TREASURE

D2.3: Participatory social impact assessment report

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Technical References

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EXECUTIVE SUMMARY

This report represents a two-fold approach to studying the issue of circular economy in the automotive industry, with the aim of understanding ethnographic nuances in the present and extracting from the findings actionable insights for future policy-making, awareness-raising, and consumer education.

The report describes the research conducted on two fronts, the online forum and workshops, and event ethnography workshops and conversations conducted within physical events with the selected public.

Both research paths are still ongoing, and the final results will be published in the final deliverable *D4.6 Report on ethnography of CE in the automotive industry* due in (February 2024.

The document describes the tools and methodology used for the research, as well as the scope, the data publication and the target audiences.

We mean this deliverable as a monitoring tool, mainly for the benefit of the reviewers. We do not expect many people to engage with the document per se. We do, on the other hand, expect the Treasure community of citizen experts to continue to engage with the individual contributions it is describing.

TABLE OF CONTENTS

1. Introduction

Edgeryders role within the Treasure project was to roll out an ethnography of the circular economy scene connected to the automotive industry. The collected data would allow us to create a deeper understanding of the drives, aspirations and challenges of the stakeholder communities (producers, recyclers, consumers). To that purpose we convened and stewarded among the automotive actors and the recycling specialists a large-scale CE-oriented conversation. Its ethnographic coding and the following semantic social network analysis of the ethnographic nodes became the corpus of a large-scale ethnographic study.

Edgeryders methodology and tools allow us to engage, govern and analyse conversations with several hundred participants and several thousands of contributions. The methodology is based on the idea of semantic social networks, a human-interpretable data graph for large-scale ethnographic corpora.

1.1. Abstract

There is large body of recent and emerging work on cultural perceptions of electronics and their role in sustainable consumption across different sectors, including the automotive one, and the more nascent body of scholarship on circular economy as such, which is "typically understood as a normatively desirable deployment of a series of tools to close material loops in economic activities, thus reducing waste, pollution and resource consumption." (McLaren et al. 2020). The "normatively desirable" characterization speaks to prevalent assumptions that certain phenomena, for example, transition to automotive electronics, or circular economy, are culturally legible and understood as self-evidently progressive and good. But the relationship between technological innovations and people's understanding of themselves as cultural actors, consumers, and environmental stewards, can be nuanced and complex. Therein lies the value of ethnographic methods to offer insight into how sustainable practices, including circular economy, are conceptualised in the context of the automotive industry, with a particular focus on how the issue of car electronics mediates the uptake of those concepts by social actors.

1.2. Objective and connection to other WPs (4,8, others)

The work is conducted under two main work packages, WP2 and WP4, and connected to others (WP8 in particular). The work within the WP2 focuses on collecting ethnographic data through two parallel lines of inquiry: the ethnographic research based on the online forum exchange and the in-person event ethnography conducted through workshops and interviews at specialised events. The collected data feeds the ethnographic coding and networks analysis conducted under the WP4.

The result is a unique insight into the social impact of the circular economy in the automotive sector. It is open to the public and presented both on Edgeryders dedicated Treasure page and the Treasure platform.

The visualisation tool with the full access to the network graphs is featured in the eco-design dashboard of the Treasure platform under WP4 prepared by TXT, one of the consortium partners and leaders of the work package.

The analysis is a base for further research and opens exploitation routes for the commercialisation of the data and interaction between the actors and the stakeholders, elaborated ad Exploitation Route 11 in the WP8, deliverable 8.1.

The results and the ethnographic corpus will remain on the dedicated webpage hosted by Edgeryders[2] and on the Edgeryders forum[3]. Its public access has a communication and dissemination value, exploited by Edgeryders through social media posts and a final publication of the research in the writing and expected to be ready by the end of the project.

1.3.   Target audience

The table below outlines our aspirations for the different groups of stakeholders whom we envision comprising a target audience for this research. Different constituent groups may have uses for different, select parts of this research, but overall, we hope that our insights can help inform policy across scales, as well as decisions and forecasting in car industry production and environmentally oriented research & development contexts.

We also hope that the general public finds edification value in the ethnographic insights our research is yielding. In particular, we hope our research will be of use and added value because car consumption and usage is a sector that is under-studied ethnographically, and while other disciplines and methodologies can yield numerous insights about behaviour and choices of customers, ethnographic interviews help us conceptualise more holistically how people understand their own behaviour and choices in the context of their broader subjectivity and sensibility as social actors with ideals, anxieties, and values.

For example, our research already revealed preferences among some interviewees for older cars with minimal or no electronics rooted in a somatic perspective and an affective experience of one's body interfacing with a mechanism like that. This approach dovetails with and can be useful to a research and innovation direction in the context of User Experience studies, a field that is both recently dedicated to "designing for sustainability" (Kramer 2012, Frick 2016) and is attentive to somatic experiences. So, interventions and directions in innovation geared at supporting and reinforcing circular and sustainable practices necessarily benefit from a holistic understanding of people's perspectives and frameworks of meaning around such practices. Phenomena and practices like circular economy are commonly understood, in general cultural perception and in the emerging body of scholarship on the subject, as self-evidently progressive and good (McLaren et al. 2020). But the relationship between technological innovations and people's understanding of themselves as cultural actors, consumers, and environmental stewards, can be nuanced and complex. Sometimes the insights may reveal that people's sensibilities and sentiments are the opposite of what

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[2] https://treasure.edgeryders.eu/
[3] https://edgeryders.eu/c/treasure

may be assumed; such insights would be valuable for industrial actors and regulators looking to shape policy and direct innovation in an evidence-based fashion.

