Heuristic Evaluation of Sprite

1. Problem

Sprite is a platform that encourages the user to fully harness the capabilities of his or her smart home device; by personifying the smart home device, the app enables the user to feel a sense of responsibility towards the item, as one might feel towards a pet, and thereby increases interaction of various forms with the device.

2. Violations Found

H6. Recognition not Recall / Severity: 2 / Found by: Evaluator A, C - After clicking on a Sprite, the name of the Sprite is no longer visible, as its replaced by 3 buttons. While this is great for minimalist design, it's no longer clear which Sprite I'm looking at, unless I memorized each Sprite by color. I'd imagine there would only be a limited number of colors anyway, so it seems likely that multiple Sprites would look similar to each other. Fix: Move buttons lower on the screen and flatten them so that there's still room to include the name of the Sprite.

H3. User Control & Freedom / Severity: 2 / Found by: Evaluator A, C - After clicking on a Sprite, it's unclear how a user could get back to the "main" display (where the user can slide between different Sprites). I would expect that clicking on the Sprite either bring up more information or perhaps a cute animation (i.e. being tickled or at least smiling), but currently that's the way to return to the main display. Fix: Only allow the user to take pictures of their Sprite from the main display, and replace the camera button with a "back" button when the user is on the Sprite detail screen.

H3. User Control & Freedom / Severity: 3 / Found by: Evaluator B - From the "Recommend" page, the user is not given an option to return to the app's home page and instead is solely given the option to go back to the previous page, "Discover," which doesn't give the user to immediately exit an unwanted state without further dialogue. Adding an option to return to the home page directly would solve this problem.

H4. Consistency & Standards / Severity: 0 / Found by: Evaluator A - The buttons on the top of the screen sit flatly on the background, whereas the 3 buttons visible on the Sprite detail screen are contained in 3 white circles which cast shadows on the background. Fix: Use a non-white (or off-white) background color behind everything, and put all buttons in the white circles. Alternately, differentiate the two types of buttons further; for example, make the background of the circle buttons dark grey, and the icon inside them white.

H4. Consistency & Standards / Severity: 2 / Found by: Evaluator A, D - When searching for a new skill on the "discover" page, an icon pops up at the top of the screen shaped like a magnifying glass, but it's a different symbol than the one inside the search feature. As a result, it's not immediately obvious how the two are related, or if they work together, or if they're separate, etc. Fix: Remove the icon used to represent discovery at the top of the page, or replace it with something sufficiently distinct from the magnifying glass that is standard in search bars.

H4. Consistency and Standards / Severity: 3 / Found by: Evaluator B - On the "Achieve" page, it is not entirely clear whether the icons above each accomplishment (i.e. "Learn," "Check," etc.) serve purely informational icons or buttons that can be clicked on. This is probably confusing because on a prior screen, similarly-round icons served as buttons that led to further pages. Standardizing what these round icons mean and what functionality they lead to would be helpful for the overall consistency of the app.

H4. Consistency & Standards / Severity: 2 / Found by: Evaluator A, C - On the "Discover" page, some of the buttons have text that is above, below, or to the right of their corresponding icons. I can tell it's tough to fit all 5 buttons with their icons and titles, but I think the consistency would help a user with a quick scan of the page. Fix: Put all text descriptions underneath their corresponding icons on each button.

H4. Consistency & Standards / Severity: 3 / Found by: Evaluator A, D - On the "recommend" page, it looks like the symbol used at the top of the screen is the same (smaller) version of the Sprites themselves, which is a little confusing. In order to be consistent with the meaning of the Sprite symbol, I think it would be best to not use anything fire-looking unless you're trying to represent the Sprites themselves in a special case. Fix: Use a different icon for the "recommend" page. In general, the choices of icons might not be the most intuitive. For example, the "leaf" icon under "lifestyle" gives me the impression that it is about something environmentally friendly, but that is not necessarily what I would expect from a section called "lifestyle". A fix would be to choose a better icon.

H10. Help & Documentation / Severity: 4 / Found by: Evaluator A - While it's pretty efficient to get to the details page of any given Sprite by clicking on them, it might not be obvious to the user to do that, especially the first time he/she opens the app and registers a new device for the first time. Fix: Include some small arrow pointing to the Sprite that says "Click me!" (or something to that effect), either the first few times the user uses the app, or indefinitely.

