

# Laundr

## Team Roles

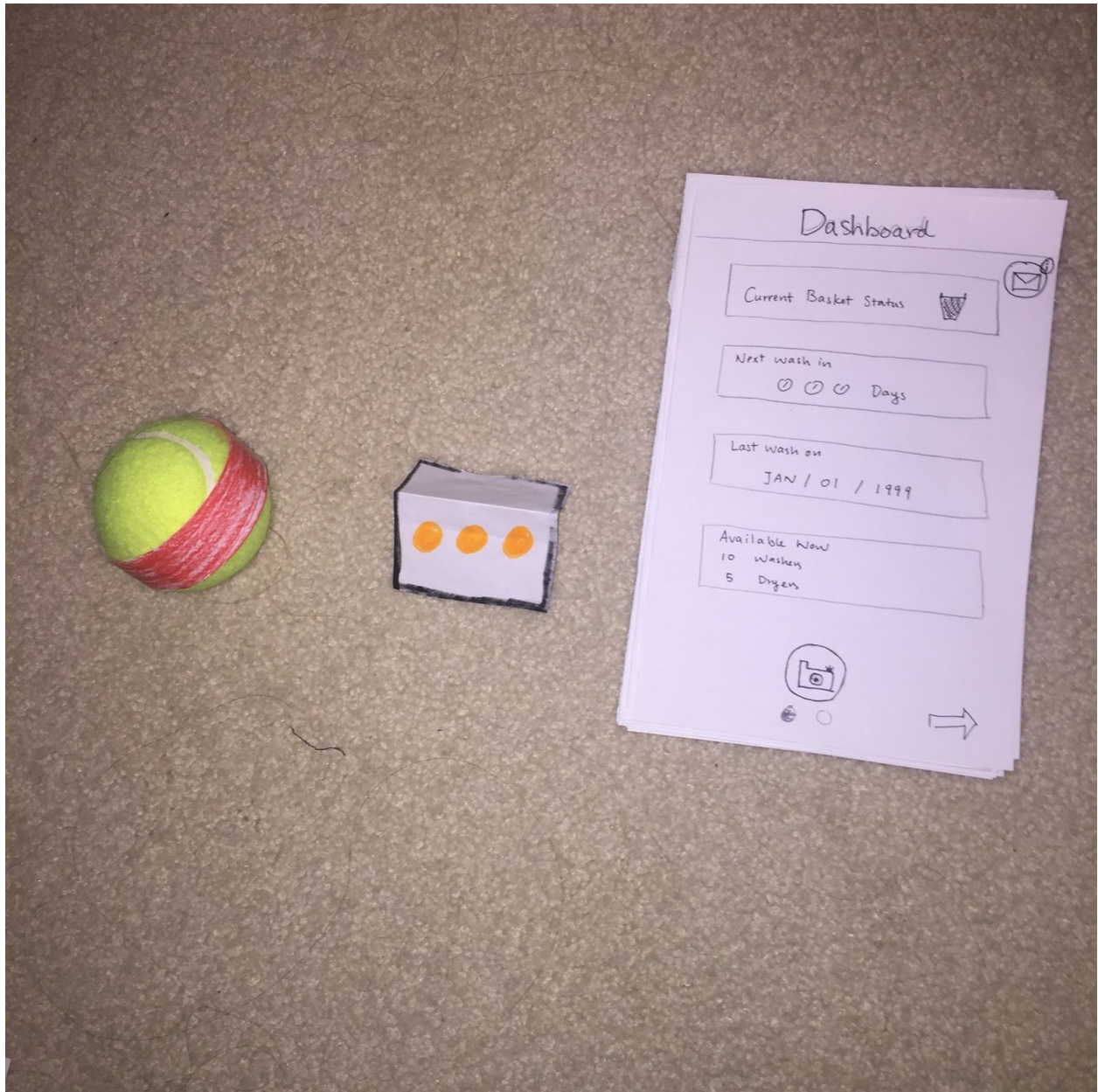
- Hang Bui: User Researcher, Design Researcher
- Atharva Naik: UX Designer, User Researcher
- Samuel Wolfson: Researcher, Interaction Designer
- Emily Zhang: User Researcher, Design Researcher

## Problem & Solution Overview

Many students and other young people live in apartments with shared laundry resources. This means that they need to coordinate their laundry schedules with other people in the complex. Without explicit coordination, they face issues such as: not knowing when a washer or dryer is available; forgetting to set reminders for when their clothes are finished being washed (and consequently forgetting to move them to the dryer); and not remembering to get the clothing from the dryer when it's finished. This results in decreased utilization of laundry resources. Our solution involves attaching sensors to each machine so that the user can know when they're in use; a "laundry ball" that goes in the machine with the user's clothing, and tracks the laundry status; and an app, called Laundr, to alert the user during different stages of the process (mainly: when machines are available for use; when washing and drying is complete).

# Initial Paper Prototype

## Overview



The ball, basket measuring device, and app interface shown together.

## Critical Aspects

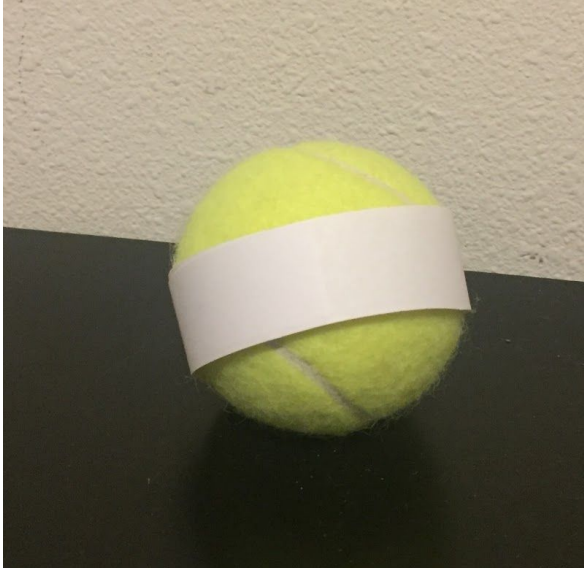
Our initial paper prototype consisted of three parts. First, we have a sensor that the user attaches to the side of his or her laundry basket. The sensor tracks the volume of dirty laundry, and when a limit is exceeded it will notify the user via the smart laundry ball. The smart laundry ball is a device that sits on the user's desk (or other visible locations) and lights up red whenever the basket is full. This signals to the user that they need to do their laundry. The ball also lights up blue whenever a machine is available by sensing the presence of other laundry balls within the apartment complex. Once the user is ready to put their clothes into the washer or dryer, they also throw in the ball, which now acts as a tracking device for when the user's washer or dryer cycle is complete. Last, the user can get updates on this process by checking their mobile app. The app will display relevant data such as how much dirty laundry the user has in their basket or how much time their laundry has left in the washer or dryer.

## Task Walkthroughs

### Task 1: Knowing when to do laundry



As they wear their clothing, the customer puts it in their hamper as normal. As the amount of clothing in the hamper increases, the sensor measures the volume of clothing in the basket.

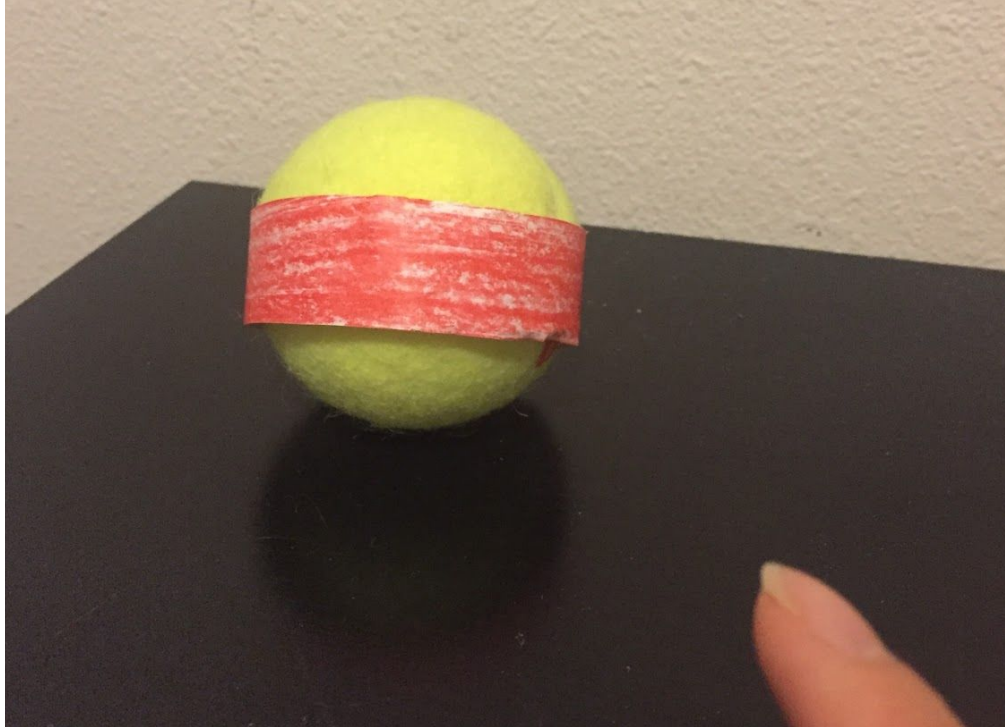


In the default state, the ball does not light up. It sits on a table in a charging dock.

