Assignment M3
CS6750 Spring 2019

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Abstract. According to a new report from Juniper Research, smart devices like the Amazon Echo, Google Home and Sonos One will be installed in a majority – that is, 55 percent – of U.S. households by the year 2022.(Perez, 2018) With this accelerated adoption rate of voice-assisted speakers comes the desire by consumers for new and innovative ways to share, access and socialize with these speech-enabled services.

Brainstorming Plan:

Objective criteria:

The objective criteria that we will aim to meet are 20 captured ideas in the initial session followed by a session that builds on the 20 ideas and finally a session that curates' ideas and enhances candidate designs.

Outline a brainstorming plan.

1. Create a written statement of the Core Problem and keep it available during the brainstorming sessions.
2. Provide Constraints: At least two ideas from Music, Video, Gaming. At least three ideas that cover non-speech interactions. At least two ideas that are futuristic.
3. Aim for 20: Provide at least 20 ideas; these could just be a few words that bring a concept forward.
4. Take a break: The session will take place over one week with the first session on Monday, next Tuesday and final Wednesday. Each session should last approximately 30 Minutes.

5. Divide and conquer: Separate actual interaction with the device and the configuration of the device.

Brainstorming Execution:

The ideas:

Note the Appendix contains snapshots of some of the papers developed over multiple brainstorming sessions. We provide only the highlight here.

The initial session asked: "In what ways would you like to be able to share, access and socialize with Speech Enables Services? (Like Alexa, Google Home, and Siri)

- Something like Jarvis from the Iron Man movies would be great.
- IBM Watson in my pocket but Watson could move into any voice-enabled speaker seamlessly.
- Alexa Services (Music, Movies, Books) Anywhere Anytime on any devices that will share with me.
- Voice Services that can help make a group decision on movie, dinner, fun. Based on location and who is present in the group. The system would make the BEST recommendations.
- Ensure Privacy and Security are paramount in all Cloud-enabled services.

The second session asked: Building on the first session and focusing on Alexa type services "What would you like to ask Alexa to do for you while you are not at home?"

- Play U2 Radio from my Pandora Account on my Friends Sonos.
- Play Iron Man from my Amazon Movie Library on my Brothers Fire TV.
- Make a Movie suggestion and suggest a theater and time based on my location and the current time.
- Create Family and Friend groups that shares likes and dislike to support better group recommendations.

The third session asked: Building on the second sessions. What technologies would be required to enable these ideas?"

- **Idea 1**: The system recognizes you (i.e., your Identity) through Voice Recognition and authorizes the use of streaming services to the Alexa device you are speaking to.
- **Idea 2**: The system uses your cell phone as a service streaming Hub. The Cell phone Hub is used for credentials management and must be networked to Alexa Devices. (Similar to connecting to a WiFi network)
- **Idea 3**: The system recognizes your location and your Identity based on your Cell Phones GPS location and streams content to an Amazon device near you.

Selection Criteria:

Selection criteria:

The selection process takes into consideration the requirements definition as well as all of the data inventory questions. We prioritized selection based upon the three main criteria from Human Centered Design desirability, feasibility, and viability (IDEO, 2019)

These selection characteristics where further refined by ensuring that our candidate ideas support our primary users (who are knowledgeable voice-enabled speaker users and early technology adopters) and cover at least one of the top tasks outline in the data inventory (to play a movie).

Additionally, the candidate ideas fulfill the data inventory questions: "What is the context of the task?" and "What do they need?"

The brainstorming and criteria selection process took high-level ideas and iterated on them to create the three candidates we have.

Prototype 1: Verbal Prototype

Maps to Idea 1

I am going to start by simulating a user scenario. The user is at a family member's home, and they would say something like “Alexa play The Beatles Live in the living room from Dan’s Account," and the Alexa device in the living room of the family members home would start to stream the music content.

So, you ask: What makes this interesting? What's interesting is that Dan is the one who owns the media content “The Beatles Live” (which is a rare Album and cannot be easily purchased), yet he is effortlessly able to play that content at a friend or family members home by just making a request to Alexa.

So, you say: There must be a catch! Now, yes there is a small catch. The catch is that Dan would have to be a member of a “family group” where the content is being streamed. Let’s define the “family group” as a collection of external Amazon accounts that have been granted permission to use the Alexa devices in this friend or family members home.