H7. Flexibility & Efficiency of Use / Severity: 3 / Found by: Evaluator A, B, C, D - The user can swipe between screens (or tap on the sides) in order to view a different Sprite, but this only allows access to its direct neighbors. This might be problematic if the user had 5 or more smart devices and wanted to be able to easily switch between all of them, because with the current implementation, that could require an annoying amount of swiping. We actually liked your original design described in the slides, where you can view the statuses of all devices and select

them. Fix: Create a way for the user to jump between Sprites if they have over some number of Sprites on the app. For example, allowing the user to click on one of the circle indicators at the bottom of the screen that shows which Sprite they're currently viewing.Perhaps design a homepage where all the devices of a user are seen clearly and the user can select which one to use.

H10. Help & Documentation / Severity 2 / Found by: Evaluator A, C - After unlocking an achievement, it's no longer possible to click on that achievement for details on what you did to unlock it (unless it's obvious from the title), or details about when it happened. While this might be a good feature, I think it also is a documentation concern because it's possible that a user forgets the skill they supposedly learned, even though their smart device "got credit" for learning the skill. Fix: Make the achievement buttons clickable, i.e. clicking on an achievement (that was already unlocked) shows what the user did to unlock it.

H3. User Control & Freedom / Severity: 1 / Found by: Evaluator A - After navigating to the achievements page and then selecting an achievement to unlock, the back button at the top left of the screen is placed on the far background of the page, which possibly implies that pressing it might bring the user out of the achievements page all together, when in reality it closes the locked achievement popup. Fix: Remove the back button (or grey it out) when the user has a modal view of the locked achievement, and add a small "x" to the detail popup window, like what currently exists for the photograph feature.

H4. Consistency & Standards / Severity: 2 / Found by: Evaluator A, C - On the recommended page, each of the items in the list use capital letters at the start of each word, but all other words in the app are strictly lowercase. Fix: Make all items in the list completely lowercase.

H1. Visibility of System Status / Severity: 1 / Found by: Evaluator A, D - Upon pressing a Sprite from the main screen (and into its detail scene), the background of the Sprite changes to add a smaller, darker blue circle around the Sprite. It looks visually appealing in both screens, but it's not clear to me what that is supposed to indicate/convey to the user. Fix: Assuming it's supposed to make the Sprite look like it's been selected, maybe change the background in an even more dramatic way (or with an animation) to put emphasis on the current Sprite.

H4. Consistency & Standards / Severity: 1 / Found by: Evaluator A - After taking a picture with the top left camera icon, the dialogue box's font is blue, while the rest of the text in the app is black or white. The user might think the blue text indicates something special or different for this dialogue box in particular. Fix: Change this dialogue box's font color to black in order to match the rest of the app.

H2. Match Between System & Real World / Severity: 2 / Found by: Evaluator A, B, C, D - The camera icon at the top left of the screen is very similar both in appearance and placement to camera icons that are now in Facebook, Snapchat, and Instagram, which all cause the user

to turn his/her camera on (either front or back-facing), rather than take a screenshot. Fix: Change the camera icon to something indicative of a screen-capture rather than a camera in order to show users that their phone cameras aren't about to be used.

H2. Match between system and the real world / Severity: 1 / Found by: Evaluator C - It's somewhat hard to conceptualize how the actions the user takes on the app will translate into the real world. In the "Lights" screen when the user asks Alexa to turn on the lights, nothing in the app changes, perhaps you can create icons or increase the light level within the app as well.

H2. Match between system and the real world and H4. Consistency and Standards / Severity: 2 / Found by: Evaluator B, C - In the home screens for the three devices Alexa, Nest and Alexa 2 are colored differently but have the same icons, and I don't think it fully reflects what those devices are in the real world. Could you create icons that resemble the physical devices or include "stats" on how the device is doing? Perhaps battery level etc. Also, while including different colors is not inherently confusing, using loaded colors (such as green) might confuse the user if he conflates the color of the sprite with a status update on the Sprite's health. This confusion can be avoided by choosing colors that do not inherently carry meaning for the target audience and not using colors like red and green, which can traditionally signify bad and good, respectively.