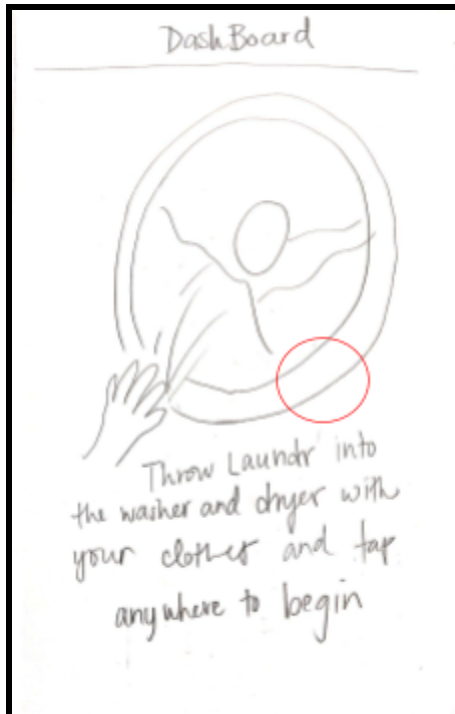




When the basket is full, the basket sensor communicates with the ball to indicate that laundry should be done soon.



The ball lights up to indicate that the basket is full and that the customer should do laundry soon.



Once you are ready, the app indicates how to use the ball: throw it into the washer with your dirty clothing so it can sense when the washer is finished.



The customer places the ball in the washer with their clothing, then starts the washer as they normally would.

## Task 2: Knowing when your laundry is done



Figure 2.1: Homepage of the mobile app (swipe left to proceed)



Figure 2.2: Displays the washer and dryer status.

The customer opens the mobile application and lands on the homepage. On swiping left, the customer is taken to the next screen which shows the current status of the washer and the dryer.





Figure 2.3: Alert Screen

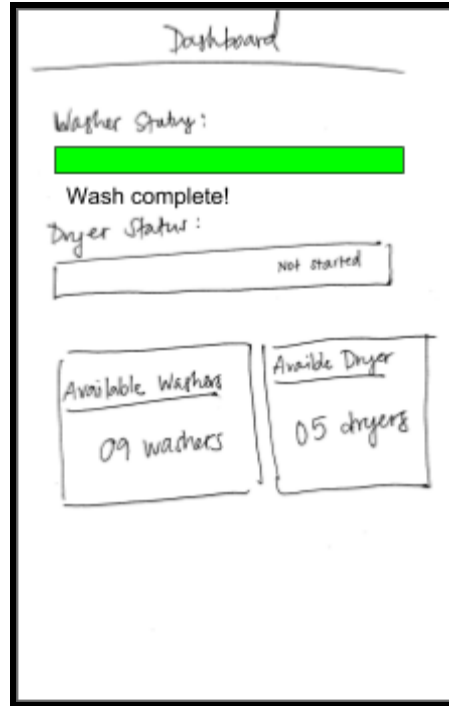


Figure 2.4: Washer status

The customer gets an alert on the app when the washer cycle is complete and gets to check if the dryer is available. This can be customized so that the customer is only notified when the washer is finished and a dryer is available.



Once a dryer is available, the customer knows to go down to the laundry room and move their clothing into the dryer. They also place the ball, which will sense when the clothing is dried, into the dryer.

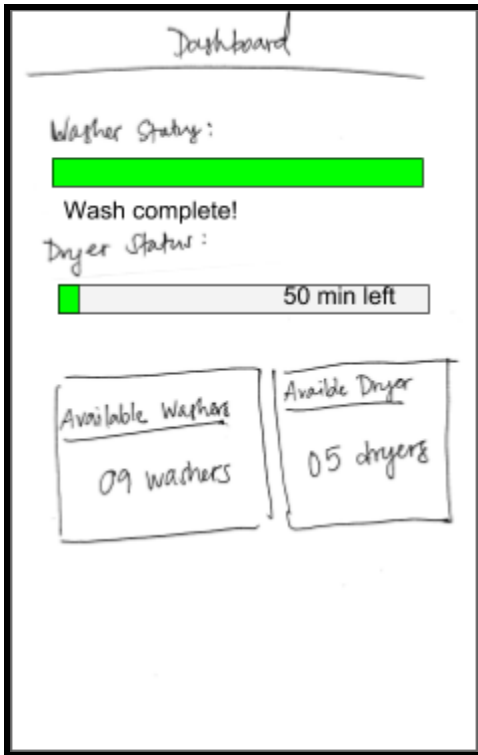


Figure 2.7: Washer/Dryer status screen



Figure 2.8: Alert screen

The ball monitors the moisture level of the clothing, and sends another notification to the app when the clothing is dry. The customer then knows exactly when they can come to retrieve their clothing.

# Testing Process

## Usability Test #1

**Participant:** UW Sophomore student living in the student housing community

**Method:** We scheduled the usability study with our participant and conducted it in the shared laundry room of his apartment complex. We gave an overview of the purpose of our app and scheduled it in the laundry room to create the best possible environment. The user was given different tasks to perform such as “checking availability of the washer”, “putting the clothes in the washer” etc. We provided the prototypes for the participant to explore and we observed whether the participant was recognizing the functions in the prototype. Based on the feedback, we worked on improving navigation in the app. We revised the functionality of the laundry ball to remove its functionality as a physical reminder (i.e. the glowing red ring) and make it solely a device which is put in the machines to communicate with the sensors which lets the app know which machine is being used.

## Usability Test #2

**Participant:** UW student living off-campus in a shared apartment complex

**Method:** The usability testing took place in the Nano Science building on campus. This student was chosen because he lives off-campus where the shared laundry room situation is common and fits our ideal target participants. We explained the purpose of the study to this participant and asked him a couple questions to identify whether this participant fits into our target user descriptions. Then we asked him to perform several tasks, such as trying to identify laundry status, check for his laundry schedule and scan the tags on this clothing. According to him, the camera function in our initial prototype was very confusing and did not have a clear purpose.

## Usability Test #3

**Participant:** UW student living in an off-campus apartment

**Method:** We explained to the participant that we were designing a system to support the process of doing laundry, being careful not to give too many details of how the system actually works. We then presented him with the home screen of our paper prototype, and asked him to “schedule when to do his laundry” (our first primary task). We asked him about his thinking during the process (how he decided what to click, and why). Once he completed that task, we presented him with a phone lock-screen containing our notification that “a washer is free” and asked him to “do laundry” using the app. There were several pieces of this task that he identified as unclear, and we had to give guidance in a few instances. Luckily, these issues were all fairly easy to resolve.

## Retrospective

As we worked with our participants, we were able to refine the tasks that we asked them to do. For our first user tests we asked our participants to complete several tasks, including ones that were not actually supported by our final design. By focusing on our two primary tasks with our last participant, we were able to get deeper feedback on the “flow” of those two tasks, rather than distract them by presenting them with a bunch of different things to do. We also gave fewer instructions regarding our app to our last usability test to see if our revisions solved the previous issues regarding app navigation and providing sufficient help and documentation to the user.

# Testing Results

## Heuristic Evaluation & Critiques

A major change that came from our heuristic evaluation was the functionality of the smart laundry ball and basket sensor. Our evaluators pointed out the inconsistency in making the smart laundry ball both a notification and tracking device. This creates confusion about how users should utilize the ball in their tasks. We also learned that having a basket sensor is not as useful as we intended; people can easily tell when their laundry basket is full. Taking in this feedback, we decided to abandon the basket sensor and instead shifted our focus on magnetic laundry machine sensors that would track machine availability as a way to define when a user in an apartment complex should do their laundry. With this, we also reduced the functionality of the laundry ball to a tracking device that tracks the status of the user's laundry when it is in a washer or dryer. Notifications will now only be delivered via the app. With these new definitions, we feel that design is more intuitive, focused, and useful.

We also added a new scheduling feature based on our heuristic evaluation. The initial version of our prototype lacked user control and freedom regarding when users would get a notification since a condition has to be met by our sensors. What if the user wanted to do laundry earlier? Thus, we added the flexibility to create their own notifications for laundry schedule, instead of adhering to the status of our sensors. Users can now schedule a time frame to be notified if a machine is available. We learned that providing the user with freedom to customize and define their task proves to be a more useful design in the long run. We also added functionality to the app allowing the user to check availability of the machines at any time (supported by the machine sensors) for additional increased flexibility.

Finally, we also realized that there were a lot of issues regarding the consistency and navigation within the app. Most of our screens lacked a way to navigate backwards. Additionally, users were confused about their location within the app since our namings were inconsistent. For example, users couldn't not tell if Laundry Status referred to the "laundry basket" or the "laundry in the washer/dryer". Thus, in the next version of our prototype, we provided a navigation bar and back buttons to the user so they can better navigation to different sections to switch between tasks. We also made sure that button names also matches the name of the place they lead to.

## Usability Test #1

We realized that it was necessary to revise the functionality of the laundry ball. We revised the functionality of the ball to be solely a device which is put in the machines to communicate with the sensors on the machines (i.e. no longer serving as a physical notification). These sensors in turn communicate with the app to identify which machine is being used. We learnt how it was necessary to simplify functionalities of our product in relation to the main task and reiterate the scope to offer users the best experience.



We could see that the user had problems in navigating our application and identifying the meaning of our labels. We worked on labelling such as changing 'Dashboard' to 'Home' and maintaining consistency throughout the application. The app navigation was modified to reduce the number of interactions. We added a navigation bar at the bottom to let the users navigate to the main pages from anywhere in the application. Instead of making the user click on the 'Laundry Status' button on the home, we display the status on the home screen itself to reduce one layer of interaction.

## Usability Test #2

As a result of this user testing, we realized that the purpose of the camera is not clear. Originally, we included this as an extra feature to allow users to scan the tags on their clothing to provide suggestions on how to wash an item. It was an extra feature unrelated to our primary tasks, which added to the confusion for the users. It was critical to get rid of this feature as it diverted the user's attention from the main functions of the application. From this, we learned that adding more features is not always a good thing. They should have a common theme or support our primary tasks in some way, otherwise, users are hesitant to interact with things that are unexpected.

## Usability Test #3

We performed this user test after making significant changes to the interface, including removal of features deemed unrelated to our primary tasks. During the usability test with our third participant, on getting a notification the user assumed that it was not necessary to open the app and go through additional interactions for transferring his laundry to the dryer which was not in line with the interaction we had planned. Our participant didn't realize that the app required interaction at different stages in the laundry process to perform tracking (i.e., tap a button to start laundry and begin tracking, tap a button when clothes are moved to the dryer) and therefore did not actually take advantage of this functionality until we explicitly told him it existed.

