
CO-CREATION NETWORKS AS ENABLERS OF INNOVATION: Uncovering the Interplay Between Network Structure and Collaboration Process

A Data Management Plan created using DMPonline.be

Creators: Paula Rodriguez Müller, Trui Steen  <https://orcid.org/0000-0003-2770-4043>

Affiliation: KU Leuven (KUL)

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Principal Investigator: Trui Steen  <https://orcid.org/0000-0003-2770-4043>

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Project abstract:

Co-creation networks involve the collaboration between public and private actors to deliver innovative solutions and cope with complex issues that governments cannot solve alone, such as urban development and mobility, or energy transition. However, while academics and practitioners treat co-creation as a panacea, there are still gaps in understanding co-creation networks and, more specifically, how they can achieve innovative solutions. This project will contribute to filling these gaps by asking under which conditions co-creation networks lead to innovation, with a focus on network structures and collaboration processes. To address this research question, the project will combine insights from co-creation and network literature to foster theoretical thinking. Five urban mobility Living Labs will be examined as they are multi-actor networks that aim to foster innovation through co-creation in real-life settings. The research project will follow a three-phase empirical study combining (1) Social Network Analysis, (2) in-depth comparative case studies, and (3) Qualitative Comparative Analysis of four projects per Living Lab (n=20). Through this multi-method approach, this project will provide a detailed understanding of the various conditions related to co-creation networks and will determine how these conditions interact to foster innovation. By bringing co-creation and network research together, this research will reveal a path to innovation for complex co-creation networks.

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FWO DMP (Flemish Standard DMP)

1. Research Data Summary

List and describe all datasets or research materials that you plan to generate/collect or reuse during your research project. For each dataset or data type (observational, experimental etc.), provide a short name & description (sufficient for yourself to know what data it is about), indicate whether the data are newly generated/collected or reused, digital or physical, also indicate the type of the data (the kind of content), its technical format (file extension), and an estimate of the upper limit of the volume of the data.

				Only for digital data	Only for digital data	Only for digital data	Only for physical data
Dataset Name	Description	New or reused	Digital or Physical	Digital Data Type	Digital Data format	Digital data volume (MB/GB/TB)	Physical volume
WP1/2/3-Literature	Network literature: notes and annotations	Reused	Digital		.pdf	<1GB	
WP1-Questionnaires	Questionnaire responses: raw data; (pseudo) anonymized data; informed consents; and empty questionnaires designed to be filled in by participants	Generate new data	Digital	Observational	.csv, .R (r scripts) .docx	<1GB	
WP2-Interviews	Interview recordings and transcripts; informed consents; and field notes taken by researcher	Generate new data	Digital	Observational	.mp3, .docx and .nvp (NVIVO file)	<100GB	
WP3-fsQCA	Analysis of 20 cases (truth tables)	Generate new data	Digital	Observational	.csv, .R(r scripts)	<1GB	

If you reuse existing data, please specify the source, preferably by using a persistent identifier (e.g. DOI, Handle, URL etc.) per dataset or data type:

NA

Are there any ethical issues concerning the creation and/or use of the data (e.g. experiments on humans or animals, dual use)? Describe these issues in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes, human subject data

Ethical approval (SMEC KULeuven) awaiting

Will you process personal data? If so, briefly describe the kind of personal data you will use in the comment section. Please refer to specific datasets or data types when appropriate.

- Yes

RDMgt approval (PRET KU Leuven) awaiting

Does your work have potential for commercial valorization (e.g. tech transfer, for example spin-offs, commercial exploitation, ...)? If so, please comment per dataset or data type where appropriate.

- No

Do existing 3rd party agreements restrict exploitation or dissemination of the data you (re)use (e.g. Material/Data transfer agreements/ research collaboration agreements)? If so, please explain in the comment section to what data they relate and what restrictions are in place.

- No

Are there any other legal issues, such as intellectual property rights and ownership, to be managed related to the data you (re)use? If so, please explain in the comment section to what data they relate and which restrictions will be asserted.

- No

2. Documentation and Metadata

Clearly describe what approach will be followed to capture the accompanying information necessary to keep data understandable and usable, for yourself and others, now and in the future (e.g., in terms of documentation levels and types required, procedures used, Electronic Lab Notebooks, README.txt files, Codebook.tsv etc. where this information is recorded).

In order to keep our data FAIR, we will make use of different types of documentation per Work Package:

Work Package 1:

For questionnaire responses, we will create a comprehensive protocol outlining the administration of the questionnaire and any subsequent follow-up procedures. A detailed codebook will be developed to define variables, abbreviations, and range of acceptable responses for each question. Moreover, a copy of the questionnaire will be retained as a methodological document.

For network data, a procedural document will be established to detail the transformation of questionnaire responses into network data. In parallel, we will maintain a lab journal to record any challenges or changes in this process. The network data will be accompanied by a codebook specifying the definitions of names, variables, and abbreviations. We will also use extensive inline comments in the R script to clarify the transformation process from questionnaire responses to network data.

