# DripIt™

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PROMPT

**Design a solution that will allow the Berkeley community to solve some aspect of the California drought.**

# OVERVIEW

1. **Problem**
2. **Journey**
3. **Final Design**
4. **Further Work**

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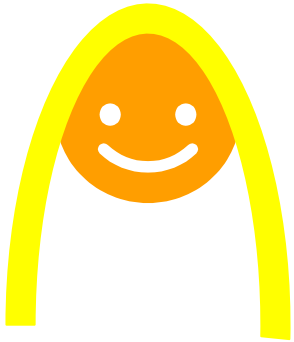
# PROBLEM

QUESTION

# “How is most of California’s available water consumed?”

EMILY



“I don’t know.”

BEHNAZ

**“Daily use. People waste water by taking showers that are too long.”**

*“Approximately nine million acres of farmland in California are irrigated, representing roughly 80% of all human water use.”*

- Public Policy Institute of California

ANSWER

# Most water usage is invisible to consumers!

| Household Use | Gallons | Agricultural Use | Gallons |
|---|---|---|---|
| 10 Minute Shower | **~20** | Slice of Cheese Pizza | **155** |
| Washing Machine | **20-40** | Bean Burrito | **125** |
| Flushing Toilet | **1-3** | Beef Burrito | **425** |

PROBLEM

# People don’t know this.

QUESTION

**“How many of gallons of water do you think it takes to prepare one pound of beef?”**

ANSWER

# 1800 gallons of water

## PROBLEM

drought awareness

+

ignorance of consumption

misinformed cutbacks

no policy drive

no policy data

# real-time visual indication of water consumption

SOLUTION

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# A versatile “water footprint” monitor to be deployed in UC Berkeley Residence Halls and Dining Facilities.

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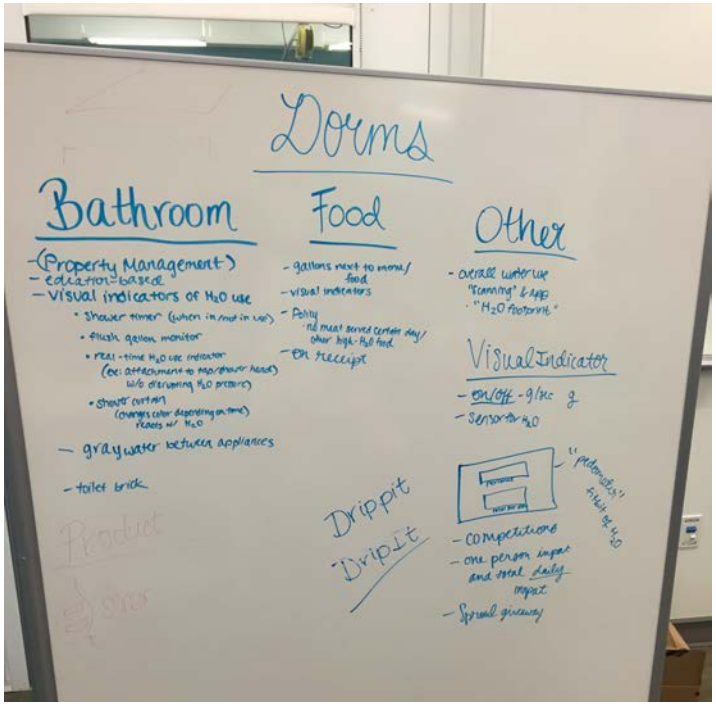
# JOURNEY

