

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 presentation to 210 middle school students at our school, 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.



**Tracking your water consumption
one shower at a time.**

Ctrl-Z Bayview Glen FLL Team #5831

Visit:

- (a) Our website at <http://filctrlz.github.io/hydrodynamics/>
- (b) Our video at <https://youtu.be/UeWJkUpCnd4>



PROBLEM IDENTIFICATION

Water usage in Canada is wastefully high. Since water is so abundant and inexpensive to the public, people are unaware of how much they use. People need to be aware of their individual water footprint to reduce wastage and the high municipal infrastructure and energy costs associated with water. If all Canadians reduced their average shower time by 1 minute, Canada would save 108 billion liters of water per year which is equal to 43,200 Olympic-sized swimming pools!

Sources of Information

- We have consulted with experts, articles, websites and conducted a survey

EXPERTS

- **Dr. Ahmed Eldyasti**, Assistant Professor, P.Eng., York University, suggested other commercial applications of The Flow Finder, such as public gyms 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 OUR 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

- We conducted a patent search.
- Many existing solutions require the use of a smart phone to connect to the shower and track water consumption. The phone connects to the shower via Bluetooth; water consumption can be seen on a website or app. The problem is that many do not have the time or incentive to connect their phone before showering or to check an app or website following their shower.

- Other solutions track the water usage per shower instead of per person. This means that individual users do not know how much water they are using.

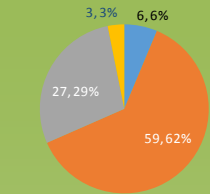
SURVEY CONDUCTED

Long shower durations and willingness to take shorter showers suggests that there is an opportunity for individuals to reduce water consumption.

Shower Duration n = 95

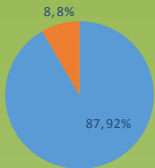


How often do you shower? n = 95



■ Twice per day ■ Once per day
■ Once every 2 days ■ Once every 3 days

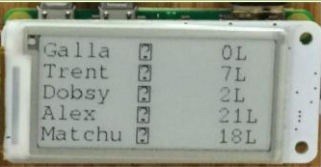
Would you be willing to take shorter showers to save water? n = 95



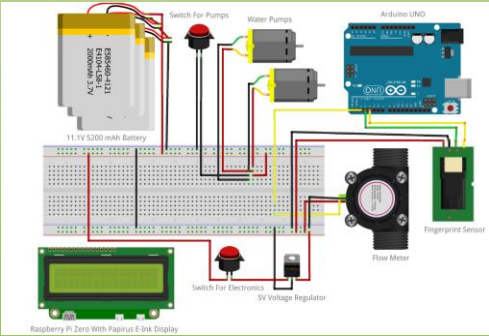
■ Willing to take shorter showers
■ Not willing to take shorter showers

INNOVATIVE SOLUTION

TEAM SOLUTION



- Our innovative solution, The Flow Finder, is a device that is installed between the shower arm and the shower head. Using biometric identification and a flow meter, it tracks the amount of water that each family member uses. It then sends the data to an eye-catching fridge magnet with a digital display.
- All you need to use the Flow Finder is a finger. Also, you will see the water usage of your family every time you walk by your fridge without having to log onto an app or a website.



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 your fridge.

PROTOTYPE COSTS

The Flow Finder Bill of Materials	
Flow meter	\$ 1.00
Fingerprint sensor	6.00
Arduino Uno Microcontroller	1.00
Metallic housing	10.00
5V Micro Hydro Generator	4.00
Fridge magnet	
Computer	15.00
E-ink screen	1.00
Battery	1.00
Wires	1.00
	\$ 40.00

VALUE PROPOSITION

- Anticipated selling price is \$79.99. The average shower length is 8 minutes, the cost of water is about \$3/ cubic meter and the cost to heat 1 litre of water is about 1 cent, coming out to about \$285 per person per year. For a 3-person family, the payback period for The Flow Finder is less than one year if everyone in the household reduces their average shower time by 1 minute!