Cross-platform **O**pen **S**ecurity **S**tack for **Con**nected Device

D7.2 Data Management Plan

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List of Acronyms

Abbreviation / acronym	Description
D7.2	Deliverable number 2 belonging to WP7
DMP	Data Management Plan
DoA	Description of Action
EC	European Commission
GDPR	The General Data Protection Regulation
IPR	Intellectual Property Rights
MS	Milestone
M*N*	Month *N* of the project
OSS	Open-Source Software
RDM	Research Data Management
SME	Small and Medium-sized Enterprise
TRL	Technology Readiness Level
UC	Use Case
WP	Work Package

Executive Summary

This deliverable reports on the activity of task T7.4 on research data management, ethics, and gender policy. Particularly, it reports on the first version of the DMP, ethics integrity considerations, and gender dimension in the project.

CROSSCON is a research and innovation activity project with a strong technical focus and scope on low-level IoT device platform specification and APIs. The targeted TRL of the project's prototypes is at TRL 4 – technology validated in lab environments – without any need for integration with end-user operational environments. As such, it has a rather limited scope of data management, ethics, and gender dimension, but sill these aspects are considered in the project to ensure completeness and transparency toward project implementation.

Personal data processing is exclusively focused on events' (co-)organisation and mailing list creation for the newsletter or other community and stakeholders' outreach activities. Following the GDPR requirements, user's consent will be the legal basis for personal data processing. These are standard consent forms and information sheet procedures (and text formulation) already in place and in use by the coordinator's and consortium members' systems.

The main pending aspect of the DMP for the first half of the project will be the identification of potential datasets of importance to the open-source and open-specification hardware communities, based on the planned validation of the technology in use case-related testbeds. While these datasets will not contain any personal data but rather low-level IoT device platform data from synthetic testbed environments, the valorisation and provisioning of these datasets to the community will be the focus of the next release of the DMP in D7.3.

Since CROSSCON is a research-oriented project across academia, SMEs, and industry, the research integrity principles underlined by the commission (reliability, honesty, respect, and accountability) will be followed for all publications and reporting activities to the EC. It is a joint effort between the consortium members and the project coordinator to minimise and avoid possible breaches of research integrity such as plagiarism or unfair reproduction or use of material.

Finally, although the project's work plan and research activities are primarily focused on technical (low-level) development, specifications, and APIs of the CROSSCON solution, the consortium will explore potential gender-inclusive design and validation activities of the project. In addition, training and capacity building activities will consider women's participation with the aim to increase awareness and foster gender balance in the domain of the project.

1 Introduction

1.1 Purpose of the document

CROSSCON is a research and innovation action project that focuses exclusively on developing a technological solution to address cyber security issues in open-source and open-specification hardware platforms for connected devices. The solution will be delivered at TRL 4 which does not require any real end-user environment or data from pilots but technology validation in lab testbeds. Consequently, the project has a limited scope on ethics, data management, and gender dimension in research and development activities. However, specific provisions and reporting on these aspects are defined in the work plan to ensure transparency and adherence to the extent possible.

This document is the first version of the DMP of the project. It identifies the scope of persona data processing, the type of research data outcomes expected in the project and particularly per WP, the research integrity principles and the collaborative effort and responsibilities for that, and the gender dimension and effort towards considering women's participation in relevant project activities both technical and training ones.

1.2 Relation to other project work

The document has a relation to: *i)* WP2 on the design activities of the CROSSCON solution and its APIs, regarding potential gender-inclusive design aspects, *ii)* WP5 on the validation activities of the CROSSCON solution through UCs, regarding identification of potential valuable datasets from experiments, and *iii)* WP6 on training and capacity building activities, regarding support and fostering women participation.

Finally, a second version of the DMP is planned in D7.3 to report on the final provisions identified and agreed upon for the dataset's generation, gender dimension adoption, and research integrity conformance in the project.

1.3 Structure of the document

The document is structured as follows. Section 2 describes the scope and foundation of the project's personal data collection. Next, Section 3 details the research data management in the project and the expected outcomes from the project activities. Section 4 defines the research integrity aspects and activities to be collaboratively performed by consortium members. Next, Section 5 outlines some of the main aspects of consideration of gender dimension in project activities. Finally, Section 6 concludes the document.

