



Koala is a recurring subscription management tool that lets you finally take control of your recurring services and payments.

Team

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For this portion of the project, which included paper prototyping, writing, and digital mockups, we worked collaboratively on each assignment. Everyone contributed to each assignment.

Problem & Solution

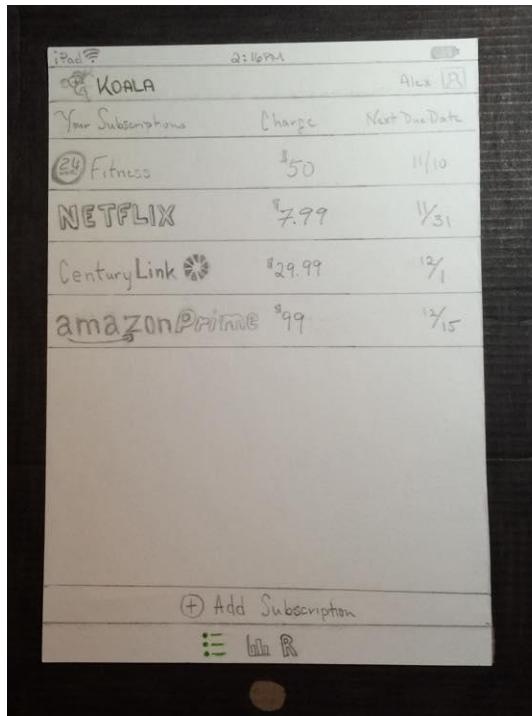
Koala allows you to manage and assess your growing portfolio of recurring subscriptions, any service that is automatically billed to you on a scheduled basis. Koala provides a platform to view your subscribed services as a whole; services such as Netflix, a gym membership, or a recurring charity donation. Within a single application, you can now add or delete a service quicker than ever before. You will finally be able to, at a glance, see exactly how many services you are currently subscribed to, how much each service is charging you, when upcoming payments are due, and how many times you use a given service. Koala will provide valuable information about how you utilize various services, allowing you to make informed decisions about whether or not those services are worth their price.

Initial Paper Prototype

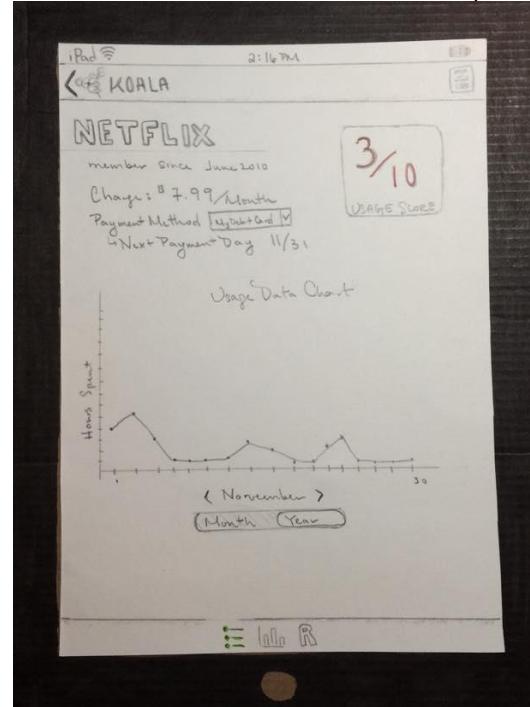
Task 1

"Please use our application to determine if your Netflix subscription has been worthwhile to you. If you find that your usage of Netflix is not worth the cost of the subscription, please use Koala to unsubscribe from Netflix."

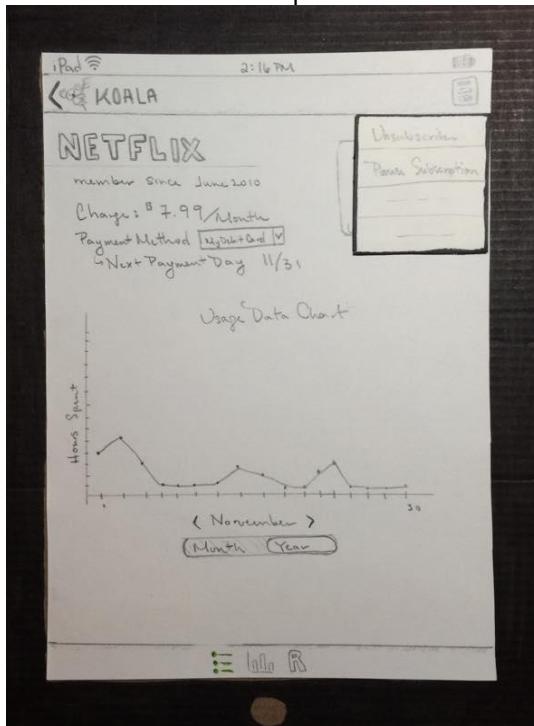
Step 1: Open Koala and land on the homepage



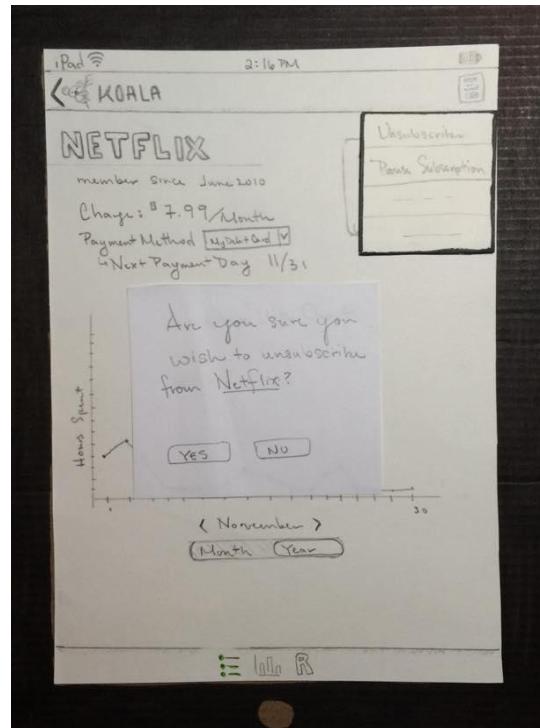
Step 2: Click on the Netflix subscription from the list. A new view floats down presenting detailed information on the Netflix subscription.



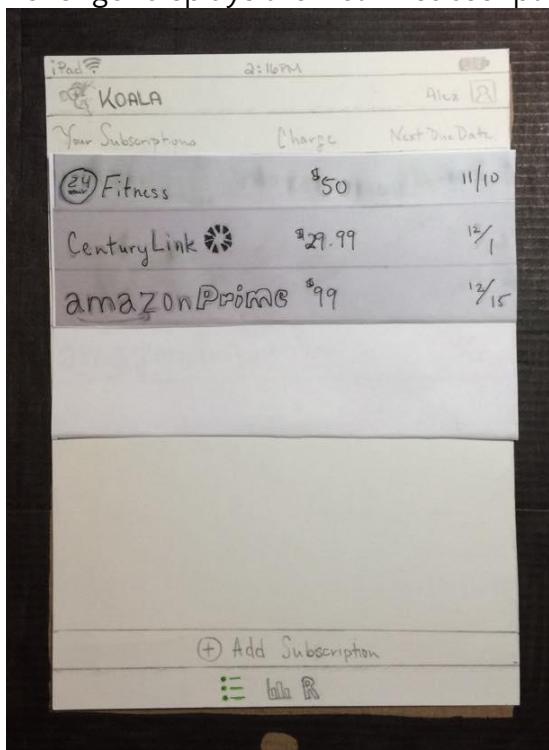
Step 3: From the data and graph presented, the participant decides to unsubscribe. They click on the settings icon in the top right corner and a new menu drops down.



Step 4: Click the "Unsubscribe" button and a confirmation window appears.



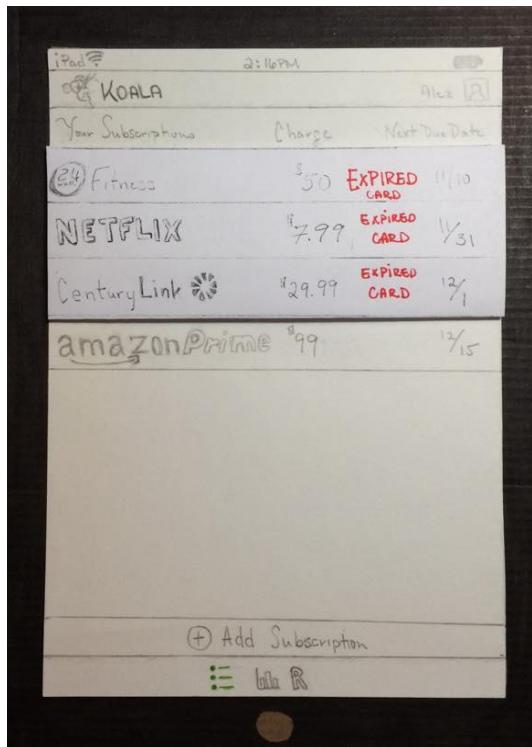
Step 5: Upon clicking "yes," the participant is navigated back to the homepage, which now no longer displays the Netflix subscription.



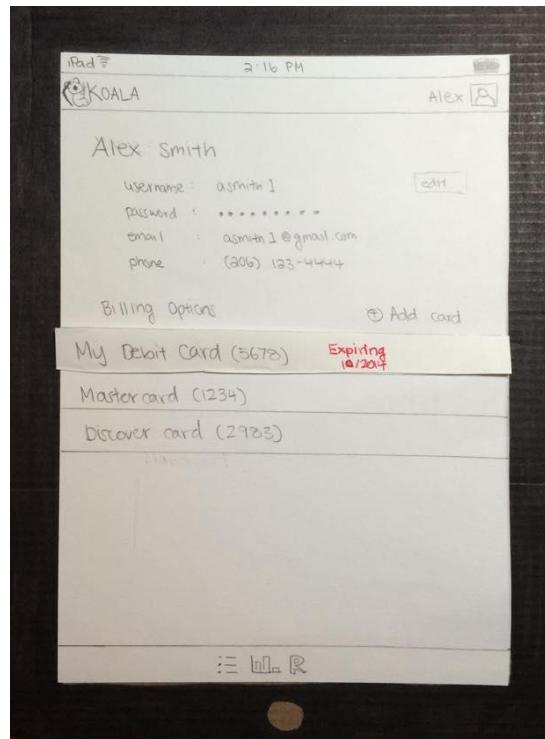
Task 2

"You just received a new debit card, exactly the same as your old card except it has a new security code “***” and a new expiration date “**/****”. Please use Koala to update your billing information so that your recurring payments will now be charged to the updated card."

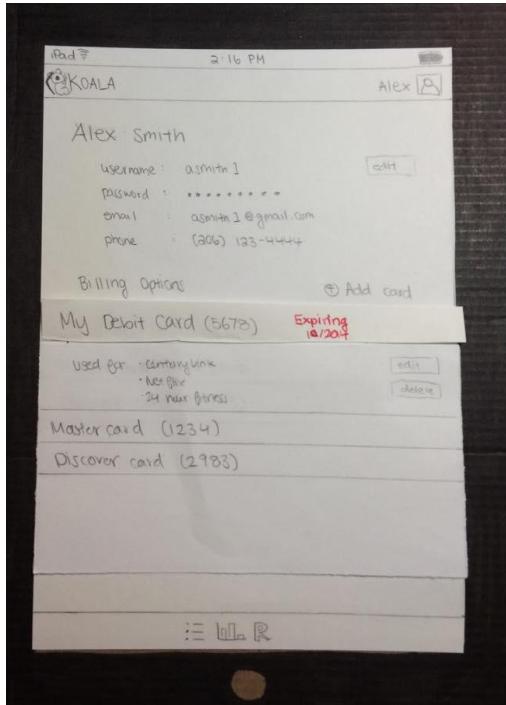
Step 1: Land on the homepage, however now there are warnings that a payment card used for several services has expired.



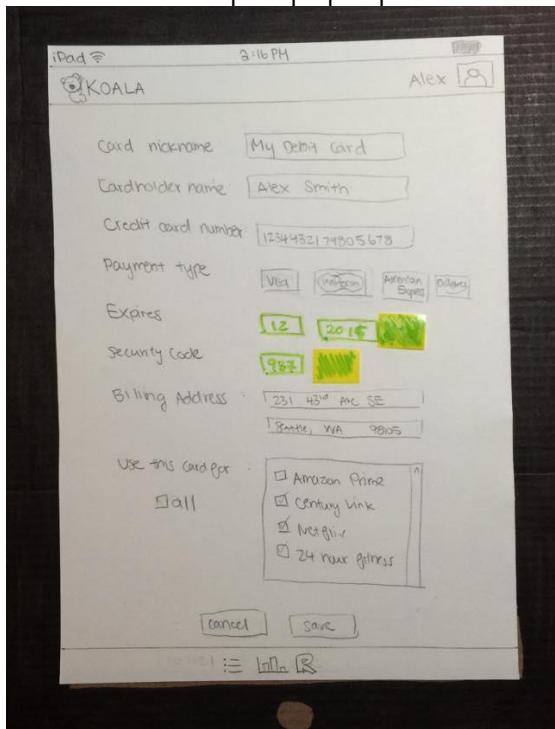
Step 2: Click on the account icon located in the right corner of the navigation bar. An account view is presented. The participant sees immediately which card has expired and needs to be updated.



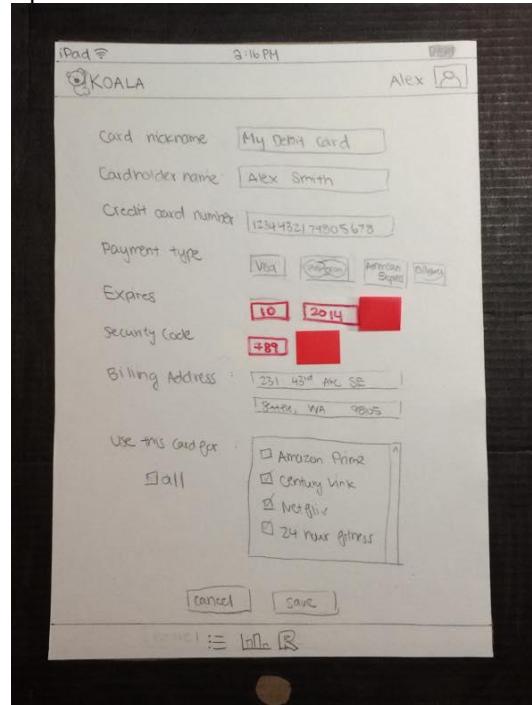
Step 3: Click on the expired debit card ("My Debit Card") and an accordion view will expand beneath the row. Here the participant will click "Edit" to edit the card's information.



