SLEEP ASSISTANT

TEAM 13

DESIGN 07 REPORT

Arno Chang, Emilio Cuartero, Trisha Mae Giron, Kenny Lu

Context video: https://www.youtube.com/watch?v=UYBGGUYQvM8
VUI functionality video: https://www.youtube.com/watch?v=MupzYI4vBsE
GUI functionality video: https://youtu.be/mmlQH8In9Tc

Problem & Solution Overview

People often times have trouble falling asleep. A large part of that is because people are constantly distracted, whether it's by their thoughts or their phones. Sleep Assistant aims to assist users in falling asleep by removing such distractions. It's a voice activated app that removes the brightly lit phone screens and allows users to fall into a calming trance with the option of a hands-free interface. Ask Sleep Assistant to count sheeps for you as you fall asleep or to play your favorite lullaby, nature sound, or song on loop. Set timers for when to stop this loop or to adjust the volume as you drift off to bed. Edit your audio playlist on the Sleep Assistant App if necessary and adjust the settings to your heart's desire.

Why This App?

Our initial idea of a Bartender app was too similar to the recipe helper assignment so we were advised to think of different idea. We came across this idea because a member of our group has an Alexa and realized that it's main functionality is a speaker, so why not take full advantage of its speaker settings and create an app geared towards assisting users in following asleep through its speaker settings. Especially because many of our members relate to this problem, we figured creating a Sleep Assistant app would be beneficial to us all.

Tasks

Task 1: (Hard)

The main task of Sleep Assistant is allowing users to select through a database of audio files and to play their desired audio files through voice activated commands. Play an audio file from the playlist by simply stating the command, "play…" and switch between audio files by saying the commands "next, previous, play a different playlist..." etc. Whilst each command is stated, the GUI adjusts accordingly to showcase the currently playing audio file.

Task 1’s complexity was categorized as “Hard” because not only did this require the proper mp3 url files, that needed to be https secure, but the coding was just as confusing as it needed to allow users to loop through the playlist according to the database of audio files, play the next or previous audio files, and change playlists. This main task allows users to play through a multitude of different audio files as opposed to the other apps that just loop over one specific one.

Task 2: (Medium)

Sleep assistant also supports users adjusting the manner in which their audio file is played. With a default setting of having the playlist on loop, users can also choose to have their specific audio files play on loop or with a set timer for the loop to stop. The GUI should reflect the stated commands with each setting appropriately toggled and users can use voice commands to turn off such loops as well.

Adjusting the settings is a medium level task as the playlist should loop naturally (under the default settings for now). To stop the looping, simply say loop off and to set a timer, we utilized the built in alexa sleep timer. Looping just one audio file wasn’t too bad as well and the GUI portion simply required users to toggle the relative buttons.

Task 3: (Simple)

GUI: Adding a song

The GUI of the Sleep Assistant allows users to customize their playlist by adding audio files they would like to listen to to their respective playlists. Instead of only listening to the pre-set audio files, this gives users the freedom to listen to whatever they want! Adding a song takes in a song name and a *https secure mp3 URL* for the audio.

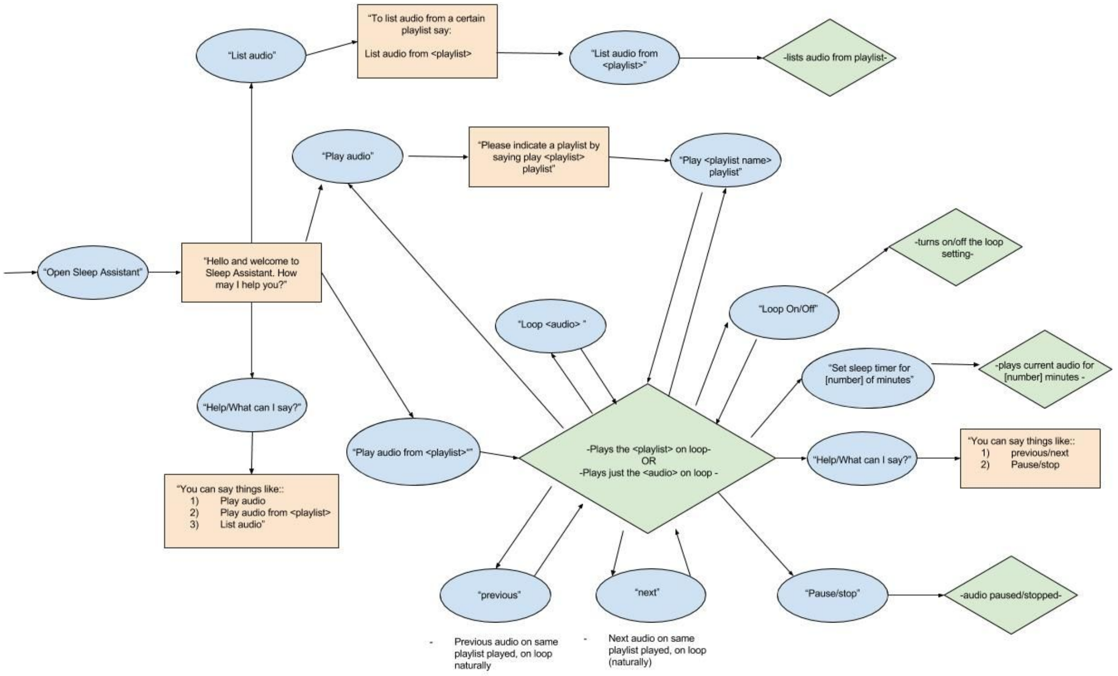
VUI: Listing songs

The VUI portion of Sleep Assistant also supports listing all the songs from a playlist for the user so that he/she can access them more easily. This removes the additional steps of scrolling through the phone to retrieve the desired audio file, which is not only tedious but also distracting as the purpose of this app is to aid users to NOT use their phones before they fall asleep and to remove such distractions.

