

Project

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1 INTRODUCTION

The interface that I choose to redesign is **reading and writing product reviews on Amazon shopping**. For most buyers, reviews from other buyers offer great reference values when a purchase decision is to be made. A effective and trustworthy reviewing system also contributes to sale revenue through the Amazon distribution channels. To illustrate, the existing interface are captured in Fig. 1 and Fig. 2. To experience it, you can:

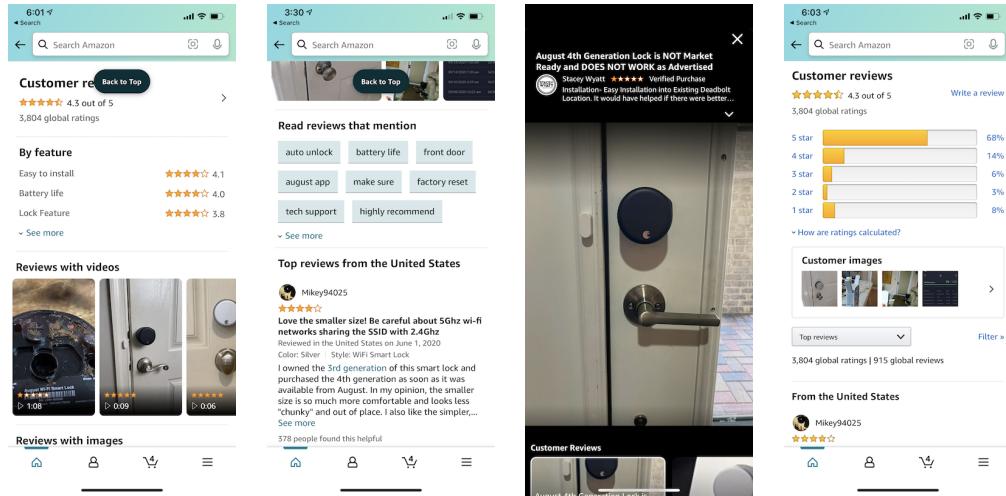


Figure 1—Left to right: (a) reviews section in product page, (b) reviews that mention keywords, (c) swipe thru images, (d) standalone reviews page.

1. Download and install the *Amazon shopping* smartphone (iPhone) app;
2. Choose any product (while popular products with more ratings and reviews are easier for you to experience the mentioned interface);
3. Tap on the stars or rating count beside the product title, near the page's top right corner, which should link you to the customer reviews section (Fig. 1a);
4. Scroll down to see review videos, images, and mentioned keywords (Fig. 1b);
5. Tap on an image, to zoom in and swipe through images (Fig. 1c), then close;
6. Tap > beside customer review, to see the standalone reviews page (Fig. 1d);
7. Tap any image thumbnail to see the collection of thumbnails (Fig. 2a);

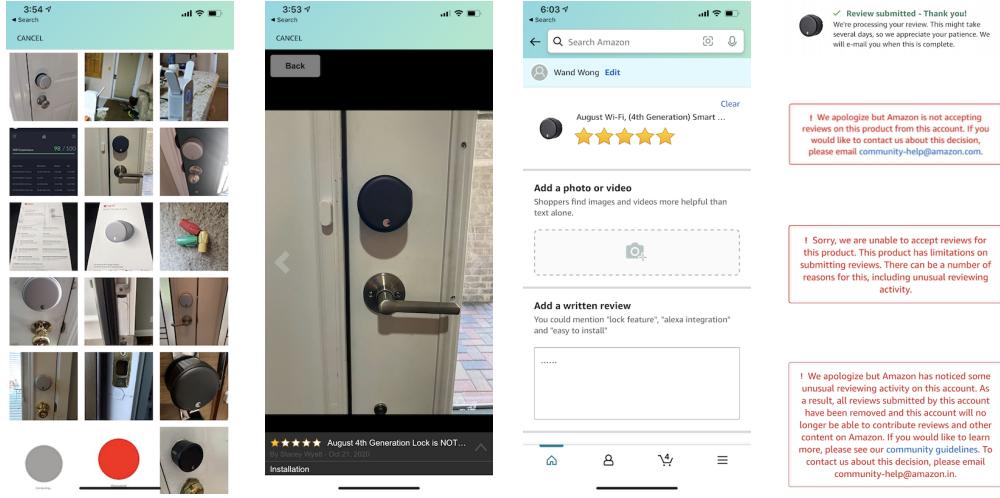


Figure 2—Left to right: (a) collection of thumbnails, (b) image with prev/next buttons, (c) write review page, (d) various submission results.

8. Tap any thumbnail in the collection to zoom in, and tap < and > to view previous and next images (Fig. 2b), then close;
9. Tap "write a review" to see the writing review page (Fig. 2c);
10. You may or may not be able to submit review, depending on your status and relationship with the product. If you succeed, you will see a thanks message, otherwise you may see a red message box, which tells you the error (Fig. 2d).

2 INITIAL NEEDFINDING

2.1 Choice

I choose to read *product reviews*, because the reviews are easily accessible and are seriously written by engaged users. For Amazon smartphone app, product reviews can be found in either Apple App Store or Google Play Store, which distribute apps to most smartphones in the world. Amazon on web usually follows the web page interaction paradigm and is therefore excluded from our current project scope. Among the stores, I only choose to read reviews from Apple App Store, since reviews from Google Play Store are shorter, while Amazon ratings/reviews are usually the secondary task of users that would only be mentioned in longer reviews.