Work Package 2:

Interview transcripts will be supplemented with a protocol outlining the conduct of interviews, the set of questions, and any prompts used. The process of pseudonymisation will be documented to reassure data privacy. A lab journal will capture insights and observations made during the interviews. The interview transcript files will follow a clear structure and naming convention, incorporating metadata to denote unique identifiers, interviewers, and timestamps.

For NVivo data, we will establish an extensive codebook elucidating each code's meaning, the rules of application, and the hierarchies or relationships among codes. We will document any alterations in the coding scheme over time.

Work Package 3:

For fsQCA data, we will provide comprehensive methodological information, describing the software and version used, calibration methods, and decision-making processes during the analysis. A detailed codebook will be generated to explain variables, possible values, and the interpretation of membership scores. If applicable, we will maintain a lab journal for recording the analysis process and any notable challenges or observations.

Work Package 4:

For the project outputs, we will generate detailed methodological documents outlining how the outputs were derived from raw data. We will embed explanations within the associated scripts to clarify the coding process. If applicable, a lab journal will capture the writing and revision process, especially if multiple authors or versions are involved. We will provide a codebook to explain any datasets included in the outputs and will incorporate metadata within each document detailing authors, date, and version.

To manage and organize our references, we will use the reference manager Zotero. Zotero will help us to collect, organize, cite, and share research sources, thereby improving the traceability and reproducibility of our work. The associated Zotero library will be made available (if permissible and ethical) to facilitate the accurate tracking of resources and references. This practice will further enhance the transparency of our research.

Will a metadata standard be used to make it easier to find and reuse the data? If so, please specify (where appropriate per dataset or data type) which metadata standard will be used. If not, please specify (where appropriate per dataset or data type) which metadata will be created to make the data easier to find and reuse.

- Yes

Metadata will be added to the references in Zotero following the Dublin Core Metadata Standard (<https://www.dublincore.org/specifications/dublin-core/dces/>)

3. Data storage & back-up during the research project

Where will the data be stored?

All the data collected and generated during the course of the project will be stored on the KU Leuven's central servers and the unit's storage drive. As for personal data, which includes contact information and information about professional/voluntary activities, it will be stored on the researchers' OneDrive, provided by KUL. This storage solution has been chosen due to its sufficient capacity (2 TB) and because it enables us to store non-pseudonymised personal data in a secure environment, away from the research unit's storage, where other researchers have access. Additionally, all publications will be stored in the Lirias repository.

How will the data be backed up?

- A back-up is provided via automatic version management of the files in OneDrive, maintaining up to 100 versions per file.
- The data on the KU Leuven's central servers will be automatically backed up, following the Research Data Management policy. Furthermore, a time-stamped master copy of the data will also be maintained on the researchers' OneDrive as an additional backup measure. This redundancy in data backup will ensure the preservation of data and prevent any data loss.

Is there currently sufficient storage & backup capacity during the project? If yes, specify concisely. If no or insufficient storage or backup capacities are available, then explain how this will be taken care of.

- Yes

Yes, there is currently sufficient storage and backup capacity for the project. Data will primarily be stored on the KU Leuven's central servers, which offer robust storage capacity and are automatically backed up in accordance with the Research Data Management policy. This ensures data safety and redundancy.

All KU Leuven personnel has access to 2 TB of data storage on OneDrive. As estimated sizes of the datasets < 100GB, sufficient storage and backup capacity is available. This platform also provides additional backup security for our data.

How will you ensure that the data are securely stored and not accessed or modified by unauthorized persons?

To ensure the security of the data, we will strictly control access to the data storage locations. The project's Principal Investigator, Prof. Steen, will be primarily responsible for data documentation, storage, and backup during the project's execution. After the project, the PI will take over responsibility for data preservation and reuse. To

prevent unauthorized access or modification, personal data will be pseudonymised before being stored in the research unit's storage. Any non-pseudonymised personal data will be securely stored on the researchers' OneDrive, where access is limited. Furthermore, our data management protocols will be subjected to review during the ethical application process via PRET for SMEC approval, ensuring stringent ethical and security measures are in place.

What are the expected costs for data storage and backup during the research project? How will these costs be covered?

OneDrive for Business is free for staff and students of KU Leuven

4. Data preservation after the end of the research project

Which data will be retained for at least five years (or longer, in agreement with other retention policies that are applicable) after the end of the project? In case some data cannot be preserved, clearly state the reasons for this (e.g. legal or contractual restrictions, storage/budget issues, institutional policies...).

The following data will be retained for at least ten years, as per KU Leuven's Research Data Management policy:

1. Questionnaire responses and related network data from WP1.
2. Interview transcripts, coding structure, reports, summaries, and other NVivo data from WP2.
3. fsQCA analysis data, including truth tables, from WP3.
4. Output-related data including peer-reviewed articles, reports, articles, and other outputs produced based on the raw data from WP4.

Where will these data be archived (stored and curated for the long-term)?

Data will be stored at KU Leuven RDR (<https://www.kuleuven.be/rdm/en/rdr/rdr>)

What are the expected costs for data preservation during the expected retention period? How will these costs be covered?

