DELIVERABLE 7.1

Trial A Report

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Abstract

This report presents an overview of the implementation of DAIAD's Trial A, which took place in Alicante from 1st March 2016 to 28th February 2017, with the participation of 102 households (293 consumers). The purpose of Trial A was to evaluate and validate DAIAD technologies in a top-down perspective, with DAIAD being offered *as a service* from the local water utility (AMAEM).

History

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1.1	09/06/2017	Revised version addressing reviewer's feedback. Summary of changes follows: - Included preliminary results in a new Section 4 (*Preliminary results*). The authors however, *strongly urge the readers to ignore* the relevant text and instead consider our extensive evaluation in Report Deliverable D7.3, which is devoted in analyzing the project's results. - Added axes descriptions in the captions of all figures *Clarification regarding Anecdotal information / Qualitative feedback*. All available information is provided in Sections 3.2.1, 3.3.1, 3.4.1, and 3.5.1 (*e.g., feelings of anticipation and anxiousness in Phase 1 and user email, nudges to users for respecting the experimental protocol in Phase 2, family members complaining about the weight/size of the device in Phase 3*) *Clarification regarding Fig. 32 and Fig 30*. Figure 32 presents the daily availability of the DAIAD system during Phase 3, while Figure 30 presents total volume of water (shower consumption) per day, as received by the DAIAD system. In day 14 of Phase 3 (Figure 32) the system was not available for almost 12 hours for planned maintenance, and in day 15 for an additional 3 hours. In day 16 of Phase 3 (Figure 32) the	Spiros Athanasiou, Pantelis Chronis, Giorgos Giannopoulos

		system had no down-time. In Figure 30, we observe that the received total shower volume in day 14 (i.e., during the down-time) was 721lt, and rapidly increased in the following days 15 and 16 (1.200lt, 3700lt) since the showers that were not transmitted in day 14 (12 hours downtime) and day 15 (*3 hours downtime*) were received in the subsequent days. There are therefore no discrepancies between Figures 30 and 32. The reader is invited to consult either of the D1.2, D1.3, or WP2 deliverables regarding the characteristics of the data transmission and collection protocol from b1 devices.	

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Executive Summary

This report presents an overview of the implementation of DAIAD's Trial A, which took place in Alicante from 1st March 2016 to 28th February 2017, with the participation of 102 households (293 consumers). The purpose of this report is to document the implementation and evolution of Trial A across its various phases, present all technical issues raised from DAIAD users (consumers and stakeholders), and report all anecdotal and informal information collected from the Consortium. As such, this report serves two goals. First, serve as a basis for the evaluation and validation of the complete DAIAD system which will be provided in Deliverable D7.3 'Trials Evaluation and Social Experiment Results'. Second, assist researchers and water sector practitioners in understanding the scope and context of our experimental study, in order to complete their background knowledge or implement similar large-scale studies.

The purpose of Trial A was to evaluate and validate DAIAD technologies in a *top-down perspective*, with DAIAD being offered *as a service* from the local water utility (AMAEM), with participants having access both to their SWM data, and one or more amphiro b1 devices. Consequently, in Trial A we attempted to replicate for participants the *experience* of DAIAD being offered as a new service from their water utility, as well as enable AMAEM's experts to use DAIAD for water demand management. Towards this, AMAEM was portrayed as the system owner, requesting from its customers to assist in evaluating a new service before its roll-out across the entire population. Further, AMAEM handled all local communication activities and provided support services through its standard Helpdesk.

The Trial comprised five (5) consecutive treatment phases for the participating population spanning eight (8) months, as well as four (4) months as leeway to account for unforeseen delays. Phase 1 focused on validating the proper installation of the DAIAD system and collecting adequate baseline water consumption data for all participants. Phase 2 compared the effectiveness of analytical vs. real-time feedback. In Phase 3, all participants gained access to the entire DAIAD functionality, with the exception of social comparisons. In Phase 4, we established a control group and provided the remaining consumers access with to social comparisons. Finally, in Phase 5 all consumers gained complete access to the DAIAD system.

The implementation and progress of the Trial was monitored by the Consortium through the DAIAD system itself. All requests for support and reported issues, as well as the subsequent corrective actions were compiled on a daily basis. The above information was analyzed and compiled on a monthly basis in the form of an internal Monthly Reports, which were distributed amongst all Consortium members. These reports served as a basis for the current document, and supported executive decisions regarding the implementation of the Trial. A number of adjustments in the timing of the various phases in response to delays and anticipated risks were performed throughout the Trial, validating our decision to budget *a priori* the extra four months.

Overall, we consider Trial A to be extremely successful across all of its aspects, with AMAEM being responsible to the *greatest degree* for this outcome. The level of AMAEM's commitment to the Trial is indicative both for its excellence as a *water steward*, as well as its strong belief regarding the potential impact of DAIAD. To the best of our knowledge, Trial A is the largest study of its kind in terms of duration and population, generating critical data and knowledge both the project and the research community at large.

Abbreviations and Acronyms

BT	Bluetooth
ICT	Information and Communication Technologies
KPI	Key Performance Indicator
LCD	Liquid Crystal Display
OS	Operating System
S/N	Serial Number
SWM	Smart Water Meter

Table of Contents

1. Introduction

This report presents the progress of DAIAD's Trial A, which took place in Alicante from 1st March 2016 to 28th February 2017, with the participation of 102 households (293 consumers). The purpose of this report is to document the implementation and evolution of Trial A across its various phases and present all technical issues raised from DAIAD users (consumers and stakeholders). As such, this report serves two goals. First, support the evaluation and validation of the complete DAIAD system which will be provided in Deliverable D7.3 'Trials Evaluation and Social Experiment Results'. Second, assist researchers and water sector practitioners in understanding the scope and context of our experimental study, in order to complete their background knowledge or implement similar large-scale studies.

The remainder of this document is structured as follows.

In Section 2 we elaborate on the design of our experimental study, providing background information about the scope and goals of the Trial, the recruiting process and demographics of participants, as well as the instruments applied to monitor the pilot, collect issues/feedback and provide support.

In Section 3 we present the progress of the Trial during its 12month duration. Our presentation is organized on a quarterly basis, aiming to convey to the reader the actual evolution of the Trial in response to the challenges we confronted. For each quarter we provide a comprehensive list of all issues reported by the Trial participants, presenting for each one the troubleshooting and corrective steps we took. The diversity of the issues was astounding, yet anticipated, ranging from naïve to challenging, and confirmed the representative nature of our study group. Further, we provide the evolution of select KPIs throughout the duration of the Trial, highlighting select time periods and events of particular interest.

2. Preparation Activities

The preparation activities to ensure the successful implementation of Trial A were performed in the context of Task 7.1 and begun already from M3 of the project, comprising a series of intertwined technical, communication, and organizational activities supported by all partners.

The purpose of Trial A was to evaluate and validate DAIAD technologies in a *top-down perspective*, with DAIAD being offered *as a service* from the local water utility (AMAEM), with consumers having access both to their SWM data, and one or more amphiro b1 devices. Consequently, in Trial A we attempted to replicate for consumers the *experience* of DAIAD being offered as a new service from their water utility, as well as enable AMAEM's experts to use DAIAD for water demand management. Towards this, AMAEM was portrayed as the system owner, requesting from its customers to assist in evaluating a new service before its roll-out across the entire population. Further, AMAEM handled all local communication activities and provided support services through its standard Helpdesk.

Preparation activities focused on delivering all material and processes required for the recruiting, training, support, and interaction with the pilot participants. In summary, this included: (a) invitations (printed, electronic) explaining in simple terms to scope of the pilot, means of participation, requirements, and process for expressing their interest (see daiad.eu/join), (b) pre-surveys (web-based) based on which the participants were selected (e.g. *demographics, household characteristics*), (c) the process for distributing and initializing the equipment (installation instructions), (d) the discrete phases of the pilot and specific goals for testing DAIAD components against a control group, (e) periodic surveys (web-based) for collecting feedback and insights from the participants, and (f) support instruments for addressing potential technical problems.

In the following sections we present the design of our experimental study, providing background information about the recruiting process and demographics of participants, as well as the instruments applied to monitor the pilot, collect issues/feedback and provide support.

2.1. Participant recruiting

Participation in the Trial was **open** in a voluntary basis for all AMAEM customers located in the City of Alicante that were served by a SWM (~100K households) and satisfied the minimum technical requirements of the Trial (see Annex 2 – Trial Guides).

The recruiting process begun in M16 with the goal of establishing a *representative* panel of 100 households. Volunteers were invited to join Trial A and express their interest, following an extensive communication campaign with focused dissemination and demonstration actions. Among others, these involved coverage from mass media (radio, TV), social media, participation in local events, demonstrations of the DAIAD system, meetings with local stakeholders (local utilities, NGOs/Citizen Associations, local government), preparation and distribution of advertising material, mail & email campaigns (*within the periodic water bills*), as well as specific-purpose sections in our web-site (daiad.eu/join, daiad.eu/es). After evaluating the expressions of

interest from volunteers, our final Trial participants were selected and contacted via AMAEM, ensuring the selection of an unbiased and representative population. The DAIAD system was shipped, distributed, and installed by trial participants, confirming its proper deployment by each participant after successfully receiving water consumption data.

In the following section we present the above activities in more detail.

2.1.1. Expression of interest

Applications for pilot participants have been publicly available in a specific section of our web-site: www.daiad.eu/join. This section included links to the web survey where volunteers can register as pilot participants, as well as links to two guides (short, long) in Spanish, in which the DAIAD project, the scope of the Trial and means for participation were presented in detail. The guides are provided in Annex 2 – Trial Guides.

The web survey (Google Forms) aimed to ensure that the basic technical requirements for DAIAD were satisfied from interested volunteers (*e.g. mobile phone, internet access*), as well as facilitate the Consortium into selecting an unbiased and representative sample of the population during the final selection of volunteers. The survey questions are provided in Annex I – Survey for expression of interest.

The open call inviting consumers to express their interest has been extensively disseminated by AMAEM through multiple channels in the context of WP7 (*e.g. social media, media coverage, open events, school visits, meetings with local stakeholders*). We have been monitoring the progress of registrations on a daily basis since M20, adjusting our communication actions accordingly. Towards this:

- AMAEM has made extensive use of its established channels of communication to disseminate the objectives of the Trial in mainstream media. This includes local TV, national/local newspapers and radio. Moreover, 10,000 leaflets have been distributed and 12,000 emails have been sent to AMAEM customers, bundled with the printed and electronic water invoices respectively. These served to inform AMAEM customers about the project, and invite participation in the Trial. Further AMAEM engaged local stakeholder groups interested in the Trial, including NGO "ASAFÁN" who works to defend the interest of large families, and the Volunteer group in favor of environment "GEA".
- A new Spanish version of the DAIAD web site has been prepared under www.daiad.eu/es/. This has been deemed necessary by the Consortium in order to enlarge the targeted population in Alicante and enable all local citizens to be informed about the Trial in their native language. The web site includes key information about the DAIAD project, its planned impact, the local Trial, as well as the role of AMAEM. Overall, it has been extremely well received by the local population, and has been used in all dissemination actions in the area.

Our recruiting goal was reached by M22 (162 registrations), but we opted to maintain registrations open till M28 (229 registrations) in order to further enlarge the potential pool of participants. This was deemed necessary to allow us more flexibility in forming and maintaining a representative panel throughout the duration of the Trial.

2.1.2. Participant selection

Starting from M20, the Consortium begun evaluating expressions of interest and initiated the selection of the participants to be accepted in Trial A. All steps of the process were performed periodically until the Trial positions have been filled. In summary:

- We removed applications which did not cover the minimum technical requirements of the system, as well as applicants that were not served by a SWM.
- The participant short-list was distributed amongst the Consortium (*including the survey responses*) for another round of filtering aiming to ensure the representative nature of our panel. Consequently, and depending on the already filled positions, we gave priority to consumers with specific demographic criteria (e.g. large families, low income households).
- Each selected participant was contacted by email and was instructed to complete within 1 week an additional survey available in Annex 3 – Trial Pre-survey. The purpose of the survey was to (a) confirm the contact details of the participant, and (b) collect additional information about the household and its water consumption behavior. If the participant failed to reply, two follow-up emails were sent, after which the participant was removed from the short-list.
- Upon successful completion of the survey, each participant received an email confirming her official inclusion in the Trial, with instructions regarding the subsequent distribution of the DAIAD system.
- Finally, the participant was added in our white-list (thus allowing her to Sign Up) and her SWM data were integrated in the system.

2.1.3. Equipment distribution

All selected participants were notified by email that they could pick-up the DAIAD hardware (amphiro b1) from AMAEM's offices. During their visit, AMAEM personnel validated their contact details, kept track of the distribution progress (*participant and device S/N*), provided a small demo of the system, and answered to any questions the participants had. The majority of participants received the equipment in this manner, with a few exceptions (*e.g. incompatible working hours*) where the equipment was handed out by AMAEM personnel to the participant's household. In cases where the participant failed to pick-up or receive the equipment, she was removed from the Trial and replaced with another participant from our pool of candidates.

Each package included a small leaflet in Spanish with instructions on how to install the DAIAD hardware and install the DAIAD software (Annex 4 – Installation instructions). The system's installation and initialization was monitored remotely through the DAIAD system (see Section 2.3) on a daily basis, with AMAEM Helpdesk contacting consumers by email in case of delays and providing support to any issues the participants experienced.

2.1.4. Drop-outs

Since participation in the Trial was voluntary, participants had the option of opting-out of the Trial at any given time (drop-outs). Participants were requested to simply notify us in such cases, informing them in advance that they only had to return their equipment. Only three (3) consumers decided to be removed for the Trial for personal reasons, which returned their equipment and were replaced with another applicant

from our pool of candidates. Further, we have been monitoring the system's use for all participants and contacted users with no activity for more than one week. At all cases the participants were experiencing either a technical problem, or were away for vacations, and begun to properly use the system following our communication.

2.1.5. In numbers

The final synthesis of the Trial A panel is presented in the following tables and figures. The following terminology and conventions are used in the presentation that follows:

- **Volunteer**. Each Volunteer is an individual that has expressed her interest to join Trial A (see Section 2.1.1).
- **Participant**. Each Participant is a volunteer that has successfully **joined Trial A and remained in the Trial for its entire duration**. No two Participants are from the same Household (see below), hence each Participant represents a unique household.
- **Drop-out**. Each drop-out is a Participant that has been voluntarily removed from Trial A *at any point* of its duration. All instances and reasons for a drop-out are documented in the Issues sub-sections of Section 3.
- **Consumers**. Includes **all household members of all Participants**. We consider all Consumers as users of the DAIAD system, as they are exposed to the system's interventions. For each household we have documented its exact number of members, age groups, and sex of its members.

Volunteers	220
Participants	102
Drop-outs	3
Consumers	293

Table 1: Summary of Trial A Panel

2.1.6. Participant statistics

In the following figures we present select statistics for our Participants and Consumers based on the two surveys completed before the start of the Trial (Section Annex I – Survey for expression of interest, Annex 3 – Trial Pre-survey).

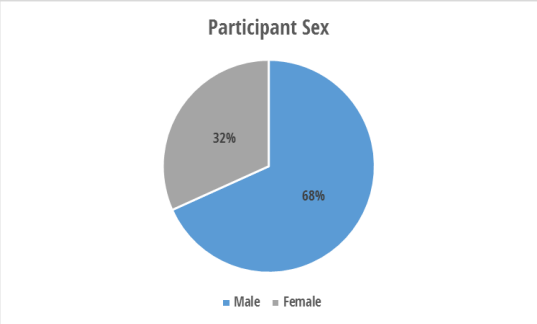


Figure 1: Participant sex

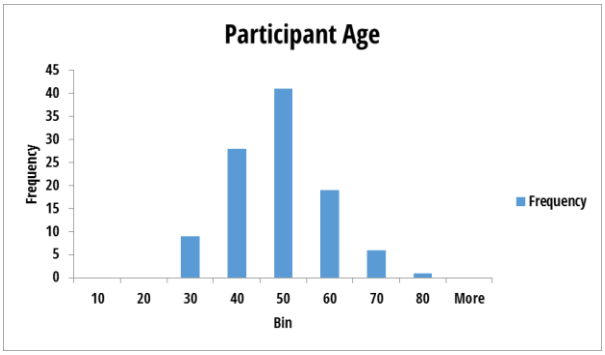


Figure 2: Participant age

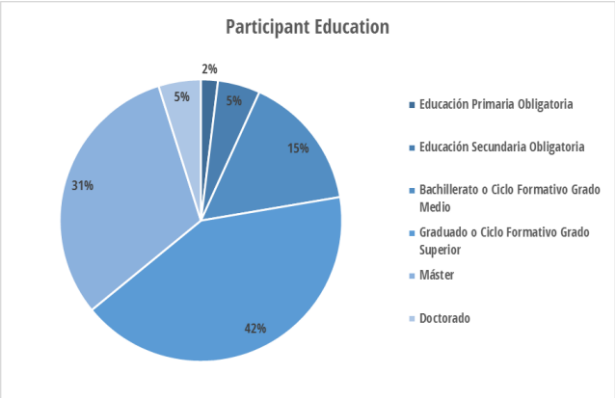


Figure 3: Participant education

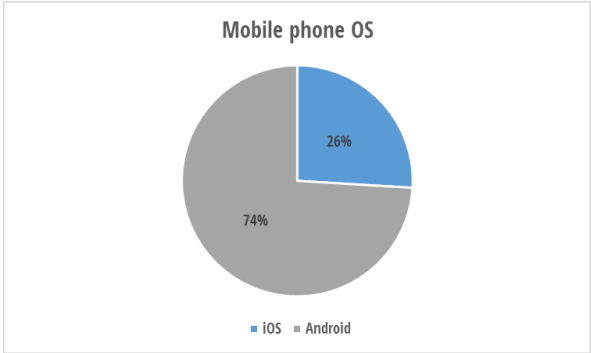


Figure 4: Participant mobile phone OS (main device)

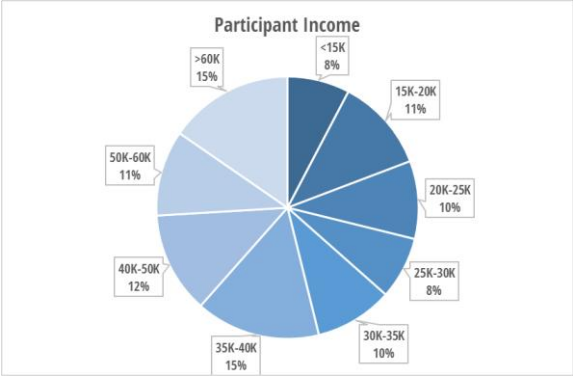


Figure 5: Participant gross income

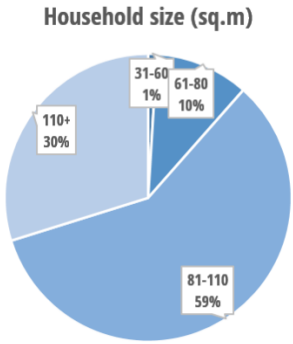


Figure 6: Participant household size (in square meters)

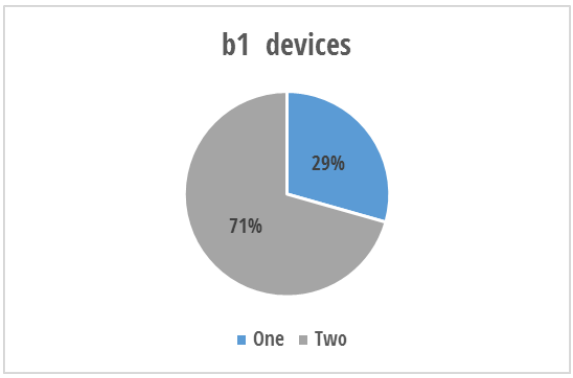


Figure 7: Number of b1 devices installed per household

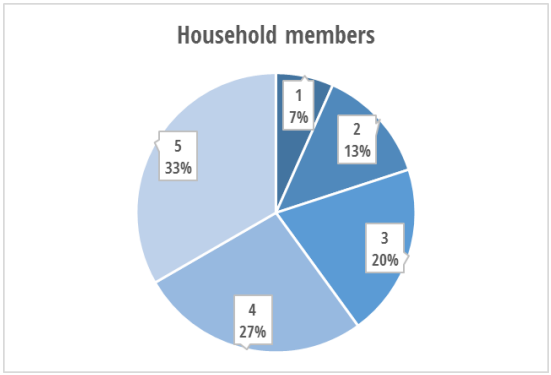


Figure 8: Number of Household members

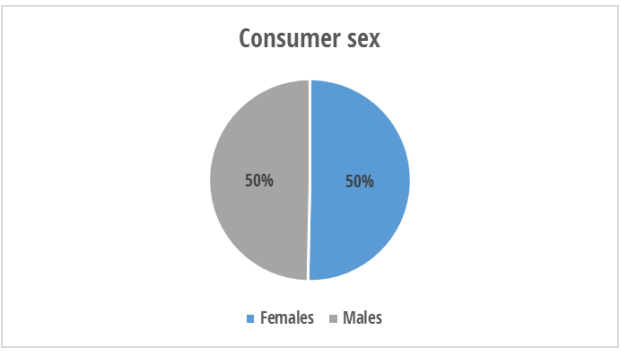


Figure 9: Consumer sex

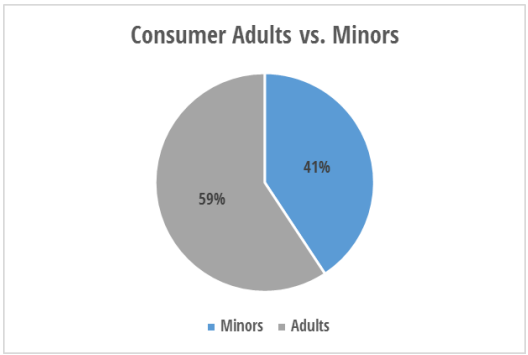


Figure 10: Consumer adults and minors

2.2. Trial phases

Trial A comprised **five (5) individual *treatment phases***, with each one focusing on collecting **baseline** water consumption data or evaluating a specific subset of the system's **interventions**. The phases and the overall experimental design of the Trial was established in M15, with the aim to maximize the studied interventions and insights, without however *over-taxing* the Trial panel with frequent changes in the DAIAD applications. Overall, the following considerations influenced the design of the treatment phases, as well as their implementation:

- **Real-world operation**. Trial A studies the application of the DAIAD system in a **top-down** perspective, i.e. as a **new service** provided by the local **water utility** to its customers. As such, these conditions need to be respected at all phases of the Trial. Consequently, in Trial A we aimed to replicate for consumers the *experience* of DAIAD being offered as a new service from their water utility, as well as enable AMAEM's experts to use DAIAD for water demand management. Towards this, AMAEM was portrayed as the system owner, requesting from its customers to assist in evaluating a new service before its roll-out across the entire population. Further, AMAEM handled all local communication activities and provided support services through its standard Helpdesk.
- **Streamline participation**. The participation in a 12month Trial can be especially challenging, requiring a small, yet critical level of commitment from its users. Since the participants of Trial A are *volunteers*, i.e. actual consumers of AMAEM with diverse demographics and technical knowhow, it was imperative that we provided *in advance full transparency* over their required involvement, while also keeping their overheard to the absolute *minimum*. Towards this, the treatment phases and the required involvement of each participant were established and communicated to candidates before the recruiting process begun (see Annex 2 – Trial Guides). In addition, during the first and more challenging phases of the Trial (*when participants installed, were acquainted, or did not yet have full access to the applications*) participants were notified via in-app and email notifications (see Annex 5 – Mode management notifications) regarding any substantial changes in the application and its functionality, before it took place.
- **Avoid bias.** The interventions that would be tested at later phases of the Trial, needed to remain *hidden* from participants. This significant detail is unfortunately neglected in other studies and work, contaminating the target/control groups of the study, and thus introducing bias that warrants any validation results void. Towards this, interventions throughout the duration of the Trial were either completely hidden from participants (*appearing only in a hidden debug mode*), or introduced through standard app updates. In addition, the design artifacts for these interventions, relevant source code, and documentation, remained private until the corresponding treatment phase ended. Finally, improvements in the already published interventions and major UI changes were not rolled-out to participants, until after the official end of the Trial.