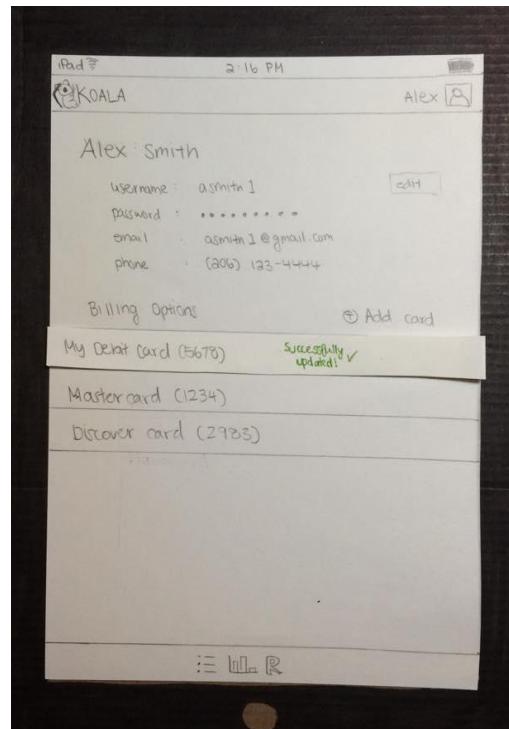
Step 5: Update both the security code and the expiration date fields with the numbers provided. Input is provided via a standard numerical touchpad pop-up.



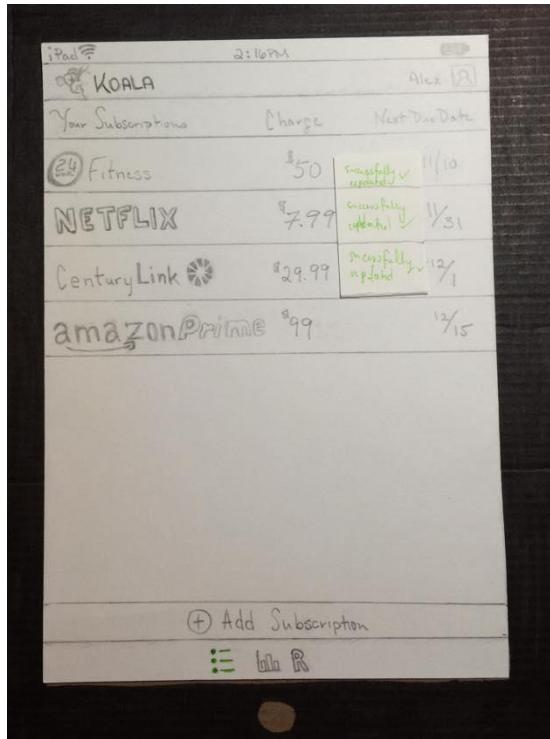
Step 4: An editable form appears containing information related to "My Debit Card." The participant quickly sees which fields need to be updated.



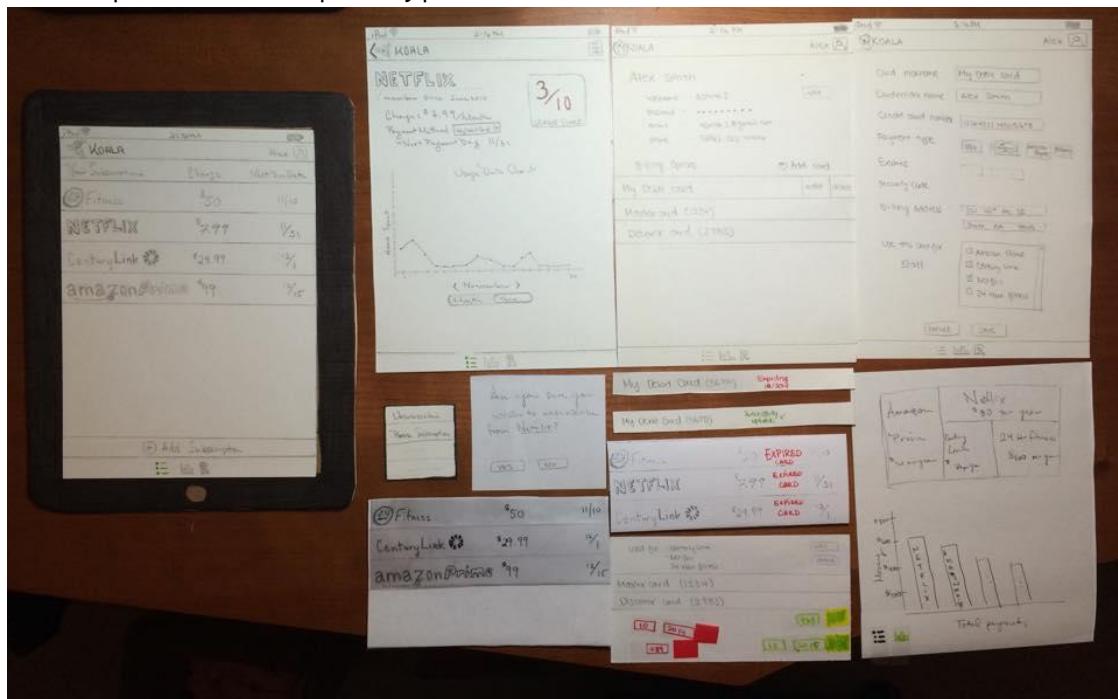
Step 6: Click the "Save" button and the participant is navigated back to the Account page where they see "My Debit Card" is now up-to-date.



Step 7: The participant may return to the homepage where they no longer see the red text. In its place there is a confirmation saying that they have successfully updated the payment for those services.



All components of the prototype:



Prototype Testing Process

Participants

The first participant is a senior computer science student at the University of Washington who has taken CSE 440 before. The second participant is a senior computer science student at the University of Washington. The third participant is an advisor in the Computer Science and Engineering Department at the University of Washington.

All of our participants are in a technology related field, are moderately affluent, and have multiple recurring subscriptions; therefore, satisfying our requirements.

Environment

We conducted our tests in locations that were most comfortable to our participants. Our first usability testing was conducted in Lab O22 in Paul G. Allen Center's basement. Our second usability testing was conducted in Paul G. Allen Center's breakout area on the second floor. And our third usability testing was conducted in the office of our third participant. All tests were completed on a table.

Tasks

1. "Please use our application to determine if your Netflix subscription has been worthwhile to you. If you find that your usage of Netflix is not worth the cost of the subscription, please use Koala to unsubscribe from Netflix."
2. "You just received a new debit card, exactly the same as your old card except it has a new security code **** and a new expiration date **/**. Please use Koala to update your billing information so that your recurring payments will now be charged to the updated card."

Method

At the beginning of test, we told participants that they could quit anytime, their names will not be published and this was a part of CSE 440's project. Also, we mentioned that we were testing the paper prototype and its interface for improvement and feedback but not participants' knowledge and intelligence. Then we briefly introduced our prototype to participants and explain what tasks we need participants to perform. Then we started the test.

During tests, we typically had 2 to 3 of us present. One acted as the computer, one the note-taker, and the last the prompter. We combined roles if there were only 2 of us. The note-taker recorded what participants had an easy versus hard time figuring out and any feedback our participants gave us. With each usability testing, we found that certain members of the team were better at prompting the participant or quickly setting up the next frame. As we gravitated to the specific role that best fit, each subsequent usability testing became smoother and easier to carry out.

In between usability tests, we took the feedback we got from the previous test and implemented any changes we felt necessary into our prototype. This allowed us to progressively iterate through our design.

Testing Results

Heuristic Evaluations

From the heuristic evaluations, we found several heuristics violated in our designs that we wanted to fix. The most important of which included error prevention, consistency/standards, and the visibility of the system.

The error that could occur in our designs was located in the payment method's edit page. We initially allowed participants to update what services that card paid for from an individual payment method's page. However, this could lead to an error if the participant selects multiple payment methods for the same service or if the participant unchecks a subscription from an individual payment method leading to no payment method selected to pay for that service. This would require a complex process to ensure that all services were being paid for by one card and require updating across the whole application. We chose to remove this function from the individual payment method's page and simply display a static list of services. Participants would need to navigate to an individual service's page and change the payment method from there.

Some parts of our design were not consistent with standards. For example, people were confused about the purpose and how to use the month/toggle switch because it did not match external standards. In addition, our accordion drop-down view for payments did not indicate that it was an accordion drop-down from the plain list view.

Other heuristics included the visibility of the system. Participants wanted confirmation that they had successfully cancelled a subscription. They also mentioned the charge per subscription bar graph in the data tab was not relevant and was not an efficient use of that space. They were more interested in usage of a service. In addition, participants were curious about the usage score and how it was calculated. At the time, we classified this as a flexibility and efficiency of use heuristic because we considered this a need for more experienced and curious participants. We chose not to address this, but as we will find out in our usability tests, this became a recurring question our participants had.

Usability Testing

We completed 3 usability tests, iterating on our design between each. With each subsequent usability test, we found our participants had an easier time completing the tasks.

Our first test was with Andrew. In our first task to evaluate and unsubscribe from Netflix, he quickly came to the conclusion that the Netflix usage score was bad. However, he had a hard time finding the unsubscribe button that was hidden in the menu/list button at the top of a single subscription's view. He started looking around for it in other places and shortly after, realized where to go. In the update debit card task, he wanted to click on the red "expired card" text on each individual subscription at first instead of the account settings. From this usability test, we decided to have the unsubscribe button in place of the menu/list where it was hidden. We also decided to add another path to the expired card to update by making the "expired card" text on an individual subscription clickable.

In our second test with Ben, he had a much easier time with both tasks. However, he still provided valuable insight to what could be improved. Interestingly, he used the monthly/yearly data on Netflix to decide whether to unsubscribe or not. He had tried to click on the usage score (which did nothing) and ended up not considering the usage score because he did not know whether it was good or bad if he did not see other scores to compare it to. He easily found the unsubscribe button. During the second task, he utilized our newly added path of reaching the edit

page of an expired card. He quickly updated the card by first clicking on the “invalid card” text on the services in the homepage. He also discovered an inconsistency in our design: at the time, we lacked any indication that a service’s payment method is expired from that individual service’s page.

Our third test with Carol confirmed insight from Ben. She also expressed interest in comparing the usage score of a service with other services and wanted to find out more about our usage score calculations. Like Ben, she used the monthly/yearly data to decide to unsubscribe. She chose to update her debit card by arriving there through the profile view/account settings page, showing that both paths to the expired card can be utilized efficiently.

Section Design Critique

From our design critique in section, we found a few more inconsistencies. Our positive/negative action orderings were inconsistent. For example, in a cancellation confirmation pop up, we ordered the action buttons as “yes” then “no.” However, in the edit payment page, we ordered the action buttons as “cancel” then “save.” To fix this inconsistency on our application, we decided to have the action buttons on the left be negative and positive on the right (i.e. “no”/“yes” and “cancel”/“save”). Our drop-down arrows were also inconsistent with standards. Standards has the arrow for a drop-down list as “>” when the drop-down is closed, and “v” when the drop-down is open. We had it as “v” in both open and closed states.

In addition, the TA suggested using a bar graph for the usage comparisons on the data tab view instead of the circles, since circles are harder to compare. Our peers also suggested adding a pop-up to indicate a payment method was successfully updated, just like our subscription cancellation success pop-up.

Digital Mockup Critique

We implemented the design suggestions from the previous critique into our digital prototype. During our digital prototype critique, we received a few more suggestions to apply for our updated digital design.

In our data tab view, people suggested having a single drop-down icon to filter what services appear in the usage and budget graphs instead of separate filters for each graph. In addition, to move this single drop-down filter icon to the right side of the application view. We have updated our digital mockup to reflect these changes. Within the filter, there was a suggestion to include an option to “Select All” service; however, we have decided to hold off on this change due to its low impact on how participants complete the tasks. We also received comments that our title for the usage graph is unclear, and have therefore rephrased it.

Another suggestion involved making a more realistic usage graph on the in-depth Netflix view. The Netflix usage should be decreasing instead of increasing to go along with our task of unsubscribing from a rarely used service to save money. Also, on the homepage, the due dates for services should be different because they were initially all the same. We have updated our digital mockups to reflect these changes. In addition, there was expressed interest in seeing additional views in the adding a subscription view: the current view to display an initial view of the add page and another to display an after view for when participants finished searching for a subscription and are looking at the results and recommendations. At the moment, we have decided to postpone from adding an additional view since adding a subscription is not one of our main tasks.

It was also suggested to have a consistent set of units on the homepage for the charges of each subscription service. Currently, some services charge per month and other services charge per

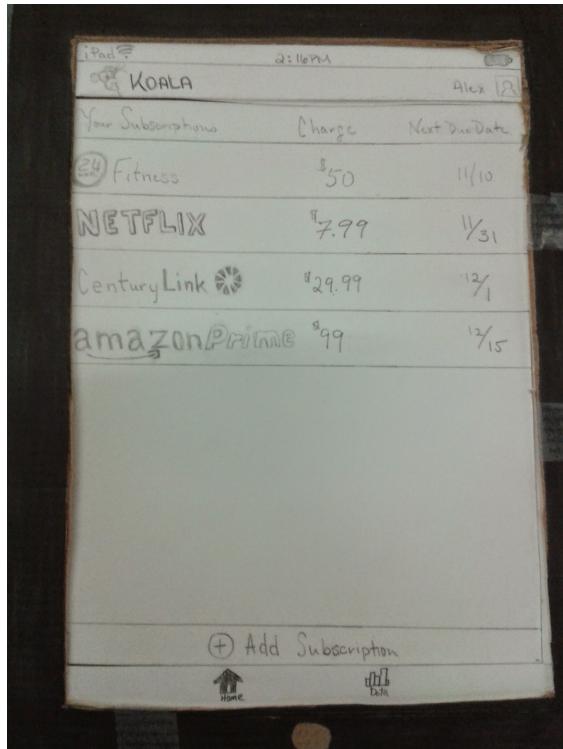
year. However, choosing to show either per year or per month charges can lead to confusion for the participant. If we showed a per year charge for a service that actually charges monthly this could scare the participant. Or if we showed a per month charge for a service that actually charges yearly this could result in poor budget planning. We will keep it as is for now, providing a "/month" or "/year" depending on subscription, to give the participant a good sense of information about their services from a glance at the homepage, but a potential fix to this may be to remove the unit completely and simply show a payment amount that will be charged on the next due date. Then we can move the units into the individual subscriptions view. We can implement this later if we were to try A/B testing to see what participants respond to better.

