A-WEAR PROJECT

A network for dynamic WEarable Applications with pRivacy constraints

Project no. 813278

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D1.2 Data Management and Quality Assurance Plan

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PP	Restricted to other programme participants (including the Commission Services)	
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Disclaimer

Acknowledgement of previously published material and of the work of others has been made through appropriate citation, quotation or both.

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Table of Contents

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List of Tables

List of Figures

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1. Executive Summary

This document comprises deliverable D1.2 Data Management and Quality Assurance Plan of WP1 Management Working Package. The document is prepared according to "H2020 templates: Data management plan v1.0 – 13.10.2016". In general terms, the research data is aimed to follow the 'FAIR' principle that refers to **f**indable, **a**ccessible, **i**nteroperable, and **r**e-usable data. A-WEAR will participate in the Open Research Data Pilot of Horizon 2020 and hence will make the research data publicly available.

This document is a living document in which information can be made available on a finer level of granularity through updates as the implementation of the A-WEAR project progresses and when significant changes occur. This document would be updated in the context of the periodic evaluation/assessment of the project if any changes appear.

2. Partners

This section provides a list of A-WEAR partners and corresponding abbreviations. We remark that the abbreviations are used here only for the sake of compactness, but they may not be affiliated with or reflect company's official abbreviation.

Table 2-1 A-WEAR Beneficiaries

Consortium Member	Legal Entity Short Name	Country
TAU Tampere University (formerly Tampere University of Technology)	TAU (formerly TUT)	Finland
UJI Universitat Jaume I de Castellon	UJI	Spain
BUT Brno University of Technology	BUT	Czech Republic
UPB University "Politehnica" of Bucharest	UPB	Romania
URC Universita Mediterranea di Reggio Calabria	UNIRC	Italy

Table 2-2 A-WEAR partner organizations

Partner Organization	Legal Entity Short Name	Country
NET Netcope technologies	Netcope	Czech Republic
CIT CITST	CITST	Romania
NXP NXP Semiconductors	NXP	Romania
WPS Wirepas	Wirepas	Finland
DLI Digital Living International Oy	DLI	Finland
BEIA Beia Consult International	BEIA	Romania
S2G S2 Grupo	S2 GRUPO	Spain
ERI Ericsson	Ericsson	Finland

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CPD City of Castellón, police department	-	Spain
IDOM IDOM Consulting, Engineering, Architecture S.A.U.	IDOM	Spain
SWO Sewio Networks	SEWIO	Czech Republic
T6E T6 Ecosystems	T6-ECO	Italy

The Working Package (WP) structure of the project is illustrated below.

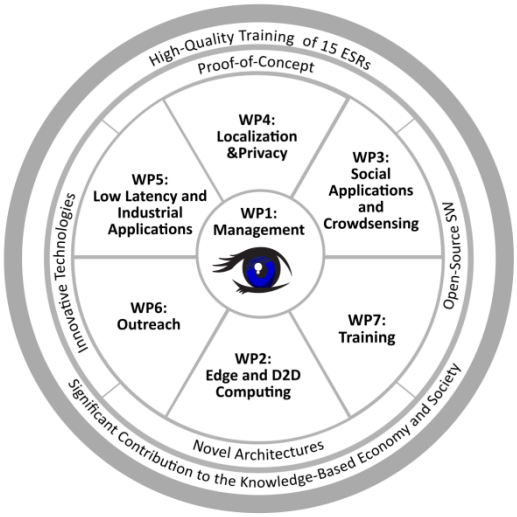

Figure 1 Working Packages in A-WEAR

3. Data Management Plan

A-WEAR is part of a flexible pilot under Horizon 2020 called the Open Research Data Pilot (ORD pilot). The ORD pilot aims to improve and maximize access to and re-use of research data generated by Horizon 2020 projects and it takes into account the need to balance openness and protection of scientific information, commercialization and Intellectual Property Rights (IPR), privacy concerns, security as well as data management and preservation questions.

3.1. Data Summary

3.1.1. Data Purpose

All technical WPs, namely WP2-WP5 (see Figure 1) will rely on various data types (simulated, measurements-based, etc.) in order to analyze, verify, test, and improve the developed algorithms and methods.

3.1.2. Data Types and Formats

The data will consist of software data developed by the (e.g., based on Matlab, C/C++, Python, VHDL, Java, Android OS, Wear OS, etc.), raw data measurements from the field experiments and testbed campaigns, mathematical and statistical models, and channel traces and context-awareness metrics in time, frequency or space domains. Data types can include multidimensional time-series, structured data, and unstructured data – such as image analysis, video analysis, audio analysis and machine generated data analysis. The data types specific to eHealth studies in WP3 will be electronic health records, clinical data based on HL7 standard, DICOM files.