H7. Efficiency / Severity: 2 / Found by: Evaluator C - I don't have an intuitive understanding of how the achievements page will translate into user behavior. What rewards incentives are there to get more accolades? How will the smart home device encourage more usage? For your complex task of discovering a new functionality, I understand how that would increase usage but only if the user buys in to the idea that new tasks are valuable to them. Perhaps you can fix this by relying on the smart home device more. Instead of prompting a user discover what a pet rock is, perhaps you can have Alexa ask "Hey, do you want to take me on a walk and I can tell people I'm your pet rock?"

H3. User control and freedom / Severity: 2 / Found by: Evaluator C, D
The fave and recs tabs don't currently allow the user to add a new action that he/she would like to try. Incorporating such a feature would increase user control.

H5. Error prevention and H6. Recognition Rather than Recall / Severity: 3 / Found by: Evaluator B, C - I know that you haven't build the full capabilities but I have no idea what the camera and settings icon at the top of the home page actually do. I can guess about the settings but what will the user use the camera for? Similarly, I don't understand what the brush icon at the bottom right is used for? Perhaps include one word descriptions at the bottom of the icons to make it more intuitive. On the third page of the medium-fi prototype (once the user clicks on Alexa), three icons are presented: a magnifying glass, a medal-like image, and a paintbrush. While the interface is aesthetic and minimalistic, I felt the icons are not universally recognized and don't clearly indicate to the user what functions they indicate. Including a small text

clarification of the function behind the icon or perhaps a popup with this information when the user hovers over the icon could fix this issue.

H10. Help and Documentation / Severity: 3 / Found by: Evaluator C - This is a novel idea that the user hasn't encountered before so educating them will be crucial in ensuring error prevention. The prototype currently does not envision how the user will sign up for the service and how they will learn about the different features and how they will connect their smart home devices to the platform. I would recommend spending time on this part in the coming week.

H7. Flexibility and efficiency of use / Severity: 2 / Found by: Evaluator C - In the current version of the platform, if the user wants to turn off the lights, he/she would need to click search and then faves and then the lights buttons, instead of simply saying "Alexa turn off the lights." This is an efficiency error since it complicates a task that the user has already been doing on their own. I would suggest having the home screen Alexa to ask a simple question like "What can I help you with today?" before jumping to all the stats and complicated features.

H8. Aesthetic and minimalist design / Severity: 2 / Found by: Evaluator C - Silly error but your prototypes are missing the iPhone top bar where the time, carrier, wifi etc. information is on. Once you add them in you might find that the picture and settings icon to be a bit too cluttered.

H8. Aesthetic and minimalist design / Severity: 1 / Found by: Evaluator C - From the prototype it is unclear what the trending, lifestyle and fun tabs will do. Are these tabs really necessary? Since you're working with a customer base that use smart home devices for the convenience and minimalism of it, limiting the amount of readable capabilities on the screen might be the way to go.

 H1. Visibility of System Status / Severity: 2 / Found by: Evaluator B - Another simple task mentioned by the designers is allowing the user to check in on the Sprite and instantly receive feedback on the Sprite's health, a task currently accomplished by looking at the Sprite's facial expression. Can a more robust indicator of the Sprite's health be added? Right now, the facial expression alone (maybe because the Sprite's expressions are fairly mild) does not seem to immediately inform the user of the Sprite's wellbeing. Adding more dramatic expressions to the Sprite icon or incorporating a color-based indicator or minimal text could provide status information more clearly.

H8. Aesthetic and Minimalistic Design / Severity: 1 / Found by: Evaluator B - The design of most pages in this medium-fi prototype is quite simple and minimalistic; however, I have listed a violation of H8 because I sometimes feel the interface is too minimalistic. The reliance on pictorial information and bright colors sometimes makes the app resemble a children's platform instead of a platform for (presumably) older individuals to interact with smart home devices more intentionally. This issue could be fixed by more text-based information and instructions in general.

H1. Visibility of System Status / Severity: 1 / Found by: Evaluator B - When unlocking a new task, the user visits the "Achieve" dashboard and sees his past badges earned. Some of the accomplishments are worded in a confusing manner: for example, "Learn: 5 new actions" and "Party: Listen 3 days" do not provide complete information as to whether 5 new actions were learned over a week or a day, or whether the listen function was invoked 3 days in a row, 3 days in the week, or just 3 days since the app was downloaded. This problem can be easily remedied by including the timeframe for each accomplishment, as the "Active: 5 uses today" icon does.