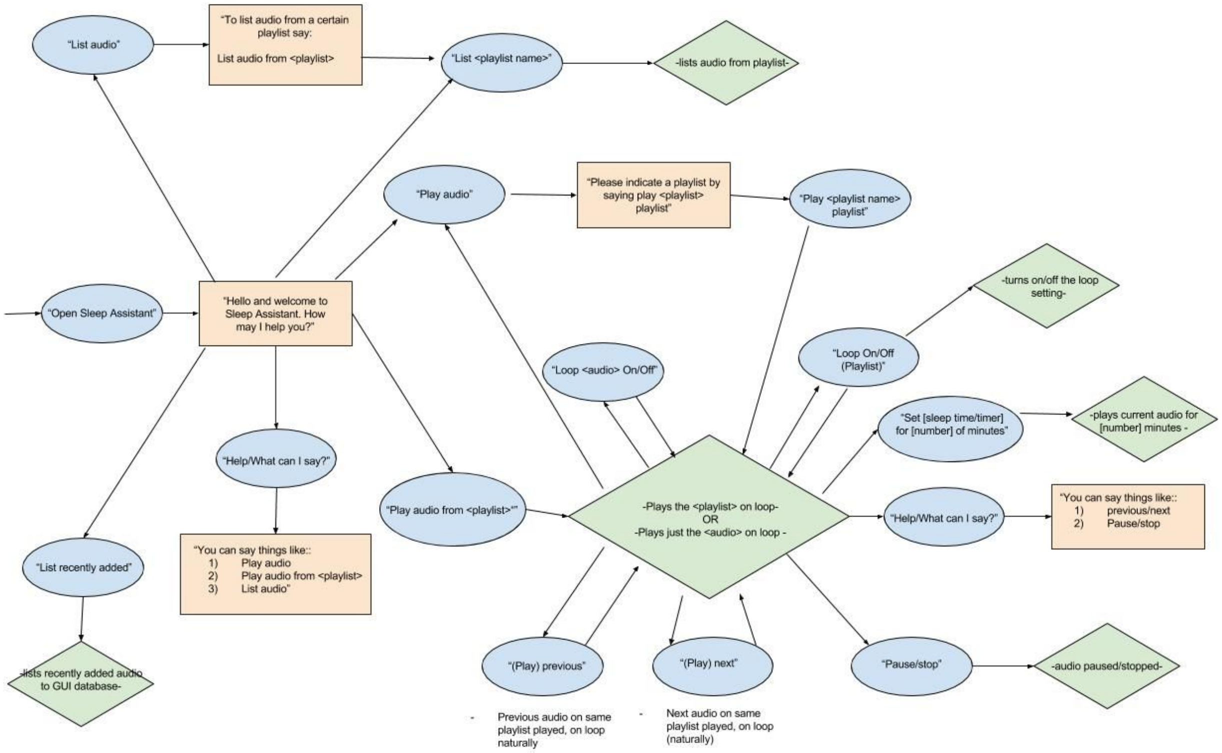
These tasks are relatively simple as adding an audio file just requires the proper links and name. This is necessary so that users can customize their sleep assistant helper. Listing the audio files through the VUI is also relatively simple and necessary as it provides users a list of the audio files without the need of their using their phone to scroll through the list.