2.2.1. Phase 1

Phase 1 is focused on validating the proper **installation** of the DAIAD system and collecting **baseline water consumption data**, without providing *any interventions* to participants. Consequently, it allows us to capture the typical water consumption behavior of participants and use this data to discover any changes in water consumption habits at later stages of the Trial. Understandably, it is the most critical phase of the Trial for a number of reasons. First, participants will be completely unfamiliar with the system and its components, thus a learning period is expected. Given the diversity of our panel, this can be very *steep* for certain individuals (e.g. low familiarity with ICT, older members). Second, a number of technical issues are expected to appear in the real-world, as it is the norm for any ICT system when entering a real-world beta evaluation. Finally, potential failure to collect accurate and representative baseline shower consumption data from the b1 device (*SWM data are available from AMAEM's smart metering infrastructure*), means that assessing the effectiveness of the system to induce sustainable changes in shower consumption behavior will not be possible.

In summary, this is the experience of our participants during this Phase:

- The participant has received one or more amphiro b1 devices (for households with more than one showers) and an email inviting her to install the system using the provided instructions (see Annex 4 – Installation instructions).
- The participant installs the b1 devices, downloads the DAIAD application, and follows a wizard (i.e. guide by guide steps) presented during Sign Up.
- After completing the process, the LCD displays of the amphiro devices remain inactive (i.e. no real-time/in-situ interventions are provided). Further, the mobile application only presents a message informing the participant that the system is in 'Learning mode', thus similarly providing no interventions.
- The participant is requested to just continue with their typical every day activities. In the background, the amphiro b1 devices store any shower events taking place transmitting them via the mobile application when in vicinity, and then back to our monitoring services. Similarly, the total water use of the household is collected from its installed SWM, retrieved from AMAEM's smart metering infrastructure, and stored in the DAIAD system.

2.2.2. Phase 2

Phase 2 is focused on comparing the effectiveness of **analytical** vs. **real-time** feedback. Our Trial panel is divided into two (2) sub-groups, with each one gaining access to either our analytical or real-time interventions. Real-time interventions are provided by the **amphiro b1** devices, and analytical interventions are provided by DAIAD's **mobile application**. It is important to mention that this is the point in time during which participants actually obtain their *first experience* into the actual interventions of the DAIAD system, seeing it *working for the first time*.

In summary, this is the experience of our participants during this Phase:

- Each participant receives an email (see Annex 5 – Mode management notifications) informing her that the Learning period is complete, and that she now has access to the DAIAD system.

- If the participant is a member of the 'Analytical' group, the next time she opens her mobile application a message informs her the mobile application is now active and that the LCD display of the amphiro b1 will remain inactive.
    - The amphiro b1 device continues to store all shower events taking place transmitting them via the mobile application when in vicinity, and then back to our monitoring services.
    - The mobile application presents analytical interventions using data from the smart water meter and the amphiro b1 data received.
- If the participant is a member of the 'Real-time' group, she is requested to have her mobile device near the shower (3-5 meters) next time she takes a shower (and repeat this process for all b1 devices installed). The LCD of the amphiro b1 will turn on, while her mobile application will remain inactive.
    - The amphiro b1 device presents in real-time interventions about the current shower. Further, it stores all shower events taking place transmitting them via the mobile application when in vicinity, and then back to our monitoring services.
    - The mobile application presents a message informing her that it will remain inactive for a few weeks.

2.2.3. Phase 3

In this phase **all** participants gain access to **both analytical and real-time interventions**, with the exception of social comparisons. This means that the LCD of the b1 device and the mobile application will become active for all participants. As such, it allows us to compare study how water consumption habits are affected by the simultaneous delivery of both types of interventions, and evaluate the preferences of users.

In summary, this is the experience of our participants during this Phase:

- Each participant receives an email (see Annex 5 – Mode management notifications) informing her that she now has full access to the DAIAD system.
- If the participant was a member of the 'Analytical' group, she is requested to have her mobile device near the shower (3-5 meters) next time she takes a shower (and repeat this process for all b1 devices installed). The LCD of the amphiro b1 will turn on.
- If the participant was a member of the 'Real-time' group, the next time she opens her mobile application a message informs her the mobile application is now active.
- For all participants:
    - The amphiro b1 device presents in real-time interventions about the current shower. Further, it stores all shower events taking place transmitting them via the mobile application when in vicinity, and then back to our monitoring services.
    - The mobile application presents analytical interventions using data from the smart water meter and the amphiro b1 data received.

2.2.4. Phase 4

This phase focuses on studying the effects of **social comparisons** regarding water consumption, and covers all analytical interventions comparing the user's water use (*actual and ranking*) against similar households, neighboring households, or an entire city. Our Trial panel is divided into two (2) sub-groups, with the first gaining access to these type of analytical interventions through their mobile application, while the second serving as the control group (*i.e. not having access to these interventions*).

In summary, this is the experience of our participants during this Phase:

- The treatment group receives an in-app notification (i.e. 'Alert') informing them that a new section of the app has been enabled. From this point on, participants have access to the social comparisons.
- The control group is not contacted, nor gains access to additional functionality.

2.2.5. Phase 5

In this last phase, the control group of Phase 4 also gains access to social comparisons, hence the *entire population* of our study has access to the *entire functionality* of DAIAD. This phase allows us to evaluate the retention of water savings when exposed to interventions in a prolonged time-frame.

2.3. Monitoring

The activity of all Trial participants, from the sign-up process to the actual system operation, was remotely monitored by the Consortium through a proprietary Web-based monitoring environment integrated in the DAIAD system. These services have been developed with a dual purpose; assist us in monitoring the Trial and facilitate any future custom study by water utilities employing the DAIAD system.

In summary, the DAIAD's monitoring environment provides the following facilities:

- Mode Management. The service provides fine-grained remote control and monitoring services over the *mode* of the system, per *individual user*. As such, it enables the assignment of each participant to a specific *Trial Phase* after examining the status (*e.g. Phase duration, collected data, activity*) of each participant. Additional services include searching and filtering (*user, group, Phase*), accessing system logs for a specific user (*e.g. to troubleshoot or accurately monitor the transition between phases*), as well as links to the detailed User's Activity (see below).

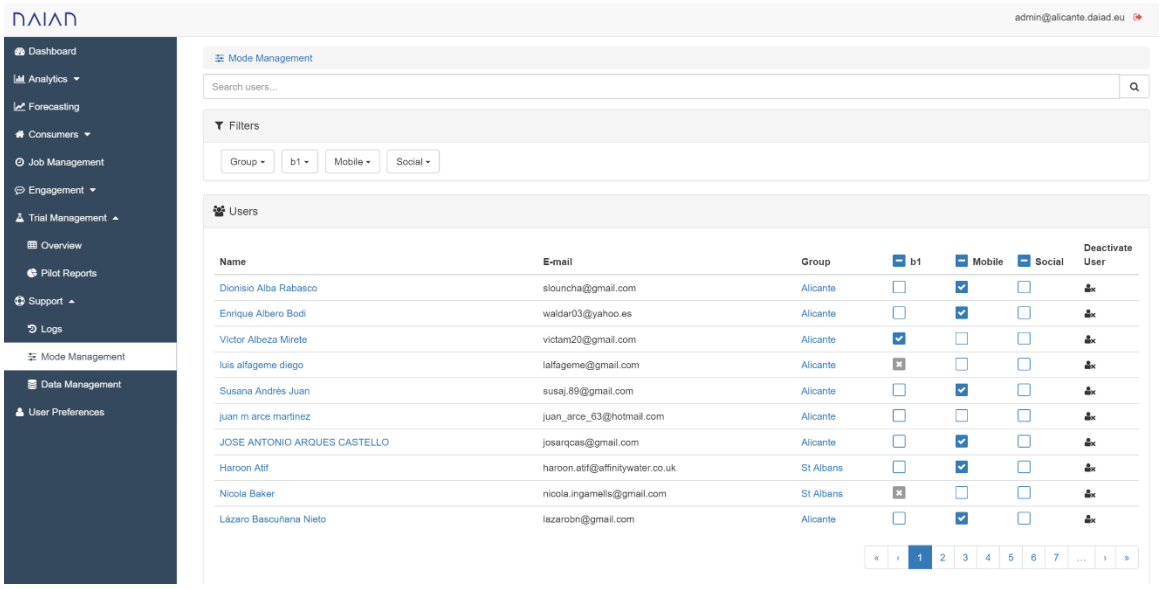


Figure 11: Mode Management

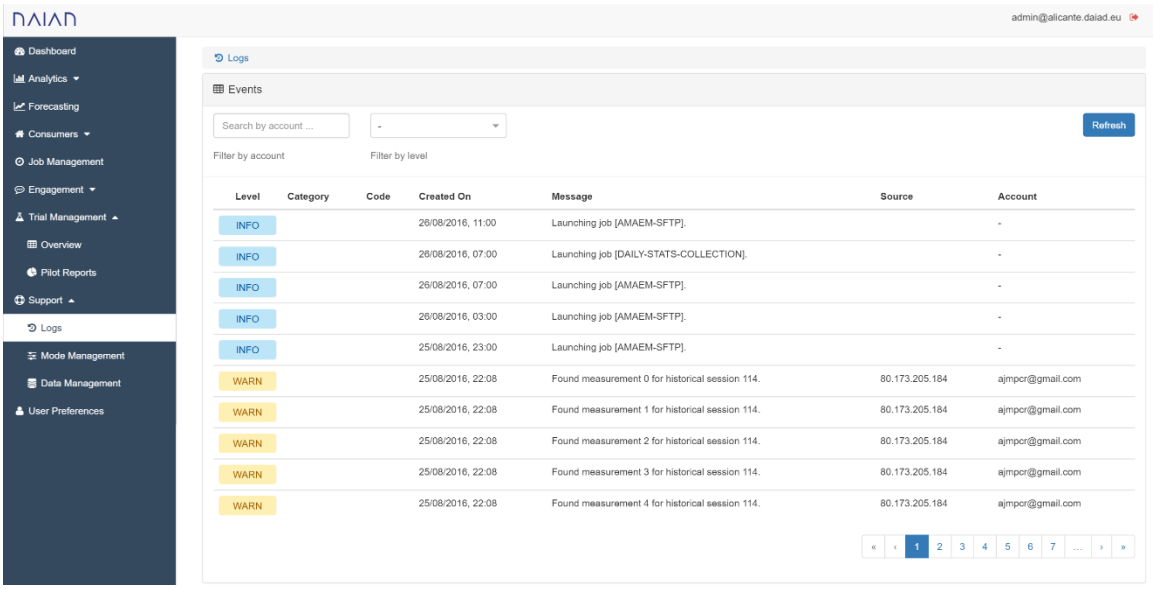


Figure 12: Detailed application logs

- Trial Activity. The service provides a high level overview regarding the progress of the entire Trial and its Phases. In summary, it offers a real-time status over the current Phase of all participants, search facilities for a specific user (*based on name, surname, email, SWM ID*), visualization services for a user's water consumption (*SWM and amphiro b1 devices*), as well as download services for all water consumption data (*SWM and amphiro b1 devices*) for a specific user in csv format. The latter is particularly important, as it allows us to easily monitor extractions during the installation steps, ensure the device operates within its working parameters, and identify potential communication or operation issues.

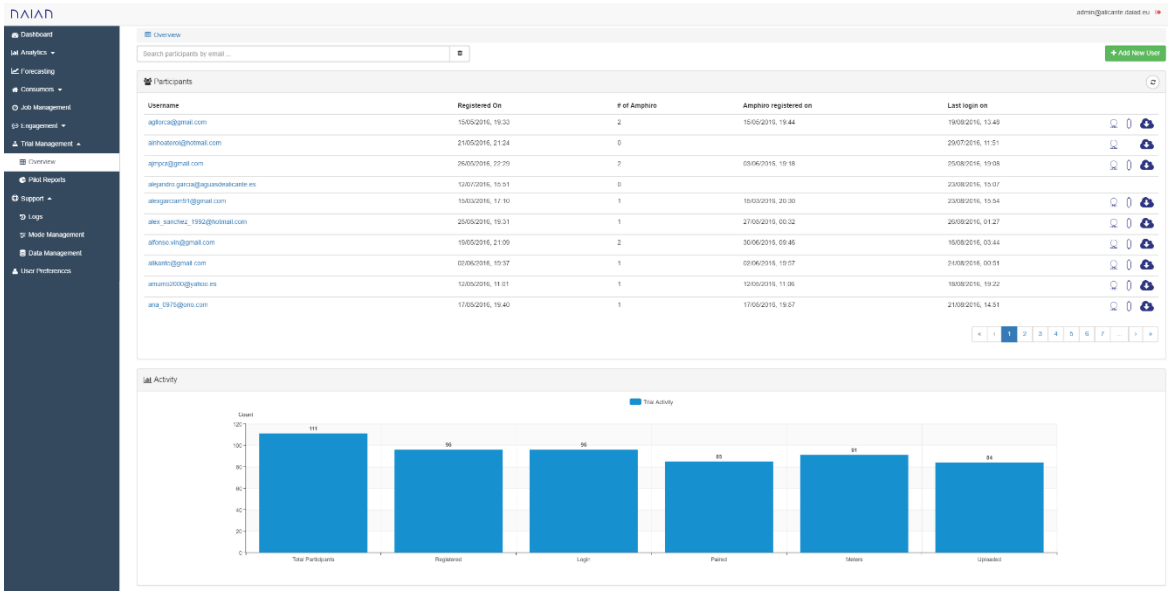


Figure 13: Trial activity

- User Activity. This services provides access to the complete information the system has for an individual user. This includes her profile (e.g. name, surname, email, address, gender, age, mobile phone/tablet OS), the groups she belongs to (e.g. age, household size, number of members), the available data sources (i.e. SWM and one or more amphiro b1 devices) with additional information for each one (e.g. device ID, last measurement, application mode, last communication), and finally an overview of her water consumption (SWM, amphiro b1) for the last 30 days.

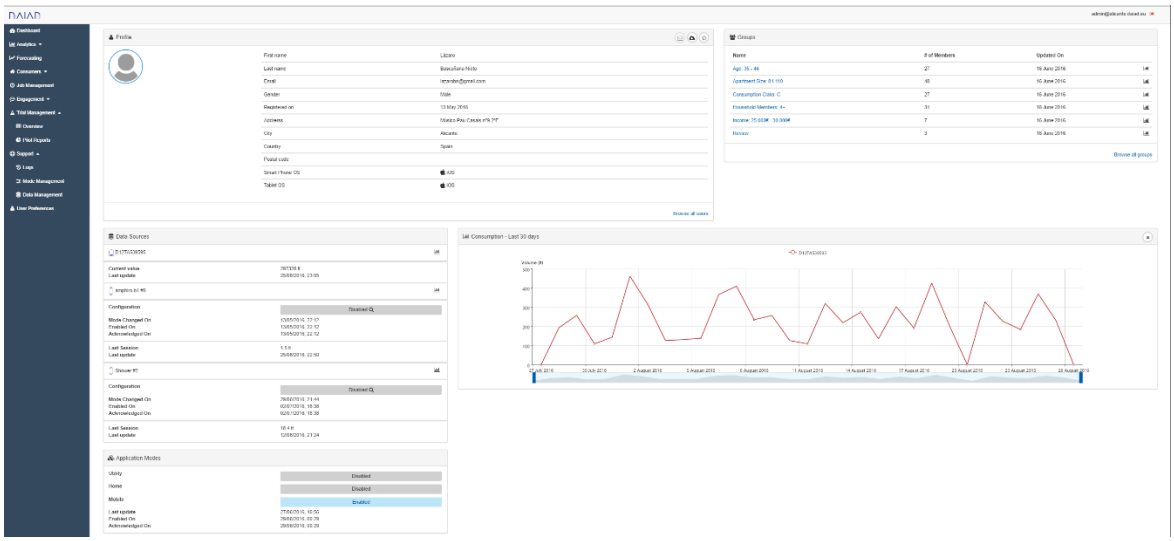


Figure 14: User activity

- Trial Reports. This service generates automatically all KPIs regarding the progress of the Trial on a monthly basis, facilitating the preparation of our internal Monthly Reports.

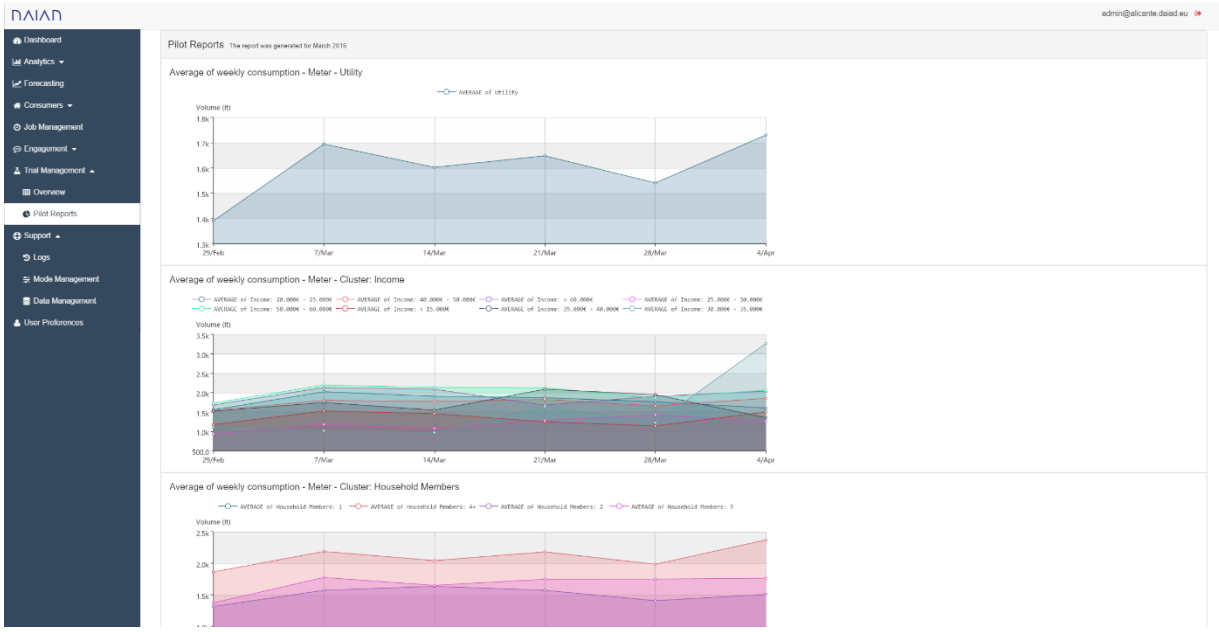


Figure 15: Trial reports

3. Trial Implementation and Evolution

Trial A officially started on 1st March 2016 (M25), after a one-year period of preparation and participant recruiting. In the following sections we present the evolution of the Trial on a *quarterly basis,* based on the internal Monthly Reports prepared by the Consortium during the actual implementation of the Trial. First, we briefly present our original planning for the timeline of the Trial established in M15. In the following sub-sections, we present for each quarter a summary of the Trial's progress, the targeting of the reference period, all technical issues reported and the corresponding corrective actions, an overview of our KPIs, as well as any anticipated risks for the following quarter.

3.1. Original Planning

The Trial comprised **five (5)** treatment phases for the participating population spanning **nine (9) months**, as well as **three (3) months** as leeway to account for unforeseen delays. The planning of the Trial was established on M15 and served as our guideline for all relevant technical, organizational, and communication tasks.

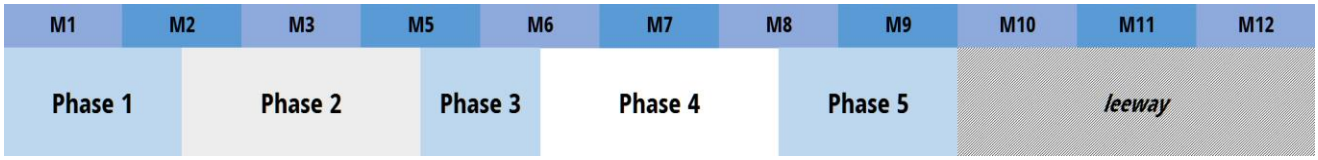


Figure 16: Trial Original Timeline

Our original decision for a 12month duration of the Trial was necessitated by the strong *seasonal* nature of water consumption. As extensively documented in the literature, domestic water use is affected by a number of factors, such as temperature, precipitation, holidays, etc. This critical detail is all too often neglected in similar studies, leading to *wrong* results which cannot be reproduced and thus applied in practice. For example, a study of water consumption beginning in the month of September and lasting for 3 months, is guaranteed to reveal strong reductions in water use (20%-30%).

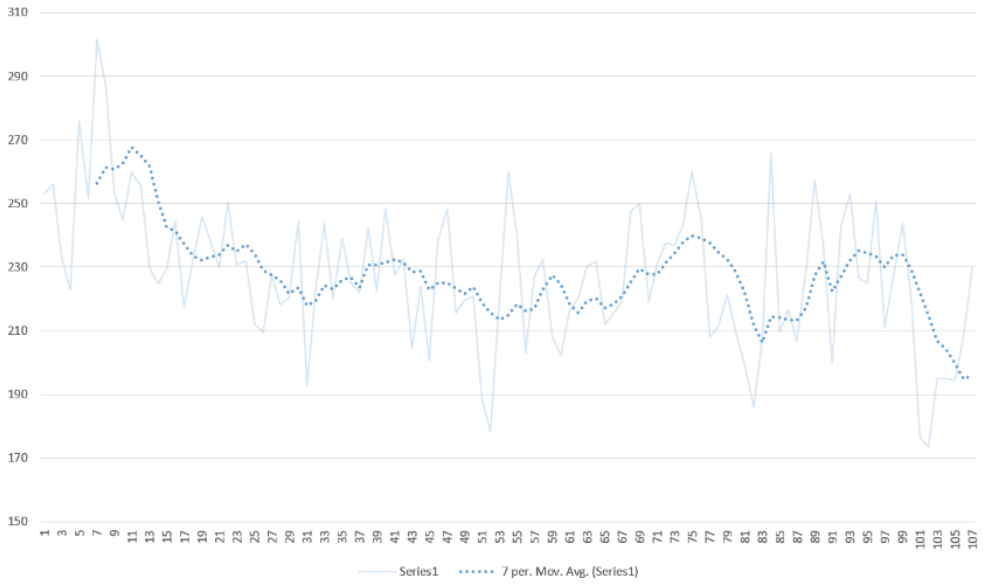


Figure 17: Seasonal effect in consumption (Y axes: daily average consumption in liters; X axes: days starting from September 1st 2015)

In Figure 17 we present the average water use of our Trial A Panel for Sep-Oct 2015 (*blue line*), i.e., before the Trial has started and well before participants were even recruited. As it is apparent, had our Trial begun in September, then we would observe a **22% reduction** in water use, which is attributed **entirely** to the seasonal characteristics of water use. Therefore, studies for interventions where the time period is *small* or *adjusted* to coincide with the seasonal drops in water use, are almost certainly void. These may be interpreted as *effective water interventions*, but in reality, the 'strong savings' are simply a *misinterpretation* of the naturally occurring reduction in water use after summer. We have taken extra care to account for all such seasonal factors and select appropriate control groups and baselines for our study.

In addition, it is important to emphasize that the timing and duration of the Phases correspond to the **minimum time** a **single participant** must spend in each Phase. Consequently, at any given point in time during the Trial's duration, we may have consumers in more than one Phase. As explained in Section 2.3, DAIAD offers integrated facilities for *remotely* altering the mode of the system, for each individual consumer (i.e. 'Mode Management'). This provided us with a very fine-grained control over the Phase each participant is in, and negates the need for synchronizing the treatment phases of the entire population. Our approach is another novelty in the study of water efficiency, as well as a major of advantage of DAIAD over other systems. The decision to follow this route was taken during M13 of the project and for the following reasons:

- The DAIAD Trials comprised multiple treatment phases, instead of just *one*, which is the norm for similar studies and projects. Instead of simply providing the system to all participants at the *same time* and studying its effects over a specific period (e.g., 3 months), our goal since the *inception* of the project was to study and compare *multiple* intervention types and approaches. This decision certainly perplexed the design, monitoring, and analysis of the Trial, but also significantly *increased its value*.
- Objectively studying and analyzing the effects of various water monitoring systems regarding water efficiency is a point of concern for the water sector, making reasoning about the effectiveness and real world adoption of ICT challenging. As mentioned previously, the vast majority of relevant studies

cannot be objectively validated and reproduced. Consequently, we decided to integrate facilities for performing arbitrary treatment studies within DAIAD itself, enabling each water utility to perform its own water efficiency study in terms of interventions, participants, duration, etc. At a later stage, our business monitoring activities in the context of WP8 revealed that the few ICT systems competing with DAIAD offer similar, yet narrower functionality, thus affirming our original decision.

