Digital Metering Hackathon

August 2025

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Challenge Statement

This hackathon seeks to find a practical solution to use digital metering data to modify consumer behaviour towards saving water through *gamification*.

The main objective of this hackathon is to develop a practical solution that incentivizes consumer behaviour change to promote water conservation. By leveraging digital metering data, participants are encouraged to explore how turning conservation into a rewarding and engaging game can foster sustained changes in water usage habits.

Gamification has successfully driven behaviour change across various domains, from health and education to energy use. With this initiative, the water industry can harness its rich digital metering data to achieve similar outcomes, making conservation both impactful and enjoyable.

Background Information

Gamification draws inspiration from games, such as points, challenges, and leaderboards, in non-game setting to boost engagement and motivation. In the water sector, gamification offers a creative way to encourage positive behaviour change, enhance staff training, improve data literacy, or engage the community.

For example, interactive dashboards with achievement tracking can motivate operational teams to improve performance, while customer-facing apps might reward water-saving habits. By making everyday tasks more interactive and rewarding, gamification helps utilities drive participation, improve learning outcomes, and foster a culture of continuous improvement.

Analysing digital metering data requires a high level of data literacy. Many people are not comfortable interpreting bar carts, diurnal curves and other typical outputs of data analysis. Gamification offers a compelling solution to translate valuable data insights into meaningful action - bridging the gap between data and decision-making.

Deploying Gamification to inspire behavioural changes is gaining traction and global adoption as documented in the following case studies:

Amsterdam Airport – Cleanliness

- *Goal*: Reduce spillage in urinals
- *Gamification Element*: A small image of a fly placed in urinals as a target
- *Impact*: Achieved an 80% reduction in cleaning costs by subtly influencing behaviour

Nike – Fitness Motivation

- *Goal*: Encourage regular exercise
- *Gamification Elements*: Challenges, social sharing, badges, and progress tracking
- *Impact*: Built a global community of runners and significantly boosted brand loyalty and user engagement

Matematigo – Education

- *Goal***:** Improve math learning in children

- *Gamification Elements***:** Interactive games, quizzes, and challenges

- *Impact***:** Increased student engagement and improved learning outcomes

1.1 Gamification in Water

In the water sector, gamification offers a creative and impactful way to:

- Encourage positive behaviour change

- Enhance staff training

- Improve data literacy

- Engage the community

The following use cases illustrate potential applications of gamification:

- Interactive dashboards with achievement tracking that can motivate operational teams to improve performance.

- Customer-facing apps that reward water-saving habits with badges, rankings, or incentives.

- Generative AI agent that identifies top-performing users and invites them to mentor others.

- Automated notifications when usage spikes or when users hit conservation milestones.

- Traditional dashboards

By making everyday tasks more interactive and rewarding, gamification can help utilities:

- Drive participation

- Improve learning outcomes

- Foster a culture of continuous improvement

Interpreting digital metering data often requires a high level of data literacy. Many domestic water consumers are unfamiliar with technical visuals like bar charts, diurnal curves, or consumption trends. Gamification can bridge this gap by transforming complex data into intuitive, engaging experiences that motivate users to act.

The Challenge

Challenge Theme

Design a gamified solution that uses digital water metering data to influence consumer behaviour and promote sustained water-saving habits.

The core challenge for this hackathon is to develop a proof of concept for a tool that provides useful insights to consumers. The information needs to be accessible to anyone with only a basic high school education.

Challenge Ideas

Participants can develop a solution that reflects the following components:

1. **Leverage Digital Metering Data**
   Use real-time or historical water usage data to inform and personalize the gamified experience.

2. **Apply Gamification Techniques**
   Incorporate elements such as:

   a. Points, badges, and rewards

   b. Challenges and milestones

   c. Leaderboards and social comparisons

   d. Progress tracking and feedback loops etc.

3. **Drive Behaviour Change**
   The solution should aim to:

   a. Make water usage more visible and understandable.

   b. Encourage users to reduce consumption through engaging incentives.

   c. Foster long-term habits, not just one-time actions.