Based on this, we removed a number of interactions from the app, including the requirement to actually open it and tell it when you were starting laundry. Now, we use the laundry ball to communicate with the closest sensor and automatically detect when you put your clothing in the washer or dryer, so that no user interaction is required when starting laundry or moving clothing to the dryer.

# Final Paper Prototype

## Critical Aspects

Our final paper prototype consists of three parts. First, are magnetic machine sensors that tracks the availability of each machines. Next, we have a smart laundry ball that communicates with the app and machine sensors to let users know which machine (washer or dryer) their laundry is in and the estimated remaining time for a cycle. Users would throw the ball in with their laundry and the tracking process would be automated. Last, we have an app component that the user can interact with to schedule reminders, track laundry status, and look up machine availability.

## Prototype Images

Machine Sensor



Laundry Ball








# Dashboard

### Dashboard

Available Now >  
3 washers  
1 dryer

Start Laundry >








### Dashboard

Laundry Status >  
Red ball: washer 1  
23 min remaining

Available Now >  
2 washers  
1 dryer

Start Laundry >








### Dashboard

Laundry Status >  
Red ball: washer 1 | complete ✓  
Transfer to dryer Finish

Available Now >  
2 washers  
1 dryer

Start Laundry >








### Dashboard

Laundry Status >  
Red ball: washer 1 | complete ✓  
☀️ waiting for available dryer  
Finish

Available Now >  
2 washers  
1 dryer

Start Laundry >








### Dashboard

Laundry Status >  
Red ball: washer 1 | complete ✓  
☀️ Detecting dryer...

Available Now >  
2 washers  
1 dryer

Start Laundry >








### Dashboard

Laundry Status >  
Red ball: washer 1 | complete ✓  
✓ Found your laundry in dryer 2  
Done

Available Now >  
2 washers  
1 dryer

Start Laundry >



## Dashboard

Laundry status >
red ball: washer 1 complete ✓
Red ball: dryer 3
Left min remaining
Available Now >
2 washers
1 dryer
Start Laundry >

home | more | schedul | help | settings

## Help Screen

Help
<u>Using Laundry</u>
when you're ready to do laundry you can check the status of all washers and dryers from the <u>Dashboard</u> or <u>machines</u> screen to know since one is available when starting your laundry place the ball in the machine with your clothing and open the <u>Start Laundry</u> screen from the <u>dashboard</u> .
home   more   schedul   help   settings

# Laundry Screen

### Machine status

Washer	1	Free
Washer	2	Free
Washer	3	47m In Use
Washer	4	Free

Dryer	1	38m In Use
Dryer	2	20m In Use
Dryer	3	Free
Dryer	4	1h3m In Use

### Start Laundry

Which ball are you using?

Red  
 Green

Place the ball in the machine with your clothes, <sup>and</sup> start the machine.

Notify me when complete

✓ Found your laundry in Washer 2.

Done

### Laundry status

Red Ball: Washer 1

~23 min remaining

Notify me when complete

### Start Laundry

Which ball are you using?

Red  
 Green

Place the ball in the machine with your clothes, <sup>and</sup> start the machine.

Notify me when complete

☀ Detecting machine...

### Start Laundry

Which ball are you using?

Red  
 Green

Place the ball in the machine with your clothes, <sup>and</sup> start the machine.

Notify me when complete

Start



Settings

Pair Ball

Enter the code on the side of the ball

X B J N 2 3

Nickname

Done

home | modes | schedul | help | settings

Machine Sensors

Washer 1

Serial #X23YB

...

Pair New Sensor >

home | modes | schedul | help | settings

Pair Sensor

Press & hold button on side for 5 seconds and wait for it to appear on the list below.

Sensor #xBf3

Nickname

Machine Type

Washer

Dryer

Done

home | modes | schedul | help | settings

Settings

Laundry Balls >

Machine Sensors >

home | modes | schedul | help | settings

Laundry Balls

Red

Serial #ABC123

Green

Serial #XY2456

Pair New Ball >

home | modes | schedul | help | settings

Schedule and Notifications

Schedule

Notify me if a washer & dryer  
 are free btwn 2-3pm on  
 Tuesdays >

Add Notification

home
inbox
schedule
help
settings

Add Notification

Notify me if a...

washer

dryer

are available...

	M	T	W	Th	F	Sa	S
6a							
7a							
8a							
9a							
10a							
11a							
12p							
1p							
2p							