2.2 Plan

On the Amazon Shopping page of Apple App Store in a web browser, under the Ratings and Reviews section, I choose See All and then scroll down repeatedly until the web browser loads a few hundred reviews. Then I search for the words "rating" or "review" to find comments that are relevant to our project scope. Afterwards, I gather those comments and group them into around ten goals/tasks/needs, which composes part of the data inventory.

To limit impact of voluntary response bias and social desirability bias, I count stars and observe them to be composing a normal distribution when I read through the reviews. Nevertheless, such control of bias is only a best effort since I am only looking for Amazon rating/review related comments. On the other hand, to limit impact of egocentric bias, I would repeat each reviewer's observations on the Amazon app, to check for validity of the comments before I gather them for consolidation.

2.3 Conclusion

2.3.1 *Summary of comments*

Following is a summary of user comments that are relevant to Amazon ratings/reviews, grouped by their goals/tasks/needs. (Note that for many tasks, the Amazon app works like a web browser, where user scrolls page to read, taps hyperlink to jump to next page, and taps back to return to previous page.)

- **Ease of discovering the reviews, in consistent ways:** Users think it is hard to find a link to (or discover) the reviews. Stars sometimes direct to review but not always, and there are different stars (incl. overall rating, by-feature rating, n-star rating) pointing to different places or nowhere. Users want a easy and consistent way to discover the reviews on a product.
- **Consistency in browsing reviews, like reading a book with bookmarks:** Reading Amazon reviews becomes more confusing when there are two different presentations of reviews, one as the last section in the Amazon product page, and one as a separate reviews page. They look similar but offer different functions: one offers photo swiping but the other offers sorting, while both do not remember the last reading position (esp. after the app was put to background). Often a "Back to Top" popup button gets in the way and turns a small slip into a long jump that goes all the way back to the page beginning,

which forces user to scroll and load hundreds of reviews before he can resume reading at where he was. From users' opinions, I can observe that they want reading reviews to be like reading a Kindle book.

- **Relating review to production variation:** A product can come in different colors/sizes, while the reviews for all colors/sizes are grouped into the same list. User wants to know the exact color/size that the reviewer bought, in order to facilitate user's buying decision.
- **Authenticity of reviews:** There seem to be many reviews written by trolls (or purchased favorable reviews), but Amazon failed to filter them. Users want the reviews to be more trustworthy, since they depend on the reviews and ratings to evaluate a product.
- **Ease of discovering where to write a review:** When user wants to write a review, there is only one "Write a review" link at the top of one long listing of reviews, which requires user to tap or scroll through many pages to discover it. The whereabouts of writing link also seems to be inconsistent across iPhone and iPad. Users want to write reviews when they are inspired, but the long journey of discovering the writing link is discouraging.
- **Accessibility to writing reviews:** Users may be blocked from writing reviews, but they are not well informed of why, or what they may do in order to resume writing. Sometimes these users are even blocked from asking product questions, which hinders their buying decisions. Although users understand that Amazon imposes community guidelines, they still want to write reviews and ask questions freely.

2.3.2 Data Inventory

- **Goals of users:** To read/write reviews, for supporting purchase decisions.
- **Needs of users:** A user needs every buyers who made purchases in the Amazon community to be the collaborators.
- **Tasks of users:** Cognitively, when reading reviews, a user has to find and browse through reviews, study the product pros and cons in each review, summarize the comments, and made a purchase decision. On the other hand, when writing a review, a user has to find the write button, then write the comments and give the rating stars.

2.3.3 Defining Requirements

- **Functionality:** User can read/write reviews to support buying decisions.

- **Usability:** User can scroll reviews efficiently, and resume scrolling at where he was after a pause/stop/exit.
- **Learnability:** User can find the reviews list or the write-review button easily, without having to scroll through lengthy pages.
- **Accessibility:** User can write reviews freely without being blocked.
- **Compatibility:** User can use smartphones or tablets to read/write reviews.
- **Compliance:** Under GDPR guidance, users can be anonymous and forgotten.

3 HEURISTIC EVALUATION

3.1 Feedback Cycle - reading reviews

Gulf of execution for reading reviews is medium to big:

1. **Intend:** User intends to read the reviews after he saw the star rating at the top of a product page. Amazon bridges this gap quite well since it shows the stars right beside the product name, but the visual hint can be improved since it is now just a hyperlink on the rating count instead of on the rating value.
2. **Specify action sequence:** Tapping on the stars and then scrolling through the reviews is consistent with the smartphone operation paradigm, which Amazon bridges well, but unfortunately Amazon mixes these reviews with other product info into the same page (Fig. 1a), and also offers another reviews page with different but incomplete sorting/filtering (Fig. 1d), therefore user may be confused by the "correct" action sequence to read all the reviews.
3. **Execute actions:** Tap and swipe (with one finger) are the only necessary executions. There are no unknown executions such as shaking or multi-touch gestures, so Amazon bridges this gap well.

Gulf of evaluation for reading reviews is medium to big:

1. **Percept:** User sees reviews listed on a long page, with additional reviews being loaded when user scrolls to the bottom, where the bridge is fine.
2. **Interpret:** Although listing of reviews is fine, user may be lost in interpretation since there are two similar reviews pages, one mixed with product info and the other stands alone, both offering different browse/sort/filter functions. User may think a filter function is gone but in fact it is on another reviews page.
3. **Evaluate:** User may feel difficult on evaluating the distribution and position of reviews, since the two reviews pages offer different sorting or filtering, and

the Amazon app does not remember user's last reading position.