H5. Error Prevention / Severity: 2 / Found by: Evaluator B - While I understand that this feature would be difficult to include in a medium-fi prototype, I think when the user is using a favorite action or unlocking a new badge--tasks that depend on voice interaction--it would be important to give the user the option of "accepting" the transliteration of the user's speech or redoing the instruction instead of proceeding with the machine's transliteration directly. It is likely that the voice recognition software isn't perfect, and occasionally instructions will be misinterpreted by the machine. In this case, the user should not be forced to proceed with an incorrect instruction.

H8. Aesthetic and Minimalist Design / Severity: 2 / Found by: Evaluator B, C - As I neared the end of this heuristic evaluation, I noticed a minor issue with the "Badge Unlocked" popup notification. I would prefer to see a different color, either on the background or of the popup bubble itself, to avoid a translucent white box on a white background. While this overlay does not significantly detract from reading the text of the popup, the UI could be made even better by making the color more contrasting or blurring out the text in the background behind the popup so that the text in the popup notification is the most prominent on the screen.

H2. Match between system and the real world / Severity: 2 / Found by: Evaluator D - The usages of vocabularies like "recs" and "faves" might make sense to a younger audience, but might cause some confusion in other people, who I think the product should target, considering that a lot of the young people are already quite savvy about smart devices. A fix to this would be to use more formal language or at least offer the user an option to do so.

H1. Visibility of system status / Severity: 1 / Found by: Evaluator D - In the achievements menu, all visible achievements are those that are already collected and others are locked, which do not tell you the requirements unless you tap on them. I think it could be better if the user can see the requirements in the achievements screen, and distinguish collected ones from not collected ones using color or some other cue.

H4 Consistency and standards / Severity 2 / Found by: Evaluator D - The icon on the phone home screen resembles the blue pet. This would be a problem since we have pets with multiple colors and using one to represent the overall experience can be problematic. It is not generalized, which can be confusing. And furthermore, what If the blue pet is not the user's

favorite? This can be problematic especially since the product is supposed to create this virtual relationship between the user and the pets. A fix would be to come up with an app icon that is more neutral.

H5 Error Prevention / Severity: 1 / Found by: Evaluator D - In the "Discover" page, different buttons are colored with different shades of blue. This is aesthetically pleasing, remaining loyal to the overall color scheme, but might be error-prone for some people, especially those that are not as sensitive to the color blue. A fix would be to better differentiate the colors.

3. Summary of Violations

Category	# Viol. (sev 0)	# Viol. (sev 1)	# Viol. (sev 2)	# Viol. (sev 3)	# Viol. (sev 4)	# Viol. (total)
H1: Visibility of Status		3	1			4
H2: Match Sys & World		1	2			3
H3: User Control		1	2	1		4
H4: Consistency	1	1	5	2		9
H5: Error Prevention		1	1	1		3
H6: Recognition not Recall			1			1
H7: Efficiency of Use			2	1		3
H8: Minimalist Design		2	2			4
H9: Help Users with Errors						0
H10: Documentation			1	1	1	3
Total Violations by Severity	**1**	**9**	**17**	**6**	**1**	34

4. Evaluation Statistics

Severity / Evaluator	Evaluator A	Evaluator B	Evaluator C	Evaluator D
sev. 0	1	0	0	0
sev. 1	3	3	2	3
sev. 2	7	4	8	5
sev. 3	2	4	3	2
sev. 4	1	0	0	0
total (sev. 3 & 4)	3	4	3	2
total (all severity levels)	14	11	13	10

***Note that the bottom rows are *not* calculated by adding the numbers above it.**

5. Summary Recommendations

Evaluator A: Although the most common violation I noted was about consistency and standards, I thought Sprite did an excellent job overall with consistency and aesthetic design; the issues I pointed out mostly felt like nitpicking, which I hope is still helpful. The app does a great job of packing many features while maintaining a minimalist design. That being said, a lot of my feedback was related to a user being confused about how to do something, so I think it would be necessary to include some form of tutorialization when the app is first being used in order to familiarize the user, or to include some "help" screen to remind users of the functionality of the app, or to include more indicators of what the user *can* do (i.e. interactive parts of the screen) in general. Some combination of those would probably be ideal! Lastly, (and this goes without saying) some features haven't been implemented that will be critical to the app's workflow, like the process of adding new smart devices. The settings page could also potentially have a way to restart tutorialization or remind the user how to do certain tasks, which addresses a few of the violations listed earlier. I'm excited to see Sprite develop more!