Final Paper Prototype

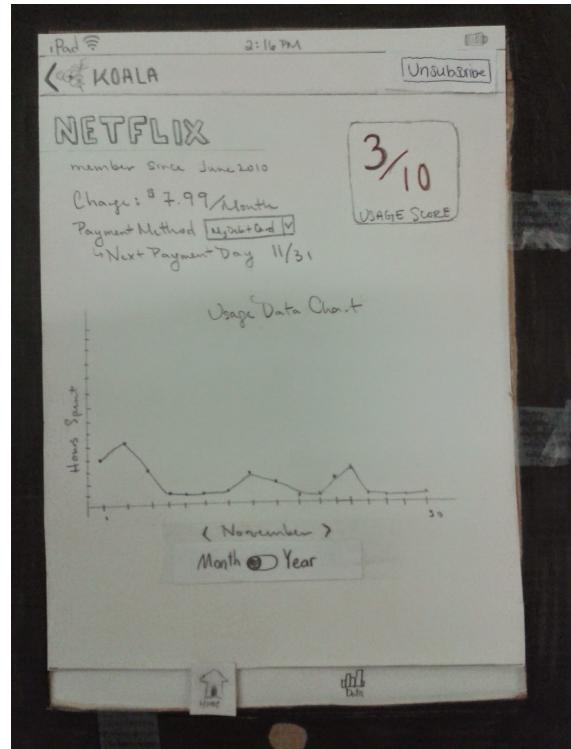
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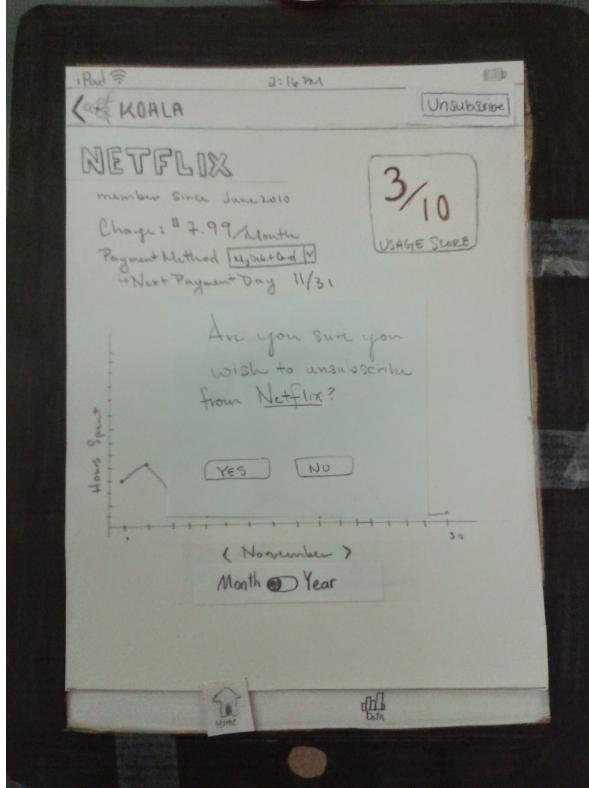
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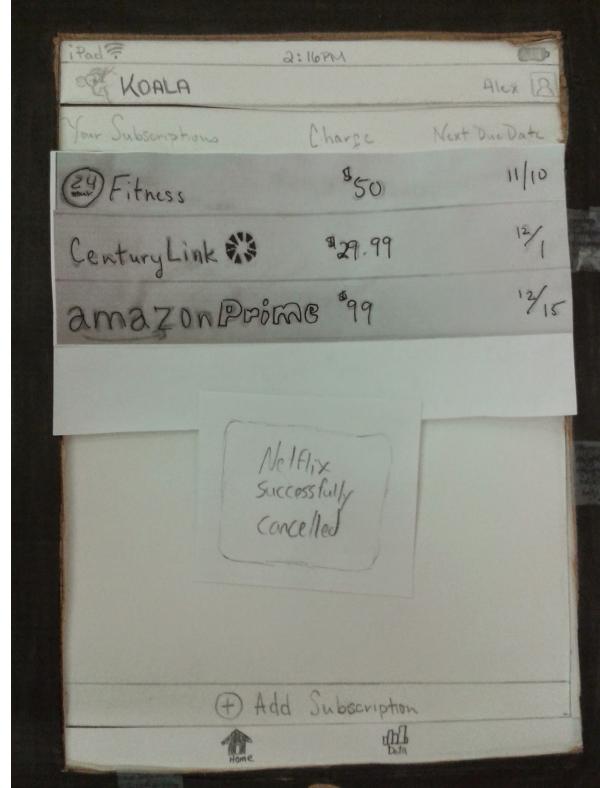
Step 2: Click on the Netflix subscription from the list. A new view floats down presenting detailed information on the Netflix subscription.



Step 3: From the data and graph presented, the participant decides to unsubscribe. They click the “Unsubscribe” button and a confirmation window appears.



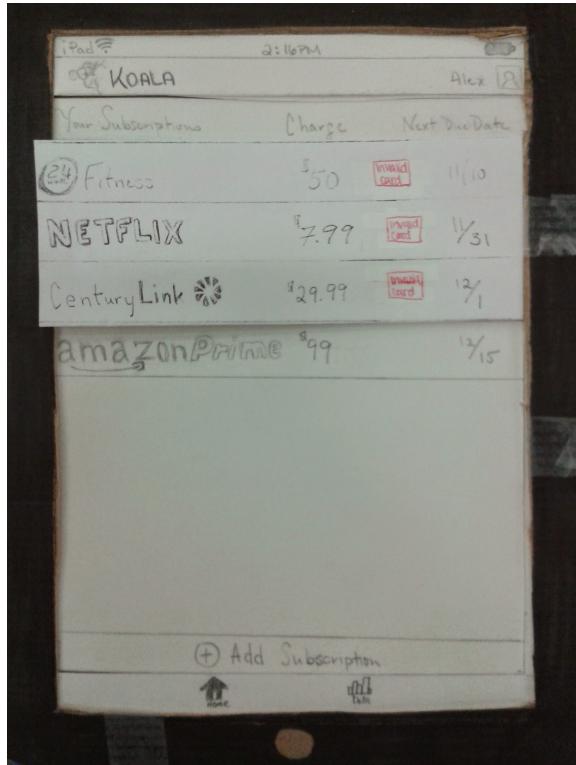
Step 4: Upon clicking “Yes,” the participant is navigated back to the homepage, which now displays a confirmation popup and an updated list that no longer displays the Netflix subscription.



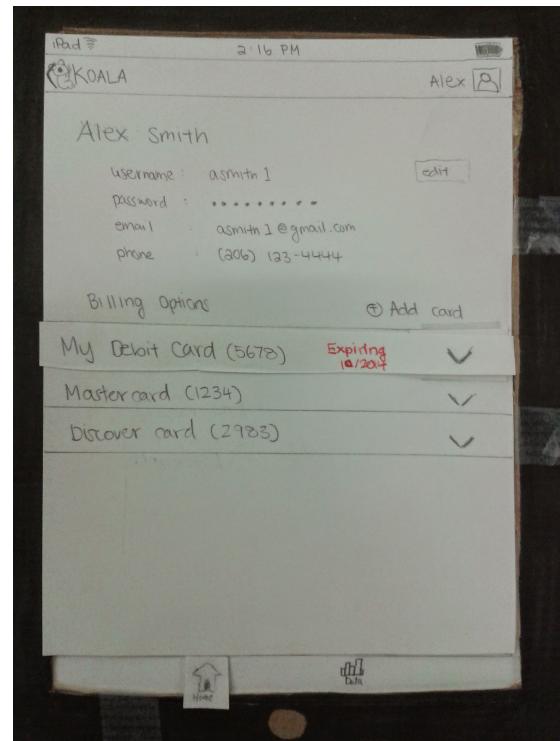
Task 2

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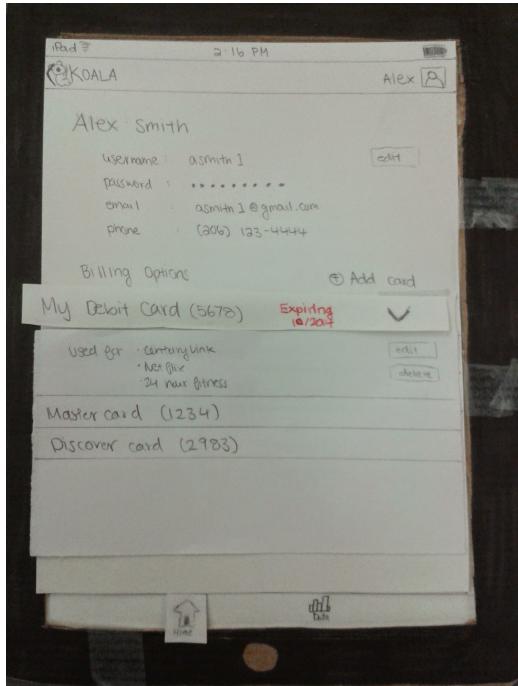
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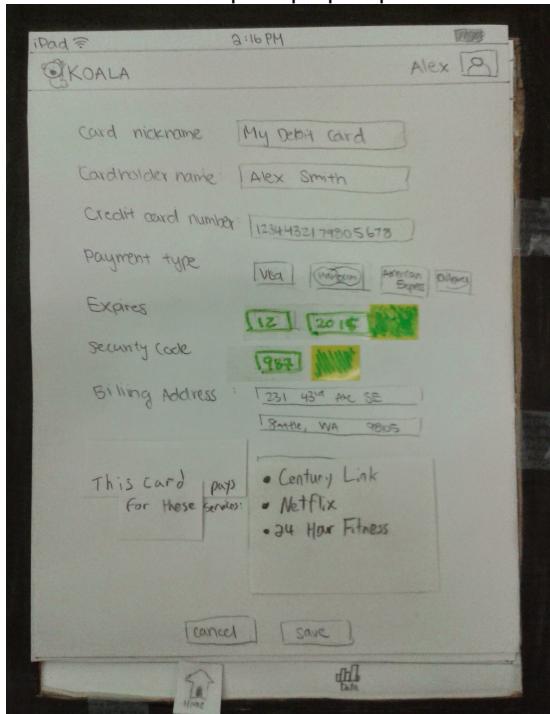
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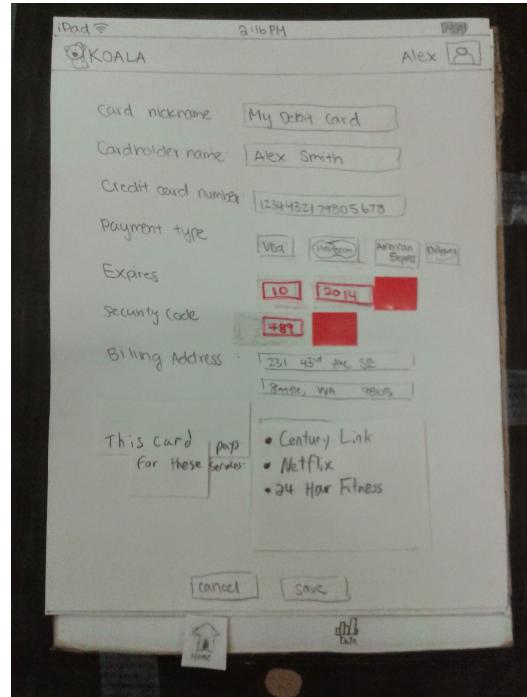
Step 3: Click on the expired debit card ("My Debit Card") and an accordion view will expand beneath the row. Here the participant will click "Edit" to edit the card's information.



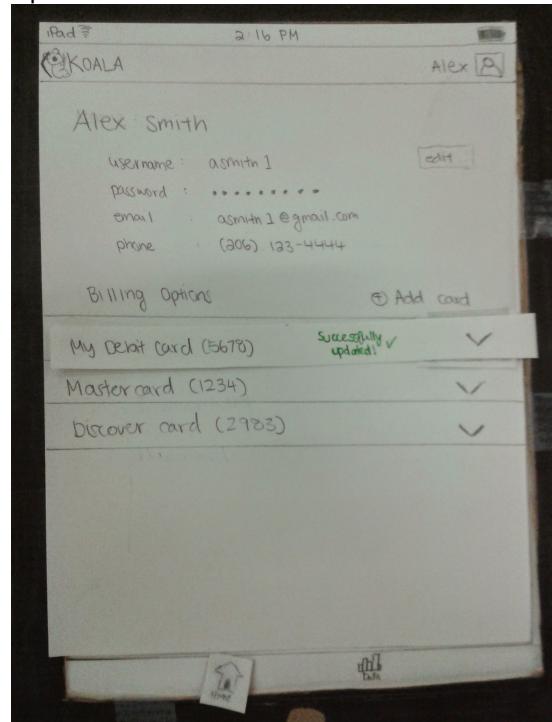
Step 5: Update both the security code and the expiration date fields with the numbers provided. Input is provided via a standard numerical touchpad pop-up.



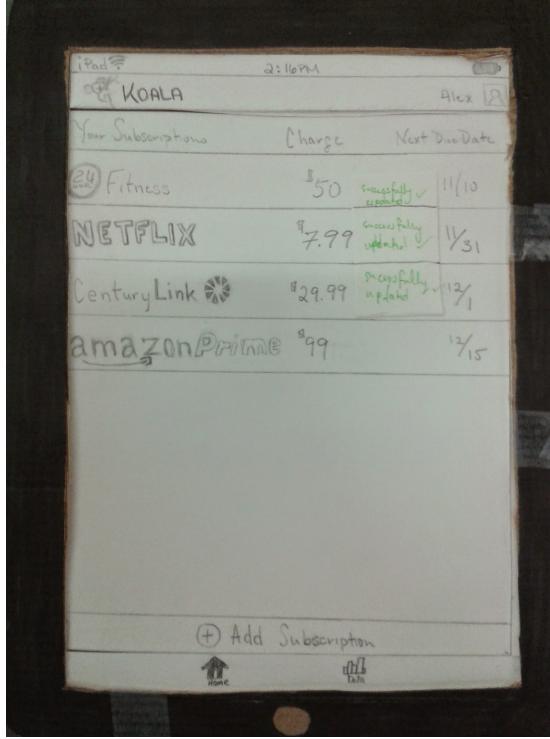
Step 4: An editable form appears containing information related to "My Debit Card." The participant quickly sees which fields need to be updated.