OK So, how do you add an Account to the family group? Adding Dan to the “family group” would be accomplished with a setup screen in the Alexa App of the family member. Similar to how other Alexa services are configured. Once the account was added, a voice confirmation would be required from Dan’s Account. This would sync the two accounts and tie Dan’s voice to the Authorization.

OK So to set this up in the first place Dan would need to be at his home, correct? Yes, so maybe that the small catch we said above may not be that small. As Dan would have to be at his home in order to pre-configure the system. That is to accept, and voice authenticate membership into the “family group”.

OK, but once the Alexa "family group" is set up it would be as easy to play your music, movies, and books in your friends' home as it would be to play them in your own home. Yup!

Are you worried about Account spoofing? Yes, current Voice recognition is pretty easy to trick but we could add an additional voice passcode.

Feedback / Evaluation

Requirements meet: This Prototype meets most of the requirements but has a complex configuration process.

Requirements missed: Although not specifically mentioned in the requirements Voice Authentication may not be optimal. A passcode could be added, but this also adds additional complexity.

Audience: The solution aligns well with the defined audience.

Prototype 2: Text Prototype

Maps to Idea 2

Imagine an Amazon Alexa interface that uses your cell phone as a media service hub. It recognizes nearby WiFi Networks and automatically joins networks if it has prior authentication. With the "sharing hub" attached to a family member or friends home network the subscription services and digital media the user owns are instantly available for sharing. Of course, multiple factors of authentication and authorization are seamlessly applied to ensure your content is secure. Let's quickly review the security. 1. You are in physical possession of your phone (the sharing hub). 2. You have logged on to your Alexa service on the sharing hub. 3. You have granted your Alexa service access to your media subscriptions. 4. Your sharing hub has been granted access to the WiFi network of a family member or friend. 5. The WiFi network you are on also has access to other Alexa devices. Additionally, note that all this handshaking is done only once and remains in place until revoked.

With the hub configured the user can stream content that they own or pay for at a remote location by saying “Alexa play the Iron Man Movie from Dan’s hub." Alex identifies the hub and the other Alexa devices on the network, finding the Fire TV as a compatible destination for the movie, the TV is turned on, and the movie content starts streaming.

Feedback / Evaluation

Requirements met: Most requirements are met but there is the additional configuration of both software and hardware which could impact the usability of the services. This prototype seems to align well with security and configuration options of other Alexa devices.

Requirements missed: This solution requires the user to introduce new hardware **need** into the solution ecosystem (the sharing hub). It also adds additional networking **needs.**

Audience: The solution aligns well with the defined primary audience of skilled Alexa Users and early adopters of new technologies. It also benefits the secondary users the kids in this example.

Prototype 3: Wizard of Oz Prototype

Maps to Idea 3

The system recognizes the user's location and identity based on their cell phones GPS and allows for streaming content to nearby Amazon Alexa devices. It is important to note that the cell phone connects to the Amazon cloud and does NOT need to have access to any local Wi-Fi networks. To use the service, start with the wake word “Alex” followed by an “invocation request” (this could be any Amazon service request that you use at home) and then end the request with “From XYZ Account” Where XYZ is the name you have given your Alexa Account. So, for example, “Alex play Iron Man 2 from Dan’s Account”.

Prerequisites

The user has an Alexa Account and Amazon Services that they currently use: Unlimited Music, Prime Movies, Audible. Additionally, the user has the Amazon Alexa App running on their cell phone allowing Amazon Alexa to know their location.

Scenario Setup

The user Anne is at her sister Kathleen's home who also has Alexa. Kathleen does not own the Iron Man 2 Movie, but Anne does, and the two want to play the movie for their kids.

User Interaction

Anne: "Alexa play Iron Man from Anne's Account in the living room."

Alexa: "I don't know Anne's Account. Would you like to add an account to the Family group?"

Anne: "Yes"

Alexa: "OK I see the account Anne@yahoo.com nearby is this the Account you would like to have added?"

Anne: "Yes"

Alexa: "OK I have added this account and sent a confirmations request to Anne@Yahoo.com's phone"

Anne:<Confirms Acceptance to the Family Group from her phone>

Kathleen's:<Alexa Device is configured to allows nearby accounts to join without additional confirmation> (This is a configurable option.)

Anne: "Alexa play Iron Man 2 from Anne's Account in the living room."

