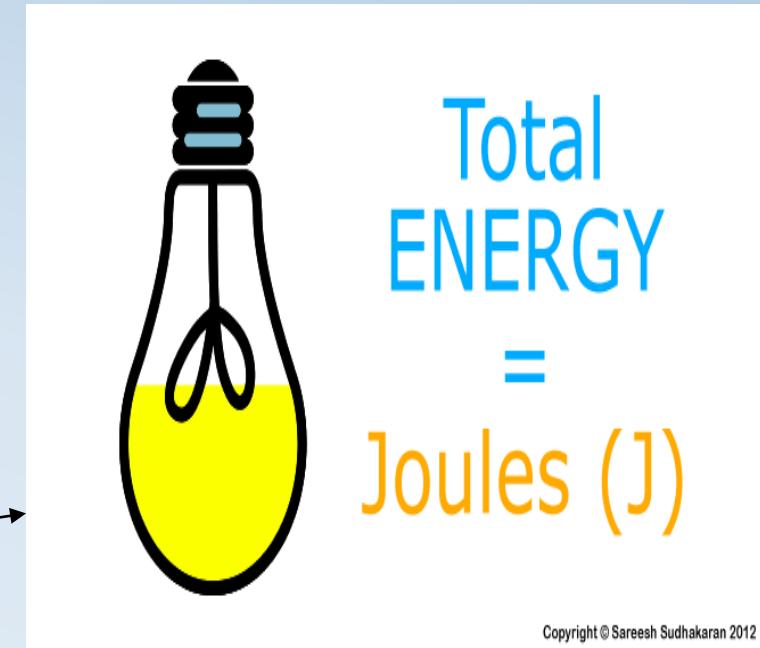


NRGY

- Boqian Yao: UI mockup designer, paper prototyping
- Peter Pan: Writer, project manager
- Yan Tan: Usability tester, writer
- Yu Song: Paper prototyping, usability tester



Overall Problems



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Overall Problems



Overall Problems

- Global Warming
- Utility Managing
- Budgeting



Task: Reminders to Save Energy

- Notifications to remind users to perform tasks in case they forgot.

Task: Recording Data

- Collect information on energy usage from various sources.

Tasks



Paper Prototype

Monthly Gasoline Cost.
\$ 70.69

Driving Away

Refill History

Current Cost Analyze

Turn off list: Available devices:

Computer A

Add

Dish Washer

Add

TV (Master Room)

Add

Oven

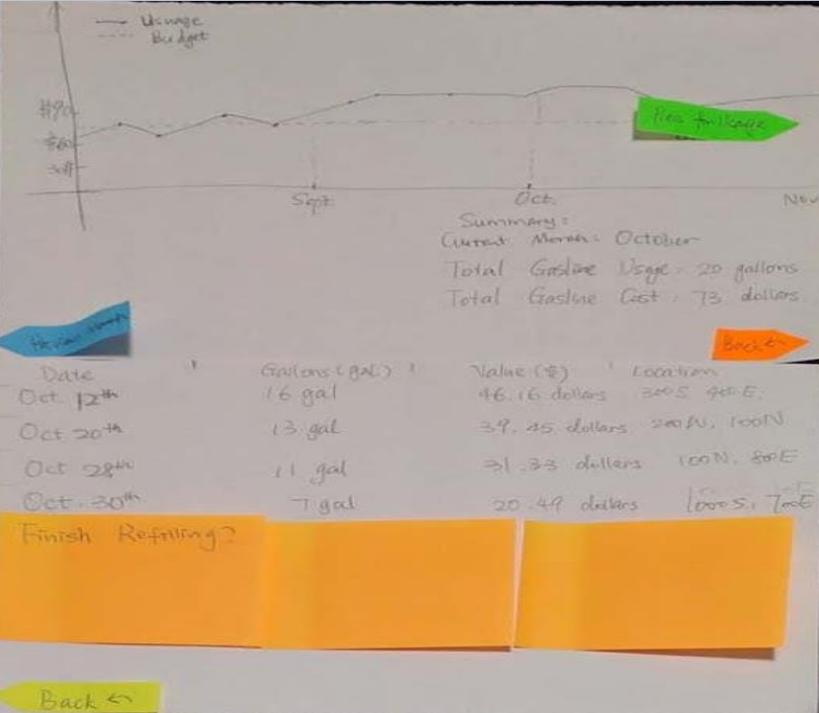
Add

Driving Away

Auto-Adjust AC and Heating
System: ON

Turn OFF Selected devices

Set turn off list



RECORD NEW COST

New Consumption

Energy Type

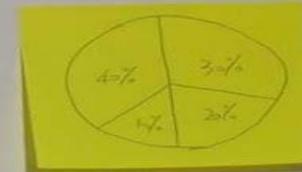
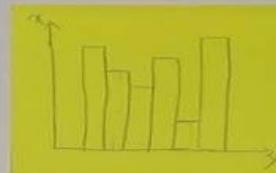
Gas

Cost

\$ 10.25

Date

10/25/2018



Confirm

Back

WELCOME TO ENERGY TRACKER!

Total Consumption

\$ 888.00

Current Cost

\$ 180.00

Energy Monitor

Record New Cost

ENERGY MONITOR

Your Devices

- AC System

\$ 2.42

OFF

- TV

\$ 16.70

OFF

- Computer

\$ 32.40

OFF

- Light

\$ 20.00

OFF

- Gas

\$ 68.99

OFF

Back

Task Two: Reminders to Save Energy

Monthly Gasoline Cost.

\$ 90.89

Driving Away

Refill History

Current Cost Analyze

Car Mode : Home Screen

Driving Away

Auto-Adjust AC and Heating
system :  ON

Turn OFF Selected devices

Set turn off list

Car Mode : Driving Away

Turn off list:

Computer A

Remove

TV (Master Room)

Remove

Available devices:

Dish Washer

Add

Oven

Add

Car Mode : Turn Off List

Turn off list:

Computer A

Remove

Available devices:

Dish Washer

Add

Oven

Add

TV (Master Room)

Add

Car Mode : Turn Off List

Task One: Recording Data

Date

Oct. 12th

Oct 20th

Oct 28th

Gallons (gal.)

16 gal

13 gal

11 gal

Value (\$)

46.16 dollars

Location

300 S. 400 E.

39.45 dollars

200 W, 100 N

\$1.33 dollars

100 N. 800 E

Finish Refilling?