Typically free  Typically in use

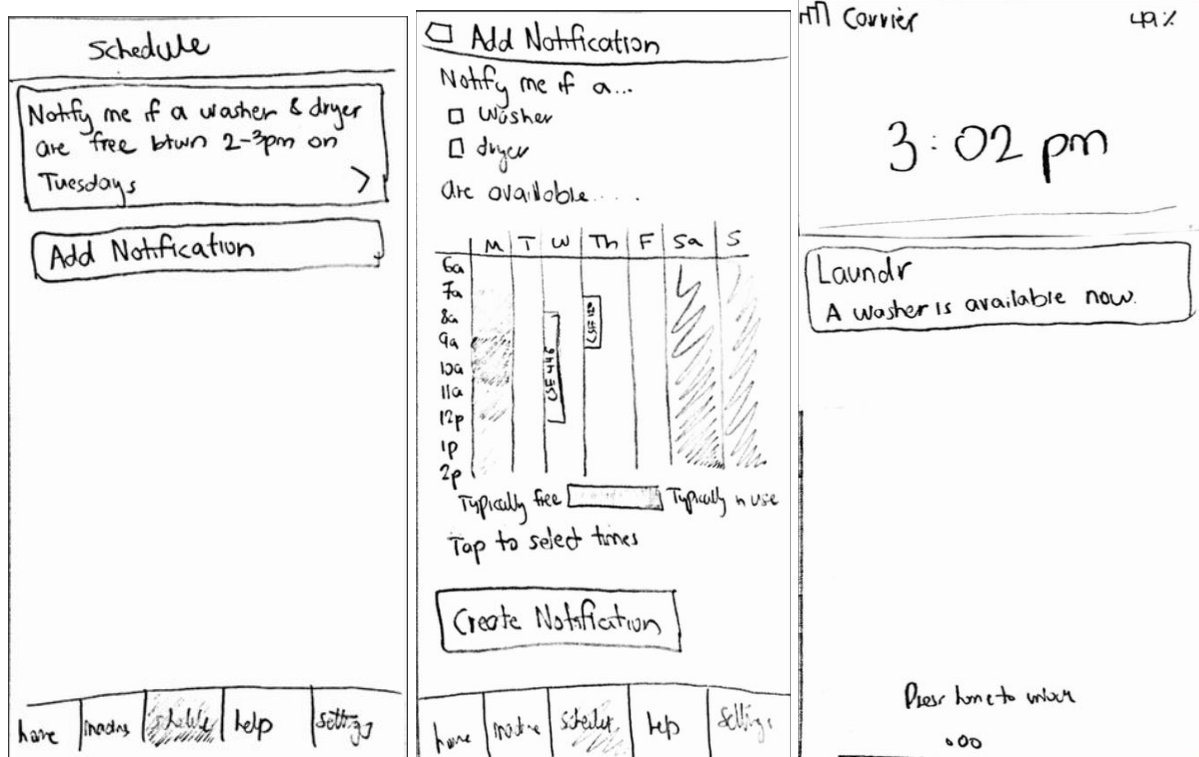
Tap to select times

Create Notification

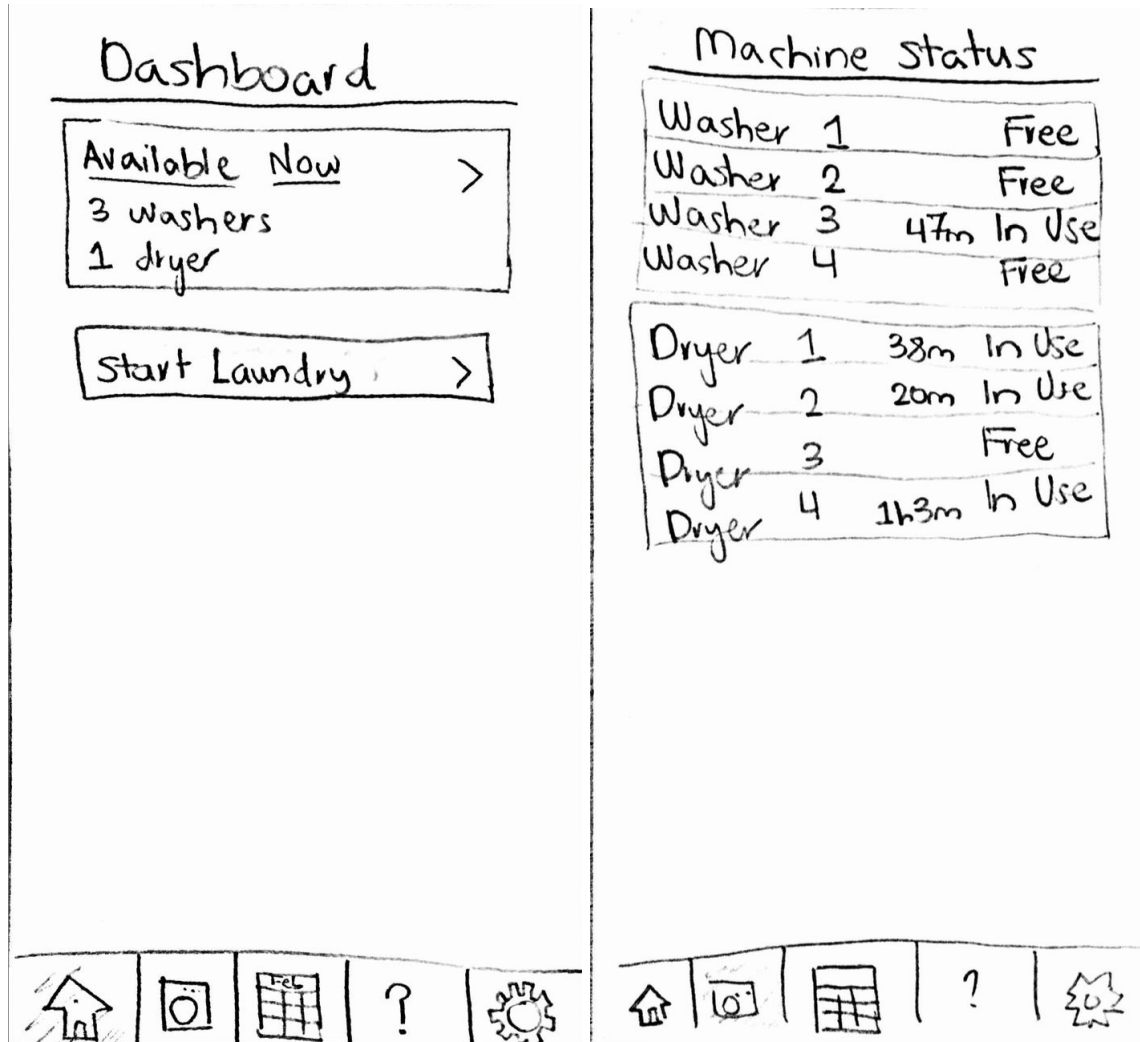
home
inbox
schedule
help
settings

# Task Walkthroughs

## Task 1: Deciding when to do laundry



The user can set notifications on certain times based on their schedule, and the likely availability of machines. The app will suggest good times to do laundry based on typical usage of machines, and then it will send the user a notification if it detects free machines within the user's timing preferences.



Alternately, the user can go into the app if they prefer to do laundry at an unscheduled time and can see both overall status of the machines from the Dashboard screen, and more detailed statistics from the Machine Status screen.

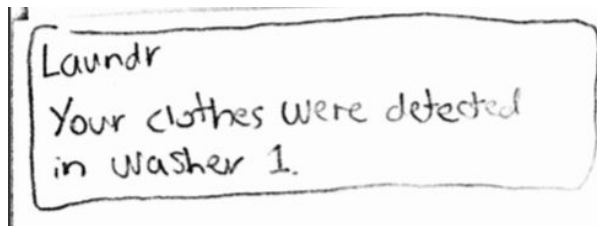
Task 2: Knowing when clothes are finished washing and drying

Note: the notification images below are assumed to be surrounded by the phone's lock screen or notification bar.

When the user receives this notification, they know that a washer is available.

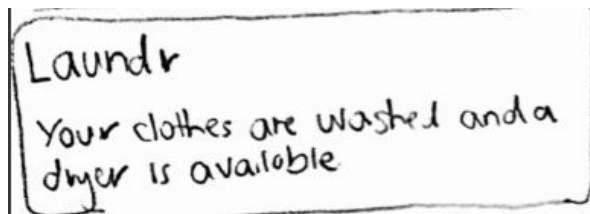


They can then go and place their clothes in the washer (along with the ball) and start it without ever interacting with the app. They will receive this notification to confirm that Laundr knows their clothing is there:

A hand-drawn rectangular box with a slightly irregular border. Inside, the text is written in a casual, handwritten style. The word "Laundr" is on the first line, and the rest of the message is on the second and third lines.

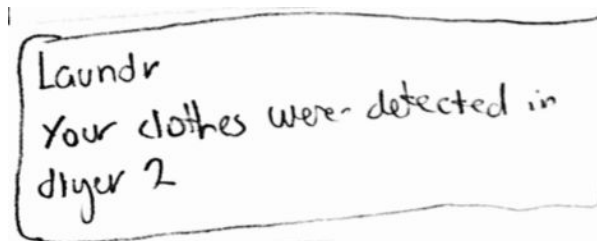
Laundr  
Your clothes were detected  
in washer 1.

At the end of the wash cycle, and when a dryer is available, they will receive a new notification:

A hand-drawn rectangular box with a slightly irregular border. Inside, the text is written in a casual, handwritten style. The word "Laundr" is on the first line, and the rest of the message is on the second and third lines.

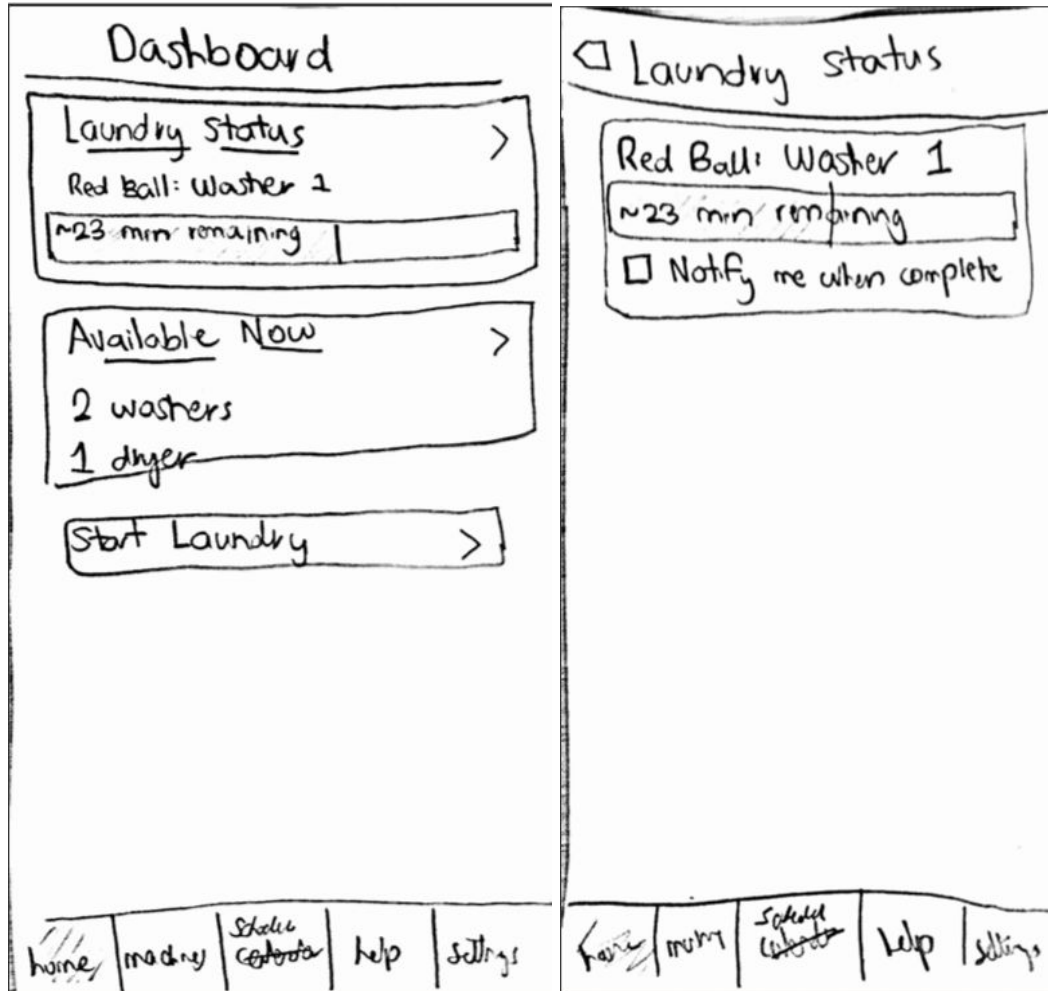
Laundr  
Your clothes are washed and a  
dryer is available

Again, the app will not require any interaction at this point -- once the user transfers their clothes they will automatically receive a notification confirmation:

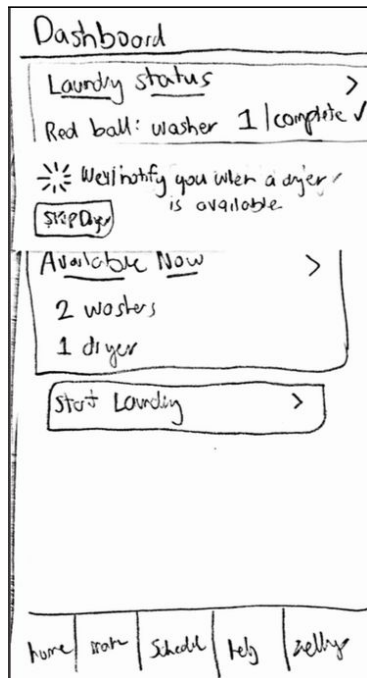
A hand-drawn rectangular box with a slightly irregular border. Inside, the text is written in a casual, handwritten style. The word "Laundr" is on the first line, and the rest of the message is on the second and third lines.

Laundr  
Your clothes were detected in  
dryer 2





Any time during the process, the user can check on the status of the washer or dryer from the Dashboard, or view a more detailed status from the Laundry Status screen. An estimated time is provided based on the app learning how long past washer cycles tend to have taken.



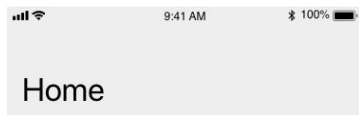
If the washer is finished but a dryer isn't yet available, the app will wait before notifying the user to transfer their clothing. An option to "skip dryer" is given in case the user prefers not to dry their clothing in a dryer. The app makes it clear that it can help with the next step (i.e. the drying) but it hasn't notified the user yet because it's waiting for availability.



Once the clothing is finished drying, the app notifies the user that their laundry is complete.

