



## DELIVERABLE 8.4

# Exploitation and business plan

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## Abstract

This document defines the exploitation plan of the DAIAD project and presents the partners' activities that will be carried out in Task 8.2. The plan sets out objectives and goals for exploitation with respect to the undertaking results in the direction of products and services, business prospects and affiliations. The report exhibits our general exploitation techniques, activities already performed, development schemes and further actions to be settled throughout the duration of the project, to bring its outcomes into business inside the briefest period from the start date.

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## Executive Summary

This document defines an exploitation plan and presents further activities which will be accomplished in Task 8.2 by the DAIAD partners. Factual arrangements rely on the exploitable results and incorporate actions towards taking advantage and commercializing the DAIAD outcomes. The document is built from partner contributions and each partner has provided relevant background material as setting for their plans.

In order to reach sustainability of the outcomes and augment the accomplishments of the project, in and beyond its runtime, this report outlines significant exploitable results, development schemes, partners' arrangements and activities. It likewise introduces the common approach of the DAIAD consortium on the project outcomes which is the broader utilization of DAIAD advances by users and communities including consumers, water utilities, stakeholders and NGOs.

An additional significant issue is the identification of innovative aspects within DAIAD that can possibly be licensed commercially. Therefore, we present a detailed description of the DAIAD outcomes, the Foreground IP status and the development schemes which can be adopted.

Following that, we give the individual exploitation plans of the Consortium partners. Exploitation activities are important to accomplish sustainability of the DAIAD outcomes. In this extent, we present activities effectively performed and tasks to be carried out in the course of the project, related with open source provision of DAIAD achievements, ceaseless market monitoring, adjustments and potential investment returns.

The exploitation plans and activities will be revised regularly with reports to allow the project and its partners to promptly respond to new advancements along the course of the project and in the commercial environment.

# Abbreviations and Acronyms

OSGeo	Open Geospatial Foundation
WDM	Water Demand Management
BT4.0	Bluetooth 4.0
EurEau	European Federation of National Associations of Water Services
AMR	Automatic Meter Reading
R&I	Research and Innovation
SaaS	Software-as-a-Service
SLA	Service-Level Agreement
ICT	Information and Communications Technology
BFE	Bundesamt für Energie
EEA	European Environment Agency
WWF	World Wildlife Fund

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# 1. Introduction

This report defines a plan to support the DAIAD consortium with the optimal exploitation of the expected project results. The document presents exploitable results, individual partners' plans and activities which will be carried out in Task 8.2. The objective is to give concrete outcomes which can be exploitable within DAIAD and associate them with individual partners' exploitation schemes. We additionally define a structure for exploitation activities, which incorporates actions effectively performed and activities which will be attained in the progression of the project.

The report mainly serves as a guidance towards the project exploitation plans and activities. It draws on the yields of WP2 Task 2.4 DAIAD@feel prototypes, WP3 Task 3.4 DAIAD@know prototypes, WP4 Task 4.4 DAIAD@home and WP5 Task 5.5 DAIAD@commons and Task 5.6 DAIAD@utility. The user trials of WP7 will give key inputs to assess, improve and formalize project results and may determine further actions. Exploitation encompasses marketing and depends partially on dissemination and along this side there will be natural interaction between the exploitation activities planned in this deliverable and the dissemination activities arranged in deliverable D8.2 of WP8.

The remainder of this document is structured as follows.

In Section 2, we present the exploitable results of the project. We provide a detailed description of the DAIAD results, the Foreground IP status and schemes for further exploitation.

In Section 3, we provide a thorough portrayal of the individual exploitation plans of Consortium partners.

In Section 4, we concentrate on the exploitation activities. These activities comprise the open source delivery of DAIAD technologies, continuous market monitoring, adjustments and potential investment returns. For every activity, we first present actions already performed and we proceed with further activities which will be finalized while the project progresses.

## 2. Exploitable Results

In this section we present the exploitable results of DAIAD in terms of technology deliverables and knowhow. For each result, we provide an overview of its intended function and capabilities, its Foreground IP status, as well as a non-exhaustive overview of potential exploitation schemes. In the natural course of the project, the provided list of exploitable results will be adapted, following technology advances, breakthroughs introduced by the partners, novel insights gained from the trials, as well as project adjustments due to market opportunities. Similarly, potential exploitation schemes may evolve, be discarded, or be introduced as a result of market demand.