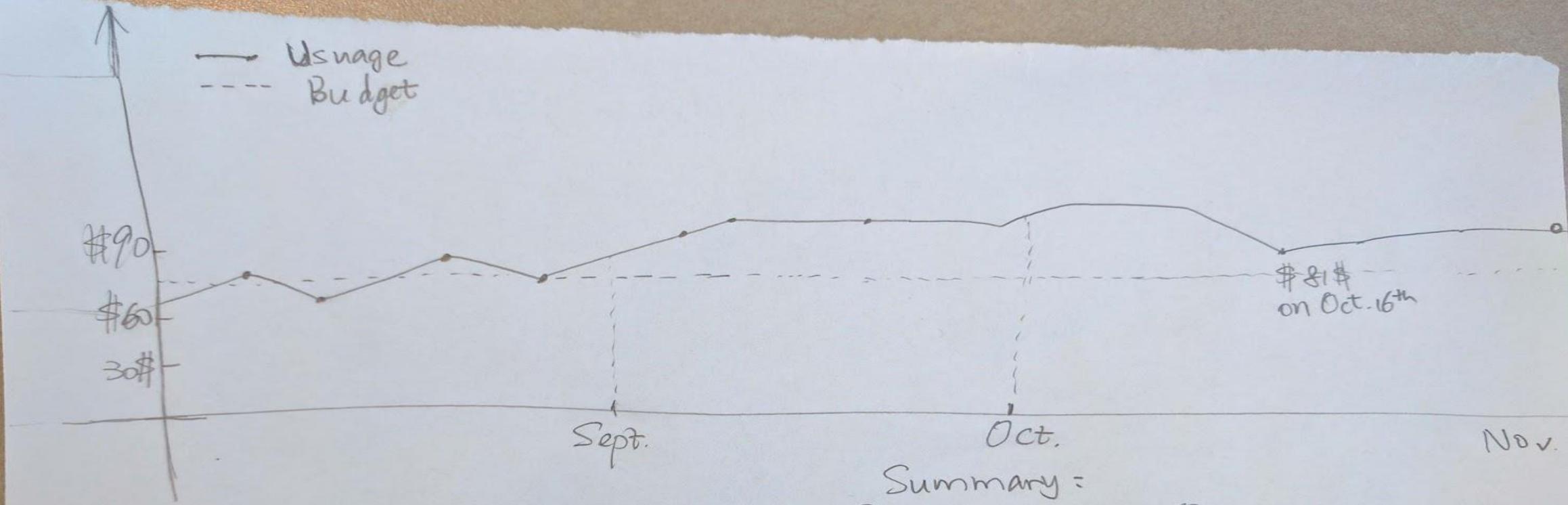
Back ←

Car Mode : Refill History

Date	Gallons (gal.)	Value (\$)	Location
Oct. 12 th	16 gal	46.16 dollars	300 S. 400 E.
Oct 20 th	13 gal	39.45 dollars	200 W, 100 N
Oct 28 th	11 gal	31.33 dollars	100 N. 800 E
Oct. 30 th	7 gal	20.49 dollars	1000 S. 700 E 1000 S., 700 E

Back ←

Car Mode : Refill History



Summary:

Current Month: October

Total Gasline Usage: 20 gallons

Total Gasline Cost : 73 dollars

Previous Month

Next Month

Car Mode : Cost Summary

ENERGY MONITOR

Your Devices.

- AC System
- TV
- Computers
- Light
- Gas.