- Our partners Amphiro and UNI BA have performed numerous similar studies in the past, comparing the effectiveness of various interventions types (*A-B, multi-variate testing*). A critical observation and knowhow from these studies concerned the extreme difficulty for ensuring all participants were synchronized across the various treatment phases. The real-world challenges in coordinating *volunteers* into performing simple, yet time-critical steps (*e.g. download a new app, take a shower*) while simultaneously managing technical issues (*e.g. sensor malfunction*), leads to significant delays, constant timeline adjustments, user frustration (*also leading to drop-outs*), and hinders data post-processing. With the DAIAD system being much more complex, we anticipated these problems to significantly increase.

The planned Phases of the Trial and their duration are as follows:

- Phase 1 (1.5 months). This phase is focused on validating the proper installation of the DAIAD system (*hardware and software*) from consumers, providing any assistance if needed. Further, during this phase we collect baseline water consumption data for all participants. As analyzed in Section 2.2.1, as soon as a consumer successfully initializes the DAIAD system, she enters the system's 'Learning mode'. On average, this selected duration would allow us to establish a baseline of at least 40 showers per household, which is in line with similar studies we have performed in the past. Note that this phase is only required for establishing the baseline of water use in the *shower* and not for their *total water consumption*. For all participating consumers we had full access to their SWM data for at least two years before the start of the Trial.
- Phase 2 (2 months). During this phase we compare the effectiveness of analytical vs. real-time feedback. The extended duration of this phase is required for two reasons. First, it would be the first actual experience consumers would have using the DAIAD system. Second, it studies a critical issue for water efficiency. Real-time interventions for water use have been shown from other studies to be more effective than analytical interventions. However, real-time interventions are significantly more expensive to provide and challenging to roll-out in the entire population. In contrast, analytical interventions are easier and less expensive to offer, but less effective.
- Phase 3 (1 month). During this phase all participants gained access to the entire DAIAD functionality, with the exception of social comparisons. The one-month duration was considered adequate, as participating consumers would already be familiar with the DAIAD system, and simply be exposed to one additional type of intervention.
- Phase 4 (2 months). During this phase we established a control group and provided the remaining consumers access to social comparisons. The expanded duration of the phase was required by its particular focus. Interventions tapping into social norms and gamification have been validated in other domains as strong influences of personal behavior. However, ample time is required for the

'social effect' to take place; competing against others, setting collective goals, and allowing a sense of *community* to form, cannot be rushed.

- **Phase 5 (1.5 months)**. During this phase all consumers gained complete access to the DAIAD system.

An extra 4 months were budgeted as leeway to address any unforeseen delays or issues affecting the implementation of the Trial. These months were to be used to expand particular Trial Phases or test additional interventions.

3.2. Quarter 1

3.2.1. Period summary

The DAIAD Trials have officially started on 1st March 2016, after a yearly long period of preparation and participant recruiting. During this period, our efforts have been focused on the distribution of DAIAD's hardware (amphiro b1), the provision of support to participants for downloading, installing and initializing the DAIAD mobile application, as well as on the management of any organizational and technical issues related to the initialization of the DAIAD system.

The distribution and initialization of the DAIAD system has been completed at the end of this period, with all participants successfully entering the Phase 1 of the Trial. In addition, a small number of participants (~10%) have entered Phase 2 of the Trial.

We have experienced a number of delays and issues regarding the installation and initialization of the DAIAD system, mostly attributed to the participant's availability and schedule considerations. In summary, the distribution of the DAIAD hardware was postponed due to the Easter vacations, as both personnel and customers were largely not available during that period. The first series of user requests for support revealed a number of issues related to the expanded nature of the Trial in Alicante (*large families, multiple amphiro devices per household*). As such, it was deemed necessary to pause the distribution of hardware for 2 weeks to better prepare the Helpdesk for handling and troubleshooting these issues.

More importantly, interacting, motivating, and maintaining a momentum with our Trial participants has proven more challenging than anticipated. However, this was a welcomed side-effect of the Trial's real-world nature and representative Trial population. After receiving their equipment, participants needed to be reminded several times (typically 2-5) to install it. Similarly, delays in the email communication after a user inquiry were all too frequent (4-10 days) or even neglected. For example, even a simple user request on how to Sign Up (*the user pressed Sign In instead of Sign Up*) was handled by the Helpdesk within the hour, but the user either did not reply back, or followed our advice after 1 week. DAIAD's analytics allowed us to remotely monitor the user's activity and thus complete our missing knowledge. In addition, during the first 4 weeks a number of critical bugs were discovered by our users, as well as several incompatibility issues with low-cost Android devices. These were successfully addressed by the Consortium, but delayed the initialization process for a number of users. Finally, in certain cases our technical support even extended to *house visits* in order to troubleshoot installation and initialization issues.

In terms of technical issues, their majority concerned the pairing process of b1 device (see Issues for details) and was caused by one or more of the following:

- *Unsupported mobile device*. The user attempted to pair the b1 with an unsupported device. The list of supported devices has been communicated several times to users, while users were explicitly required to confirm *twice* that they had a compatible device during the recruiting process. Further, with DAIAD being compatible with 95% of current devices sold in the market, the compatibility problems affect mobile devices at least 3 years old or extremely low-cost Android devices.
- *Android BT stack*. The implementation of the BT software stack from several device manufacturers (*especially high volume/low cost devices*) is slow and even non-conformant to the relevant standards. In these cases, the user experiences a long delay to complete the pairing process (*e.g. 1-10 min instead of 5-10 sec*). We have addressed most of these delays by refactoring our BT connection stack and developing proprietary libraries for specific devices.
- *Amphiro b1 malfunction*. For 3 b1 devices used for internal testing, the integrated BT radio of the b1 would not work, or operate intermittently. The result was failure to complete the pairing process, dirty data, or complete failure to transmit real-time water consumption data. Such cases have not been identified in Q1, but we expect them to be reported by users in the upcoming period.
- *Additional b1 pairing*. The user could not connect a second or third b1 device, despite having successfully connected the first one. After extensive testing we confirmed that this was not caused by a system bug, but from one of the above reasons.

In terms of anecdotal information, the increased communication and interaction with Trial participants during this period, was a source of great informal feedback. There was a broad feeling of anticipation for the Phase 2 of the Trial (i.e. access to DAIAD system), which climaxed during the end of the quarter. Participants were really anxious to begin using the system after successfully installing it in their households. We reminded them several times that the 'waiting' period is necessary to collect baseline data, and asked for their patience. Further, we received a number of comments (*especially from large families*) that the DAIAD system covers an important need in their households; to train and guide their children towards water efficiency.

A really impressive email was received during the selection period; we reproduce it below (*in English, translated from Spanish*) as a sample of a new generation of consumers, which are more environmentally aware and technological savvy.

> "Hi, good afternoon
>
> My name is José and I am writing to you as I have just filled the registration form to participate in your most interesting project.
>
> That's why we would like to add voluntary complementary information in order to let you understand why we are really interested in participating in the DAIAD project.
>
> We live in a recently built house (finished in 2013) holding a D Energy Rating (no heating is required during the winter months if the temperature is over 8º).
>
> The illumination is all in LED (included fridge and kitchen's extractor hood illumination).

Hot water is produced by the building's solar panels. The hot water heater (…) has two accumulators instead of one in order to turn on only one heater as required.

Electronic devices such as fridge or water machine have received A+++ Energy Rating (and we only use the later when it is full in order to improve our efficiency and decrease our energy consumption). The LED TV has received A+ e.r.

Moreover, we use Wi-Fi plugs than turn on/off by an app according to our timetable (…).

With this comments we would like to state we are really conscious of sustainably development and the importance of good behavior and optimization of energy use, issues that are in line with your project. Until now, we have the control of every energy consumption point at home but we had not found anything to date to monitor the cost and consumption of such an important element as the use of water at home.

We would like to add that we are always connected at home by Wi-Fi using our mobiles (Android devices, both of them wit 6.0.1 operative system), (…) and keep Bluetooth 4.0 active 24 hours a day because we have been using smart bracelets for more than one year now, thus we think that we fulfil the requirements to participate in the DAIAD project.

Looking forward to hearing from you. Do not hesitate to ask us in case of doubt

Congratulation for this initiative

Best Regards,

Marieta and Jose"

Finally, the end of Q1 finds the Trial *delayed by 1.5 months* compared to our original schedule. It is important to highlight such delays were anticipated already by the planning phase of Trial, by budgeting 4 months as a leeway in case of technical and/or organizational difficulties. Consequently, the overall picture regarding the progress of the Trial in the course of this period remains positive.

3.2.2. KPIs

In this section we provide the evolution of select KPIs presenting the progress of the Trial A in Q1, highlighting specific periods and/or events of particular interest.

3.2.2.1. Participants per Phase

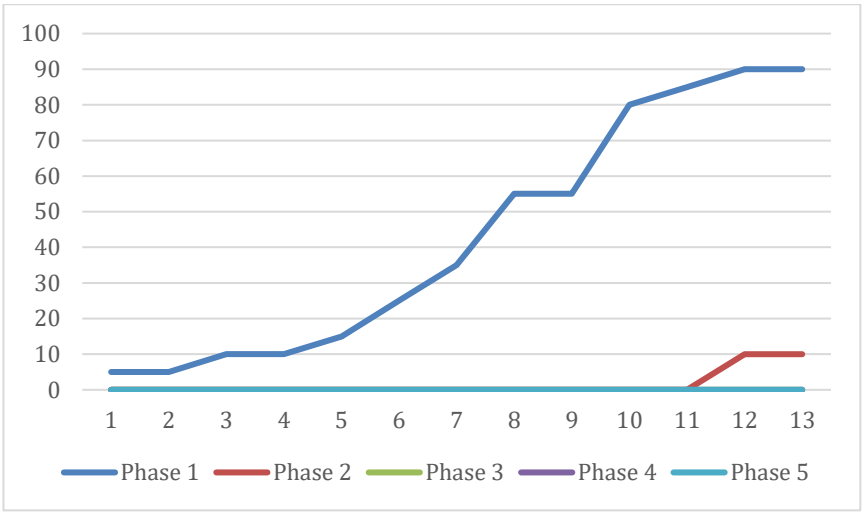


Figure 18: Distribution of participants per phase during Q1 (Y axes: % of panel population; X axes: week in Quarter 1)

The installation and initialization of the system (Phase 1) progressed at a lower rate than anticipated due to the issues encountered by participants, which are elaborated on the next section. However, by the end of Q1 all participants had successfully entered Phase 1 of the Trial, with a small number of participants (~10%) even progressing to Phase 2.

3.2.2.2. Water Consumption (SWM)

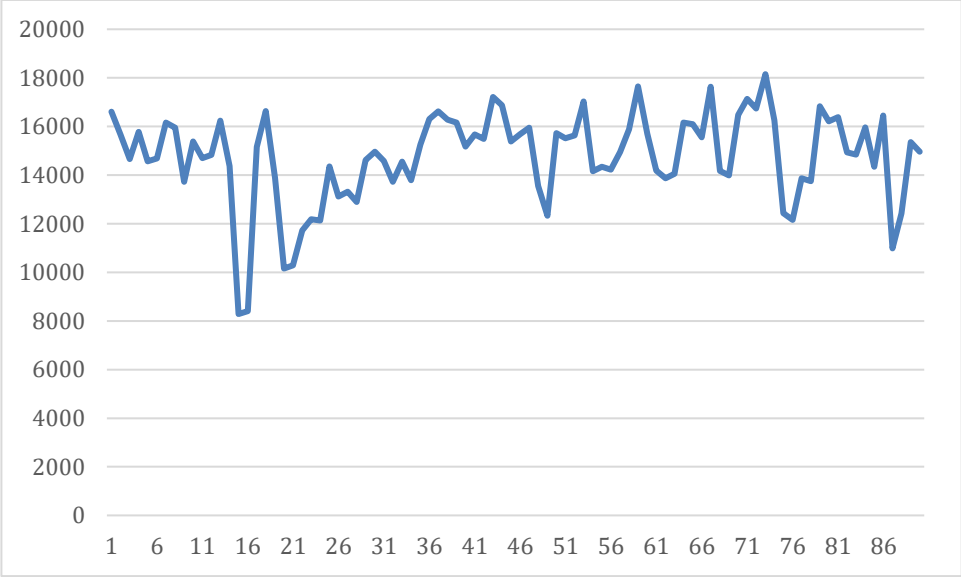


Figure 19: Total daily consumption for Q1 (liters) (Y axes: total water consumption in liters; X axes: day in Quarter 1)

The total daily consumption of our Panel for Q1 is normal, with consumption patterns accurately reflecting the periodicity (working days, week-ends) of water use.

3.2.2.3. Water Consumption (shower)

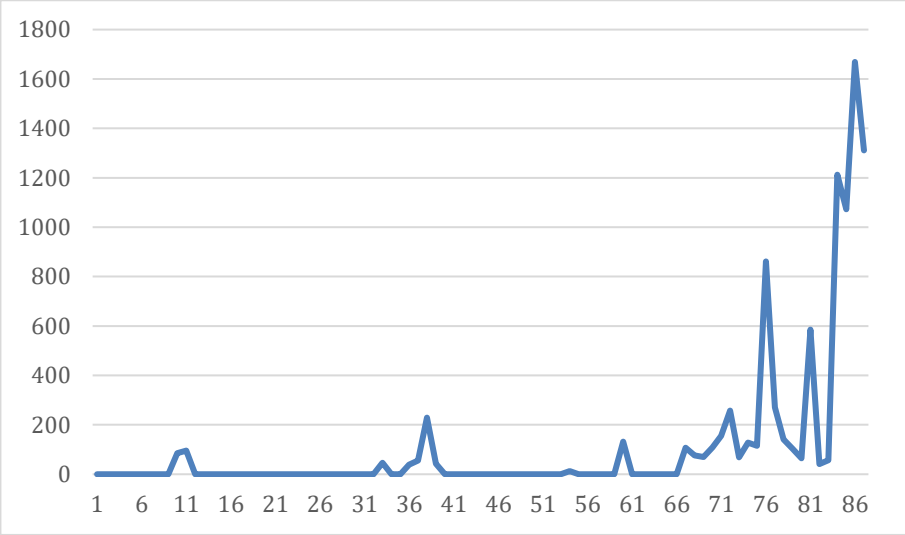


Figure 20: Total daily shower consumption for Q1 (liters) (Y axes: total shower consumption in liters; X axes: day in Quarter 1)

With the large majority of consumers in Phase 1 and Phase 2, the transmitted shower use from the amphiro b1 devices is expectedly very low (also see next KPI). As analyzed in Deliverable D1.2, shower events are transmitted from the b1 devices in an opportunistic manner. When the user's mobile device is within working BT range of the b1 during a shower, then we receive the real-time shower information (*i.e., a full time-series of water, temperature and flow*) along with historical shower data stored within the b1 (*i.e., shower events not captured in real-time*). Specifically, in Phase 1 the system provides no interventions (*mobile and b1 displays are off*) so the users due to lack of familiarity and incentive, largely do not have their mobile devices in proximity of the b1 during a shower event. In addition, we observe that as consumers gain access to Phase 2, the number of shower events captured from the b1 devices and transmitted to the system increase as expected.

3.2.2.4. Shower events

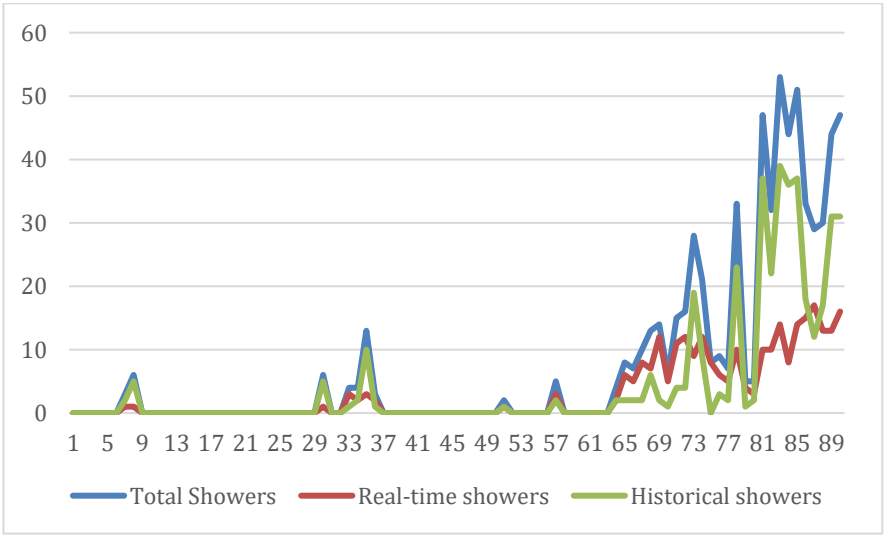


Figure 21: Shower events (total, real-time, historical) for Q1 (Y axes: number of shower events; X axes: day in Quarter 1)

During this period, we captured in total 544 shower events, of which 230 are real-time shower events and 314 historical shower events. For the reasons explained in the previous sub-section, we can observe the low number of transmitted shower events during Phase 1, and the expected increase during Phase 2.

3.2.2.5. Amphiro b1 malfunctions

During this period, no problems were reported with the 184 deployed b1 devices.

3.2.2.6. System availability (uptime)

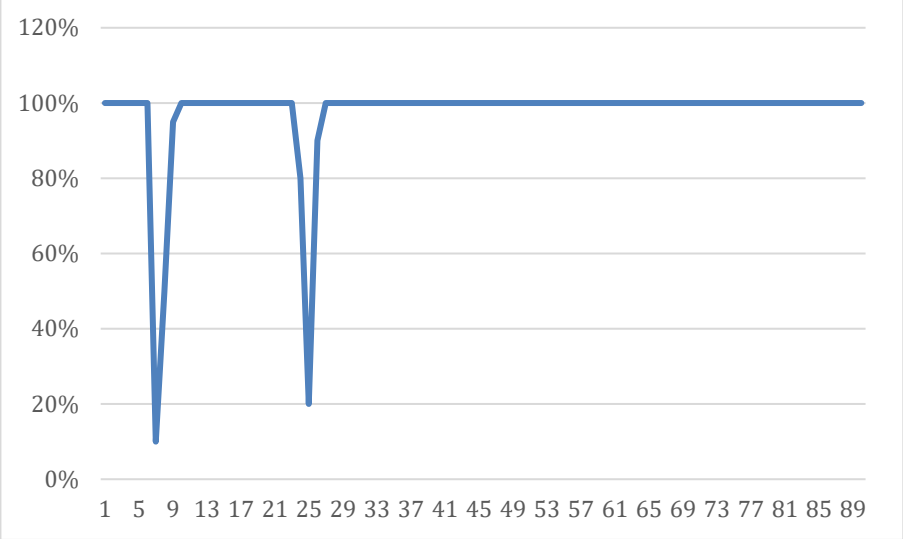


Figure 22: Daily system availability (% of time within a day system was available) (Y Axes: % of system availability; X axes: day in Quarter 1)

All interruptions in the system's availability during Q1 were *scheduled* down-times (maintenance/upgrades).

3.2.3. Issues

The following table presents the issues we addressed during Q1 of Trial A, and the corrective steps we took in in order to explore, analyze, and address them.

ID	Date	Problem Description	Corrective Steps
1	15/04/2016	• Amphiro's b1 display, melting iceberg. A participant contacted us by email and asked when the iceberg which is displayed at the b1 LCD disappears.	We informed the user that the iceberg displayed at the LCD of amphiro b1 disappears when the energy class of hot water while showering switches to F+. This corresponds to a water temperature of approximately 38-39°C and a water volume of 80 liters.
2	11/05/2016	• Bluetooth connection problem.	We provided the user with suggestions to address the most common technical issues. The

		A user contacted us by email reporting a problem connecting the amphiro b1 with the DAIAD app during the initialization steps.	user updated the DAIAD app and she reported us that she successfully paired the amphiro b1 with her mobile device.
3	11/05/2016	• Sign-up problem. A user contacted us by email reporting that she could not Sign Up in DAIAD's mobile application.	The issue was caused by a delayed transfer of the participant's details in the Trial's Whitelist. This process is manual in order to ensure that all participants have responded in both required surveys, have responded to email communication, and that they fully satisfy the minimum requirements (technical, demographics, etc.) for our study. As a result, delays of 1-2 working days in manually importing a participant in the DAIAD Whitelist are expected. The participant was imported in our Whitelist and notified to proceed with the Sign Up process. The user reported us that she successfully completed the Sign Up process.
4	12/05/2016	• Unsupported device. A user contacted us by email reporting a problem connecting the amphiro b1 with her mobile device.	We provided the user with suggestions to address the most common technical issues, which revealed that the user has installed the app in an unsupported device (iPhone 4). We reminded the user the minimum requirements for the DAIAD mobile application (i.e. Android 5.0, Bluetooth 4.0). The participant reported that she used a compatible mobile device which was successfully paired with the amphiro b1.
5	12/05/2016	• Data transmission problem. A user contacted us by email reporting that her mobile device could not be paired with the second amphiro b1 in the household.	We provided the user with suggestions to address the most common technical issues. We also informed her that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled.
6	13/05/2016	• Unsupported device. A user contacted us by email reporting a problem connecting the amphiro b1 with the mobile device (Windows phone).	We informed the user that Windows phones are not currently supported and advised her to use an alternative compatible device. She replied that a compatible mobile device is available and that she will pair it with the amphiro b1. In the following days we observed from our

			monitoring UI that the user has successfully completed the pairing process.
7	16/05/2016	• Pairing second b1. A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	We provided the user with suggestions to address the most common technical issues. We also informed her that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. The showers will be stored in the device's internal memory, so no further action is required.
8	17/05/2016	• Pilot drop-out. A user contacted us by email informing us about her intention not to participate in the pilot. The reason was her repeated failure to complete the pairing process.	We provided the user with suggestions to address the most common issues. However, the user requested to be removed from the Trial and return the device. The equipment was returned and allocated to another participant within 3 weeks.
9	18/05/2016	• Unsupported Android device. A user contacted us by email reporting a problem connecting the amphiro b1 with her mobile device.	After providing the user with suggestions to address the most common technical issues, the user responded that her mobile device (Android v4.2) wasn't compatible with the minimum requirements. After a few days, she reported that there is an available mobile device in the household which satisfies the minimum requirements for the DAIAD mobile application (i.e. Android 5.0, Bluetooth 4.0). Finally, she informed us that she has successfully completed the pairing process.
10	19/05/2016	• Pairing second b1. A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	We provided the user with suggestions to address the most common technical issues. We also informed her that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. The showers will be stored in the device's internal memory, so no further action is required.
11	19/05/2016	• Sign-in problem. A user contacted us by email reporting a problem signing-in the DAIAD app.	This was not caused by a technical issue, but from the user selecting 'Sign Up' (i.e. create an account) rather than correctly proceeding with 'Sign-in'. We gave the user detailed instructions on how to correctly 'Sign-in' the DAIAD app.