Consequently, the contents of this section only serve *as a starting point* to guide exploitation actions throughout the project. Whenever new exploitation opportunities arise, as well significant advances in the expected exploitable results, we will update the contents of the section to reflect all potential exploitable results and pathways.

### 2.1. Sensors for real-time, multi-point water monitoring

#### 2.1.1. Description

DAIAD@feel will be a sub-100 euro solution for monitoring cold/hot water consumption in residential settings, which will be battery-less and easy to install for non-experts, require limited maintenance, and accurately monitor all types and points of water consumption activity. It will deliver high granularity temporal and spatial measurements of water consumption, well beyond the capabilities of existing systems. The infrastructure will be compatible with current open smart metering systems, to enable integration in smart grids/houses and metering infrastructures from utility providers. Further, data will be available through open standards to enable integration and value added services.

The sensors (DAIAD@feel) will be available in three versions: one with a visual interface only, one with a standardized RF interface, and one with both a local display and an RF interface.

#### 2.1.2. Foreground IP

In accordance to our Consortium Agreement, the Foreground IP for the DAIAD@feel sensors is owned 100% by Amphiro.

#### 2.1.3. Exploitation schemes

- *Commercial production and sales of sensors to consumers, water utilities and NGOs.* This is the *core business activity* of Amphiro. Improvements produced in the context of the project are already rolled-out in the existing and planned products of the company. Amphiro b1, the next version of Amphiro a1 (*the starting point of the project*) with BT4.0 RF capabilities is in a pre-commercialization state, with tooling/marketing activities performed from M10. Beyond the retail market, sales to other

stakeholders (water/energy utilities, NGOs, public sector) will be assessed during the course of the project.

- *Integration with existing water monitoring products.* This exploitation scheme will be discussed with manufacturers of water fixtures and similar equipment. A DAIAD@feel kit (sensor array, RF) is already available for evaluation from manufacturers. Depending on market interest, gauged in the context of our dissemination and networking actions, this exploitation scheme will be considered.
- *Integration with water metering solutions.* The market of water metering (Automatic Meter Reading (AMR), billing) has strict requirements and standards in terms of accuracy. During the project, we will significantly improve the accuracy (*and associated guarantees*) of the water sensor in order to investigate the potential application of data generated for (a) the control/validation of water meters, (b) the provision of highly granular data for a sample of customers.
- *Extension and application for water monitoring beyond domestic environments.* We will explore adjacent markets, such as the irrigation, as well as specific use cases for industrial and/or high water-use businesses (e.g. hotels).
- *Application of produced technology components to other sensor types and/or applications.* The competitive advantage of DAIAD@feel compared to all other domestic water monitoring solutions in the market is its advanced micro-generator, supporting energy-autarkic operation of all electronic equipment. Hence, the micro-generator itself (i.e. even without sensing capabilities) can be applied to power electronic devices situated on/near water-flow fixtures. This exploitation option will be assessed and its application will depend on market interest, as well as potential synergies (not identified at this stage) with manufacturers of electronic devices.

## 2.2. Interfaces for efficiently communicating /exploring water consumption

### 2.2.1. Description

DAIAD@know is a collection of interfaces (*or interventions*) for conveying water consumption data, analysis, and recommendations. It applies various representations, capabilities, and paradigms, in order to accommodate the cognitive capacity and limited attention span of every day consumers. DAIAD@know interfaces are categorized in two classes, the first appropriate for *web/mobile environments* and the second for *in-situ installations*. Further, they will be instantiated and integrated in other technology deliverables of the project: DAIAD@feel (*integrated display*), DAIAD@home (mobile/web applications), DAIAD@commons (web applications), and DAIAD@utility (web applications). Consequently, exploitation of DAIAD@know will be *driven* by the exploitation plans of these components. However, exploitation of the interfaces beyond this context is also possible and pursued by the partners in the design and implementation phase, adopting highly flexible and platform-agnostic development options.