\$ 8.42

ON

\$ 16.74

ON

\$ 32.45

ON

\$ 20.00

ON

\$ 68.99

ON

Home Mode : Cost Summary

Back

RECORD NEW COST

New Consumption

Energy Type

Gas

Cost

\$ 73.25

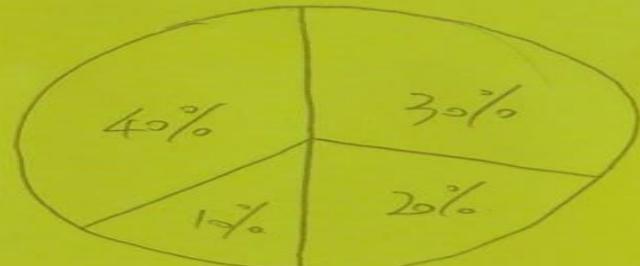
Date

10/20/2016

Electric

\$ 1047.64

10/20/2016



Home Mode : Input Data

Back

Testing Process and Results

Tasks

- Recording Data
- Reminders to Save Energy

Test Procedure

- Facilitator
- Note Taker
- Follow-up Questions
- Finish Interview

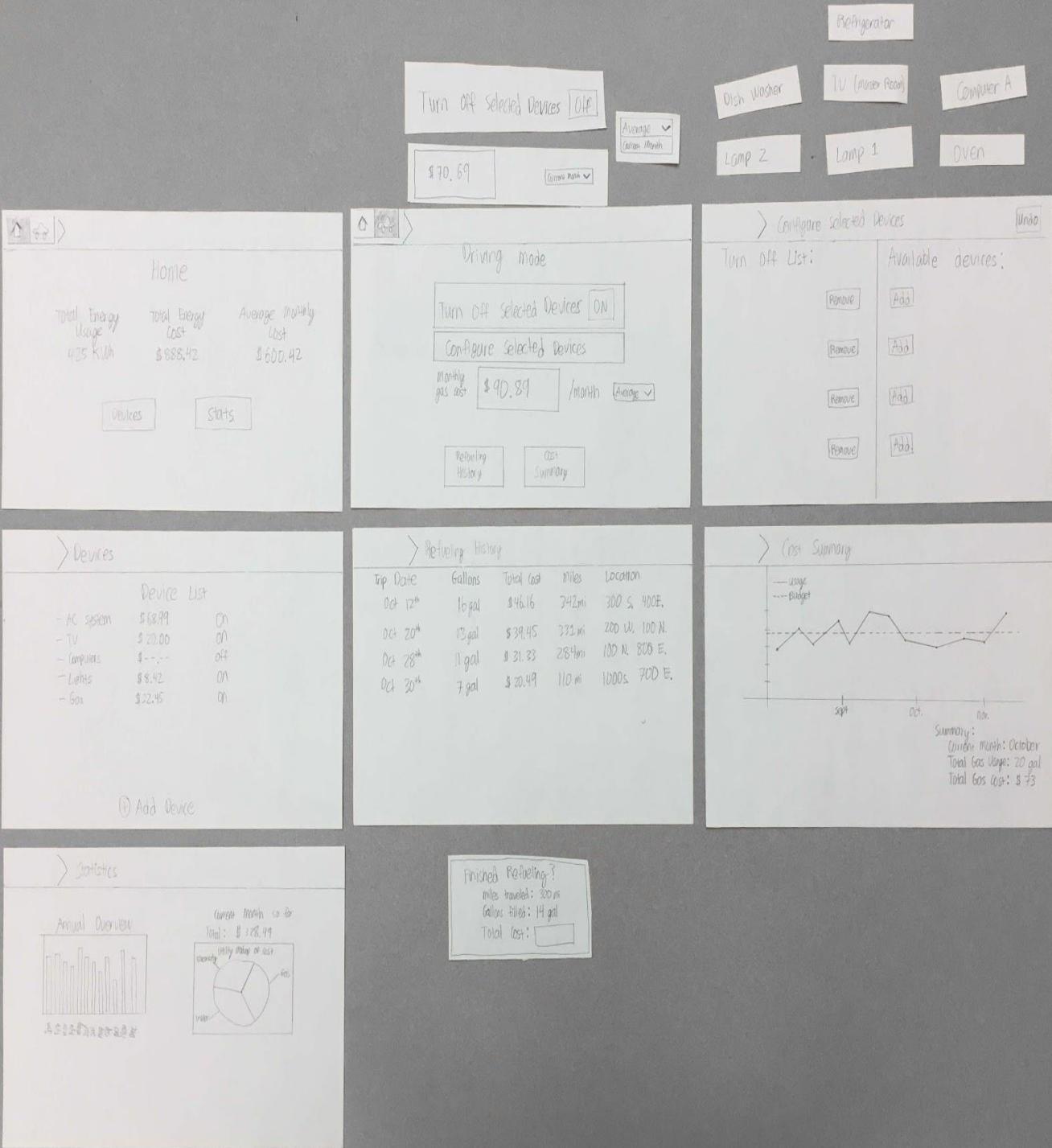
Participants

- Computer Science Student
- Economic Student
- Photographer

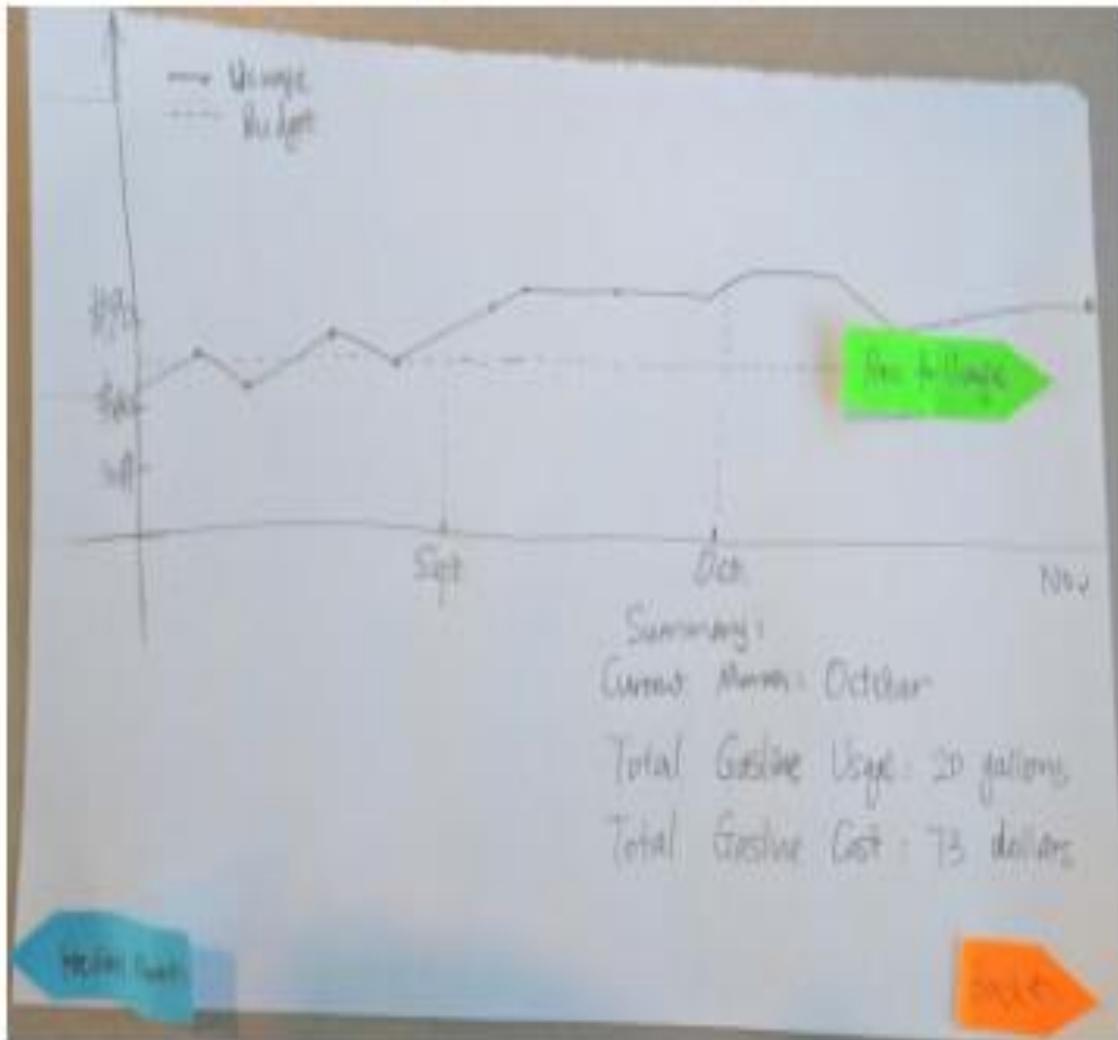


Testing Process and Results

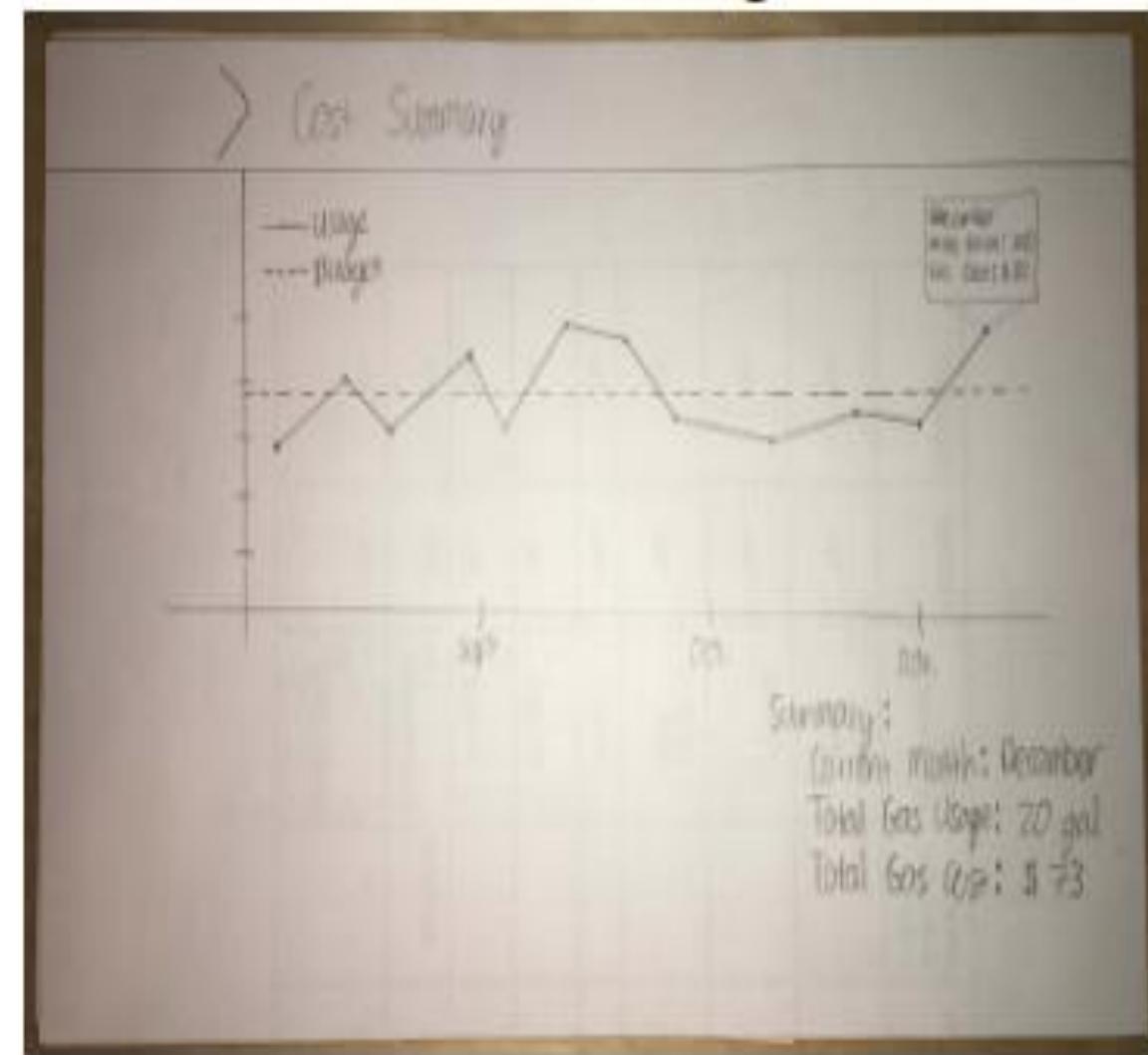
- Simplified System
- More Functionalities
- Clear data visualization
- Better Structure