Policy Sector	We aim for the insights from this research to Research on policy decision-making has historically suggested that "ideas" rather than "data" are more influential for informing policy (Lavis et.al 2003). Our ethnographic approach translates data that is attuned to complexity into
Local (municipal?) administration	Research shows that municipal level is important for policy shifts towards sustainability (Mendes 2007), and "Cities have become crucial actors for the global governance of climate change" Hakelberg 2014). And studies show that municipalities are interested in and use research in shaping policy (Hjort et.al 2021). We aim for this research to become a resource for municipal-level initiatives, throughout Europe and beyond, geared at greater sustainability in the transportation and recycling sectors.
Car industry	As Mayyas et.al (2012) write: "sustainability continues to become a critical issue for the automotive industry motivating more significant reductions to the overall environmental impact of vehicles worldwide, in order to ensure the automobile as a product is an environmentally sustainable one. …This trend adds more pressure on the original equipment manufacturers (OEMs) to…come up with new solutions to minimise the environment impact through the usage of more efficient processes that preserve resources. Because our study centres not only car owners but car enthusiasts, we hope that our findings pertaining to that demographic's perspectives on sustainability and what role the automotive industry can play in it, can be of interest to the car industry as insight into environmental sensibilities of customers or prospective customers.
Sustainability-centred R&D enterprises	As Inigo and Blok (2019: 279)) point out, ", at the time of emergence of the CE, another

	framework has emerged, mostly with the support of the European Commission (European Commision, 2012): responsible research and innovation (RRI, onwards). They go on to point out that "Both the CE and RRI ultimately aim to address problems related with sustainable development through innovation…[and] show some complementarities in objectives and methods." We also hold that the circular economy paradigm is a natural ally to sustainability-centred research and development models, and thus we envision contributing to that synergy with this research.
Education sector	Sustainability-themed education has been acknowledged as important and valuable at all educational levels. At university level, or in postgraduate contexts, this research can be useful in curricular materials for students specialising in topics ranging from industrial ecology to sustainability studies to environmental and sustainable engineering.
The general public	The "general public" is a broad community that overlaps with each of the previously named groups at times, but also includes people who may not have specific professional focus or personal commitments pertaining to topics of sustainability, but they may be car consumers or car users, or regular citizens considering the role of electronics in devices they use on a daily basis, who may find their own preferences and concerns articulated in our research, and may be motivated to engage in self-reflection as drivers, consumers, and environmental citizens.

1.4. Methods and overall participation

In Edgeryders standard procedure, community managers and trained ethnographers foster conversations or conduct interviews on a specific topic. The data is either directly generated on an online forum, or in case of events and workshops, transcribed in form of interviews on the platform. Trained ethnographers code the conversations and interviews using the open-source

tool Open Ethnographer, creating a base of contextual ethnographic codes. Successive visual representation of the connections between codes and co-occurrences is conducted using the open-source tool Graphryder[4], presenting a semantic social network analysis of the material.

The specific methodological "toolbox" of ethnography contains various ways of gathering data. This study uses as its primary method structured interviews in an "event ethnography" (Campbell et al 2014) setting. While the original vision for this project involved gathering data in a digital format, by prompting interlocutors to discuss topics of interest on the Edgeryders platform, upon starting the project, we determined that considering the post-Covid "online fatigue" (Deniz et. al. 2022, Nesher Shohan and Wehrt 2022) it would be more advantageous to shift the modality to face-to-face interviews conducted at in-person gatherings.

In the mixed-methods tradition that we utilise, ethnographic data yielded by the interviews is transcribed and coded (where snippets of text from interviews are associated with semantic codes and expressed as a network of co-occurrences. Said network is then analysed, reduced and visualised, using techniques from network science. This approach gives us a bird's eye view into structuration of discourses and meaning. Ethnography explores what people say and how they say it, with attention and sensitivity to cultural context. Visualisations help us see the patterns of co-occurrences of those codes and identify when those co-occurrences are prevalent enough that their association also signifies something about cultural production of meaning. Thus, the combination of two methods allows us to see not only what people are saying, and how they are saying it, but also explore what things are mentioned together by the same people, identify areas of broad consensus, and overall produce a mental map of informants as a cultural group (Cottica et al 2020).

The data that emerged through ethnographic interviews allowed us to identify recurrent salient themes that informants used to discuss the topics under study. This, in turn, allowed us to identify and map the emergent discursive categories that are relevant for understanding how car owners/users are conceptualising and affectively relating to the notion of circular economy in the automotive sector. After coding the interviews, we were able to construct a Semantic Network which offers us a visual map of how, and in what configurations, people are linking the salient concepts pertaining to the specific topic of the study in the broader context of discourses about sustainability, personal responsibility, automotive politics, modernization and shifts towards electronic technology, etcetera.

1.5.   Documentation and follow up

The data collected through our ethnographic research (with the previous consent from the participants) conducted during such events is published entirely.

To promote easier access and documentation we created a website directing to the materials, the forum conversations and the graphic visualisation. The dual function of the website is to present the entire work on the project, facilitating access to raw and analysed data and, and to act as a landing page for engagement and communications campaigns. It will continue to be

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[4] http://graphryder.edgeryders.eu/

fostered after the end of the project. Because of that, it includes the consent funnel for collection of data.

The datasets are published on [Zenodo](#)[5]. The first version was published on 25 July 2023. The final version will be published after the end of the research.

The work plan provides for the creation of a final deliverable, *D4.6 Report on ethnography of CE in the automotive industry (final version)*. Alongside this deliverable, we aim to collect in one place the contributions received under the community journalism program and through the event ethnography engagement, organising them in thematic chapters and including some key insights based on the online-ethnographic analysis of the whole corpus, not just of the community journalism program's contributions. Their purpose is to place such contributions in the context of the broader conversation they helped to spur.

We will also include a brief account of the overarching narrative emerging from the program as a whole.

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[5] The first version contains 6,219 posts by 196 participants, 5,161 annotations, 300 codes. The corpus consists of interviews conducted between January 2022 and June 2023 with car owners and enthusiasts at car industry events. The interviews focus on experiences with car electronics and perspectives on sustainability and the circular economy.

1.6.   Promotion/dissemination

Promotion and dissemination will include circulating the results and insights to several stakeholder communities, including:

- Communities that interviewees were drawn from, i.e. automotive-focused and sustainability/CE-focused organisations and institutions that convene people for thematic events like the ones that served as the basis for our interviews. In addition to sharing research with the communities involved in said research being a good ethnographic practice, in this case the communities in question have vested interest in this subject, and may find insights from our research influential or actionable as they make their choices as consumers and/or professionals.