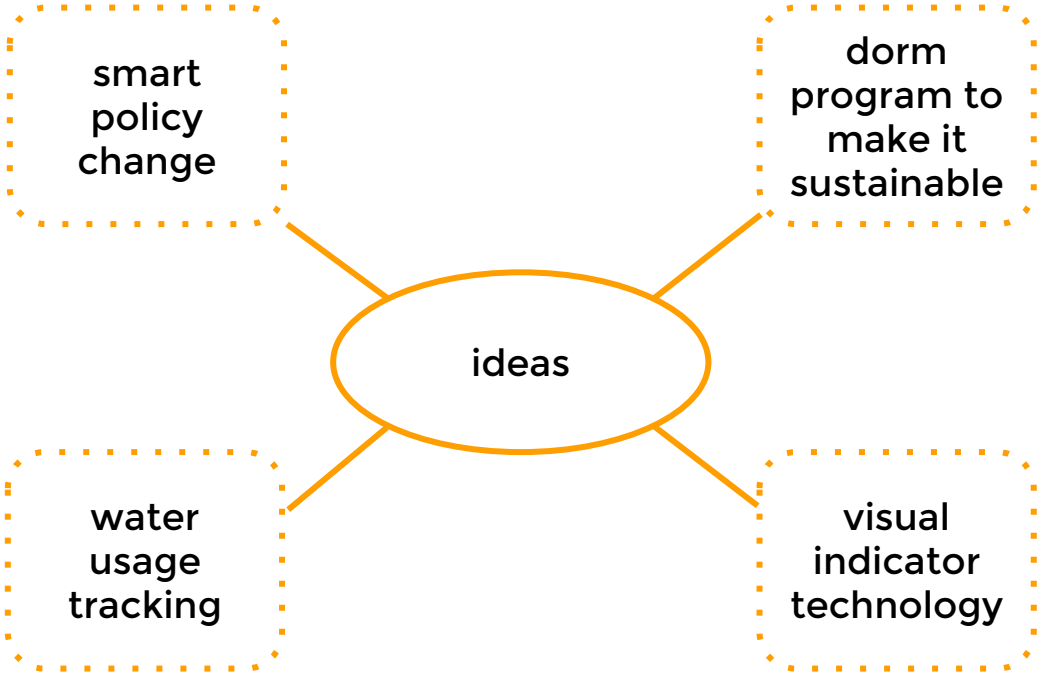
QUESTION

# “How is most of California’s available water consumed?”

# IDEATION


Dorms
Bathroom
Food
Other
(Property Management)
- education-based
- visual indicators of H2O use
• shower timer (when in use)
• flush gallon monitor
• real-time H2O use indicator
(ex: attachment to tap/shower head)
w/o decreasing H2O pressure
• shower curtain
(changes color depending on time)
reacts w/ H2O
- graywater between appliances
- toilet brick
- gallons next to menu/food
- visual indicators
- Penny
- EN receipt
- overall water use "framing" & app
- "H2O footprint"
Visual Indicator
- on/off - g/sec g
- Sensor to H2O
Drippit
Drip It
- competitive
- one person input and total daily input
- Spread giveaway

# IDEATION

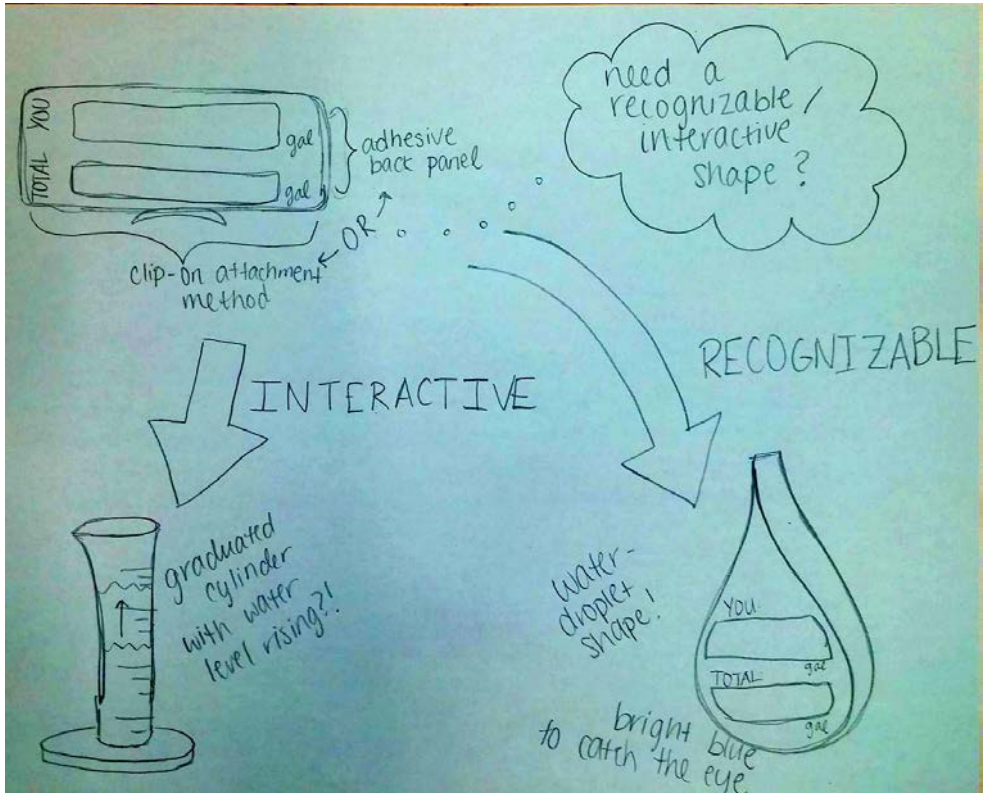

smart policy change
dorm program to make it sustainable
ideas
water usage tracking
visual indicator technology

