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

D7.3 Data Management Plan Revised

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List of Acronyms

Abbreviation / acronym	Description
D7.3	Deliverable number 3 belonging to WP7
DMP	Data Management Plan
DoA	Description of Action
EC	European Commission
GDPR	The General Data Protection Regulation
IPR	Intellectual Property Rights
M*N*	Month *N* of the project
MS	Milestone
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 document presents a revised version of the CROSSCON data management plan (DMP), ethical considerations, and gender policy, as part of task T7.4. Particularly, this revised version inherits and consolidates all provisions from the first version, and adds two new provisions: i) a recommendation to technical work packages (WP3, WP4, WP5) to consider, to the extent possible or applicable, dataset release as part of final version of technical components with the aim to support evaluation, validation or reproducibility of components' functionality; and ii) a recommendation to the consortium to increase consideration of gender inclusivity in scientific and research activities.

The first recommendation will benefit comprehension and adoption of the CROSSCON technical solutions even at a low TRL, while the second recommendation will benefit alignment and contribution to relevant EU policies on gender inclusiveness. We explicitly note that gender inclusivity shall be pursued to the extent possible and applicable to the project nature and activities.

The focus of CROSSCON is on research, technology development and specification of a low-level secure IoT device stack and hardware mechanisms. Given the research nature of the project and the targeted TRL of technical outcomes TRL 4 – technology validated in lab environments, there are no workplan activities that involve end users and operational environments. As such, the scope of personal data processing, ethics, and gender policy is limited but considered to ensure completeness and transparency toward project implementation.

Personal data processing takes place but in a rather traditional context of events' organisation, mailing list management and newsletter, training, and stakeholders' outreach activities. Following the GDPR requirements, user's consent is the legal basis for personal data processing. Consent forms and information sheet are already in place and in use by the coordinator's and consortium members' systems for such activities.

Ongoing activities related to the DMP are on specification of datasets resulting from the CROSSCON development and technical artefacts' release, and on validation of technology in use case-related testbeds. We recall that no personal data is collected from such activities but only synthetic data. In the final reporting document under WP3, WP4 and WP5, a description and refence to available datasets will be provided.

Regarding ethics, the main applicable principle is the research integrity including honesty, respect and accountability (plagiarism-free) in all publications and reporting activities. There are already joint activities among the consortium members and the project coordinator to minimise and avoid possible breaches of research integrity such as plagiarism, unfair reproduction, or use of material.

As in the first version, this second version encourages any synergies with other initiatives to explore and consider women's participation in research and outreach activities, to increase awareness and foster gender balance in project's domain.

Finally, this second version of the project's DMP, adopts and revises provisions from the first version towards the final year of project activities, and is the applicable version of the DMP for the rest of the project.

This version reuses portions of text from the previous version across sections 1-5, whenever the same provisions apply. New revisions are introduced to Section 3, Table 1, Sub-section 3.2, and Section 5.

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 EU policies to the extent possible.

This document is the second 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 with the collaborative effort and responsibilities for these integrity principles, 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, WP3 and WP4 in the context of potential datasets, ethics integrity, and gender-inclusive participation in design, research and development activities of the CROSSCON solution, *ii)* WP1, WP5 in the context of gender-inclusive participation in requirements specification and validation 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.

This second version of the DMP reports on the final provisions for datasets consideration, gender dimension, 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 the main aspects of consideration of gender dimension and inclusivity 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 are 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 is 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 encompasses the research data and datasets generated by the project. In particular, the following type of data are identified to be handled along the project implementation:

- Context data, coming from literature and publicly available data sets, to set the baseline knowledge of the project;
- Artefacts release, open-source code, and whenever possible, dataset supporting artefact validation, performance evaluation or reproducibility of operation;
- Data from testbed validation, such as security test and validation scripts, and results of evaluation concerning the performance of the solution designed in UC scenarios.

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.

Table 1 lists the outcomes of research data per WP and type of data 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 the CROSSCON stack and services. Software implementation of each of the CROSSCON stack components and trusted services.	- Technical documentation, algorithms, and diagrams. - Open-source software. - Usage guidelines. - Dataset supporting component validation, performance evaluation, or reproducibility of operation.	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. - Dataset supporting component validation, performance evaluation, or reproducibility of operation.	No
WP5	Testbed design and specification. Use cases implementation on testbed. CROSSCON stack and services integration	- Security logs and events. - Other monitored data from IoT devices' SW and HW components	No

WP	Research data outcome	Type	Personal data
	(prototypes) in use cases. Pilot validation and security testing results of CROSSCON.	(e.g., CFI measurements, HW performance counters, etc.). - Security testing and validation scripts and results of evaluation. - Security- and performance-relevant data collected from testbed-specific pilot trials and security testing of the CROSSCON stack.	
WP6	Data from newsletter subscription, workshops, and events' organisation or participation including synergies with other projects and initiatives. Data from collaborations including participants' data, discussion notes, and minutes. Advisory board meetings.	- Graphical, textual, numerical, and media representations. - Blog posts, media posts. - White papers, - Web site analysis.	Yes

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.