- Academics and academics/practitioners working on topics in sustainable transitions, industrial ecology, circular economy, etcetera. To that end, we have already presented the results from the first part of this research project at the *11th International Conference for Industrial Ecology* in Leiden, the Netherlands in July 2023. We presented a paper titled *"An ethnography of the automobile: A participatory tool for understanding human behaviour in automotive recycling context"* at a well-attended session themed on "Vehicles." We have also submitted an article resulting from this conference paper, titled *"Conceptualizations of sustainable behaviour, circular economy, and car electronics in the automotive sector: An Ethnographic Perspective from Germany"* to a special issue of the *Journal of Industrial Ecology* dedicated to showcasing work emerging from this conference. We plan on producing at least one additional peer-reviewed article based on this research once the second phase of the research is complete. We also plan on using the platform of Scipod, a science communication platform that "translates" academic publications into podcasts available to the academics from different disciplinary backgrounds (and general public) on common streaming platforms like Spotify, Apple Podcasts, Google Podcasts, Audible, Researcher, etcetera.

- Industry partners and stakeholders, including but not limited to other participants in the TREASURE project (companies like SEAT and TXT who manage the platform into which we are embedding our analysis). This also includes the electronics specialists like MARAS and WalterPack and the recyclers, as well as UNI which focuses on standardisation. All these TREASURE partners are representative of the kinds of industry contexts where our research may find uptake, and the more general benefit to them is described in Section 1.3.

2. Onboarding workshops: online and in-person

Anchoring ethnographic research in a broader spectrum of engagement brings a more diverse community of experts on the themes of the circular economy. The discussion offers more depth and allows us to explore different paths by continuously prompting the conversations, either through script adaptation or piloting the general direction.

Much more than a simple survey, ethnographic coding explores the context, the ramification of the meaning, the implicit and the unsaid. Elaboration through graphs, anchored in network science, illuminates the interconnections and allows us to identify the most salient nodes and discover the ones impossible to identify in a simple survey.

The principle of the data collections, thus, relies on fostering large conversations, channelled in broadly defined topics, to collect the batches of data, which can be refined by exploring the most interesting elements which emerged.

Consent and privacy during the research

Ethical risks and privacy protection during Edgeryders ethnographic research for Treasure were addressed in a dedicated document, *D10.1. Ethical handling of research on humans in TREASURE,* submitted in the beginning of the project.

A summary of actionables defined in the document include the creation of a *consent funnel*, as a gateway to access the Edgeryders Treasure platform (replacing the traditional and ethically ineffective 'I accept the Terms and Conditions' box to tick), setting up of *a public forum for the research group*, the draft of *a Treasure social contract[6]* , a commitment to *data minimalism*.

In addition, we created an informed consent form for the in-person events (Annex 2 of this document) in English and in German, used for interviews in the field where participants had to sign it or acknowledge their verbal consent in recording. The form was designed to disclose to potential interviewees the information necessary to make an informed decision; to facilitate the understanding of the disclosed information; and to emphasise the voluntariness of the decision about participating, including the interviewee's ability to stop the interview or withdraw their consent at any time. To provide further protection of personal data, all the interviewees were anonymised in the transcripts on the platform.

Outreach and engagement strategy

Our research on Treasure follows two different lines of engagement. The first is based on the online forum open conversation, prompted through a "community journalism" program. The

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[6] https://edgeryders.eu/t/edgeryders-treasure-rules-of-engagement/19315

second is based on in-person "event ethnography" workshops conducted during selected events.

First Line of Research: Community Journalism

The first line of research is aimed at the general public participating in the forum, starting from the initial "seed" content provided by the community journalism program. The conversations on the platform are stewarded by trained community managers[7] who monitor the conversation, encourage and give positive reinforcement to contributors and draw new participants in, which allows the conversation to go "deep". Cyber-ethnography and discourse analysis that it yields has become a fruitful methodology and approach in anthropology and other ethnographically focused fields in the years since digital communities started forming around common interests and concerns, and in fact some social scientists have argued that "Understanding people, communities, and organisations in everyday life now means considering computer-mediated communication" (Hallett and Barber 2013: 326) and that "today it is impossible to aim at social research excluding digital environments" (Delli Paoli and D'Auria 2021: 244).

The community journalism program is deployed creating "seed" content to attract new users and contributions.

In addition, we created a dedicated website[8] for the Edgeryders Treasure forum which introduces new participants to the project, directs them to the initiatives and facilitates the access to data.

To identify the interested communities and mapping of the possible fields of intervention, we research dedicated publications and events, and engage with them to convey the conversations towards the platform.

Through social media posts and targeted invitations, we aim to create the content which would make the Treasure forum thought-provoking, and therefore more engaging. The created content elicits conversation-starting posts, using them to "seed" the Treasure conversations on Edgeryders platform. For the whole duration of the project, the outreach campaign uses a combination of open calls for contributions and targeted interviews, social media invitations, and direct participation in selected events.

The posts in the community journalism program are meant to be read as stand-alone articles. They are shared on social media and interacted with by way of a "Comment" button. They are published as regular forum posts on the Edgeryders platform and are accessible either directly through the forum or, with a facilitated access, through the dedicated Edgeryders' Treasure website.

At the time of writing, the exchange has grown to 7662 posts among 225 participants[9]. Considering the still not encoded data, the number of actual participants rises to 303. By the end of the ongoing final phase of the forum engagement campaign, the number of participants will continue to grow.

As one of the outputs of the research, we plan to publish a selection of materials collected during the research, including the authors, interviewees and the subjects of their contributions who

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[7] https://edgeryders.eu/t/community-management-manual/2245
[8] https://treasure.edgeryders.eu/
[9] The report is visible with admin authorisations on the post counts queries of Edgeryders forum

gave consent, conveying the focus on the themes, observations and questions which emerged from the discussions on the platform.

Second Line of Research: The Event Ethnography

In early phases of mapping and research, we understood that the engagement of the communities would be more effective[10] if conducted through in-person or in hybrid formats. Accordingly, we decided to introduce a second line of research based on the "event ethnography", the in-person on-the-field interviews with public belonging to areas of interest directly connected to automotive, recycling and circular economy communities.

This line of research was deployed in two stages, focusing in the first moment on the perspective of "car enthusiasts" and their take on circular economy practices. Building on the analysis of this first batch of data collected through 6 onboarding workshops, the second moment saw the engagement with the "experts from the sector".

