Final report for the WaterAware workshop

1 INTRODUCTION

Resource conservation is an ever important topic, and as we face new challenges in resource availability and management new ideas and innovations play an important role. This is true, not least for household water consumption. In many industrialized countries water is largely seen as an unlimited resource, and it is being used liberally for a large number of purposes. Commonly, personal direct water consumption may exceed 100 liters per day, and it is likely that there are ample room for reducing this number, without reducing perceived utility. However, for conservation efforts to be effective it is important to bring in the user perspective first (bottom-up approach), in which the present workshop aim to put the end-users, if not in the driver's seat, at least in the passenger seat, providing directions.

The WaterAware workshop was held on May 14th 2018, in the conference venue in HSB Living Lab (HLL), Gothenburg, Sweden (see Figure 1). The workshop was arranged by Chalmers university of technology (Chalmers) and Chalmers Students for Sustainability (CSS). The workshop event was promoted mainly towards students at Chalmers and the tenants of HLL, but information was also posted to a wider audience on social media and on the WaterAware website (wateraware.eu).

The workshop program comprised an introduction guest lecture by professor Greg Morrsion of Curtin University, Australia on video link, a brainwriting session, a co-creation workshop session and finally presentations and summaries. Industry expert Per Ericsson of Greytec AB was invited and participated as reference person and inspirator.

In this report the output of the workshop is summarised per activity. In the Conclusions section an aggregated assessment is presented and finally in the Recommendations section we present ideas for continued work.

Figure 1. Photo showing participants in the main workshop session in the conference hall at HSB Living Lab.

2 RESULTS

2.1 GUEST LECTURE

The guest lecture was given by professor Greg Morrison (see Figure 2), one of the initiators of HSB Living Lab, now located at Curtin University, Australia. The lecture of professor Morrison covered some theories on practices and the current research being conducted at Curtin University in the field of utilities conservation.

Shortly summarized it can be said that practices can be interpreted through a three-dimensional framework consisting of *meaning*, *skill* and *technology*, which together explain the practice. However, practices are part of a series of habits and routines, and thus does not exist as separate entities, but rather as a part of an interconnected chain or system of practices. It has been previously suggested that attempts to influence and change the practices and promote sustainable consumption patterns that do not take into consideration on one hand the dimensions underlying the practice, as well as the patterns in the interconnected system of practices on the other hand are likely to have little or no persistent impact.

Thus, it is important for any initiative that aim for reduced resource consumption to be based on a proper analysis and understanding of the full spectrum of elements comprising the targeted practice, but also how it is entangled with everyday practices that are combined in clusters across space and time.

Studies at Curtin have largely confirmed how specific practices depend on the context, i.e. related routines and practices, which may vary depending on for example weekday. The results of this research will be a valuable complement to the output of the WaterAware workshop in planning and designing future studies within HSB Living Lab, and elsewhere.

Figure 2. Professor Greg Morrison, Curtin University, Australia.

2.2 BRAINWRITING SESSION

Brainwriting is a form of silent brain storming process where participants instead of talking to each other get a few minutes to write one or several ideas on a piece of paper (see Figure 3). After the time ends, the participants hand their paper to the person next to them, who then get another couple of minutes to comment, critique or propose improvement to the original idea. This is repeated until each sheet of paper has been with each participant.

This method is often more effective in generating ideas in short time spans than traditional brain storming since it reduces intermittent chatter and participant anxiety as they can freely formulate their idea. Potentially brainwriting can generate many ideas in relatively short sessions.

Figure 3. Snapshot of note from the "brainwriting" exercise.

In the present workshop the brainwriting method was used early in the session to stimulate the creative process. The time allowed for ideation and commenting was three minutes and participants were asked to add comments, critique and suggestions based on the original idea of the sheet. At the end each sheet was summarized in a brief conclusion (see Figure 2).