Revised Interface Design

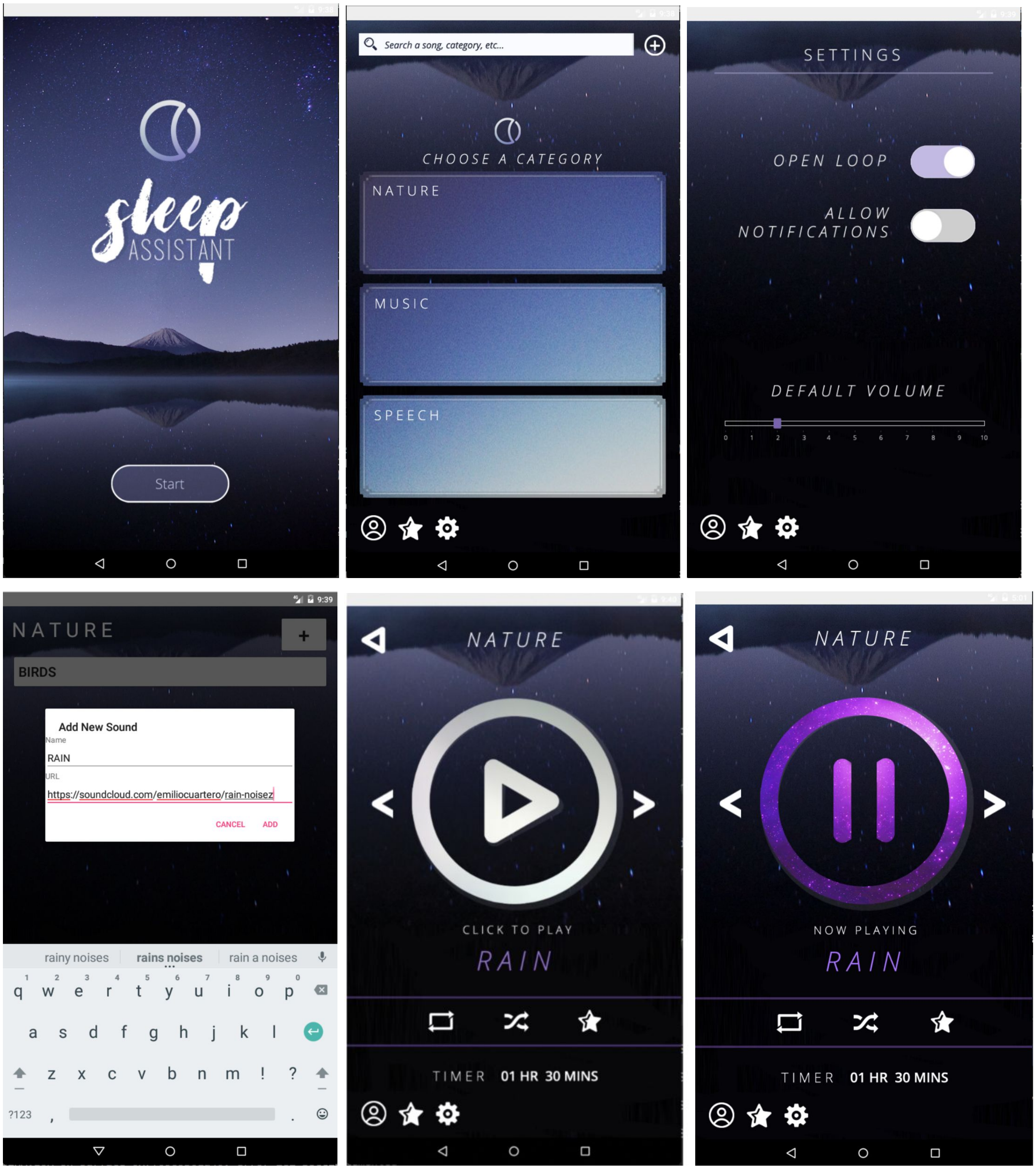
Prototype VUI Flow (3rd iteration):


"To list audio from a certain playlist say:
List audio from <playlist>
"List audio"
"List audio from <playlist>"
-lists audio from playlist-
"Play audio"
"Please indicate a playlist by saying play <playlist> playlist"
"Play <playlist name> playlist"
-turns on/off the loop setting-
"Open Sleep Assistant"
"Hello and welcome to Sleep Assistant. How may I help you?"
"Loop <audio> "
"Loop On/Off"
"Set sleep timer for [number] of minutes"
-plays current audio for [number] minutes -
"Help/What can I say?"
"Play audio from <playlist>"
-Plays the <playlist> on loop- OR -Plays just the <audio> on loop -
"Help/What can I say?"
"You can say things like:: 1) previous/next 2) Pause/stop
"You can say things like:: 1) Play audio 2) Play audio from <playlist> 3) List audio"
"previous"
"next"
"Pause/stop"
-audio paused/stopped-
- Previous audio on same playlist played, on loop naturally
- Next audio on same playlist played, on loop (naturally)

Updated final VUI flow (4th iteration):


"List audio"
"To list audio from a certain playlist say:
List audio from <playlist>
"List <playlist name>"
-lists audio from playlist-
"Play audio"
"Please indicate a playlist by saying play <playlist> playlist"
"Play <playlist name> playlist"
-turns on/off the loop setting-
"Open Sleep Assistant"
"Hello and welcome to Sleep Assistant. How may I help you?"
"Loop <audio> On/Off"
"Loop On/Off (Playlist)"
"Set [sleep time/timer] for [number] of minutes"
-plays current audio for [number] minutes -
"Help/What can I say?"
"Play audio from <playlist>"
-Plays the <playlist> on loop- OR -Plays just the <audio> on loop -
"Help/What can I say?"
"You can say things like:: 1) previous/next 2) Pause/stop
"List recently added"
"You can say things like:: 1) Play audio 2) Play audio from <playlist> 3) List audio"
-lists recently added audio to GUI database-
"(Play) previous"
"(Play) next"
"Pause/stop"
-audio paused/stopped-
- Previous audio on same playlist played, on loop naturally
- Next audio on same playlist played, on loop (naturally)

Updated GUI:



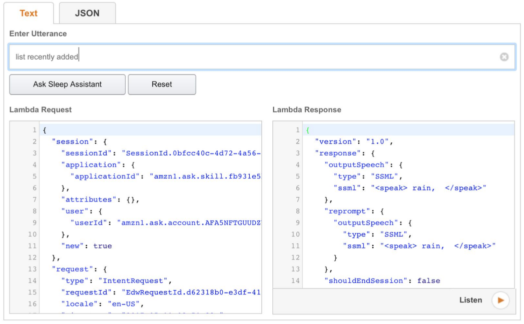
Name
RAIN

URL
https://soundcloud.com/emiliocuartero/rain-noisez

TIMER 01 HR 30 MINS

Adjusted VUI changes (reflected on updated VUI flow):

1) We added a 'Recently Added' playlist which is initially empty, but is automatically populated when a new audio item is successfully added from the GUI. This is accessed the same way as other playlists and is referred to as a 'recently added' playlist. We added this because users indicated that it would be a nice feature to have so that they can hear/play through the most recently added audio files.
    a) Users can now directly say "list recently added" to get a list of recently added Audio files or "play recently added" to play these files. **This can be seen through our VUI video link on the first page.**



list recently added

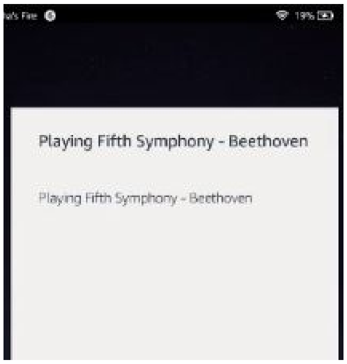
Lambda Request

```
{
  "session": {
    "sessionId": "SessionId.0bfcc40c-4d72-4a56-
    "application": {
      "applicationId": "amzn1.ask.skill.fb931e5
    },
    "attributes": {},
    "user": {
      "userId": "amzn1.ask.account.AFA5NFTGUUDZ
    },
    "new": true
  },
  "request": {
    "type": "IntentRequest",
    "requestId": "EdwRequestId.d62318b0-e3df-41
    "locale": "en-US",
```

Lambda Response

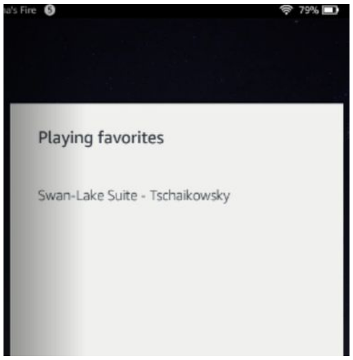
```
{
  "version": "1.0",
  "response": {
    "outputSpeech": {
      "type": "SSML",
      "ssml": "<speak> rain,  </speak>"
    },
    "reprompt": {
      "outputSpeech": {
        "type": "SSML",
        "ssml": "<speak> rain,  </speak>"
      }
    },
    "shouldEndSession": false
```

2) Users can directly list the audio from a desired playlist by saying "list <playlist name>" as opposed to going through the step by step procedure of "list audio> then "list audio from…>. This gives more user flexibility and is more efficient.
3) "Loop audio" is now "Loop audio On/Off" after taking into consideration user feedback that it should also be togglable like the looping playlist function. "Loop Audio On" would make the current audio playing, play on infinite loop. This is also more conventional.
4) To stop Sleep Assistant from playing an audio file, users originally stated "Set Sleep timer for [duration]." Now users can say "Set timer for [duration]" or Stop playing in [duration]."
    a) **This can also be seen through our VUI video link on the first page.**
5) Likewise users can say "Play next/previous" now as opposed to just "Next/Previous" for more user freedom.
6) <u>VUI card update change</u>: The card has now been updated to showcase the Playlist title on top and now the audio name on the second line. This is to remove redundancy.



Playing Fifth Symphony - Beethoven

Playing Fifth Symphony - Beethoven



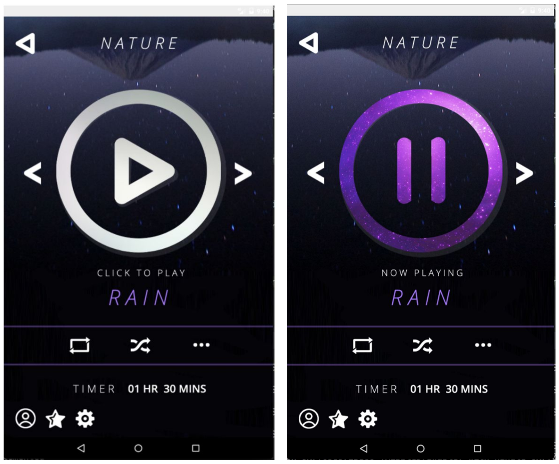
Playing favorites

Swan-Lake Suite - Tschaikowsky

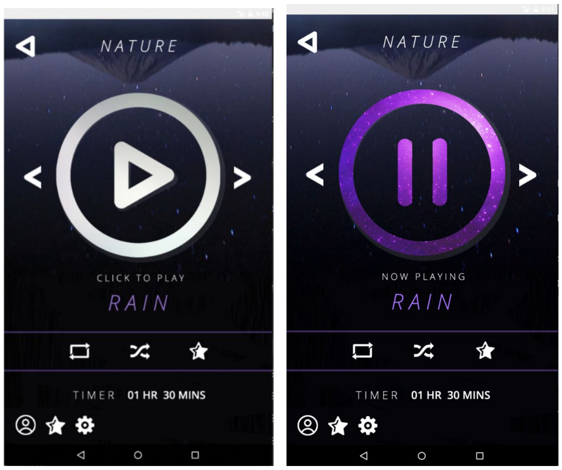
Adjusted GUI changes:

1) Fixed playlist items bug: Previously, our prototype did not retain newly added items if you left the add songs screen (for example, if you add “RAIN” and go to the playback screen and then RETURN to the playlist screen, “RAIN” would not be updated/visible). Now, it keeps the added items as the user navigates to different screens.
2) On the playback screen, the original [...] icon was meant to direct users to a “more options” setting however user feedback showcased that they were more confused by this “...”. Users mention that there really isn’t any “other options.” Instead we changed it to the *favorite (star) icon* so that users can favorite their desired audio. According to user feedback, toggling the favorite option is a more common task that users will find more likeable to be featured and easily found.

Before

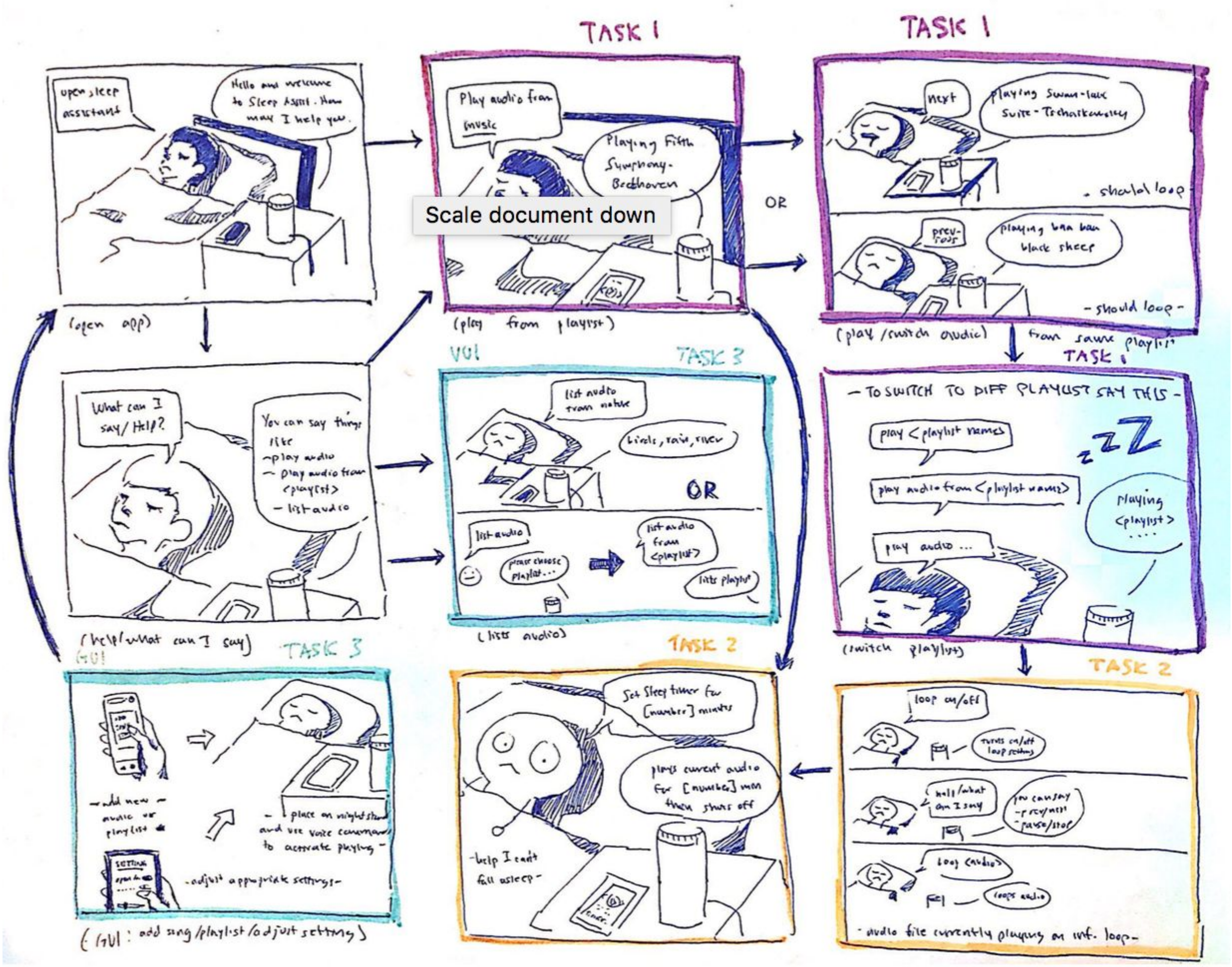


After



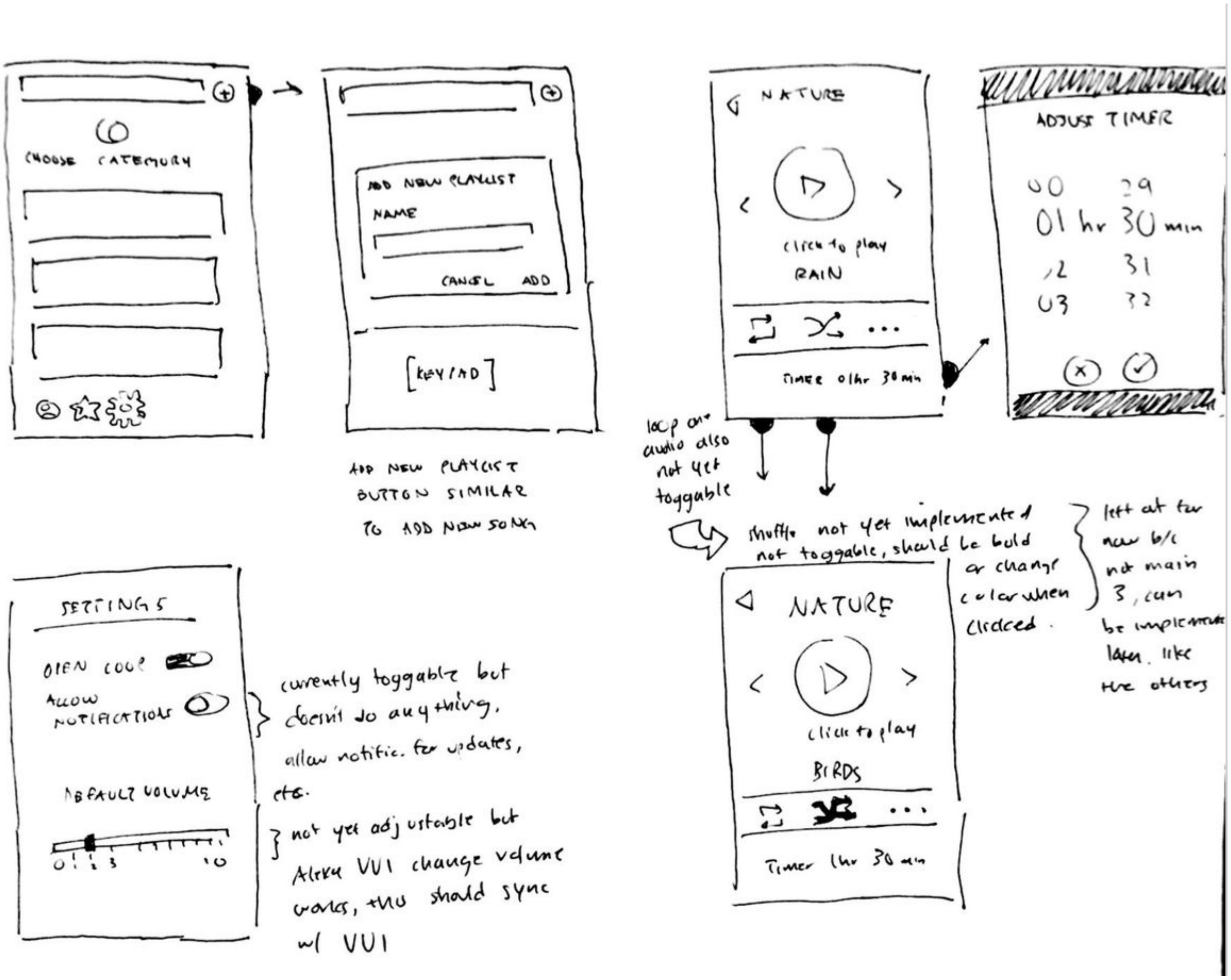
3) Not pictured: As mentioned in the VUI changes, a ‘Recently Added’ playlist has been added but it is not visible in the GUI prototype. In full implementation, it will be accessed by the user by scrolling down on the playlist screen.
4) Many users liked our GUI design so there weren’t many feedbacks telling us to change it. We were also content with our initial prototype design aesthetic and decided to stick with most things so that we could stay true to our own design aesthetics.