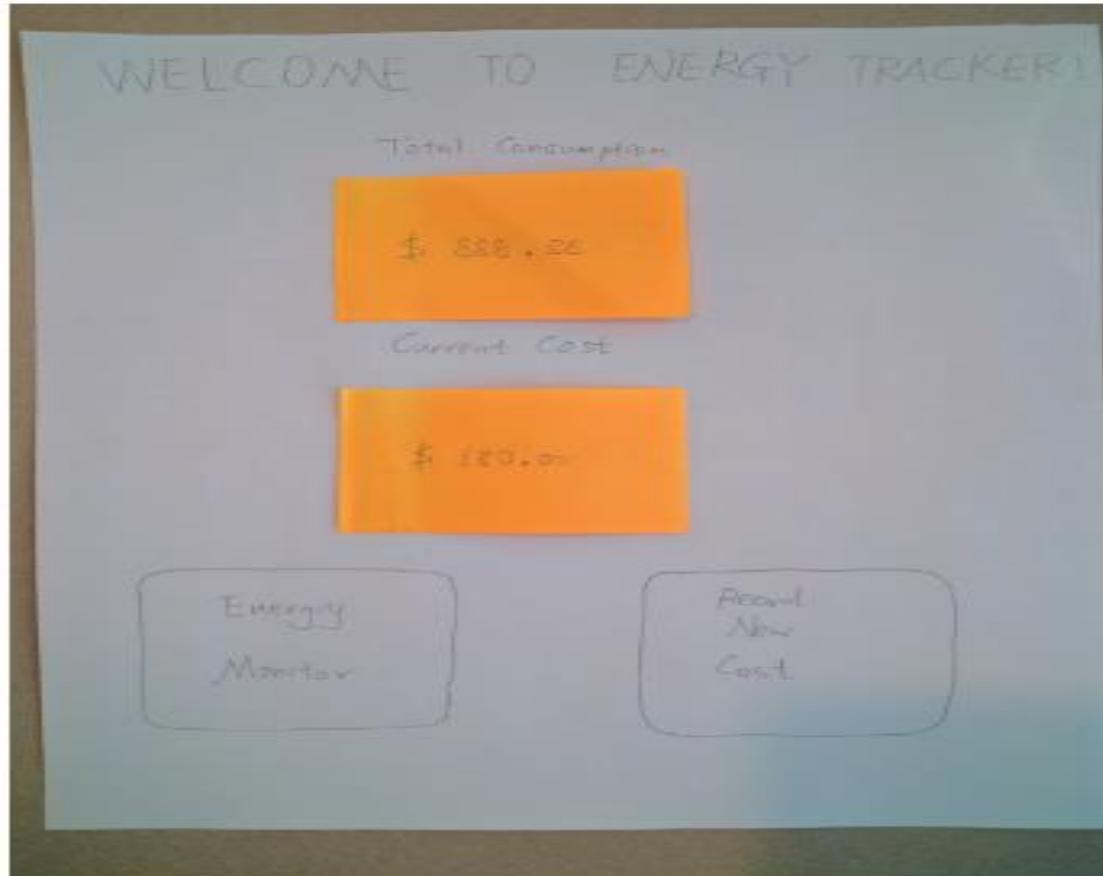
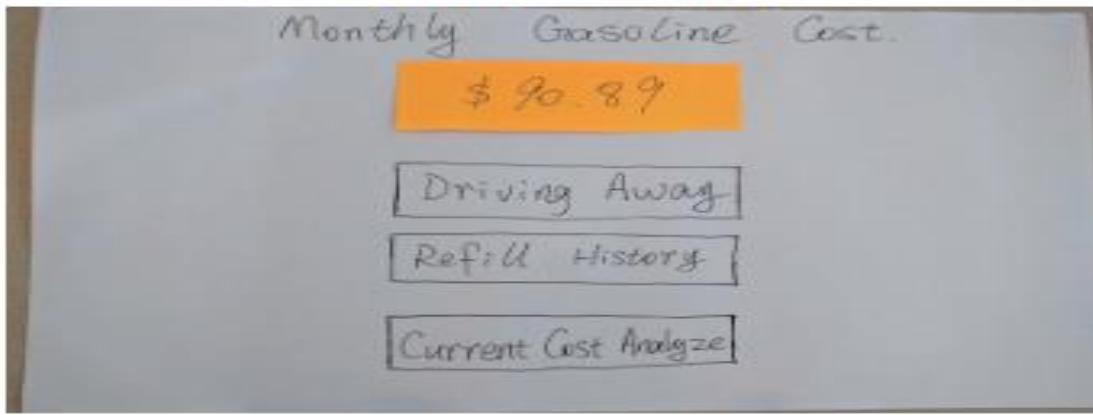
Original Design



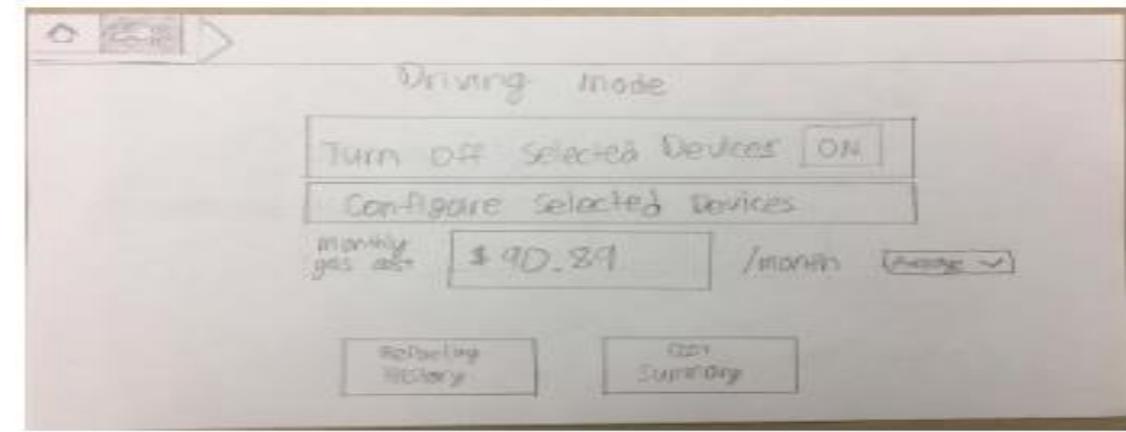
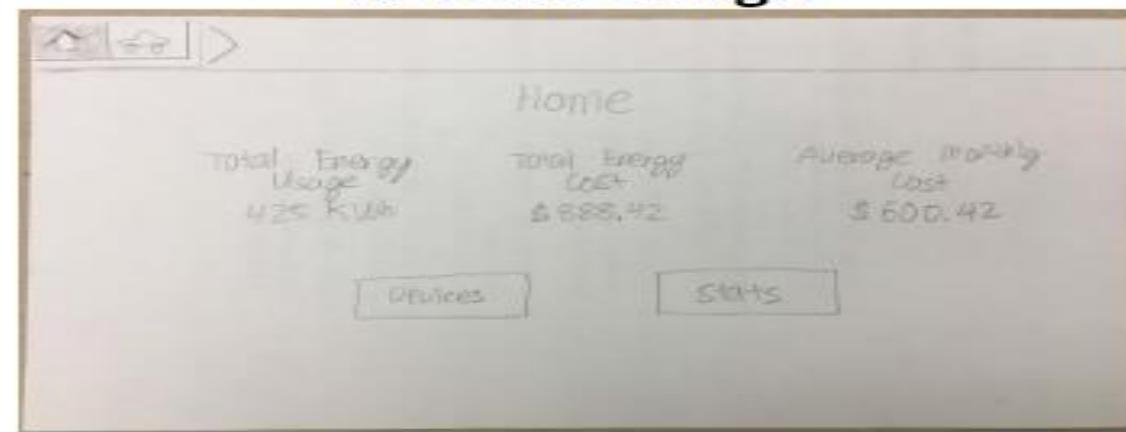
Revised Design