Ideas covered, and the conclusions/summary transcriptions can be seen in Table 1. Trying to extract the main lines of ideas seem to indicate that **showing** the consumption to the consumer is a key element, as is **motivation** or **incentives** and some form of **gamification** element (see also Figure 4). Gamification is the application of game-design elements and game principles in non-game contexts with the end goal to incite user engagement in the activity. The gamification targets the natural desires for aspects as socializing, learning, competition, achievement, status, self-expression or altruism. While gamification is generally perceived as a viable design strategy, there are critique pointing out that gamification sometimes generates unexpected behavior, and that gamification elements employed in apps are generally

fragmented and shallow, or that "initial popular strategies for gamification as not being fun and creating an artificial sense of achievement" [1].

Regardless of these reservations, the key ideas of *showing*, *motivating* and *gamification* all go in hand.

Table 1. Transcription of brainwriting sheets.

A	Device to measure water consumption
	  − Will probably be expensive
	  − But most people will probably not take the time to measure it themselves
	  + With this data it would be easy to compare it with others and open new usage areas there
	  + For example, have a connected app on your phone that notifies you about heavy usage or give complements on good use or [unreadable]

B	Competition in housings for getting discounts on rent or some accessibilities to special services (can be 20 first persons)
	  • Winners can be a percentage on to for lowest consumption
	  • The prize/discount can be provided by the SGS or…since this would reduce their bills and they can assign a part of it to giving discounts, etc.
	  • The government can also provide a little fund for companies, owners who implement this
	  • Some communities and incentives in each building and the competition between buildings, cities….

C	Survey to inform both the public and the surveyors
	  - How important is hot water?
	  - How important is clean water?
	Use a list of priorities as a basis for water recycling
	  • Compare the results to the existing plans for gray water recycling and see if the priorities match the plans
	  • Include feedback for survey taker to they can understand why this is important and scientifically what water actually needs to be pure and what water actually needs to be hot from a safety and cleanliness standpoint.

D	Create a local platform where people can talk about/exchange ideas. Make the possibility to swapt[sic!] water consumption.
	  • Having an app to follow your water consumption maybe.
	  • For incentives → presenting similar/replacement alternatives.

E	App to get better
	  • Identify water usage product
	  • Tips, show, measure water usage
	  • Phone, gamification "plogging" [*activity where particpants pick litter while jogging/excercising. Auth. Comm.*]
	  • Ice-bucket challenge/one bucket challenge
	  • Focus on creating awareness – making it cool – become aware – ideal trend – conscious
	  • Sustainable – how can it keep on doing affecting life?
	  • Q: if it can be done for a longer time?

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[1] John Pavlus (November 4, 2010). "Reasons Why "Gamification" is Played Out". Fast Company.

F	Device measure
	• Data Big Platform • Blockchain technology for data • Add small money to play store • Challenges • Make change live • Trust of the information you are getting
G	Visualization – show how much water is used. What type of water (shower, dishes etc). Relate, compare to goals. • Your own goals? Maybe make it fun through gamification • Compare with friends • Nice idea – motivations? Rewards? To create interest for the topic? • Short shower challenge or even cold shower challenge • Maybe have some kind of system/app that can show you what improvement you can make • Show a limit where you know if your use is high or low
H	• Direct feedback on products how much water has been used to produce the product • To inform the consumer and give them a choice. A sign that shows how much • Make the amount relatable. What amount is a good amount? Goals, compare to something. scale? • Can be for services as well? • How about and app that can show this info independent from producers participating or not? Might be difficult to start, but high impact if implemented
I	• If washing dishes by hand, adopt water saving way of • How to save water when washing by hand? Reuse water in a system/tank • Show how much water is used • Show how much water is saved nby this to add motivation • User several bowls for washing: 1 wash – dirty, 2 wash - soapy, 3 wash – bit cleaner…etc. IN that way nr.2 can be 1 later, and nr. 3 can be 2…
J	• Bucket challenge - try to live on a low amount of water per week + share with friends + social media • Gamification! Nice. How could people be motivated to participate? Rewards? Social status? • Competitions similar to sport event, like ironman, marathon. Instead: How to use a small mass of water? Awards? • Social media, how is the water used when succeeding?