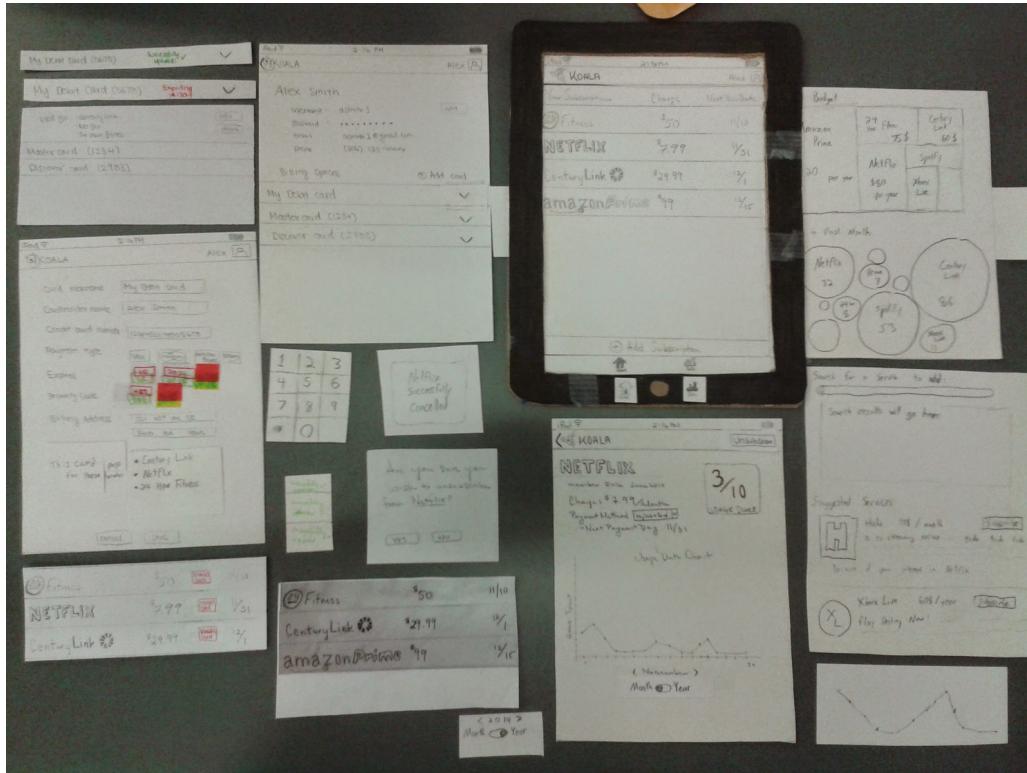
Step 6: Click the "Save" button and the participant is navigated back to the Account page where they see "My Debit Card" is now up-to-date.



Step 7: The participant may return to the homepage where they no longer see the red text. In its place there is a confirmation saying that they have successfully updated the payment for those services.



All components of the prototype:

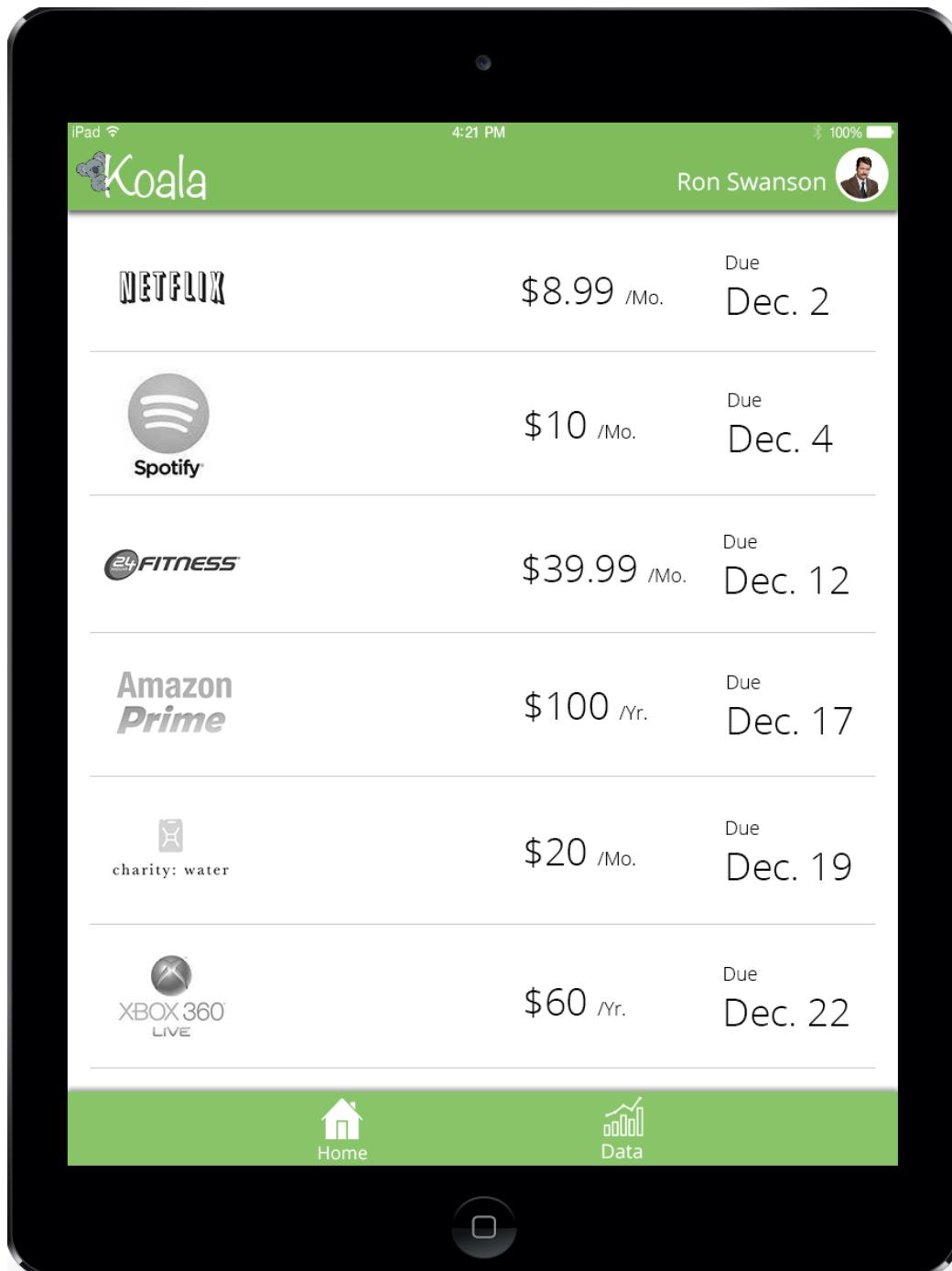


Digital Mockup

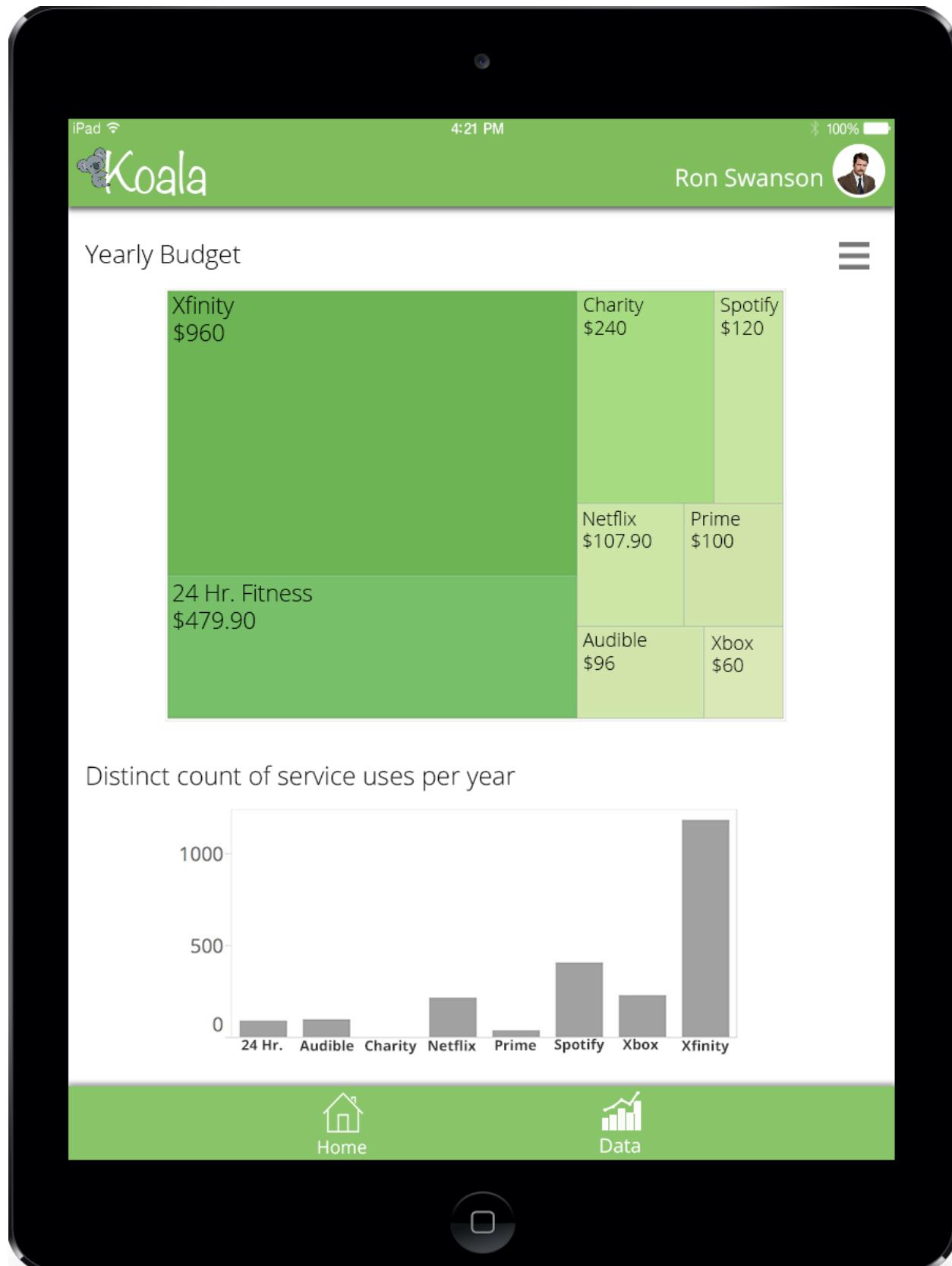
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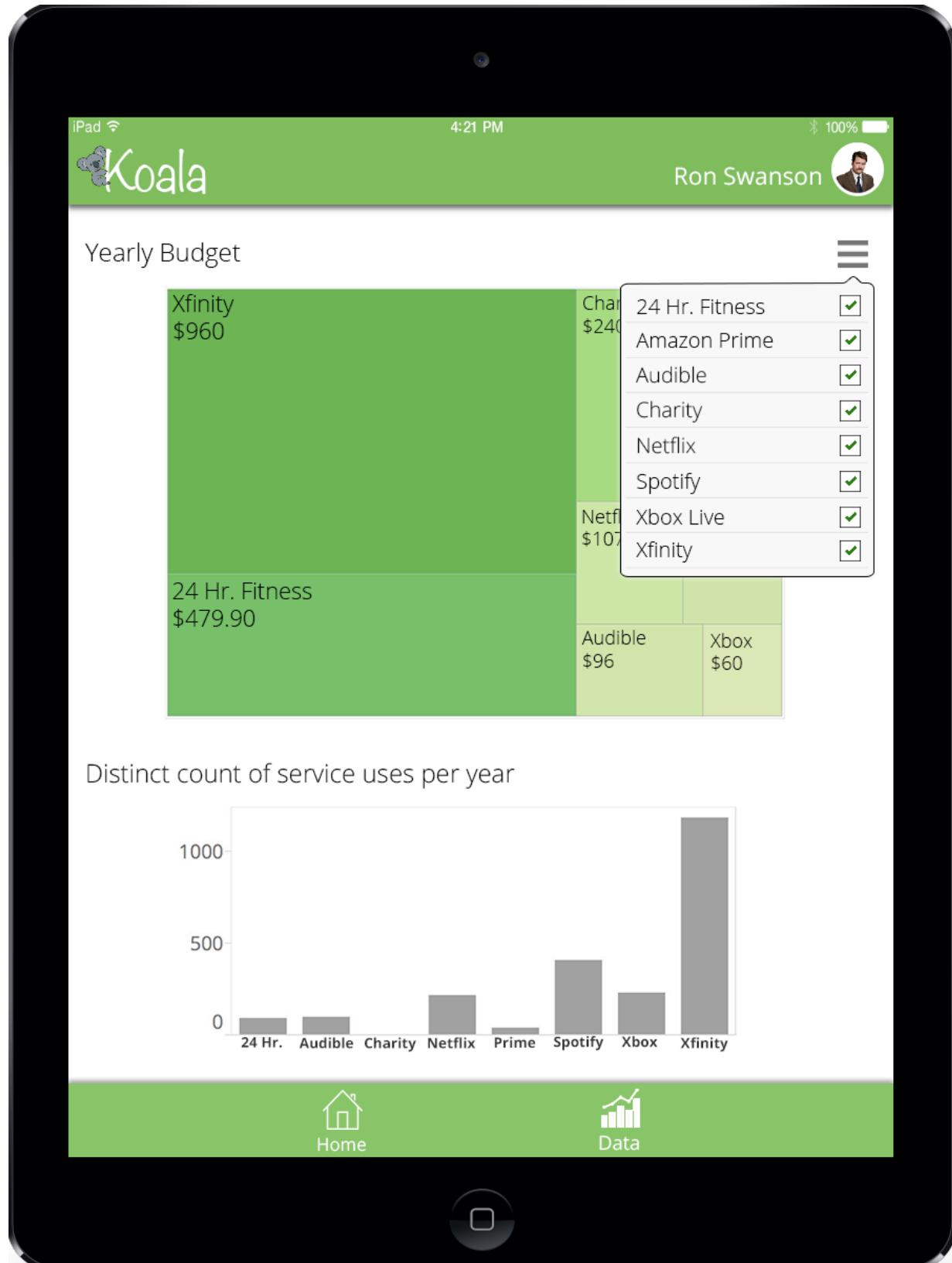
Step 1: Open Koala and land on the homepage



Step 2: The participant decides to explore the “Data” tab. They swipe to the left or click on the data icon in the bottom navigation bar.