## 2.2.2. Foreground IP

In accordance to our Consortium Agreement, the Foreground IP for DAIAD@know is jointly held (50%-50%) by UNI Bamberg and Athena RC. As is the case for all software developed within the project, DAIAD@know will be provided with an open source license. This means that all Consortium partners, as well as third parties, can freely use and extend all developed interfaces. Consequently, our exploitation schemes focus on three major pathways: (a) exploitation in the context of DAIAD system as a whole, (b) exploitation by extending, repurposing and (c) offering knowhow to interested parties.

## 2.2.3. Exploitation schemes

- *Commercial production and sales of sensors to consumers, water utilities and NGOs.* This exploitation scheme concerns the integration of DAIAD@know interfaces directly in DAIAD@feel, and hence the Amphiro device and associated services. All considerations for the corresponding exploitation scheme of DAIAD@feel apply here.
- *Commercial offering of applications presenting water consumption.* The DAIAD@know interfaces are designed to accommodate and leverage water consumption data regardless of the original source. Hence, they can be applied to present water consumption data from smart water meters, or any other similar technology, with relatively low effort (i.e. integration of a new data API). Monetization could be based on (a) custom-application development (i.e. for a particular product) or (b) a software-as-a-service model.
- *Extension for energy resource consumption.* The DAIAD@know interfaces are easily transferable to the energy domain, for conveying knowledge regarding energy use, either in the smart-home ecosystem, or smart grids. These options will be assessed during the progression of the project and will be actively pursued after its end through a small-scale Research and Innovation (R&I) effort aiming to rapid commercialization.
- *Integrate design artifacts in existing and new products.* This exploitation scheme implies the direct application or extension of DAIAD@know design artifacts (i.e. paradigms) in existing water/energy monitoring products (in-situ and web/mobile). While it requires more effort and planning compared to other exploitation options, it consists a significant opportunity given the rise of the smart home ecosystem. Any decisions towards exploitation will be based on the actual growth of this market (ecosystems, leading manufacturers).

# 2.3. Consumer-oriented analysis and recommendation services for water consumption

## 2.3.1. Description

DAIAD@home is a collection of services for analysis and recommendation of water measurements from real-time water consumption data. It automatically handles all data collection, management and knowledge extraction duties. DAIAD@home supports analysis of water consumption data for various residential and consumer dimensions, identifies behavioral patterns, and provides personalized recommendations. It

provides open interfaces enabling knowledge extraction and integration in third systems. Further, DAIAD@home operates both in consumer hardware (e.g. desktop PC) and a cloud infrastructure, offering flexibility in installation and service provision.

### 2.3.2. Foreground IP

In accordance to our Consortium Agreement, the Foreground IP for the DAIAD@home is owned 100% by Athena RC. DAIAD@home will be provided with an open source license. Therefore, all Consortium partners, as well as third parties, can freely use and extend all developed interfaces. Consequently, our exploitation schemes focus on three major pathways: (a) exploitation in the context of DAIAD system as a whole, (b) exploitation by extending, repurposing and (c) offering knowhow to interested parties.

### 2.3.3. Exploitation schemes

- *Commercial offering of analysis software as a standalone product and in a Software-as-a-Service (SaaS) model.* The DAIAD@home is developed to support a desktop and a cloud based deployment. Hence, users (consumers, water utilities and NGOs) can choose according to their needs between software as a standalone product which can be installed in a local computer or as a service which can be provided by a cloud provider. Monetization could be based on custom-service development either as application or as a SaaS model.
- *Integration of algorithms and services (collection, analysis, recommendation APIs) to third party analytics software and services.* This exploitation scheme will be discussed with other stakeholders such as resources utilities. It involves the direct application or extension of DAIAD@home services in existing water/energy analysis and recommendation products.
- *Extension of analysing and providing recommendations for energy consumption and resource consumption in general.* The DAIAD@home services can be easily applied to the energy domain for energy consumption analysis and recommendation. This perspective will be assessed during the course of the project and will be actively pursued after its end through a small-scale R&I effort aiming to rapid commercialization.
- *Expansion of DAIAD@home to consumer facing applications.* There is an opportunity to develop consumer home water/energy calculators as applications or websites that use real-time data to provide consumer feedback. This can be linked to labeling and compliance schemes for water efficient products, which will enable water companies to provide direct product rebates or advice to households. The applications would be funded by retailers, manufacturers, utilities or sold directly to the consumer.

