

Digital Ethics Charter

Digital technologies are playing an ever more prominent role in our professional and private lives. All over the world, Artificial Intelligence, Big Data, the Internet of Things and other digital technologies are radically transforming our organisations, our business models and our ways of working and interacting with one another.

As Thales is a global leader in providing the digital technologies that customers require, we have drawn up this Charter to outline the Group's commitments with respect to three societal challenges: the human

dimension of digital technologies; safety and security; and environmental protection. Thales sees these challenges as particularly important because our products and systems need to interact with human beings at all times; they must be resilient and secure; and they must take into consideration the imperative need to conserve the natural environment.

We believe the present Digital Ethics Charter will help us to achieve the ambitious goals encapsulated in our purpose of "building a future we can all trust".

This Charter does not replace or supersede the national and international laws and standards in effect in the Group's countries of operation, which Thales strives to apply in the strictest possible way.

The contents of this document are liable to evolve over time to reflect advances in technology, the changing expectations of customers, employees, partners and citizens, new societal demands and environmental objectives, and the national and European standards of digital ethics that are currently being established.

1. Placing humans at the centre of digital technologies and helping to build a more inclusive, more equitable world

Keeping humans in control of artificial intelligence

Thales technologies enable humans to retain responsibility for the actions taken by machines. Human beings must decide when and where these technologies are used, and they must conserve the capacity to assume control, either before or during any action by a machine.

Thales uses Artificial Intelligence to enhance people's ability to make decisions, not to replace human beings.

Promoting diversity by tackling discriminatory bias and related issues

From the earliest design phase and throughout the lifecycle of its systems, Thales strives to detect and remediate risks of discriminatory bias.

The Group is also working to achieve greater diversity within its design and development teams, with a particular focus on scientific and technical positions as well as management roles.

Promoting inclusion through the digital transformation

Digital solutions developed by Thales help customers to build a more equitable world.

For example, the Group's satellite expertise helps to guarantee access to knowledge for all, bridge the digital divide, provide telecommunications services during natural disasters and ensure universal access to public services by providing each citizen with a legal identity.

In addition, through the community engagement strategy led by the Thales Solidarity programme, Thales is committed to helping the largest possible number of people meet the challenges of the digital transformation.

Thales Solidarity projects and employee engagement initiatives leverage innovation and technology in support of:

- Education and professional integration
- Digital citizenship
- Environmental protection.

Training our people

To support its own digital transformation, Thales has put in place a number of different training programmes focusing on new technical fields and new business models.

Members of knowledge communities share concrete use cases with one another and provide continuing education and learning opportunities ranging from awareness campaigns to advanced skills development programmes.

2. Helping to make the world safer and more secure by increasing the safety and security of our solutions

Strengthening data governance

When designing its solutions, Thales adopts a reasoned approach to the use of data, striving to optimise the types and amounts of data needed to achieve the desired outcome.

In addition, Thales applies a strict policy on personal data governance and management.

Thales's internal processes incorporate data privacy and confidentiality considerations, particularly with respect to data storage issues.

Thales solutions are developed according to the principles of "privacy by design":

- analysis of functional requirements to determine which data is needed
- limited use of data through anonymisation
- regular verification and validation of levels of data protection.

Ensuring the security and resilience of Thales solutions

During the design process and throughout the commercial lifecycle of its solutions, Thales assures the integrity and inviolability of the algorithms they employ, and of the data they use, capture, store and/or aggregate.

Depending on the risks and requirements of each use case, Thales verifies the robustness of its digital solutions to guarantee that they can function even in degraded operating conditions (substantive changes to the operating environment and/or antagonistic interactions with humans or other systems).

Promoting transparency

The Group undertakes to provide customers with the information they need to understand the decisions made or proposed by Thales's digital solutions. This includes providing details of the design and development process and the algorithms themselves, in compliance with rules on privacy and confidentiality, protection of sensitive information, and measures to protect our intellectual property.

Enabling explainability

Thales solutions incorporate mechanisms to ensure the traceability of the recommendations or decisions made by its systems. This is because Thales believes that, as far as is practicable, it should be possible to explain these recommendations and decisions, retrospectively or in real time, in any given context.

As an example, Thales is developing air traffic management solutions that identify the root causes of any deterioration in the performance of flight path monitoring functions, and explain those causes to operators.

3. Using digital technologies to help build a more environmentally responsible world

Developing the positive environmental impact of digital technologies

The digital solutions developed by Thales enable customers to reduce their use of physical resources, which has a positive impact on environmental protection.

Thales uses Artificial Intelligence technologies to help minimise carbon emissions, for example by optimising flight paths so that customers can reduce aircraft condensation trails or schedule aircraft approaches to minimise the time spent in holding patterns in the air.

In addition, Thales develops Earth observation solutions to monitor environmental change.

Thales's onboard systems activities are also developing digital technologies that meet stringent size, weight and power requirements and thereby minimise energy consumption.

Reducing the environmental impact of digital technology usage

The rapid development of digital technologies is driving growth in demand for raw materials and energy, which has significant environmental consequences.

To address these new challenges, Thales undertakes to act at every level of the technology chain (infrastructure, equipment, hardware and software building bricks) to reduce the environmental impact of its digital solutions. In particular, this will involve adopting eco-design practices in line with its strategy for a low-carbon future. Thales's objective is to apply eco-design principles to 100% of its new solutions and systems by 2023.

For example, Thales is developing "frugal" algorithms that achieve the desired outcome with smaller volumes of data, and "neuromorphic" hardware architectures and technologies that only consume small amounts of energy.

In addition, through its edge and far-edge computing strategy, Thales endeavours to ensure that digital processing and computing operations are carried out as close as possible to the data source (e.g. sensors such as radars, cameras and satellite instruments). This approach reduces traffic on data networks and thereby lowers the amount of energy needed to transmit data to remote servers or datacentres.

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