Step 3: The participant decides to filter out some of the data to get a clearer picture of how they use Netflix. The Xfinity service is noisy data for them at this point. They open the context menu to modify the data visualization charts.



Step 4: The participant unclicks the check next to Xfinity to filter out its data.

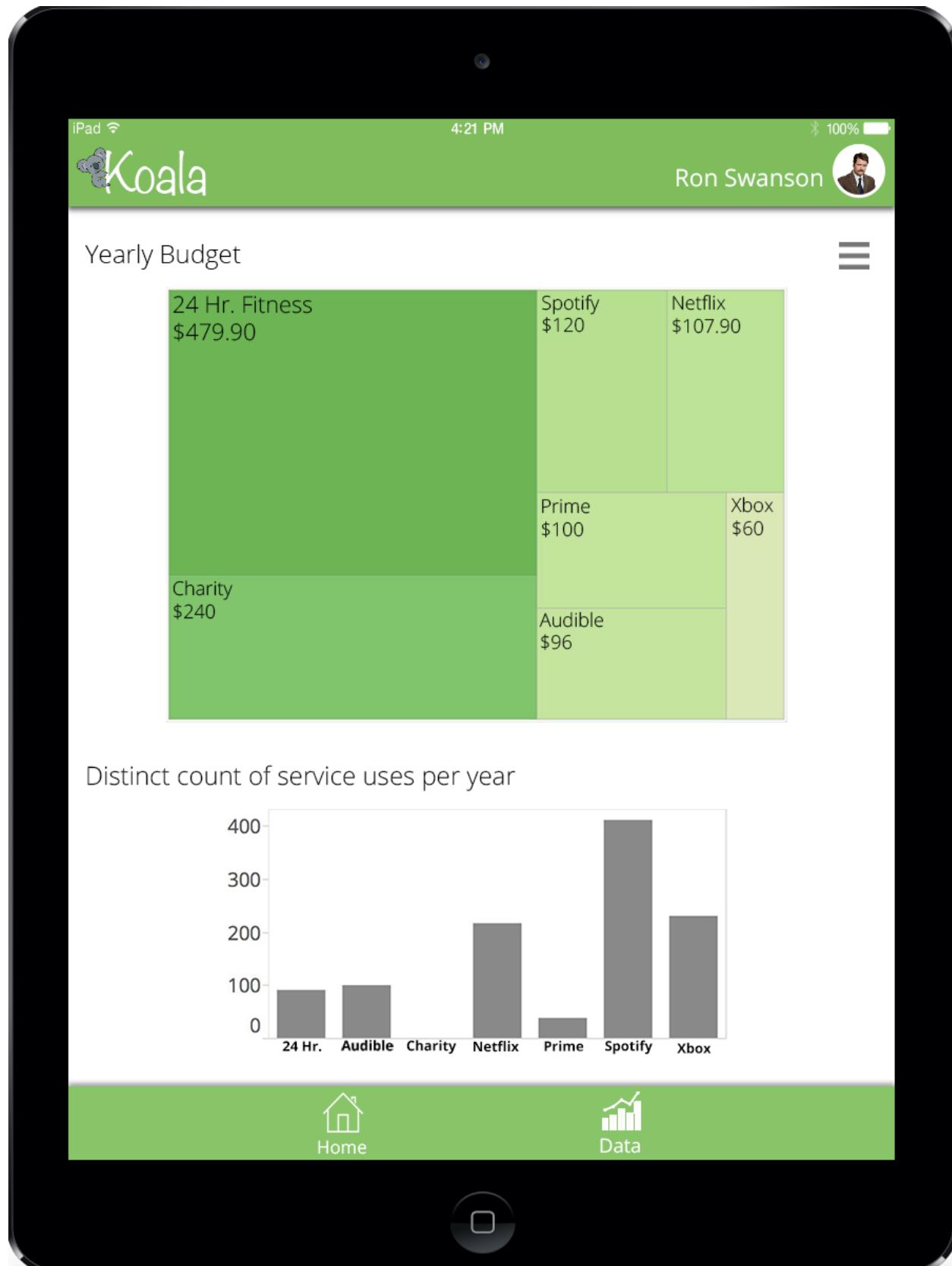
The screenshot shows the Koala app interface on an iPad. At the top, there's a green header bar with the Koala logo, the time (4:21 PM), battery level (100%), and a profile picture of Ron Swanson. Below the header, the main screen displays a "Yearly Budget" section. This section includes a large green box for "Xfinity" (\$960) and a smaller green box for "24 Hr. Fitness" (\$479.90). To the right of these boxes is a vertical list of services with checkboxes: 24 Hr. Fitness (checked), Amazon Prime (checked), Audible (checked), Charity (checked), Netflix (checked), Spotify (checked), Xbox Live (checked), and Xfinity (unchecked). Below this list is a small green box for "Audible" (\$96) and another for "Xbox" (\$60). At the bottom of the screen is a chart titled "Distinct count of service uses per year". The chart has a y-axis from 0 to 1000 and an x-axis with categories: 24 Hr., Audible, Charity, Netflix, Prime, Spotify, Xbox, and Xfinity. The bars show the following approximate values: 24 Hr. (~50), Audible (~50), Charity (~100), Netflix (~150), Prime (~20), Spotify (~400), Xbox (~150), and Xfinity (~1100). The bottom navigation bar features a "Home" icon with a house and a "Data" icon with a bar chart.

Service	Checkmarked
24 Hr. Fitness	✓
Amazon Prime	✓
Audible	✓
Charity	✓
Netflix	✓
Spotify	✓
Xbox Live	✓
Xfinity	✗

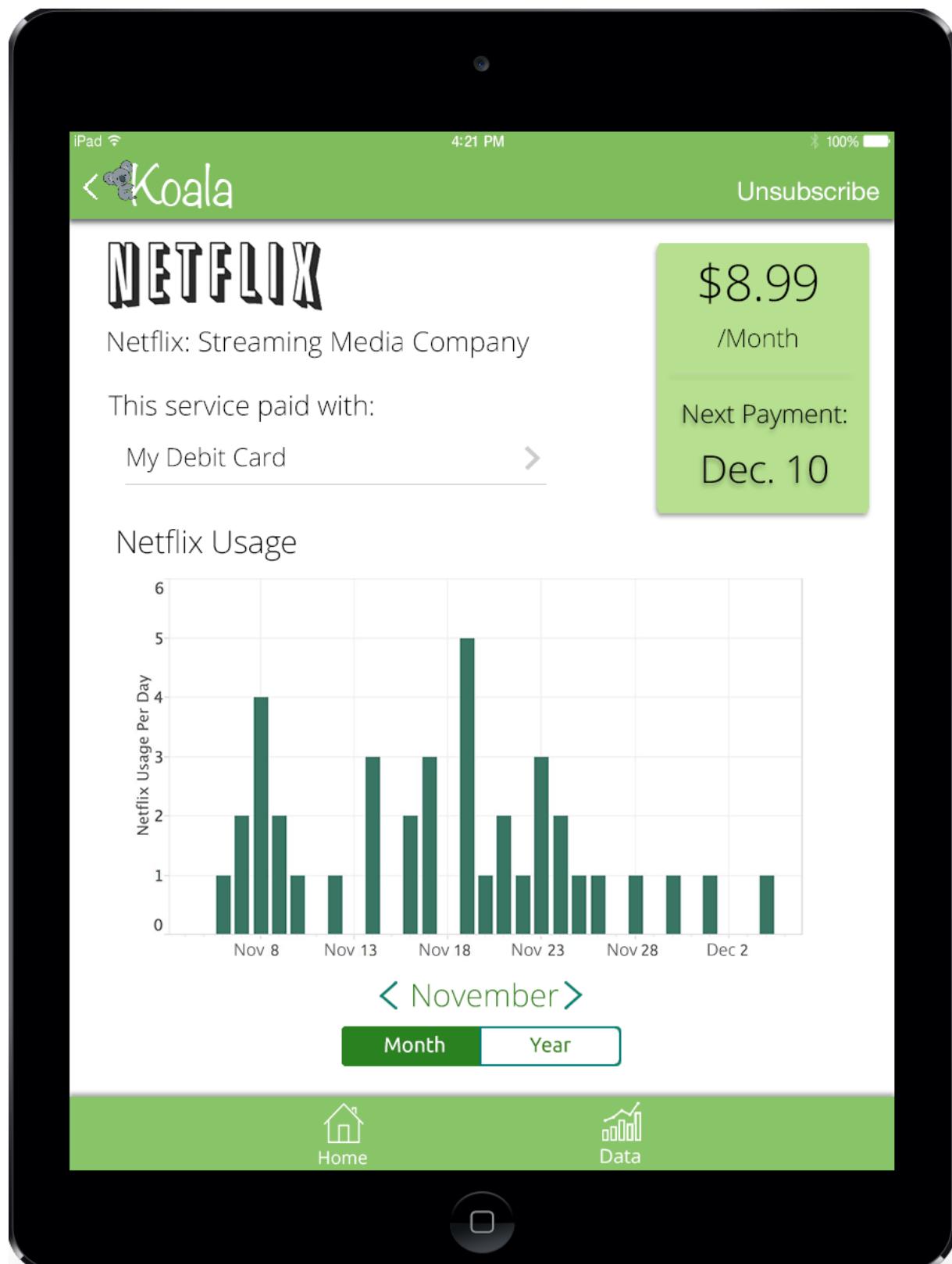
Distinct count of service uses per year

Service	Count
24 Hr.	~50
Audible	~50
Charity	~100
Netflix	~150
Prime	~20
Spotify	~400
Xbox	~150
Xfinity	~1100

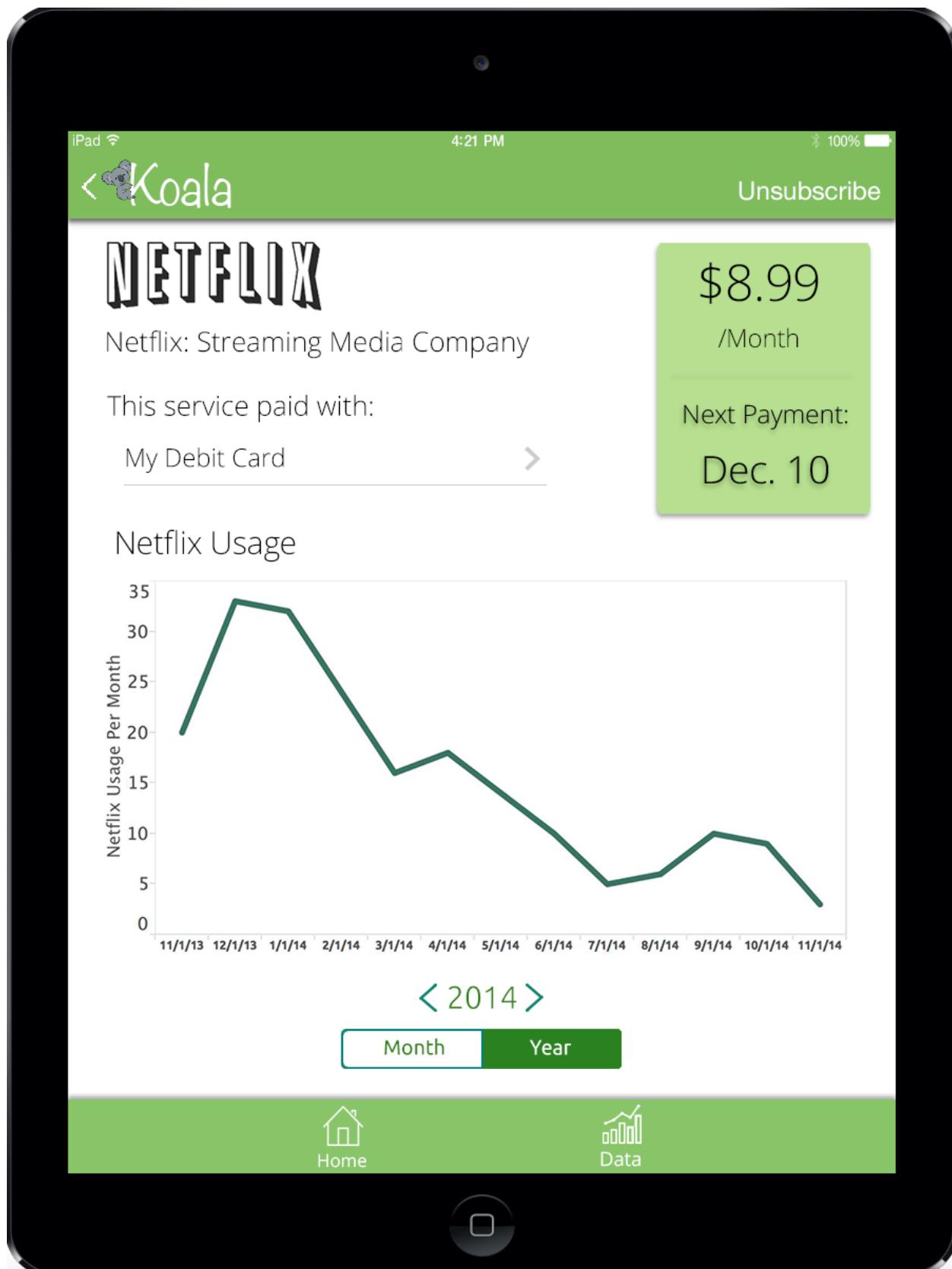
Step 5: Clicking off of the context menu, the participant see updated data visualization charts that exclude the Xfinity data.



