enough had the most individuals who had heard of the Amazon Echo (79%), surpassing even the group who preferred voice which had a smaller number of people who had heard of the Echo (67%).
- Of those who definitely wanted to purchase the Echo, 87% were individuals who preferred the voice medium. Only 1% of those who definitely wanted to purchase the Echo declared their communication medium of preference to be an app.
- 30% of those who definitely did not want the Amazon Echo stated that voice was their communication medium of preference.
- Focus interviews showed that people tend to want different mediums for different contexts. People interviewed also do not want a separate app for each device.



Analysis of Results

Some of these results are very interesting and pose further questions to be answered. For instance, it was surprising that non-verbal messages would be a desired medium at all- the only well-documented instance of such a project is run by LG.

Likewise, it is interesting to see the highest levels of acceptance of the voice medium coming from the 19-25 year old age group. One of the subjects that I interviewed claimed that on a whole, 19-25 year olds are people that live alone and do not typically have families. Voice control of smart devices may be inappropriate in households where people have different schedules of sleeping infants. This is only one such explanation for this phenomenon, but it may be worth interviewing more people about their preferences for voice technology vs. apps.

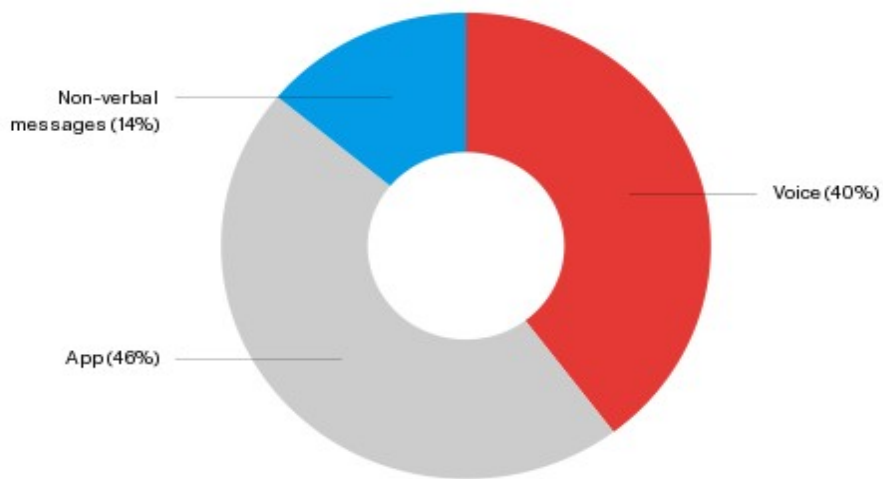
The results regarding the Echo show that even amongst college graduates and technically-oriented individuals (Hackathon Hackers and Mozilla Interns), only 60% of the respondents knew what it was. Of those respondents who knew what the Amazon Echo was, only 18% showed a definitive desire to purchase the Amazon Echo. Likewise, it is clear that despite being aware of the Amazon Echo, some respondents would opt to use mediums besides voice.

This analysis truly indicates that more in-depth research is needed to better understand peoples' preferences. There doesn't appear to be a single, unanimous winner in the race of smart device communications. It is too premature to gauge whether one medium is more "natural" than the others, and more research is needed to determine what mediums are appropriate in what settings and with what demographics.



Appendix A

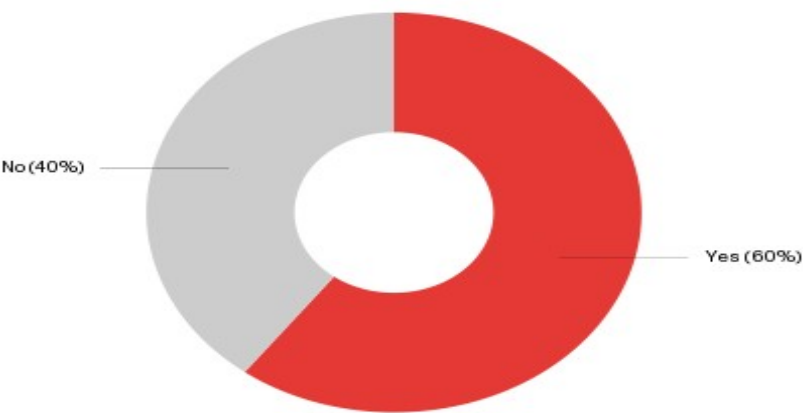
Q1 - You live in a smart home. You can turn lights/coffee machines/TVs on, hands-free. Would you rather control your smart home with voice (Siri-style), an app on your smart phone/watch, or sending non-verbal texts/messages to your devices to control them?



Answer	%	Count
Voice	40%	54
App	46%	63
Non-verbal messages	14%	19



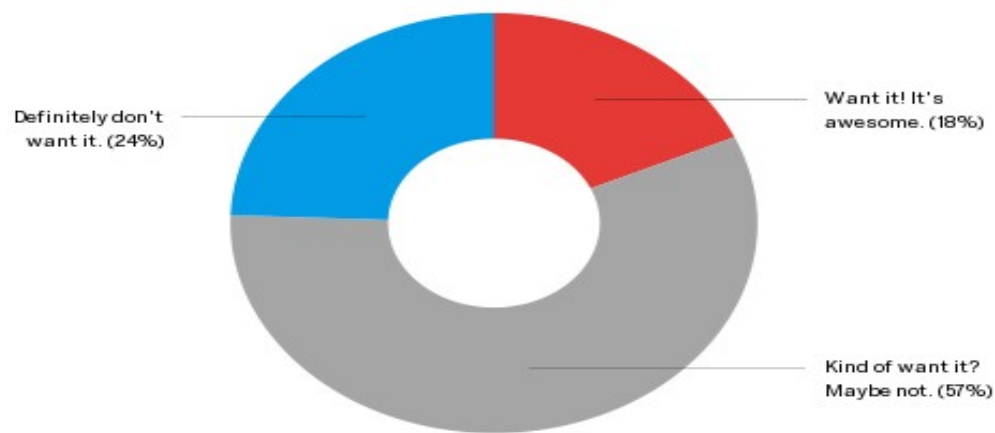
Q2 - Have you heard of the Amazon Echo?