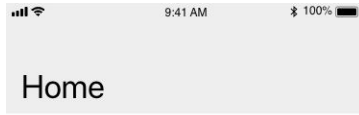
# Digital Mockup

## Mockup Screenshots



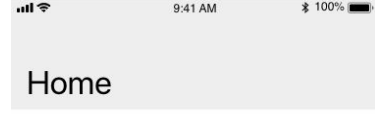
Laundry Status  
None active

Available Now  
4 washers  
1 dryer



Laundry Status  
Red Ball: Washer 1  
23 minutes remaining  
 Notify me when complete

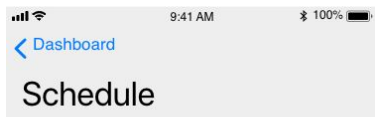
Available Now  
3 washers  
1 dryer



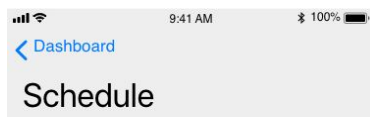
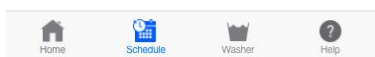
Laundry Status  
Red Ball: Washer 1  
Laundry complete!

We'll notify when a dryer is available  
Skip Dryer

Available Now  
2 washers  
0 dryer

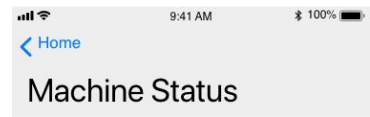


Add Notification >



Notify me if a washer & dryer are free between 7 -11 am on Tuesdays >

Add Notification >



- Washer 1 ●
- Washer 2 ●
- Washer 3 ●
- Washer 4 ●
- Dryer 1 ●
- Dryer 2 ● 20 mins to complete
- Dryer 3 ● 15 mins to complete
- Dryer 4 ● 10 mins to complete



9:41 AM 100%

[Schedule](#)

## Add Notification

Notify me if a...

Washer  Dryer  
are available.

	M	T	W	Th	F	S	S
6 am							
7 am							
8 am							
9 am							
10 am							
11 am							
12 am							
1 pm							

Usage:

Typically free
Typically in use

Create Notification

Home Schedule Machines Help

9:41 AM 100%

[Home](#)

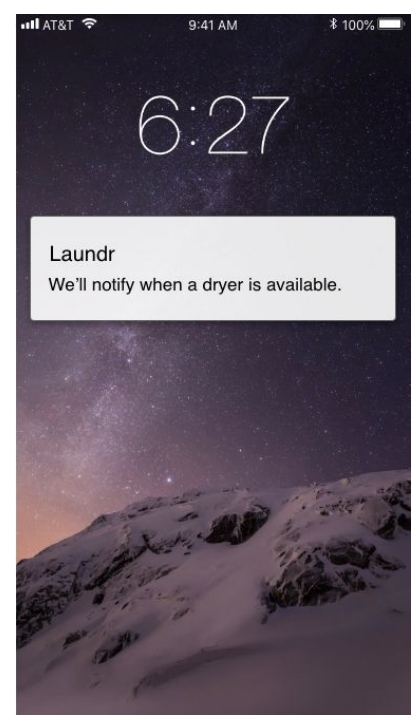
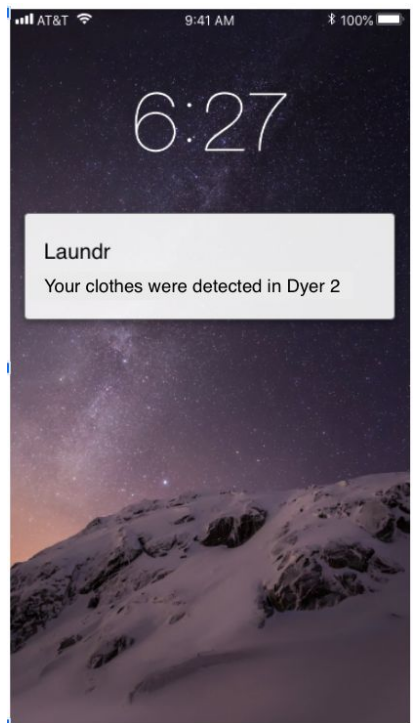
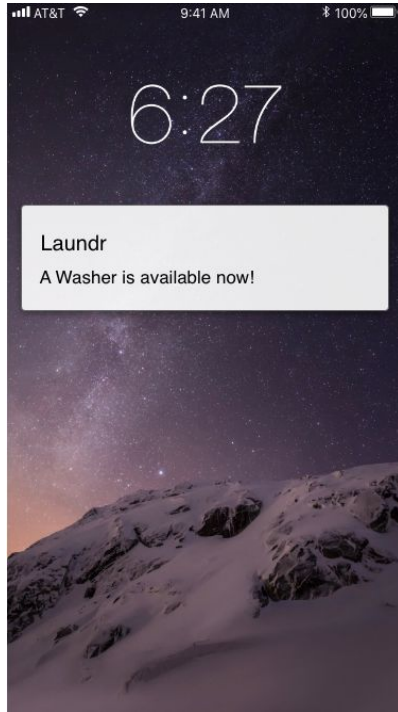
## Help

Welcome to Laundr!

1. You can check the status of all washers and dryers from the Home or Machines tab
2. When you are ready, simply throw your Laundr ball into the machine (washer or dryer) with your clothes and it will be tracked in the Home tab
3. You will be notified when your clothes are ready

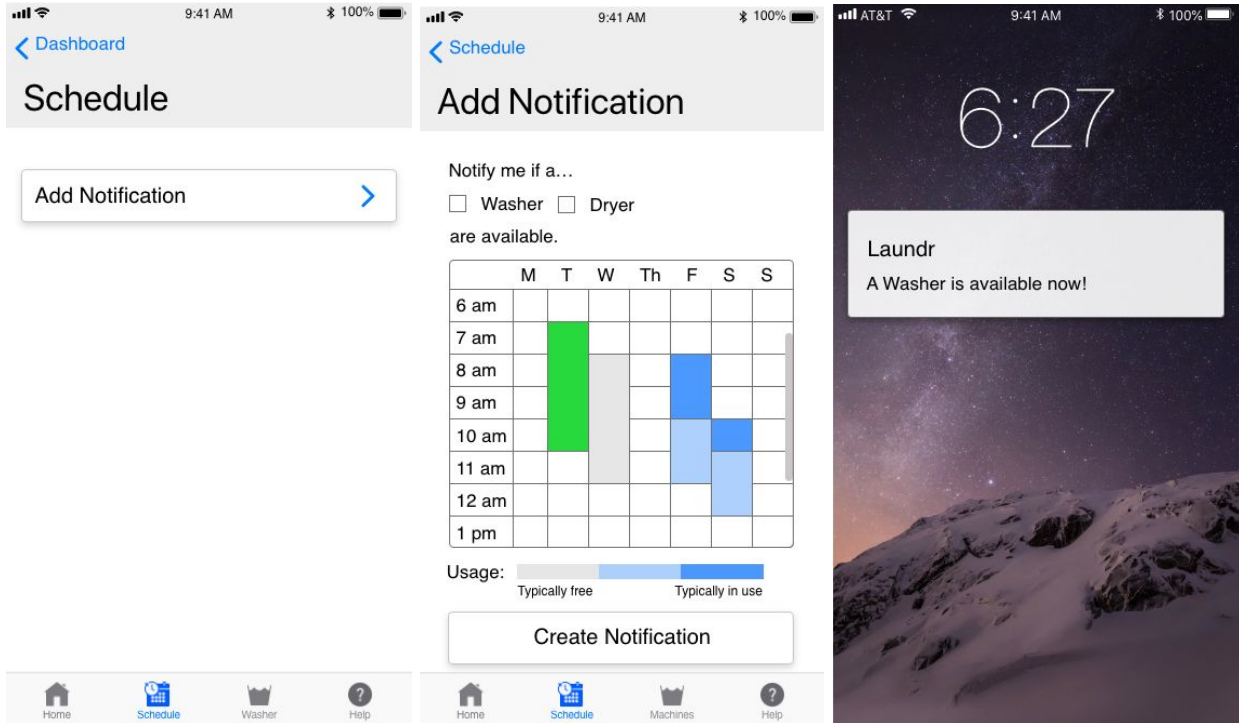
Home Schedule Machines Help



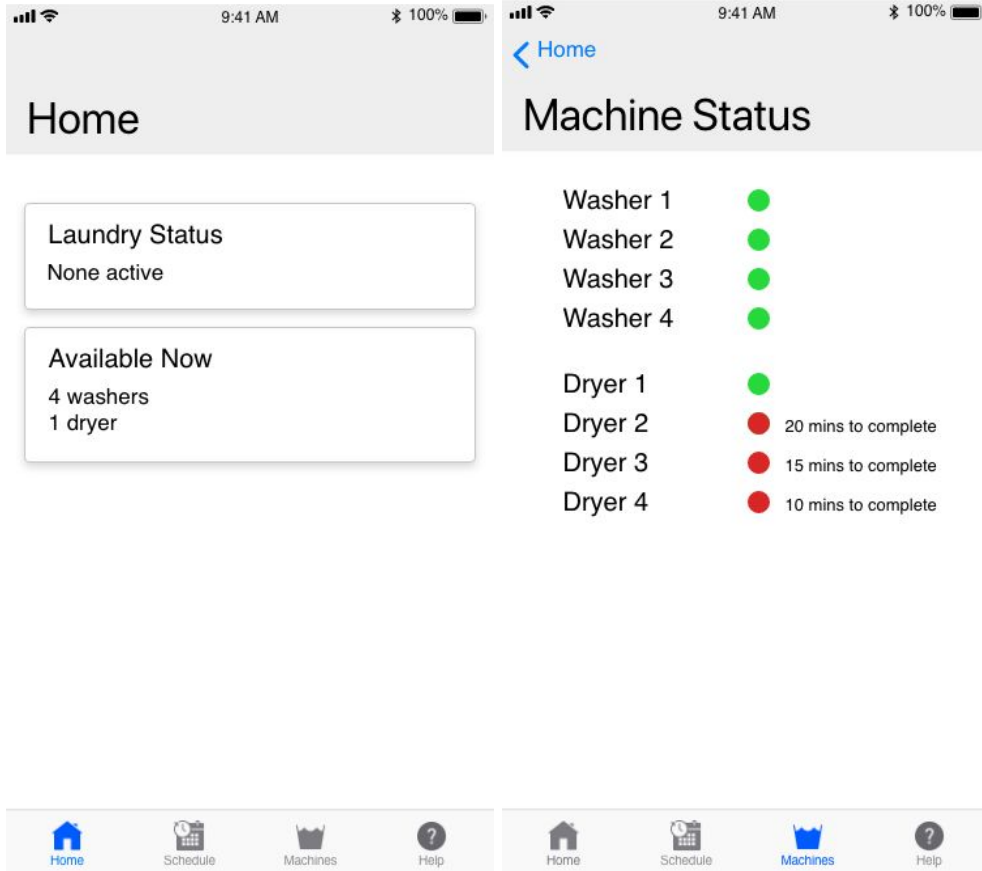


# Task Walkthroughs

## Task 1: Deciding when to do laundry



The user can set notifications on certain times based on their schedule, and the likely availability of machines. The app will suggest good times to do laundry based on typical usage of machines (as indicated by the usage bar at the bottom), and then it will send the user a notification if it detects free machines within the user's timing preferences.