Alexa: "OK" <The movie starts playing on the Fire TV in Kathleen's Livingroom>

Feedback / Evaluation

Requirements met: The prototype meets the requirements as defined and additionally it meets the majority of the data inventory questions.

Requirements missed: Although not specifically stated in data inventory. This Prototype adds an additional **need** which is that the user is required to have a cell phone to enable the solution.

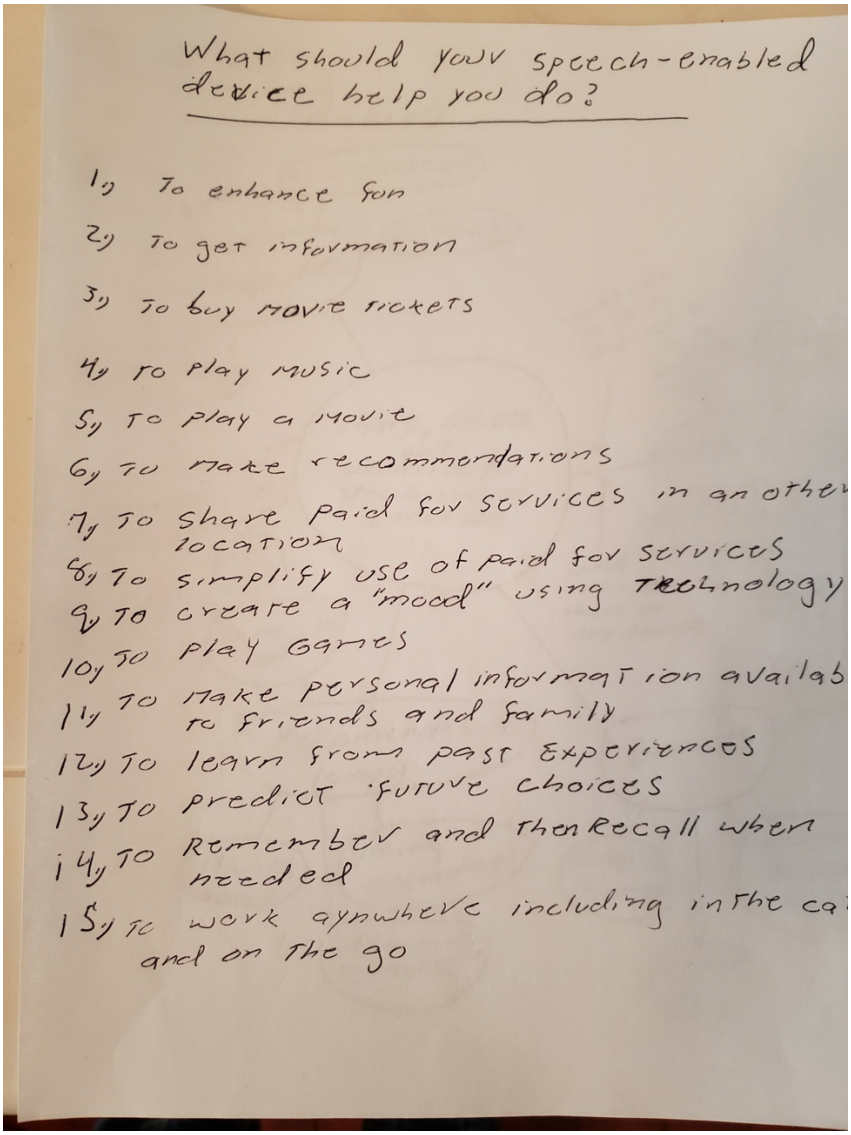
Audience: The solution aligns well with the defined primary audience of skilled Alexa Users and early adopters of new technologies.