In order to execute this stage or research, the Edgeryders team researched and mapped out potential thematically appropriate events (car-themed for state 1, circular economy for stage 2). Before travelling to these events, our field ethnographer contacted the event organisers, and secured permission to conduct interviews with participants. Once at the events, he recruited interview participants, briefed them in compliance with our informed consent form, and conducted structured interviews based on the interview script that was iterated as necessary between events based on feedback from the events. The interviews were recorded and then transcribed using Sonix audio transcription software, then coded by native English and German speakers (depending on the language of the interview). The transcripts were then uploaded to the Edgeryders platform and coded using Open Ethnographer, an open-source tool for Qualitative Data Analysis.

2.1.   Online workshops

The topics selected to engage participants in conversation included four themes: *automotive nightmares, state of the art of car and car electronics recycling, Europe as an electronics recycling hub, Electronics recycling beyond precious metal recovery*.

Provocative and descriptive methods[11] were used in the environment of an online forum, to kick start conversations which gathered ethnographic data from posts in forum threads. The topics were based on the counter position of arguments such as:

- Unnecessary is wasteful - What is the most pointless feature of your car?

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[10] From the earliest phase of the data collection, we encountered two challenges: a phenomenon of "internet fatigue" after the long periods of COVID-19 restrictions, and a certain resistance from people active in the automotive industry, to openly discuss circular economy applications to the automotive world. The reasons could be attributed to their contractual obligations (e.g., NDAs and data protection policies of the employers).

[11]

- What parts of your car would you like to be able to repair yourself/ are the most annoying to have repaired? Why?
- What does your ideal use/disposal of car look like in a net zero world
- What keeps automakers from engineering for a circular economy?
- What keeps automakers from engineering for "real" user demand? Is democratic control possible?
- What external pressures do automakers need to create better products?

At the same time, a community journalism program was set up to propose stories and further topics.

Three onboarding workshops were held online deriving from the original material collected on the forum: Automotive Nightmares, How to Green Cars, Circular Car in a Net Zero World.

The collection of data, to protect the participants' privacy was based on the Chatham House rules, agreed with the participants through collection of consent on registration and in the beginning of the events.

2.2.   In person workshops

Together with raw data, these onboarding workshops yielded interlocutors for interviews, as some participants were engaged and interested in discussing these topics in greater depth. In some cases, interviews were in small groups, as that dynamic translated naturally from the workshop ethos.

At the moment of writing, the coded corpus contains 1877 posts, with 6721 annotations and 674 ethnographic codes. The ethnographic coding is ongoing.

The research was conducted in two phases. The first one, largely covered in *D4.5 An ethnography of Circular Economy in the automotive industry*, focused on the events which attracted the attention of the public interested directly in the automotive world.

The results which emerged served as a base to continue the research broadening the target communities.

2.3.   Main Results

The project is still in progress, however below we recapitulate the results depicted in the first report (deliverable 4.5 from August 2022), which was based on 5 car industry events expounded upon in greater detail in Annex 1.

The first (completed) phase of the event ethnography research drew on data from car industry events in Germany. Notable concepts emerged in the process of transcribing interviews with 111 participants, which yielded 285 codes, and analysing them discursively. After SSNA visualisation and reduction techniques were applied. the combination of discourse analysis and visualisations, helped us understand holistically the discourses and perspectives of our informants.

Analysing it, we found that there is a pervasive ambivalence about car electronics and the corollary implications for circular economy that stem from the different sensory and interactive experience between a human and a car, and concerns about privacy and surveillance and their impact on user acceptance of sustainable technologies. These insights emerged from the first layer of discourse analysis of the interviews and were validated by visualisations, which were performed on the aforementioned 285 codes.

The codes turned out to be connected by 11,468 co-occurrence edges, many of them parallel (which means that the same two codes co-occur multiple times). Unique co-occurrences are 3,999. As is usual for codes co-occurrence networks, this network that emerged was too large and dense for visualisation, and was thus reduced according to different criteria (Cottica et al 2021), including association depth (Figure 1 below) and association breadth (Figure 2 below):
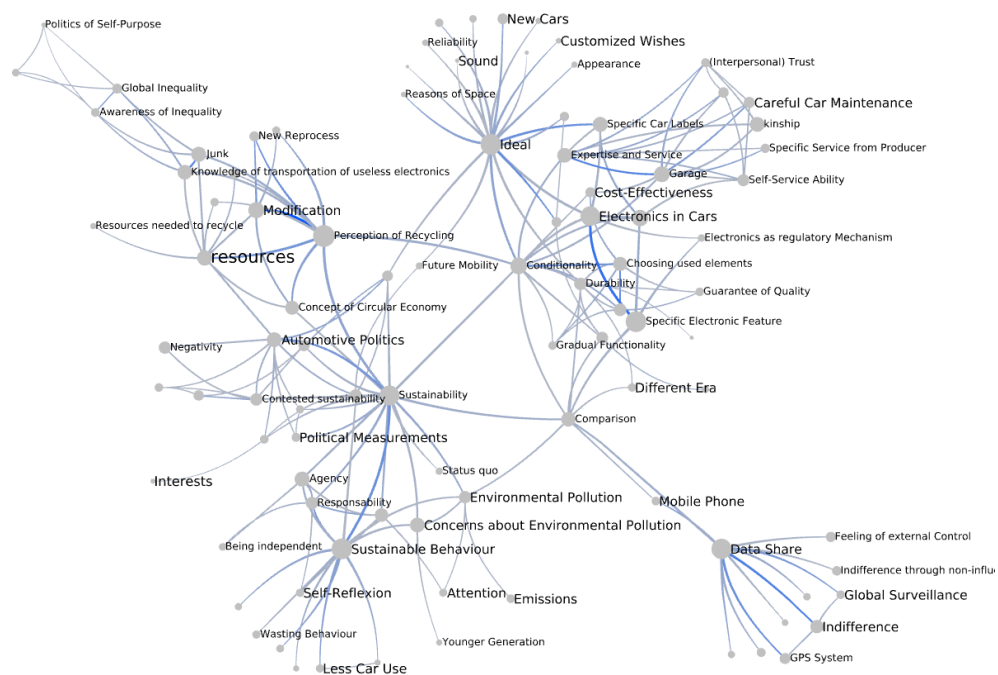

Figure 1, Association Depth. *The reduced codes co-occurrence network of the TREASURE corpus (97 codes, 191 edges). Only the edges between codes that co-occur 10 times or more are represented. Brighter blue edges indicate higher numbers of co-occurrences, so deeper associations.*

Figure 2. Association Breadth. The reduced codes co-occurrence network of the TREASURE corpus (83 codes, 87 edges). Only the edges between codes that co-occur in the interviews of 7 or more informants are represented. Brighter green edges indicate higher numbers of informants, so broader associations.