4. **Design for Real-World Use**
   Consider:

   a. User accessibility and inclusivity.

   b. Integration with existing platforms or smart devices.

   c. Scalability across different household or business types.

5. **Demonstrate Impact**
   Show how your concept could lead to measurable water savings. This could be through:

   a. Simulated data

   b. User journey mapping

   c. Behavioural science principles

Challenge Deliverables

- A working prototype, concept demo, or storyboard.

- A brief pitch explaining the gamification strategy and expected impact.

Available Digital Metering Data

The data used for this hackathon was collected for the SmartH$_2$O project funded by the European Commission. The data consists of two anonymised datasets of 327 digital meters in Terre di Pedemonte in Switzerland and 439 devices in Valencia in Spain between 2014 and 2017. The data also contains detailed metadata about participants, such as swimming pools, appliances and other determinants of water consumption.

The SmartH$_2$O project developed an ICT platform for reducing urban water demand through smart meters, based on models of consumer behaviour. The software developed for this project is available in various code repositories, linked on the SmartH2O project website.

The raw data, including metadata and documentation, is available at: https://zenodo.org/records/556725

Please note that this data does contain anomalies and missing data points. Participants need to transform and clean the data before it can be used in production.

Participants can use other data sets, but only with express permission from the data owner, or publicly available data shared under a permissible license.

1.2 Data Exploration

A cleaned data set is available for participants on the IWN GitHub page: https://github.com/intelligent-water-networks/iwn-hackathon-2025

The data for the two towns has been merged and the metadata restructured. The data shows various anomalies, such as negative flows and outliers. Meta data is only available for a small subset of the available digital meters.

An interactive online application is available to explore the data: https://prevos.shinyapps.io/iwn-hackathon-2025/

Participants don't have to use the complete data set for their proof of concept. Given issues with missing data and outliers, participants should select a subset of households in the available data.

Rules of Engagement

Registration

Registration for the hackathon will open on 27 July at the VicWater Conference. Upon registering, all participants will receive a copy of the challenge statement along with the relevant data package.

We aim to include all interested participants, and applications will be assessed to ensure representation across all IWN member organizations. We strongly encourage the formation of diverse teams, not limited to data analysis experts.

To enrich the problem-solving approach, consider recruiting team members from a broad cross-section of your water utility, such as:

- ✓ External communications specialists
- ✓ Catchment health subject matter experts
- ✓ Data analysts and technical staff

This diversity will help bring varied perspectives and expertise to the challenge.

Process

An online pre-event-session will be held for all participants to introduce the problem. During this session, teams can ask questions about the challenge, data, and deliverables. A channel on the VicWater Teams site will be available to ask questions during the analysis process.

Program

The Hackathon will conclude with a face-to-face workshop held at the Melbourne Water's Head office in Melbourne on 17 October 2024.

08:00 – Doors open

08:30 – Sign-in commences

09:30 – Opening / briefing (Acknowledgement of Country, accessibility conversation at the welcome)

10:00 – Commence Hack

13:00 – Hacking Lunch

14:30 – Work on presentation (judge arrival)

15:00 – Presentations

16:30 – Judges deliberation

16:45 – Ceremony and award

17:30 – Drinks reception

Judging Criteria

The final data product and presentation will be judged on three criteria:

Usefulness

- **Clarity:** Is there a clear result, message or outcome?
- **Value:** Does the data product have clear value for the target stakeholder audience?
- **Actionable:** Is the data product usable and scalable?
- **Commercial potential:** Can the end-result be commercialised?
- **Ease of use:** Is it simple enough to be used by a broad audience irrespective of data literacy level?

Soundness

- **Technical robustness:** Has the data product been developed in a way that is technically and logically rigorous?
- **Alignment:** Does the proof of concept use digital metering data.
- **Details:** Are all assumptions and calculations made in the development of the data product specified?

Aesthetics and functionality

- **Appeal:** Is the data product easy to understand and visually appealing?
- **Re-engagement incentive:** Does the data product encourage users to use it frequently?