<p align="center">**Innovation Challenge 2021**</p>

**Introduction**

This paper has been written based on Yorkshire Water.

Yorkshire Water should give serious consideration to entering the water innovation competition 2021.

https://www.ofwat.gov.uk/regulated-companies/innovation-in-the-water-sector/water-innovation-competitions/

**Purpose of this document**

This document is intended to provide an outline high level framework setting out the particular innovations that should be included in competition entry.

**Background**

Water is by far the world's most valuable and precious resource, without it life on earth cannot exist. Yet most attention certainly in the U. K. is focussed on renewable energy, climate change and carbon footprint. The lack of focus on water is regrettable. Water conservation should be at the heart of our environmental policy and must be elevated to the point whereby every consumer understands the absolute need to conserve this most vital commodity.

Water is the most fundamental yet most undervalued natural resource.

The questions that need to be asked are as follows:

1. How to encourage all consumers to save water?
2. How can water companies reduce their carbon footprint?
3. How can water companies reduce their costs?
4. How to improve the service that water companies provide to consumers?
5. How to engage consumers?
6. How can water companies generate additional revenue streams?

This paper will seek to answer these questions.

**Challenges**

Consumer engagement is the key to all of the questions above. Therefore, the challenge is to dramatically increase consumer engagement.

Yorkshire Water has some 2.3 million domestic customers and 130,000 business customers (source Wikipedia). The current Yorkshire Water application (app) has a total number of downloads totalling 10 thousand plus and has a star rating of only 2.6 (source Playstore)

Therefore, the rough estimate of uptake is 0.41% for android users. If we assume a similar take up for iPhone users the estimate is just 0.82%

This low level of uptake reflects the fact that the app is extremely limited in its capabilities.

Conclusions.
The current app is in dire need of improvement.
Customers are not engaged.
Customers see little or no incentive to use the app.
No one cares about water.

## **Infrastructure Development**

In order for all of the above points to be addressed the water industry must advance the technology related to meter readings. This is the single most important aspect.
Energy utility companies currently use smart meters but to be frank they are not truly smart. Water companies must innovate to develop a truly smart meter concept.

Smart meters for the water industry rely on Automated Meter Reading (AMR) technology or some variant. This represented an advance over physical meter readings but is still a very inefficient way to collect meter data as readings can only be obtained twice per annum at best and rely on vehicles travelling to every metered property with the associated implications for cost and carbon footprint. Complex algorithms are required to forecast usage based on this model.

What is needed is to have meter readings taken on a periodic basis that are sent to the water company automatically over the existing HAN network used by the energy companies. I am sure that work on this is already under development or at least it should be. However, this is only part of the solution, in point of fact this is only a very small part as it does nothing to increase consumer engagement.

The fundamental technical aspect that is so desperately lacking is to design an infrastructure (communication protocol) that is capable of communication with <u>mobile</u> devices.

Depending on the frequencies used for the HAN network it may be possible for existing mobile devices to use this network. If this is not possible then an interface device would need to be added to the meter in order to provide the required connectivity. This interface device may be required in any case where meters are located at some distance from the property or are subterranean.

Consideration should be given during the development phase to providing connectivity to both gas and electric smart meters

## **Consumer Engagement**

The basis for increasing consumer engagement is to develop an application that meets the needs of an increasingly tech savvy customer.

Most customers have little to no idea just how much water they are using and just see it as another bill to pay. As a result, conserving water is not even a small blip on their radar. The best way to change this culture is via a downloadable application:

The app should have 2 main versions comprising a free to download basic version and a premium version available to download for a price. Both variants should be available on at least 3 platforms. Android, iOS and PC. By having a premium version available this provides the possibility of a revenue stream for Yorkshire Water.

The existing Yorkshire Water application can be used as the basis to reduce development costs but should be customisable to allow for use by different companies - logos, colour schemes layout etc. Once developed this app has the possibility to be sold to other water companies in order to generate a further revenue stream.