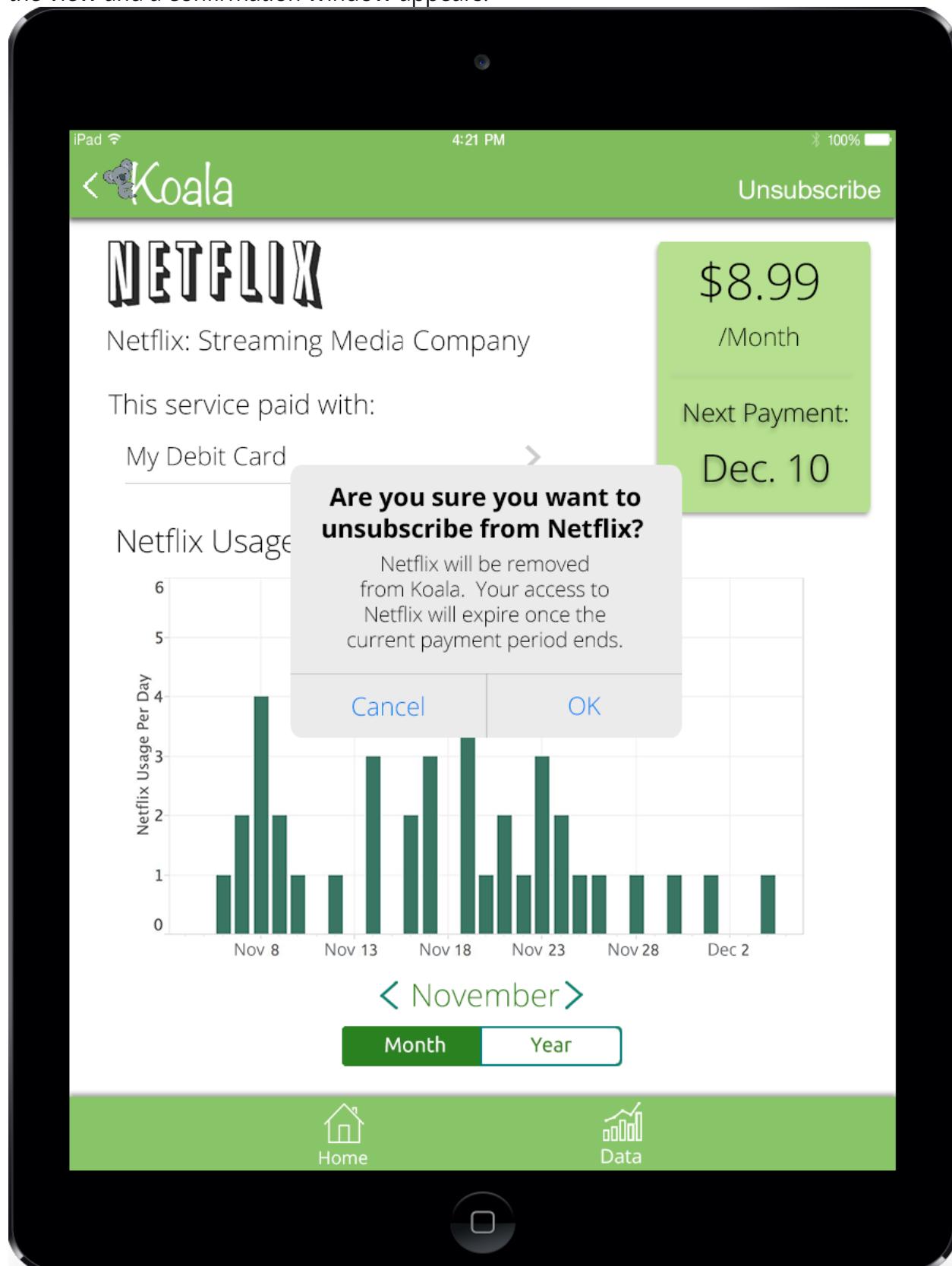
Step 6: The participant now wants to see a more detailed view of Netflix. They click on the Netflix bubble or tree map tile. Alternatively they could click on the Netflix item in the list located on the homepage. A new view floats down presenting detailed information on the Netflix subscription.



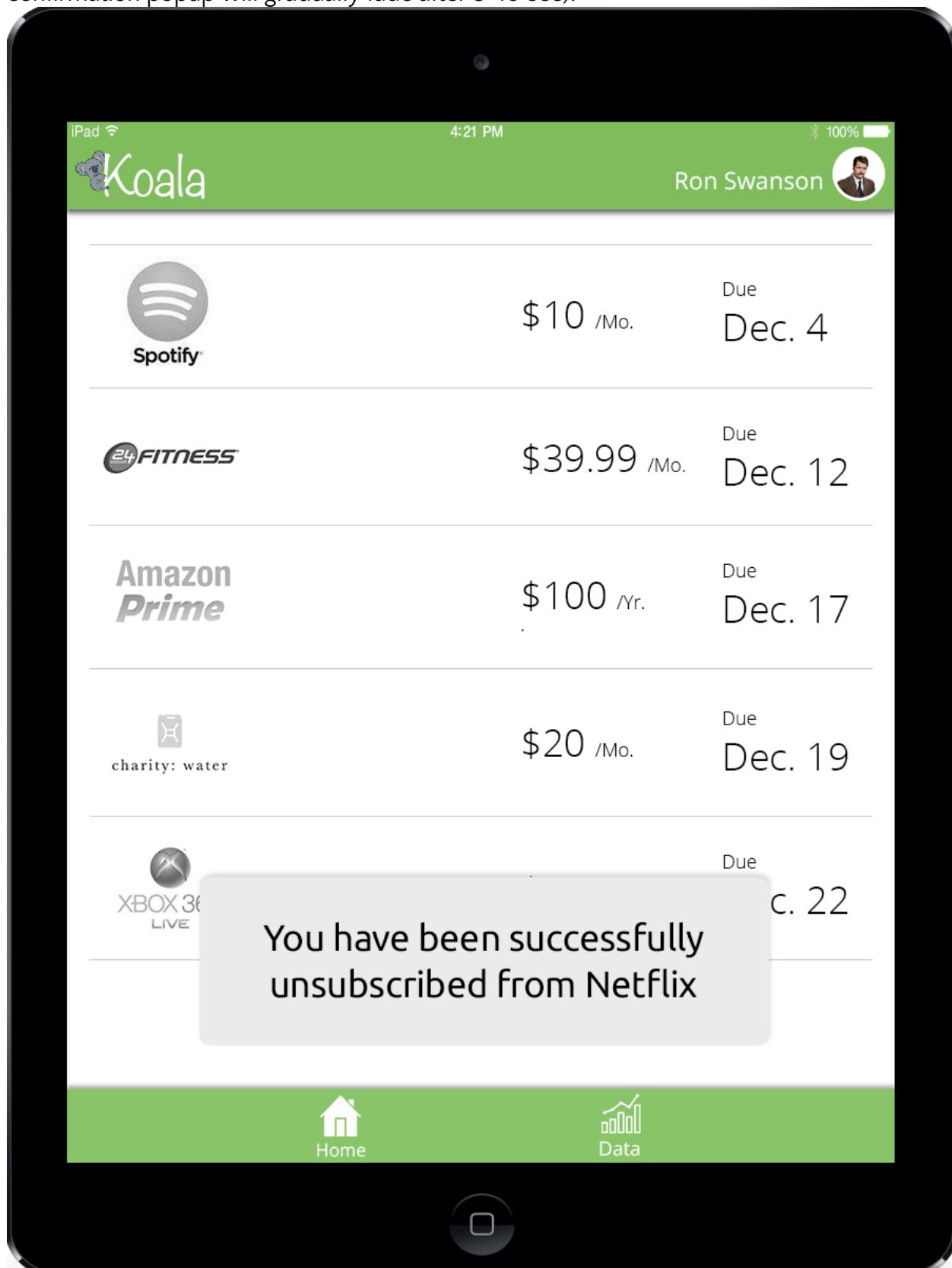
Step 7: The participant can choose to aggregate their data monthly by using the slider at the bottom of the view.



Step 8: At this point, the participant has decided that their usage of Netflix is not worth the price, and therefore would like to unsubscribe. They click the “Unsubscribe” button in the top right of the view and a confirmation window appears.



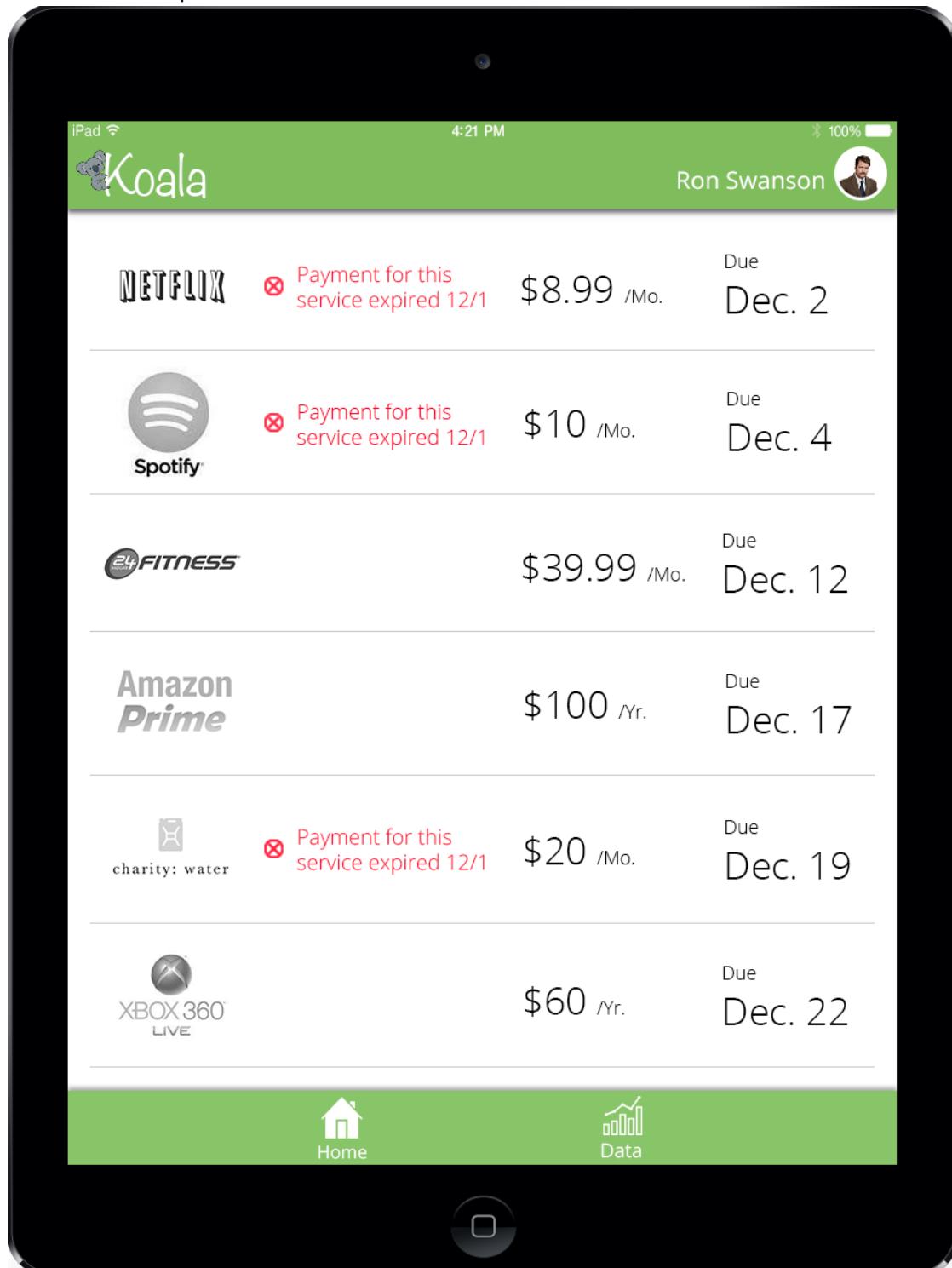
Step 9: Upon clicking “yes,” the participant is navigated back to the homepage displaying a confirmation and an updated list of subscriptions that no longer includes Netflix. (note - the confirmation popup will gradually fade after 5-10 sec).



