ZDMP Blog

Ethics related to the use of data and AI technologies

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Some questions for you

- In a smart manufacturing scenario, has your company considered creating or adopting an existing framework for the ethical use of non-personal data and AI-based technologies?
- Do you consider the risks to your company from the misuse of data or AI-based technologies?
- Have your considered changing your company's data management strategy to promote more ethical use of data and AI-based technologies within it?

Ethical use of data

In today's world, data is employed for a variety of purposes (eg generating insights, profiling, training of algorithms, etc) by thousands of private companies, research institutions, and public bodies around the world. Despite this, little is said about the ethical rules for its utilisation, and questions have started to rise.

According to DataEthics, a politically independent “Think – Do – Tank” to promote data processing activities to remain ethical, data use must not produce negative consequences to individuals, especially to their human rights and personal data protection. Therefore, all processing activities must be respectful, at a minimum, with the requirements set out in the Charter of Fundamental Rights of the European Union, the European Convention of the Human Rights, and the General Data Protection Regulation. Nonetheless, this concerns mostly to personal data. [1]

The lack of regulation for the ethical use of data, particularly for the use of non-personal data, have led most companies to develop either their own ethical rules for the use of data or adhere to principles or standards developed by organisations of all kinds and public bodies.

For instance, the large consultancy Accenture, in collaboration with various ethics experts, proposed a set of 12 principles known as the "Universal Principles of Data Ethics" based on their research in "Building digital trust: the role of data ethics in the digital age". Accenture's widely renown principles, aim at helping organisations develop frameworks for the ethical use of data through all phases of the data supply chain (acquiring and storing of data, aggregation and analysis of data, and the use, share / sell or dispose of data). They can help prevent situations that may result in legal disputes or permanent damage to company's image as a consequence of the misuse of data. [2]

Another example is UK's Data Ethics Framework, a guideline developed by the UK government for data practitioners, policymakers, and operational staff that work directly or indirectly with data in the public sector to educate them on how to properly design policies for the ethical use of data [3]. Though it is intended for the public sector, many of the principles it proposes can be applied to private organisations (eg, the use of data must consider individuals' expectations and needs, and must be transparent, accountable, and auditable) and even coincide with principles established in frameworks created by private organisations.

Ethical use of AI

The increasing development and use of AI-based technologies have raised ethical concerns on various fronts as well. In response, public bodies, private companies, and research institutions from across Europe and the world have defined principles and issued guidelines for ethical AI in recent years. For instance, various international organisations have created expert committees on AI to draft guidelines or provide their expert opinions, such as [5]:

- The High-Level Expert Group on Artificial Intelligence appointed by the European Commission
- The expert group on AI in Society of the Organisation for Economic Co-operation and Development (OECD)
- The Select Committee on Artificial Intelligence of the UK House of Lords

However, although it might seem that the ethical use of AI is properly regulated, there is no common ethical framework or agreement on what constitutes ethical AI. Even when there is a convergence around the same principles (eg transparency, fairness, privacy, responsibility, non-maleficence), such convergence does not exist on how these principles should be interpreted. [4]

What will ZDMP achieve

Non-personal data and AI-based technologies have been present in the ZDMP project from the very beginning. Data will be used to generate insights for participants in the ecosystem through the use of zApps, which, at the same time, uses data for training purposes. Many of the solutions ZDMP intend to provide as well as the components developed for the project rely on AI as well. Therefore, there are some critical points related to the ethical use of data and AI that ZDMP most consider, to assess if changes are necessary. From the ethical use of data point of view, ZDMP expects to consider the following:

- If the implementation of a data ethics framework makes the existing policies of ZDMP partners obsolete, incomplete, or inadequate
- If the implementation of said framework will change what is considered by the project policies an "appropriate use of data"
- If it is necessary to change the way data is collected and used to meet the project's goals?

Moreover, given that the ethical use of data is not regulated at a European level and that there is a multiplicity of guidelines and frameworks created by organisations of all kinds and public bodies, ZDMP should focus particularly on principles common to them all, such as the protection of individuals, or limiting the collection of data to what is strictly necessary to meet the project goals.

As for the ethical use of AI, considering the lack of a harmonised regulation for the interpretation of the ethical principles and the lack of a unique common ethics framework, and as a European project funded by the Commission, ZDMP is recommended to take as a reference the Ethics Guidelines for Trustworthy Artificial Intelligence designed by the High-Level Expert Group. The principles of the guideline can be applied to ZDMP context as follows [5]:

- **Human agency and oversight**: The use of AI analytics solutions in ZDMP should support and simplify decision-making related to the improvement of processes and product quality in manufacturing environments, as well as human involvement in the decision process is expected
- **Technical robustness and safety**: ZDMP should develop resilient and secure AI systems to ensure prevention or minimisation of unintentional harm. The system should be accurate, reliable, and reproducible as well
- **Privacy and data governance**: In ZDMP privacy and data management issues are continuously thoroughly analysed and measures are implemented for the creation of a trustworthy framework for the project. Technical solutions should be implemented for components involving AI solutions to comply with this principle as well
- **Transparency**: ZDMP should consider traceability when developing and offering their AI solutions through the platform to maintain the system and their decisions explainable to the users
- **Diversity, non-discrimination, and fairness**: ZDMP must assure that the system is accessible to all and avoid bias
- **Social and environmental wellbeing**: In ZDMP the targets regarding the economic and societal (including environmental) impacts of the project has been identified as well as the management actions for i4FS to maximise the economic and societal impact of its activities. All relevant activities conducted in the project (including the development of the platform tools) intend to address these impact objectives
- **Accountability**: The responsibility and accountability of the AI systems and their outcomes should be ensured through adequate mechanisms. ZDMP could assess the accountability of AI systems through audits

ZDMP Links

• Architecture Component(s)	None
• Work Package	WP2 – Business Challenge: Vision, Market, Usecases and Regulation
• Tasks	T2.5 – Regulation and Trustworthy System / Data Management

References/Acknowledgements

[1] DataEthics, 2018, *Principles and Guidelines for Companies, Authorities & Organisations* [Available on: https://dataethics.eu/wp-content/uploads/Dataethics-uk.pdf]

[2] Accenture, 2016, *Building digital trust: The role of data ethics in the digital age* [Available on: https://www.accenture.com/_acnmedia/pdf-22/accenture-data-ethics-pov-web.pdf]

[3] UK Government, 2018, *Data Ethics Framework* [Available on: on: https://www.gov.uk/government/publications/data-ethics-framework/data-ethics-framework]

[4] Nature, 2nd September 2019. '*The global landscape of AI ethics guidelines*' [Available on: https://www.nature.com/articles/s42256-019-0088-2]

[5] European Commission, April 2019, Ethics Guidelines for Trustworthy AI [Available on: https://ec.europa.eu/digital-single-market/en/news/ethics-guidelines-trustworthy-ai]