2 Personal Data Collection

The CROSSCON project will not collect or process personal data for its development, implementation, and validation activities. However, the project may collect personal data such as name, email address, role, or affiliation as part of its website, mailing list(s) for the project newsletter, or as part of event organization activities. It is worth noting that the project will not collect any sensitive personal data such as religious, health, political, or any other similar information throughout its activities. The legal basis for the collection and process of such personal data is based exclusively on the consent of the data subjects for the purpose and scope of data collection. The retention period of personal data collection will be at most until the end of the project. All personal data will be deleted or fully anonymised afterwards.

Whenever applicable, the project activities will always include participant **Information Sheet** and **Consent Form**, implemented concerning the collection, storage, and protection of personal data. Such consent will always be requested in accordance with the GDPR, either through a registration web page, through a document signature (if in presence), or by email if other means are not possible or practical. Participants will be informed about the voluntary nature of their involvement as well as their rights to withdraw and delete their personal data and any data pertaining to their participation at any time.

All personal data collected will be stored in relevant files and protected by means of encryption and controlled access on a need-to-know basis. A consortium member who organises an event or any activity that involves personal data collection in any form will be in charge (as a data controller) for the processing and protection (including retention) of personal data in compliance with national and EU legislation.

3 Research Data Management

The DMP will encompass the research data management and datasets that will be generated by the project. In particular, the following data and information are expected to be gathered and handled along with the project implementation:

- Context data, coming from literature and publicly available data sets, to set the baseline knowledge of the project;
- Data from testbed implementation, concerning the performances of the solution designed in UC scenarios;
- Open-source codes and components.

So far, it has not been identified any need to collect personal data as part of research data management and development. However, in case any personal data e.g., device profile, names, user IDs, or any network or device IDs that may relate to personal data, are potentially collected during the project implementation, they will be handled, protected, and anonymized according to the GDPR requirements.

In Table 1 below, we list the research data outcome defined per WP and what type of data is expected.

Table 1. CROSSCON Research Data Outcome

WP	Research data outcome	Type	Personal data
WP1	Use cases definition, requirements, and validation criteria of the CROSSCON stack.	- Graphical, textual, and numerical representation.	No
WP2	Body of knowledge on design and implementation of trusted IoT applications through open specification, architecture, and design principles (incl. HW-SW co-design), and structure of certification manifest.	- Graphical, textual, numerical. - Technical diagrams. - API's formal annotation, formal specification,. - White paper(s).	No
WP3	Development and documentation of each of the CROSSCON stack components. Software implementation of each of the CROSSCON stack components.	- Technical documentation, algorithms, and diagrams. - Open-source software. - Implementation.	No
WP4	Development and documentation of hardware primitives, hardware security mechanisms, extension primitives for trusted services, and secure FPGA provisioning mechanisms. API specification for domain specific HW architectures. Development board FPGA implementation of HW/SW extension primitives.	- Technical documentation, algorithms, and diagrams. - API specification. - FPGA implementation open-source or specification.	No
WP5	Datasets from pilots and validation results of CROSSCON. Datasets regard security- and performance-relevant data collected from testbed-specific pilot trials and security testing of the CROSSCON stack.	- Security logs and events. - Other monitored data from IoT devices' SW and HW components (e.g., CFI measurements, HW performance counters, etc.).	No
WP6	Data from newsletter subscription, workshops, and events' organisation or	- Graphical, textual, numerical, and media representations.	Yes

	participation including synergies with other projects and initiatives. Data from collaborations including participants' data, discussion notes, and minutes.	- Blog posts, media posts. - White papers, - Web site analysis.	

3.1 Context Data and Public Datasets

CROSSCON has established an internal repository that is confidential to the consortium, where literature documents, needed for the project implementation, are collected and used by the consortium. Given the project is a Research and Innovation Activity project, and since the early months of the project, a number of research papers (articles related to the state of the art) have been used, internally shared, to position project activities.

Datasets from public repositories will be referenced and used in the project conforming to the rules and restrictions of the public repositories or authors providing the datasets. CROSSCON will use public datasets for the needs of its implementation or validation activities. As such, public datasets will be retained in the project for its duration and will be deleted afterwards, unless otherwise agreed upon in the next release of the DMP.