3.2 Feedback Cycle - writing a review

Gulfs of execution and evaluation for writing a review is medium, since Amazon presents the task as common web form and bridges the gulfs reasonably fine. The remaining gaps are:

- **Intend:** User may feel difficult on getting the intention to write a review, since there are two reviews pages but only one of them provides a writing link. The product features in writing review are also inconsistent with the product features in reading reviews.
- **Evaluate:** Failed submission results may not come with a follow-up action, so it is sometimes difficult to evaluate what to do next (Fig. 2d).

3.3 Design Principle: Consistency

The reviews section in product page (Fig. 1a) is inconsistent with the standalone reviews page (Fig. 1d). Former offers ratings by features, swiping through reviews with videos/images (Fig. 1c), and reviews that mention keywords (Fig. 1b); latter offers reviews of different stars, collection of images (Fig. 2a), sorting & filtering, and a write review link. Since the former view provides a next page button to enter the latter view, therefore a common user would expect the latter to be a elaborated version of the former, with all actions and interpretations in the former being reusable in the latter by the same conventions; unfortunately the user would be surprised.

Adding to the inconsistency, images in the reviews section of product page are inconsistent with images on the standalone reviews page. The former opens up a scroll view that allows swiping through videos/images, like reading a e-book or watching a video with thumbnail scrubbing (Fig. 1c), but the latter opens up a collection view of all image thumbnails (Fig. 2a), which opens each image with prev/next buttons but no swiping (Fig. 2b).

In addition, the product features available to writing review is also inconsistent with the product features **discoverable** in reading reviews. When reading reviews, three features and their ratings are initially shown, while more (~5) features can be discovered (by tapping "See more"), but those discovered features are never available for rating when writing review. That makes a reviewer wonders how these feature ratings got into the previous reviews. The correctness of

mental model also becomes questionable.

3.4 Design Principles: Simplicity, Discoverability, Perceptability

Amazon has successfully made the reading of reviews simple (on either reviews section in page or standalone reviews page), with just overall ratings, ratings per feature/stars, images and videos, and list of reviews, which are what common users will need. Nevertheless, Amazon unnecessarily shows the search bar on screen top and the tab bar on screen bottom, and shows some ratings per feature/stars that are rarely needed and better hidden as discoverable.

The standalone reviews page (Fig. 1d) is discoverable from the reviews section in product page (Fig. 1a), while feature ratings and mentioned keywords are discoverable by tapping "See more". Amazon has done well by making these info visible to users, without distracting users with redundant data.

Nevertheless, since the images/videos and reviews are also discoverable (i.e. more images and reviews are loaded from internet when a user scrolls to end of the image or review list), a user can never perceive or **predict** (as in **Predictor Model**) the total number of images/videos/reviews, until he scrolls to the end.

3.5 Design Principle: Affordances

Amazon app follows the web page paradigm and shows clickable actions as hyperlink. Therefore, links (to some other views) and actions are mixed together, and sometimes actions are shown as either blue text hyperlinks or big yellow/grey buttons. Moreover, clickable graphics (e.g. the rating stars) cannot be displayed as blue text, and so are not obviously interpreted as actions.

Arguably affordances on web page are not the best for smartphones. Recent iPhone apps employ blue rectangular boxed text (as actions), blue plain text (as links), and controls such as segmented controls and outlined icons, all of which signify affordances to be tapped or swiped, with predictable feedback.

3.6 Design Principle: Flexibility

Amazon loads the first set of ~10 reviews or images when the relevant view loads, and then loads the next set when user scrolls to the end. Meanwhile, Amazon forgets the last viewing position when user exits the view or quits the app. When these behaviors combine, it means that a user who wants to re-read the 100th review or the 100th image needs to scroll & load ten times (with each

time taking ~3 sec to pull up/left & load) and skims through every loaded set to check if the 100th review/image is there. It may be fine for a patient user, but is both inefficient (if viewing user as **processor model**) and demanding for cognitive resources.

To solve a similar problem, Amazon Kindle provides flexibility to expert users on creating bookmarks for interesting pages. Together with a view that pre-loads all thumbnails of pages (reviews/images) before scrolling, and a long-term app memory to remember the last viewing position, a redesigned interface can make reading reviews on product as invisible as reading a book on Kindle.

3.7 Design Principle: Equity

Since Amazon app follows the web page paradigm and shows links and actions as blue text (without underline), when a user chooses to switch iPhone display to black & white (Accessibility > Display & Text Size > Color Filters > on Grayscale), the blue text hyperlinks become indistinguishable from common black text, effectively removing all affordances (or clickable actions) from the interface. This violates the principle of equity, where an interface should accommodate individual preferences and abilities. As mentioned above, showing a rectangular outline box around each clickable action can signify their affordable to be clicked/tapped, even if they are displayed in black & white.

On the other hand, Amazon forbids some users from writing review on some products, due to various reasons incl. reviewers not buying enough, sellers not selling enough, and use of strong language. This arguably violates the principle of equity, since a user may not have the monetary ability to buy a product but his evaluation may be the most helpful of all. In addition, everyone is eligible for free (not false) speech in an open society, which supports the efficient exchange of information and the best decision for every buyer/seller. Even weird reviews should be accepted, though only visible to readers with weird preferences.