## 2.4. Big data management and analysis infrastructure for water consumption

### 2.4.1. Description

DAIAD@commons is a collection of services for data management, knowledge extraction and analysis of big data from massive, real-time water consumption measurements. It is cloud-based, entailing the complete

lifecycle of data. DAIAD@commons is a turnkey solution enabling stakeholders to efficiently store and manage water consumption data, perform analysis, identify patterns, estimate projections, and visualize information. It provides open interfaces to enable integration with third party systems. It also provides integration with social networks to support automatic publishing of aggregated consumption results. DAIAD@commons is targeted to consumer groups of non-expert users (e.g. neighborhoods, grassroots initiatives, NGOs) that voluntarily wish to participate in efficient water management practices.

## 2.4.2. Foreground IP

In accordance to our Consortium Agreement, the Foreground IP for the DAIAD@commons is owned 100% by Athena RC. DAIAD@commons will be provided with an open source license. Therefore, all Consortium partners, as well as third parties, can freely use and extend all developed interfaces. Consequently, our exploitation schemes focus on three major pathways: (a) exploitation in the context of DAIAD system as a whole, (b) exploitation by extending, repurposing and (c) offering knowhow to interested parties.

## 2.4.3. Exploitation schemes

- *Commercial offering of analysis as a standalone product, in a SaaS model and through cloud infrastructures.* The DAIAD@commons is developed to support interoperability based on open and standardized protocols for data exchange. End users can have three options of deployment mode. DAIAD@commons can be available as a standalone product which can include user support, Service-Level Agreement (SLA), extensions, proprietary integration, as a service and as cloud based services which can include commercial VMs in Amazon/Azure. Monetization could be based on custom-service development either as application or as a SaaS model.
- *Integration of algorithms and services to third party big data management software and services.* This exploitation scheme will be discussed with other stakeholders such as resources utilities, big data and business analytics companies. It involves proper APIs to support analysis, queries and exported functionality in third party applications.
- *Extension to big data management and analysis for real-time data in general.* The DAIAD@commons services are easily applied to the energy or the transportation domain for analysis and knowledge extraction. This perspective will be assessed during the course of the project and will be actively pursued after its end through a small-scale R&I effort aiming to rapid commercialization.

# 2.5. Water demand management & pricing strategies

## 2.5.1. Description

DAIAD@utility is a collection of services which extends DAIAD@commons to address the specific needs of water stakeholders in order to exploit, design and validate their Water Demand Management (WDM) strategies. It provides facilities to integrate and manage highly granular water consumption data, along with other relevant detailed data sources (e.g. demographics, GIS, weather data). It also supports analysis services offering expert users the capability to explore the hidden correlations of the parameters that shape water demand strategies and water pricing. DAIAD@utility applies a what-if analysis framework for water management strategies, supporting novel and non-traditional pricing schemes. It also supports a two-way

communication among consumers and resource providers. In this way, the operator is able to offer targeted scenarios testing for specific populations, design a novel pricing strategy, inform the consumers, roll-out the new policy, and continuously assess its impact. Further, the operator is able to optimize the usage of the existing infrastructure capacity (i.e. rather use the existing pipe system more efficiently than extending it) and also receive valuable information concerning the location of leakages in the water pipes (i.e. difference between quantity fed into the pipes and the quantity consumed by specific users).

### 2.5.2. Foreground IP

In accordance to our Consortium Agreement, the Foreground IP for the DAIAD@utility is owned 100% by Athena RC. DAIAD@utility will be provided with an open source license. Therefore, all Consortium partners, as well as third parties, can freely use and extend all developed interfaces. Consequently, our exploitation schemes focus on three major pathways: (a) exploitation in the context of DAIAD system as a whole, (b) exploitation by extending, repurposing and (c) offering knowhow to interested parties.

### 2.5.3. Exploitation schemes

- *Commercial services for analyzing water consumption and overhauling current demand management & pricing strategies.* The DAIAD@utility is based on DAIAD@commons and provides software tools to WDM experts and stakeholders. These include services which facilitate the analysis, and the creation of sophisticated WDM models and pricing policies. Monetization could be based on custom-service development either as application or as a SaaS model.
- *Advanced analysis of water consumption by applying highly granular big data.* The DAIAD@utility can provide advanced and combinatorial analysis services by taking into account other data sources including data from geospatial, attitudinal and census repositories.
- *Consulting services to water stakeholders.* This exploitation scheme will be discussed with other water stakeholders. It involves consulting services for efficient management and consumption of water resources. It can be extended to other relevant stakeholders and providers in the energy domain.

