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Systems and software engineering — Life cycle management —

**Part 7000:
Standard model process for
addressing ethical concerns during
system design**

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IEEE Standard Model Process for Addressing Ethical Concerns during System Design

Developed by the

**Systems and Software Engineering Standards Committee
of the
IEEE Computer Society**

Approved 16 June 2021

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Abstract: A set of processes by which organizations can include consideration of ethical values throughout the stages of concept exploration and development is established by this standard. Management and engineering in transparent communication with selected stakeholders for ethical values elicitation and prioritization is supported by this standard, involving traceability of ethical values through an operational concept, value propositions, and value dispositions in the system design. Processes that provide for traceability of ethical values in the concept of operations, ethical requirements, and ethical risk-based design are described in the standard. All sizes and types of organizations using their own life cycle models are relevant to this standard.

Keywords: case for ethics, concept of operations, ethical value requirements, ethical values elicitation, ethically aligned design, IEEE 7000™, software engineering, system engineering, value-based requirements, value prioritization

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Introduction

This introduction is not part of IEEE Std 7000™-2021, IEEE Standard Model Process for Addressing Ethical Concerns during System Design.

Organizations are becoming increasingly aware of the need to demonstrate socially responsible behavior when dealing with stakeholders, customers, regulators, and society in general. Socially responsible organizations recognize that their decisions and actions affect not just their financial bottom line but also society and the environment. One of the principles of social responsibility is ethical behavior.

Engineers, their managers, and other stakeholders benefit from well-defined processes for considering ethical issues along with the usual concerns of system performance and functionality early in the system life cycle. Consumers can be unaware of the ethical considerations regarding the products and services they use; it is only by rigorously examining ethical concerns that manufacturers, engineers, and technologists can align products and services with the results valued by acquirers, consumers, and users.

This standard aims to support organizations in creating ethical value through system design. Creating ethical value is a vision for organizations that recognizes their central role in society as shapers of well-being and carriers of societal progress that benefits humanity. Implementing IEEE Std 7000 can help them to strengthen their value proposition and avoid value harms. It is applicable to all kinds of products and services, including artificial intelligence (AI) systems.

IEEE Std 7000 is recommended for use by organizations engaged in concept exploration, requirements definition, or development of new or revised products or services. The standard requires consideration of values relevant to the culture where the system is to be deployed. It is applicable with any life cycle model or development methodology. IEEE Std 7000 is designed to work for all sizes and types of organizations (e.g., large, small, for profit, non-profit) aiming to deliver products that enable the ethical values of their customers and their own organization. The standard can help organizations to build better products with a more refined and nuanced value proposition and with less risk. This standard can be more easily applied in the context of organizational policies that are consistent with the organization's ethical values, such as the following:

- Readiness to include a wide group of stakeholders in the engineering effort
- An open, transparent, and inclusive project culture
- A commitment to quality
- A dedication to ethical values from the top of the organization
- A commitment to allocate sufficient time and resources for ethical requirements definition

IEEE Std 7000 is most effectively applied when organizational leaders and top management are involved in and assume responsibility for the products and services created. Through key roles defined for IEEE Std 7000 project teams, this standard seeks to help align management and engineering activities with stakeholder expectations for ethical values in the operational concept, value propositions, and design features being developed.

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