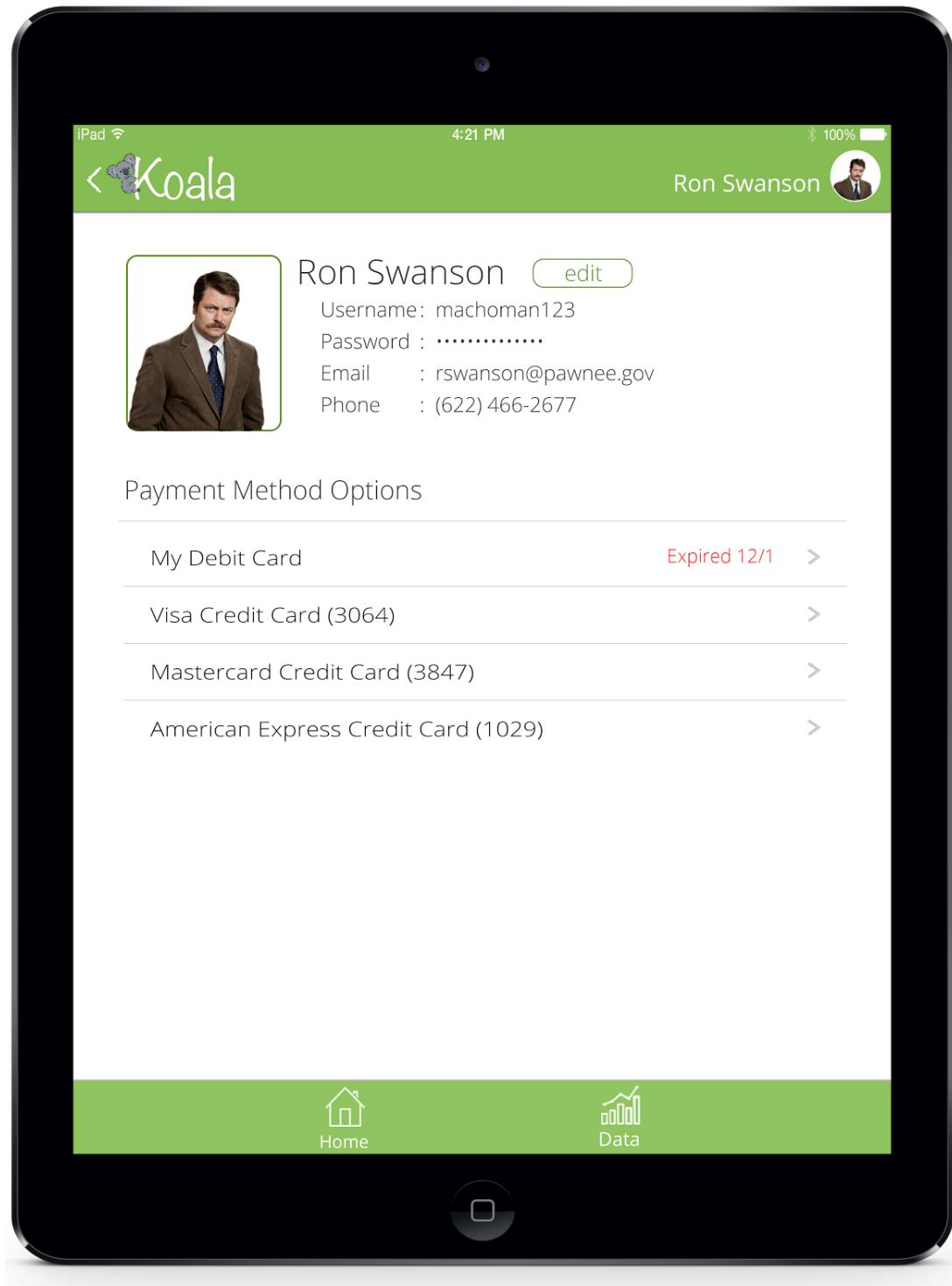
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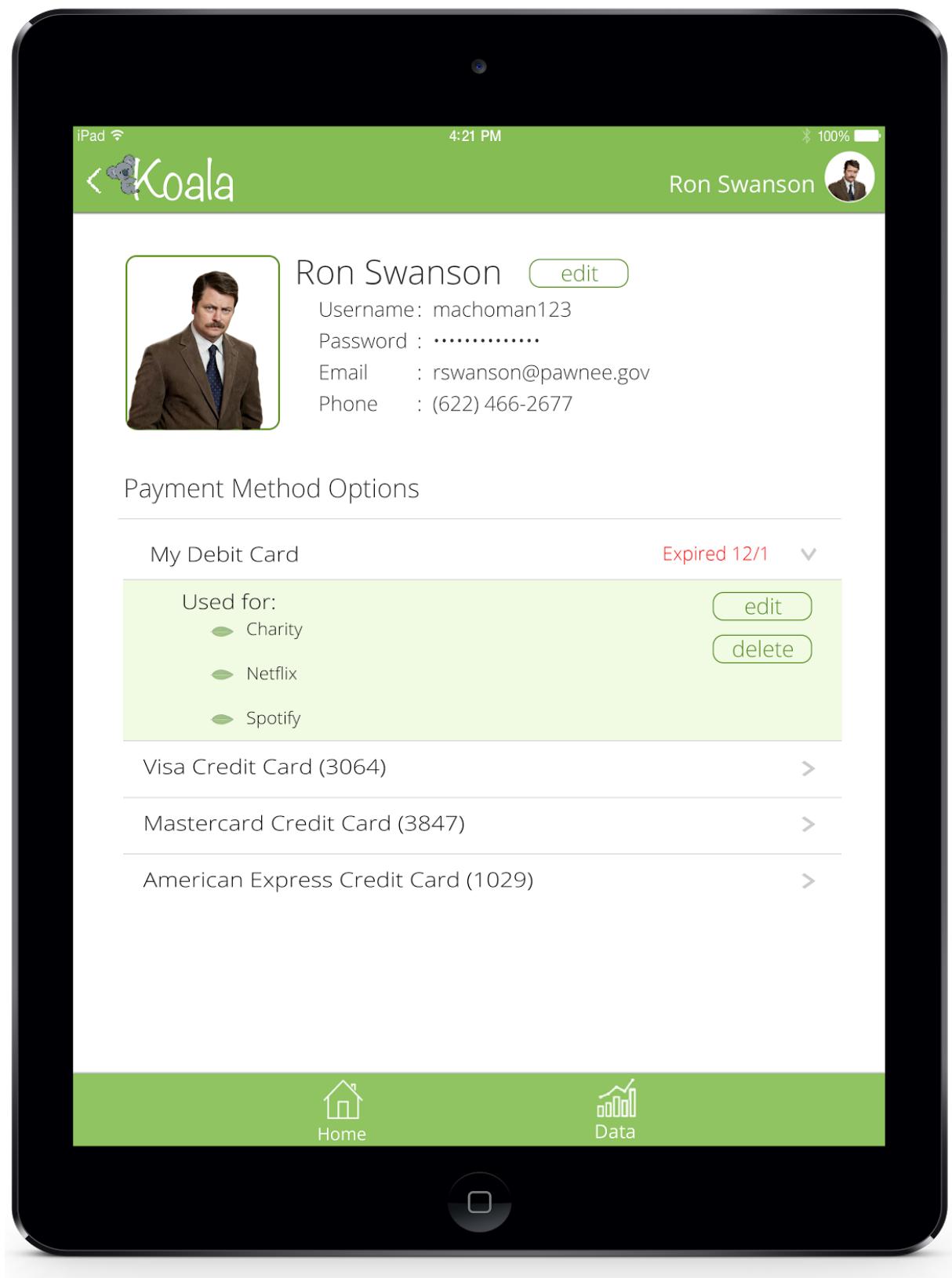
Step 1: Land on the homepage, however now there are warnings that a payment card used for several services has expired.



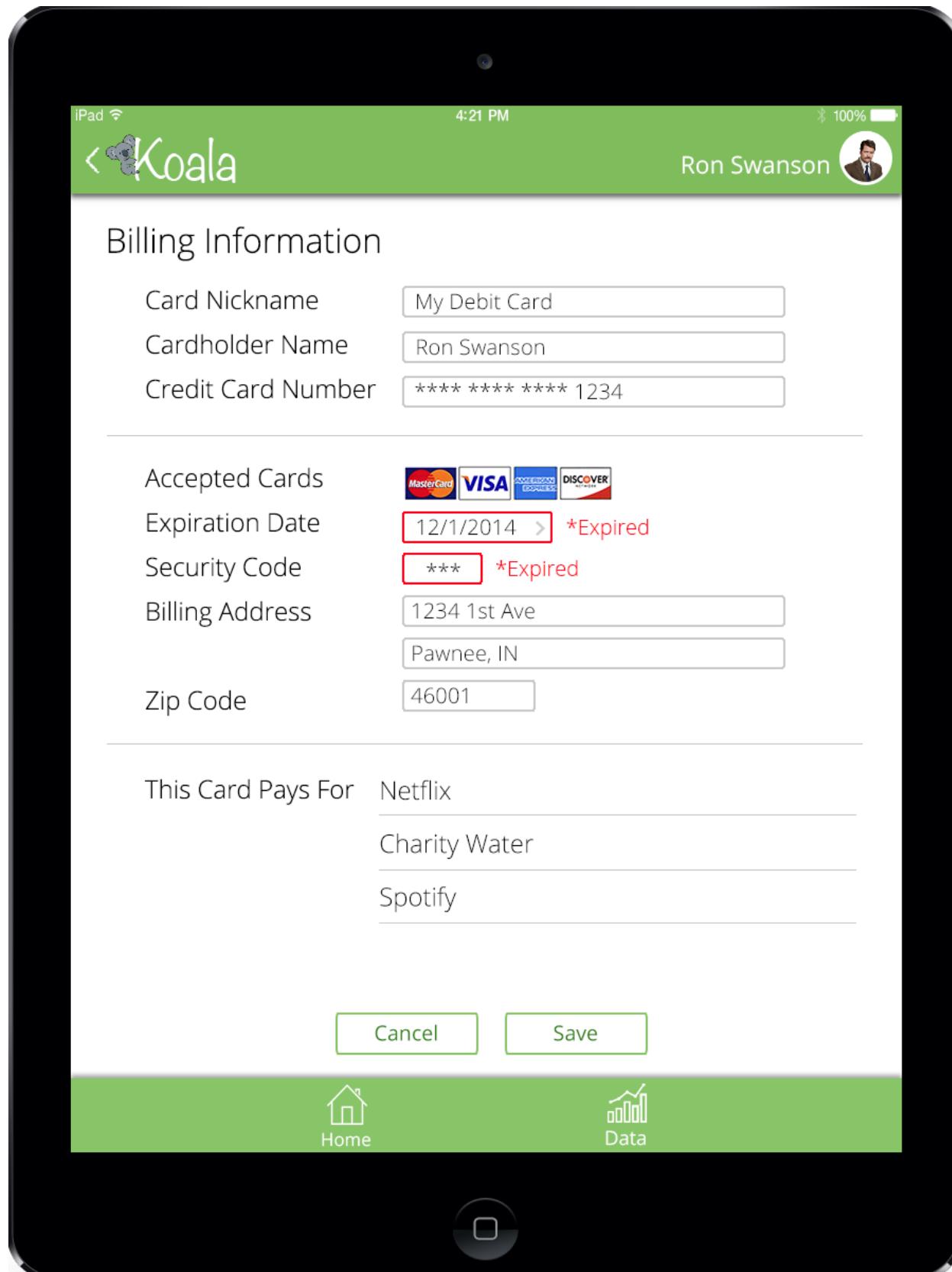
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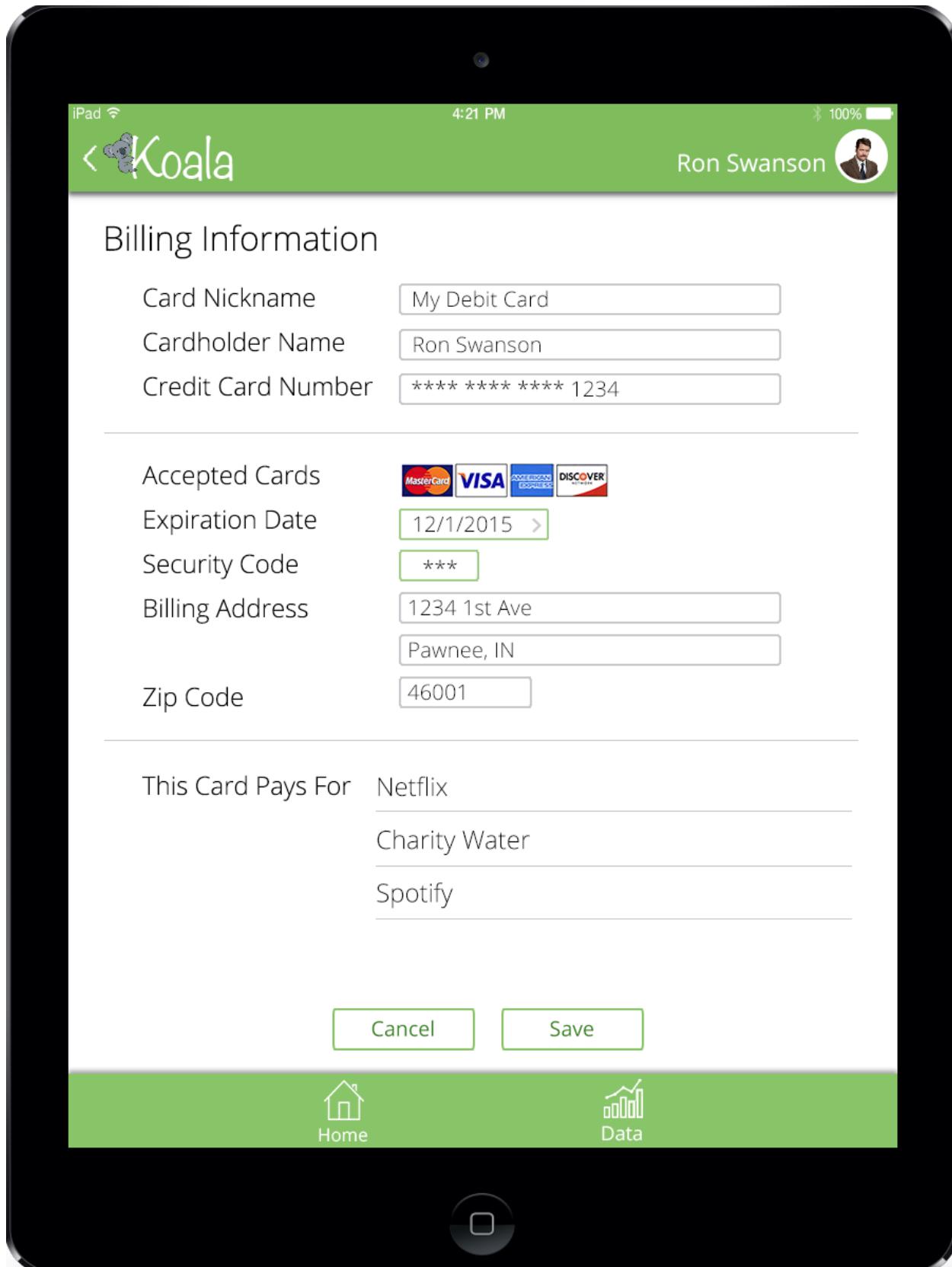
Step 3: The participant can expand the “My Debit Card” to see more information and options available.