StoryBoard:


open sleep assistant
Hello and welcome to Sleep Assist. How may I help you.
(open app)
TASK 1
Play audio from music
Playing Fifth Symphony - Beethoven
(play from playlist)
OR
TASK 1
next
playing Swan-lake Suite - Tchaikovsky
- should loop
previous
playing baa baa black sheep
- should loop -
(play /switch audio)
from same playlist
What can I say/ Help?
You can say things like
~play audio
- play audio from <playlist>
- list audio
(help/what can I say)
VUI
TASK 3
list audio from nature
birds, rain, river
OR
list audio
please choose playlist...
list audio from <playlist>
lists playlist
(lists audio)
TASK 1
- TO SWITCH TO DIFF PLAYLIST SAY THIS -
play <playlist names>
play audio from <playlist names>
play audio ...
zzZ
Playing <playlist> ....
(switch playlist)
GUI
TASK 3
- add new - audio or playlist
- place on night stand and use voice commands to activate playing -
SETTING
- adjust appropriate settings -
(GUI : add song /playlist /adjust settings)
TASK 2
Set Sleep timer for [number] minutes
plays current audio for [number] min then shuts off
- help I can't fall asleep -
TASK 2
loop on/off
turns on/off loop settings
help/what can I say
you can say - prev/next - pause/stop
loop (audio)
loops audio
- audio file currently playing on inf. loop -