Figure 4. Word cloud visualization of the brainwriting session.

2.3   MAIN WORKSHOP SESSION

When evaluating the material from the main workshop session, several main strategies proposed by the participants emerged (see also Figure 5).

1. Gamification. This was also the most recurring topic of discussion, and several proposals revolved around the gamification concept.
2. Peer pressure, or social coercion. The main idea here is that if your peers or neighbors (or some other social constellation) confess to a certain practice, there is an intense pressure on the individual to conform to the group practice. This is especially true if the practice is revealed in some form (i.e. social media or other communication platforms).
3. Information or education. This approach addresses a presumed lack of knowledge and/or skill that would motivate and enable a certain practice. It was proposed that such an approach is combined with a feedback component that either visualize or in some other way put the user in contact with their own consumption, which otherwise may be quite abstract or disconnected from user experience.

The full output from the main workshop session can be found in Appendix 1. The oral presentations were not documented, but the main takeaway points has been incorporated into the summary of the outcome.
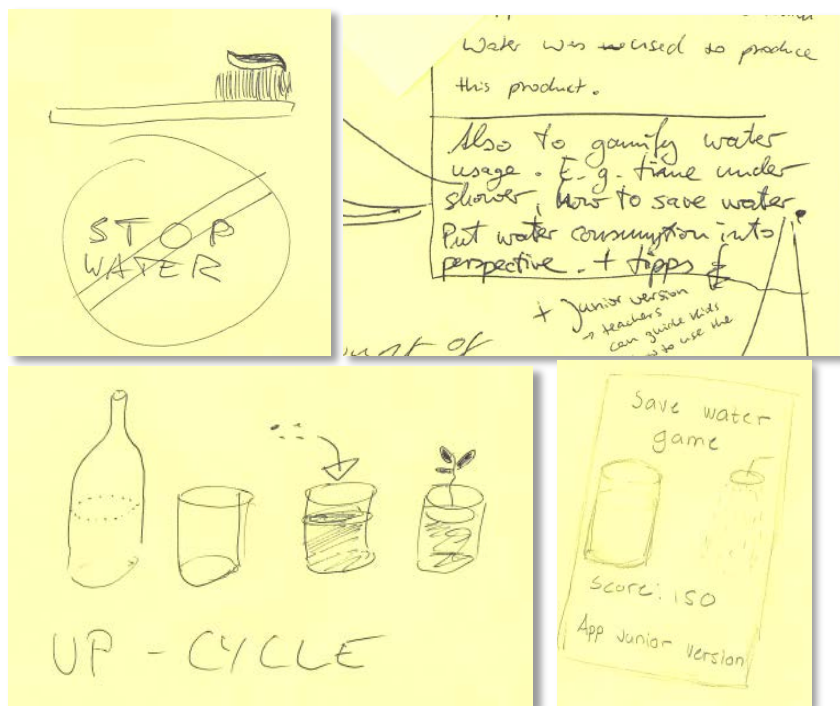
Figure 5. Extract scans from main workshop session participant notes.

3 CONCLUSIONS

The ideas from the brainwriting sessions where echoed in the main session of the workshop, which is to be expected. The output of the workshop is summarized and documented in this report, and while some main points have been observed, further analysis is possible, which will probably yield further insight and refined ideas. The three main takeaways from the workshop are the thematic approaches

- Gamification
- Motivation
- Information

i.e. add a *game* component for retaining user engagement, *motivate* the user to modify practices (e.g. by social pressure) and *inform* the user facilitate practice based on knowledge (primarily on conservation related issues) .