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3.1.3. Data Re-using

Open-access datasets and other open-access data might also be used for the scope of A-WEAR research. The main open-access repositories that we plan to use are:

1. EU Zenodo repository (www.zenodo.org): it contains research papers, datasets with measurements, software tools (Matlab, Python, etc.), etc.
2. EU OpenAIRE (https://www.openaire.eu/) is the EU emerging repository for open science. We remark that the metadata records of the published data sets on Zenodo can be easily loaded into the OpenAIRE platform.
3. EU Open Data Portal (https://data.europa.eu/euodp/en/home): a repository of an expanding range of data from the European Union institutions and other EU bodies
4. Github repository (https://github.com/): it mostly contains software tools, but also reduced-scope datasets with measurements are available. Github and and Zenodo are tightly coupled and publishing majors releases of data in Zenodo from GitHub is trivial (almost automated).
5. Crawdad (https://crawdad.org/) is an archive for wireless datasets at Dartmouth university
6. ArXiv (https://arxiv.org/) is an archive of pre-print publications and unpublished work by research community in various fields (ICT, physics, mathematics, etc.)
7. Stanford Large Network Dataset Collection (https://snap.stanford.edu/data/#email) is a library of relevant datasets for research on large social and information networks
8. Kaggle (https://www.kaggle.com/datasets): it provides a large collection of datasets and models in various areas, such as health domain (e.g., physiological parameters), demographics, data visualization tools, etc.
9. CodeOcean (https://codeocean.com) is a collection of scientific codes (software) associated to papers published in IEEE venues, with the target of making the research results reproductible and reusable
10. UC Irvine machine learning repository (https://archive.ics.uci.edu/ml/index.php)
11. Finnish open data (https://www.avoindata.fi/en) is a repository of open data sets from Finnish R&D units, covering all vertical industries, such as smart cities, agriculture, energy, health, etc.
12. US government open data (https://www.data.gov/) is a huge repository of data, software tools, and other resources with the purpose to help the research in various areas and to develop web and mobile applications
13. Romanian government open data (http://data.gov.ro/) is a Romanian repository of open-access data collected from public administration institutions in Romania

All A-WEAR researchers will be highly encouraged to add all their publications (and other relevant material) on Zenodo, in addition to other institutional or personal repositories.

In addition to the above-mentioned open-access repositories, an open health data repository will be available soon (managed by the Finnish National Institute for health and Welfare), as an "Act on the Secondary Use of Health and Social Data" has come to effect in Finland[1] since 1 May 2019.

The available open-source datasets can be used in various manners, such as:

14. benchmark data to test the developed algorithms in A-WEAR;

[1] https://stm.fi/en/secondary-use-of-health-and-social-data

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15. benchmark unlabeled (blind) data to organize competitions in A-WEAR or other events (e.g., at IPIN annual events);
16. benchmark software codes to compare the developed algorithms with existing state-of-the-art from scientific literature;
17. benchmark calibration scenarios and parameters for the purposes of cross-validation;
18. PhysioNet offers free web access to large collections of recorded physiologic signals (PhysioBank) and related open-source software (PhysioToolkit).

3.1.4. Data Origin

3.1.5. Data origin at Beneficiaries

The data will be collected utilizing the hardware (HW) existing in the A-WEAR team, such as Arduino, Raspberry Pi-s, wireless sensor/actuator devices of various nature, RFID systems, Intel Galileo dedicated to medical devices, brain computer interface systems, and Artix-7 development boards, as well as software (SW) tools available on mobile devices (e.g. via Google play for Android devices) or developed by the A-WEAR team, software tools for network traffic analyses (such as Wireshark or similar), external open source software tools available online.

In order to attain A-WEAR objectives, large or massive wearable data might be collected through crowdsensing approaches for the purpose of social and consumer applications, such as eHealth and public safety (e.g., for studies in WP3). Crowdsensed data can be either stored/processed in the aggregated manner, or represented in a user-tailored form according to the target application.

The eHealth data used in our studies come from PhysioBank that offers a variety of medical signals and data. Also, some data come from different paraclinical investigation obtained from emergency hospitals of Bucharest based on signed protocols. During our future experiments, data collection will also contain information coming from the wearable healthcare monitoring systems that may consist of various types of biosensors. These sensors are measuring significant physiological parameters such as blood pressure, electrocardiogram (ECG), muscle electromyography (EMG), oxygen in the blood, body temperature and patient position.