## 3. Exploitation Plans

This section presents the individual exploitation plans of the partners. It contains a short description of each partner and its interest, as well as the opportunities the partner sees for exploiting results developed within DAIAD.

### 3.1. Athena RC

Athena RC is pursuing a research agenda with an emphasis on delivering tangible assets and reusable components for EU's data economy. Athena RC (through its Corallia initiative) is also an incubator for hundreds of small start-up and spin-offs, providing full support in all phases of their lifecycle. Therefore, the exploitation plan of Athena RC contains both strong research and commercial aspects. On the research level, Athena RC will transfer and adapt the big data management and analysis technologies in other data domains, where it has a strong research activity. On the commercial level, Athena RC will establish a spin-off company well before the end of the project in order to provide commercial-grade support for deploying DAIAD technologies in SE Europe. The company will provide a full array of services, ranging from consulting (e.g. water utilities, regional authorities) to developing custom extensions for DAIAD. The commercial activities will be spearheaded by a SaaS platform, which will provide data analysis services for water consumption data. Given the time frame of the project, this service will be available by 2015, and thus have a competitive advantage in knowhow, and a sizeable head-start for establishing a successful business activity on data analysis services for water consumption.

### 3.2. Bamberg University

Bamberg University is the leading house of the Bits to Energy Lab, which focuses primarily on the combination of Information and Communications Technology (ICT) and behavioral sciences to trigger energy efficient behavior. It uses its expertise to contribute to the exploitation activities in the following fields: Research, support of start-ups and policy makers, and teaching.

Bamberg University contributes to the research fields of information systems, energy informatics, and behavioral economics by releasing DAIAD results concerning behavioral change, IT adoption, self-tracking, Gamification, and IT-usage (continuous usage). The research team has planned to publish at least six papers at high-standing international conferences (such as AMCIS, ICIS, ECIS, CHI, and UbiComp) and to submit four peer-reviewed, top-tier journal articles on the project results in the course of the project. Especially, the topics related to "the Quantified Self" and "IT-induced behavioral change" are of interest to the team. For example, in the context of DAIAD, the team develops a scale for measuring self-tracking attitudes/motivations and conducts a large-scale study on the effects of real-time feedback on resource consumption.

Fruitful cooperation in the consortium entails additional partnerships in future projects for promoting energy efficiency and water conservation. The acquired knowledge throughout the international cooperation (especially with Amphiro AG) conduces to support students and young entrepreneurs to find and accelerate the growth of start-ups in the clean-tech domain. All experiences drawn from planning, development, execution, testing, pricing, and commercializing activities (e.g. via Kickstarter campaigns) will be passed in the form of mentoring and concrete cooperation. As an example, in 2014, the Bits to Energy Lab organized a start-up contest for entrepreneurs with innovative ideas supporting sustainable and efficient use of energy and resources during the D-A-CH conference “Energy Informatics”. The D-A-CH initiative on smart metering represents a community for scientists, policy makers, and practitioners. The yearly conference “Energy Informatics” offers an excellent exchange platform for all participants. Bamberg University and the Bits to Energy organized the conference in 2014. Bamberg also advises policy makers on high-impact projects, e.g. within the new impact assessment on a nation-wide roll-out of smart meters for the Swiss Federal Office for Energy (BFE – Bundesamt für Energie).

Moreover, the project results serve as input for several lectures in the energy informatics field. Two new master’s and bachelor’s degree courses integrate insights from the development phase and the trials. For example, the course uses anonymized DAIAD data for case studies in the course “Smart Grid Data Analytics” for master students. The course “Energy efficient systems 2”, which focuses on teaching statistical methods and machine learning techniques for time series data, profits from the availability of data from DAIAD in several course modules, including outlier recognition, cluster analysis, classification, association analysis, and regression analysis. Furthermore, experiences and research results concerning the design of persuasive interfaces (localized and analytical feedback) provide input for case studies and exercises in the bachelor’s level course “Foundations of Energy Informatics”. Insights from the project will also be exploited for seminars and final theses. DAIAD results also serve as input for projects, workshops, and presentations aiming at recruiting prospective computer science students (high school student programs, “Bamberger Tag der Informatik” – Bamberg Informatics Day). DAIAD also supports programs specifically tailored to convincing prospective female students consider a technical fields of study (“Mädchen und Technik” – Girls and Technology workshop).