Original Design



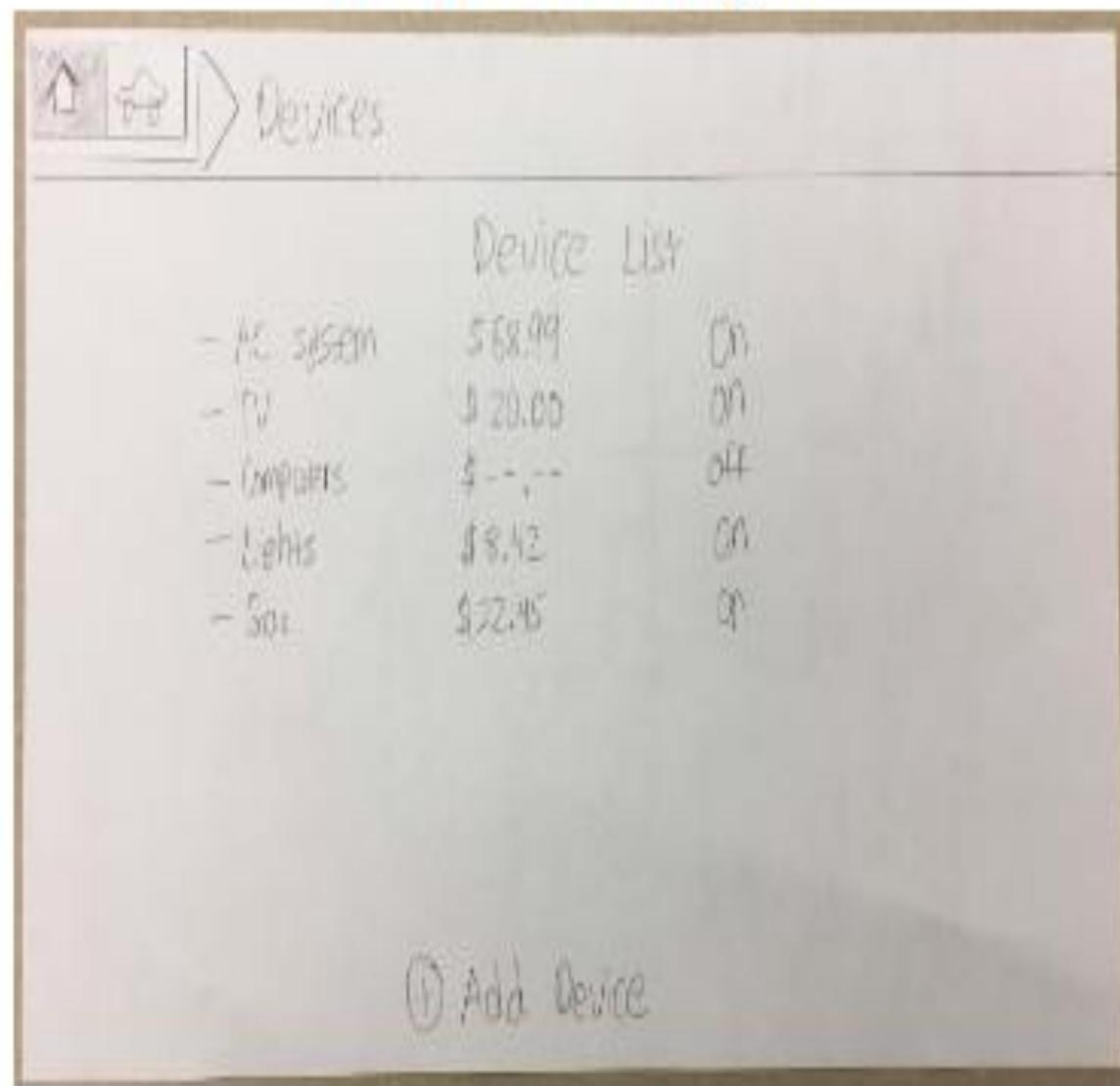
Revised Design



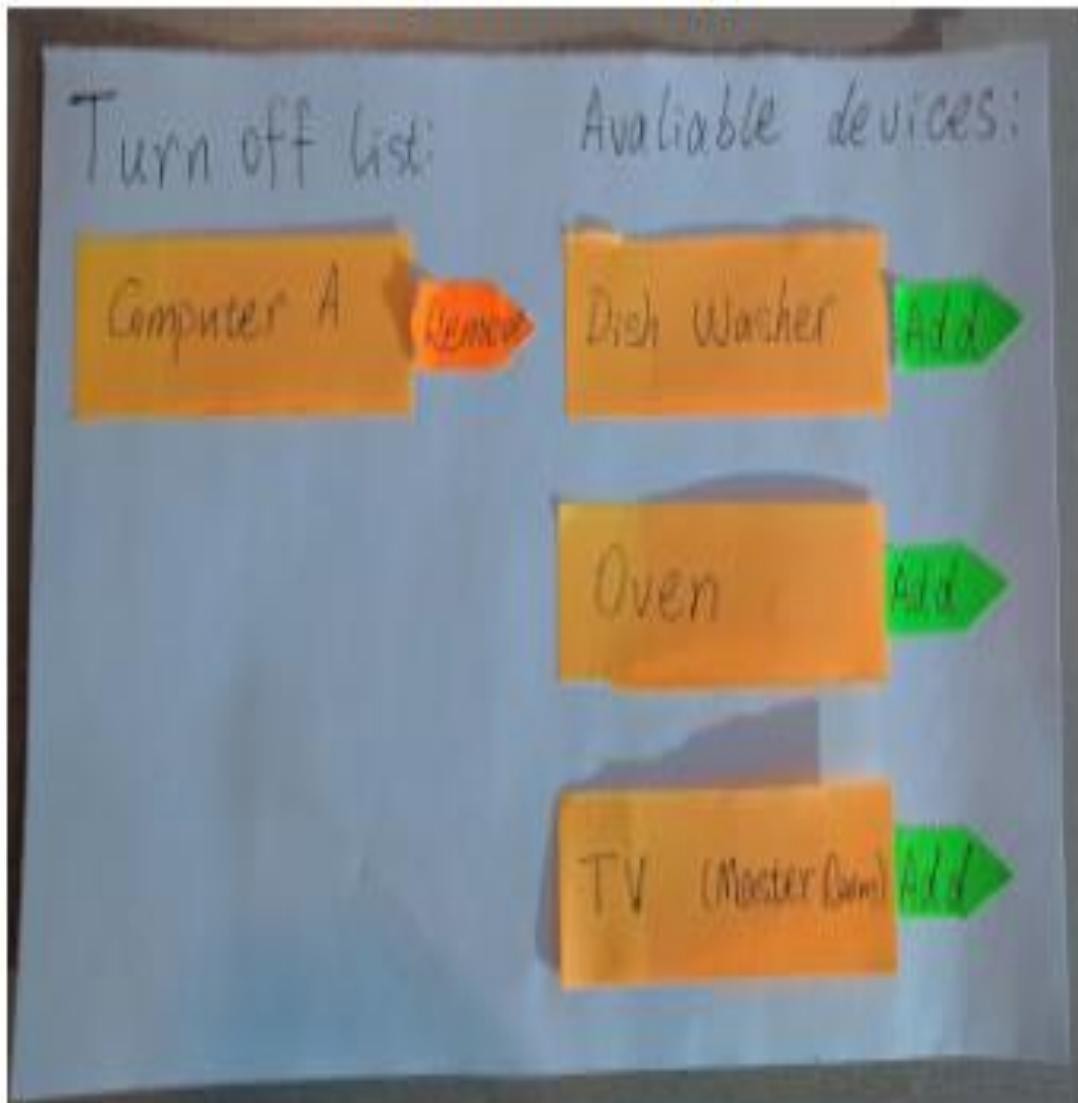
Original Design



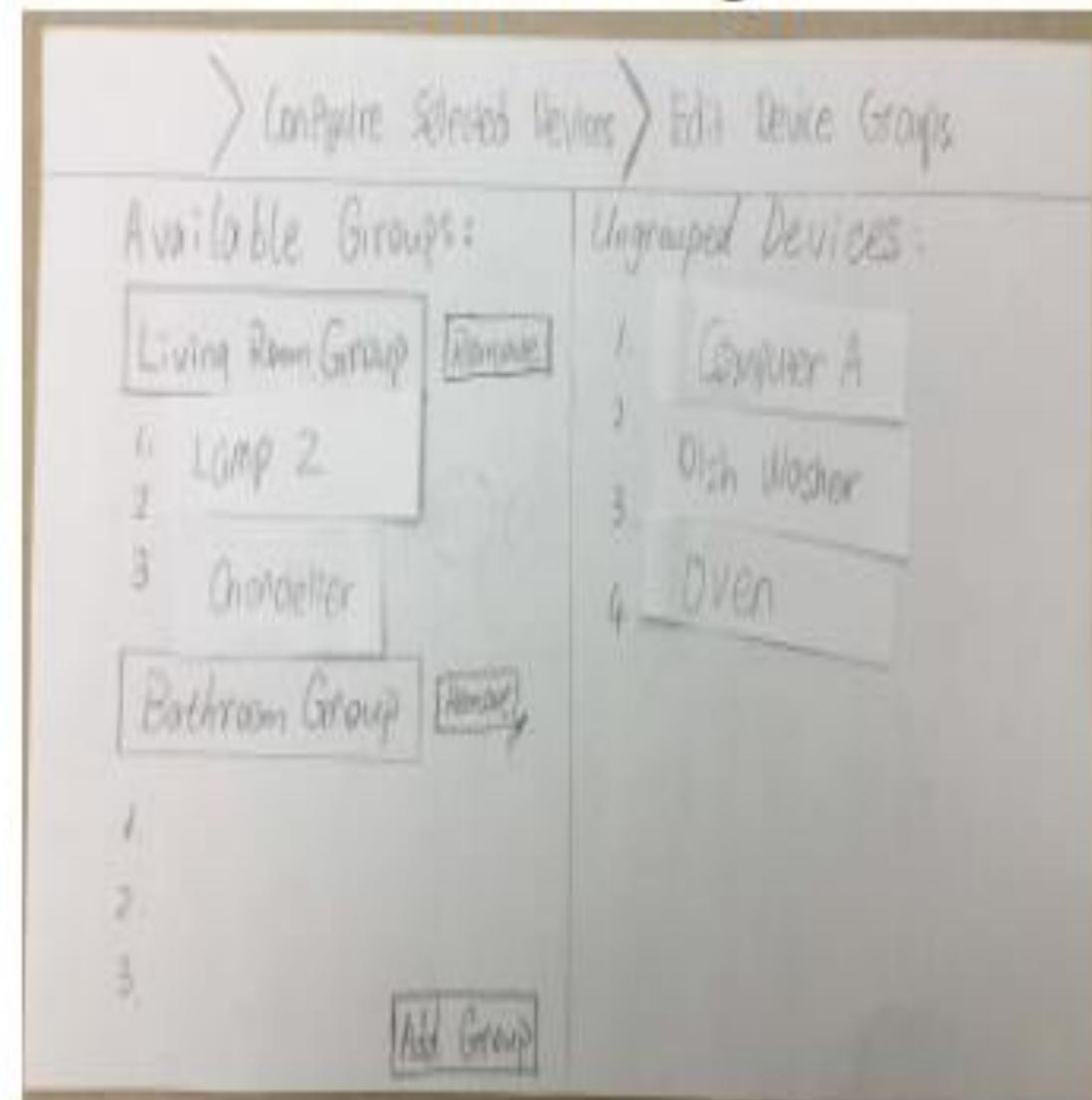
Revised Design



Original Design



Revised Design



Original Design

Monthly Gasoline Cost.

\$ 90.89

Driving Away

Refill History

Current Cost Analyze

Revised Design

Driving mode

Turn On Selected Devices

Configure Selected Devices

Monthly
gas cost /month

Refill History

Cost
Analyse

The two primary tasks

- Remind the user to turn off specific devices.
- Record driving data as well as household utility consumption.



Final Paper Prototype Overview

The image displays a 3x3 grid of paper prototypes for a mobile application, illustrating the final design of the user interface.

- Home Screen:** Shows total energy usage (425 kWh), total energy cost (\$888.42), and average monthly cost (\$600.42). Includes buttons for "Devices" and "Stats".
- Driving mode Screen:** Shows a "Turn Off Selected Devices [OFF]" button, a cost input field (\$70.69), and dropdowns for "Average" and "Current Month". It also shows monthly gas cost (\$90.89) and a "Refueling History" button.