Sensors found or planned on top android devices will be: Accelerometer, Gyroscope, Magnetomete, Barometric pressure sensor, ambient temperature, Heart rate monitor, Oxymetry sensor, Skin conductance sensor, skin temperature sensor, blood glucose, wrist force sensors, ECG. Some sports sensors (bicycle) will also be considered: speed, cadence, power, heart rate.

The cloud context-aware platform will be based on the UJI's experience in open sensor platforms for the smart city context. Crowdsourcing positioning data will be collected and used for reduced training efforts and for the study of the device-free localization methods (e.g., addressed in WP4).

Data origin for WP5 studies will rely on the different laboratory as well as field measurement campaigns, where the data will be collected via a variety of personal wearable devices (e.g. AR/VR glasses, smart watches, smart wristband, etc.) as well as industrial sensors (e.g. electricity meters, environmental sensors, etc.). The research will have to tackle the analysis of various data types including multidimensional time-series, structured data, unstructured data – such as image analysis, video analysis, audio analysis and machine generated data analysis.

3.1.6. Data origin at Partner Organisations

During the secondment the researcher might have access to data sets which are provided for commercial purposes and property of the partner organisations or the third parties. In these cases, the access rights

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and the use of the data for scientific purposes will be agreed separate. In any case, opening the data sets and supporting the researchers' possibilities to research and graduate will be targeted, as well as extend their skills for advanced career possibilities. Always, when possible these data sets will be opened to allow the maximum exploitation of the outcome of the action as well for further scientific purposes beyond the action as for the commercialization by the industry.

3.1.7. Estimated Data Sizes

The data sizes are expected to be on average below 100 GB of data/year), however occasionally huge amount of data may be captured via USRPs measurements with high sampling frequencies and such data can easily reach few snapshots of 100GB or more in size (e.g, hours of data collected at high sampling frequencies which might be relevant for the 5G studies of ESR4 may require in excess of several hundred GB of storage, also smaprtphone data such as gyroscope data, accelerometer data, WiFi and BLE data, etc. typically can reach about 150 MB/hour in uncompressed form).

3.1.8. Data Utility

The main bulk of generated data to be made available will be SW and measurements data. Sharing platform for the consortium data is the Microsoft OneDrive and the main sharing platforms for the open-source data to be created in A-WEAR are the EU Zenodo and GitHub. As parts of the university infrastructure at TAU, the vital components of hosting and sharing the data are expected to stay in place in the long term (i.e., minimum15 years after the project's end), thus ensuring continued access to the collected data.

3.1.9. Data sharing across the consortium

Data not containing any personal information and not raising any ethical concerns (e.g., such as simulated data) will be shared between the Consortium units on-a-need basis. The sharing of any other data types across the consortium will be based on anonymity of data. Where partners require access to data to enable a synthesis of findings across studies, this will be provided in strongly anonymized form only. We will comply with the EC Data Protection Directive[2] and its newer amendments[3] at all steps in our project and after its end.

3.2. FAIR data

3.2.1. Making data findable, including provisions for metadata

A-WEAR project will follow the EU FAIR data guiding principles in order to make it Findable, Accessible, Interoperable, and Reusable. A-WEAR goals are to follow FORCE11 FAIR data principles[4] where possible:

Metadata to be created within A-WEAR refers to any summaries and documentations about data to be produced within the project (measurements, SW, simulated data, analytical/mathematical model, etc.), publications, conference slides, workshop presentations, etc. Most metadata will be available through the

[2] Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data, Official Journal of the European Communities (23.11.95) No. L 281/31 – 39.

[3] EU General Data Protection Regulation (GDPR), http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.119.01.0001.01.ENG&toc=OJ:L:2016:119:TOC, accessed 09 May 2019

[4] FORCE11 Groups The FAIR Data Principles, https://www.force11.org/group/fairgroup/fairprinciples, accessed 10 May 2019

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project deliverables and open-access publications, as well as through the project dissemination channels (webpage, blog, Twitter, Youtube channels, etc.). We will be guided by the following FAIR principles:

In order to make the data findable in A-WEAR, the following procedures will be followed:

19. Clear version numbers will be used for the project deliverables.
20. The target publication venues of A-WEAR are open-access peer-reviewed journals and conferences, due to wide dissemination opportunities. Those are easy to access online and offer a simple keyword, author or DOI (digital object identifier) search through their homepages or publication search engines such as “sciencedirect.com” or “scopus.com”.
21. standard metadata generated for publications (Springer, SCOPUS, ISI, etc).
22. standard metadata for software on GIT.