Answer	%	Count
Yes	60%	82
No	40%	54
Total	100%	136



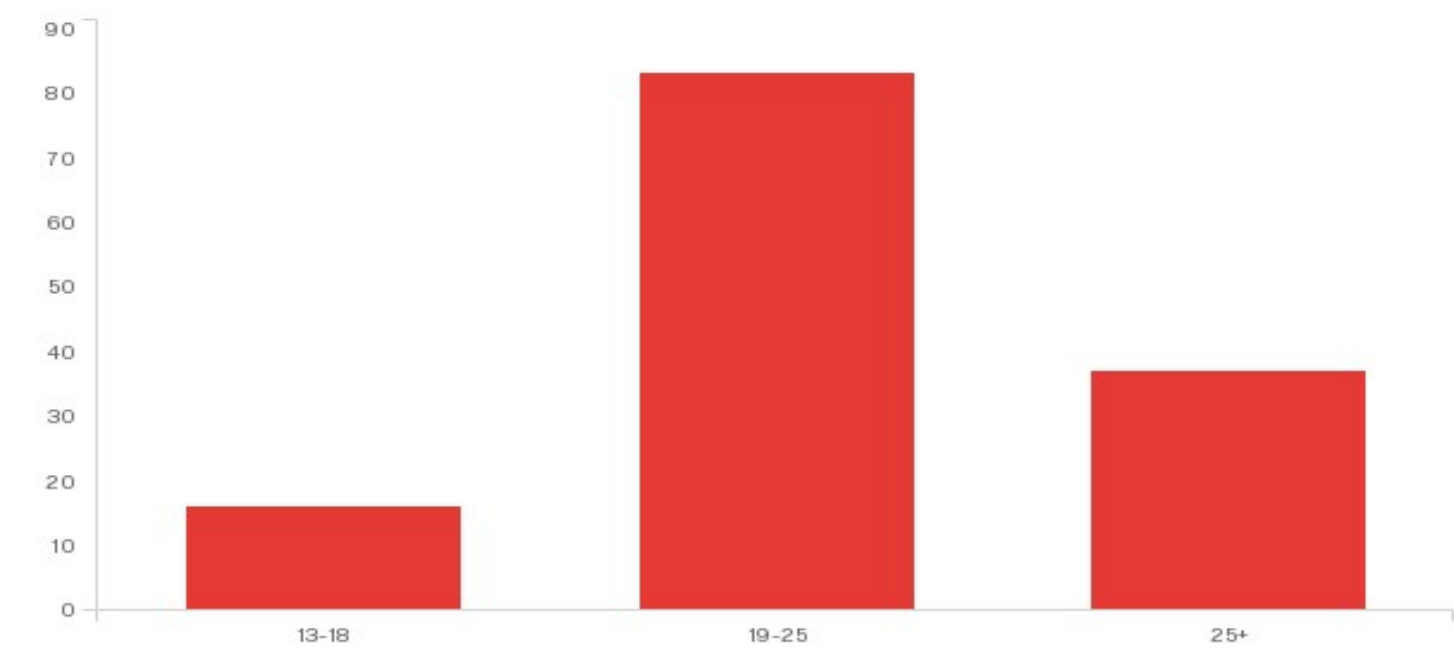
Q3 - How do you feel about the Amazon Echo?



Answer	%	Count
Want it! It's awesome.	18%	15
Kind of want it? Maybe not.	57%	47
Definitely don't want it.	24%	20
Total	100%	82



Q4 - What is your age range?



Answer	%	Count
13-18	12%	16
19-25	61%	83
25+	27%	37
Total	100%	136



SH Comm Options vs. Age

		You live in a smart home. You can turn lights/coffee machines/TVs on, hands-free. Would you rather...			
		Voice	App	Non-verbal messages	Total
What is your age range?	13-18	4 25.00%	9 56.25%	3 18.75%	16 100.00%
	19-25	37 44.58%	39 46.99%	7 8.43%	83 100.00%
	25+	13 35.14%	15 40.54%	9 24.32%	37 100.00%
	Total	54 39.71%	63 46.32%	19 13.97%	136 100.00%



SH Comm Options vs. Heard of Echo

		You live in a smart home. You can turn lights/coffee machines/TVs on, hands-free. Would you rather...			
		Voice	App	Non-verbal messages	Total
Have you heard of the Amazon Echo?	Yes	36 66.67%	31 49.21%	15 78.95%	82 60.29%
	No	18 33.33%	32 50.79%	4 21.05%	54 39.71%
	Total	54 100.00%	63 100.00%	19 100.00%	136 100.00%



Echo Op. vs SH Comm Options

		You live in a smart home. You can turn lights/coffee machines/TVs on, hands-free. Would you rather...			
		Voice	App	Non-verbal messages	Total
How do you feel about the Amazon Echo?	Want it! It's awesome.	13 86.67%	1 6.67%	1 6.67%	15 100.00%
	Kind of want it? Maybe not.	17 36.17%	21 44.68%	9 19.15%	47 100.00%
	Definitely don't want it.	6 30.00%	9 45.00%	5 25.00%	20 100.00%
	Total	36 43.90%	31 37.80%	15 18.29%	82 100.00%