SHARING

- We presented our innovative solution to Professors Magdalena Krol, Ahmed Eldyasti and Usman Khan of York University

- We demonstrated The Flow Finder to Professor Jit Sharma, Chair of Civil Engineering at York University

- We showed our prototype to Mr. Corey Ryan, Program Manager, Education and Outreach, Regional Municipality of York

- We invited Mr. Calvin Chan of Rubinet Faucets to our robotics team meeting where he learned about our rationale for developing The Flow Finder.

- We presented The Flow Finder to numerous visitors at the Bayview Glen School open house.

- We presented our innovative solution and pitch to over 500 middle school and high school students at Bayview Glen.

IMPLEMENTATION

- Next step for our innovative solution is to consult with engineers to assist us with end-to-end product design and development and fully explore the commercial viability of The Flow Finder.

The Flow Finder

Tracking your water consumption one shower at a time.

Ctrl-Z Bayview Glen FLL Team #5831

Visit:
(a) Our website at https://fllctrlz.github.io/ctrlz/
(b) Our video at https://youtu.be/yk7CyCaWl9c

PROBLEM IDENTIFICATION

The price of water in Canada is amongst the lowest in the world, and shamefully our consumption per capita is one of the highest. As Canadians, we should take a global leadership role by setting an example and conserving in spite of our country's abundance of fresh water. Global water supplies are rapidly depleting. We cannot continue wasting water at our current rate. We need to conserve.

Sources of Information

- **We have consulted with experts, conducted surveys and referred to articles and websites**

EXPERTS

- **Dr. Ahmed Eldyasti,** Assistant Professor, P.Eng., York University, suggested other commercial applications of The Flow Finder, such as public gyms, hotels and Airbnb.
- **Mr. Corey Ryan,** Program Manager from the Regional Municipality of York, informed us that any form of conservation education will result in positive behavior change.
- **Mr. James Downham,** President & CEO, PAC (Packaging Consortium), said that we should set The Flow Finder price based on the payback period.
- **Dr. Magdalena Krol,** Assistant Professor, P.Eng., York University, stressed the importance of knowing who the intended user is.
- **Dr. Usman T. Khan,** Assistant Professor, P.Eng., York University, said awareness is the way to change attitudes on water conservation.
- **Mr. Calvin Chan,** Operations Manager, Rubinet Faucets, suggested that we make The Flow Finder a device that is positioned between the shower arm and the shower head, so consumers can keep their existing shower heads.

SOME OF THE ARTICLES WE REFERRED TO

- United States Environmental Protection Agency, WaterSense Labeled Showerheads, www.epa.gov/watersense, Oct 2017
- Malatest & Associates, Moderator's Guide, CRD Shower Behaviour Focus Groups, http://www.malatest.com
- Conair home, Cut Cost and Consumption with WaterSense, https://www.conair.com/co/112/cut-cost-and-consumption-with-watersense/253, Accessed Nov 18, 2017

EXISTING SOLUTIONS

Comparison of The Flow Finder with Selected Smart Shower Systems					
	Cost	Tracks individual water usage	Identifies user without requiring a phone	Allows user to keep existing showerhead	Provides information without app or website
Flow Finder	**$80**	✓	✓	✓	✓
EvaDrop	$110	✓	✗	✓	✗
Nebia	$650	✗	✓	✗	✗
Oasense	$175	✗	✓	✗	✗
U by Moen	$345	✗	✗	✓	✗
HYDRAO	$135	✓	✗	✗	✗
WaterHawk	$55	✗	✗	✗	✓

Current smart shower systems rely on a cell phone connection from each user. Not only is it inconvenient to connect your phone using Bluetooth every time you want to shower, but some family members might not have smart phones. The water consumption data is shared on a website, which requires users to constantly remember to check their statistics.

SURVEY CONDUCTED

Through our survey, with 182 responses, we found that many people are taking needlessly long showers. As well, we found that people are willing to reduce their shower time by about 2.2 minutes. Although people are willing to save time in the shower, there is little motivation for them to do so.

- People we surveyed take needlessly long showers

On average, how long do you spend in the shower in minutes?
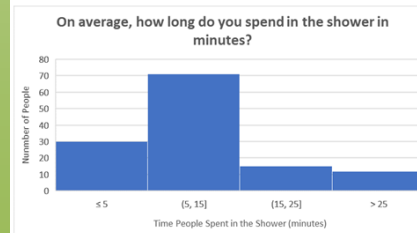
- On average, people are willing to reduce their shower time by about 2.2 minutes

By how many minutes would you be willing to reduce your showering time?
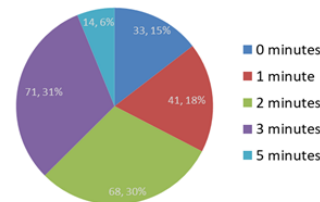
INNOVATIVE SOLUTION

TEAM SOLUTION

Since showering accounts for over 30% of domestic water use and people are taking needlessly long showers, reducing shower time is an easy way to save a significant amount of water. The Flow Finder is a device that is installed behind your shower head. Using a fingerprint sensor and a flow meter, it tracks the amount of water that each family member uses. An eye-catching LCD display can be placed anywhere in the house to show water consumption of each family member. Family members can compete with each other as a fun way to encourage water savings. The Flow Finder will educate people so that they know the value of water as a precious resource. We are not the owners of this world, we are merely its stewards. It is our duty to look after it for the future generations and the Flow Finder will help us fulfill this obligation.
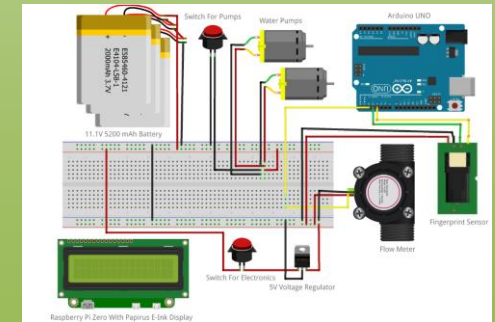
INNOVATION

- Gamifies saving water into a simple and fun competition within the family
- Does not require a smart phone
- All you need to use The Flow Finder is a finger
- Family water usage is visible every time you walk by the eye-catching display

PROTOTYPE COSTS

Manufacturing Costs	
Shower Head Component	
5V DC 10W Micro Hydro Generator	$ 3.00
Microcontroller ATMEGA328P	1.00
Wireless Module ESP8266	1.00
FS01 Optical Fingerprint Reader	6.00
Housing	2.00
Labor and Other	6.50
Fridge Magnet	
Microcontroller ATMEGA328P	1.00
Wireless Module ESP8266	1.00
2S 900 mAh Lithium Polymer Battery	3.00
ePaper Display 2.13 Inch 3 Colour Low Power	2.00
Housing	0.50
Labor and Other	3.50
Total	**$ 30.50**

VALUE PROPOSITION

- The average shower length per person is 8 minutes. The average showerhead flow rate is 7.9 L/minute. A family of 2.5 persons could pay back the $79.99 selling price of The Flow Finder in less than 5 months.