Societal and environmental well-being

The sixth of the seven requirements on **Ethics Guidelines for Trustworthy AI** refers to “Societal and Environmental Well-being”.

AI systems should benefit all human beings, including future generations. It must hence be ensured that they are **sustainable and environmentally friendly**. Moreover, they should take into account the environment, including other living beings, and their **social and societal impact** should be carefully considered.

Perhaps one of the most straightforward requirements, Societal and Environmental Well-being refers to the impact of AI technologies on society and the environment. The assessment can be broken down into two main aspects:

Societal Impact Assessment

In principle, AI systems should enhance human well-being and quality of life. Assessing this involves **evaluating the intended and unintended consequences** of

AI applications on individuals and communities, covering emotional, behavioral, and mental health implications (among others).

This includes examining **whether the AI system promotes social inclusion, reduces inequality, and supports public goods such as education and healthcare.** It also includes monitoring forms of human attachment and empathy towards these systems and critically assess the usefulness of anthropomorphic features and their individual and social implications.

Engaging with stakeholders, including marginalized and vulnerable groups, helps identify potential risks and benefits from their perspective. Ethical review boards or committees can provide guidance on these issues, ensuring that AI systems do not undermine social cohesion or cultural integrity.

Environmental Sustainability

AI systems should be designed to minimize environmental impact and carbon footprint by optimizing resource usage. Assessing this involves examining the energy consumption of AI models, especially during training and deployment phases.

However, the environmental impact goes beyond energy-efficient models. It includes **assessing the lifecycle impact of hardware used in AI systems**, from **manufacturing to disposal**. It also includes the energy mix used in data centers to train such algorithms, being renewable or not. As a result, strategies to mitigate negative environmental effects are multifaceted and require access to a broader set of information to properly implement and assess them to **address the goal of energy reduction in the overall AI system's life cycle.**

In addition, AI systems must comply with environmental regulations and standards. This includes adhering **to local, national, and international environmental laws**

and guidelines. Assessing compliance involves verifying that AI systems meet these legal requirements and that organizations have mechanisms in place to monitor and report on compliance.

Regular audits and reviews ensure that the AI systems continue to meet these standards over time.

Societal and Environmental Well-being in MANOLO

MANOLO focuses mainly on the environmental impact by establishing mechanisms (led by ATOS IT) to assess energy efficiency and model performance under various conditions, for both training and inference. Going a step ahead, MANOLO will also explore the use of energy-efficient hardware (i.e., neuromorphic accelerators developed by Fraunhofer IIS or other commercial-of-the-self microcontrollers)

Societal impact will be assessed via the MANOLO use cases, where specific scenarios will be put in action to demonstrate the MANOLO impact under realistic conditions, providing a clear view of societal **dimensions for healthcare, industrial, and telecommunications applications.**

WRAP UP

The requirement "Societal and Environmental Well-being" emphasizes the importance of evaluating the effects of AI technologies on both society and the environment. To positively impact society, AI systems should enhance human well-being and quality of life by fostering **social inclusion, reducing inequalities, and supporting public goods**. In terms of environmental sustainability, these systems must aim to **minimize their carbon footprint, optimize resource utilization, and adhere to environmental regulations by addressing factors such as energy consumption and hardware lifecycle**.

In MANOLO, environmental impact is a priority. The project will establish **mechanisms to assess energy efficiency and model performance, with an exploration into energy-efficient hardware like neuromorphic accelerators**. Societal impacts are expected to be assessed through use cases in healthcare, industrial, and telecommunications applications, demonstrating MANOLO's impact under realistic conditions.