Scale document down

Sketches of UI left out


CHOOSE CATEGORY
ADD NEW PLAYLIST
NAME
CANCEL ADD
KEYPAD
ADD NEW PLAYLIST BUTTON SIMILAR TO ADD NEW SONG
NATURE
click to play
RAIN
TIMER 01hr 30min
ADJUST TIMER
00 29
01 hr 30 min
02 31
03 32
loop one audio also not yet toggable
shuffle not yet implemented not toggable, should be bold or change color when clicked.
left out for now b/c not main 3, can be implemented later. like the others
NATURE
click to play
BIRDS
Timer 1hr 30 min
SETTINGS
OPEN CODE
ALLOW NOTIFICATIONS
DEFAULT VOLUME
0 1 3 10
currently toggable but doesn't do anything. allow notific. for updates, etc.
not yet adjustable but Alexa VUI change volume works, this should sync w/ VUI

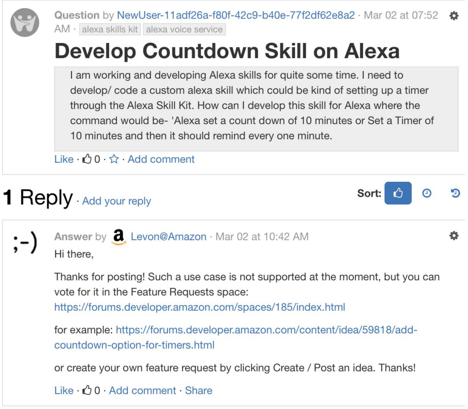
Prototype Overview

Appropriate constraints of the VUI/GUI and was left out/why: (Limitations/Trade Offs)

1) While some users still suggested looping audio files over one another, we realized this is somewhat out of our scope and unnecessary as the focus of this project is a Voice activated Alexa app.
    a) We interviewed several users and found that while this is a "cool" function to have, it's not really practical. Most users who fall asleep to a certain sound, usually only listen to one sound. Having additional sounds overlapping one another can be more distracting if anything and can deter the user from peacefully falling asleep as it would require more commands. Not only that but this functionality would be more feasible through a GUI rather than a VUI.The VUI portion of this would be very confusing as it would ask users to "merge <audio1> from <playlist 1> with <audio2> from <playlist2>" with the appropriate

settings/etc. We’re not trying to make a GUI heavy app but more so a VUI with a simple/not as frequently used GUI.

2) Some users still suggested removing the bottom bar of the GUI and to have a separate side settings bar.
    a) While this is not a bad suggestion, we realized that the focus of this app is more so geared towards the VUI so this is unnecessary as well since the bottom toolbar is easy to use/accessible. It’s conventionally understood what each icon does and this simple bottom toolbar removes the additional clicks that a sliding out settings bar would require.
3) Left out the “list alphabetically” portion of the app
    a) Listing from the playlist is sufficient enough. No need to list alphabetically as this is excess coding/not needed
4) We’re forced to still use Alexa’s built in sleep timer settings as opposed to creating a separate timer setting for the Sleep Assistant because we couldn’t find any other way around it and why change something that already works?
    a) But we did include additional commands like “stop playing in [duration]” or “set timer for [duration]” for more user flexibility.
    b) https://forums.developer.amazon.com/questions/55724/setting-custom-timers-reminders-using-skills-kit.html
    c) https://forums.developer.amazon.com/questions/60841/develop-countdown-skill-on-alexa.html
    d) We weren’t able to find ways to code for custom Alexa skill timers. We’ve asked different GSI’s as well and checked the forums. The only solution we could find at the moment was to take advantage of Alexa’s built in sleep timer settings which stops audio from playing at a designated time.



Question by NewUser-11adf26a-f80f-42c9-b40e-77f2df62e8a2 · Mar 02 at 07:52 AM · alexa skills kit · alexa voice service

Develop Countdown Skill on Alexa

I am working and developing Alexa skills for quite some time. I need to develop/ code a custom alexa skill which could be kind of setting up a timer through the Alexa Skill Kit. How can I develop this skill for Alexa where the command would be- 'Alexa set a count down of 10 minutes or Set a Timer of 10 minutes and then it should remind every one minute.

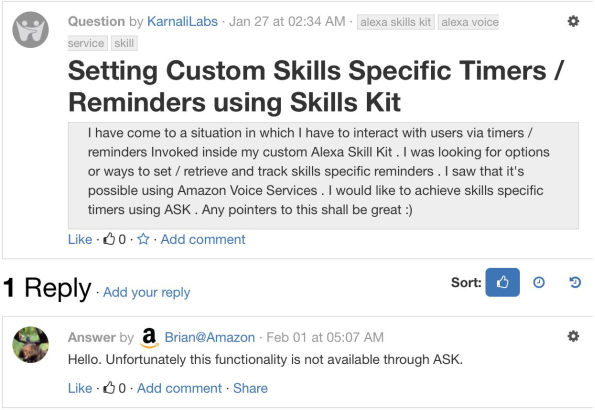
Answer by Levon@Amazon · Mar 02 at 10:42 AM

Hi there,

Thanks for posting! Such a use case is not supported at the moment, but you can vote for it in the Feature Requests space: https://forums.developer.amazon.com/spaces/185/index.html

for example: https://forums.developer.amazon.com/content/idea/59818/add-countdown-option-for-timers.html

or create your own feature request by clicking Create / Post an idea. Thanks!