3.2.2. Making data openly accessible

27 out of 35 A-WEAR deliverables are to be open-access deliverables. Relevant measurement data and simulation-based data generated within A-WEAR project will also be made available at least on Zenodo open-access repository, and possibly to the Beneficiaries’ relevant webpages. Relevant software codes developed with AWEAR will be made available at least on GitHub repository, and possibly to the Beneficiaries’ webpages. The **relevance** will be agreed upon by discussions within the Advisory Board of A-WEAR, by considering the following aspects:

23. the open-access data must be useful for the research community at large, e.g., by providing valuable benchmark solutions (SW, measurements, etc.).
24. the open-data might have a reasonable tradeoff between its size and its potential usefulness (e.g., huge datasets of radio frequency (RF) or intermediate frequency (IF) samples at high sampling frequency may be not relevant enough to be shared directly with the community or might not fit into the current upper size limits of existing repositories, but there might be made available on request to interested researchers).

The main target groups of the dissemination are the scientific community, the industrial stakeholders in wearables and IoT, the authorities and bodies responsible for development national and EU knowledge societies and digital economy, potential end users (including all population in contact with a wearable device, primary end users, public service personnel, etc.), high-school pupils (as the future users of wearables and current users of Internet), and persons developing multinational PhD and cross-sector trainings.

Several activities will be considered in A-WEAR to ensure that there is a clear way of communication between the ESRs and both the scientific and general public the target groups. The main goal of these activities will be to share results and more in general to create awareness of the importance of A-WEAR research themes to society and to raise awareness of the MSCA Actions aiming to follow FAIR principles.

A-WEAR will use 10 dissemination and outreach activities listed in Table 3-1 and conference and journal publications and workshop participation.

Table 3-1 The 10-step involvement in social media in A-WEAR, in addition to the project webpage

Additional dissemination activities besides webpage, scientific publications, conference & workshop participation, and patents. All ESRs will be involved in all these activities. One or two ESRs/task will lead the efforts	Lead ESRs
Webropol survey active all through the EJD where users and stakeholders will be free to share their concerns and challenges regarding the technology (on one hand) and applications (on the other hand) of wearables	1,9
Facebook open group for A-WEAR public awareness	10
LinkedIn open group regarding discussions in the areas of A-WEAR with **blog** posts on LinkedIn, including ESRs’ blog inputs on their experiences within the EJD (technical, social, experiences associated to mobility in other country, lesson learnt and	4,5

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best practices) with at least two posts/quarter	
Adding A-WEAR open-source measurement data on **open repositories,** such as EU **Zenodo, GitHub** or **Bitbucket** – Fellows 3 and 13 will be in charge with finding out the distribution terms for the open repositories, informing the other fellows of those and regularly reminding each of them to distribute their open measurement data through those repositories	3,13
ESRs will maintain a **youtube** channel with video clips and fellows testimonies related to the main topic of the project, providing lessons and general-purpose talks, to spread the relevance of the activities carried out in the network	6,14
Twitter 140-character postings with links to to results and elevator pitches	8
ESRs will attempt contact with **local mass-media** to spread the activities of the consortium, the Marie Curie Actions, and of individual activities	2,12
Each ESR will post his/her publications (at least the abstract) on **ResearchGate** and participate in the ResearchGate discussions related to A-WEAR topics	7
ESRs from each beneficiary will organize a **A-WEAR Open Day** (one per beneficiary) where general audience will be invited to visit the host facilities and create attraction to the conducted research activities & doctoral studies	11
Each ESR will commit to act as Marie Curie Ambassadors and visit **local schools and universities**, as well as **local councils**, exposing the activities and results of the network. They will give at least 2 public presentations per ESR within the 36 months of contract. The specific election of places to give the talk will be left for decision of the ESRs with the support of the nominated supervisors.	15

Research papers will be published as open-access by taking up self-archiving rights for journals and conferences that have them, or if necessary paying the open-access fees where self-archiving and or free open access is not possible. Also, online pre-publication in ArXiv will be recommended to fellows.

In addition, related to data accessibility, participants to the conferences where A-WEAR fellows will present their work will have a direct access to the information through oral presentations, posters and conference proceedings.

The A-WEAR webpage is hosted at TAU. The project will have a dedicated webpage aims to promote the ESRs' skills and progress in their career in order to be available for the best possible employment opportunities, the training network, disseminate the results achieved and announce the events organized within this project. This website will be supported by a set of static content pages (institutional content) and will integrate a more dynamic area, eventually adding a blog and making easy to any participant in the network to collaboratively update and create new content.