4 INTERFACE REDESIGN

In our redesigned interface, user can choose from home, account, cart, search, and settings from the bottom tab bar, which is almost the same as the existing interface. (Interaction of the tab bar is not relevant to our current scope of reading/writing reviews, but is drawn here for the sake of interface completeness.) When user views a product, the top segment control bar appears, where user

can choose either product (info), gallery, or review (Fig. 3a).

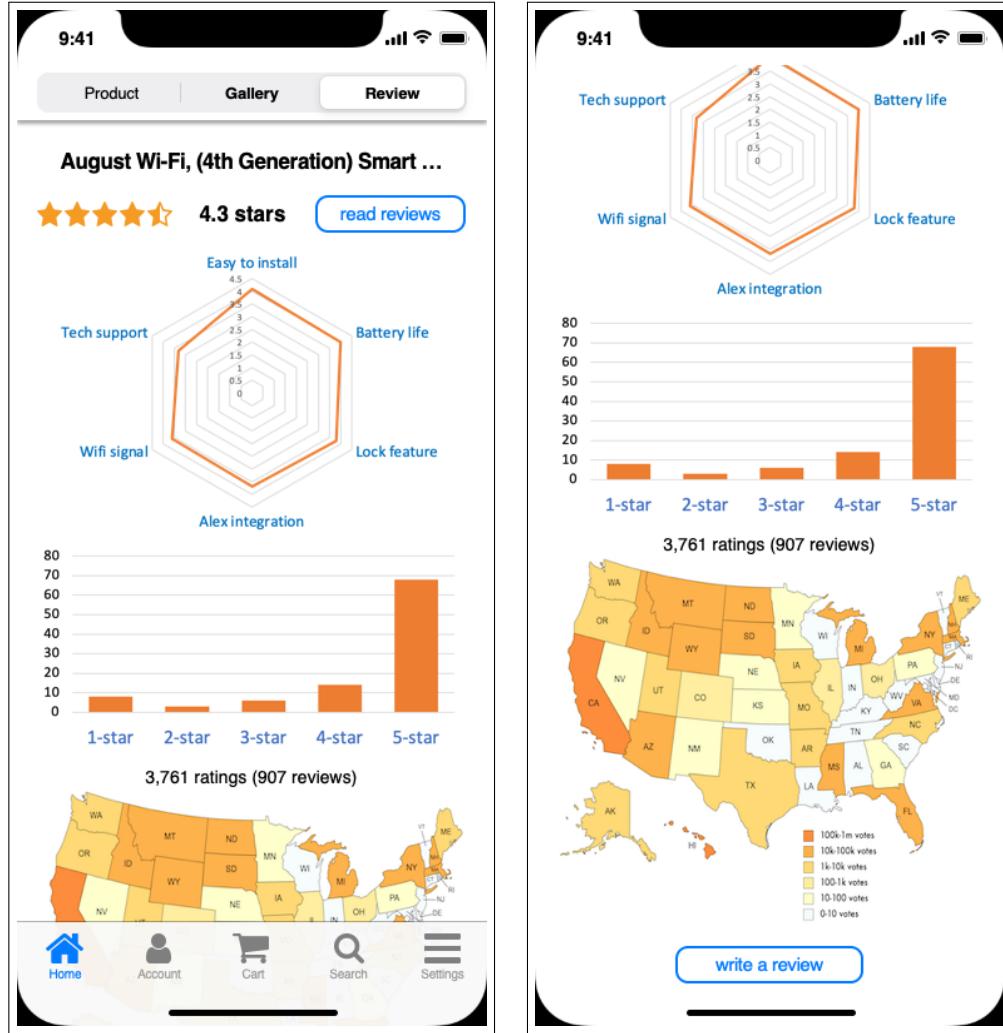


Figure 3—(a) review summary; (b) summary, scrolled up.

The review segment shows a summary of all reviews on the product. The blue text (e.g. "3-star", "tech support"), when tapped, will bring user to the review page with the appropriate filter set. When user scrolls up the summary, the top and bottom bars auto-hide to reveal more content (Fig. 3b).

When user taps "read reviews" on the summary page, the review page pulls up (Fig. 4a), which shows the text and images in each review. User can scroll through all the reviews by either (1) swiping through the review pages, (2) swiping the image thumbnails at the bottom thumbnail carousel, or (3) scrolling the