- Configure selected devices Screen:** Shows a "Turn Off List:" section with "Available devices:" and "Selected devices:" lists, each with "Remove" and "Add" buttons. An "Undo" button is also present.
- Devices Screen:** Shows a "Device List" with items: AC System (\$58.99 ON), TV (\$20.00 ON), Computers (\$-- off), Lights (\$8.42 ON), and Gas (\$22.45 ON).
- Refueling History Screen:** Shows a table of trips: Oct 12th (1 gal, \$46.16, 342 mi, 300 S, 400 E.), Oct 20th (13 gal, \$39.45, 332 mi, 200 W, 100 N.), Oct 28th (11 gal, \$31.33, 284 mi, 100 N, 800 E.), and Oct 30th (7 gal, \$20.49, 110 mi, 1000 S, 700 E.).
- Cost Summary Screen:** A line graph comparing "usage" (solid line) and "budget" (dashed line) from September to November. A summary at the bottom states: Current Month: October, Total Gas Usage: 20 gal, Total Gas Cost: \$73.
- Statistics Screen:** Shows an "Annual Overview" bar chart and a pie chart of "Utility Major of cost" (Water, Electricity, Gas).
- Refueling Confirmation Screen:** A box asking "Finished Refueling?" with fields for miles traveled (300 mi), gallons filled (14 gal), and total cost (\$28.49). A "Total Cost" input field is also present.



