Ethics by design

Historical and Theoretical overview

The Ethics by Design approach will be used throughout DOME in addressing technical Ethics issues, and most of all those raised (or potentially raised) by AI, in accordance with the Ethics By Design and Ethics of Use Approaches for Artificial Intelligence notes and guidelines.
The adoption of the Ethics by Design approach, however, does not preclude additional measures to ensure adherence to all major AI ethics principles and compliance with the EU legal framework, in order to guarantee full ethical compliance and implementation of the ethical requirements.
Ethics by Design has been largely influenced by both Privacy by Design and Value Sensitive Design as an approach to a design process. Privacy by Design involves incorporating privacy concerns across the design process. A key part of the Privacy by Design methodology is the regular implementation of privacy design strategies to make technology development more privacy compliant. With Ethics by Design, there is the implementation of Ethical design requirements to try to make technology more Ethical, or more aligned with Ethical standards.
Value Sensitive Design is a theoretically grounded approach to the design of technology that accounts for human values in a principled and comprehensive manner throughout the design process .
In Value Sensitive Design, technology development can be analysed in terms of what is "good" or "important", as determined by stakeholders, and alternative design options can be developed. Designs are developed using an investigation consisting of three phases: conceptual, empirical and technological. These investigations are intended to be iterative, allowing the designer to modify the design continuously.
The process can lead to new design solutions that balance priorities from different values and mitigate harms. It is worth noting that Ethical values can be used as the main drivers of this type of design process.
Value Sensitive Design is subjected to criticisms most of all in relation to the adopted methodology. First, it is implemented on analysing a technology that already exists, developing/proposing alternative designs. However, if a harmful technology is already developed, this is negative per se, ethically speaking, whether or not that technology is actually used. To fulfil Ethical values it is preferable that harmful technologies are not developed at all. Furthermore, by focussing on what stakeholders define as "good", there is little consideration of how the development of the technology aligns with guiding principles of what is "right": something that is good for one person might not be the right thing to do if there are negative consequences for others. As such, Value Sensitive Design can be considered as a starting point, but additional features must be added to make the outcomes more Ethical.
As stated in the Ethics By Design and Ethics of Use Approaches for Artificial Intelligence , for many AI projects, the relevant ethical issues may only be identified after the system's deployment (making it very useful for Value Sensitive Design), while for other projects these might be revealed during the development phase. Ethics by Design is intended to prevent ethical issues from arising in the first place by addressing them during the development stage, rather than trying to fix them later in the process. This is achieved by proactively using the principles as system requirements. What is more, since many requirements cannot be achieved unless the system is constructed in particular ways, ethical requirements sometimes apply to development processes, rather than the AI system itself.
The aim of Ethics by Design is to make the systems designers think about and address potential ethics concerns, while they are developing a system.

Ethics by Design requirements and principles in DOME
The planned development, implementation, and use of AI tools in DOME is actually limited to the adoption of a chatbot for customer service.
Ethics by Design tools and methodologies, as presented below, will be followed during the planning, development, and use phase of the envisaged chatbot, including aspects of NLP functionalities development and machine learning.
In the Ethics By Design and Ethics of Use Approaches for Artificial Intelligence , Ethics by Design is described with a five-layer model. This model is similar to many others in Computer Science: higher levels are more

abstract, with increasing levels of specificity going down the levels.
In the above mentioned guidelines, Ethics by Design is premised on the basis that development processes for AI and robotics systems can be described using a generic model containing six phases, which can be considered parts of a sequential process or can be iterative or even incremental. By mapping the development methodology to the generic model used here, the relevant ethical requirements can be determined. Once this has been accomplished, the Ethics by Design will be embedded into the development methodology as tasks, goals, constraints and the like. The chance of ethical concerns surfacing is thus minimised because each step in the development process will contain measures to prevent them arising in the first place.
The six tasks in the generic model are:
1. Specification of objectives: The determination of what the system is for and what it should be capable of doing.
2. Specification of requirements: Development of technical and non-technical requirements for building the system, including initial determination of required resources, together with an initial risk assessment and cost-benefit analysis, resulting in a design plan.
3. High-level design: Development of a high-level architecture. This is sometimes preceded by the development of a conceptual model.
4. Data collection and preparation: Collection, verification, cleaning and integration of data.
5. Detailed design and development: The actual construction of a fully working system.
6. Testing and evaluation: Testing and evaluation of the system.
During the DOME implementation, whenever appropriate the partners will apply the generic model methodology, as explained in detail in the Ethics By Design and Ethics of Use Approaches for Artificial Intelligence guidelines, page 13/22.

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