12	24/05/2016	• Mode change (b1 ON). A user contacted us by email reporting that the LCD of her amphiro b1 device remained disabled.	We provided the user with suggestions to address the most common technical issues. In the following days, she reported that the LCD was successfully enabled.
13	24/05/2016	• Pairing second b1. A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	We provided the user with suggestions to address the most common technical issues. We also informed her that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. The showers will be stored in the device's internal memory, so no further action is required.
14	25/05/2016	• Unsupported iOS device. A user contacted us by email reporting a problem connecting the amphiro b1 with her mobile device.	We provided the user with suggestions to address the most common technical issues, which revealed that the user has installed the app in an unsupported device (iPhone 4). We reminded the user the minimum requirements for the DAIAD mobile application (i.e. Android 5.0, Bluetooth 4.0). The participant reported that she used a compatible mobile device which was successfully paired with the amphiro b1.
15	25/05/2016	• Unsupported Android device. A user contacted us by email reporting a problem connecting the b1 with the DAIAD mobile app during the initialization steps.	We provided the user with suggestions to address the most common technical issues, which revealed that the user has installed the app in an unsupported device (Lenovo, Android v4.2). We reminded the user the minimum requirements for the DAIAD mobile application (i.e. Android 5.0, Bluetooth 4.0). The participant reported that she used a compatible mobile device which was successfully paired with the amphiro b1.
16	25/05/2016	• Sign-in problem. A user contacted as by email reporting a problem signing-in the DAIAD app.	This was not caused by a technical issue, but from the user selecting 'Sign Up' (i.e. create an account) rather than correctly proceeding with 'Sign-in'. We gave the user detailed instructions on how to correctly 'Sign-in' the DAIAD app.
17	26/05/2016	• Sign-up problem. A user contacted us by email reporting that during the initialization steps she	We updated the user's location in DAIAD system and informed her by email that the problem was resolved.

		mistakenly selected a wrong location.	
18	27/05/2016	• Pairing second b1. A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	We provided the user with suggestions to address the most common technical issues. We also informed her that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. The showers will be stored in the device's internal memory, so no further action is required.

Table 2: Q1 Issues

3.2.4. Risks

We anticipate the following risks for the next period of the Trial.

ID	Risk	Contingency Plan
1	Malfunctioning b1 devices	The risk is small, as currently more than 99% of the distributed devices operate trouble-free. We will be monitoring the pilot for any technical issues, replace the devices when needed, and study them to identify any systematic technical problems.
2	Delays in the Whitelist update process	The risk is small as it relates only to the next period, and may affect at most 3-5 users. We have accelerated the manual approval process, but we will not automate it completely (*although it is technically feasible*).

Table 3: Q1 risks

3.3. Quarter 2

3.3.1. Period summary

During this period, our efforts were focused on providing technical support to participants, collecting their feedback, and maintaining active communication with the system's administrators in order to rapidly identify and address all issues encountered by users.

A highlight of our efforts has been the OpenWaterDay organized in Alicante, in which our participants were invited to meet the DAIAD team, learn more about the project, and provide their feedback. A number of users participated in our OWD Workshop for water innovation, contributing with novel ideas for improving DAIAD

and expanding its user base. Further, a number of users were interviewed by the Consortium and were added in the project's video, offering their own honest views about the system.

Overall, it has been an extremely intensive period in terms of providing support to our participants and evaluating all reported issues. With the majority of our panel gradually moving between Phases, being introduced to new interventions, and gaining access to the entire DAIAD system, this level of activity was anticipated by the Consortium. In this respect, the vast majority of issues was not technical in nature, but attributed from the *impatience* of our participants to *gain full access* to DAIAD. This is a very positive finding, as it vividly demonstrates the genuine interest of our participants in using DAIAD to its full degree. However, it also meant that we had to keep reminding our panel the specific purpose and scope of the experimental study (*as established already from their recruiting and communicated via email*), advising them to be patient, and keeping them engaged. Another great source of support inquiries was caused by the users not having correctly paired their additional b1 devices (2^{nd}, 3^{rd}) during Phase 1, and against the specific instructions provided to them. Again, we had to *nudge* the users towards respecting the experimental protocol and reassure that they would have full access to the DAIAD system pretty soon.

In terms of technical issues, their majority concerned the operation of the b1 (see Issues for details) and was caused by one or more of the following:

- *Amphiro b1 malfunction*. In seven (7) cases (*out of 184 devices*) the integrated BT radio of the b1 would not work, or operate intermittently. The result was failure to complete the pairing process, dirty data, or complete failure to transmit real-time water consumption data. In all these cases the devices were replaced and delivered to Amphiro for further analysis.
- *Additional b1 pairing*. The user could not connect a second or third b1 device, despite having successfully connected the first one. After extensive testing, we confirmed that this was not caused by a system bug, but from the user not having completed the process during the initial installation.

Finally, the end of Q2 finds the Trial *delayed by 2 months* compared to our original schedule. As explained, such delays were anticipated already by the planning phase of Trial, by budgeting 4 months as a leeway in case of technical and/or organizational difficulties. Consequently, the overall picture regarding the progress of the Trial in the course of this period remains positive.

3.3.2. KPIs

In this section we provide the evolution of select KPIs presenting the progress of the Trial A in Q2, highlighting specific periods and/or events of particular interest.

3.3.2.1. Participants per Phase

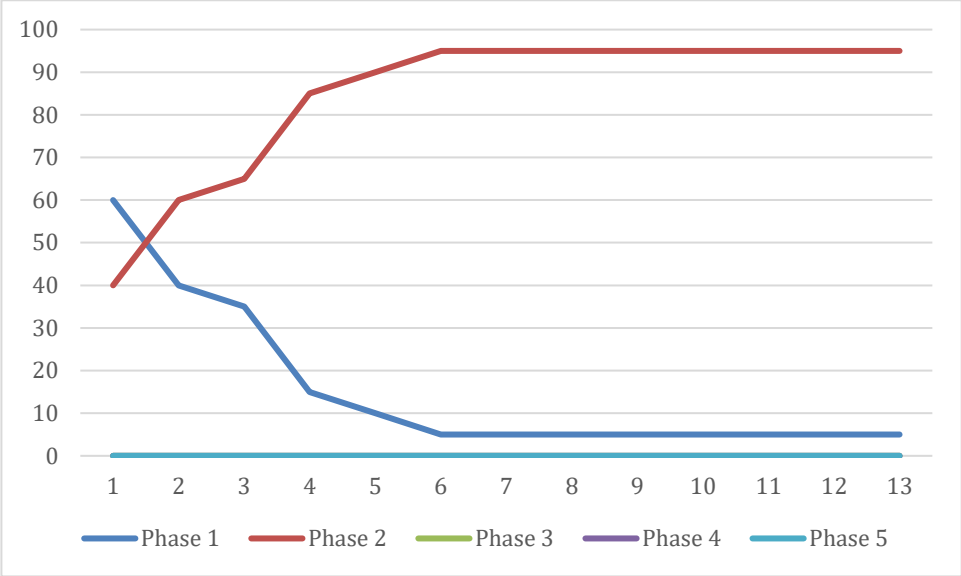


Figure 23: Distribution of participants per phase during Q2 (Y axes: % of panel population; X axes: week in Quarter 2)

The progression of all Trial participants towards Phase 2 continued during the first weeks of Trial A and was completed by week 6. As explained in the previous sections, in Phase 2 our participants were split into two groups, with the first gaining access only to real-time interventions (i.e., b1 display ON) and with the second gaining access only to diagnostic interventions (i.e., mobile app ON).

3.3.2.2. Water Consumption (SWM)

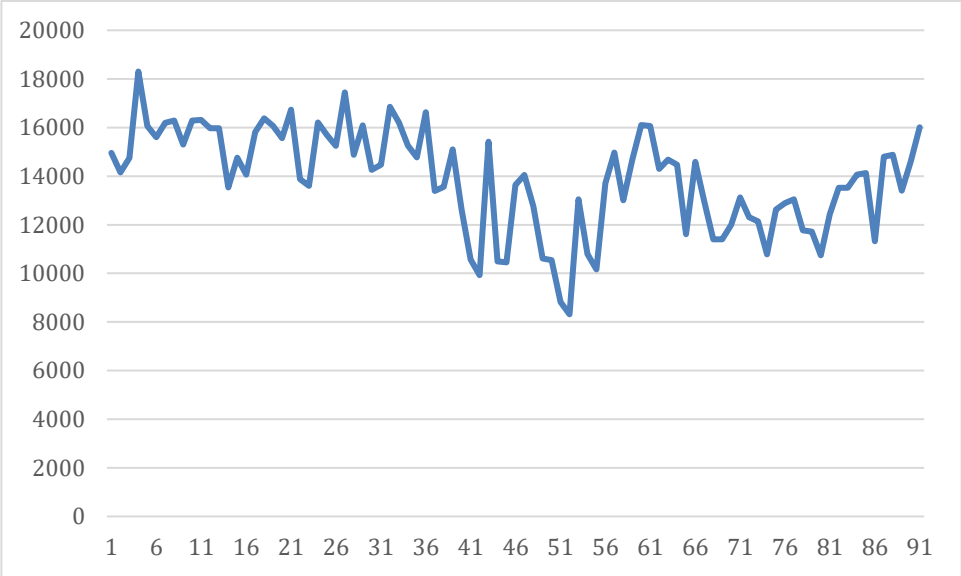


Figure 24: Total daily consumption for Q2 (liters) (Y axes: total water consumption in liters; X axes: day in Quarter 2)

The total daily consumption of our Panel for Q2 is normal, with consumption patterns accurately reflecting the periodicity (working days, week-ends, public holidays) of water use.

3.3.2.3. Water Consumption (shower)

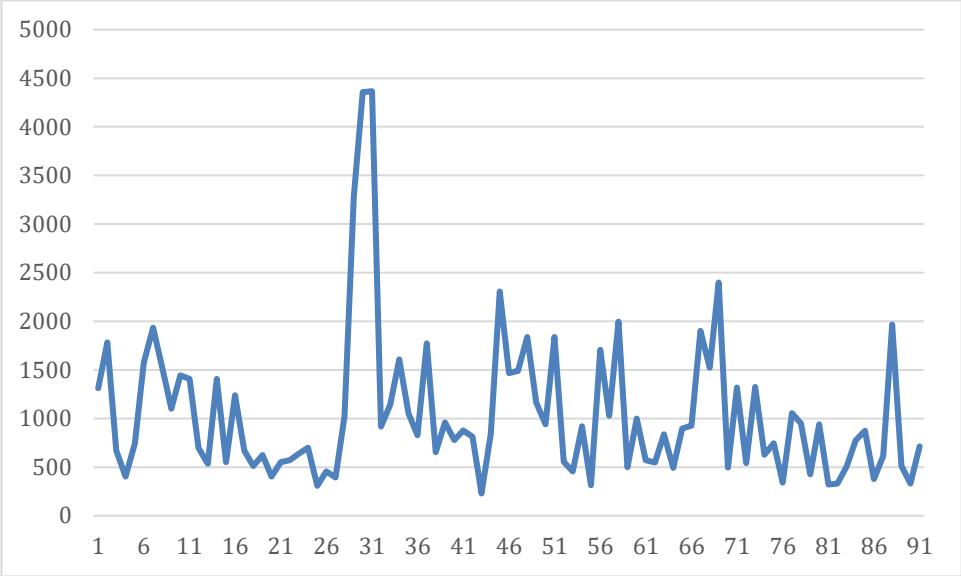


Figure 25: Total daily shower consumption for Q2 (liters) (Y axes: total shower consumption in liters; X axes: day in Quarter 2)

The daily volume of transmitted showers from our Trial participants rapidly increased as expected, with a visible peak around days 26-32, during which a new app update increased the throughput for receiving historical showers (*hence a high number of historical showers were retrieved these days*). Further, the time-series accurately reflects the periodicity (working days, week-ends, public holidays) of shower use, with patterns its visible throughout the period.

3.3.2.4. Shower events

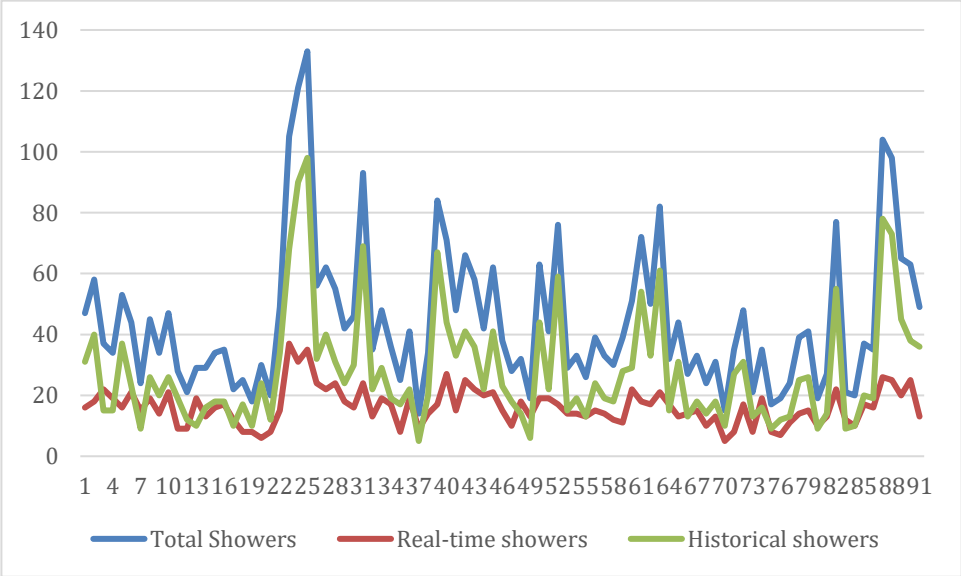


Figure 26: Shower events (total, real-time, historical) for Q2 (Y axes: number of shower events; X axes: day in Quarter 2)

During this period, we captured in total 3,918 shower events, of which 1,451 are real-time shower events and 2,467 historical shower events. As we can observe, the number of historical showers increased after the

introduced mobile app update mentioned in the previous section, and is directly responsible for the increase in total shower events (*real-time showers remained practically stable throughout the period*).

3.3.2.5. Amphiro b1 malfunctions

During this period, seven (7) out of 184 deployed b1 devices (3.8%) were reported as malfunctioning and replaced accordingly.

3.3.2.6. System availability (uptime)

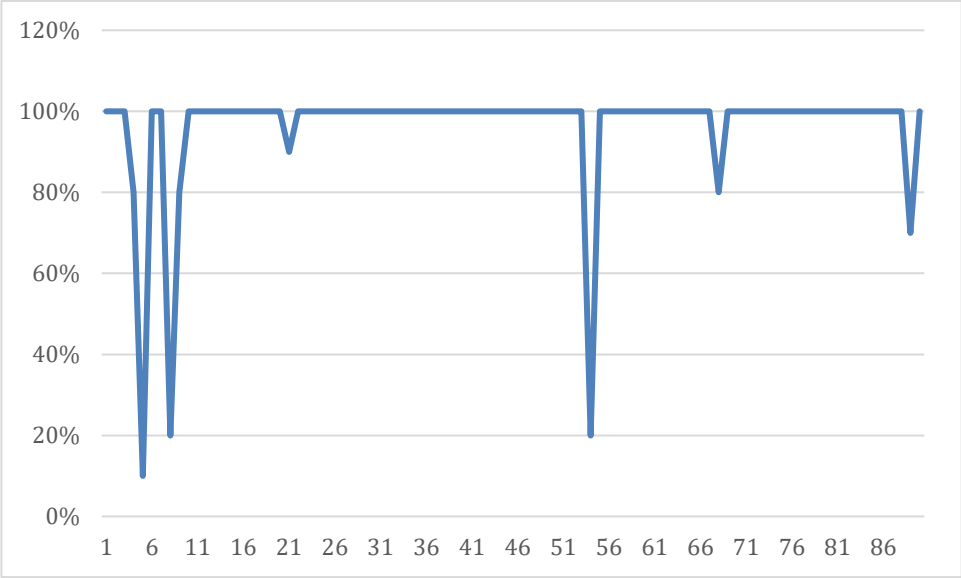


Figure 27: Daily system availability (% of time within a day system was available) (Y Axes: % of system availability; X axes: day in Quarter 2)

All interruptions in the system's availability during Q2 were *scheduled* down-times (maintenance/upgrades).

3.3.3. Issues

The following table presents the issues we addressed during Q2 of Trial A, and the corrective steps we took in in order to explore, analyze, and address them.

ID	Date	Problem Description	Corrective Steps
19	01/06/2016	• Previous version of mobile app installed A user contacted us by email reporting a problem connecting the b1 with the DAIAD mobile app during the initialization steps.	After consulting DAIAD's user logs, the user was instructed to update the DAIAD mobile app at the latest version, which included manifold improvements for the Bluetooth pairing process. After updating the DAIAD mobile app, the b1 was successfully paired

20	01/06/2016	• Learning mode A user contacted us telling that her app was 'locked'	The user had misinterpreted the message presented during the Learning mode (Phase 1), believing that she could not use the app because it was 'locked'. We reminded the user about the purpose and duration of the Learning mode.
21	01/06/2016	• Amphiro b1 pairing A user contacted us by email reporting a problem connecting the b1 with the DAIAD mobile app.	The user was invited to visit Aguas de Alicante, where Consortium members demonstrated the pairing process using our demo b1 devices. Following this demonstration, the user successfully paired her amphiro b1 device.
22	02/06/2016	• Learning mode A user contacted us telling that the app seems to be 'locked' because the Learning mode remained active.	We reminded the user about the purpose and duration of the Learning mode, advising her to be a bit more patient (she had only completed a few days in Learning mode). After 3 weeks and evaluating the collected baseline data, the user was moved to Phase 2.
23	03/06/2016	• Sign-up problem A user reported that she could not Sign Up in the mobile app	The issue was caused by a delayed transfer of the participant's details in the Trial's Whitelist. The participant was imported in our Whitelist and notified to proceed with the Sign Up process, which she performed successfully.
24	04/06/2016	• Forgotten password A user was not able to sign in because he had forgotten his password	A new password was generated and sent to the user. Further, the user was reminded that she could reset her password from the DAIAD mobile app itself.
25	10/06/2016	• Pilot drop-out A user who had unsuccessfully tried to pair the device decided to leave the pilot	The user was contacted in order to explore the reasons for the technical difficulties she encountered. Unfortunately, the user did not respond and requested to be removed from the Trial. The equipment was returned and allocated to another participant within 3 weeks.
26	11/06/2016	• Learning mode. A user contacted us telling that the app seems to be 'locked' because the Learning mode remained active.	We reminded the user about the purpose and duration of the Learning mode, advising her to be a bit more patient.
27	14/06/2016	• Pairing second b1	After evaluating the system's logs, we discovered that the user had not installed the

		A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	second b1 device during the initial setup, with the DAIAD app having entered its Learning mode. We informed the user that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. The showers will be stored in the device's internal memory, so no further action is required
28	15/06/2016	• Learning mode A user contacted us telling that her app was 'locked', and both amphiro devices' displays were blank	We reminded the user about the purpose and duration of the Learning mode, confirming that this is the intended operation of the DAIAD system in the Learning mode, and advised her to be a bit more patient.
29	15/06/2016	• Learning mode A user contacted us complaining that the app seems to be locked because the learning mode had not been changed to normal mode.	We reminded the user about the purpose and duration of the Learning mode, confirming that this is the intended operation of the DAIAD system in the Learning mode, and advised her to be a bit more patient.
30	26/06/2016	• Learning mode A user contacted us telling that she didn´t know how to use the app. Additionally, her 3 b1 devices' displays were blank and didn´t show any data	We reminded the user about the purpose and duration of the Learning mode, confirming that this is the intended operation of the DAIAD system in the Learning mode, and advised her to be a bit more patient.
31	27/06/2016	• Amphiro b1 pairing A user contacted us by email reporting a problem connecting the b1 with the DAIAD mobile app.	The user was invited to visit Aguas de Alicante, where Consortium members demonstrated the pairing process using our demo b1 devices. Following this demonstration, the user successfully paired her amphiro b1 device.
32	27/06/2016	• Pairing second b1 A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	After evaluating the system's logs, we discovered that the user had not installed the second b1 device during the initial setup, with the DAIAD app having entered its Learning mode. We informed the user that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. The showers will be stored in the device's internal memory, so no further action is required
33	28/06/2016	• Learning mode	We reminded the user about the purpose and duration of the Learning mode, confirming that

		A user contacted us telling that she didn´t know how to use the app. Additionally, her 3 b1 devices' displays were blank and didn´t show any data	this is the intended operation of the DAIAD system in the Learning mode, and advised her to be a bit more patient.
34	30/06/2016	• Malfunctioning b1 A user contacted us complaining that she had been able to pair only one of her devices, even though normal mode was already active	After evaluating the system's logs and all other possible sources of error, the b1 unit was found to be defective and was replaced. The user successfully installed and started using the new b1, while the malfunctioning b1 was delivered to Amphiro for examination.
35	30/06/2016	• Amphiro b1 LCD remained inactive One user complained because only one of her b1 devices was activated in Phase 2.	The user was instructed to use the inactive b1 as normal, explaining her that her data are safely stored in the device. In parallel, we examined the system's logs and successfully reproduced the problem using the same mobile device (type/OS) of the user. A new version of the DAIAD mobile app addressing this bug was immediately published. The user confirmed that after updating the mobile app, the b1's LCD was successfully activated.
36	01/07/2016	• Unsupported Android device A user contacted us by email reporting a problem connecting the amphiro b1 with her mobile device.	We provided the user with suggestions to address the most common technical issues. The user responded that her mobile device (Android v4.2) wasn't compatible with the minimum requirements. No additional action was required because the participant decided to use a compatible mobile device.
37	01/07/2016	• Pairing b1 A user contacted us by email and reported that she could not pair her mobile device with amphiro b1.	We provided the user with suggestions to address the most common technical issues. She communicated that she had successfully paired her mobile device and the problem was resolved.
38	04/07/2016	• Account problem After attempting to pair the devices without finishing the process, a user deleted and reinstalled the app. Her account was not recognized as	After evaluating the system's logs, we discovered that the user account had been erased from the DAIAD system due to a bug in the Data API. The user account was immediately restored and the bug in the API was fixed, with no further incidents reported.

		valid when he introduced it for the second time.	
39	05/7/2016	• Pairing b1 A user contacted us by email and reported that she could not pair her mobile device with amphiro b1.	We provided the user with suggestions to address the most common technical issues. She communicated that she had successfully paired her mobile device and the problem was resolved.
40	06/07/2016	• Pairing second b1 A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	After evaluating the system's logs, we discovered that the user had not installed the second b1 device during the initial setup, with the DAIAD app having entered its Learning mode. We informed the user that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. After moving the user to Phase 2, she reported that she had trouble pairing the b1. We visited the user's premises and successfully paired the device.
41	08/07/2016	• Unsupported Android version A user informed us that she could not sign in the DAIAD app	The user had performed an OS recovery (Android) of her mobile device to an unsupported version (<4.4). Due to this involuntary downgrade, the app was no longer compatible. We instructed the user to update the OS of her mobile device and the problem was resolved.
42	11/07/2016	• Unsupported device A user contacted us by email reporting a problem connecting the amphiro b1 with her mobile device	We verified that the user was attempting to use an unsupported mobile device. Following our communication, the user selected a compatible device, experiencing no problems.
43	12/07/2016	• Amphiro b1 LCD remained inactive. A user complained because only one of her b1 devices was activated in Phase 2.	The user was instructed to use the inactive b1 as normal, explaining her that her data are safely stored in the device. In parallel, we examined the system's logs and successfully reproduced the problem using the same mobile device (type/OS) of the user. A new version of the DAIAD mobile app addressing this bug was immediately published. The user confirmed that after updating the mobile app, the b1's LCD was successfully activated.

44	12/07/2016	• Malfunctioning b1 A user expressed her irritation due problems with her b1 device. She claimed that in her attempt to identify the causes, she had repeatedly spent too much water.	The b1 was retrieved and examined, confirming a malfunction of the b1's Bluetooth module. The device was replaced, addressing all issues the user encountered.
45	12/07/2016	• Malfunctioning b1 A user complained because only one of her b1 devices was activated in Phase 2.	A technician visited the premised of the user to test the system. One of the devices' Bluetooth was found to be malfunctioning and it was replaced accordingly.
46	13/07/2016	• Amphiro b1 LCD remained inactive A user complained because only one of her b1 devices was activated in Phase 2.	The user was instructed to use the inactive b1 as normal, explaining her that her data are safely stored in the device. In parallel, we examined the system's logs and successfully reproduced the problem using the same mobile device (type/OS) of the user. A new version of the DAIAD mobile app addressing this bug was immediately published. The user confirmed that after updating the mobile app, the b1's LCD was successfully activated.
47	14/07/2016	• Unsupported mobile device A user informed us that nothing appears in the historic record of showers in the mobile app, even though real time information of shower events is displayed.	We confirmed that the historic record of the user's showers is correctly registered in the monitoring environment. After consulting the system's logs, we informed the user that the issue was caused by an unsupported mobile device (tablet), advising her to use the compatible mobile device she already has available.
48	14/07/2016	• Malfunctioning b1. A user informed us that only one of her b1 devices was activated in Phase 2.	A technician visited the premised of the user to test the system. One of the devices' Bluetooth was found to be malfunctioning and it was replaced accordingly.
49	14/07/2016	• Malfunctioning b1 A user informed us that only one of her b1 devices was activated in Phase 2.	The b1 was retrieved and examined, confirming a malfunction of the b1's Bluetooth module. The device was replaced, addressing all issues the user encountered.
50	14/07/2016	• DAIAD functionality A user wrote us when the app became active (moved in Phase	We thanked the user for her communication and support.