For further insight, modularity analysis was performed. The modularity value of a network is a number between zero and one. Zero indicates that the network has no discernible community structure: its pattern of linking is indistinguishable from that generated by a random process. High values indicate a pattern of linking that is unlikely to be random. The reduced network of Figure 2 is highly modular (Q = 0.72), which means it resolves into six in our case, as seen below. Figure 3 shows the same network as Figure 2, but this time codes and edges are colour-coded according to the community of codes they are part of, as detected by the Louvain algorithm (Blondel et al 2008).
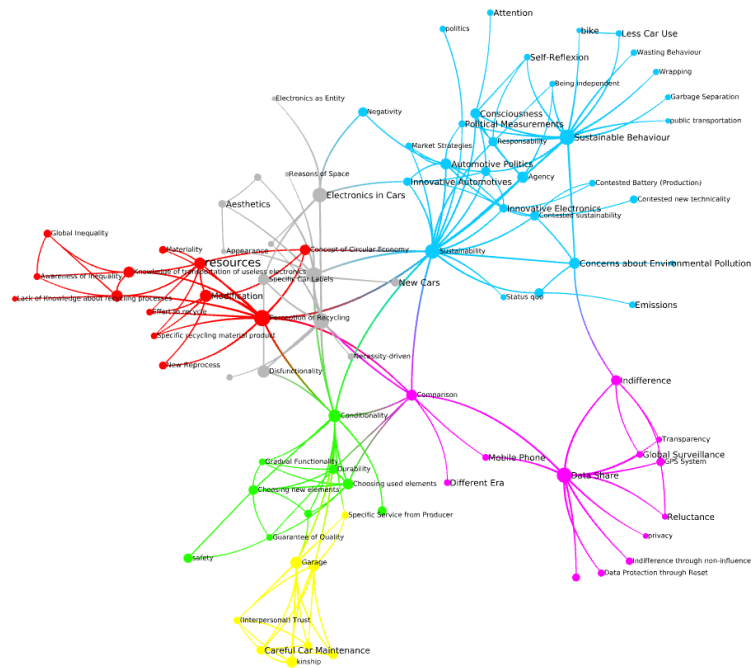
The communities that emerged centred around 1) codes related to pros and cons of electronics in cars (grey community) 2) codes related to the relationship between materiality and the circular economy (red community) 3) codes related to personal expertise networks and the trust and personal relations involved in decision-making around car maintenance (yellow network), 4) related to deliberation/consideration by drivers around choices they make and perceptions of quality, durability, cost-effectiveness, etc. (green community), 5) codes related to data sharing and surveillance (purple community) and 6) systemic consideration of sustainability, linking personal feelings with global structures (blue community).

The second phase of event ethnography research, now in progress, takes circular economy and sustainability focused events, and explores the same topics within those demographics. While many car owners and enthusiasts are concerned with issues of sustainability, and while many social actors who are dedicated enough to the issues of circular economy either personally or professionally to attend topical conferences and summits own or use cars, the perspectives that emerge at these different types of collective gatherings yield different and complementary insights. To date, we have interviewed ethnographic interlocutors at 5 events (Bern User Forum on Circular Economy, International Automotive Recycling Congress 2023, Greentech Festival Berlin, TechBlik Berlin, Congress for Resource Efficiency and Circular Economy Stuttgart).

Annex 1: List of online workshops and in-person events

Online workshops

Automotive Nightmares

29 April 2022, online workshop, 17 participants

The Automotive Nightmares series introduced the online forum topics on circularity and automotive, through a community journalism approach. Beginning from the initial themes "Unnecessary is wasteful" and " What is the most pointless feature of your car?", the series opened with the online event on 29 April 2022[12] with 17 participants.

The still ongoing series continues to develop by exploring themes of car electronics and privacy, and cars as "computers on wheels", "digital extraction machines".

Participatory workshop on circular cars with Neol

18 August 2022, online workshop, 22 participants

The co-creation workshop focused on the imaginative skill of the participants into shaping a future where today's concept of mobility has evolved into circularity. The participants had to discuss the actual situation of mobility and the private use of the vehicles and draw the steps that would have been necessary to get to a society where mobility relied only on circular economy practices. The base for discussion was the concept of a "circular car"[13]: which *uses efficient and renewable energy sources, with lifetime optimised for resource efficiency, materials used without waste, optimised user rates.*

The exercise yielded interesting discursive strands and framings. Some participants approached the task through more of a macro lens, while others took a more micro approach. The discussion opened the themes of *political ecology*, transitioning to a circular mobility society by situating it in a broader socio-political context, the need for structural changes as predicates to such a transition, the need for a new approach to urban planning, and a general societal shift.

The extrapolation from the visualisations and debrief of the "micro" approach can offer the following insight: non-circular and resource-consuming mobility/car sector relates to a highly structured regimented social existence centred around many specific obligations. A more socio-centric and need-centric society, with a basic income, and established local food security solution, would require a) less movement and b) fantasising further, could also have room for objects to move around and come to people (e.g. a movable vertical urban farm feeding the

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[12] Eventbrite page of the event 29 April 2022

[13] defined by the World Economic Forum's Circular Car Initiative

city) requiring less movement around of cars. This imagines a car sector that is minimised rather than circular per se, but in the pursuit of similar environmental goals.

How to Green Cars - For a deeper understanding of circularity
25 January 2023, online workshop, 19 participants

The event[14] with Paul Nieuwenhuis, an expert on cars and the environment, delved into the multifaceted impact of automobiles on our environment, beyond the obvious question of tailpipe emissions. Originating his research on emissions, Nieuwenhuis explored the legal approaches to emissions from California State efforts in this domain from the 1950s. The event placed in focus the current inefficiency of the car disposal systems, following the throwaway trend spanned across various products introduced over the past century, from washing machines to mobile phones.

Several factors contribute to the short lifespan of cars and the shift towards CE should take in consideration design and standards, together with materials[15], alternative business models such as "micro-factory retail" present in the UK, and harmonisation of the circular economy directions with the new technologies.