Alternately, the user can go into the app if they prefer to do laundry at an unscheduled time and can see both overall status of the machines from the Home screen, and for more detailed statistics from the Machine Status screen.

Task 2: Knowing when clothes are finished washing and drying

When the user receives this notification, they know that a washer is available.



They can then go and place their clothes in the washer (along with the ball) and start it without ever interacting with the app. They will receive this notification to confirm that Laundr knows their clothing is there:

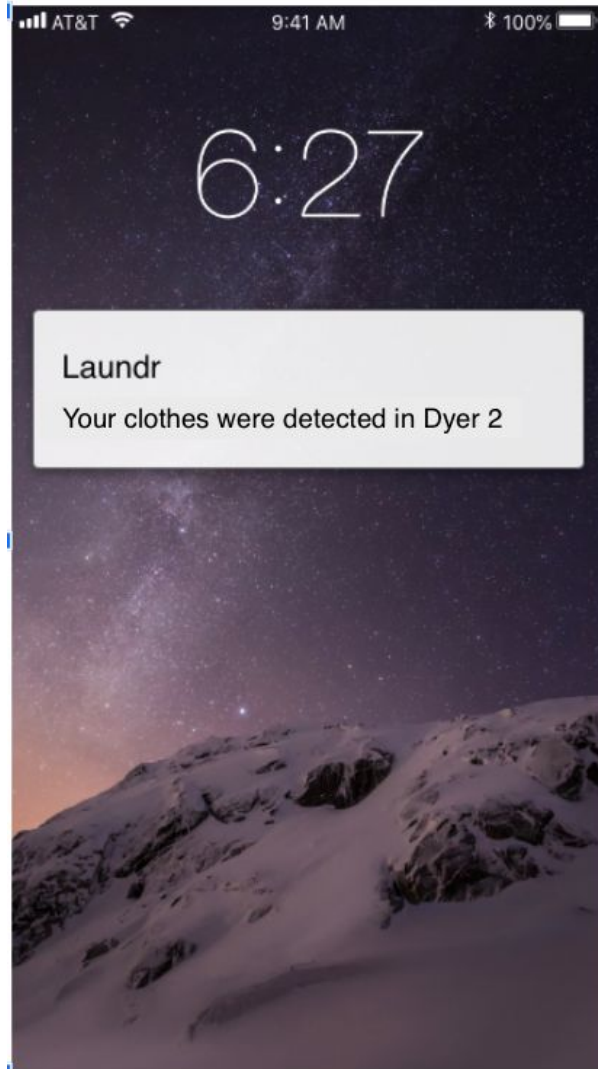


At the end of the wash cycle, and when a dryer is available, they will receive a new notification:





Again, the app will not require any interaction at this point -- once the user transfers their clothes they will automatically receive a notification confirmation:



Any time during the process, the user can check on the status of the washer or dryer from the Home screen. An estimated time is provided based on the app learning how long past washer cycles tend to have taken.



If the washer is finished but a dryer isn't yet available, the app will wait before notifying the user to transfer their clothing. An option to "skip dryer" is given in case the user prefers not to dry their clothing in a dryer. The app makes it clear that it can help with the next step (i.e. the drying) but it hasn't notified the user yet because it's waiting for availability.

# Home

## Laundry Status

Red Ball: Washer 1



Laundry complete!

We'll notify when a dryer is available

Skip Dryer

## Available Now

2 washers  
0 dryer



Home



Schedule

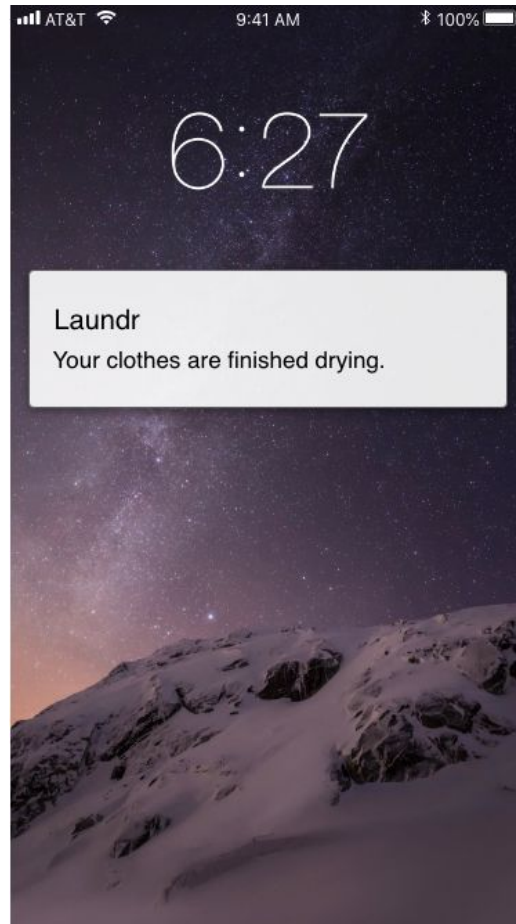


Machines



Help

Once the clothing is finished drying, the app notifies the user that their laundry is complete.



## Revision Summary

A change that we've made in our digital mockup is to take away all interactions in the "Home" screen and only use it as a centralized place to display tracking information such as Laundry Status and Available Now. Originally, users could tap on the "Laundry Status" box and it would take them to a separate "Laundry Status" screen which would show how much time is remaining for their active washer or dryer session. We felt that the transition was redundant in the digital mockup and realized that users can view all of this information from directly from the "Home" screen. To keep things consistent and for the same reasons above regarding redundancy, users will not be able to tap on the "Available Now" box after this change.

We've also decided to not overlay events from the user's Calendar app to our "Add Notifications" screen. Based on one of our usability tests, we wanted to add a feature to sync the user's calendar with Laundr to make scheduling notifications more seamless without requiring them to switch between apps. However, this feature made our "Add Notifications" screen very busy as we already have information regarding machine usage overlay onto the scheduler. Thus, since it was labeled with a severity level 1, we wanted to prioritize user's experience with our primary task instead of overloading our UI with extra features.

## Discussion

Through our usability tests, we've identified many problems that were not apparent to us as the designers. We found that running our prototypes through different people revealed diverse feedback ranging from user freedom and control to navigation consistency. Negative feedback was given special attention because it revealed flaws in our design. With each iteration, we tried to address user complaints and in doing so, we were able to create a design that tackled the same primary tasks from different angles. For example, when one of our user suggested the ability to schedule his own notifications, we thought it was a great feature to add for primary task #1 (deciding when to do laundry) in addition to our current solution of tracking machine availability. Through each usability test, we made informed changes to our design based on user needs. Our design went through major revisions and in the end, we've produced a final mockup that has substantially deviated from where we originally began with our vision and redefinition of our product.

The iterative design process shaped our final results by forcing us to look back at the number of tasks we were originally trying to accomplish at once and refine them to the two primary tasks that we really care about, removing the functionality that was less well thought-out and therefore served mainly as a distraction. The first revision to our design was a major overhaul, in which we removed the aforementioned features and settled on a significantly different and clear interface. The second revision was more subtle and focused more on refining the workflow of the primary tasks instead of making large design changes within the interface.

We think it would have been helpful to make more iterations on our design. In hindsight, the original paper prototype had a lot of issues that we should have caught earlier, which means that our first two testers had difficulty with the system in general and could not give as specific feedback about the stages of our primary tasks. We only had time to test with a single user for the first revision of our interface, but since it included a number of significant changes, we believe that it's unlikely he was able to uncover all of the possible usability problems. Having the time to further improve the revised prototype in response to further user feedback would have been helpful.

## Appendix

### Task Descriptions

During our final usability test, we read aloud the following task descriptions:






- "You know that if you don't do laundry at least once per week, you'll run out of clothing. But you can never tell if the machines are in use or not, and you don't like the hassle of running down the stairs to check before going back for your clothes. Use Laundr to schedule a time for you to do laundry."