3.2 Artefacts Release and Pilot Validation Data

Datasets (both raw or processed data), and any other relevant information generated during the project either as part of technical artefacts release in WP3 and WP4, or as part of pilot validation in WP5 will be retained in the project's GitHub repository after project completion for a period of 3 years, according to current provisions.

The previous provision of making selected datasets from technical release and pilot validations further published in repositories of open access such as IEEE DataPort (ieee-dataport.org) or Zenodo (zenodo.org), is not continued in this final version of DMP. Such additional effort has no clear added value over the GitHub's data availability and visibility to the community.

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.

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 M34 – using a major online platform 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 put in place a 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.

The GitHub repository already contains the first release of key CROSSCON stack artefacts across WP3 and WP4 according to milestone MS04.

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[1] 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 raised 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) have been in charge 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][2].

As a project coordinator, ATOS aims to raise awareness of research integrity periodically, for instance at each GA meeting or at WP7 specific meetings, 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 remain 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.

In this second version of DMP, a new recommendation is identified for the CROSSCON consortium to increase consideration of gender inclusivity in scientific and research activities. This regards CROSSCON-specific research activities, for which we have several female scientists in the consortium such as Prof. Dr. Alexandra Dmitrienko, principal investigator from UWU (research task leader in WP3 and WP4), Dr. Shaza Zeitouni from TUD (research task leader in WP2 and WP4), and also Ms. Ainara García from BIOT (research task leader in WP1 and WP5).

Furthermore, Prof. Ahmad-Reza Sadeghi, the PI of TUD in CROSSON, co-organised a relevant series of events called *High-Tech Women*[3] (HTW) with the aim to raise awareness of women inclusiveness in high tech research and innovation. One of our consortium members, Prof. Dr. Alexandra Dmitrienko, represented CROSSCON for 2023 edition[4], while a recent female member from TUD involved in CROSSCON (research under WP4), Dr. Huimin Li, participated to the 2024 edition.

The policy also identifies that all activities in WP6 should include or at least well consider female participation and female feedback. 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.

This second version of the policy recommends, without imposing, the five dimensions from the first version to be considered as part of a gender inclusivity 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).

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[3] methodology whenever that fits the CROSSCON design objectives and scope.

Furthermore, it is recommended to consider the following actions in the rest of the project to increase gender inclusivity in project activities:

1. *Consider GenderMag for the CROSSCON prototype design*. As of this revised version of the document, we evidence limited applicability of gender-inclusive design given the low-level technical scope of the CROSSCON stack and trusted services.
2. *Participation in CROSSCON technical and requirements specification*. The participation of the above-mentioned female members in the consortium (WP1-WP5) did result in constructive decisions on specification of CROSSCON stack components and requirements. We will follow

[3] 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.

gender inclusiveness for the final year activities regarding CROSSCON technology final specification and release.

3. *Participation in CROSSCON technology validation activities*. We will follow gender inclusiveness in technology validation involving female participation in such activities, such as Ms. Ainara García, project manager from BIOT and leader of task T5.4, and Ms. Malvina Catalano, an R&D scientist from CYSEC, involved in validation of use case 4 of UAVs in agriculture. We also note that BIOT has internally shared the CROSSCON stack with female developers for integration and validation in BIOT's use cases.

6 Conclusions

This document presents the second version of the project's DMP, adopting provisions from the first version, and revising those towards the final year of project activities. As such, this second versions overrides the previous version, and is to be considered as the applicable version of the DMP for the rest of the project.

This second version consolidates previous provisions and adds (makes more explicit) two new recommendations – one on dataset delivery in support of validation and evaluation the artefacts final release (given the targeted TRL4), and another one for an increased consideration of gender inclusivity in research and innovation. Both recommendations have already started to take effect as of month 24 of the project and will further be followed for the final year of the project. Results of these activities will be outlined in D6.6.

Although the CROSSCON activities show limited scope for research data management, ethics, and gender inclusiveness, still the consortium is committed to undertake relevant steps and show transparency and conformance to those.

References

[1] **European Code of Conduct for Research Integrity,** https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/guidance/european-code-of-conduct-for-research-integrity_horizon_en.pdf

[2] **Swiss National Science Foundation code of conduct and scientific integrity principles,** https://www.snf.ch/en/aY67ewrkFZ6Ntmfp/topic/scientific-integrity

[3] **High-Tech Women**, https://hightechwomen.org/

[4] **CROSSCON Events,** https://crosscon.eu/events/high-tech-women-htw23