There are no expected costs for data preservation during the retention period (each KU Leuven researcher gets to store 50 GB per year for free on KU Leuven RDR).

5. Data sharing and reuse

Will the data (or part of the data) be made available for reuse after/during the project? In the comment section please explain per dataset or data type which data will be made available.

- Yes, in a restricted access repository (after approval, institutional access only, ...)

Data will be deposited in the KU Leuven RDR data repository. (Pseudo)anonymized data will be deposited in restricted access. Participants will be informed in the informed consent form.

If access is restricted, please specify who will be able to access the data and under what conditions.

Scientific researchers will have to motivate why they want access to the data:

What topic are you studying?

How is the data linked to your research domain?

Why do you think you need this data?

Which question/problem will the data help with?

What do you expect the data to provide you with?

We will always ask to give credit to the original data creators when the data is being used by other researchers

Are there any factors that restrict or prevent the sharing of (some of) the data (e.g. as defined in an agreement with a 3rd party, legal restrictions)? Please explain in the comment section per dataset or data type where appropriate.

- Yes, Privacy aspects

We work with confidential data (e.g., name, gender, subjective perceptions...). The collected data on the datasets of WP1, WP2, and WP3 could contain personal or sensitive information or data, that will be pseudo-anonymized.

Where will the data be made available? If already known, please provide a repository per dataset or data type.

Via RDR, the KU Leuven institutional repository.

When will the data be made available?

Upon publication of research results

Which data usage licenses are you going to provide? If none, please explain why.

We will apply a Custom KU Leuven license to the restricted pseudonymized data (<https://www.kuleuven.be/rdm/en/rdr/custom-kuleuven>)

Do you intend to add a PID/DOI/accession number to your dataset(s)? If already available, you have the option to provide it in the comment section.

- Yes

When depositing data in RDR, datasets receive a DOI.

What are the expected costs for data sharing? How will these costs be covered?

RDR is free for KU Leuven personnel, hence, no costs are expected for data sharing

6. Responsibilities

Who will manage data documentation and metadata during the research project?

The PhD researcher (TBC) will be responsible for data documentation & metadata, under supervision of the PI (Trui Steen)

Who will manage data storage and backup during the research project?

Data management, storage and back up will be performed by the PhD researcher (TBC), under supervision of the PI (Trui Steen)

Who will manage data preservation and sharing?

The PI (Trui Steen) will be responsible for ensuring data preservation and sharing.

Who will update and implement this DMP?

The PhD researcher (TBC) will be responsible for updating this DMP. The PI (Trui Steen) bears the end responsibility for updating and implementing this DMP.

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Application DMP

Questionnaire

Describe the datatypes (surveys, sequences, manuscripts, objects ...) the research will collect and/or generate and /or (re)use. (use up to 700 characters)

During the research project, we will collect and generate the following type of data:

WP1:

- Questionnaire responses. Format: .csv
- Network data based on questionnaire responses and Social Network Analysis R script

WP2:

- Interview transcripts (interview recordings will not be preserved after transcription to allow for pseudonymisation of the participants). Format: .mp3, .doc and .csv
- Data generated as part of the interview analysis through NVivo software (NVivo data, incl. reports, summaries, coding structure). Format: .txt and .doc

WP3:

- Data generated as part of the fsQCA analysis (e.g., truth tables). Formats: .csv and .txt

WP4:

- Output related data (e.g., peer-reviewed articles – incl. working versions), reports, articles and other outputs produced based on the raw data. Formats: .txt and .doc.

Specify in which way the following provisions are in place in order to preserve the data during and at least 5 years after the end of the research? Motivate your answer. (use up to 700 characters)

Data will be archived on KU Leuven's central servers (automatic backup) for at least 10 years, conform the Research Data Management policy. Output and processed data will be stored on the unit's storage drive. During the project, Prof. Steen (PI) will be responsible for data documentation, storage and backup. In addition, a time-stamped data's master copy will be kept on the researchers' OneDrive provided by KUL (2 TB capacity) as not-pseudonymised personal information is unsuitable for storage on the research unit's storage (where all researchers have access). After the project, the PI will be responsible for data preservation and reuse. Publications will be stored in Lirias.

What's the reason why you wish to deviate from the principle of preservation of data and of the minimum preservation term of 5 years? (max. 700 characters)

We do not wish to deviate from the principle of preservation.

Are there issues concerning research data indicated in the ethics questionnaire of this application form? Which specific security measures do those data require? (use up to 700 characters)

NA

Which other issues related to the data management are relevant to mention? (use up to 700 characters)

We will collect ordinary personal data, including contact information (phone number, email) information about the person's professional/voluntary activities (organisational affiliation, position, personal experience/perception when performing different aspects of his/her professional duties). Recordings of the interviews will be made in the initial stage of the research for the purposes of transcription via a recording device and then transferred to OneDrive. Next, interviews will be removed from the recording device to allow for pseudonymisation. Data management will be reviewed during the ethical application via PRET for SMEC approval.

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DPIA

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Have you performed a DPIA for the personal data processing activities for this project?

- Not applicable

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GDPR

GDPR

Have you registered personal data processing activities for this project?

- Not applicable