- “You’ve received a notification that a washing machine is available. Do laundry with the assistance of Laundr.” (intentionally very open-ended; assumes that the sensors are installed properly and the user understands that they put the ball in the machines)

## Critical Incidents

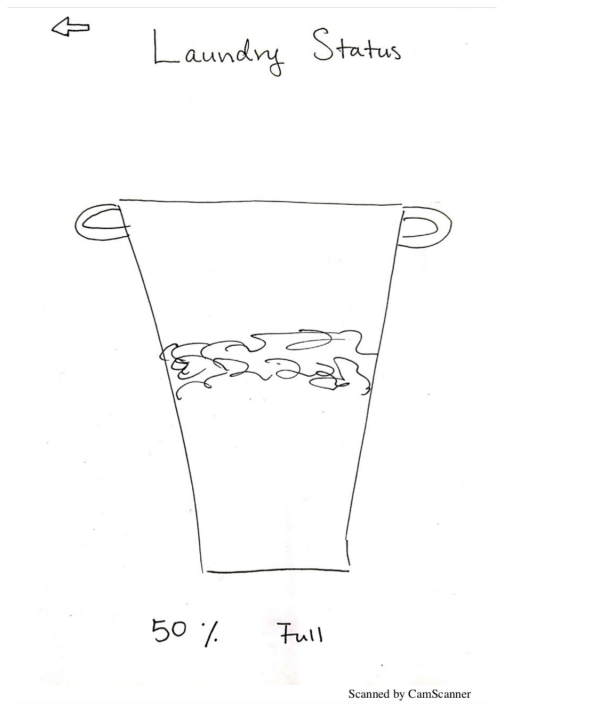

### Incident 1: Interaction and Navigation

- Severity: 4
- Purpose of the camera not clear: our users are not tapping on the camera button because they are unsure of what the camera button will do. We decided to remove this feature because it is not our primary task that we decide to address and it is becoming more confusing than it should have been.
- Current basket and machine status not visible: the participant tried to click on it when it is only a status notification of what is available. It is not clearly conveyed that it is not a button, but a status report.

Original	Revised
<p>Dashboard</p> <p>Current Basket Status  </p> <p>Next wash in 🕒 🕒 🕒 Days</p> <p>Last wash on JAN / 01 / 1999</p> <p>Available Now 10 Washers 5 Dryers</p> <p>  </p>	<p>Dashboard</p> <p>Laundry Status &gt; Red Ball: Washer 2 23 min remaining</p> <p>Available Now &gt; 2 washers 1 dryer</p> <p>Start Laundry &gt;</p> <p>home   machines   Status Controls   help   settings</p>

## Incident 2: Labelling

- Severity: 2
- Laundry Status means Laundry Basket or the Laundry in the Washer/Dryer: our participant did not find a clear indication of whether this is a laundry status of dryer or washer, it is difficult to distinguish the difference because there is no obvious indication.
- Title of the page could be Current Status instead of Laundry: the inconsistency of the title becomes confusing to the participants and they were lost in the process of trying to navigate through this software

Original	Revised
 <p>← Laundry Status</p> <p>50% Full</p> <p>Scanned by CamScanner</p>	 <p>Schedule</p> <p>Notify me if a washer &amp; dryer are free btwn 2-3pm on Tuesdays &gt;</p> <p>Add Notification</p> <p>home   media   <del>table</del>   help   settings</p> <p>We have decided to remove this feature and added a notification scheduling service instead. Users will receive notifications according to their own preference.</p>

← Laundry Status



OVERLOADING

Scanned by CamScanner

Add Notification

Notify me if a...

Washer

dryer

are available...

	M	T	W	Th	F	Sa	S
6a							
7a							
8a							
9a							
10a							
11a							
12p							
1p							
2p							

Typically free  Typically in use

Tap to select times

Create Notification

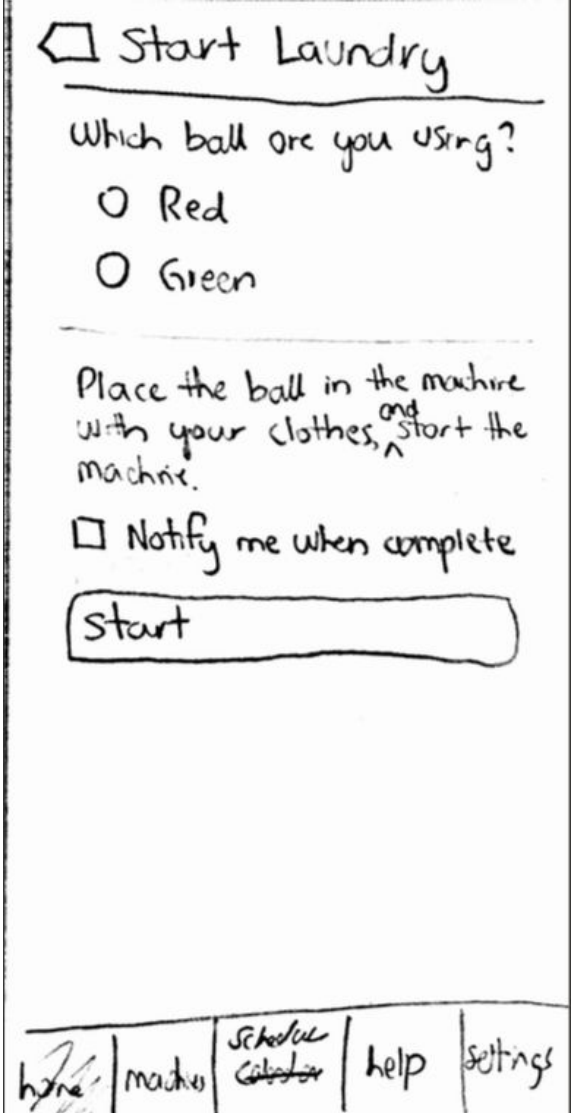
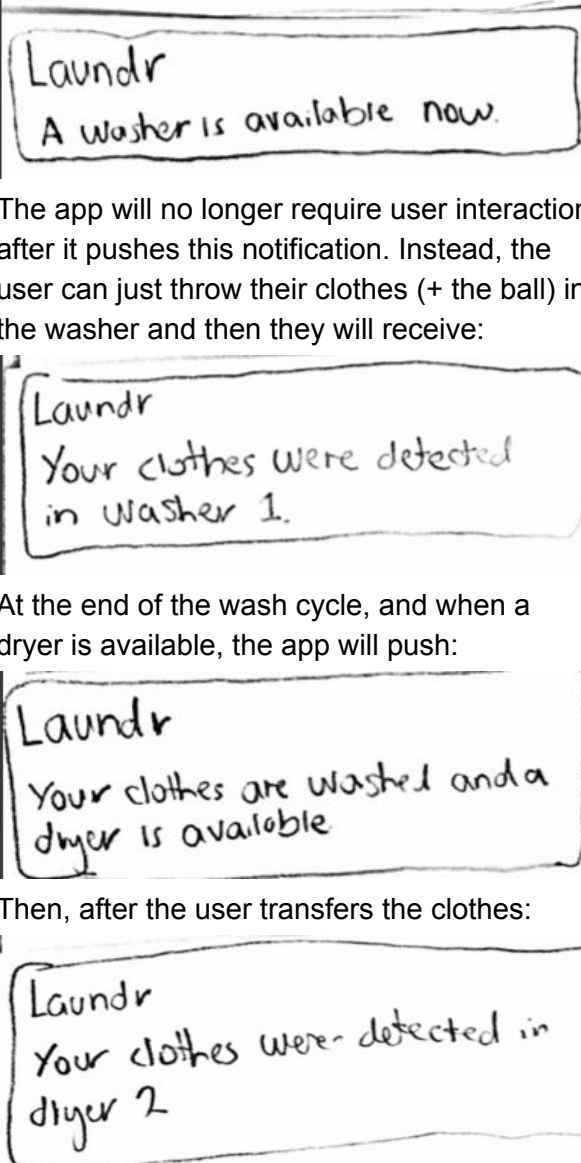
home	notifications	scheduler	help	settings
------	---------------	-----------	------	----------

The software also provides flexibility to create their own notifications for laundry schedule, instead of being notified according to the status of the laundry basket.