A-WEAR beneficiaries commit to make their results available in open–access as much as possible, through at least the followings: a) majority of deliverables in public access; b) publications via open-access option in IEEE and other publication forums; c) dissemination of results on open-forums such as ResearchGate, personal webpages, and open library pages (e.g., TUT has own open-access portfolios: Dpub and TUTCRIS, UJI publish the papers also on their webpages, etc.); d) less sensitive and privacy-preserving measurement data to be provided in open access.

The next European Researchers' Night will be organized on 27 September 2019 together with Europe and 11 other locations in Finland. During one day and night, visitors from all walks of life can take part in different kinds of workshops, panel discussions and exhibitions as researchers open their doors to the public. The A-WEAR researchers will participate the events yearly either as soon as possible talking about their work or visiting the relevant scientist. All events have been earlier very popular in Finland. They are organized in collaboration between the universities and research organisations and are free of charge.

The webpages of the partner organisations will be linked to the project webpage. The partner organisations are encouraged to refer the A-WEAR action in their professional or commercial occasions always when possible.

For cryptography-related papers free repository (https://www.iacr.org/eprint/) will be used.

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3.2.3. Making data interoperable

In order to make the data interoperable in A-WEAR, standard open formats will be used for storage. Additional metadata will be described and clarified. Proprietary software and language-dependent formats will be avoided where possible (e.g., during industrial secondments).

3.2.4. Making data re-usable (through clarifying licenses)

In order to make the data re-usable in A-WEAR, the following procedures will be followed:

25. The datasets will be typically shared under Creative Commons Attribution-NonCommercial 4.0 International License. Commercial licenses will be available upon request. Data is expected to be available as long as the service used for sharing data is operational. Data published in scientific journals in form of a journal article would be in open access.
26. We will encourage the use of the collected data in open challenges at dedicated conferences (e.g. IPIN annual open challenge on indoor localization).
27. We will include information how data were created and will describe experiment details.

A-WEAR team recognizes the importance of software licensing from the outset of the project, but given the uncertainty we have now of the potential value of such tools in the future, the exact licenses to be used in case-by-case situation will be refined through the project. This is because some of the created data may only be demonstrators or proof of concepts. Other type of created data, on the contrary, may be valuable tools to launch marketable ideas via starts-ups. Once we will have a clearer idea of what type of data will be produced by the ESRs during the project (e.g., only open sources tools, mix of proprietary and software tools, etc.), the DMP will be updated with relevant information. At this point, we are exploring the spectrum of licenses as a preliminary step based on the information found at https://choosealicense.com/.

Regarding the WP3 studies (eHealth domain), we mention that the interoperability of medical data is a key concept for the electronic health records by measuring the communication and cooperation capacity between different healthcare entities that allow the exchange of information through electronic health records or other medical information systems. The interoperability of medical data is realized by means of HL7 standard that assure automated conversion of information into structured data. Interoperability of medical data also mean interoperability with medical devices that capture (generates) medical information from medical sensors and different devices like Holter, ECG, MRI, ECOGRAF, etc., interoperability with emergency support systems, with other systems that can quickly and efficiently deliver the medicines needed for patients unable to move and interoperability of medical information by creating medical social media portals for physicians, where they can access studies, updated medical guides and patients records.

3.2.5. Data – related procedures at A-WEAR units

3.2.5.1. TAU

The public datasets will be archived and shared through the Research data storage IDA (https://openscience.fi/ida) and Research data finder ETSIN (https://openscience.fi/etsin) services provided by the Finnish IT Centre for Science (SCS) and endorsed by the Finnish Ministry of Education and Culture. In addition, the data will be promoted on the project web site, through relevant publications (with related DOIs and keywords) and through presentation in scientific and public events.

All the data collected during the subjective experiments will be anonymized and aggregated. The created test databases will be made available through web sites where applicable.

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3.2.5.2. UJI

The public datasets will be archived published in Zenodo and the IndoorLoc platform (http://indoorloc.uji.es) provided by Universitat Jaume I. In addition, the data will be promoted on the project web site, through relevant publications (with related DOIs and keywords) and through presentation in scientific and public events.

All the data collected during the subjective experiments will be anonymized and aggregated. The created test databases will be made available through web sites where applicable.

3.2.5.3. BUT

We will publish the data sets in Open data of the Czech Republic, https://opendata.gov.cz/. In addition, the project outputs (generic data, software, etc.) will be promoted on the project web site, through relevant publications (with related DOIs and keywords) and through presentation in scientific and public events.

All the data collected during the subjective experiments will be anonymized and aggregated. The created test databases will be made available through web sites where applicable.