3.2 Pilot Testbed Data

Datasets (both raw or processed data), and any other relevant information generated during the pilot trials in WP5 (ref. Table 1 WP5) will be retained in the project's repository GitHub after its completion for a period of 3 years, according to current considerations.

In addition, selected datasets from the pilots can be published in repositories of open access such as IEEE DataPort or Zenodo, following a proper process of meta-data description, license agreements, and structure to facilitate reuse and adoption by other organisations and stakeholders.

To improve the discoverability of datasets, CROSSCON will adopt persistent and unique identifiers (e.g., DOIs, URIs, CURIEs) connected to a set of metadata describing an outcome and/or to the outcome itself. To enhance interoperability, the consortium will seek adoption of standard formats and vocabularies for metadata and dataset usage. Licences for data sharing and re-use will be provisioned as part of the IPR management. It will be prioritised and encouraged the use and adoption of permissive licenses for data sharing e.g., through Creative Commons, and Open Data Commons.

Finally, unauthorized access to the raw and processed data of pilot activities will be prevented by implementing tailored methods and procedures to limit access only to authenticated users according to their level of access to the data and role in the project e.g., distinguishing between project partners, linked third parties, external experts, etc.

3.3 Software and Artefacts Release as OSS

CROSSCON considers open source of utmost importance to accelerate the uptake of its novel stack solution, increase transparency, and help to attract additional contributors.

CROSSCON will thus make the software open-source to the relevant communities as early as possible and at latest according to the planned milestones (MS04 at M18, and MS08 at M31), using a major online platform such as GitHub. The consortium, as part of its exploitation plan, will define an appropriate license that maximizes the reusability of project results without hindering the partners' exploitation paths. Therefore, MIT, GPL or Apache-type licenses will be encouraged.

The consortium has already registered a dedicated CROSSCON account on the GitHub platform https://github.com/crosscon to publish software and artefact releases across WP2—WP5, to strengthen the findability and visibility of the results, and to leverage a wide community of developers.

4 Research Integrity

CROSSCON aims to generate a body of knowledge about IoT device security and assurance with a major focus on extensive research generation and dissemination to the community. Given that, research integrity forms an important part of the DMP of CROSSCON.

The European Code of Conduct for Research Integrity defines reliability, honesty, respect, and accountability as core principles of research integrity. CROSSCON aims to undertake these principles with each consortium member's employees involved in the project to achieve responsible research practices and high-quality research results. As such, CROSSCON aims to raise awareness among all consortium members that the first and most important instance of responsibility is the participating organisations themselves to make sure their employees and researchers act consciously and responsibly to minimise the risk of violations of research integrity including any form of plagiarism.

To achieve so, both public and private sector organisations (i.e., universities and SMEs) need to ensure the appropriate local policies, facilities, and procedures are in place to minimise and avoid possible breaches of research integrity.

CROSSCON defines two main levels of awareness and control of research integrity:

- At CROSSCON Project Coordinator (ATOS) as a project-level decision making of research quality control of "go" or "no go" for all documents of type deliverables before submission to the EU's portal regarding both public and confidential dissemination levels.
- At each CROSSCON consortium member (including the coordinator) for decision-making of research integrity control[1] of "go" or "no go" for any document or contribution to document of type deliverable, publication, position paper, white paper, etc., individual or collaborative, or any document of public nature with or without a peer-review process.

In other words, the project coordinator ATOS reserves the right to perform quality control and plagiarism control on any project deliverable it deems necessary before submission to the EC's portal to check compliance with the principles of research integrity, to the extent possible and visible to the ATOS's adopted tools of plagiarism control. While each CROSSCON consortium member is in charge of research integrity control and held responsible for the content the consortium member contributes to deliverables and any publications.

The project coordinator shall not be held responsible for others' contributions to deliverables even if ATOS has applied certain quality control procedures, but that remains the sole responsibility of the contributing organisations.

In that respect, it is worth noting that all CROSSCON members, except CYSEC, are EU-based researchers from countries covered by the GDPR and the European Code of Conduct for Research Integrity. While CYSEC, a Swiss SME, is under a similar level of code of conduct and research integrity principles[2].

As a project coordinator, ATOS aims to raise awareness of research integrity periodically, for instance at each GA meeting WP7 slot, to inform other consortium members of the principles of accountability, responsibility, and ethics in research. A similar level of periodicity and awareness are requested and expected to take place by each consortium member to their employees and researchers involved in the project.