# INSPIRATION





# INITIAL DESIGNS



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# FINAL DESIGN

# FUSION 360


You
Today


**display of individual and aggregate use**

# configured to off-the-shelf sensors

## PARTICIPATION

- **Sensor Technology**
  - Humidity Sensors
  - Flow Sensors
  - Temperature Sensors
  - IR Sensors

- **Different sensors for different applications**

SENSOR TECHNOLOGY

IST
INNOVATIVE SENSOR TECHNOLOGY

**cloud:**

**stores data,**

**aggregates it, and provides usage rates**

CLOUD


1.DripIt labelled in cloud, ie ‘Dessert Box’

4. DripIt pulls usage/increment cloud. Increments automatically.

5. DripIt pushes usage data to cloud.

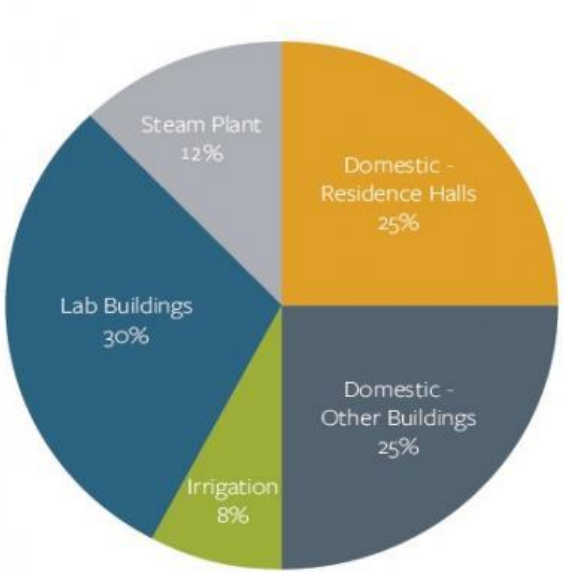
3. Server calculates usage per serving or second

2. Staff sync DripIt to menu item or appliance

6. Aggregated data available for organization

# STAKEHOLDERS

- **UC Berkeley**
  - GOAL: *"Reduce potable water use to 10% below 2008 levels by 2020"*
  - Measures **primary** water use, but not **secondary** water use
  - Students are unaware of Berkeley's "Water Action Plan"




(Source: http://sustainability.berkeley.edu/water)

# STAKEHOLDERS

- **Berkeley Students**
  - Need information to make personal choices and drive policy reform.
  - Need to see personal usage footprint, whether or not they care enough to look it up online or via an app.

# IMPLEMENTATION

## IMPLEMENTATION

## STAKEHOLDERS

- **Dining Hall Staff**
  - Responsible for setting ‘per serving’ usage in dining halls.
  - Usage must be quick and not require calculations or calibration.

# IMPLEMENTATION


**DripIt**

## STAKEHOLDERS

- **Residence Hall Staff (Adults)**
  - Responsible for placing product in dorms.
  - Usage must be quick and not require calculations or calibration (ResComp)
- **Residential Advisors (Upperclassmen)**
  - Initiate inter-floor competitions
  - Floor meetings
- **Residential Hall Associations (Peers)**
  - Initiative to promote water conservation
  - Committee meetings can relay feedback

Residence
HALL ASSEMBLY
BERKELEY

# WHY DripIt

real-time visual indication of water consumption

in the physical space, no one can hide

ability to connect to a variety of sensors yields many applications

# IMPACT

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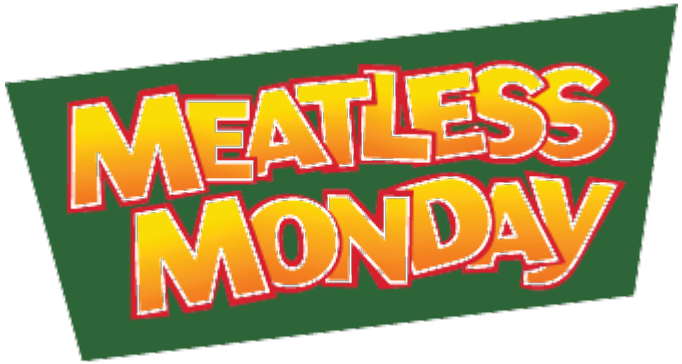
# FURTHER WORK

**DripIt can influence policy:**

- Meatless Mondays
- Low-water meals
- Dorm floor competitions



# EXPANSION

**DripIt  in other places:**

- Rest of campus
- Other universities
- Other organizations

## CONCLUSION

**present.** **passive.** **personal.**

DripIt™