3.2.5.4. UPB

UPB will have a local site linked to http://cs.pub.ro on which the collected data will be available. The data will be also promoted on the project web site, through relevant publications. Regarding ESR8 research, the collected data will be non-personal data (e.g. radio measurements).

3.2.5.5. URC

After the execution of any test, the resulting collected are analyzed for modelling, model verification or contribution purposes. The data collected during any subjective experiment will be anonymized and aggregated.

Data is then kept in personal computers with password security and open access for only the people involved in the study or co-authors of the relevant article for scientific purposes. The created test databases will be made available through web sites where applicable. The collected data will be disseminated through relevant publications (with related DOIs and keywords) and through presentation in scientific and public events. Publications will be available on the project web site and through other channels.

Should experiment involve external subjects supplying data (such as position, for example), although these data are anonymized, subjects are also informed to have rights to have their collected results destroyed if they wish by supplying the nick name they chose or the number they are assigned with.

3.3. Allocation of resources

The data will be prepared during regular working hours of the ESR. The data will be stored on OneDrive provided by TAU. No additional cost to the project is expected for the OneDrive repository. The costs for publications in Open Access journals can be between 1000 and 4000 EUR per paper and this will be covered by A-WEAR project allocated resources.

3.4. Data security

All data will be stored on secured password protected computers. Data will not be stored on unencrypted flash drives. For possible vulnerable data (such as the data regarding anonymous user traces and operator collected data) to be commonly used by several Consortium partners, a password-protected space on the project web server will be created and data will be stored in encrypted form.

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The sharing platform for the consortium data is the Microsoft OneDrive. As parts of the university infrastructure at TAU, the vital components of hosting and sharing the data are expected to stay in place in the long term, thus ensuring continued access to the collected data in a secure way.

Raw data collected from volunteers will only be retained for the lifetime of the research project and stored on OneDrive and password-protected computers according to the participants' information security policy. It will be stored unless explicit permission is requested and given by the research participants for an extension period (which may necessitate an appropriate consent form amendment).

All research participants will be informed of the nature and limits of confidentiality in accordance with the data protection and privacy legislation in the jurisdiction where the research is to be carried out. The web surveys to be organized within A-WEAR will be done with volunteers and fully consenting to fill in the web surveys and the data will be collected anonymously, and without storing the IP of the respondent (e.g., Webropol survey tool to be used in Dissemination activities has such an option). No data will be collected from children or vulnerable adults or any other person deemed unable to express his/her full and free consent.

3.5. Ethical aspects related to data management

Detailed description of the ethical aspects is given in deliverable D1.3 Collection of ethical clearance procedure and forms available at each beneficiary.

3.5.1. Wearables data of individuals

Making data anonymous and implementing privacy-enhancing mechanisms will require access to non-anonymized or weakly anonymized data at some point. In A-WEAR, all data sets used will come from informed and volunteer individuals and approved databases that will only be used for training purposes. Anonymity techniques will be implemented as soon as it is feasible and databases will not be shared between institutions.

Ethical assessment is a key component for the adoption of new medical technologies. Ethical problems resulting from the inherent risks of Internet enabled devices can appear due to the sensitivity of health-related data, and their impact on the delivery of healthcare. These issues can also come from that fact that devices range from single-sensor wearable devices to complex spatial networks capable of measuring and health-related behaviors for management of health and well-being. When talking about ethical issues concerning eHealth wearables, we call the ethics of devices and data. eHealth wearables are generally carried by the user at home, at residential care, workplace or public spaces. In each case, a door into private life is created, enabling the collection of data about the user's health and behaviors and the analysis. The lives of users can be digitized, recorded, and analyzed, creating opportunities for data sharing, processing and mining. That is why the privacy should be respected and ethical forms will be signed with all the individuals that will be involved in any experiments and medical reports.

3.5.2. Assessing privacy intrusion

In order to assess the acceptability and privacy intrusion of specific privacy-enhancing solutions, partners may choose to conduct surveys. For web surveys, the information will be collected anonymously and with full consent of the participants, on a volunteer basis. For in-person surveys, if any, information sheets and consent forms will be provided, storage of personal data will be avoided whenever possible and data with potential for re-identification will be safely deleted as soon as it is feasible.

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3.5.3. Webropol surveys

If qualitative methodologies are used, participants will be duly informed in writing of the nature of the research and their involvement, their rights during and after their participation and the final goal of the study. Data will be collected and stored anonymously, as Webropol survey tool has an option for fully anonymous data collection.

3.6. Other aspects

3.6.1. Issue register

The "Issue Register" is a log of any issue which arises during the course of the project, and will be maintained by the Project Coordinator on a separate folder on OneDrive. The Issue Register will collate any issue as it arises, issues will then be analyzed and escalated or dealt with accordingly.