Evaluator B: Overall, the Sprite team tackles a unique problem with a creative and well-designed solution: by showcasing a fun and interactive interface, their medium-fi prototype makes it evident how a user might develop a sense of responsibility towards his or her smart home device and therefore find the motivation to interact with it to its full capacity. One large area of improvement would be the minimalism of the interface. I feel that Sprite could actually benefit by incorporating more details into their interface while maintaining the fresh and playful look. Additionally, the team might consider standardizing the role of circular icons as buttons or purely icons and could add more clarity, perhaps through text-based instructions, on what clicking on these icons might lead the user to do. Adding text-based information to the platform might also provide more complete information on the Sprite's well-being to the user, who currently infers it from pictographic representations. Given that the team eventually intends to

integrate voice recognition into the Sprite platform, I would recommend including additional error prevention and error handling functionalities, since voice recognition software is especially error-prone and may not produce perfect output from a user's oral instructions every time. Finally, a few minor fixes with regards to color (such as avoiding loaded colors and maintaining appropriate contrast between popups and the app background) could contribute to a really fantastic platform!

Evaluator C: Overall I really like the direction you're taking and I think most of the errors within the prototype can be fixed by focusing on the user. You are trying to make a time-saving piece of hardware even more efficient by allowing connectivity and a better understanding of smart home devices. Your user is likely to be someone who really values the fast nature of an Alexa or a Google Home, so you should work to make your app reflect this innate value system. You can try cutting some of the tabs to make the app more concise and you can try labelling everything clearly to avoid any confusion. Furthermore, you can bring in Alexa's core functionality to the app by asking the user immediately what they need help with. Furthermore, I would recommend that you experiment with connecting different smart home devices within your solution. If the user can see Sprite as a platform where all their smart home devices come together, it'll be much more valuable. I am really looking forward to seeing where you end up going with this, it's very exciting!

Evaluator D: In general I consider the interface to be very good, sleek and consistent. I think there could be some room for improvement by thinking about taking the sweet spot between a minimalistic design and usability. The app mainly uses icons and only occasionally very succinct verbal descriptions to help people understand what's going on, which might be pleasing to a younger audience but could lose the opportunity of reaching out to a wider group. It would be great if you can add more visual cues indicating what does what, or add some verbal description here and there to help users get familiar with the application.

Overarching Feedback: Main areas of improvement include balancing minimalistic design with providing the user enough information, standardizing pictographic and color representations, and streamlining the app in terms of efficiency of use (especially with many devices) to keep with the target audience's ultimate goal. Keep up the good work!

6. Legend

Severity Ratings

0 - don't agree that this is a usability problem
1 - cosmetic problem
2 - minor usability problem
3 - major usability problem; important to fix
4 - usability catastrophe; imperative to fix

Heuristics

H1: Visibility of System Status
- Keep users informed about what is going on

H2: Match Between System & Real World
- Speak the users' language
- Follow real world conventions

H3: User Control & Freedom
- "Exits" for mistaken choices, undo, redo
- Don't force down fixed paths

H4: Consistency & Standards

H5: Error Prevention

H6: Recognition Rather Than Recall
- Make objects, actions, options, & directions visible or easily retrievable

H7: Flexibility & Efficiency of Use
- Accelerators for experts (e.g., gestures, kb shortcuts)
- Allow users to tailor frequent actions (e.g., macros)

H8: Aesthetic & Minimalist Design
- No irrelevant information in dialogues

H9: Help Users Recognize, Diagnose, & Recover from Errors
- Error messages in plain language
- Precisely indicate the problem
- Constructively suggest a solution

H10: Help & Documentation
- Easy to search
- Focused on the user's task
- List concrete steps to carry out
- Not too large