TREASURE

D10.2: GEN - Requirement No. 2
Ethical profile of TREASURE and potential issues

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EXECUTIVE SUMMARY

This document looks at the ethical stance of the TREASURE project. It was authored by Alberto Cottica (EDGE research director), with support from Paolo Rosa (POLIMI, TREASURE principal investigator), Rubén Calvo Sanjuán (ILSSA), Mirco DI Francesco (POLLINI), and Marta Iglesias Embil (SEAT) and approved by our Ethics Advisor, Marco Manca.

It is structured as follows. We first describe the areas of TREASURE that we feel need special attention on ethics, as well as the general principles and methods from which we move. Next, we address how TREASURE plans to further sustainable development goals. Finally, we turn our attention to a specific problem; the protection of personal data stored in the onboard electronics of end-of-life vehicles.

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1. Introduction: an ethical profile of TREASURE

We consider that TREASURE's stance on ethics benefits the most from delivering with care three activities.

The first activity is research on humans. One of the partners, EDGE, plans to conduct research on humans, mostly in task 2.3. The ethical considerations surrounding this activity have been documented in deliverable D10.1, and we will not repeat them here.

The second activity is a "big picture" consideration of the overall ethical impact of TREASURE. From an industrial point of view, TREASURE is about increasing the reuse and recycling rates of onboard electronics of motor vehicles. This is undoubtedly a good thing for the automotive industry, but how does it impact society at large? Would the success of TREASURE unintentionally have adversarial effects? This is the object of section 2.

The third activity concerns a specific issue: the protection of personal data stored in the onboard electronics of end-of-life vehicles. Based on our research, this is an under-researched issue, and industry practices to address it are not yet very advanced. This, we believe, is an area where TREASURE has an opportunity to advance the state of the art. It is the object of section 3.

In the remainder of this section, we describe TREASURE's approach to ethics in a general way.

1.1. Sources and principles.

TREASURE's ethical compass is grounded in the European Convention on Human Rights and the EU's Charter of Fundamental Rights. It strives to orient the research activity in ways that will uphold the principles therein, among which: human dignity ("people are not datapoints"); transparency of the research process; informed consent to participation; privacy and data protection; inclusivity; protection of vulnerable individuals; full disclosure of research results.

1.2. Ethics advisor.

Our ethics advisor is Marco Manca, a medical doctor and scientific attaché at CERN in Geneva. Marco is Chairman of the Board and co-founder of SCImPULSE Foundation, a Dutch public benefit organization dedicated to "breaking through the chains of our economy's incentive scheme on research and collaboration".[2]

1.3. Approach.

TREASURE considers that a project's *morality* is the set of values underpinning it. Its *ethics* is the ongoing evaluation of how the actions it takes affect everyone involved in the project, seen through the prism of those values. So, ethics is something you do; it's a style of running a project. Ethical integrity is found, and evaluated, in action.

[2] http://www.scimpulse.org/about-us/

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This is important, because some ethical risks can be forecast ex ante, and measures to deal with them can be planned ahead. But human systems are fallible: mistakes might happen (in fact they will always happen in a sufficiently long run). The "ethics as action" approach allows us to shift the focus from trying to forecast every possible contingency to fixing things, together with the project's community and acting with its interest at heart.

In medicine, we find that doctors that are least likely to be accused of unethical behavior are not those who make the least mistakes, but those who are best at communicating openly the mistakes they do make, explaining how they propose to fix them, and actively listening to what the patients have to say about the situation[3].

This translates into three principles:

1. **Ethics as action**: TREASURE considers that its ethical stature is only as good as the actions it undertakes to neutralize the ethical risks our research entails. The accent is on processes, not on values.
2. **Openness and response over anticipation**. Some risks can and should be anticipated. Others can not. It is important to stay open to acknowledging unanticipated ethical risks, and reacting quickly, in full honesty and transparency, to fix them.
3. **Data management has ethical implications**, so we treat the two together. This is why section 3 of this document is dedicated to a data protection problem.