An issue could be anything which is of concern to an ESR, beneficiary, partner, supervisor, etc., this could be deviations from the project plan, identification of new risks or just concerns.

For example it may be an issue such as Partner X is not responding to emails, this may be a precursor to larger problems which may impact on A-WEAR progress, therefore, as an issue is raised it may cause a trigger which causes a new risk to be identified and added to the risk register.

This register will also allow an additional tool for keeping track on the risks and means for responding immediately with mitigating activities.

3.6.2. Lessons Learnt Log

A lessons log will also be maintained by the Project Coordinator to record lessons generated out of the "Issues Register" and any other lessons from the project. The lessons log will categories the lessons for their significance to different parties and the stage in future projects at which the lesson log should be reviewed. The A-WEAR project lessons log will be available to all of the consortium members for ensuring that lessons learnt in this project may be applied to future projects.

As well the lessons Learnt Log will provide information relevant for realizing the significant results

- linked to dissemination, exploitation and impact potential of the outcome overall and the management and usage of data in particular, and
- with significant immediate or potential impact in science or industry.

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4. Quality Assurance Plan

Internal quality assurance (QA) of all deliverables will be carried out prior to submission to the Commission. First of all, each deliverable gets assigned of up to two internal reviewers. To that purpose, a draft copy will be delivered to the internal reviewers one month before its due date for comments on technical as well as formal quality.

The reviewer has specific responsibility for providing feedback to the lead authors on more detailed quality assurance in terms of presentation, quality of writing, consistency, clarity, etc. Reviewing will be done by using the reviewing form, provided in Annex 1, in order to ensure consistency in the reviewing process.

At the same time, draft copies of deliverables will be circulated electronically to all partners for additional comments. Review forms and comments are to be sent in the agreed way within a maximum of two weeks to those responsible for deliverables, which gives the latter one week correction time before the final version is delivered to the PC team and submitted.

External quality assurance is to be gained from the various contacts within the advisory board, during the dissemination moments, and with the various other contacts that will be established, including any ongoing and future academic and industrial collaborations. For the appointed external advisory board member, one week of reviewing time will also be granted, and one week of revision time for the deliverable authors.
In addition, as ESRs will publish in peer-reviewed open-access publication channels, the peer reviewed papers are a reliable quality check.

The impact from the representatives from industry during meetings or public/professional presentations, etc. or the possible implementation of the outcome as a part of the product development of the partner organisations will also prove of the good quality of the outcome

4.1. Project Coordinator Involvement

Project coordinator (PC) team is officially responsible for sending all deliverables to the European Commission for the evaluation process. It cooperates with the deliverable leaders and Training and Project Manager on all relevant matters to ensure the quality of the project's deliverables. PC receives (in cc) the deliverables for peer reviewing from the respective responsible party followed by the results of peer reviewing from each assigned reviewer. Finally, PC receives the confirmation of the satisfactory implementation of the recommendations.

PC team should send reminders and alerts in due time to the responsible parties in order to remind them the deadlines for the delivery submission and the procedure to be followed within the quality assurance phase. PC team receives the deliverables for peer reviewing from the respective responsible partner and organizes the quality assurance procedure. If necessary, OD team is also in charge with

28. Compiling the related peer review reports with recommendations or, if necessary, sending the deliverable to another partner who will be in charge for peer reviewing.
29. Delivering the results of peer reviewing to the deliverable author and other beneficiaries.
30. Verifying the satisfactory implementation of the recommendations of the peer review report, in co-operation with the responsible partner.

PC team is also responsible for keeping track of the reviewer's assignments and storage of the related data.

4.2. Review responsibilities and process

A deliverable is sent by the responsible person 15 days prior the deadline for any comments and revision.

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The compiled peer review report (if any major comments) is sent to the relevant author(s) within 7 calendar days. If no major comments, the minor comments are provided via telco or email to the responsible person.

The Author(s) of the deliverable, in cooperation with the other partners (if applicable), carries out the required improvements with the highest priority, and sends it back to the project coordinator team within a further 5 calendar days.

4.3. Simplified quality assurance procedure

In order to achieve the QA, each reviewer will provide his comments either in a free form or with track changes on the deliverables or by filling the form given in Annex 1.

The reviewers will keep in mind the following questions when reviewing a deliverable:

1. are the objectives/goals of the deliverable clearly presented?
2. does the work include references to relevant material and literature? (if applicable)
3. is there sufficient detail in all areas?
4. is the information technically sound?
5. are the findings clear and well argued?
6. does the deliverable provide inputs as expected for the subsequent work?
7. is the information clearly presented?
8. is the work cohesive and consistent?
9. is the writing style appropriate?
10. is the graphical content appropriate?