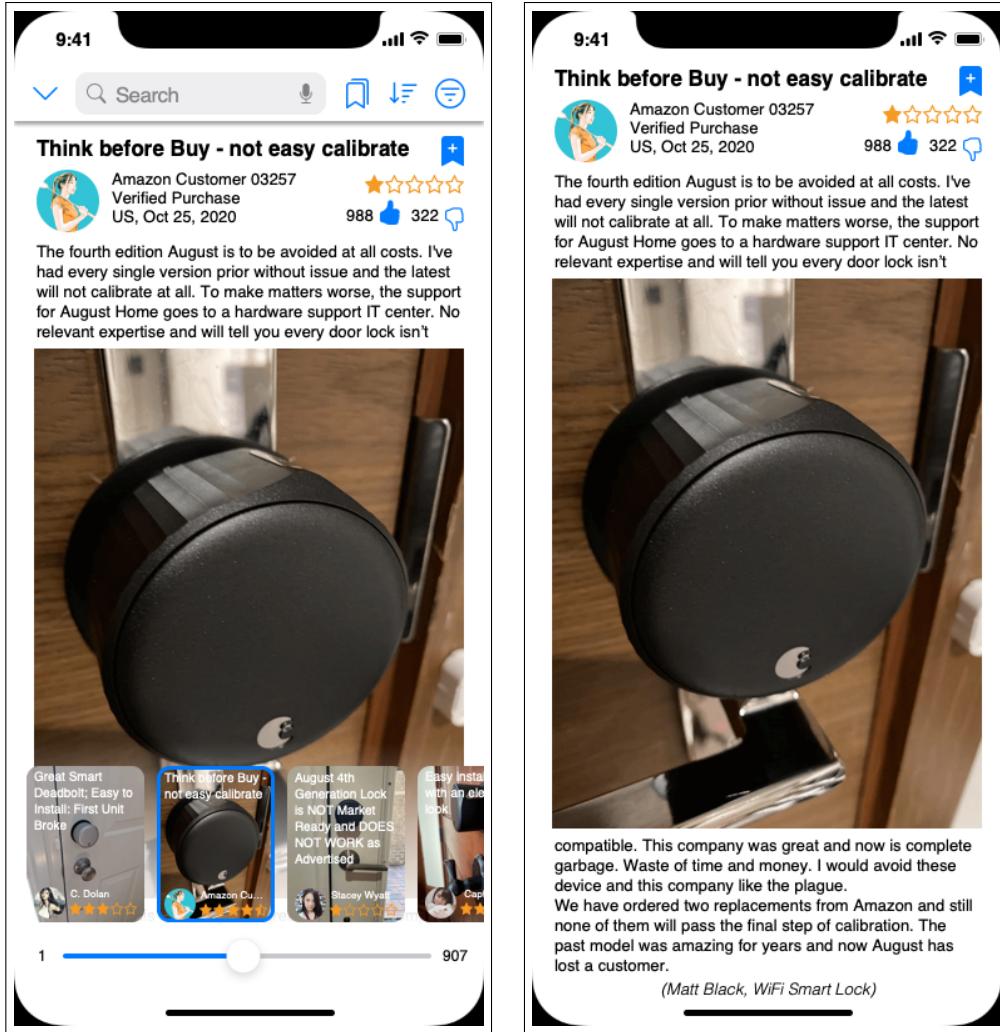


Figure 4—(a) reading review; (b) review, scrolled up.

knob at the bottom scroll bar. These three swiping/scrolling tasks are synchronized, but in case they reach a text-only review, the thumbnail carousel shall pause scrolling and not highlight any image.

Meanwhile, videos are presented the same as images, except that they have the common video controls (not drawn here). In addition, similar to the summary, when the review page scrolls up, the top and bottom bars auto-hide (Fig. 4b).

When user enters search keywords, the interface finds all the matching reviews and displays them with the keywords highlighted (Fig. 5a). User can also sort the reviews by "top reviews" or "most recent" (Fig. 5b).

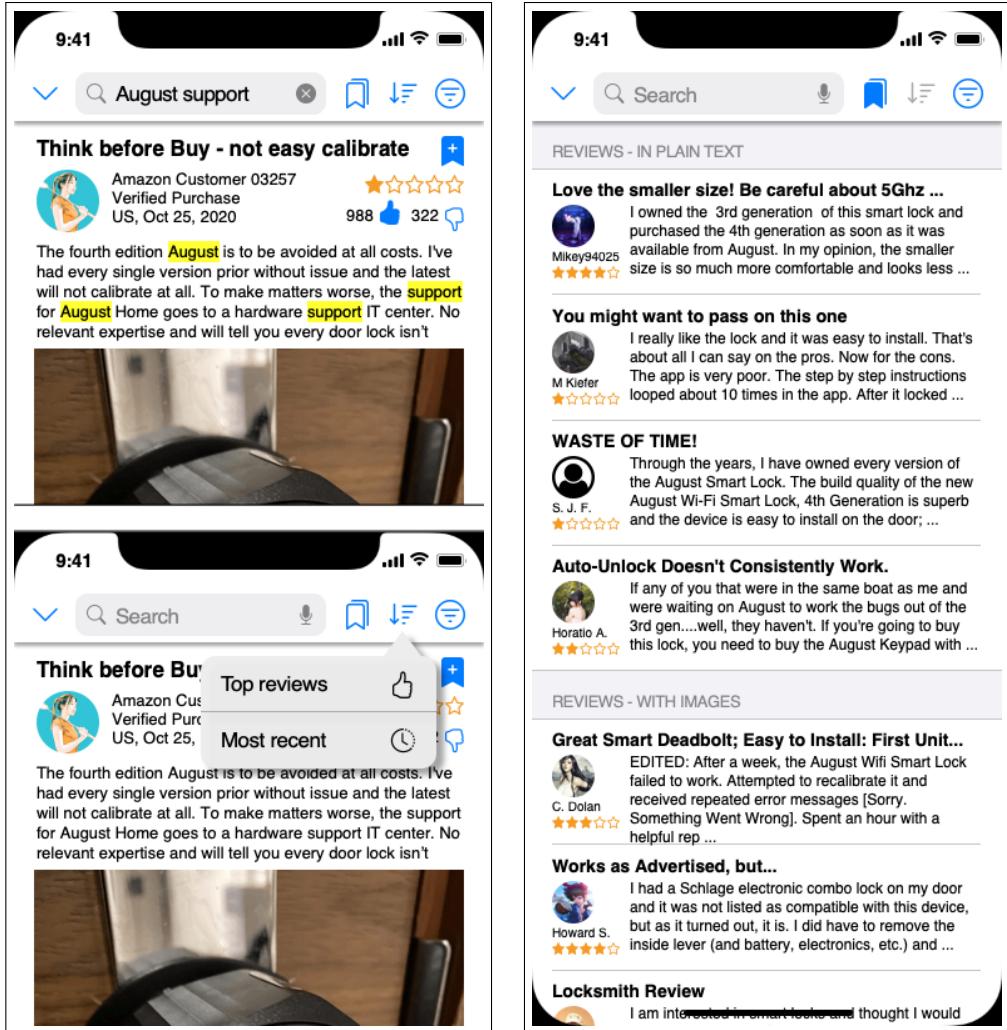


Figure 5—Left: (a) search, (b) sort. Right: (c) bookmarks.