### 3.3. Amphiro AG

Amphiro AG is a clean-tech start-up that develops and markets micro-generators and self-powered feedback devices for the sanitary faucet and fittings market. Its energy-autarkic devices make it possible to integrate sensing and communication technologies without expensive external power supply and high-maintenance batteries, thus allowing for ICT-functionality in mid-priced faucets.

Currently, Amphiro uses its sensors and micro-generators primarily in products that promote sustainable resource usage. An RF-enabled version of the consumption feedback device termed “amphiro b1” is currently being developed within DAIAD. This self-powered, networked water meter can measure and communicate data on individual extraction processes. It has been designed specifically for shower applications. Together with a smartphone application that receives the data, it can provide feedback to users and forward the data to home automation systems.

Major exploitation activities include the strengthening of existing customer and business partner relationships. Currently, several major utilities consider conducting “amphiro-enabled” saving campaigns for their customers. As an example, the Public Utility Board of Singapore will use a current intervention planned within DAIAD. The large pilot that is under way may lead to another project with a network-enabled variant of Amphiro and to an interactive energy saving campaign.

Beyond concrete applications of amphiro b1, DAIAD allows Amphiro to discover new fields of application and test environments for their generators (with the goal of improving the expandability). The planned trials will help to promote an installation of Amphiro’s devices in countries where Amphiro lacks experience or market access such as the UK and Spain. Furthermore, DAIAD opens the possibility to Amphiro to acquire new partners (e.g. utilities) for new projects that again serve as test bed for future roll-outs. A crowd-funding campaign on kickstarter (more information in Section 4.5) that has been supported by Bamberg University and Waterwise helped to fund new features of amphiro b1. The campaign also served as entry point to finalize a deal with a large Dutch utility that purchased b1 for a water and energy efficiency campaign in the Netherlands.

Throughout the project, DAIAD increases the international attention drawn to Amphiro and supports the optimization of the product range. Amphiro gains positive feedback and support from other initiatives; recent achievements include the nomination of Amphiro AG for the GreenTecAward 2015 (European’s largest clean-tech award) in the Top 3 of the category “Energy”.

### 3.4. Fraunhofer

Fraunhofer is a research institute with a strong focus on technology development and innovation on the one hand and political means for the promotion of these innovations in favour of economic, ecological and social development on the other. From this perspective, knowledge gained in this project will be exploited scientifically, commercially and on the policy level. On the science and research level, knowledge collected in the project (especially the evaluation of the user trials and the model building) will also increase Fraunhofer’s competence and, by communicating the results at conferences and via journal articles, will further increase reputation for this type of work. From the commercial perspective, this increase in knowledge and reputation will enable Fraunhofer to engage in more projects of this type and help the respective clients to introduce a more effective and more sustainable Water Demand Management. Eventually, Fraunhofer will use the gained experiences to support policy makers in solving (on the national or EU level) challenges arising from non-sustainable water use.

From the current perspective, the following activities addressing conferences and journals are planned with regard to the different perspectives in order to present the project, its approach and first results. A presentation of the DAIAD approach to integrated water resource management and its application in practice is planned at the international conference on “Integrated Water Resource Management” which takes place in Karlsruhe (Germany) in November 2015 and addresses scientists as well as stakeholders from policy and practice. A presentation on the Biennial Conference on Environmental Psychology is planned in order to present the research project and discuss ongoing psychological studies within the project. With regard to stakeholders from policy and practice, an article for the journal of the German Association for Gas and Water (DVGW), which is the main association of water suppliers in Germany, will be written and

submitted. This journal covers various topics, including practical water supply issues and information concerning technical and other innovation in the field. With regard to the scientific community, an article within a psychological journal (e.g. Journal of Environmental Psychology) is planned for submission.