Driving mode

Turn off Selected Devices ON

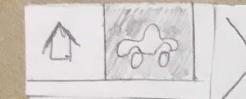
Configure Selected Devices

Monthly gas cost \$ 90.89 /month Average Current Month

Refueling History Cost Summary

Task 1: Reminders to save energy

Turn On/Off devices



Driving mode

Turn off Selected Devices OFF

Configure Selected Devices

Monthly gas cost \$ 90.89 /month Average Current Month

Refueling History Cost Summary

Task 1: Reminders to save energy

› Configure selected Devices Undo

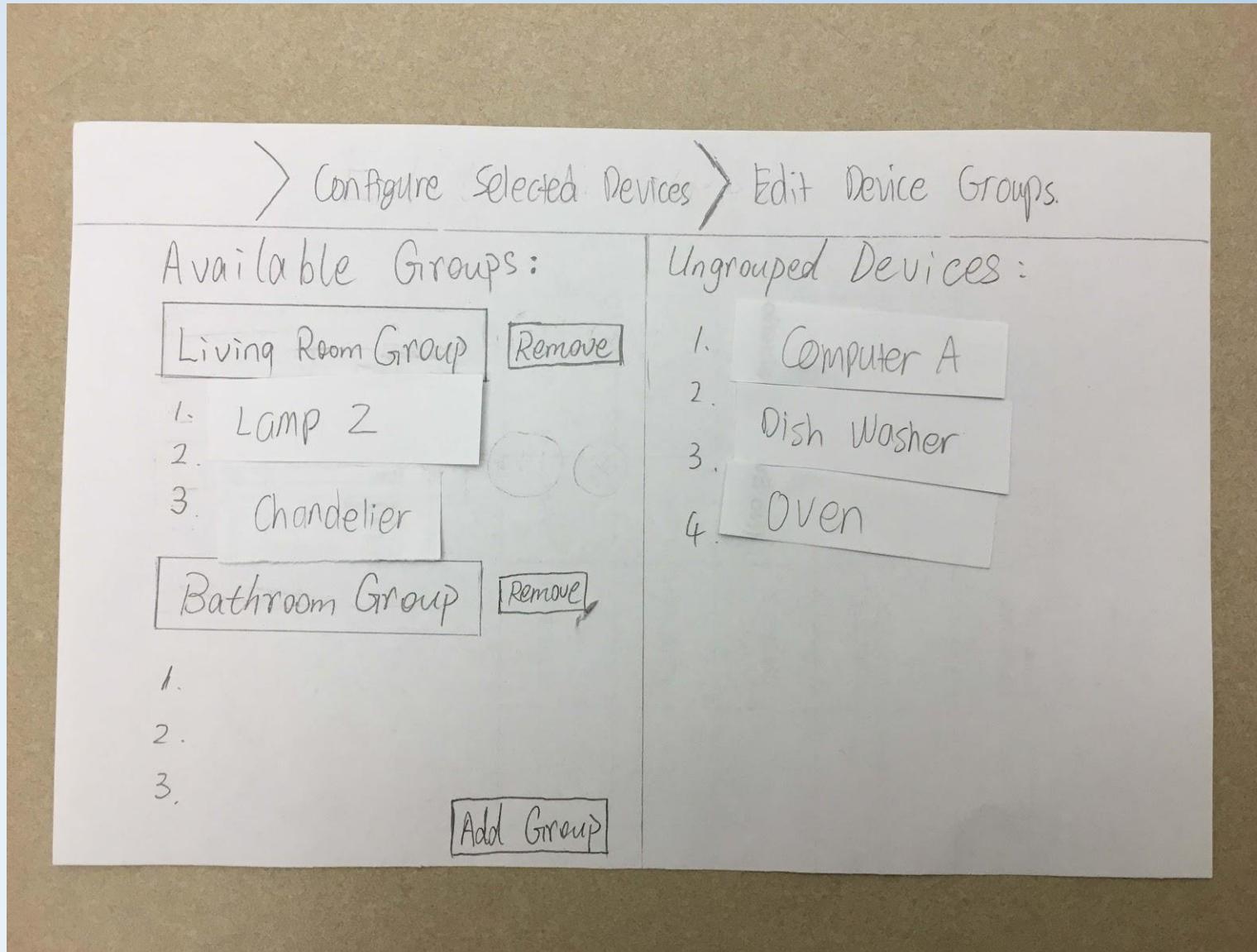
Turn off List:	Available devices:
Computer A Remove	Add Lamp 2
TU (master Room) Remove	Add
Dish Washer Remove	Add
Lamp 1 Remove	Add

› Configure selected Devices Undo

Turn off List:	Available devices:
Computer A Remove	Add Lamp 1
TU (master Room) Remove	Add Lamp 2
Dish Washer Remove	Add
	Add

Add/Remove devices

Group the devices



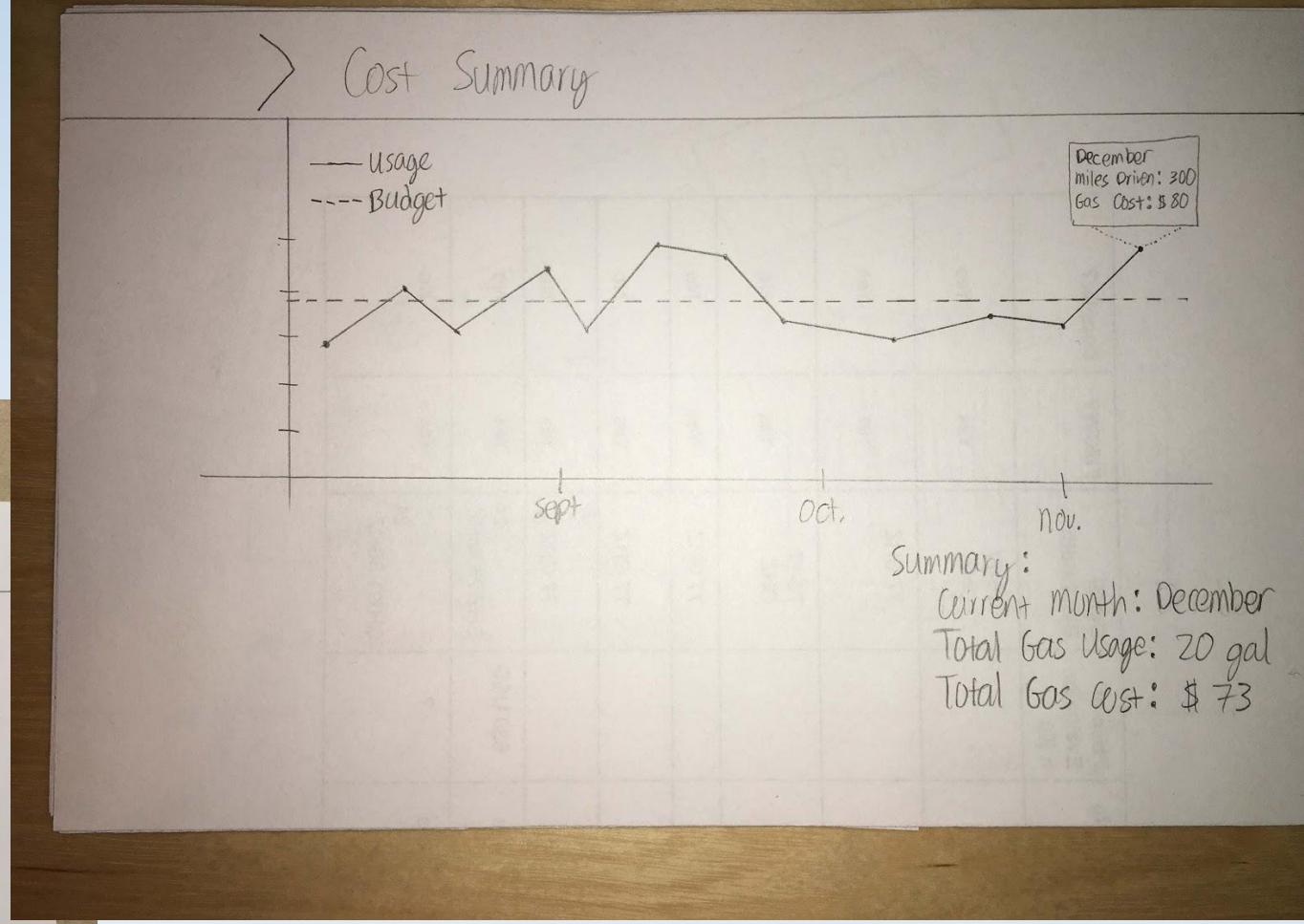
Task 1: Reminders to save energy

Task 2: Recording Data

In Home mode, collects data about energy usage and costs

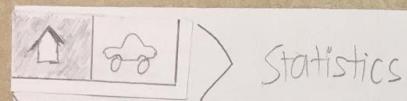


Home		
Total Energy Usage	Total Energy Cost	Average Monthly Cost
425 kWh	\$888.42	\$600.42
Devices	Stats.	

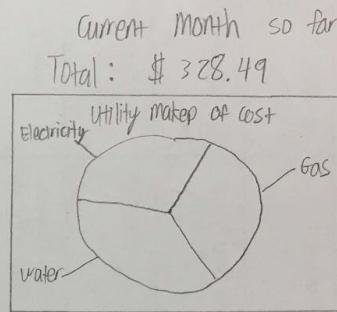
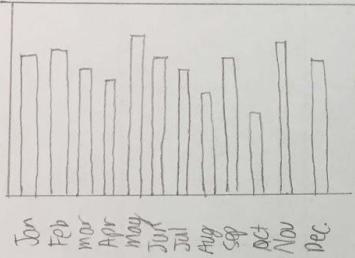


In Drive mode, there is a "Cost Summary" which analyzes the gas usage and cost

Task 2: Recording Data



Annual Overview



Device List

- AC system	\$ 68.99	On
- TV	\$ 20.00	On
- Computers	\$ --.--	Off
- Lights	\$ 8.42	On
- Gas	\$ 32.45	On

⑦ Add Device

Shows Devices and analyzes the overall statistics

> Refueling History

Trip Date	Gallons	Total Cost	Miles	Location
Oct 12 th	16 gal	\$46.16	342 mi	300 S. 400 E.
Oct 20 th	13 gal	\$39.45	331 mi	200 W. 100 N.
Oct 28 th	11 gal	\$31.33	284 mi	100 N. 800 E.
Oct 30 th	7 gal	\$20.49	110 mi	1000s. 700 E.