[3] Kachalia, Allen, et al. "Liability claims and costs before and after implementation of a medical error disclosure program." Annals of internal medicine 153.4 (2010): 213-221.

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2. Overall ethical impact

TREASURE makes every effort to align itself with Sustainable Development Goals. In particular, we see the project as contributing towards the following goals:

1. **SDG8 (decent work and economic growth)**: within TREASURE, the adoption of automation (generally of Industry 4.0 technologies) does not need to be seen as an attempt to replace human labour with automatic systems. On the contrary, all the technologies adopted (e.g. cobots and AI) will support human operators in their daily activities, by improving efficiency, quality, knowledge and information sharing. Specifically, the adoption of a cobot will support operators in doing PCB disassembly (a completely new activity, never considered by ELV management practices). This way, the economic opportunity offered by selling electronic components and recovering valuable materials embedded into them could be achieved by ELV management actors (for additional information, please see D1.3). In addition, the adoption of AI will support operators in managing new cars entering the EoL processes, by assisting them in locating components to be disassembled, their market value/hazardousness and showing the most promising disassembly procedure to follow. This way, AI could ease the daily work of humans and reduce risks related with the management of hazardous components. Additional information is available in deliverables D1.3 (economic benefits of recovering materials from onboard electronic components) and D1.2 (reduction of risks associated with handling hazardous materials).
2. **SDG9 (build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation)**: TREASURE wants to improve the material efficiency related to valuable materials embedded in car electronic components. These materials, currently shredded together with the rest of the car (and lost in powders, acids residues and ashes), could be correctly recovered from wasted car electronics and re-entering in automotive (or related) production processes. This way, a reduction of materials extracted from mines is expected.
3. **SDG10 (reduced inequalities)**: TREASURE will not focus on luxury cars. This is guaranteed by the absence of any luxury carmaker within the TREASURE consortium. On the contrary, TREASURE focuses on affordable cars (specifically, SEAT cars). Within D3.1 there is a detailed description of the SEAT models considered by TREASURE and the list of electronic components considered. The intent of TREASURE is not to create something exclusively adoptable by rich people, but enabling circular practices exploitable for the management of any kind of car, by any social group in any part of the world.
4. **SDG12 (responsible consumption and production)**: This is the core concept of TREASURE. For the automotive sector to consume valuable materials in a responsible way, TREASURE wants to test, optimize and demonstrate the benefits coming from the adoption of circular practices in managing obsolete car electronics. To this aim, both I4.0 technologies, innovative materials recovery processes and industrial applications will be integrated together with the aim to replicate at small-scale a set of innovative circular business models and supply chains.
5. **SDG13 (climate action)**: TREASURE indirectly relates with SDG13. Given its strong focus on car electronics (and electronics is one of the most impacting sectors in terms of water consumption) TREASURE wants to make the car electronics sector more circular and sustainable. This intent is not only intended in terms of optimizing material

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recovery processes, but also to check the opportunity to reuse secondary materials in both new electronics applications and next-gen electronics production processes.

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3. The data protection of personal data stored in the onboard electronics of end-of-life vehicles

3.1. Problem and context

Modern cars contain many electronic devices. In an important sense, they are self-mobile computers. More and more, these devices are not simply connected to the different mechanical systems of the vehicle, but interface with the driver and passengers: for example, this is the case of entertainment systems and GPS navigation units. Such devices end up accumulating information that falls under the heading of personal data about the vehicle owner: an obvious example is the list of saved destinations of the GPS unit. Therefore, handling end-of-life vehicles constitutes a privacy and data protection risk, and, in the European Union, the GDPR applies to it.

Such risks are quite concrete, as there are records of rental companies trying to bulk sell drivers' data acquired without the consent of the drivers themselves; and of consumers associations recommending to wipe end-of-life vehicles (ELVs) clean before selling or shredding them.