### 3.5. Waterwise

Waterwise intends to exploit the project outcomes through practical implementation. Knowhow from the social media aspects of DAIAD will influence and inform other large scale participatory water efficiency projects. DAIAD sensors and software will be used to improve the cost effectiveness of future water efficiency interventions. Furthermore, the data gathering opportunities afforded by DAIAD will be exploited to identify the most effective water efficiency interventions. Waterwise has already discussed the planned project outcomes with ten of the UK water companies and is looking at ways the outcomes can be exploited to deliver water sector targets around per capita consumption. We have been asked by the UK water sector to arrange technical seminars around two specific areas of the work relating social networking, the use of sensors and software to provide data feedback to customers. A number of UK water companies are interested in using elements of the project design to run their own local pilots. We have also had information requests from a number of water utilities in the Gulf States and we intend to engage with other European water undertakers through European Federation of National Associations of Water Services (EurEau) who have asked us about the DAIAD project. Waterwise is also interested in using the project outcomes to develop spin-off customer facing applications relating to whole-house water use and product labeling in association with the Alliance for Water Efficiency in the USA and SmartWater Mark in Australia.

### 3.6. AMAEM

AMAEM intends to exploit the project's results in multiple areas, time frames, and applications. In particular, the project's WDM and pricing policies will be directly considered for implementation in the Alicante region. The software tools developed within the project for analyzing water consumption will be instantiated with actual data for the city of Alicante and evaluated for actual deployment and production use. The experience gained from experimenting with ICT and data-intensive technologies will be applied in the future plans of AMAEM to manage and exploit the information from smart meters, and modernize its billing reports through a web interface.

Water Demand Management, in particular, is a strategic issue for Aguas de Alicante in its context of water scarcity and strongly seasonal demand. The results of the project will be used to assess the current WDM policies and consider alternative ones.

Water Demand Prediction, resulting from the Big Data analysis of consumption will also be a highly valuable output for the company. This aspect is fundamental both for short and long strategies, including network operation, energy efficiency, infrastructure planning, and management of hydraulic resources.

Finally, AMAEM expects to get a novel insight of the customer's requirements and information needs, which will be applied in the company's communication channels: website, online billing, and customer applications. The project should be a starting point for a renewed relationship with our customers, in which the consumer plays a central, active role thanks to its capacity to make informed decisions.

## 4. Exploitation Activities

This section presents a detailed portrayal of the activities that will be held towards the exploitation of DAIAD results. These activities incorporate arrangements for further advancement and exploitation as the project progresses. Therefore, the presented exploitation activities can be adjusted, after advances in research, innovation and experience gained from the trials. Also, changes can be extended due to emerging market opportunities.

As a consequence, this section generally serves as a starting direction towards the exploitation activities throughout the project. At the point when noteworthy advances come up in the expected exploitable results which might likewise influence exploitation activities, we will overhaul the substance of the section to report the respective actions.

### 4.1. Open source

The heart of our exploitation plan is the availability of most technologies produced within the project through an open knowledge license, enabling royalty-free use and reuse. For this purpose, all software developed by the project will be published with an open source license (EUPL, or a compatible), while research results, content and data will be published under a CC-BY license.

The availability of the project's technology through an open knowledge license can accelerate adoption from citizens and stakeholders, introduce immediate pathways for commercialization, and ease real-world applications. Anyone will be able to freely use, extend and (re)produce similar products and services, driving costs down, promoting innovation, and building up technology adoption. This can also lead to low cost (re)production of DAIAD sensors and displays, integration in existing offerings (e.g. monitoring, faucets) and increased marketable water monitoring solutions. In this manner, we succeed in maximizing the awareness among the relevant communities, creating a market for real-time water monitoring solutions and products, educating the water stakeholders and the industry, giving shape to a new ecosystem of products and services.

Open-source based exploitation is a valid business model for software, being applied across various multi-billion domains and industries. It is especially appropriate and successful for new, disruptive technologies as a means to increase user/developer base. Monetization can follow a number of options, such as custom development, dual licensing, SaaS, and support/SLA contracts.

### 4.2. Market Monitoring

Market monitoring is an important instrument for setting directions to the activities of the project towards the exploitation of its results.