## Basic Version Design Specification

a) Password and biometric login
b) Meter serial number verification per address\customer account number, telephone number. Non changeable except on moving house with further verification required post move (fraud prevention)
c) Data encryption between meter and verified device to prevent fraudulent use
d) Meter readings taken to 3 decimal places at 1 second intervals via secure handshake protocol.
e) Provide continuous, daily, weekly, monthly, quarterly and annual numeric data in 2 selectable formats – cubic metres and litres (with continuous monitoring it would be possible to see how much water is used when taking a bath or use a hosepipe)
f) *Timer function – start and stop to monitor specific activities*
g) *Ability to add comments to graphs for specific dates (ran a bath, used hosepipe etc)*
h) No real time billing or cost information, only historic bills can be downloaded
i) Ability to send initial and final meter reading relating to moving house.
j) Application shall be locked immediately after final meter reading submission and can only be unlocked by following the verification process at the new property.
k) Ability to send manual meter reading at company request or in the event of infrastructure failure.
l) Leak reporting.
m) Fault reporting.
n) Water saving tips.
o) Water hardness information.
p) Service status and planned maintenance.
q) Interruption to service alerts.
r) Water quality alerts.
s) Algorithm to detect abnormal water usage.
t) Star ratings to assess customer satisfaction.
u) Yorkshire Water company contact details.

v)  Customer feedback star ratings to gauge customer satisfaction

Development costs could be recouped by a modest price increase e.g. £0.50 per annum for each customer. This cost could either be absorbed or passed on to consumers.

## Premium Version Design Specification

The premium version shall have all of the features included in the basic version plus:

a)  Provides graphs and charts based on daily, weekly, monthly, quarterly consumption.
b)  Ability to set usage targets.
c)  Alerts if usage target exceeded.
d)  Reward stars if usage target met.
e)  Ability to import pricing information from website to app.
f)  Ability to add any pre agreed exemptions such as septic tank etc.
g)  Full billing information provided on a continuous, daily weekly monthly quarterly. and annual basis.
h)  Direct debit forecast calculator to help consumers stay on top of their bills.
i)  Price change notifications with prompt to download new prices with seamless integration.

Terms and conditions to state that billing information on the app is for information only and actual bills may vary from app.

App target price per download £1.50 for a perpetual licence. This will allow water companies to realise a return on investment (ROI).

## Involved parties

Water company technical expert
Mobile phone company technical experts
App developer company 3 formats
Water meter company technical experts
HAN network technical expert

## Benefits

There are significant potential cost and environmental benefits as consumers are encouraged to save water.

a)  Reduced pumping (cost and carbon footprint)
b)  Reduced meter visits (cost and carbon footprint)
c)  Early leak detection (cost and carbon footprint)

### Product Launch

Information should be included on customer bills asking customers to download the app stressing that they will be contributing to saving the planet (or some such words)
Social media presence promoting app benefits
Local radio ads
Print media ads
TV ads
A suitable slogan?
"Count every drop because every drop counts"

In addition to the above, the government needs to be actively engaged perhaps even to sponsor the development as part of "Build Back Green"

As environmental issues are now at the heart of government policy and public consciousness, now is the time to innovate with a purpose. What is more fundamental to our very existence than saving water.
Water conservation is not in the public eye. Attention is focused on Gas and Electricity production with the most precious resource of all largely ignored other than negative attention surrounding leakage. A culture change is required and this innovation is the way to achieve it.

### Additional Opportunities

There is the potential to rollout (sell) not only to other water companies but also to energy companies with a single data collection interface for all utilities.

The U.K. is blessed with a relatively plentiful supply of water, however not all countries are as fortunate so this technology could potentially be exported.

*Allow consumers to switch providers allowing for competition to be opened up (could be problematic however due to regional cost differences*

### Closing Statement

Of course, there will be challenges and plenty of individuals saying that this cannot be done. They will spend time finding reasons why it cannot be done, however the only motivation that I would need in order to push this through to a conclusion would be everyone telling me that "it cannot be done".

Yours Sincerely

Ian Armitage
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