In Drive mode, record the data of refueling and cost

Task 2: Recording Data

> Refueling History

Trip Date	Gallons	Total Cost	Miles	Location
Oct 12 th	16 gal	\$46.16	342 mi	300 S. 400 E.
Oct 20 th	-	-	331 mi	200 W. 100 N.
Oct 28 th	-	-	-	100 N. 800 E.
Oct 30 th	-	-	-	1000s. 700 E.

Finished Refueling?
miles traveled: 300 mi
Gallons filled: 14 gal
Total cost: []

Digital Mockup



The screenshot shows a mobile application interface for managing smart devices. At the top, there are icons for a car, a house, and a right-pointing arrow. Below them, the title "DRIVING MODE" is displayed. Two orange buttons are present: "TURN OFF SELECTED DEVICES" with a power-off icon and "CONFIGURE SELECTED DEVICES". To the right of these buttons is a dark rectangular box containing the number "19". Below these buttons is a section showing "Monthly gas cost" as "\$90.89 /month" with a dropdown menu set to "Average". At the bottom are two more buttons: "Refueling History" and "Cost Summary".

Task 1: Reminders to Save Energy

This screenshot shows the same mobile application interface as the first one, but it is displayed on a different screen or in a different orientation. It features the same navigation icons at the top, the "DRIVING MODE" title, the "TURN OFF SELECTED DEVICES" and "CONFIGURE SELECTED DEVICES" buttons, the "19" count, the monthly gas cost information, and the "Refueling History" and "Cost Summary" buttons at the bottom.

The image shows a mobile application interface for managing smart devices. At the top left are icons for a car and a house. To the right of the house icon is the text "CONFIGURE DEVICES".

Turn off List:

- Bedroom Computer -
- Bathroom Group -
- Television -
- Washing Machine -
- Dish Washer -

Available Devices:

- + Living Room Light
- + Refrigerator
- + Heater
- + Air Conditioning
- + Porch Lamp

Edit Groups button.

Groups:

- Bedroom Computer -
- Bathroom Group -
- Television -
- Washing Machine -
- Dish Washer -

Ungrouped Devices:

- + Living Room Light
- + Refrigerator
- + Heater
- + Air Conditioning
- + Porch Lamp

Add Group button.

Task 1: Reminders to Save Energy

Add/Remove/Group up the devices

The image shows a mobile application interface for managing smart devices. At the top left are icons for a car and a house. To the right of the house icon is the text "CONFIGURE DEVICES".

Turn off List:

- Bedroom Computer -
- Bathroom Group -
- Television -
- Washing Machine -
- Dish Washer -

Available Devices:

- + Living Room Light
- + Refrigerator
- + Heater
- + Air Conditioning
- + Porch Lamp

Edit Groups button.



HOME MODE

Total Energy Usage

425 kWh

Total Energy Cost

\$888.42

Average Monthly Cost

\$600.42

Devices

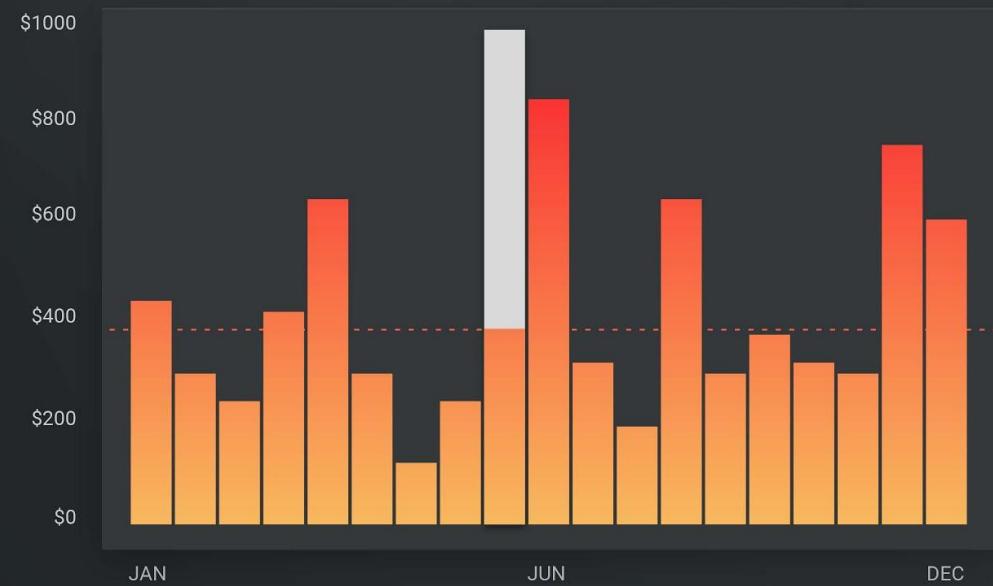
Stats



Current Month: December

Total Gas: 20 gal

Total Cost: \$73.24



In Home mode, collects data about energy usage and costs

In Drive mode, there is a “Cost Summary” which analyzes the gas usage and cost

Task 2: Recording Data



DEVICES

DEVICE LIST

name	cost	status
Air Conditioning	\$68.99	On
Television	\$ - - - -	Off
Computers	\$8.42	On
Gas	\$32.45	On

Add Device

Task 2: Recording Data

Shows Devices and analyzes the overall statistics



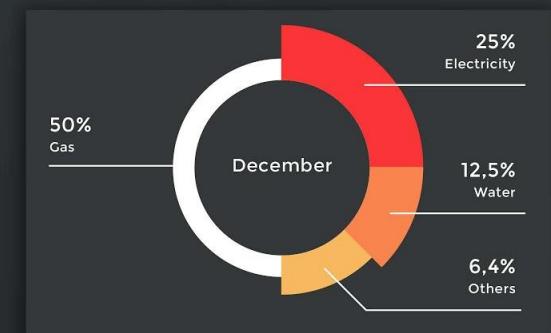
Statistics

Annual Overview



Current Month

Total: \$328.49





REFUELING HISTORY

trip date	gallons	total cost	miles	location
2016/10/12	16.205 gal	\$46.16	342 mi	300 S. 400 E.
2016/10/20	17.300 gal	\$39.45	331 mi	200 W. 100 N.
2016/10/28	10.846 gal	\$31.33	284 mi	100 N. 800 E.
2016/10/30	14.838 gal	\$20.49	110 mi	1000 S. 700 E.

In Drive mode, record the data of refueling and cost



REFUELING HISTORY

trip date	gallons	total cost	miles	location
2016/10/12	16.205 gal	\$46.16	110 mi	300 S. 400 E.
2016/10/20				200 W. 100 N.
2016/10/28				100 N. 800 E.
2016/10/30				1000 S. 700 E.

Finished Refueling?

Miles Traveled: 300 mi

Gallons Filled: 20 gal

Total Cost:

Task 2: Recording Data

Summary

- Brain storm is the best way to generate ideas.
- As the program goes further, we can always get ideas to improve it.
- User feedback is really important for the program!
- Whatever improvement you made, don't hope it can fit everyone's need



Thank you!

Any questions?