While risks are real, industry practice around them seems still embryonic: for example, we have been unable to find an industry observatory on data protection, of the kind that exists for the medical technology industry. Industry standards and shared best practices as to how to handle the personal data generated by the automotive industry are being put together only now[4].

With TREASURE, we aspire to contribute to improving this scenario. To do so, we map the pipelines through which TREASURE partners handle ELVs; assess their data security procedures as we would do for a GDPR-compliance exercise; and propose improvements. A full fix of the issue is of course not possible at the level of an individual car-shredder, and requires cooperation between companies across the whole automotive value chain; nevertheless, risk management begins with risk awareness, and in this sense this analysis is already a first contribution to the field.

3.2. ELV handling in ILSSA

Currently, ILSSA processes ELVs in a plant, protected by surveillance 24/7. No theft of material of any kind has been reported. The plant has no facilities to retrieve and process data stored in onboard electronics, which are not relevant to ILSSA's business.

Most ELVs processes by ILSSA are cars with an average age of 10 years or more. This means that electronic components capable of storing digital information are relatively few in these vehicles.

[4] For example, the first guidelines concerning the treatment of personal data sent via mobile network by vehicles' onboard electronics to remote servers only appeared in 2020. https://www.acea.auto/publication/acea-comments-on-edpb-guidelines-1-2020/

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The end result of ELV processing is almost always disassembly. In other words, the processing physically destroys the supports for whatever personal data might have been stored on the vehicle: at the end of the process, the risks associated with data protection are eliminated.

ILSSA reminds vehicle owners that it is good practice to wipe their vehicle's data and restore factory settings before turning it in for disassembly.

Going forward, ILSSA acknowledges that it would be optimal to be able to erase personal data from ELV onboard electronics as part of the disassembly process. This is not currently possible for disassembly installations. Making it possible would require the involvement of manufacturers.

3.3. ELV handling in POLLINI

Once a vehicle is received at POLLINI's dismantling facility, employees run a preliminary checklist to spot out any economically valuable materials and then prepare a report of the list of components to be recovered for dismantling, in accordance with health and safety regulations.

Italian law (D.Lgs. 209/03, implementation of the EU directive 2000/53) establishes that dismantlers must:

1. Comply with relevant safety procedures to ensure the management of ELVs is processed at least within 10 days from receipt including the removal of hazardous components and substances such as the battery, engine oil, hydraulic oil, oil, brake fluid, fuels, etc. As the battery is removed, every electronic component ceases to be active and accessible to the operator.
2. Take steps to promote recyclability. This means removing non hazardous components like plastics, tires, glass, ferrous and non-ferrous metals, etc.
3. Resell spare parts after dismantling.

POLLINI is currently unable to reset any onboard electronic device, such as GPS units, electrical control units, etc., at our facility. This is because:

1. Recent models of navigation systems need special alphanumeric codes to be reset. These codes, however, are difficult to find.
2. Even if we have access to the codes there is no guarantee of data cancellation. Some types of data cannot be reset, even by authorized repair shops. Depending on the model, such data might include email addresses, phone numbers, navigation history. The reset that can be carried out whilst the vehicle is still running does not guarantee a total factory reset of the data stored in GPS units, onboard computers and other control units.

Additionally, some of the vehicles entering the facility are accident-damaged. Very often it is not possible to power them on, and that makes it impossible to access the data in onboard electronic devices.

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POLLINI has no interest in collecting, handling or processing these data found in a vehicle device and is ready to publicly commit not to do so. On the other hand, it cannot guarantee that the information contained in any traded device will not be handled by a third party who purchased the spare part.

3.4. ELV handling in SEAT

Each SEAT vehicle comes with a user's manual, which contains information on how personal data can be erased in the infotainment system (which includes the GPS unit). However, the manual makes no mention of personal data protection in this context.

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