		2) telling that everything was OK and that she was really delighted with the pilot	
51	14/07/2016	• Malfunctioning b1 A user informed us that she was not able to pair the second device even though the bear appeared and every data was shown in the screen.	The b1 was retrieved and examined, confirming a malfunction of the b1's Bluetooth module. The device was replaced, addressing all issues the user encountered.
52	15/07/2016	• Missing historical showers A user contacted us complaining for missing time-series information for a number of her showers	We reminded the user the way shower data are transmitted from the b1 and displayed in the app, advising her to keep her mobile device near the shower at all times, in order to collect full real-time data for her shower events.
53	18/07/2016	• Malfunctioning b1 A user informed us that only one of her b1 devices was activated in Phase 2.	The b1 was retrieved and examined, confirming a malfunction of the b1's Bluetooth module. The device was replaced, addressing all issues the user encountered.
54	19/07/2016	• LCD remained inactive A user in Phase 2 complained because only her mobile device was activated	We reminded to the user the purpose of the study, advising her to be a bit patient, and informing her that she will have full access to the DAIAD system within a few weeks.
55	25/07/2016	• Pairing second b1 A user informed us that her mobile device cannot be paired with the second amphiro b1 in the household.	After evaluating the system's logs, we discovered that the user had not installed the second b1 device during the initial setup, with the DAIAD app having entered its Learning mode. We informed the user that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. After moving the user to Phase 2, she reported that she had trouble pairing the b1. We visited the user's premises and successfully paired the device.
56	01/08/2016	• Pairing second b1 A user contacted us by email reporting that her mobile device cannot be paired with the second amphiro b1 in the household.	After evaluating the system's logs, we discovered that the user had not installed the second b1 device during the initial setup, with the DAIAD app having entered its Learning mode. We informed the user that she will be able to pair the second amphiro b1 when the 'Normal mode' will be enabled. After moving

			the user to Phase 2, she reported that she had trouble pairing the b1. We visited the user's premises and successfully paired the device.
57	04/08/2016	• Malfunctioning b1 A user informed us that only one of her b1 devices was activated in Phase 2.	The b1 was retrieved and examined, confirming a malfunction of the b1's Bluetooth module. The device was replaced, addressing all issues the user encountered.
58	05/08/2016	• Installation problem A user contacted us by email reporting that her b1 was malfunctioning.	After an email exchange with the user, the source of the problem could not be identified, and a technician was dispatched to the user's premises, where it was discovered that the user had installed the device in the opposite position and consequently, the b1 couldn´t work. After correctly installing the b1, the problems were solved.
59	11/08/2016	• Sign in problem A user called our telephone support department informing us that her spouse could not sign in using his account.	We contacted the user the following day but the problem was already addressed by the user, as it was only a typing error when entering her credential's in the app
60	28/08/2016	• General complaints A user wrote us complaining that he preferred the standalone b1 (*i.e. not linked to the app*) instead of using the mobile app.	We reminded the user the purpose of examining and evaluating different types of interventions (*in this case real-time vs. analytical*), while also thanking her for the remarks and comments. The user was really comprehensive, understanding the purpose of the study.
61	31/08/2016	• DAIAD App connectivity A user informed us that app shows a message telling there is no data connection available, even though GPRS data connection is turned on	After examining the system's logs, we managed to reproduce to problem, and correct it at the next version of the mobile app.

3.3.4. Risks

We anticipate the following risks for the next period of the Trial.

ID	Risk	Contingency Plan
3	Malfunctioning b1 devices	The risk is small, as currently more than 96% of the distributed devices operate trouble-free. We will be monitoring the pilot for any technical issues, replace the devices when needed, and study them to identify any systematic technical problems.
4	Unsupported mobile devices	The risk is small, with less than 5% of the participants having problems due to the specific type/version of their mobile device. These cases have been narrowed down to low-cost Android mobile devices, which do not fully confront to OS and/or BT stack specifications. We have taken extra care to test the mobile app against such devices, and even extending the app to support them despite their proprietary nature.

3.4. Quarter 3

3.4.1. Period summary

During this period, our efforts were focused on providing technical support to participants, collecting their feedback, and maintaining active communication with the system's administrators in order to rapidly identify and address all issues encountered by users.

Overall, the number of issues and support inquiries had been much small than the previous period, as expected, with users progressing to the next planned Phases of the Trial with minimal problems. We opted to proactively communicate with users when moving to a new Phase, confirming the system was operating as intended. A satisfaction survey was distributed to Trial participants (see Annex 6 – Satisfaction survey), which will be repeated during the next final period, with their results presented in the Deliverable D7.3 'Trial Evaluation'.

In terms of technical issues, their majority concerned an incompatibility of a new app version which resulted into the app simply presenting a blank screen. The problem affected a specific type/version of Android mobile devices *(<4 used in the pilot*) due to a non-standard API implementation. A bug-fix was developed and a new version of the app was uploaded, resolving the issue. Further, in this period we only discovered only one malfunctioning b1, confirming our estimates for the low risk of these issues. Finally, two users left the pilot; the first due to a change of address (*no SWM was available at her new residence*) and the second due to difficulties in using the b1 in the shower (*family members complained about the weight/size of the device*).

The most critical issue discovered during this period did not affect the Trial, but the collection of SWM data to enable the subsequent analysis and evaluation of the Trial. Specifically, in the context of T7.5 'Evaluation', the Consortium had already begun the analysis of the participant's SWM time-series in terms of periodicity, seasonality, correlation with demographic characteristics, etc. From this analysis, we discovered a number of *irregularities* in the data, which upon a closer inspection were attributed to missing data points from the SWM

data extracted from AMAEM's smart metering system. In general, these type of quality issues were expected (*e.g., data transmission problems, dirty reads*) and actually gracefully managed by the system and our analysis algorithms to ensure the robustness of the system. However, the statistical analysis of these specific problems identified them as *systematic* in nature, rather than random. Upon a further round of analysis, and after AMAEM's *intense efforts*, the problem was identified as a malfunctioning data processing script *within* AMAEM's smart metering system. The problem was resolved by AMAEM, and all missing data points were successfully retrieved. While the Trial's implementation was not affected in any way, this issue resulted into the delay of T7.5, as all *data pre-processing, data cleaning, statistical analysis and evaluations* needed to be reinitialized and performed from the very beginning. This experience was nevertheless beneficial as it confirmed two important aspects related to the application of SWM data for Big Data and ML-based analytics. First, smart metering infrastructures have been designed and operate to efficiently support *billing*, rather than complex household-level analytics. The corresponding compromises in data quality (*necessary to reduce TCO of smart metering*) are quite often *not even known* to water utilities, as data quality issues can only be discovered when applying the SWM data for complex analytics. Second, any system applying SWM data to extract complex analytics (*e.g., demand management, consumer engagement*) must *by-design* assume that input data will be of low quality, inherently accommodate across all of its aspects the low veracity of data, and be extremely robust to changes in data quality.

Finally, the end of Q3 finds the Trial *delayed by 1 month* compared to our original schedule. Consequently, the overall picture regarding the progress of the Trial in the course of this period remains positive, and we expect it to be successfully completed within the next period.

3.4.2. KPIs

In this section we provide the evolution of select KPIs presenting the progress of the Trial A in Q3, highlighting specific periods and/or events of particular interest.

3.4.2.1. Participants per Phase

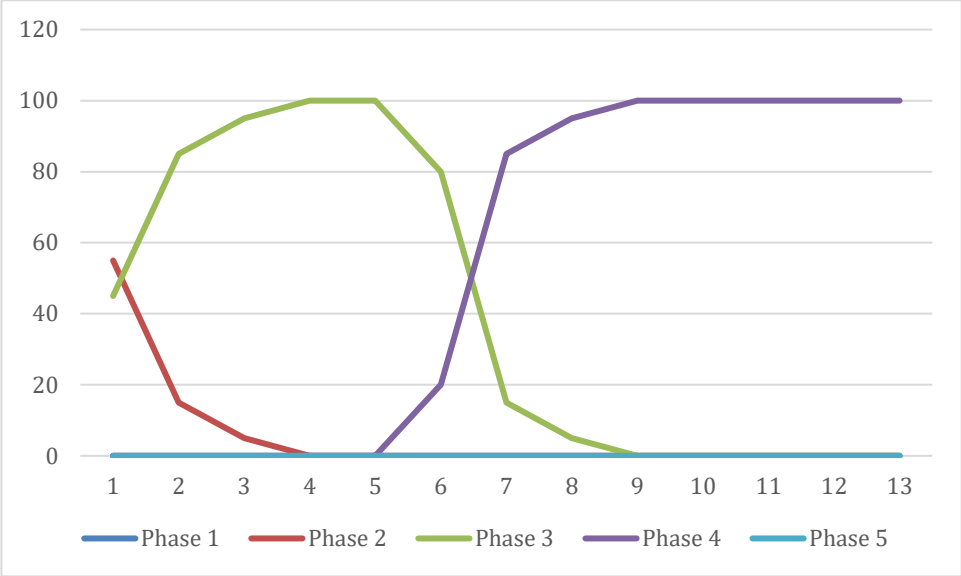


Figure 28: Distribution of participants per phase during Q3 (Y axes: % of panel population; X axes: week in Quarter 3)

During this period, all participants gradually obtained full access to the DAIAD system (Phase 3), at which point they gained access to the hidden interventions of Phase 2. This marked an important milestone for the Trial, as participants were exposed both to diagnostic and real-time interventions, and for the first time received a complete impression of the normal operation of the system. As the period progressed, our participants moved to Phase 4, during which only half of them were exposed to social-based comparisons.

3.4.2.2. Water Consumption (SWM)

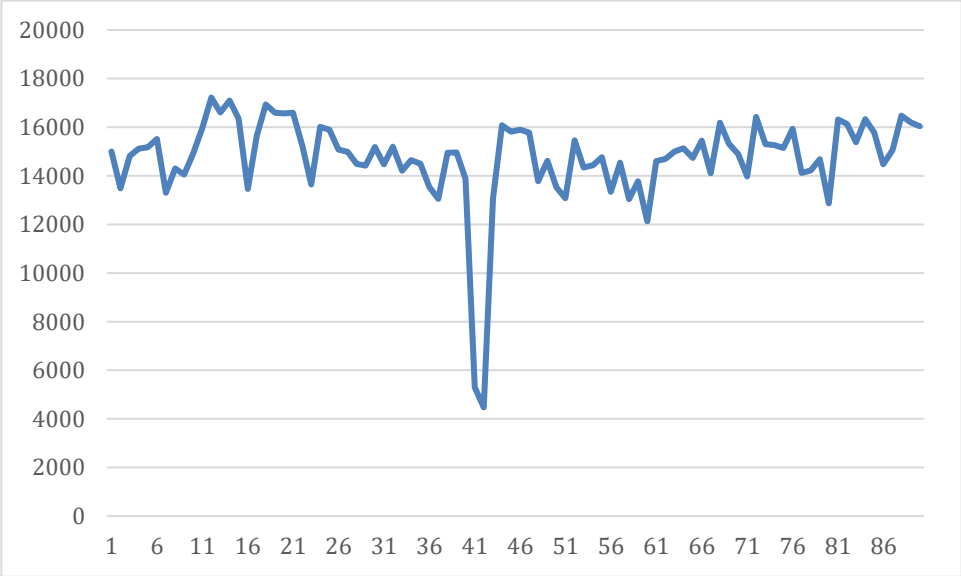


Figure 29: Total daily consumption for Q3 (liters) (Y axes: total water consumption in liters; X axes: day in Quarter 3)

The total daily consumption of our Panel for Q3 is normal, with consumption patterns accurately reflecting the periodicity (working days, week-ends) of water use. The sharp reduction of water use observed in days

40-41 were caused by a malfunction in the automated SWM data transmission from AMAEM's smart metering infrastructure (*this data was successfully retrieved asynchronously at a later date*).

3.4.2.3. Water Consumption (shower)

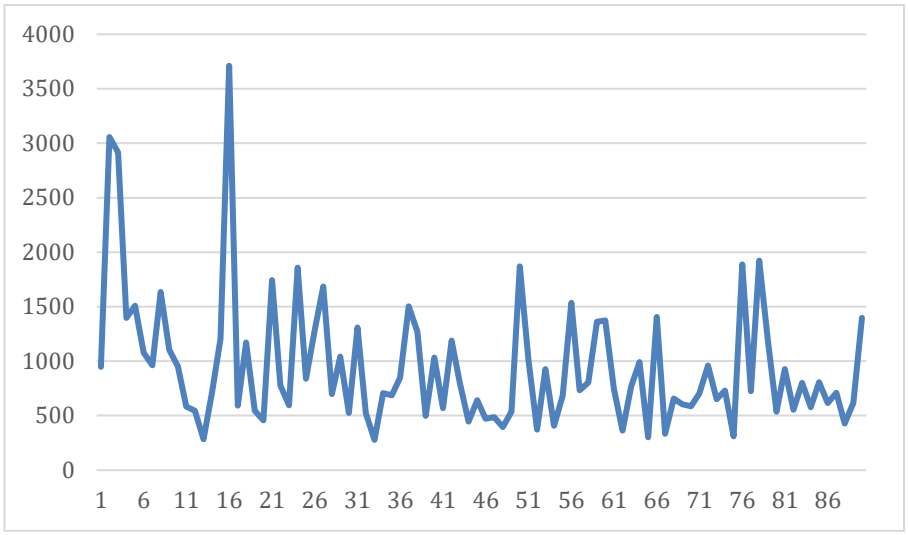


Figure 30: Total daily shower consumption for Q3 (liters) (Y axes: total shower consumption in liters; X axes: day in Quarter 3)

The daily volume of transmitted showers from our Trial participants remained stable and practically the same with the previous period, with two visible peaks around days 2-3 and 16-18, during which the system was not available due to scheduled maintenance. This increased the number of showers received in the following days, as the mobile app manages potential server down-time and re-transmits any failed packets, thus ensuring no data loss. Finally, the time-series accurately reflects the periodicity (working days, week-ends, public holidays) of shower use, with patterns its visible throughout the period.

3.4.2.4. Shower events

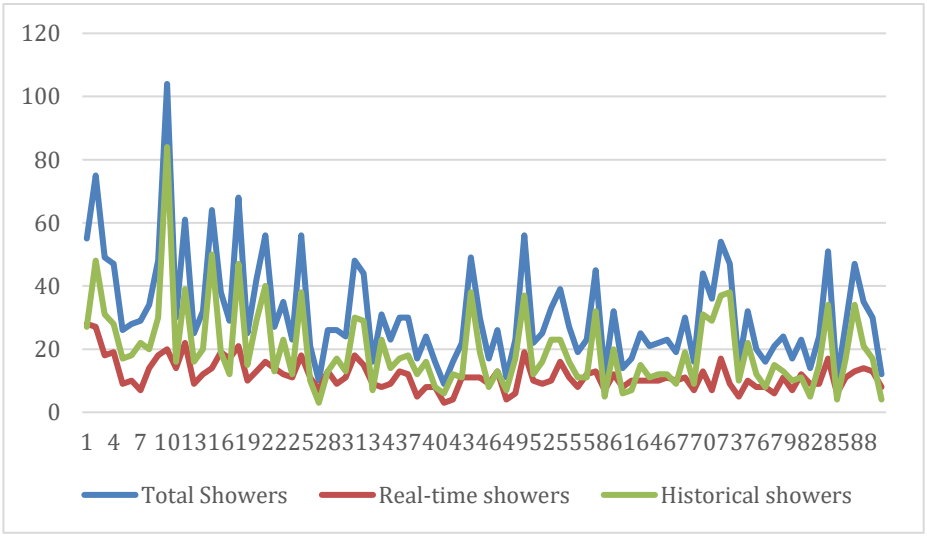


Figure 31: Shower events (total, real-time, historical) for Q3 (Y axes: number of shower events; X axes: day in Quarter 3)

During this period, we captured in total 2,915 shower events, of which 1,070 are real-time shower events and 1,845 historical shower events. As we can observe, the number of historical showers increased following the days of system down-time, as explained in the previous section. In addition, throughout the course of the period we observed that the number of real-time shower events *decreased in half*, probably due to the participants losing their early momentum and *fully integrating the system in their every-day lives*. This is a highlight for the Trial, as it unofficially marks a period beyond which we can *safely observe the sustained effect* of the system. However, it also necessitates a further improvement in the throughput of the data transmission for historical showers (*at least 100%*) to ensure that *more* historical showers are transmitted in the fewer opportunities available (*i.e., the real-time events*), and thus all shower data eventually reach the server.

3.4.2.5. Amphiro b1 malfunctions

During this period, one (1) out of 184 deployed b1 devices were reported as malfunctioning and replaced accordingly. Since the beginning of the Trial, the total number of malfunctioning b1 devices is eight (8), i.e., 4.3%.

3.4.2.6. System availability (uptime)

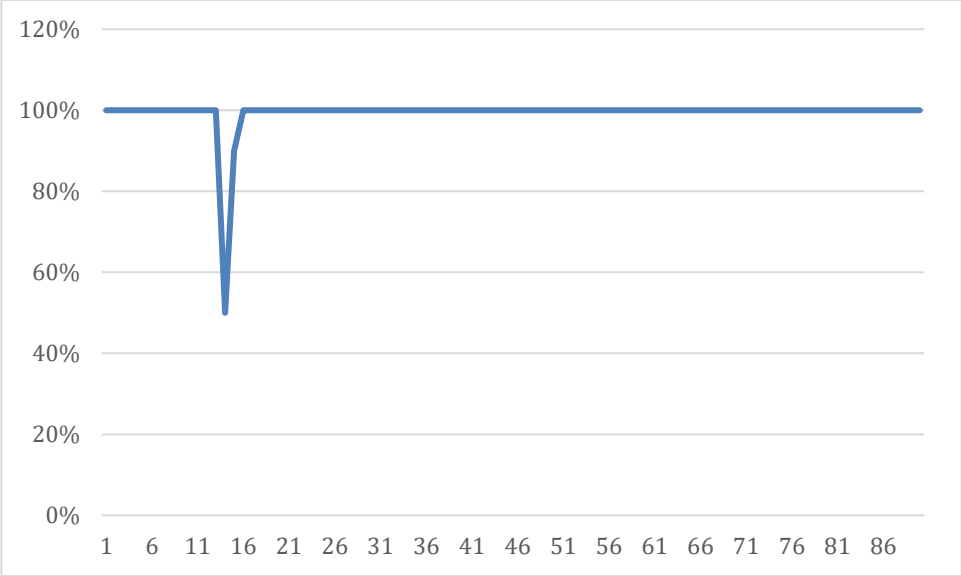


Figure 32: Daily system availability (% of time within a day system was available) (Y Axes: % of system availability; X axes: day in Quarter 3)

All interruptions in the system's availability during Q3 were *scheduled* down-times (maintenance/upgrades).

3.4.3. Issues

The following table presents the issues we addressed during Q3 of Trial A, and the corrective steps we took in in order to explore, analyze, and address them.

ID	Date	Problem Description	Corrective Steps
62	01/09/2016	• Pilot drop-out A user informed us that her family found the amphiro made showers uncomfortable due to its weight and size, and as such, she decided to left the pilot	We thanked the user for her patience and retrieved the devices.
63	01/09/2016	• Installation problem A user informed us that even though she had received an email telling her she entered normal mode, the display of the b1 remained blank.	After communicating with the user, a technician was dispatched to the user's premises, where it was discovered that the user had installed the device in the opposite position and consequently, the b1 did not work properly. After correctly installing the b1, the problems were solved.
64	02/09/2016	• Malfunctioning b1 A user informed us that the display of one of his b1 devices was blank.	After analyzing the system's logs, we advised the user to perform a number of small tests, which revised that one of his b1 devices was malfunctioning. The device was replaced and installed correctly.
65	07/09/2016	• New mobile device A user informed us that she purchased a new mobile device and wished to install the mobile app and repeat the pairing process	We remind the user the installation steps, and instructed her to bring her new mobile device within working range of the b1 Bluetooth for her first showers in order to retrieve her historical shower events from the internal b1 memory.
66	08/09/2016	• Forgotten password A user was not able to sign in because her sibling had deleted the app and she did not remember the password. She later contacted us again because the password provided to her didn´t work	A new password was generated and sent to the user. Further, the user was reminded that she could reset her password from the DAIAD mobile app itself. In the following, the user informed us she had trouble signing in the app, but this was caused by the user mistyping the password.
67	29/09/2016	• Sign in problem A user who had been on holidays notified us she tried to sign in and the app notified him that his user was wrong	The user had pressed Sign Up, instead of Sign In. After correctly selecting sign in, she experienced no problems.

68	07/10/2016	• Blank screen A user informed us that after updating the app to its latest version, when the app opens it only presents a static white screen.	After analyzing the system's logs and the changes introduced in the mobile app updated, we reproduced the problem. The white screen is presented on a specific type/version of Android mobile devices (<4 used in the pilot) due to a non-standard API implementation. We developed a bug-fix and uploaded a new version of the app within a few days, which solved this problem.
69	09/10/2016	• Blank screen A user informed us that after updating the app to its latest version, when the app opens it only presents a static white screen.	After analyzing the system's logs and the changes introduced in the mobile app updated, we reproduced the problem. The white screen is presented on a specific type/version of Android mobile devices (<4 used in the pilot) due to a non-standard API implementation. We developed a bug-fix and uploaded a new version of the app within a few days, which solved this problem.
70	22/11/2016	• Blank screen A user informed us that after updating the app to its latest version, when the app opens it only presents a static white screen.	We advised the user to update the app to its latest version. The user confirmed the problem was solved.
71	30/11/2016	• Forgotten password A user had accidentally uninstalled the app and did not remember her password. She tried to recover it, but did not receive an automated email as was expected.	After analyzed the system's logs, we discovered that the mail daemon was malfunctioning. The problem was addressed and we introduced several changes in the app logic to ensure a similar issue would not appear in the future.

3.4.4. Risks

We anticipate the following risks for the next period of the Trial.

ID	Risk	Contingency Plan
5	Malfunctioning b1 devices	The risk is small, as currently more than 96% of the distributed devices operate trouble-free. We will be monitoring the pilot for any technical issues, replace the

		devices when needed, and study them to identify any systematic technical problems.
5	Unsupported mobile devices	The risk is small, with less than 5% of the participants having problems due to the specific type/version of their mobile device. These cases have been narrowed down to low-cost Android mobile devices, which do not fully confront to OS and/or BT stack specifications. We have taken extra care to test the mobile app against such devices, and even extending the app to support them despite their proprietary nature.

3.5. Quarter 4

3.5.1. Period summary

This period marked the successful end of the Trial and the availability of its results to the entire Consortium for analysis and evaluation in the context of T7.5. We received very few support requests from our Panel, signaling both the increased technical maturity of the app, as well as their increased familiarity with its use.

Overall, our efforts have been focused on *maximizing* the data generated from the Trial, ensuring excellent coverage and quality. Towards this, we have taken the following measures:

- *Historical b1 data*. We introduced a new harvesting scheme for our opportunistic data transmission protocol from the b1, placing emphasis on retrieving *all historical data* stored within the device that were not transmitted during past real-time events. This change was rolled-out in an app update and allowed us to massively collect all shower events performed by our Panel, thus completing our knowledge concerning shower usage for all participants during the Trial.
- *1min SWM data*. To facilitate the analysis and evaluation of disaggregation and personalization algorithms, we deployed in two (2) households additional in-line SWMs monitoring consumption every 1 min. This highly granular data is retrieved by the DAIAD system (*system supports 1s-1month readings*), thus validating its flexibility, and forwarded for further analysis and evaluation in the context of WP4.
- *Coherent data export.* A new facility was integrated in DAIAD, allowing all Consortium members to retrieve the data produced during the Trial in a uniform manner. Users can download the original data (*SWM, b1, phases, users*), the cleaned data (*applying common rules for data cleaning and sanitization*), as well as auxiliary data (*SWM data for 1K external consumers to be used for comparison*).
- *Pricing and Post-experimental surveys.* Two new surveys were prepared and sent to AMAEM customers. The first was prepared in the context of T7.4, exploring different pricing points for the system, while the latter was sent to all Trial A participants in order to assess their final impressions from the system. The results of both surveys will be analyzed and presented in D7.3.