References

IDEO. (2019). Human Centered Design Kit. Retrieved from http://www.designkit.org

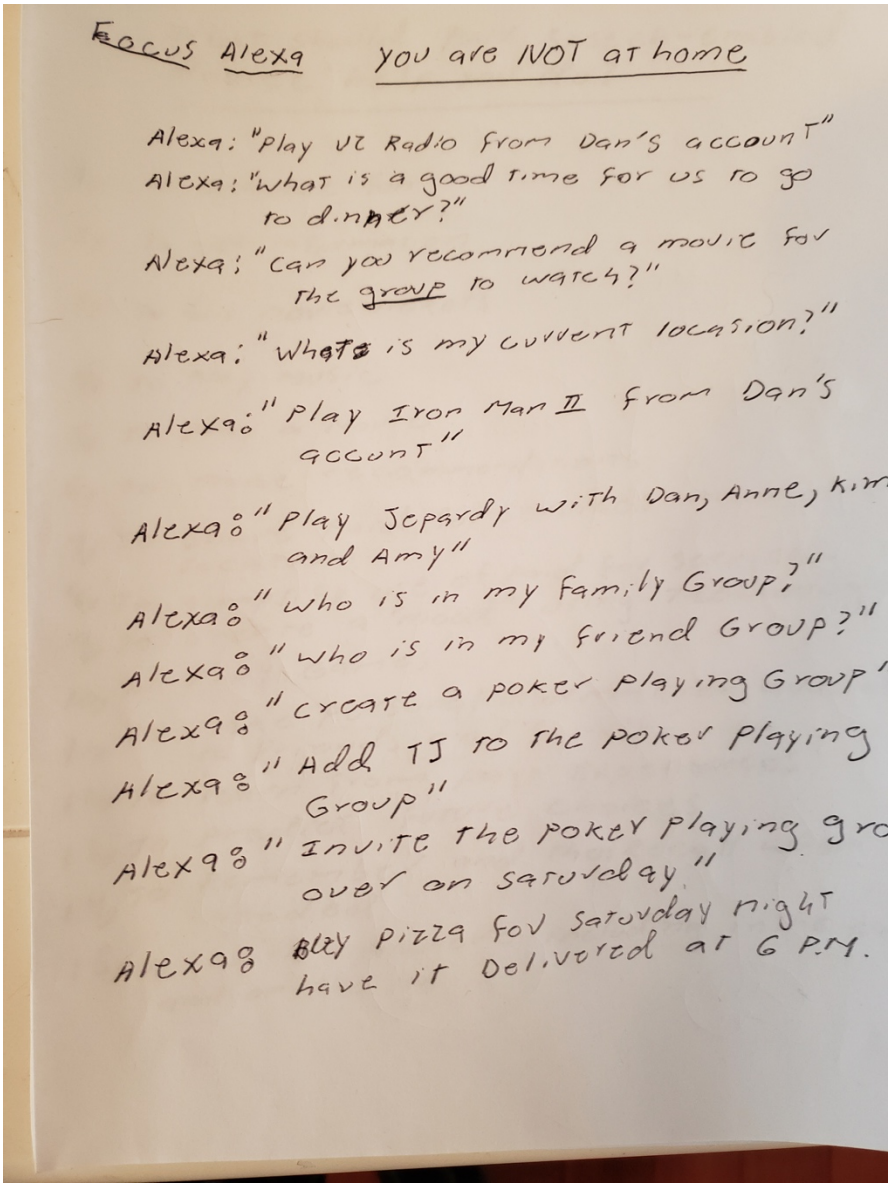
Perez, S. (2018). Voice-enabled smart speakers to reach 55% of U.S. households by 2022, says report. Retrieved from https://techcrunch.com/2017/11/08/voice-enabled-smart-speakers-to-reach-55-of-u-s-households-by-2022-says-report/