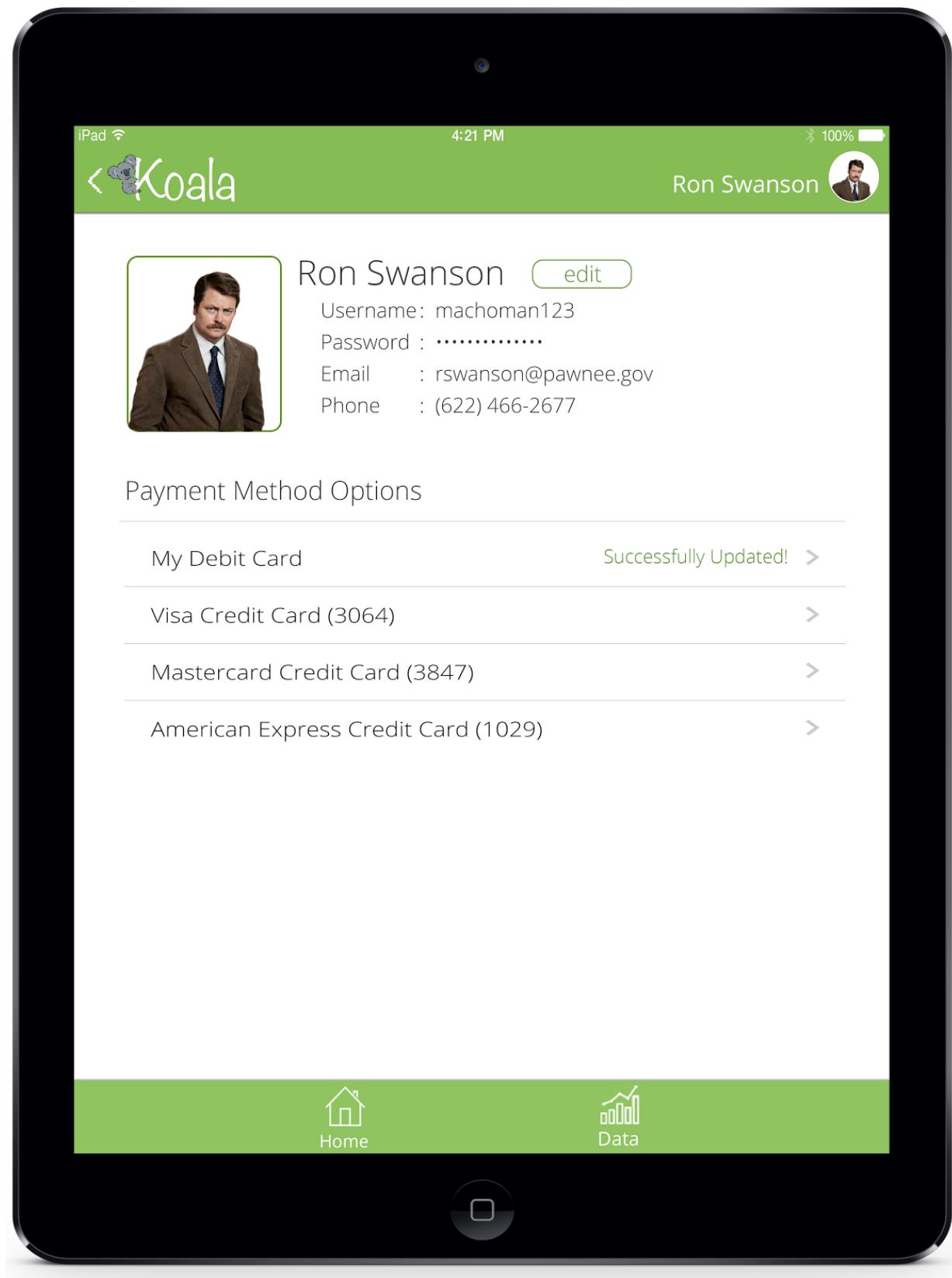
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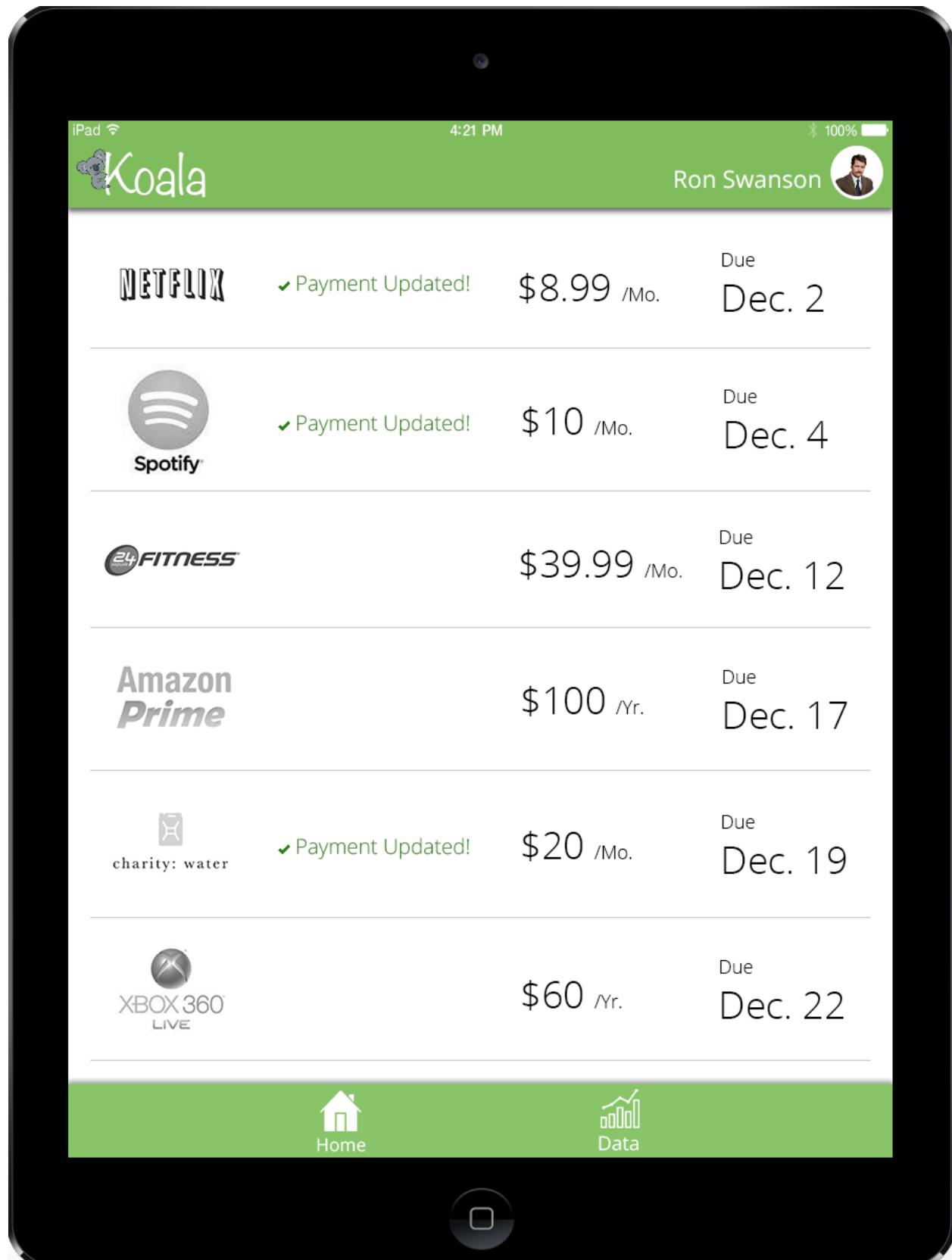
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Step 6: Click the “Save” button and the participant is navigated back to the Account page where they see “My Debit Card” is now up-to-date.



Step 7: The participant may return to the homepage where they no longer see the red text. In its place there is a confirmation saying that they have successfully updated the payment for those services.



Brief Discussion on Digital Mockup

Switching to our digital tools in Adobe Photoshop, we had to make a few more decision decisions. They involved the following:

- We picked a green colored theme, as our application is in the financial space.
- We picked the Open Sans font, as it provides a clean, mobile friendly look.
- We removed the bubble chart from our usage view and replaced it with a bar chart, as we felt this more intuitively conveyed the data we were trying to present.
- We decided to add filters to our usage charts so that participants could easily filter out data that they did not wish to see. This simple addition makes the data more useful.
- We decided on the specific wording for various dialogs and alerts.
- Many of the UI elements changed slightly to align with iOS design principles. We are targeting this application for the iPad initially, so we wanted our design to look as much like an iOS app as possible.
- On the detailed service view, we decided to place more visual emphasis on the next payment due date and the cost of a service.
- We moved the add subscription button to the bottom of the home view's main scrolling view, instead of having it be pinned to the bottom of the frame. This is a more natural place for this button to go.

We did make a few modifications based on the critique we received in section. There were several points in our prototype that need some modifications. For example, on the data tab, there was some redundancy in having two context menus. And our usage graph for Netflix originally didn't accurately reflect a progressive decline. In addition, there were some inconsistency issues that were fixed .

Our design supports our first task in providing an informed view of how a participant is using a specific service. We provide two ways for participants to make an informed decision. Under our data tab, participants can compare cost rates and usage across all of their subscriptions services. While under a specific subscription service, participants can analyze a more detailed graph of the usage for that specific subscription. And from these sources of information, if the participant is unhappy and wishes to unsubscribe, they can do so in just two clicks.

In addition, our design supports our second task in allowing participants to update a payment method across all multiple subscription services in a single location. In the Account section of Koala, participants can quickly see what are their different payment methods, identify which of those are expired, and then easily update any expired payment cards synchronized across all subscription accounts.

Discussion and Reflection

Overall, the iterative approach to our design was of the appropriate length. We learned a lot from the heuristic evaluations and usability tests. We believe that more usability testing would have entered the realm of diminishing returns, so we were satisfied with the amount we took away from the design process, and also believe our designs are on right track to solving the problems we set out to solve.

There were a few instances in our design where we initially did not make it easy and intuitive enough for the participant to complete an important action. For example, the ability to unsubscribe from a service was a core part of one of our tasks, and our UI obfuscated this functionality. Thus, we decided to make this functionality easier to find. We also learned some important UI lessons regarding affordances. For example, we initially provided a toggle switch that changed the aggregation range on our graphs from a monthly aggregate to a yearly aggregate. Initially, the function of this toggle was unclear to the participant, therefore we changed its style to make its purpose clear to the participant. There were a few more similar cases where we did not design elements as clearly as we had initially thought.

The biggest change that we made based on these studies was to remove the usage score from our application. Based on feedback from our participants, we decided that this feature was confusing and incoherent. We learned that people do not want an arbitrary score to help them compare two different services. Often, comparing two services without the participant's personal knowledge can be very difficult. While a participant may spend more for a gym membership and use it less than the cheaper Netflix subscription, the participant might still find that gym membership incredibly worthwhile to them and would be confused when they see the Netflix subscription rated much higher than the gym membership. Additionally, there are some cases where a usage score simply does not apply. What is your usage for a recurring monthly donation? We learned that the participant of our system has a wealth of domain knowledge on how they use their services that we cannot capture. If we try and simulate that knowledge and give our best guess for a service's usage, we will leave many of our participants confused. Thus we have decided that our task should be focused on presenting data to the participant, rather than trying to draw insight from that data. That is, rightfully, their job.

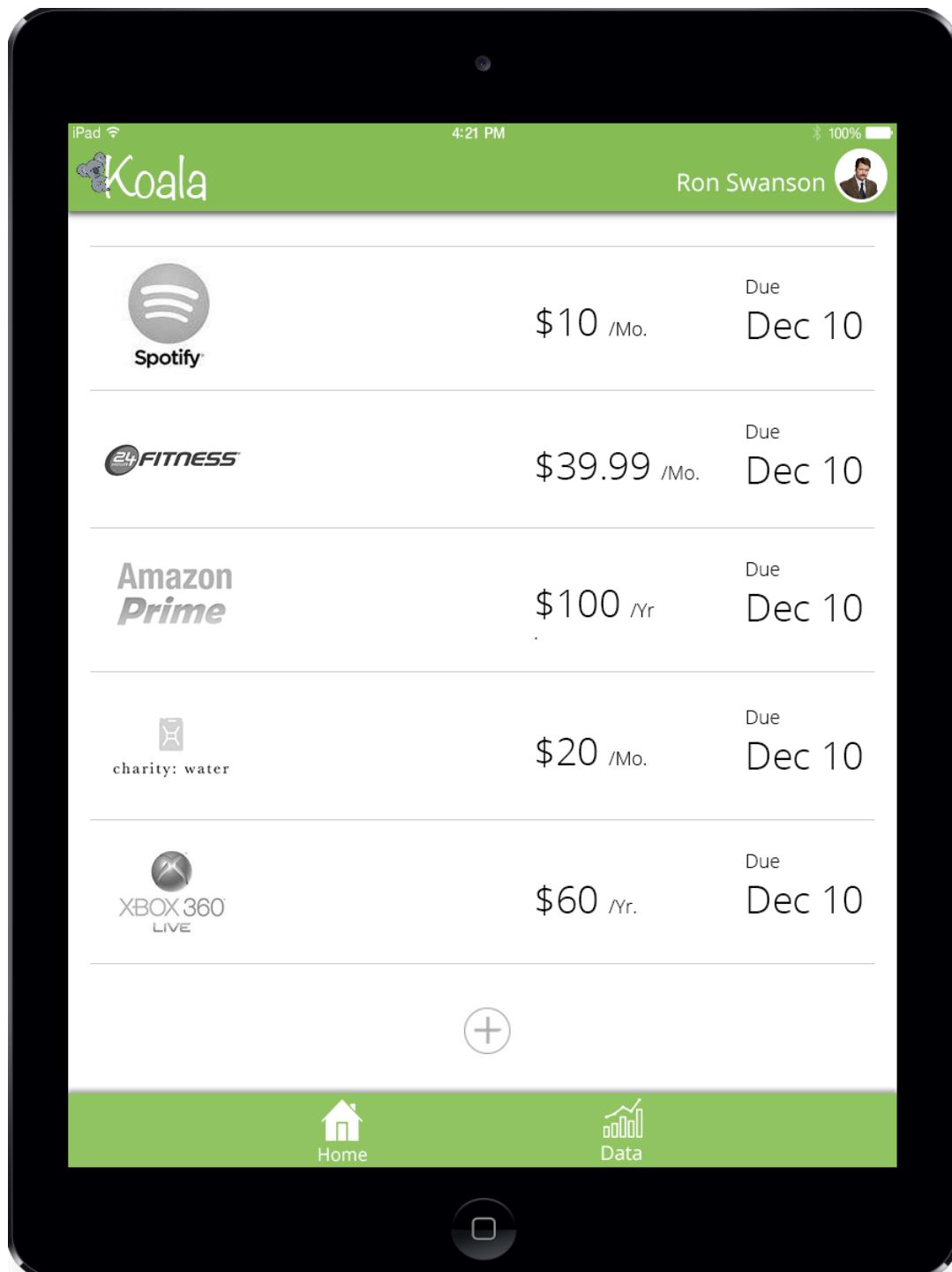
Throughout the course of our usability testing, we found that our tasks remained unchanged. Since our tasks started off with a narrow enough goal, participants were able to understand what the task needed to accomplish and then proceed in navigating through our app. The changes that arose from our usability testing dealt with parts and aspects of our design that were somewhat confusing or not thought out all the way.

While we feel that the amount of usability studies we performed was sufficient for this stage in the process, if we were to continue with this project, we would not be finished with our iterative design (you never are). We still have some unanswered design questions that could be answered by an iterative and lean approach. We would love to be able to release a real prototype of our application and do some A/B testing to answer certain questions, but that is outside the scope of this course.

Appendix

While not used in our two tasks, we wanted to briefly include how a participant would add a subscription through Koala:

- 1) The participant clicks on the plus icon at the bottom of the homepage.



- 2) From there, the participant can search for a subscription or choose a recommended subscription.