The interface remembers user's last position of reading the reviews; in addition, when user thinks a review is worth remembering, he can bookmark it; all the bookmarked reviews can later be recalled by the bookmarks button (Fig. 5c).

To filter the reviews, user can choose from a set of filter options (Fig. 6a). Among those, the production variation (which are "color" and "style" in our current sample) will differ in different products, while the search field (and the keyword tags that expand from it) behaves the same as the search field on the top menu bar. Choosing a keyword tag is equivalent to typing those keywords into the search field.

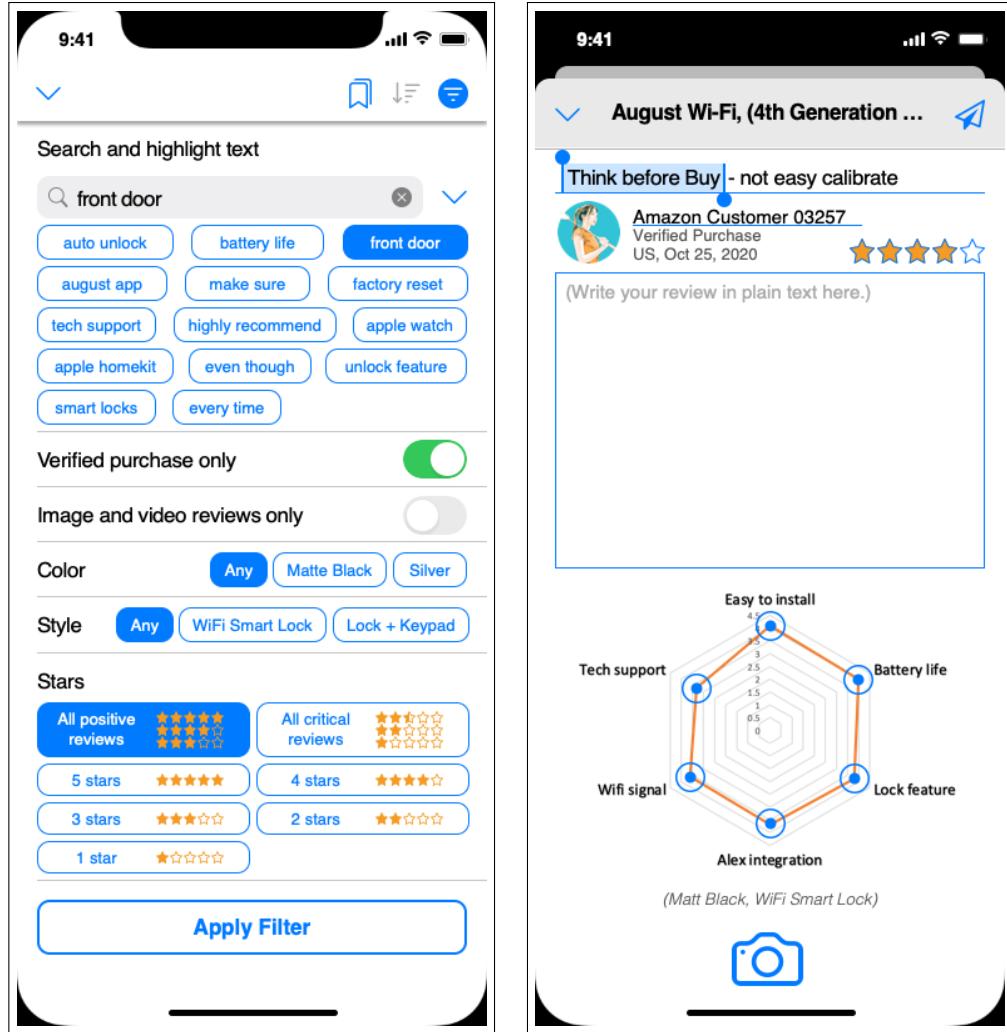


Figure 6—(a) filter options; (b) writing a review.

When user taps "write a review" on the summary page (Fig. 3b), the write review card pulls up (Fig. 6b). User can write review text, give rating stars, and drag the dots on radar chart to fine tune the ratings by features. After user enters sufficient info (incl. at least a title), the send button at top right is highlighted, which user can tap to submit the written review. After review submission, the interface shows a pop-up message or notification (not drawn here), which goes away either by hand or after a few seconds.

5 INTERFACE JUSTIFICATION

5.1 Feedback Cycle - reading reviews

Gulf of execution for reading reviews in the redesigned interface is small:

1. **Intend:** User intends to read reviews after he saw the "read reviews" button in Review section (Fig. 3a), which affords tapping. Therefore the gap is short.
2. **Specify action sequence:** After tapping on the read button, user sees a review in screen body and a list of review images on top of a scroll bar in screen footer (Fig. 4a), so to be consistent with his smartphone experience, he swipes each review and drags the knob on scroll bar. Therefore the gap is short.
3. **Execute actions:** Tap and swipe are the only executions, so the gap is short.