Given the research scope and focus of the project, accountability and plagiarism control remains one of the main aspects to be paid attention to in this context.

[1] For instance, avoiding any copy or reproduction of material without proper citation or acknowledgement. Clearly identify new contributions from previous work cited or recalled in a document. Do not reuse or claim previous work as new contribution, and so on.

[2] For instance, refer to the Swiss National Science Foundation code of conduct and scientific integrity principles at https://www.snf.ch/en/aY67ewrkFZ6Ntmfp/topic/scientific-integrity .

5 Gender Policy

The CROSSCON gender policy aims at establishing specific provisions and considerations during relevant project activities such as stakeholders' outreach, community feedback, training, and capacity building. We have identified the role of gender in the assessment feedback on the training and usage of the security stack, trusted services, and mechanisms of CROSSCON. This will target specific gender inclusiveness in the selection of stakeholders and employees for the training and capacity building activities.

The policy identifies that all such activities in WP6 need to include or at least well consider the beginning of female participation and female feedback from such activities. While the gender balance will not be an exclusive target, the policy and the project coordinator will encourage and will provide further informative sessions on the participation of females in relevant activities under WP6 - Dissemination, Exploitation, and Impact Creation.

The policy also defines, since the project inception phase, five dimensions to be considered and reflected as part of a gender inclusivity perspective in the methodology for outreach, training, and community feedback: (1) motivation for using technology; (2) information processing style (selective vs. comprehensive); (3) self-efficacy (low, medium, high); (4) attitude towards risk (risk aversion vs. risk seeking); and (5) attitude towards tinkering (prefer vs. avoid).

The policy also encourages and considers gender inclusiveness as part of consortium members (employees) involved in different technical activities of CROSSCON. For instance, CROSSCON already involves female members in several of its activities such as UCs' definition (T1.1), requirements' elicitation (T1.2), and leadership of technical activities such as new trusted services (T3.3) and primitives (T4.1).

The policy also identifies the need to support and promote women in research and technology innovation. For instance, CROSSCON already contributed to the High-Tech Women (HTW'23) event where the principal investigator of UWU, Prof. Dr. Alexandra Dmitrienko, represented CROSSCON[3].

To increase the awareness in the consortium, the project coordinator will act as a gender inclusivity representative. The role is intended as a contact point for partners that are looking for information about gender inclusivity in the project.

The policy recommends the use of GenderMag[4] methodology whenever that fits the CROSSCON design objectives and scope. For instance, to increase gender inclusivity in the research activities, it is recommended to consider the following actions:

1. Consider GenderMag for the CROSSCON prototype design, and in the next revised version of the DMP at M24 (D7.3) include a section discussing if and how a gender-inclusive design was adopted. We open a note that given the low-level technical scope of the CROSSCON stack and its trusted services' APIs, the room for gender-inclusive design is seen as limited but still, the consortium will make an effort following the policy recommendation.
2. Whenever the CROSSCON prototypes are tested or validated with subjects (e.g., developers, researchers) we will ask partners to select a gender-inclusive group, to the extent possible, for relevant feedback. Furthermore, in validation-related deliverables (under T5.4), we will include a short section discussing the role of gender in the validation.

[3] https://crosscon.eu/events/high-tech-women-htw23

[4] The GenderMag methodology is an approach that aims to address gender inclusivity issues in user interface design. It involves using personas with diverse gender identities to evaluate interfaces for potential biases and design flaws, along with a checklist of common issues to look for. By encouraging developers to think critically about gender and its impact on user experience, GenderMag promotes more inclusive design decisions that consider a wider range of gender identities.

6 Conclusions

This document presents the first version of the project's DMP. The main goal of this first version is to define the scope and level of consideration by the consortium members on the different aspects of research data management, ethics, and gender dimension. Although the CROSSCON activities show limited scope for these aspects, still the consortium is committed to undertake these aspects in its activities to the extent possible and show transparency and conformance to those.

A second version of the DMP in D7.3 will report on the conformance of project activities to the scope, principles, and recommendations of this first version, on the results of dataset identification for the pilot evaluation activities, and on the results of research integrity and gender dimension achieved by that time in the project. The second version of the DMP will also serve and be used as a reference point for activities in the final stage of the project for CROSSCON validation, training, and capacity building.