4.4. Risk management

TAU as coordinator is in charge with the risk management procedure. Each partner has the responsibility to report immediately to their respective WP leader and to the PC any risky situation that may arise and may affect the successful completion of A-WEAR objectives. In case of problems or delays, the AB will be consulted and it may set up task forces in order to take the necessary actions. In case there is no resolution, the PC together with AB will establish mitigation plans to reduce the impact of risk occurring. Table 3.2c shows the implementation risk analysis.

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Table 4-1 Implementation risks and mitigation procedures

Type	Risk No.	Description of Risk	Probability / Impact	WP No	Proposed mitigation measures
Technical	R1	Input measurement data is unavailable in research literature at the time when mathematical modelling work has to start	High/Low	2	Conduct own measurements in BUT-TAU LTE test network similar to how it was done in http://wislab.cz/our-work/lte-assisted-wifi-direct
	R2	Scarce availability of off-the-shelf devices for implementing& testing real use cases	Low/ Medium	2	A-WEAR team has a wide expertise in the implementation of simulators and testbeds in order to overcome the considered issues
	R3	Insufficient crowdsensed data in WP3 studies	Low/ Medium	3	Collecting data through all A-WEAR units as much as possible; using analytical models & existing open-source data to supplement the missing measurements
	R4	Standardization efforts in wearables is highly dynamic; new emerging standards may rely on privacy assumptions we have not considered	High/ Low	4	Actively following the standardization efforts in wearables, IoT and future wireless communications in in order to adjust the hypotheses and project work accordingly.
	R5	Noisy mmWave and industrial data or inappropriate data format, not suitable for machine learning analysis	Low/ Medium	5	Collecting data through all A-WEAR units in both supervised and unsupervised modes from very beginning of the project; supplementing unavailable data with statistical models; discussing with industrial partners for finding out suitable/standardized formats
	R6	Some of the envisioned tasks may require collaboration with experts in other fields (user experience, control theory, SW engineering, etc.)	Medium/ Medium	5	Utilize the rich contact network of the consortium units to seek prompt advice in complex matters related to other fields of knowledge; proactive role of AB in providing timely feedback on tasks planning and completion
Administrative	R7	Integration problems in building the SW and HW platforms	Low/ Medium	2-5	A-WEAR team has a wide expertise in SW, HW and SoC and active discussions and feedback from AB will help to overcome the problems.
	R8	Delays in recruitment process	Medium/ Low	1-7	The positions will be actively advertised through various channels, in addition to the joint network links of all partners
	R9	More than 36 months needed to complete the double/joint PhD degree	High/ Medium	1-7	Each beneficiary commits to ensure all needed resources in terms of funding & supervision to allow the ESRs to finish their joint/double degree.
	R10	Potential problems in leading a consortium of 17 partners	Low/ High		PC has worked successfully before (projects, publications,…) with 47% of the 17 A-WEAR units; PC has experience in leading large national Consortia and she gets strong support from TAU Research Services (having great experience in ITNs and EU projects) to address promptly any issues that might appear
	R12	Scientific misconduct	Low/ Medium	1-5	Termination of contract and recruitment of replacement
	R13	Some industrial partner going bankrupt	Low/ Low	1-5	Replacing the industrial secondment unit with new industrial partners, suitable to the addressed objectives.
	R14	Topic divergences from the scheduled A-WEAR network events in table 1.2b	Medium/ Low	7	If some of the forecast lecturers are not available, we invite new lecturers to cover in a comprehensive non-overlapping manner the core topics

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Annex 1 Reviewer form

Task Number	XX	Date submitted for Review	DD/MM/YYYY
Responsible partner	XXX	Date returned	DD/MM/YYYY
Main author(s)	A AA and B BB		
Reviewer	C CC	Date	DD/MM/YYYY

Measurement classification is as following: 1 – Not at all; 2 – To a limited extent; 3 – Satisfactory; 4 – Good; 5 – Excellent; "N/A" – Not applicable.

#	**Quality criteria**	**Evaluation**						**Comments (if any)**
		1	2	3	4	5	N/A	
1	Are the deliverables' goals clearly stated?							
2	Does the work include references to relevant material and literature?							
3	Is there sufficient detail in all covered areas?							
4	Is the information technically sound (if applicable)?							
5	Is the information clearly presented?							
6	Is the writing style appropriate?							
7	Is graphical content appropriate? (if applicable)							

Additional comments: (to fill as many as needed)

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