4 FUTURE WORK

The conclusions from this report should be implemented and tested in future studies in the HSB Living Lab (or elsewhere). Using the practice theory as a fundamental underpinning to support suggested approaches from workshop outcome would be of particular interest. The first step would likely be to develop a method to properly identify practice interconnectedness, meanings to users and skills involved, and the second step to implement gamification, motivation and information components.

5 Appendix 1: Workshop output
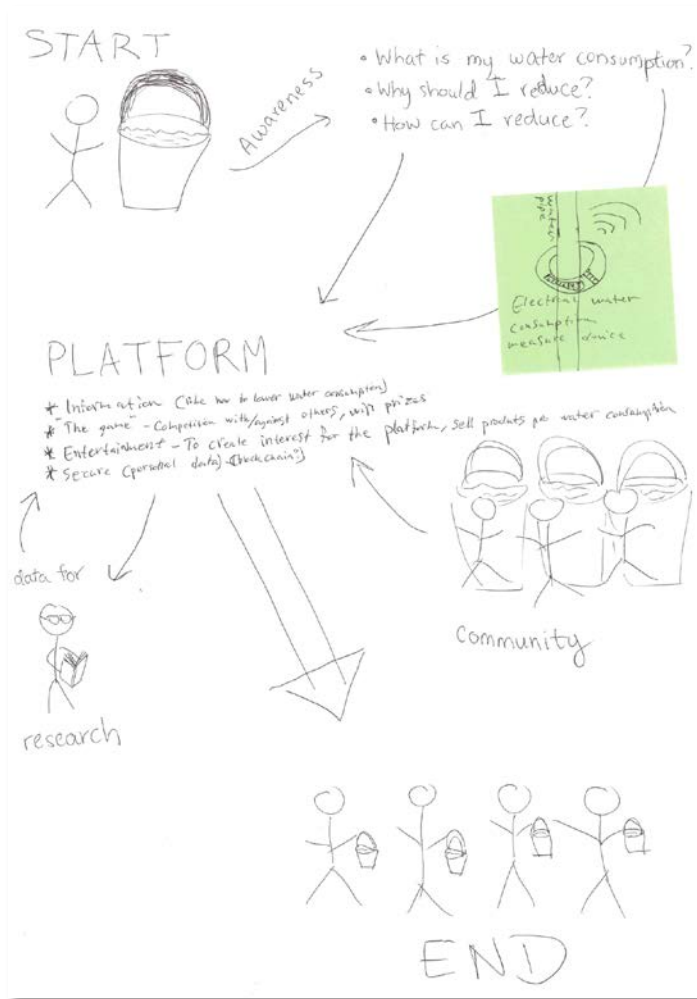
* Social responsibilits must be taught?

* Social pressure isn't enugh? Economic better?

* Gamification ✓ only social pressure (I'm better than you) isn't enugh
                        but you save this amount of money etc better

* Level of water cleanness is differen depending on it it cones from sink, shower, etc

7litres/minute ⟶

50-40CC's

"IF YELLOW (OR BLUE) LET IT MELLOW, IF BROWN FLUSH IT DOWN..."

STOP WATER

UP - CYCLE

AREAS OF PERSONAL USE

Dishes

toilet flush

Brushing teeth + shaving

Clothes

Car wash (Re-use car wash water) Technology

Shower

Cooking & drinking

Gardening
+ DIY upcycling
+ chosing products with low water use

Using granish water / washing by hand. No bowl with water but removing of dishes by sponge and then low volume of running

...challenge

"if ... , let it mellow, is it brown flush it down"
→ use biodegradable color to hide if someone already peed ...

Shopping

...give... information to be... the product & how ...nergy... water ...

pp that shows how much water was invested to produce this product.

Also to gamify water usage. E.g. time under shower, how to save water. Put water consumption into perspective. + tipps f

+ Junior version ... children will can grow wild in how to use ... ...

first swaping and rinse with a little amount of water

• share old water on apps or open fridges where you can get "swim-water"

• water from old water bottles
• soapwater that can be used to plant with special soap