Nieuwenhuis' call for a more in-depth exploration of the circular economy, a step further than the current, too conceptual, understanding allowed us to open new discussions on the platform considering the clarification whether loops should be closed within single products, sectors, or economies and at what scale.

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[14] [Eventbrite page of the event 25 January 2023](link)

[15] The majority of cars are made of steel, capital-intensive, forcing large-scale production for profitability. This leads to an overemphasis on volume production rather than durability.
'', a localised, low-volume manufacturing model. Here, cars are assembled in small units, allowing customization and local sourcing. Moreover, as the demand for new cars wanes, the focus can shift to maintenance and recycling.
Circular Economy Concerns: While the circular economy is touted as a sustainable model, Nieuwenhuis argues it presumes a static technological environment. For instance, while steel, a primary component of most cars, is recyclable, not all car materials are. Furthermore, embracing newer technologies might disrupt the circular loop, particularly when shifting from one dominant material or technology to another.

In-person workshops

Part I: The "car" public

Technonorama Ulm 2022[16]

Workshop with classic car enthusiasts and do-it-yourself mechanics

Ulm, Germany, 22-23 April 2022, 21 participants

For over four decades, the Technorama in Ulm has served as a gathering ground for classic car aficionados. Drawing visitors from all corners of Europe, this event unites those with a passion for historical classic cars, modern classics, and motorcycles and the ability to restore and repair these cars themselves.

With its link to reutilisation, reparation automotive history and sustainability, this specialised event presented a good opportunity for interviewing the public of competent suppliers, classic car owners, repair experts. Numerous clubs and interest groups dedicated to preserving the automotive heritage set up information desks, providing a hub for like-minded enthusiasts.

Frankfurter Automobilausstellung 2022[17]

Interviews during the 8th Frankfurt Motor Show which hosted a crowd of car enthusiasts, families and curious onlookers.

Frankfurt, Germany, 22 May 2022, 24 participants

Frankfurt-Fechenheim hosted the 8th Frankfurt Motor Show, attracting car enthusiasts, families, and curious onlookers alike. A lineup of 20 local dealers showcased vehicles from an array of brands, offering a visual feast and the possibility of test drives right on the spot. The outdoor exhibition featured 36 car brands, including over 150 cars and 20 motorbikes.

The FAA, the largest car exhibition in the entire Rhine-Main area, emphasised e-mobility at the Klassikstadt site, a former factory facility with vintage car workshops and dealerships. Here, vintage car owners can rent a space to store their beloved classics, particularly during winter. This juxtaposition of classic cars against their modern counterparts added depth to the exhibition and provided multifaceted conversations.

Being the first exhibition following the pandemic-induced hiatus, it confirmed the usefulness of engagement during live events.

Audi Meeting Krefeld 2022[18]

Workshop with car enthusiasts in a very diverse community setting in Krefeld

Krefeld, Germany, 26 May 2022, 16 participants

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[16] https://edgeryders.eu/t/report-technorama-ulm-2022/17040

[17] https://edgeryders.eu/t/report-frankfurter-automobil-ausstellung-22-05-2022/17038

[18] https://edgeryders.eu/t/report-audi-meeting-krefeld-26-05-2022/17039

Krefeld, Germany, came to life on Thursday, May 26, 2022, as Audi aficionados united for the first Audi Meeting since the pandemic-induced hiatus. The event coincided with a significant day on the German calendar, the religious holiday of the Ascension of Christ, which also doubles as Father's Day in the country.

The venue, Mo's Bikertreff, in the Niederrhein Halle restaurant, has been for more than 20 years as a magnetic hub for diverse gatherings. Started as a flea market, it hosted cattle auctions for local farmers and after the Krefeld Pinguine ice hockey fans joined this community, Mo's biker meetings began in 2011. Soon, it evolved into a melting pot, drawing bikers, trikers, vintage and contemporary car enthusiasts, scooter aficionados, and devotees of American automobiles.

On weekends and regular holidays, from early April to late September, the Bikertreff gradually expanded to embrace a wide array of automotive fans from various brands.

The Audi Meeting, scheduled from 10:00 to 17:00 saw a lineup of around 40 to 45 Audi vehicles, spanning vintage models from the 1970s to contemporary models, including some tuned variants. This automotive gathering saw the participation of approximately 100 individuals, both drivers and enthusiasts, very open to discuss their passion.

Stuttgart Karrieremesse automotive TopCareer[19]

Conversations on circularity with car and technology professionals and aficionados in a historic place for the car industry

Stuttgart, Germany, 20 June 2022, 26 participants

The annual Automotive TopCareer fair, organised by ifa Management GmbH and Crain Communications GmbH took centre stage at the Wagenhallen in Stuttgart.

Steeped in history, Stuttgart is the birthplace of the automobile, with 19th century pioneers such as Gottlieb Daimler and Carl Benz. Today, it is one of the epicentres of the automotive world, home to car manufacturers like Mercedes-Benz and Porsche, and a network of suppliers and research institutions dedicated to advancing the automotive sector. The region itself is a hotbed of research and development in mobility and automotive innovation. The public did not disappoint.

With a strong focus on electromobility, autonomous driving, connected vehicles, and alternative drive concepts, the Automotive TopCareer provided a stage for automotive manufacturers, suppliers, engineering service providers, and mobility experts to showcase their latest developments and seek potential talent.

The event, focusing on electromobility, autonomous driving, connected vehicles, and alternative drive concepts, brought together around 50 companies and a vibrant audience of students and young professionals.

Allsted Cars Meet Photographers 2022[20]

Interviews with the car customisation and car photography public

Allsted, Germany, 10–11 June 2022, 32 participants

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[19] https://edgeryders.eu/t/report-topcareerstuttgart2022/17097
[20] https://edgeryders.eu/t/report-allstedt-cars-meet-photographers-2022/17102

A passionate team of photographers who view the world of automotive customization through a distinctive lens organised the Allstedt Cars Meet Photographers 2022. Over the weekend, more than 1,200 cars arrived at a vast airfield to be immortalised through the lenses of over 60 dedicated photographers. The event, which started on Friday and continued into the night, saw a remarkable transformation from a sparsely populated airfield to a bustling automotive extravaganza by Saturday.