Appendix



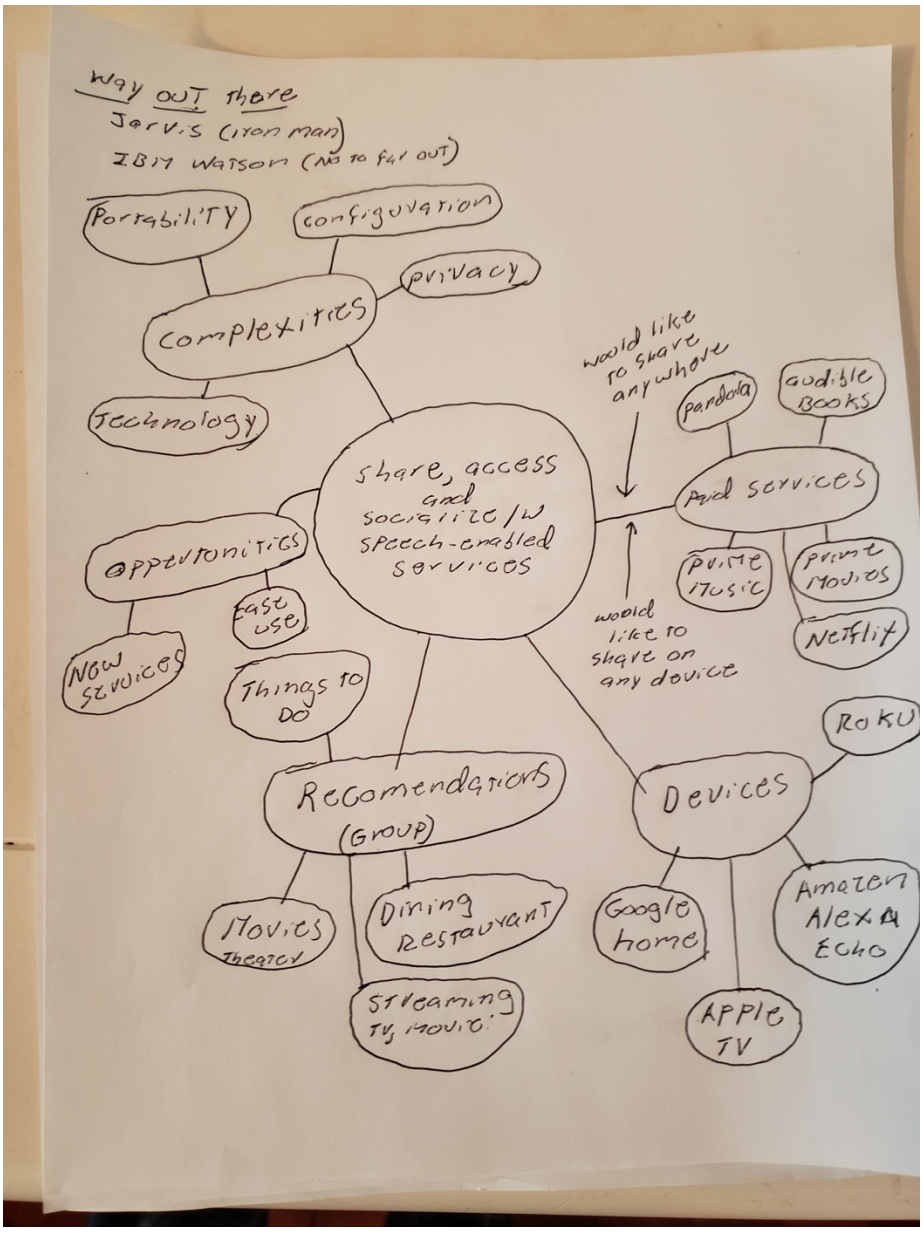
What should your speech-enabled device help you do?

1y To enhance fun
2y To get information
3y To buy movie tickets
4y To play music
5y To play a movie
6y To make recommendations
7y To share paid for services in an other location
8y To simplify use of paid for services
9y To create a "mood" using technology
10y To play games
11y To make personal information availab to friends and family
12y To learn from past experiences
13y To predict future choices
14y To Remember and then Recall when needed
15y To work anywhere including in the ca and on the go



Focus Alexa you are NOT at home

Alexa: "play VL Radio from Dan's account"
Alexa: "what is a good time for us to go to dinner?"
Alexa: "can you recommend a movie for the group to watch?"
Alexa: "what is my current location?"
Alexa: "play Iron Man II from Dan's account"
Alexa: "play Jeopardy with Dan, Anne, Kim and Amy"
Alexa: "who is in my family Group?"
Alexa: "who is in my friend Group?"
Alexa: "create a poker playing Group"
Alexa: "Add TJ to the poker playing Group"
Alexa: "Invite the poker playing gro over on saturday"
Alexa: Buy pizza for saturday night have it delivered at 6 P.M.


Way OUT there
Jarvis (iron man)
IBM watson (not to far out)
Portability
configuration
privacy
Complexities
Technology
share, access and socialize w/ speech-enabled services
would like to share anywhere
Pandora
audible Books
Paid services
Opportunities
Fast use
Prime Music
prime Movies
Netflix
would like to share on any device
New services
Things to DO
Recomendations (Group)
Devices
ROKU
Movies
Theater
Dining Restaurant
Google home
Amazon Alexa Echo
Streaming TV, Movie
Apple TV