An initial market overview of current practices, technologies and service offerings with respect to water monitoring solutions and water demand/pricing strategies was established through the deliverable D1.1

“State of the art Report”. We have identified the following markets and fields related to the project activities:

- *Water sensing technologies and practices.* Water sensing technologies are established in domestic environments. A market perspective includes Smart Home domain which incorporates future domestic application fields of ubiquitous computing that are connected with each other.
- *Interventions and Interfaces for water consumption.* A thorough description and insights were presented regarding feedback and stimuli to convey water consumption in the household and fixture levels.
- *Big Water Data Management and Analysis.* We introduced water consumption data and analysis approaches in the Big Data landscape.
- *Water Demand Management.* We presented the determinants of water demand and an overview of the most recent and relevant large-scale trials of smart water metering technologies.

The market will constantly be monitored throughout the progression of the project to identify competitive and complementary technologies, trends, business and knowledge transfer opportunities.

### 4.3. Project adjustment

With the specific end goal to verify that the project results will be ideally exploitable, any important adjustment will be deliberately connected with the project's research and development directions. In the meantime, we will persistently monitor the market and assemble feedback from users, relevant communities and stakeholders. Adjustments will likewise propel water use and reuse by active users and water utilities, present novel supply/demand water administration procedures and ameliorate existing pricing models.

To be closely related to the market, we officially incorporated into RF modules BT4.0 which focuses on low energy utilization and enhancements regarding association time. Amphiro b1 with BT4.0 RF abilities is in a pre-commercialization state, with promoting activities performed from M10.

To expand the potential impact and exploitation opportunities, the research directions of the project can be effectively versatile. Such decisions will be handled within the project management procedures and if assessed as important will be further discussed with the EC Officer.

### 4.4. Economic benefits

For all exploitation opportunities, we will explore the conceivable economic benefits and expected effects of the research results, over all included business areas. Likewise, it is fundamental to contemplate potential venture investments from the inclusion of DAIAD outcomes in new products and services over all potential business area zones.

An additional objective will be to figure indicators in light of the trials. From the appraisal of trials, we will compute quantifiers of water resources utilization, which can be likewise stretched out to the energy domain, and will spur active users towards custom utilization practices.

## 4.5. Crowd-funding

An alternative for the exploitation of DAIAD's outcomes is to apply a rising option of financing, i.e. crowd-funding, which gives access to financing directly from customers. The crowd-funding model has been effectively applied for various novel ICT products (e.g. Oculus VR). Crowd-funders are motivated to take part into funding schemes with a combination of: early access to the product, special limited-edition versions, free access to cutting edge capabilities, public acknowledgements. On the other hand, the main spark is the actual belief of crowd-funders in the vision of the inventors and potential impact of the product.

A small-scale crowd-funding campaign has already been successfully concluded during the first year of the project. During the one-month kickstarter campaign, Amphiro reached not only their funding goal of 20k, but managed to raise 30k from supporters. Several pledge options (funding schemes with different conditions) have been tested and extensive press coverage attracted 232 supporters. The supporters comprise consumers, researchers, and utilities from all over the world. The strong interest and support experienced during the campaign underlines the relevance of DAIAD and supports Amphiro in mass-producing the new product variant b1 with Bluetooth connection and a first application for iOS and Android.

A larger crowd-funding campaign is anticipated for the later phases of the project (during Trial B), in order to explore the capacity of social development in funding and applying novel water monitoring technologies. We will request consumers to pledge an amount of money with the aim to seed 300K for manufacturing of DAIAD-compatible domestic water equipment.

If the crowd-funding campaign winds up successfully, a spin-off before the project end will be established by DAIAD partners.

## 4.6. Open Water Monitoring Foundation

Another direction for the exploitation of DAIAD's outcome is the foundation of a non-profit organization which can safeguard and advance open knowledge and open technologies for real-time water monitoring and analysis. The founding members can incorporate all Consortium members and additional worldwide and EU bodies/NGOs (e.g. EEA, WWF). The Open Geospatial Foundation (OSGeo) which has led to the successful incubation and monetization of numerous open source projects for geospatial information can be followed as example.

The organization will serve as a foundation for the establishment of a cross disciplinary group of specialists, engineers and citizens and will support innovative work and development of open knowledge endeavours in water monitoring technological advancements.