- *Evaluate production roll-out*. The experimental protocol of the Trial allowed us to evaluate multiple interventions, but did not provide us with an opportunity for assessing the *production* roll-out of the DAIAD system. Specifically, in a real-world setting, the system will start *directly with its full functionality available* (i.e., in Phase 5), since the interim phases are only relevant for our experimental study. Towards this, we decided to extend the Trial to additional 30 users located outside Alicante, thus approaching users not already familiar with DAIAD. AMAEM, with the cooperation of the city council of Sant Joan d'Alacant, recruited 20 households in Sant Joan, which gained full access to the DAIAD system (SWM/b1). This activity was supported by the "Green Houses" initiative, a scheme promoted by the MAGRAMA (Spanish Ministry of Agriculture, Food and Environment), which is also associated with the European "Green in everyday life" project (http://www.green4life.world/). In this manner, we also exploited local synergies, further increasing DAIAD's visibility and reach.
- *Evaluate retention*. Following the official end of our Trial, we decided to *maintain* the operation of the DAIAD system till the end of the project, allowing our users to continue using the system, and allowing us to monitor the retention of the achieved changes in their consumption behavior. In this period, we will not provide any support to consumers, and only continue the monitoring and analysis of their behavior, which we consider as an important aspect for our work in T7.5.

3.5.2. KPIs

In this section we provide the evolution of select KPIs presenting the progress of the Trial A in Q4, highlighting specific periods and/or events of particular interest.

3.5.2.1. Participants per Phase

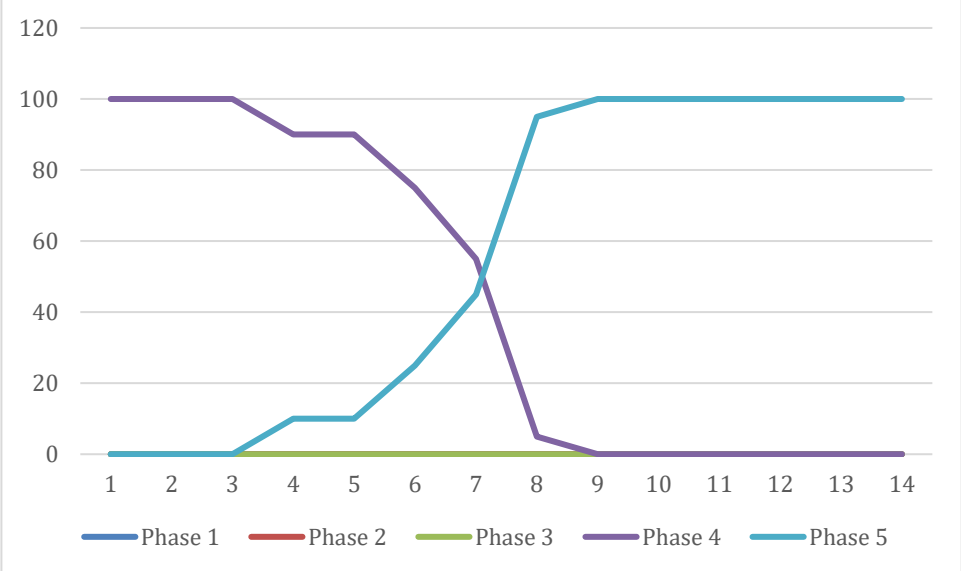


Figure 33: Distribution of participants per phase during Q4 (Y axes: % of panel population; X axes: week in Quarter 4)

During this period, all participants were successfully moved to Phase 5, at which point the complete functionality of the system became available to all users with no exceptions.

3.5.2.2. Water Consumption (SWM)

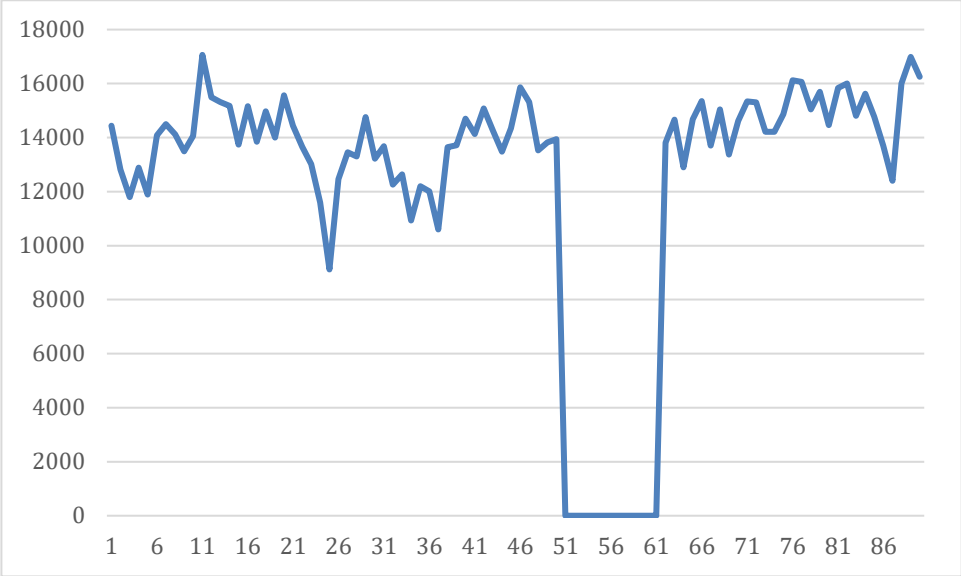


Figure 34: Total daily consumption for Q4 (liters) (Y axes: total water consumption in liters; X axes: day in Quarter 4)

The total daily consumption of our Panel for Q4 is normal, with consumption patterns accurately reflecting the periodicity (working days, week-ends, public holidays) of water use. The close to zero water consumption observed in days 51-61 were caused by a malfunction in the automated SWM data transmission from AMAEM's smart metering infrastructure (*this data was successfully retrieved asynchronously at a later date*).

3.5.2.3. Water Consumption (shower)

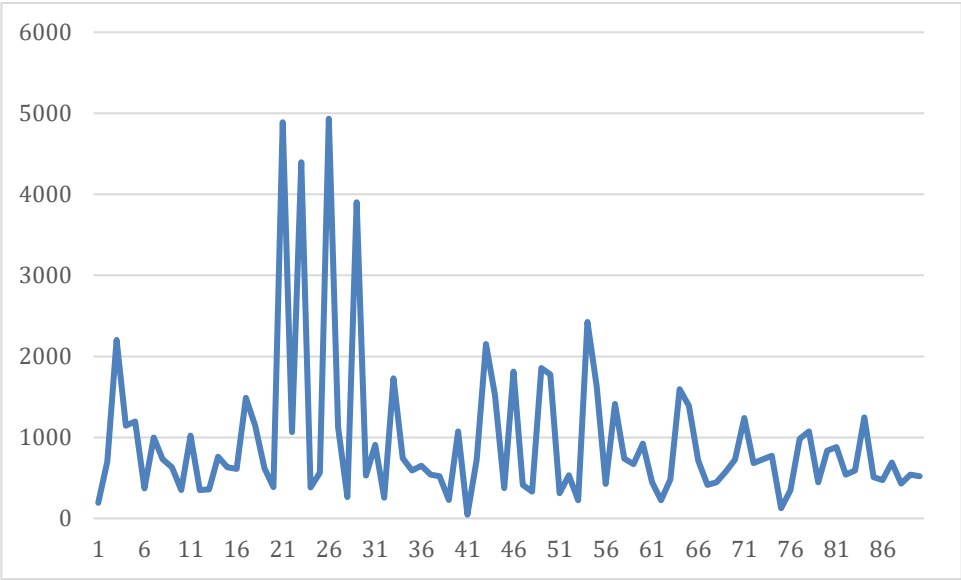


Figure 35: Total daily shower consumption for Q4 (liters) (Y axes: total shower consumption in liters; X axes: day in Quarter 4)

The daily volume of transmitted showers from our Trial participants remained stable and practically the same with the previous period, with a number of visible peaks around days 20-31, during which a new app update *tripled* the throughput for receiving historical showers (*hence a high number of historical showers were retrieved*

these days). This improvement was planned during the previous period (see 3.4.2.3) and ensured that *all shower events* captured and stored in the b1 were successfully transmitted to the server. Finally, the time-series accurately reflects the periodicity (working days, week-ends, public holidays) of shower use, with patterns its visible throughout the period.

3.5.2.4. Shower events

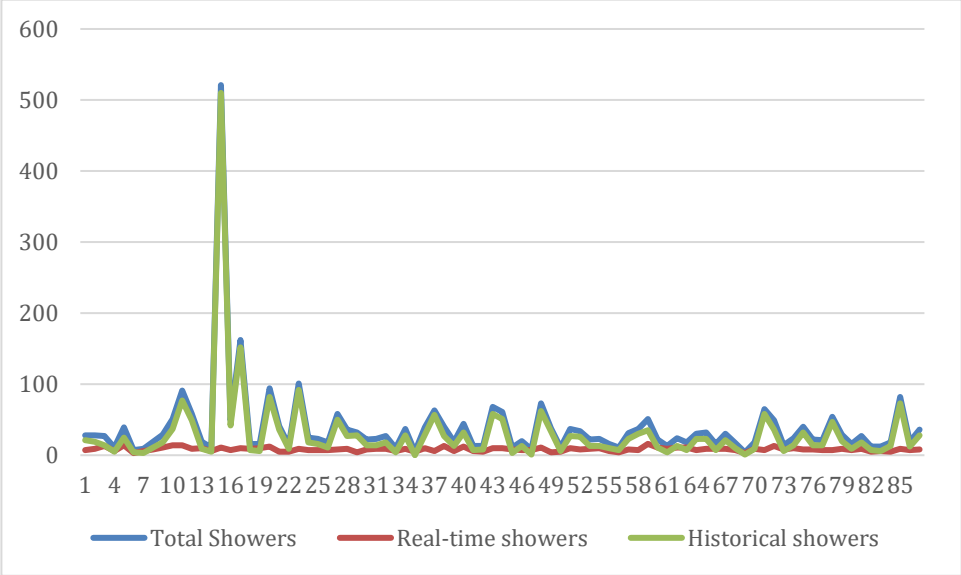


Figure 36: Shower events (total, real-time, historical) for Q4 (Y axes: number of shower events; X axes: day in Quarter 4)

During this period, we captured in total 3,381 shower events, of which 757 are real-time shower events and 2,627 historical shower events. As we can observe, the number of historical showers increased after the introduced mobile app update mentioned in the previous section, and is directly responsible for the increase in total shower events (*real-time showers remained practically stable throughout the period*).

For the entire duration of the Trial, we captured in total 10,758 shower events, of which 3,508 are real-time shower events and 7,250 historical shower events.

3.5.2.5. Amphiro b1 malfunctions

During this period, no b1 devices were reported as malfunctioning. For the entire duration of the Trial, the total number of malfunctioning b1 devices is eight (8), i.e., 4.3%.

3.5.2.6. System availability (uptime)

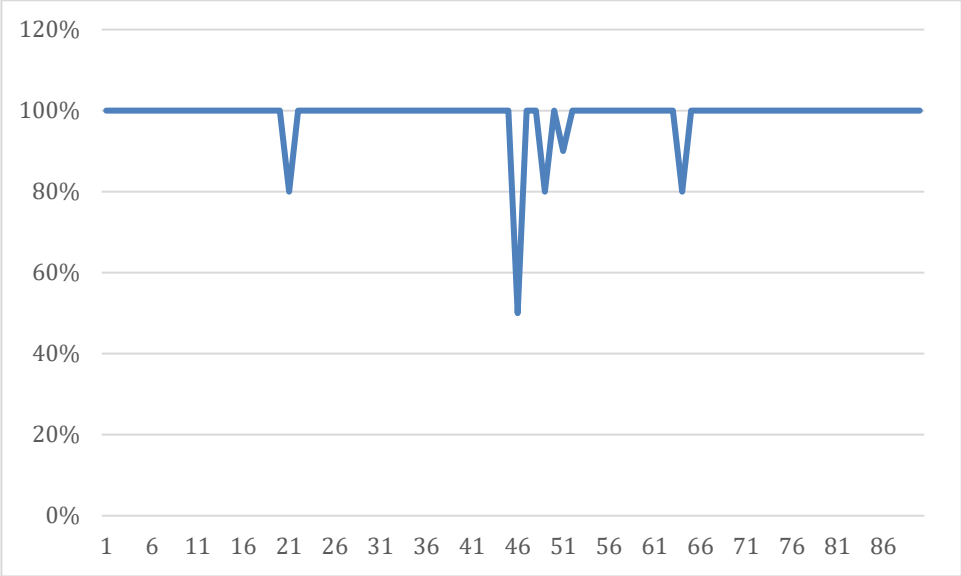


Figure 37: Daily system availability (% of time within a day system was available) (Y Axes: % of system availability; X axes: day in Quarter 4)

All interruptions in the system's availability during Q4 were *scheduled* down-times (maintenance/upgrades).

3.5.3. Issues

The following table presents the issues we addressed during Q4 of Trial A, and the corrective steps we took in in order to explore, analyze, and address them.

ID	Date	Problem Description	Corrective Steps
72	01/12/2016	• Blank screen A user informed us that after updating the app to its latest version, when the app opens it only presents a static white screen.	We advised the user to update the app to its latest version. The user confirmed the problem was solved.
73	17/12/2016	• Forgotten password A user had purchased a new mobile and installed the mobile app, but did not remember her password.	We explained to the use how to reset the password herself using the integrated functionality of the mobile app.
74	02/01/2017	• Various bugs A user informed as that since the latest app version: (a) her total water consumption appeared	We explained to the user that the total water use in presented in m3 rather than liters which she expected (*measurement units are clear in the app*). Regarding the second comment, this was

		low, and (b) the current (i.e. in real-time) water use in the shower is not visible	an intentional behavior of the app for the last period of the Trial, aiming to extract all non-transmitted historical shower data stored in her b1 devices. Specifically, we explained to the user that due to the way Bluetooth operates, the current consumption is not presented, in order to save bandwidth and ensure all historical data are transmitted when the mobile phone is in close vicinity with the b1 device.
75	31/01/2017	• Use of a second mobile device A user contacted us wanting to know if it is possible to sign in the app with a second device.	We informed the user that she could use any other compatible mobile devices available in the household, reminding her to always use the same user account.

4. Preliminary results

4.1. Introduction

In the following, we provide some preliminary results regarding the effect of the DAIAD system in terms of water savings for our Trial population. The reader is strongly urged however, to ignore the following text and instead study our Report Deliverable D7.3, which is dedicated on presenting a thorough analysis of the user Trials across multiple dimensions.

At the time of this writing, the analysis of the Trial data *has not been completed* for reasons that are apparent from studying this report and of course relate to the real-world focus of our experimental evaluation. In summary:

- Smart water meter data collected during the entire duration of the Trial are still evaluated in terms of completeness and veracity to identify systematic or ad hoc problems in the collection, transmission, or processing of data from AMAEM's smart metering infrastructure. As already mentioned in the previous sections and in the following section 4.3, we have discovered several data inconsistencies and problems (*e.g., missing data points, outliers, out of order data*) which require an extremely careful and time-consuming analysis to identify and address via ad hoc extractions and/or improvements in AMAEM's smart metering infrastructure. According to our experience, this low data quality is a common, yet accepted, inherent challenge in smart metering infrastructures, and ignored in most studies ('perfect data assumption'). In the contrary, we consider this as an important finding of our work, as it clearly highlights the need for *robust* systems and SWM *improvements* to reduce veracity. At all cases, at this point in time we cannot guarantee that the retrieved SWM data, and hence the savings mentioned in the following, are correct and will not change.
- Shower extraction events from our Trial panel are transmitted in the system in an *opportunistic* manner, as explained in this report and the corresponding project deliverables. In summary, during a shower event, if a mobile device is near the b1 device (5-6 meters) and with Bluetooth turned on, then we receive the shower time-series in real-time. In parallel, we also retrieve shower extraction events stored within the device's internal memory. In case of a shower event where data retrieval from the b1 device is not possible (e.g., turned off Bluetooth, out of range), the shower extraction event is stored in the device's memory. This is the reason in this report we distinguish received shower events in real-time (*i.e., received synchronously*) and historical (*i.e., received asynchronously*). At a non-extreme scenario, it possible for a user to have taken 200 showers (*~3 months for a 2-person households*) without any data transmitted (the user simply did not take her mobile device near the shower). During shower #201 the user has her mobile device with her, so we retrieve *one* real-time shower (#201) as well as all the internally stored *200 historical showers*. As it is obvious, and even at the time of this writing, there are still shower extraction events stored in the b1 devices of our panel, that have not been received (*ranging from gaps of a few showers, to hundreds*). At all cases, at this point

in time we cannot guarantee that the retrieved shower extraction data, and hence the savings mentioned in the following, are complete and will not change.

4.2. Water savings

Table 4 presents the savings, averaged over all Trial users for all phases of Trial A.

Phases	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
% Saving in water consumption (SWM)	-3.7%	-18.6%	-10.1%	-7.2%	-17%
% Savings in shower consumption (b1)	N/A	-7.7%	-3.4%	-21.6%	N/A

Table 4: Water consumption savings in all Phases

4.3. Insights

In the following, we provide select early insights from the Trial. Overall, we consider the implementation of Trial A to be extremely successful, providing the Consortium with manifold insights and observations, which allowed us to significantly improve the DAIAD system.

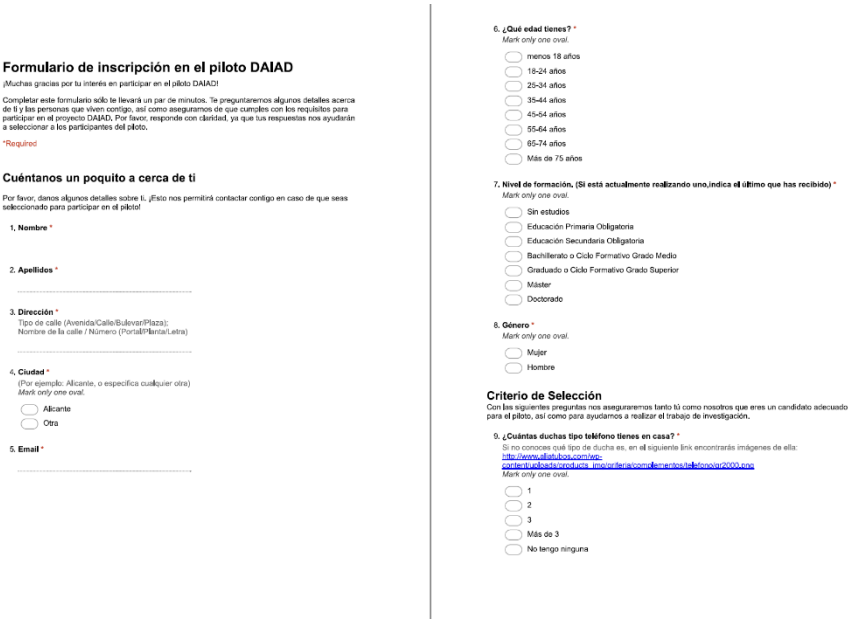
- User satisfaction from the DAIAD system, as documented from our periodic satisfaction surveys was *extremely* positive (*~80% Very satisfied or satisfied, 2% not satisfied*). Further, participants have been extremely *active, interested, and vocal* regarding the DAIAD system, communicating their approval, as well as ideas for improvements, through multiple means. We have received *hundreds* of suggestions by email, surveys, and face to face meetings with participants. Further, we identified two common themes in their communications: (a) the system should be expanded and even become *compulsory* for all consumers, (b) their awareness of water use before being introduced to DAIAD was extremely *lacking*. We attribute this heightened interest in three factors: (a) the local historical water challenges which *sensitized* the local population over the years, (b) the extremely active and close *collaboration* of AMAEM with the local authorities due to its governing status, and (c) the DAIAD system, which accommodated their concerns about water challenges, and provided them with *tangible insights* for their individual water use.
- A number of participants experienced problems during the pairing process of their *second* amphiro b1 device. In their vast majority, these issues were caused by the mobile devices used (*specific low-cost Android mobile phones*) and faulty b1 devices (*<4%*). New versions of DAIAD's mobile app addressed all similar problems, while the malfunctioning b1 devices were collected and studied to identify systematic problems. At all cases, the malfunctioning devices were replaced.
- A technical issue in the automatic uploading process of SWM data was discovered and successfully addressed in M28. The issue was discovered during our analysis of water consumption data to detect patterns and outliers and resulted to missing values from water consumption time-series in a completely random manner. A number of improvements were introduced both in the DAIAD system and AMAEM's ETL process to account for similar future data gaps in SWM data.

- We observed that the overall *quality* of SWM data was *relatively low* (*e.g., negative values, missing values, outliers*). According to our experience, this is a *systemic issue* of smart meter roll-outs, as their *priority* is to provide automated *metering* and *billing* services. In this context, the low data quality is not a problem since the large metering and billing periods (*1-3 months*) negate any effects. In contrast, when applying the highly granular data for more complex services (*e.g., model training*), the low data quality becomes a significant obstacle across the data lifecycle (*e.g., evaluate prediction accuracy*). Depending on the data quality, standard cleaning approaches may actually have a *compounding* negative effect.

5. Annex I – Survey for expression of interest

In this Annex we provide the Welcome screen of the web survey as well the complete list of questions and answers (*exported via printing the form, styling omitted*).

Figure 38: Survey for expression of interest - Welcome screen



Formulario de inscripción en el piloto DAIAD

¡Muchas gracias por tu interés en participar en el piloto DAIAD!

Completar este formulario sólo te llevará un par de minutos. Te preguntaremos algunos detalles acerca de ti y las personas que viven contigo, así como asegurarnos de que cumples con los requisitos para participar en el proyecto DAIAD. Por favor, responde con claridad, ya que tus respuestas nos ayudarán a seleccionar a los participantes del piloto.

*Required

Cuéntanos un poquito a cerca de ti

Por favor, danos algunos detalles sobre ti. ¡Esto nos permitirá contactar contigo en caso de que seas seleccionado para participar en el piloto!

1. **Nombre** *

2. **Apellidos** *

3. **Dirección** *
Tipo de calle (Avenida/Calle/Bulevar/Plaza):
Nombre de la calle / Número (Portal/Planta/Letra)

4. **Ciudad** *
(Por ejemplo: Alicante, o especifica cualquier otra)
Mark only one oval.
- Alicante
- Otra

5. **Email** *

6. **¿Qué edad tienes?** *
Mark only one oval.
- menos 18 años
- 18-24 años
- 25-34 años
- 35-44 años
- 45-54 años
- 55-64 años
- 65-74 años
- Más de 75 años

7. **Nivel de formación. (Si está actualmente realizando uno,indica el último que has recibido)** *
Mark only one oval.
- Sin estudios
- Educación Primaria Obligatoria
- Educación Secundaria Obligatoria
- Bachillerato o Ciclo Formativo Grado Medio
- Graduado o Ciclo Formativo Grado Superior
- Máster
- Doctorado

8. **Género** *
Mark only one oval.
- Mujer
- Hombre

Criterio de Selección

Con las siguientes preguntas nos aseguraremos tanto tú como nosotros que eres un candidato adecuado para el piloto, así como para ayudarnos a realizar el trabajo de investigación.

9. **¿Cuántas duchas tipo teléfono tienes en casa?** *
Si no conoces cuál tipo de ducha es, en el siguiente link encontrarás imágenes de ella:
http://www.ullati-box.com/wp-content/uploads/products_images/complementos/telefonovar2000.png
Mark only one oval.
- 1
- 2
- 3
- Más de 3
- No tengo ninguna

10. **¿Dispone su hogar al menos de un Smartphone? Elija una opción:** *
Mark only one oval.