We interviewed 32 people who shared their insights, including 20 men and 12 women. One intriguing aspect of this event was the notable reluctance of many participants to be interviewed. This hesitance stood out as an anomaly, especially when compared to previous events of a similar nature.

4WD Event Oss[21]

Environmental awareness, scepticism towards e-cars among the 4WD aficionados

Oss, Netherlands, 24-25 September 2022, 26 participants

The event is the last event in the research series on the "car" public. It was not included in the preliminary ethnographic report but has confirmed its assumptions.

The 12th edition of the 4WD Festival is a haven for seasoned 4x4 vehicle owners and an introduction to the broader 4WD lifestyle.

It showcased an array of 4x4 car brands, equipment suppliers, and accessories, along with a captivating display of motorsport thrills. Visitors tested mettle on challenging terrains, learned the ropes of off-road travel, and admired the latest 4x4 models.

From importers to clothing vendors, rally teams to 4x4 clubs, and even off-road travel agencies the festival had a rich offer for the numerous visitors. The activities included demonstrations, featuring trials, challenges, high-speed runs, and Dakar 4x4s rally teams.

We conducted a total of 26 interviews with visitors and participants. A critical note stood out on e-mobility, described as "coming too quickly" and under political pressure, without regard for potential recycling problems.

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[21] https://edgeryders.eu/t/report-4wd-event-oss/17900

Part II: the public specialised in circularity and recycling

Bern User Forum on Circular Economy[22]
Conversations with circularity experts

Bern, Switzerland, 28 March 2023, 14 participants

Organised by the Bern University of Applied Sciences — one of Switzerland's leading institutions of applied sciences — and Prozirkula — who advise public procurement agencies on integrating circular economy into their tenders — the Bern User Forum on Circular Economy highlighted the growing importance of circular economy to address sustainability and provided a platform for attendees to share their experiences and ideas.

Presenters discussed business models, resource efficiency, procurement, eco-design, value streams, and waste prevention. Through lecture-style presentations, participants brainstormed "solutions that make optimal use of resources and allow those resources to be recovered following their use, in a sustainable, circular, value-added cycle."

As expected, the public here showed in-depth knowledge of the circular economy, indicating a growing awareness and interest in the circular economy in Switzerland. The conversations were richer.

IARC 2023[23]
Ethnographic workshop with automotive recycling experts

Geneve, Switzerland, 21-23 June 2023, 31 participants

International Automotive Recycling Congress 2023 (IARC) brought together several hundred experts, decision-makers and environmentalists to report on the latest trends and technology developments and look for new ways and ideas in automotive recycling.

During the event, organised by ICM AG, we conducted the research among the participants with the focus on the transition of the European automotive supply chain towards a circular future.

The IARC proved valuable in the context of event ethnography due to the variety of sector experts, which allowed the continuation of the cross-pollination of expertise approach. The salient points that emerged from the conversations were the need to address recycling starting with the design and the need for international cooperation and standards.

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[22] https://edgeryders.eu/t/1-bern-user-forum/18645
[23] https://edgeryders.eu/t/international-automotive-recycling-congress-2023-in-geneva/18898

Some participants remarked how recycling has always been an integral part of the automotive industry but that new materials are what pose a challenge. "Cars have now been produced for over 120 years. Car recycling has existed since that time. Spare parts and scrap materials have been reused from the beginning, from 1900. They were reused, and it wasn't as special as it is today, where the challenge is represented by new materials like plastic and electronics. But for me, circularity in car recycling starts with the image of a shredder."

GTF berlin 2023[24]

Workshop and conversations with experts on Europe's Largest Sustainability Festival

Berlin, Germany, 14-16 June 2023, 41 participants

Founded in 2019 by former Formula 1 racer Nico Rosberg and Berlin entrepreneurs Marco Voigt and Sven Krüger, GREENTECH FESTIVAL brings together environmental activists, politicians, researchers, startups, tech companies, and consumers to showcase and discuss environmentally friendly technologies, services, and products with an environmentally conscious audience.

Over 600 celebrities, political leaders, civil society, entrepreneurs, and around 11,500 visitors attended the 5th edition of the GREENTECH Festival, Mission to Net Zero, at the former Tegel Airport site in Berlin.

Over three days, we organised a workshop and engaged in conversations with 41 experts from different countries, including some speakers at the festival. The participants shared their points of view on sustainability in the automotive key.

Tech Blik[25]

Conversations with industry leaders, tech enthusiasts on potentially shaping the ever-changing world of electronics: rethinking the tech starting from design

Berlin, Germany 17-18 October, 2023, 32 participants

TechBlick Berlin 2023 brought together several hundred experts, decision makers and interested public to report on the future of electronics reshaped. A variety of panels and discussions covered topics ranging from blockchain technology and autonomous driving to environmental technology and digital healthcare. This cultural exchange is an important aspect of TechBlick, as it helps to break down the boundaries in the global technology community, according to one of the exhibitors. The organisers announced that more than 50% more trade

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[24] https://edgeryders.eu/t/greentech-festival-2023-in-berlin/18894
[25] https://edgeryders.eu/t/report-techblick-berlin-2023/19185

visitors had participated in TechBlick compared to the previous year. During the events we engaged in conversations with 32 people, focusing on circularity and sustainability.

Kongress BW Stuttgart[26]

Conversation among circular economy experts

Stuttgart, Germany, 15-17 November 2023, 34 participants

The annual Congress for Resource Efficiency and Circular Economy (Kongress BW), organised by the state of Baden-Württemberg government, brought together around 1000 participants, mostly experts from business, politics and science of the region and neighbouring countries. The focus was on current challenges and opportunities around sustainable resource use and circular economy.

The congress consisted of lectures, workshops and panel discussions with several information stands from various associations and companies.

The participants also had the opportunity to take part in workshops in which concrete approaches to implementing circular economy concepts in various industries were developed. The diversity of the ideas and innovations presented demonstrated the participants' commitment to a more sustainable future.

We engaged in conversation with 34 people and the depth of conversations on circular economy was rich, as expected from such a public.

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[26] https://edgeryders.eu/t/report-kongressbw-stuttgart-2023/19276

Annex 2: Informed consent for ethnographic research on TREASURE

This document contains the informed consent form used provided to all participants of the ethnographic workshops or interviews. The signed versions are kept on the Edgeryders protected drive. After opting for total anonymisation of the participants, we recorded their consent on tape after having them read the form.