Question by KarnaliLabs · Jan 27 at 02:34 AM · alexa skills kit · alexa voice service · skill

Setting Custom Skills Specific Timers / Reminders using Skills Kit

I have come to a situation in which I have to interact with users via timers / reminders Invoked inside my custom Alexa Skill Kit . I was looking for options or ways to set / retrieve and track skills specific reminders . I saw that it's possible using Amazon Voice Services . I would like to achieve skills specific timers using ASK . Any pointers to this shall be great :)

Answer by Brian@Amazon · Feb 01 at 05:07 AM

Hello. Unfortunately this functionality is not available through ASK.

5) **In choosing what to implement, we concentrated on prioritizing showing the 3 main tasks we wrote about.** Since our focus was a **T design of the functionalities**, some things are not fully implemented either because they don’t fall within the scope of the 3 main task or the T-design, they can be assumed by the user, OR they can be explained in a Wizard of Oz procedure for the user to understand.

Some GUI functions not fully implemented:

a) 'Add playlist' button/screen not functional.
   i) This is similar to the add new audio button and can be fully implemented in full production of the app. It is not relevant now as it is **not one of the main 3 tasks (since it mimics the add new audio functionality) and** our **focus is not on the GUI.** User can add most of their desired audio into one of the main 3 preset categories since most things can fit/act as a "music" for now or "speech." Not really sure what else users might listen to to fall asleep except white noise, which can be added as an "other" category in the future.

b) Search bar functionality (cannot type in/submit a search query)
   i) **Unnecessary for the prototype now** as it's understood that the fully implemented search would output the desired audio/category users are searching for.

c) 'Nature' is the only playlist reflected and selectable, the others are not.
   i) **Focused on a T-design and used the first category as the top of the T.** The other categories should work like the Nature in the final product.

d) Playlist page is not scrollable (so cannot show new 'Recently Added' playlist or any new playlists theoretically added by user)
   i) A feature that is easily fixable but right now, **unnecessary, given the preset categories presented**.

e) The GUI coders currently did a WoZ based playback screen that follows a preset template of Nature category consisting only of "BIRDS" and then you add "RAIN." Then when you press play, it'll play between "BIRDS" and "RAIN." If you add "THUNDER," it updates the playlist to have "THUNDER" but when you try to play it, it still only shows the "BIRDS" and "RAIN."
   i) This is further explained in the WoZ method.

f) There is also no timer button for now nor are the other "togglable" setting icons working; clicking anywhere in the screen only changes between play and pause.
   i) **It's assumed pressing the buttons would toggle them** and adjust the settings accordingly. This will be implemented in the final production but since this is a **prototype,** these features on the GUI are unnecessary as t**he focus is on a working VUI and a complementary GUI**. Adjusting the settings on the VUI work perfectly fine given the proper commands, including setting a timer. Since our app isn't 100% synced, it does not update the GUI accordingly but in the final product, the GUI should sync.

g) The volume setting is not adjustable.
   i) **The focus is on a functional VUI. Users should adjust the volume with Alexa voice commands** and the GUI should sync accordingly. Since its not synced, it's not adjustable now.

6) A database is not used. In full implementation, an individual database for each user would have to be used (to differentiate favorites/recently added/etc.). In the case of the prototype, we do not need to store any changes as we only need to illustrate main tasks

and functionalities, and this can be done by starting with a clean slate and pre-coded representations (such as a preset item in the ‘Recently Added’ playlist).

Non-standard interactions:

1) We still had to use built in Alexa sleep timer for the audio to stop looping as forums have indicated how you can’t implement a built in Alexa skill timer for some reason. When we asked the GSI, they also recommended this.
2) For the most part everything else for the VUI was standard and worked according to our code.

Any WoZ methods needed (or description of backend functionality)

1) Since we don’t have a database, we hardcoded into the file preset audio links we found online so that the Alexa skill can play them accordingly. We hope the final product allows for proper database retrieval/importing of audio files.
2) The playback selection screen is currently hardcoded as well as it’ll only showcase “BIRDS” → “RAIN” in the play screen for now. This is because we focused on showing a T-design template of what the final GUI product would actually look like in the final production. In the final implementation, adding more songs should populate it properly but since the focus is on a VUI with a supporting GUI, we chose to leave that out for this prototype. The VUI works properly and plays between the various audio files in our preset hardcoded “database” but the GUI will only show the T-design Rain/Birds for now after you “add” a RAIN audio file.
3) Likewise, in the ‘Recently Added’ playlist, ‘Rain’ has been pre-added in the VUI to represent a recently added song from the GUI. It is hardcoded but in the final implementation, it should retrieve the last 3-5 recently added songs to the database and populate the “Recently Added” Playlist according to that.

Team member contribution:

Arno: I worked on updating the GUI based on user feedback
Emilio: I worked on making the context video and updating the GUI based on user feedback.
Trisha: I implemented the VUI and VUI improvements/changes, contributed to writing out VUI/GUI changes/reflections, and filmed/edited the context video and the VUI functionality video.
Kenny: I interviewed users and updated the VUI flow diagram to accommodate the user feedback. I also recorded the GUI T-design functionality video and contributed to writing out the VUI/GUI changes/report.