Gulf of evaluation for reading reviews in the redesigned interface is small:

1. **Percept:** User sees reviews shown like cards in deck, so the gap is short.
2. **Interpret:** The review page is the only definitive place to display a review, so user shall not misinterpret the perceived representation as another mental model. The same goes for reviews summary. Therefore the gap is short.
3. **Evaluate:** User can easily evaluate his reading position, since the redesigned interface remembers it, with additional bookmarks memory. The reviews summary page also offers graphical representations of reviews statistics to assist evaluation. Therefore the gap is short.

5.2 Feedback Cycle - writing a review

Gulf of execution for writing a review in the redesigned interface is short:

1. **Intend:** On the reviews summary page (Fig. 3), there are **simply** two buttons: "read reviews" and "write a review"; the former (used more often) is initially displayed for **ease** of access, while the latter (used less often) is **discoverable** by scrolling. Common user should have no problem on discovering the intention to write a review, so the gap is short.
2. **Specify action sequence:** On the review writing page (Fig. 6b), all actions are marked with blue outlines, so a common user should feel easy to specify the action sequence, and the gap is short:
 - Tappable buttons are blue outlined icons.
 - Editable text are blue underlined or in blue outlined box, with grey bracketed prompt when text is still empty.

- Tunable star rating is a set of blue outlined stars filled with orange color.
 - Tunable per-feature rating is a set of draggable blue outlined dots on a radar chart.
 - Photo capture is a blue outlined camera icon at the usual snapshot button place.
3. **Execute** actions: Tap and drag are the only executions, so the gap is short.

Gulf of evaluation for writing a review in the redesigned interface is short, since we propose Amazon to accept every review (even with inappropriate language), so the perceived feedback is just a auto-hiding popup message or notification, which the user may not need to evaluate (except during the rare occasion of network error).

5.3 Design Principle: Consistency

Since the pages are consolidated and simplified in the redesigned interface (see section 5.4), there is no inconsistency between different reviews pages or different image browsing tasks. In addition, the review writing page (Fig. 6b) now looks the same as the review reading page (Fig. 4b) (with the same radar chart from reviews summary, Fig. 3a), so now every writer knows what he writes is consistent with what he reads; such consistency also helps to establish the *mental model* of review structure. As a bonus, the image orientation is also consistent with behaviors of common smartphone users, who hold smartphone and take photos in portrait mode rather than in landscape mode.

In addition, the buttons are also consistent with modern iOS controls, where a bright blue outlined shape signifies a touchable button / draggable spot / editable area, a bright blue filled shape signifies a switched-on choice/status/mode, and a pale grey outlined shape signifies a disabled control.

5.4 Design Principles: Simplicity, Discoverability, Perceptability

The redesigned interface maintains the existing simplicity of review summary and discoverability of review tasks, but is even simpler since there are now just one reviews summary page (Fig. 3) and one review page (Fig. 4). In addition, since both summary page and review page extend beyond the screen bottom, user would naturally scroll down to discover the unseen part, which would auto-hide the top and bottom control bars, un-cluttering the screen estates to further simplify the interface.

On the reviews summary page, user can now perceive the per-feature ratings as a radar chart, which is a mental model representation that establishes correlations between different product features. Meanwhile in the existing interface, Amazon states the number of ratings as a hint to the product's popularity; in order to visualize this popularity for user perception, the redesigned interface draws these orders of magnitudes of populations as different colored regions on a map (e.g. pale orange map for an unpopular product, bright orange map for a popular product). Now user can also perceive the total number of reviews from the review page's scroll bar, with all image thumbnails ready for swipe (at a minimal cost of speed since only miniaturized images are loaded).

The redesigned interface gathers the previously scattered filter options into a single page (Fig. 6a), ready for user to discover via the filter button. This definitive filter page also helps user to perceive a complete mental model of all filter options. Meanwhile, sort options are discoverable via the sort button (Fig. 5b).

5.5 Design Principle: Affordances

As stated in section 5.3, in the redesigned interface, all blue outlined shapes afford to be touched or dragged or edited. Such affordances, and the other controls, are consistent with modern iOS apps.

5.6 Design Principle: Flexibility

The redesigned interface remembers user's last position in reading reviews, so an expert user can flexibly continue to read at where he left off, while a novice user can browse from the beginning. For more flexibility, the redesigned interface adds the bookmarks function, which (similar to Kindle) lets user tap a bookmark (on review page top right corner, Fig. 4b) to remember a page. Then an experienced user can flexibly recall the bookmarks (Fig. 5b) at days later, and continue to read the important reviews that were bookmarked.

Meanwhile, searching for reviews with keywords is in fact filtering and highlighting reviews with matching keywords (Fig. 5a), so the definitive search field is among the filter options, but since the search function is used so often it is put forward to the review page header when the filter options are awaiting discovery. After the filter options are discovered, expert user can flexibly choose from the frequent search keywords to fill the search field (Fig. 6a).

5.7 Design Principle: Equity

To accommodate different display preferences (e.g. Grayscale Color Filter), the interface is so redesigned to work in either color or grayscale. Generally speaking, when the redesigned interface is on a grayscale display, all outlined small shapes afford to be tapped / dragged / edited, while editable text areas with no input yet are marked with light grey bracketed prompts.