### Incident 3: Flexibility and Efficiency of use

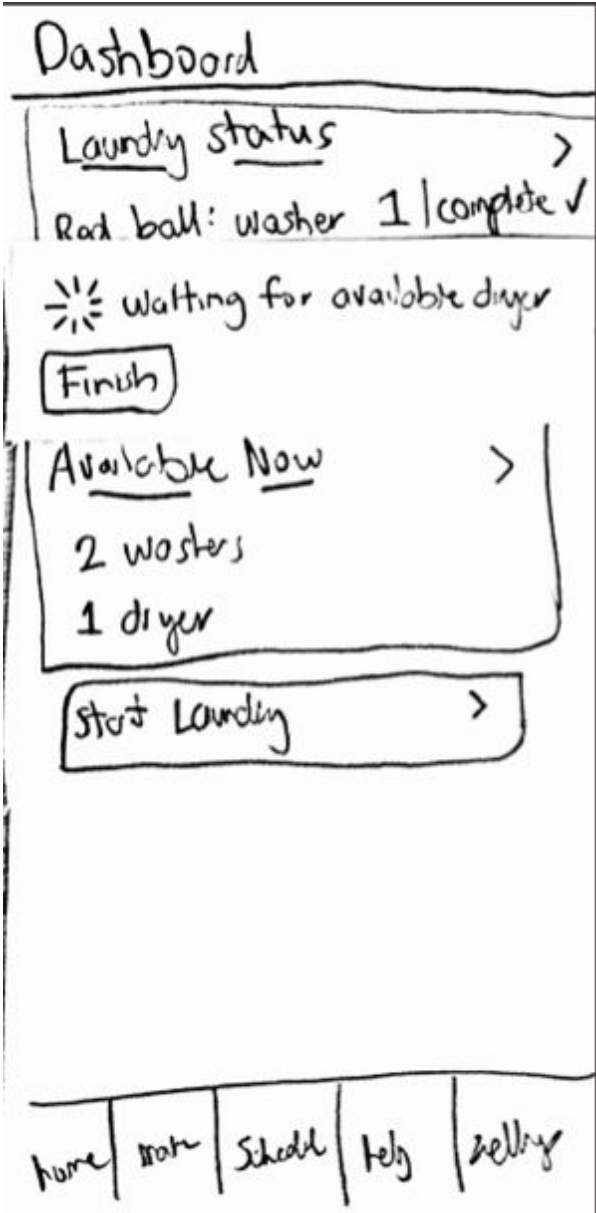
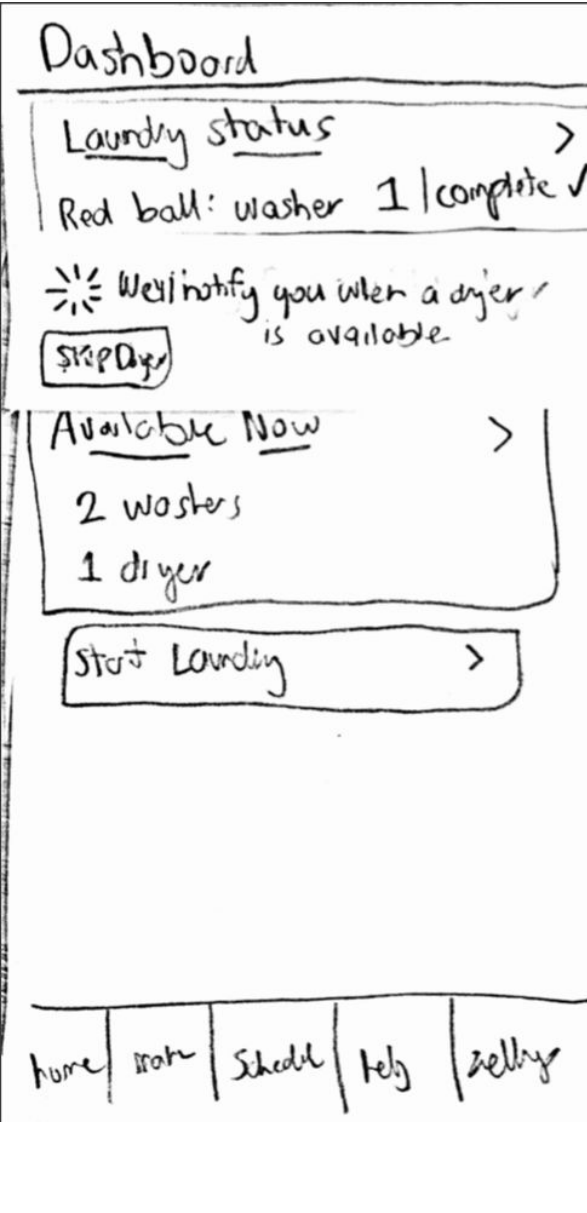
- Severity: 2
- The user assumes that when there is a notification, he does not have to open the app to do additional setup for transferring his laundry to the dryer
- We will automate the setup process and have the ball detect when it is in the washer or dryer so all the user have to do is throw it into the machines. The active balls will automatically show up on the app while inactive balls do not.
  - The app will notify the user when the laundry has been detected in the machines, to keep them informed without requiring direct interaction
- We removed the original setup screen and take the user directly to the laundry status screen

Original	Revised
 <p>Hand-drawn sketch of the original 'Start Laundry' screen. It features a title 'Start Laundry' with a back arrow icon, a question 'Which ball are you using?' with radio button options for 'Red' and 'Green', instructions 'Place the ball in the machine with your clothes, and start the machine.', a checkbox for 'Notify me when complete', and a 'Start' button. At the bottom is a navigation bar with 'home', 'machines', 'Schedule', 'help', and 'settings'.</p>	 <p>Hand-drawn sketches of three notification messages. The first says "Laundr A washer is available now." The second says "Laundr Your clothes were detected in washer 1." The third says "Laundr Your clothes are washed and a dryer is available." Below these are explanatory paragraphs and a final notification sketch: "Laundr Your clothes were detected in dryer 2".</p> <p>The app will no longer require user interaction after it pushes this notification. Instead, the user can just throw their clothes (+ the ball) in the washer and then they will receive:</p> <p>At the end of the wash cycle, and when a dryer is available, the app will push:</p> <p>Then, after the user transfers the clothes:</p>

	<p>The user never has to enter the app to tell it that they're moving their clothes -- it will happen automatically.</p>
--	--

#### Incident 4: Labelling

- Severity: 2
- The user assumed that “waiting for available dryer” meant there was nothing else the app could help with, and clicked the “finish” button.
- We changed the dialog to say “we’ll notify you when a dryer is available” to make the next system step more clear, and changed the button to “skip dryer.”

Original	Revised
	

### Incident 5: Flexibility and Efficiency of use

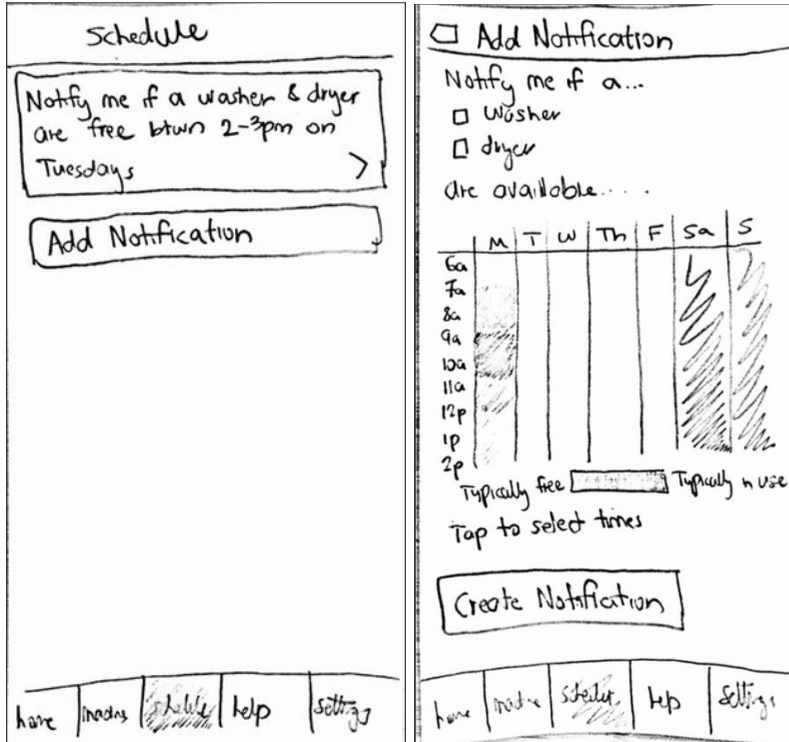
- Severity: 1
- When scheduling reminders, the user noted that he would have to switch between our app and his Calendar app to remember when he is and isn't at home.
- We will integrate with the phone's Calendar app to overlay events on the "Add Notification" page.

Original	Revised																																																																																																																																																																
<div data-bbox="227 567 625 630"> <input type="checkbox"/> Add Notification         </div> <div data-bbox="251 640 576 703">           Notify me if a...         </div> <div data-bbox="259 703 446 808"> <input type="checkbox"/> Washer  <input type="checkbox"/> dryer         </div> <div data-bbox="251 819 584 871">           etc available...         </div> <table border="1" data-bbox="243 882 787 1281"> <thead> <tr> <th></th> <th>M</th> <th>T</th> <th>W</th> <th>Th</th> <th>F</th> <th>Sa</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>6a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12p</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1p</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2p</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <div data-bbox="267 1291 803 1354">           Typically free <span style="background-color: #cccccc; border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> Typically in use         </div> <div data-bbox="259 1354 576 1417">           Tap to select times         </div> <div data-bbox="243 1449 641 1554" style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">           Create Notification         </div> <div data-bbox="219 1606 795 1722"> <span>home</span>   <span>inbox</span>   <span>scheduler</span>   <span>help</span>   <span>settings</span> </div>		M	T	W	Th	F	Sa	S	6a								7a								8a								9a								10a								11a								12p								1p								2p								<div data-bbox="836 567 1218 630"> <input type="checkbox"/> Add Notification         </div> <div data-bbox="860 640 1177 703">           Notify me if a...         </div> <div data-bbox="868 703 1047 808"> <input type="checkbox"/> Washer  <input type="checkbox"/> dryer         </div> <div data-bbox="860 819 1193 871">           etc available...         </div> <table border="1" data-bbox="852 882 1396 1281"> <thead> <tr> <th></th> <th>M</th> <th>T</th> <th>W</th> <th>Th</th> <th>F</th> <th>Sa</th> <th>S</th> </tr> </thead> <tbody> <tr> <td>6a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>7a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>8a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>9a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>10a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>11a</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>12p</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1p</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2p</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <div data-bbox="885 1291 1421 1354">           Typically free <span style="background-color: #cccccc; border: 1px solid black; display: inline-block; width: 50px; height: 15px;"></span> Typically in use         </div> <div data-bbox="876 1354 1193 1417">           Tap to select times         </div> <div data-bbox="860 1449 1250 1554" style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;">           Create Notification         </div> <div data-bbox="836 1606 1412 1722"> <span>home</span>   <span>inbox</span>   <span>scheduler</span>   <span>help</span>   <span>settings</span> </div>		M	T	W	Th	F	Sa	S	6a								7a								8a								9a								10a								11a								12p								1p								2p							
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## Positive Incidents

### Incident 6: Flexibility and Efficiency of use

- This was a positive incident where the user were able to quickly and easily schedule reminders for available machines.
- He effectively navigated to the scheduler screen and back to the dashboard via our improved navigation bar



### Incident 7: System status Visibility

- User could easily locate and understand information regarding machine availability and laundry status

### Machine status

Washer 1	Free
Washer 2	Free
Washer 3	47m In Use
Washer 4	Free

Dryer 1	38m In Use
Dryer 2	20m In Use
Dryer 3	Free
Dryer 4	1h3m In Use

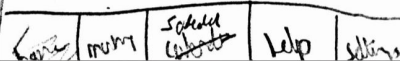


### Laundry status

Red Ball: Washer 1

~23 min remaining

Notify me when complete



## Contribution Statement

Hang Bui: 35% Contributed to critical aspects, testing results, and discussion; proofreading

Atharva Naik: 20% Wrote usability test 1 & 2, created digital mockups and contributed to testing results.

Samuel Wolfson: 35% wrote problem & solution overview, usability test 3; contributed to discussion; proofreading

Emily Zhang: 10% Wrote usability test 1