- Sistema Operativo IOS (Por ejemplo, iPhone 4, iPhone 5 o versiones posteriores)
- Sistema Operativo Android (Por ejemplo, HTC, Samsung, LG, Sony, Motorola)
- Sistema Operativo Windows (Por ejemplo, Windows Phone or Windows 10 en Nokia, Samsung, HTC, Huawei)
- Otro Sistema Operativo Diferente (Por ejemplo, Blackberry, Firefox, Sailfish, Ubuntu, Tizen)
- No sé que sistema operativo tiene mi smartphone
- No tengo smartphone

11. **Mi tablet es...** *
Mark only one oval.

- Sistema Operativo IOS (Por ejemplo, iPad/iPad mini)
- Sistema Operativo Android
- Sistema Operativo Windows
- No tengo tablet

12. **Tanto para el smartphone como para la tablet, ¿Sueles encender el Bluetooth?** *
Mark only one oval.

- Siempre o casi siempre
- Bastante a menudo
- De vez en cuando
- Ocasionalmente
- Nunca o casi nunca
- Lo enciendo sólo cuando lo necesito
- Mi smartphone o tablet no tienen Bluetooth

13. **¿Tienes conexión Wi-Fi en casa?** *
Mark only one oval.

- Si
- No
- No estoy seguro

14. **¿Tienes conexión de datos en tu teléfono?** *
Mark only one oval.

- Si
- No
- No estoy seguro

15. **¿Tienes planeado estar fuera de tu vivienda habitual durante más de 3 meses? (Por ejemplo. Vacaciones, residencia de verano, etc)** *
Mark only one oval.

- Si
- No

16. **¿Nos das tu consentimiento para utilizar tus datos y los de las personas que viven contigo durante el piloto?** *
Toda tu información personal será tratada de forma anónima y confidencial para el análisis de los datos y no serán compartida con terceras partes.
Mark only one oval.

- Si
- No

17. **¿Estás dispuesto a darnos tus opiniones y comentarios acerca del proyecto a lo largo del piloto?** *
Mark only one oval.

- Si
- No

Tu vivienda

Por favor, facilítanos información acerca de las personas que viven contigo. Ello nos ayudará a entender como DAIAD será usado por ti y las personas que residen contigo.

18. **¿Cuántas personas viven habitualmente en tu vivienda?** *
Mark only one oval.

- 1
- 2
- 3-5
- 6-10
- 11 o más

19. **¿Cuántos de ellos son menores de edad?** *
Mark only one oval.

- Ninguno
- 1
- 2
- 3
- 4
- 5 o más

20. **¿Qué superficie aproximada tiene tu vivienda?** *
Mark only one oval.

- menos de 30 metros cuadrados
- de 31 a 60 metros cuadrados
- de 61 a 80 metros cuadrados
- de 81 a 110 metros cuadrados
- más de 111 metros cuadrados

6. Annex 2 – Trial Guides

6.1. Short guide

¡Hola Alicante!

¿quieres unirte a nosotros?

www.daiad.eu/join

¡Bienvenido a DAIAD!

Introducción

Aguas de Alicante se enorgullece en anunciar que nuestros clientes podrán participar en un piloto de 12 meses de las tecnologías de monitoreo de agua novedosos desarrollados por DAIAD, un proyecto de investigación de la UE.

DAIAD ha creado una nueva forma para que usted pueda controlar y entender la cantidad de agua que utiliza, ayudando a tomar decisiones informadas y reducir el uso del agua. Imagine que su factura de agua periódico, pero aún mejor! Un nuevo sensor inteligente del agua, en colaboración con su medidor de agua, le permitirá entender de dónde y por qué se utiliza el agua. Usted tendrá acceso a esta información desde su teléfono móvil, la web, incluso en la ducha!

Aguas de Alicante ha logrado asegurar que 100 de nuestros clientes pueden participar en el programa piloto de forma gratuita!

Quienes somos

El equipo DAIAD

DAIAD es un proyecto de investigación afrontar un reto importante para la sostenibilidad y el bienestar de nuestra sociedad. Queremos mejorar la forma en que usamos y reutilizar el agua, y aumentar la conciencia individual y colectiva para el uso eficiente del agua. Hacia esto, desarrollamos nuevos sensores de agua, aplicaciones móviles, y sistemas inteligentes para ayudar a los consumidores a entender y mejorar su uso del agua.

¿En que consiste el piloto?

El sistema DAIAD

Todos los participantes recibirán de forma gratuita el sistema DAIAD, que pueden seguir usando después de que el piloto ha terminado. El sistema DAIAD incluye un sensor inteligente del agua, una aplicación para su teléfono móvil o tableta, y un sitio web dedicado. Todos ellos trabajan juntos para monitorear y analizar el uso del agua, y le proporcionará ideas sobre cómo usted puede mejorar su consumo de agua.

Sensor de Agua | Aplicación movil | Sitio Web

¿Eres un candidato elegible?

Requisitos de los participantes

Ducha de tipo teléfono — Necesitas tener una ducha de tipo teléfono en tu hogar.

Dispositivo móvil — Ya sea móvil o tablet.

Unos pocos minutos de tu tiempo! — Necesitamos sus comentarios! Sólo unas pocas horas en 12 meses.

Tu consentimiento — Estaremos analizando información sobre usted y su hogar.

¿Que voy a hacer en el piloto?

Sólo tienes que utilizar el sistema!

En realidad es muy sencillo! Después de instalar el sensor de agua inteligente y la aplicación móvil, simplemente continuar! No queremos que usted para tratar de cambiar su comportamiento, o hace algo similar. Tome una ducha, lavar los platos, beber agua (es bueno para usted) y nada fuera de lo normal.

•Le notificaremos por correo electrónico si usted es seleccionado para participar en el piloto (¡Hurra!). Usted puede contar con este correo electrónico en los últimos meses de 2015. — 2015

•Se le invita a completar una encuesta que nos proporciona información sobre usted y su hogar. Recuerde acerca de nosotros de dar su consentimiento? Bueno eso es todo! Necesitamos que usted sea completa, precisa y sincera.

•Después de unas semanas usted recibirá el sensor inteligente del agua en una bonita caja. Se parece a cualquier otro dispositivo ordinario de comprar en una tienda.

•Va a seguir las instrucciones que se incluyen para instalar el sensor en su ducha, descargar la aplicación móvil y comprobar que todo funciona. No debe tomar más de 10 minutos de su tiempo.

•Felicitaciones, usted es ahora miembro de DAIAD! — 2015

•Después de 12 meses, le invitamos a completar una encuesta final, dándonos sus puntos de vista y experiencias del sistema. — 2016

•Y este es el fin del piloto! El sistema DAIAD es suya y puede seguir usándolo durante todo el tiempo que quieras.

Quiero unirme al piloto

¡Gracias!

¡Estamos realmente contentos de que nos ayudes!

Por favor, entra en el siguiente link y completa la encuesta para indicarnos tu interés. Serán sólo dos minutos.

Te enviaremos lo antes posible un mensaje para hacerte saber si participas en el piloto.

www.daiad.eu/join

¡Gracias!, Thank you, Ευχαριστώ, Vielen Dank!

@DAIAD_EU — www.daiad.eu

DAIAD is a research project funded by European Commission's 7th Framework Programme

6.2. Long guide

¿Eres un candidato elegible?

Requisitos de los participantes

La participación en el proyecto está **abierta para todos los clientes de Aguas de Alicante**, siempre y cuando vivan en Alicante ciudad o San Juan Playa. Además, es necesario verificar una serie de mínimos requerimientos que deben cumplir aquellos usuarios que participen

Ducha de tipo teléfono

Necesitas tener una ducha de tipo teléfono en tu hogar.

Dispositivo móvil

Ya sea móvil o tablet.

Unos pocos minutos de tu tiempo!

Necesitaremos que nos hagas comentarios e impresiones del sistema DAIAD. ¿Te gusta? ¿Crees que le falta algo? ¿Se te ocurre alguna idea para hacerlo mejor? Tus impresiones y comentarios son importantes para que mejoremos el dispositivo! No te preocupes, sólo serán unas 5 veces a lo largo de los 12 meses que dura el piloto.

Tu consentimiento

Durante el piloto analizaremos los datos de tu consumo de agua en un esfuerzo de extraer conocimiento y visualizar que te ayudará a mejorar tu uso del agua. Esto significa que te solicitaremos información acerca de ti y tus familiares o compañeros de piso.

Es importante que tengamos tu consentimiento para recolectar y analizar los datos por una simple razón, si no tenemos tu consentimiento, no seremos capaces de mejorar el sistema DAIAD.

¿Que voy a hacer en el piloto?

Sólo tienes que utilizar el sistema!

Realmente es muy simple. Después de que hayas instalado el dispositivo inteligente y te hayas descargado la App todo irá sobre ruedas. No queremos que cambies tu comportamiento ni nada por el estilo. Dúchate, lava la ropa, bebe agua (esto es bueno además) y nada fuera de lo normal.

Ahora, esto es sólo una visión general de cómo será su participación en el programa piloto.

- Le notificaremos por email si has sido seleccionado para participar en el piloto (¡Hurraa!). Este correo llegará a finales de 2015.
- Recibirás una encuesta para rellenarla y facilitarnos tu información y la de tus familiares o compañeros de piso. ¿Recuerdas lo de darnos tu consentimiento? ¡Bien! ¡Pues ahora es el momento! Ahora es cuando lo necesitamos.
- Tras algunas semanas recibirás tu sensor inteligente de medición de consumo en una preciosa caja. Será muy parecida a cualquier otro dispositivo que compres en una tienda.
- Siguiendo las instrucciones de instalación del sensor en tu ducha y descargando la app y comprobando que todo funciona correctamente ya estarás participando en el proyecto. Esto no debería quitarte más de 10 minutos.
- **¡Enhorabuena, Ya eres un miembro de DAIAD!**
- Tras 12 meses, te enviaremos la encuesta final para facilitarnos tus experiencias y comentarios acerca del sistema.
- Y este es el final del piloto! El dispositivo es tuyo y tú puedes seguir usándolo por tanto tiempo como quieras.

Quiero unirme al piloto

¡Gracias!

¡Estamos realmente contentos de que nos ayudes!

Por favor, entra en el siguiente link y completa la encuesta para indicarnos tu interés. Serán sólo dos minutos.

Te enviaremos lo antes posible un mensaje para hacerte saber si participas en el piloto.

www.daiad.eu/join

¡Gracias!, Thank you, Ευχαριστώ, Vielen Dank!

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Preguntas Frecuentes

Para más información, contactarnos al ideas.idi@aguasdealicante.es

Preguntas Generales

¿Necesita algún tipo de batería para su funcionamiento? No. El dispositivo tiene alojado en su interior una picoturbina que produce energía a partir del propio flujo del agua sin producir pérdidas de presión apreciables.

¿A qué me comprometo participando en este proyecto? Los usuarios que participen en el proyecto harán uso del dispositivo durante el piloto, preferiblemente todas las veces con el fin de recoger los datos necesarios una vez se conecte el dispositivo a internet. También deberá responder a una serie de encuestas para valorar el producto y conocer las condiciones de la vivienda que se está estudiando en el piloto.

¿Qué ocurre si se me olvida conectar el bluetooth del móvil en alguna ocasión? El dispositivo es capaz de almacenar en su memoria al menos 10 duchas. La única diferencia será que si no se conecta el bluetooth, no podrá conocer cómo se ha duchado a lo largo de la misma, sino que tendrá un valor único para cada ducha.

¿Aguas de Alicante vende el producto? No, Aguas de Alicante sólo participa en el proyecto para la selección de los participantes, y la adquisición de los datos necesarios.

¿Cómo van a utilizar mis datos? No se utilizarán ni los nombres ni direcciones de ninguno de los participantes del piloto. Todo será realizado de forma anónima, conociendo sólo lo estrictamente necesario: Personas por vivienda, número de duchas y los consumos.

¿Qué pasará con el producto cuando termine el piloto? Los usuarios que participen en el proyecto, podrán quedarse el producto para su uso.

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Preguntas Frecuentes

Para más información, contactarnos al ideas.idi@aguasdealicante.es

Preguntas Generales

¿Cómo surgió el proyecto DAIAD? La gestión eficiente del agua y de la energía es un reto constante en nuestro día a día. Sin embargo, no hay un soporte eficiente para cuantificar cómo usamos el agua y si lo hacemos eficientemente. El proyecto DAIAD constituye un enfoque innovador para encaminar este reto de gestionar eficientemente el agua a través del conocimiento en tiempo real de agua consumida en el punto de mayor consumo de agua de nuestras viviendas, la ducha.

¿Cuál es el papel de Aguas de Alicante en el proyecto? Aguas de Alicante, en su esfuerzo para mejorar la calidad de su servicio está continuamente invirtiendo en nuevas tecnologías para la gestión del agua para así salvaguardar nuestro preciado recurso. Con la colaboración de científicos e investigadores europeos en un esfuerzo de mejorar la manera en la que usamos el agua de forma sostenible, AMAEM apoya este proyecto europeo realizando el piloto en sus explotaciones facilitado la información necesaria para poder recoger todos los datos imprescindibles para obtener unos resultados según lo esperado y poniendo en contacto a nuestros clientes con el proyecto.

Ducha de tipo teléfono

¿Por qué es necesario tener una ducha tipo teléfono? El dispositivo está conectado a tu ducha a través de la manguera, por lo que si no tienes este tipo de ducha, no serás capaz de usarlo.

Tengo más de una ducha. ¡No pasa nada! Te daremos un dispositivo por cada ducha de teléfono que tengas en tu vivienda.

La ducha tipo teléfono está utilizada mayormente por mis hijos. De nuevo, ¡No pasa nada! DAIAD ha sido diseñado para que sea fácil de usar incluso por los niños.

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Preguntas Frecuentes

Para más información, contactarnos al ideas.idi@aguasdealicante.es

Dispositivo móvil

¿Por qué necesito un dispositivo móvil? La transmisión del consumo de agua que recoge el dispositivo se envía a tu móvil. Por lo que si no tienes un Smartphone no serás capaz de ver tu histórico de consumos y acceder a ellos.

¿Necesito tener el Bluetooth encendido? ¡Por favor, SI! No hay razón alguna para preocuparse por la batería; el Bluetooth 4.0 tiene un consumo de batería muy bajo.

No sé si mi teléfono tiene Bluetooth 4.0. En este caso, tranquilo. Si tienes un teléfono Android con una antigüedad inferior a 2 años tendrás esta versión de Bluetooth o superior.

¿Utilizaré mis datos de móvil para enviar la información? Dependerá de si tienes activado el Wi-Fi den casa. De todas formas, el consumo de datos por parte de la App es muy muy bajo.

Sólo tengo tablet. ¡No hay problema! DAIAD puede funcionar con ella.

Tengo tanto móvil como tablet. ¡Perfecto! Tú podrás instalar la App de DAIAD en ambos dispositivos si quieres.

¿Puedo usar más de un móvil? ¡Por supuesto! Actualmente, todos los miembros de tu vivienda pueden instalar la app en sus móviles.

Tus comentarios

¿Qué comentarios queremos que nos des durante los 12 meses del piloto?

•Unas 5 encuestas. Te notificaremos todo vía email con un margen de tiempo de 2 semanas para completarlas.

•Enviarnos tus comentarios vía correo electrónico o a través de la app DAIAD para cualquier comentario, sugerencias o ideas que puedas tener. Cualquier cosa, ¡queremos que nos la cuentes!

•Participar en una serie de actividades como podrían ser jornadas de puertas abiertas, o foro de discusión informal con los investigadores del DAIAD y otros participantes del piloto. Queremos conocerte y escuchar tu opinión acerca de nuestro trabajo.

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Preguntas Frecuentes

Para más información, contactarnos al ideas.idi@aguasdealicante.es

Tu consentimiento

Durante el piloto analizaremos tus consumos de agua para extraer el conocimiento y la perspectiva que nos ayudará a mejorar tu consumo de agua. Esto significa que te pediremos información acerca de las personas que viven contigo.

El tener tu consentimiento para recoger y analizar estos datos es muy importante para nosotros. Sin ellos, simplemente no seremos capaces de mejorar el sistema DAIAD.

Permítenos ponerte un ejemplo de a qué nos referimos. A través de analizar tu consumo de agua con los datos meteorológicos, podemos observar si tu consumo de agua está influenciado por si hoy llueve o no. Puede que descubramos una asociación entre el tamaño de tu familia y el consumo de agua por persona. ¿Quién sabe? Eso es lo que llamamos una línea abierta de investigación.

Por nuestro lado, te garantizamos que tu información será utilizada sólo con propósitos de investigación científica y que no será compartida con nadie.

Actualmente, ya has facilitado información similar a otras aplicaciones. ¡Y posiblemente sin saberlo! Como podría ser a una app de deporte, de dietas, o cualquier otro tipo de app.

¿Sabes la información que has facilitado a tus redes sociales? ¡Posiblemente no! Nosotros somos científicos y nuestro código de ética nos prohíbe usar tu información sin tu consentimiento.

Si tienes alguna objeción en darnos tu consentimiento, no participes en el piloto. Te agradeceremos que lo entiendas.

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DAIAD

7. Annex 3 – Trial Pre-survey

In this Annex we provide the Welcome screen of the web survey as well the complete list of questions and answers (*exported via printing the form, styling omitted*).

Figure 39: Expression of interest survey - Welcome screen

DAIAD - Encuesta Inicial

¡Hola familia. Bienvenida a DAIAD!

Habéis sido seleccionad@s para participar en el piloto DAIAD. Pero antes de que comience, necesitamos que completes este pequeño formulario.

Queremos preguntarte un poco sobre ti, quiénes viven contigo, vuestra actitud y hábitos en la ducha, así como una serie de cuestiones generales sobre vuestra actitud hacia temas de eficiencia energética e hídrica.

Tus respuestas nos ayudarán a hacernos una idea de la efectividad del sistema DAIAD al final del piloto.

¡Muchas gracias!

*Required

Tus datos de contacto

¡Tus respuestas serán utilizadas para crear una cuenta personal en DAIAD!

1. **Nombre** *

2. **Apellidos** *

3. **Email** *
Por favor, facilítanos el correo que utilizarás durante el piloto y que usaste para registrate

4. **Edad** *

¿Quiénes viven contigo?

Tus respuestas nos ayudarán a relacionar el consumo de agua con las características de los que vivás en el mismo domicilio.

5. **¿De cuántos miembros se compone tu vivienda?** *
Por favor, especifica el número total de personas que residís en tu vivienda, incluido tú. Si vives sólo, selecciona 1.
Mark only one oval.
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 o mas

6. **¿Cuántos de ellos son mujeres?** *
Por favor, especifica el número total de mujeres que vivan en su casa.
Mark only one oval.
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 9
- 9 o mas

7. **¿Cuántos son hombres?** *
Por favor, especifica el número total de hombre que vivan en su casa.
Mark only one oval.
- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 o mas

8. **¿Hay algún menor de edad en su vivienda?** *
Mark only one oval.

- 0
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9 o mas

9. **¿Qué ingreso bruto anual tenéis en vuestra vivienda?** *
Incluyendo todos aquellos que trabajen.
Mark only one oval.

- Menos de 15.000€
- 15,000€ - 20,000€
- 20,000€ - 25,000€
- 25,000€ - 30,000€
- 30,000€ - 35,000€
- 35,000€ - 40,000€
- 40,000€ - 50,000€
- 50,000€ - 60,000€
- Más de 60,000€

10. * *
Mark only one oval.

- Propietario
- Alquiler
- Otro

11. **Creo que el consumo de agua en mi vivienda es...** *
Mark only one oval.

- Extremadamente alto
- Alto
- Normal
- Bajo
- Extremadamente bajo

19. **¿Cuánto tiempo (minutos) utilizas al día fregando a mano?** *
Si no friegas a mano, indica 0.

20. **¿Cuánto tiempo (minutos) utilizas agua al día en otras actividades? (ej: riego de plantas, lavar el coche, etc.)** *
Si no utilizas agua en este tipo de actividades, indica 0.

Tus hábitos en la ducha

El consumo de agua en la ducha es una parte importante del total que gastamos en la vivienda.

Tus respuestas nos ayudarán a conocer qué es para ti una ducha normal, así como conocer tus hábitos en ella.

21. **¿Cuántos litros de aguas crees que consumes en la ducha cuando no te lavas el pelo?** *

22. **¿Cuántos litros de agua crees que consumes en una ducha cuando también te lavas el pelo?** *

23. **Teniendo en cuenta que vamos a comparar tu consumo de agua con otras 100 personas con más o menos el mismo sexo y "corte de pelo", ¿Cuánta gente crees que consume más que tú?** *

12. **¿Con qué frecuencia hablas con tu familia o compañer@s de piso sobre el consumo de agua?** *
Mark only one oval.

- Siempre que quiero
- Al menos una vez por semana
- Al menos una vez al mes
- Alguna vez cada varios meses
- Al menos una vez al año
- Ni idea.

Vuestros hábitos de consumo de agua

Tus respuestas nos ayudarán a establecer una base para el consumo típico de agua que tenéis en vuestra vivienda.

Cuando respondas, por favor, recuerda tener en cuenta el número total de personas que vivís en casa. No es necesaria una gran precisión, pero nos gustaría que nos dieras tu mejor estimación.

13. **¿Cuántas veces os ducháis a la semana?** *
Por favor, incluye las duchas de todos los miembros de la casa.

14. **De media, ¿Cuánto tiempo (minutos) tardáis en ducharos?** *
No hace falta precisar hasta el segundo, con una estimación será suficiente.

15. **¿Cuántas veces os bañáis por semana?** *
Por favor, incluye las duchas de todos los miembros de la casa.

16. **¿Cuántas veces estiráis de la cadena de la cisterna del baño al día?** *
Por favor, incluye las de todos los miembros de la casa.

17. **¿Cuántas veces a la semana utilizáis la lavadora?** *
Si no usáis lavadora, indica 0.

18. **¿Cuántas veces a la semana utilizáis el lavavajillas?** *
Si no usáis lavavajillas, indica 0.

24. **¿Hasta qué punto estás de acuerdo con las siguientes afirmaciones?**
Mark only one oval per row.

	Totalmente en desacuerdo	En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	Totalmente de acuerdo
Para mí, la ducha significa relajación, disfrute y bienestar					
La ducha es tan necesaria como lavarse los dientes, es más un deber que un placer					
Siempre busco tiempo para ducharme al menos una vez al día					
En general, intento reducir mis consumos de agua y energía					
Espero reducir mis consumos de agua y energía con los contadores de agua inteligentes					

Tus hábitos respecto al consumo de Agua y Energía

Por favor, facilítanos cierta información acerca de vuestros hábitos respecto al uso eficiente del Agua y de la Energía.

Tus respuestas nos ayudarán a entender cómo DAIAD podría ayudar a mejorar vuestros consumos.

25. **¿Qué opinión tienes acerca de todo lo que tiene que ver con el Medio Ambiente?** *
Mark only one oval.

- Es sólo una moda, nada de lo que debamos preocuparnos realmente ahora mismo.
- Es algo a tener en cuenta, pero no estoy realmente interesado.
- Es necesario que desde el Gobierno se tomen medidas políticas, y que sean apoyadas por la población.
- Participo activamente en acciones de protección medioambiental.
- No opino.

26. **¿Tenéis alguna aplicación o sistema de eco-eficiencia instalado en vuestra vivienda?** *
Mark only one oval.

- Si
- No
- No lo sé

27. **¿Tenéis algún teléfono de ducha eco-eficiente?** *
Mark only one oval.

- Si
- No
- No lo sé

28. **¿Tenéis alguna cisterna de baño de doble descarga?** *
Si no sabes lo que es una cisterna de doble descarga: http://aca-web.gencat.cat/aca/sequera/es/sabies-que-doble-descarrega.jsp
Mark only one oval.

- Si
- No
- No lo sé

29. **¿Hasta qué punto estás de acuerdo con las siguientes afirmaciones?** *
Mark only one oval per row.