These are the English and the German version (used for participants in German speaking countries who did not speak English).

INFORMED CONSENT FOR: **Project TREASURE**

Project TREASURE (www.treasureproject.eu) wants to support the transition of the automotive sector towards **Circular Economy.** *The project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101003587*

Dr. Veronica Davidov, veronica@edgeryders.eu

You are being asked to be a participant in a research study.

What is the purpose of this study?

The purpose of this study is to collect the opinions of the car consumers on ways to support the transition of the automotive sector towards a circular economy.

What will you have to do, if you agree to be in the study?

If you agree to be in this study, your part will involve *the active participation in the conversations (group or one on one) on the topic. These conversations will be recorded and collected under an alias on the Treasure section of the Edgeryders online forum, edgeryders.eu. There they will be processed ethnographically to understand the connections and the concerns of all the participants.*

Are there any possible risks to being in this study?

If you agree to be in this study, there are no foreseeable risks to you, above those that you experience in your daily life.

Are there any possible benefits to being in this study?

There is no direct benefit to you by participating in this study. The results of this study will indirectly benefit the scientific field by adding new information about the topic being studied.

How will your anonymity be protected?

Your name will not be linked in any way to the information you provide. Your consent form will be kept separate from your study information.

Your information will be viewed by the study team and other people within Edgeryders who help administer and oversee research. If information from this study is published or presented at scientific meetings or on Edgeryders online forum, your name and other identifiable information will not be used.

Important Contact Information

Please contact the *principal Investigator dr Veronica Davidov* via email at **veronica@edgeryders.eu** if you have any questions about the study, or if you believe you have experienced harm or injury as a result of being in this study.

Your participation is voluntary!

Your participation in this study is voluntary. You may decide not to participate at all or; you can stop the interview at any time. If you complete the interview, but later change your mind,, you may withdraw at any time without any penalty. To do so, simply contact the principal investigator.

Signing your name below, or giving verbal consent to the interviewer on record indicates that you (a) have read this consent form, (b) you agree to be a participant in this study, and (c) you are over *18* years old.

_____

Participant's Signature   Person Obtaining Consent

_____

Printed Name   Printed Name

_____

Date   Date

EINWILLIGUNGSERKLÄRUNG FÜR: **Das Projekt TREASURE**

Das Projekt TREASURE (www.treasureproject.eu) will den Wandel des Automobilsektors auf dem Weg zur Kreislaufwirtschaft unterstützen. *Das Projekt wurde von der Europäischen Union im Rahmen von Horizont*

Europa 2020 und dem Innovationsprogramm im Rahmen der Finanzhilfevereinbarung Nr. 101003587 finanziert.

Dr. Veronica Davidov, veronica@edgeryders.eu

Sie werden gebeten, an einer Forschungsstudie teilzunehmen.

Was ist der Zweck dieser Studie?

Der Zweck dieser Studie ist es die Meinungen der Auto Konsumenten zu Möglichkeiten zur Unterstützung des Übergangs der Automobilbranche hin zu einer Kreislaufwirtschaft zu sammeln.

Was müssen Sie tun, wenn Sie der Studie zustimmen?

Wenn Sie zustimmen an dieser Studie teilzunehmen, beinhaltet Ihr Teil die aktive Teilnahme an den Gesprächen (Gruppen- oder Einzelgespräche) zum Thema. Diese Gespräche werden aufgezeichnet und unter einem Alias im Treasure-Bereich des Online-Forums von Edgeryders, edgeryders.eu, gesammelt . Dort werden sie ethnografisch aufbereitet, um Verbindungen und Anliegen aller Beteiligten zu verstehen.

Gibt es mögliche Risiken für die Teilnahme an dieser Studie?

Wenn Sie der Teilnahme an dieser Studie zustimmen, bestehen keine vorhersehbaren Risiken für Sie.

Gibt es mögliche Vorteile an dieser Studie teilzunehmen?

Die Teilnahme an dieser Studie hat für Sie keinen direkten Nutzen. Die Ergebnisse dieser Studie werden indirekt im wissenschaftlichen Bereich, indem neue Informationen zum untersuchten Thema hinzugefügt werden, einen Bonus bringen.

Wie wird Ihre Anonymität geschützt?

Ihr Name wird in keiner Weise mit den von Ihnen bereitgestellten Informationen verknüpft werden. Ihre Einwilligungserklärung wird getrennt von Ihren Studieninformationen aufbewahrt werden. Ihre Informationen werden vom Studienteam und anderen Personen bei Edgeryders eingesehen, die bei der Verwaltung und Betreuung der Forschung helfen. Wenn Informationen aus dieser Studie veröffentlicht

werden oder auf wissenschaftlichen Tagungen bzw. auf Edgeryders-Online-Forum präsentiert werden, wird Ihr Name und andere identifizierbare Informationen nicht verwendet werden.

Wichtige Kontaktinformationen

Bitte kontaktieren Sie die Studienleiterin Dr. Veronica Davidov per E-Mail unter veronica@edgeryders.eu, falls Sie irgendwelche Fragen zur Studie haben oder wenn Sie glauben durch die Teilnahme an dieser Studie

Nachteile zu befürchten.

Ihre Teilnahme ist freiwillig!

Ihre Teilnahme an dieser Studie ist freiwillig. Sie können sich jederzeit entscheiden, überhaupt nicht teilzunehmen; Sie können das Interview zu jedem Zeitpunkt stoppen. Wenn Sie das Interview abgeschlossen

haben, aber später Ihre Meinung ändern, können Sie jederzeit Ihre Einwilligung zur Teilnahme an dieser Studie zurückziehen ohne Nachteile für Sie. Wenden Sie sich dazu einfach an die Studienleiterin.

Wenn Sie unten mit Ihrem Namen unterschreiben, bedeutet dies, dass Sie (a) diese Einverständniserklärung gelesen haben, (b) Sie zustimmen, ein Teilnehmer an dieser Studie zu sein und (c) Sie über 18 Jahre alt sind.

Unterschrift des Teilnehmers   Person, die die Zustimmung
                                                    einholt

Gedruckter Name   Gedruckter Name

Datum   Datum

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