We also suggest Amazon to accept all review submissions (even with inappropriate languages), since that exhibits freedom of speech and promotes recognition of Amazon ratings, whereas inappropriate reviews (or unverified purchases) that no reader considers helpful (i.e. all thumbs down but no thumb up) shall naturally give little impact to the overall product rating.

6 EVALUATION PLAN

6.1 Approach

Interview is chosen as a qualitative evaluation on the *wireframe prototype*. **Plan** of interview is as follows:

- The *task* is "reading and writing reviews on Amazon shopping".
- I will *recruit participants* from friends or family, due to limiting invitation time and constraining time zones. I will try to recruit the people who have previous experience on shopping and reading (writing) reviews on Amazon, so that they can compare the experiences between existing and redesigned interfaces.
- The interview will be *performed via phone or video conference*, where I shall send the high fidelity wireframe prototype of the redesigned interface to each participant before the interview starts.
- If participants agree, I will do *two interview sessions for each participant*, in order to test memorability of the prototype. The 2nd interview results can also be compared vs the 1st to make the overall results more reliable and valid. I will also run a *pilot study* on the interview session with a friend (who will not be a participant, to minimize bias) in order to ensure its smoothness.
- I will *video record* the interview sessions, since that can automatically and comprehensively captures every interview quotes, while I can actively question the participants and translate the video to text later. I suppose that will not intrude the participants since they all are my trusted friends.

Interview content will be semi-structured; I only script ~10 guiding questions which I must ask the participants, but when participants think of relevant topics then I will follow their trains of thoughts and ask follow-up questions. I will brief a participant on background info before interview starts; then I will only give usage hints when participant is confused during the interview, so that I can focus on his feedback.

6.2 Interview Script

Following is the **background info** that I will tell a participant:

- *Context:*
 1. Imagine you are using a smartphone (iPhone), and already found a product on Amazon, which you wish to buy;
 2. You want to read its reviews before you make the purchase decision;
 3. After you received the product, you go back to the Amazon product page, and want to write a review on the product.
 4. After imagining the above scenario, look at the existing interface, which is workable, and the wireframe prototype, which offers similar functions but works differently.
- *Goal:*
 - Read the reviews, and evaluate if the product is worth buying.
 - Write a review, to tell others if the product is worth buying.

Following are the **interview questions**, where a participant needs to imagine that the wireframe prototype is workable:

1. *Goal:* What info and statistics do you want to read from the reviews? If you write a review, what do you want to tell your readers?
2. *Needs and Compatibility:* Who (or which collaborators) can give you the reviews? What additional or alternative hardware do you need?
3. *Tasks:* In order to read or write reviews on this prototype, what tasks do you need to do? What information would you analyze and summarize, after reading the reviews? What information would you research and draft, for writing a review?
4. *Functionality, Efficiency, Usability, and Accessibility:* On this prototype, can you read or write reviews, and evaluate your buying decision? Can you achieve these faster than before? How much faster (or slower)? What in the redesigned interface may be blocking you from reading/writing reviews effectively?

5. *Learnability*: How difficult would it be for you to learn using this redesigned interface? How much time would you spend on learning?
6. *Accuracy*: Where will you possibly slip on this prototype (e.g. accidentally clicking a neighboring button)? Where will you possibly make a mistake (e.g. clicking the wrong button since you are confused by the interface)?
7. *Memorability*: (Only questioned in the 2nd interview session for a participant) Do you remember what tasks you need to do (or which buttons to press) in order to read/write the reviews?
8. *Satisfaction*: How much do you prefer this prototype over the existing one?
9. *Compliance*: How much do you think your privacy is protected?
10. *Demographic*: What is your age, gender, and occupation?
11. Anything further that you want to say about this prototype?

6.3 Performance Metrics

By analyzing and summarizing the interview results, we can answer the following *performance metrics questions* on the **data inventory** (section 2.3.2) and **defined requirements** (section 2.3.3), as concluded previously in the initial needfinding:

- *Goals of users*: Are users' goals the same on this prototype?
- *Needs of users*: Can users get the required info, from the relevant collaborators, on this prototype?
- *Tasks of users*: Can users perform the required tasks, e.g. summarizing or drafting reviews, on this prototype? Are some tasks already done automatically?
- *Functionality*: Can users read/write reviews on this prototype?
- *Usability*: Can users read/write reviews effectively?
- *Learnability (and Accuracy and Memorability)*: Can users adapt to this prototype, with little effort and little time? Can users avoid slips and mistakes after learning? Can users easily memorize what they learned?
- *Accessibility*: Can users be possibly blocked from reading/writing reviews?
- *Compatibility*: Can this interface work on smartphone (iPhone) or tablet? Do users need an additional desktop or notebook computer to achieve their goals?
- *Compliance*: Do users think their privacy are protected?

6.4 Limiting Biases

Following are measures to limit the effect of my own biases:

- To limit impact of **confirmation bias**, during the interview, I would specifically

look for signs that contradict to my own beliefs. On the contrary, whenever I see signs that align with my beliefs, I look for *empirical evidences*. I would also invite a sufficient number of participants to limit the bias from any individual. In addition, after the interview, I would draw observations and conclusions by the *performance metrics*, instead of just choosing whatever observations that confirm our redesign.

- To limit impact of **observer bias**, I would prepare *interview script* for *peer reviews* and *pilot study* before actually doing the interviews, to make sure that I am not subconsciously biasing the interviewees. During the interview, I would avoid sentimental words and control my voice tones / facial expressions / body gestures, to avoid offering hints on a preferred sentiment.

END OF PROJECT REPORT