	Totalmente en desacuerdo	En deascuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	Totalmente de acuerdo
Suelo hablar acerca del ahorro de energía					
Suelo hablar acerca del ahorro de agua					
Tengo dispositivos y/o aplicaciones de ahorro de energía para reducir mis consumos					
Tengo dispositivos y/o aplicaciones de ahorro de agua para reducir mis consumos					
Me esfuerzo por reducir mi consumo de energía					
Me esfuerzo por reducir mi consumo de agua					
Modificando mis hábitos en la ducha podría reducir mi consumo de energía					
Modificando mis hábitos en la ducha podría reducir mi consumo de agua					
Si reduzco el consumo de agua en la ducha, éste tendrá un impacto directo sobre mi consumo energético					
Si reduzco el consumo de agua en la ducha, éste tendrá un impacto directo sobre el Medio Ambiente					
Si reduzco el consumo de agua en la ducha, éste tendrá un impacto directo sobre mi presupuesto del hogar					
Las personas a las que les importo piensan que debería reducir mi consumo energético					
Las personas a las que les importo piensan que debería reducir mi consumo de agua					
Las personas importantes para mi se esfuerzan por reducir su consumo de energía					
Las personas importantes para mi se esfuerzan por reducir su consumo de agua					
En mi situación actual, es difícil pensar acerca del ahorro de energía					
En mi situación actual, es difícil pensar acerca del ahorro de agua					
No me importa lo que la gente piense. Siento que debo hacer lo que esté en mi mano para reducir mi consumo energético.					
No me importa lo que la gente piense. Siento que debo hacer lo que esté en mi mano para reducir mi consumo de agua.					
Siento remordimientos cuando tomo una ducha muy larga					
Siento remordimientos cuando tomo una ducha muy caliente					

Tú y la tecnología

Tus respuestas nos ayudarán a establecer una base acerca de vuestras relaciones con las nuevas tecnologías, así como tus habilidades personales.

30. **Por favor, califica cómo de bien te identificas con las siguientes afirmaciones.** *
Mark only one oval per row.

	Nada que ver conmigo	Probablemente no tenga que ver conmigo	Algo tiene que ver conmigo	Me identifico totalmente
Disfruto aprendiendo a usar nuevas aplicaciones y otras tecnologías				
Cuando se me requiere aprender a usar una tecnología desconocida para mi o una nueva máquina, suelo acceder				
Solucionar problemas tecnológicos me transmiten la sensación de estar realizando un buen desafío				
La tecnología es mi amiga				
Encuentro la mayoría de la tecnología fácil de aprender				
La gente espera que yo sepa de tecnologías y no quiero defraudarlos				
Me entiendo bien con las tecnologías y las máquinas				
Me siento cómodo aprendiendo sobre tecnologías				
Sé desenvolverme para solucionar problemas o malfuncionamientos de las tecnologías				
Me siento tan actualizado con las tecnologías como mis compañeros				

31. **¿Hasta qué punto te describes con las siguientes afirmaciones? Me veo como alguien que...**
Mark only one oval per row.

	Totalmente en desacuerdo	En desacuerdo	Ni de acuerdo ni en desacuerdo	De acuerdo	Totalmente de acuerdo
es reservada					
siempre dice la verdad					
tiende a ser perezosa					
es relajado, controla bien el estrés					
está interesado en el arte					
es extrovertida y sociable					
tiende a buscar fallos en los demás					
trabaja de forma exhaustiva					
se pone nerviosa fácilmente					
tiene una imaginación activa					

8. Annex 4 – Installation instructions

9. Annex 5 – Mode management notifications

9.1. Phase 1 – Reminder

Hola DAIADista

¡Casi lo hemos conseguido!

Recuerda tener tu móvil o tablet cerca ¡siempre que te duches!. Antes de ducharte recuerda abrir la app DAIAD y asegúrate de tener encendido el Wi-Fi y el Bluetooth. Tu móvil debe estar lo más cerca posible de la ducha (3-5 m) y en lugar seco.

¿Por qué es importante?

Muy bien, pues DAIAD está en "Modo Aprendizaje" y parece estar inactiva. ¡Pero no!, está funcionando y recogiendo tu uso típico de la ducha, lo que llamamos "Línea Base". Esto permitirá entender cómo DAIAD influye tu consumo de agua a largo plazo.

¡Y la única forma de establecer esa "Línea Base" es recoger la información de tu dispositivo con el móvil!

Si ya estás haciendo esto, pronto terminará el "Modo Aprendizaje" y ¡podrás empezar a usar DAIAD!. Si no lo haces así, el dispositivo necesitará permanecer mucho más tiempo en Modo de Aprendizaje.

Y recuerda, nos encantaría conocer tu experiencia, cuéntanosla a través de Twitter usando el hashtag #ProyectoDAIAD y mencionando a @AMAEM_Oficial y @Daiad_EU.

¡Hasta pronto!

Un cordial saludo,

El equipo DAIAD

9.2. Phase 2 (b1 ON/mobile OFF)

Muchas gracias por tu paciencia, ¡ahora puedes empezar a usar DAIAD!

DAIAD ha estado en "Modo Aprendizaje" desde que lo instalaste para ir recopilando información crucial sobre tus consumos habituales de agua. ¡Por eso tanto la aplicación del móvil como el amphiro b1 estaban inactivos!

Pues bien , ¡el periodo de aprendizaje se ha completado!

Ahora avanzamos hacia una nueva fase del piloto:

- Tu amphiro b1 se activará por sí solo, mostrando el caudal, la temperatura y la eficiencia de tu ducha.
- La aplicación del móvil permanecerá inactiva durante unas semanas más.

Sigue los siguientes pasos:

- La próxima vez que vayas a ducharte, recuerda coger tu móvil.
- Abre la aplicación de DAIAD y asegúrate de tener conectado el Bluetooth y el Wi-Fi.
- Deja el móvil cerca (3 a 5 metros) y ¡dúchate!
- Si todo funciona correctamente, después de unos minutos la pantalla del amphiro b1 se activará!

¡Esto es todo! De ahora en adelante podrás ducharte mientras conoces en tiempo real tu consumo de agua.

Simplemente recuerda **tener el móvil cerca** cuando te duches siempre que sea posible (idealmente, en todas las ocasiones). Asegúrate de abrir la aplicación DAIAD con el Bluetooth y el Wi-Fi activados. La aplicación parecerá inactiva, pero sin embargo estará recogiendo los datos de la ducha en segundo plano.

Y recuerda, nos encantaría conocer tu experiencia, cuéntanosla a través de Twitter usando el hashtag #ProyectoDAIAD y mencionando a @AMAEM_Oficial y @Daiad_EU.

¡Muchas gracias por tu participación en este piloto y por colaborar en mejorar DAIAD! Si necesitas ayuda puedes contactarnos al email proyecto.daiad@aguasdealicante.es

¡Esperemos que disfrutes utilizando DAIAD!

Un cordial saludo,

El equipo DAIAD

9.3. Phase 2 (b1 OFF/mobile ON)

Muchas gracias por tu paciencia ¡Ahora puedes utilizar DAIAD!

DAIAD ha estado en “Modo Aprendizaje” desde que lo instalaste, recogiendo la información necesaria para establecer tus hábitos en la ducha. Por esta razón tanto la app como el dispositivo estuvieron inactivos.

Pues bien, ¡esta etapa se ha completado!

- Y pasamos a la siguiente fase:
- La app DAIAD se activará por sí sola, mostrándote información acerca de tu uso del agua.
- Tu Amphiro b1 (el dispositivo en la ducha) permanecerá inactivo durante un par de semanas.

Sólo sigue los siguientes pasos:

- La próxima vez que vayas a ducharte, recuerda coger tu móvil.

- Abre la aplicación de DAIAD y asegúrate de tener conectado el Bluetooth y el Wi-Fi.
- Deja el móvil cerca (3 a 5 metros) y ¡dúchate!

¡Esto es todo! A partir de ahora podrás visualizar tus duchas a través de la app DAIAD.

Descubrirás una serie de nuevas funcionalidades que podrás utilizar. ¡Explóralas y utilízalas! Nos gustaría darte unas instrucciones detalladas de uso, pero dejarte descubrir cómo funcionan ¡es parte del experimento! :)

Simplemente recuerda **tener el móvil cerca** cuando te duches siempre que sea posible (idealmente, en todas las ocasiones). Asegúrate de abrir la aplicación DAIAD con el Bluetooth y el Wi-Fi activados. La aplicación parecerá inactiva, pero sin embargo estará recogiendo los datos de la ducha en segundo plano.

Y recuerda, nos encantaría conocer tu experiencia, cuéntanosla a través de Twitter usando el hashtag #ProyectoDAIAD y mencionando a @AMAEM_Oficial y @Daiad_EU.

¡Muchas gracias por tu participación en este piloto y por colaborar en mejorar DAIAD! Si necesitas ayuda puedes contactarnos al email proyecto.daiad@aguasdealicante.es

¡Esperemos que disfrutes utilizando DAIAD!

Un cordial saludo,

El equipo DAIAD

9.4. Phase 3

Estamos muy contentos de anunciarte que ahora tienes acceso completo al sistema DAIAD!

El amphiro b1 y la aplicación de móvil estarán ambos activados ¡Lo que te permite conocer tu uso del agua dónde y cuándo quieras!

Sólo sigue los siguientes pasos:

- La próxima vez que te duches ten tu móvil cerca.
- Abre la aplicación de DAIAD y asegúrate de tener conectado el Bluetooth y el WiFi.
- Deja el móvil cerca (3 a 5 metros) y ¡dúchate!

¡Eso es todo!

Simplemente recuerda **tener el móvil cerca** cuando te duches, a ser posible, siempre que lo hagas. Asegúrate de tener encendidos el Bluetooth y el WiFi cuando enciendas la app, así siempre que te duches, se enviará la información a tu móvil.

Y recuerda, nos encantaría conocer tu experiencia, cuéntanosla a través de Twitter usando el hashtag #ProyectoDAIAD y mencionando a @AMAEM_Oficial y @Daiad_EU.

¡Pronto contactaremos contigo! Tenemos muchas novedades que te ayudarán a mejorar el uso del agua.

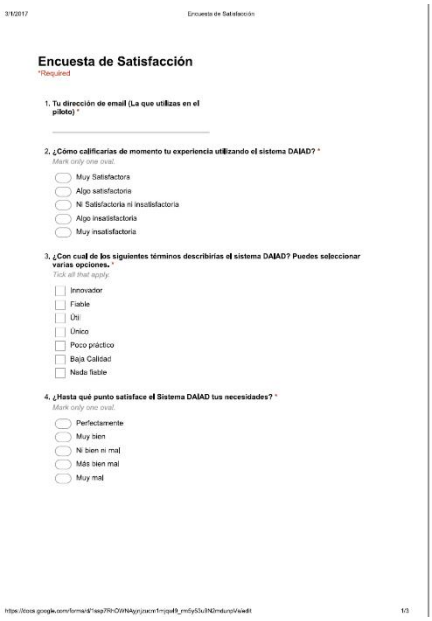
¡Esperemos que estés disfrutando usando DAIAD!

Un cordial saludo,

El equipo DAIAD

10. Annex 6 – Satisfaction survey

In this Annex we provide the complete list of questions and answers (*exported via printing the form, styling omitted*).



Encuesta de Satisfacción

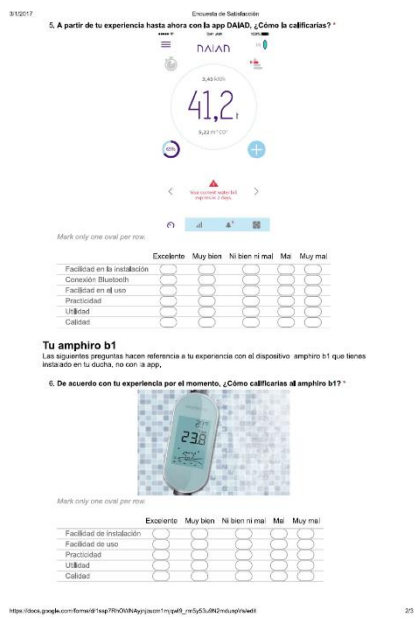
*Required

1. Tu dirección de email (La que utilizas en el piloto) *

2. ¿Cómo calificarías de momento tu experiencia utilizando el sistema DAIAD? *
Mark only one oval.
- Muy Satisfactoria
- Algo satisfactoria
- Ni Satisfactoria ni insatisfactoria
- Algo insatisfactoria
- Muy insatisfactoria

3. ¿Con cual de los siguientes términos describirías el sistema DAIAD? Puedes seleccionar varias opciones. *
Tick all that apply.
- Innovador
- Fiable
- Útil
- Único
- Poco práctico
- Baja Calidad
- Nada fiable

4. ¿Hasta qué punto satisface el Sistema DAIAD tus necesidades? *
Mark only one oval.
- Perfectamente
- Muy bien
- Ni bien ni mal
- Más bien mal
- Muy mal



5. A partir de tu experiencia hasta ahora con la app DAIAD, ¿Cómo la calificarías? *

Mark only one oval per row.

	Excelente	Muy bien	Ni bien ni mal	Mal	Muy mal
Facilidad en la instalación					
Conexión Bluetooth					
Facilidad en el uso					
Practicidad					
Utilidad					
Calidad					

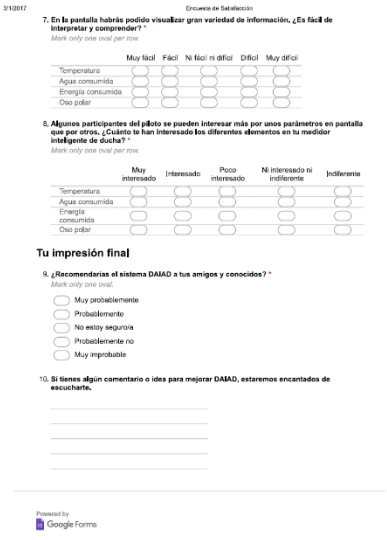
Tu amphiro b1

Las siguientes preguntas hacen referencia a tu experiencia con el dispositivo amphiro b1 que tienes instalado en tu ducha, no con la app.

6. De acuerdo con tu experiencia por el momento, ¿Cómo calificarías al amphiro b1? *

Mark only one oval per row.

	Excelente	Muy bien	Ni bien ni mal	Mal	Muy mal
Facilidad de instalación					
Facilidad de uso					
Practicidad					
Utilidad					
Calidad					



7. En la pantalla habrás podido visualizar gran variedad de información. ¿Es fácil de interpretar y comprender? *
Mark only one oval per row.

	Muy fácil	Fácil	Ni fácil ni difícil	Difícil	Muy difícil
Temperatura					
Agua consumida					
Energía consumida					
Oso polar					

8. Algunos participantes del piloto se pueden interesar más por unos parámetros en pantalla que por otros. ¿Cuánto te han interesado los diferentes elementos en tu medidor inteligente de ducha? *
Mark only one oval per row.

	Muy interesado	Interesado	Poco interesado	Ni interesado ni indiferente	Indiferente
Temperatura					
Agua consumida					
Energía consumida					
Oso polar					

Tu impresión final

9. ¿Recomendarías el sistema DAIAD a tus amigos y conocidos? *
Mark only one oval.
- Muy probablemente
- Probablemente
- No estoy seguro/a
- Probablemente no
- Muy improbable

10. Si tienes algún comentario o idea para mejorar DAIAD, estaremos encantados de escucharte.

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11. Annex 7: Annual evolution of KPIs

For completeness and to assist the reader, in the following sub-sections we have assembled the evolution of our KPIs in throughout the 12-month duration of the Trial.

11.1. Participants per Phase

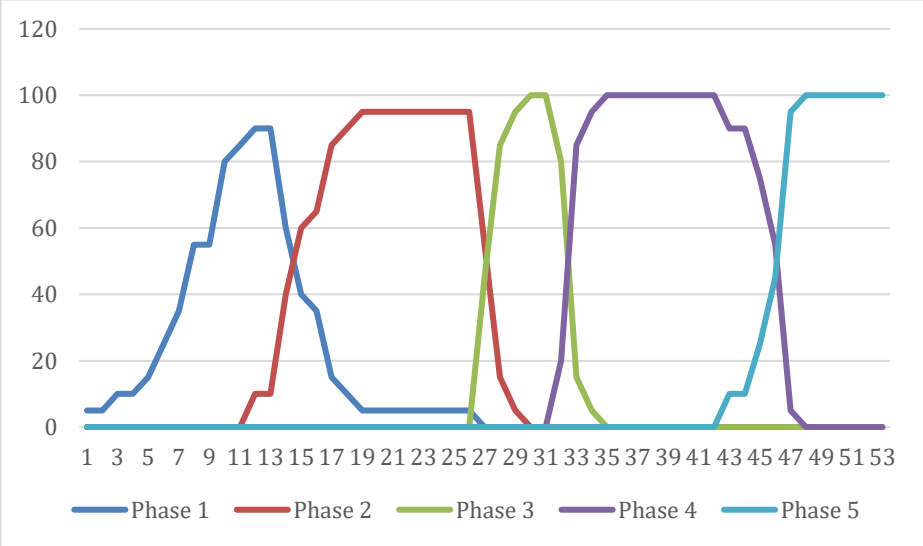

Figure 40: Distribution of participants per phase during Trial A (Y axes: % of panel population; X axes: week in M1-M12 of the Trial)

11.2. Water Consumption (SWM)

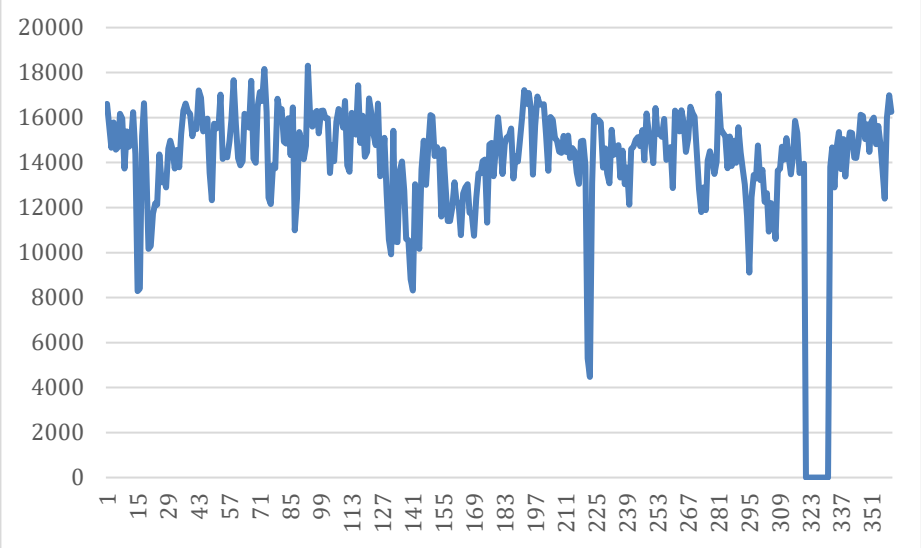

Figure 41: Total daily consumption for Trial A (liters) (Y axes: total water consumption in liters; X axes: day in M1-M12 of the Trial)

11.3. Water Consumption (shower)

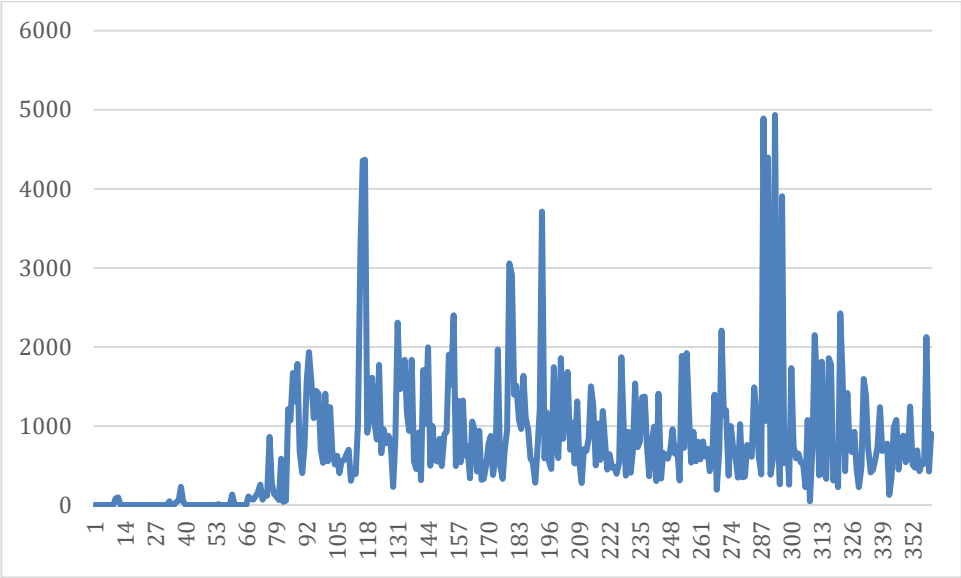

Figure 42: Total daily shower consumption for Trial A (liters) (Y axes: total shower consumption in liters; X axes: day in M1-M2 of the Trial)

11.4. Shower events

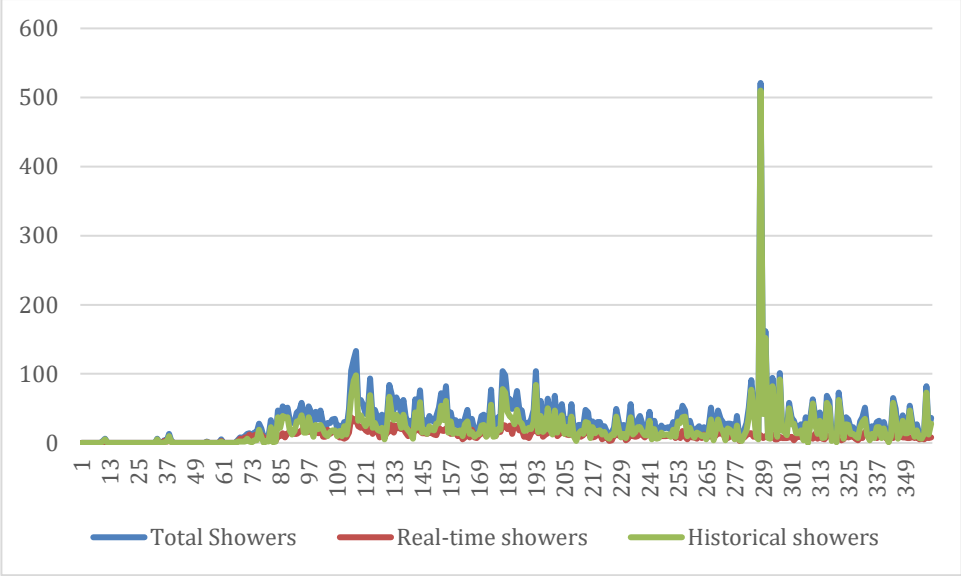

Figure 43: Shower events (total, real-time, historical) for Trial A (Y axes: number of shower events; X axes: day in M1-M12 of the Trial)

11.5. System availability (uptime)

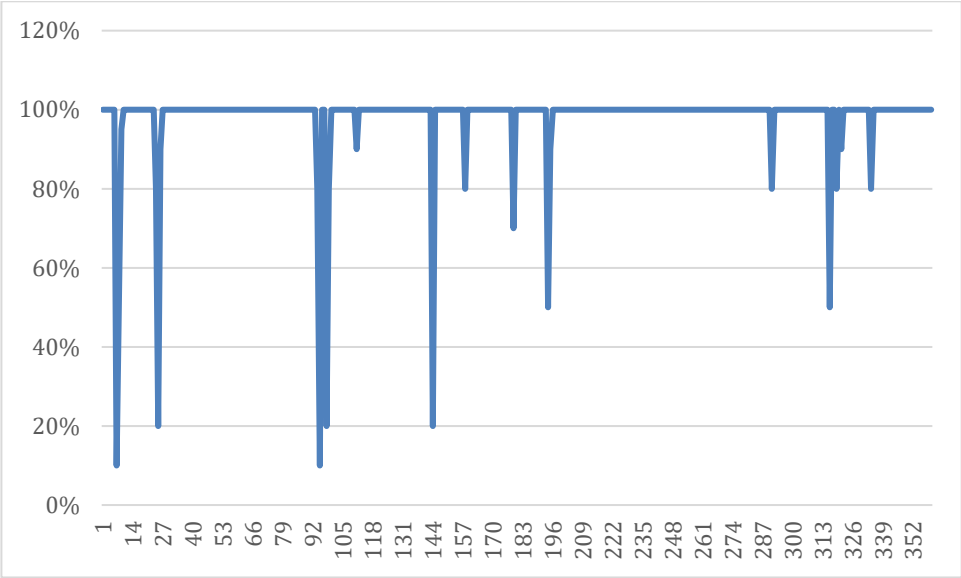

Figure 44: Daily system availability for Trial A (% of time within a day system was available) (Y Axes: % of system availability; X axes: day in M1-M12 of the Trial)