



IEEE Standard for an Age Appropriate Digital Services Framework Based on the 5Rights Principles for Children

IEEE Consumer Technology Society

Developed by the
Standards Committee

IEEE Std 2089™-2021

STANDARDS

IEEE Standard for an Age Appropriate Digital Services Framework Based on the 5Rights Principles for Children

Developed by the

Standards Committee
of the
IEEE Consumer Technology Society

Approved 9 November 2021

IEEE SA Standards Board

Abstract: A set of processes by which organizations seek to make their services age appropriate is established in this standard. The growing desire of organizations to design digital products and services with children in mind and reflects their existing rights under the United Nations Convention on the Rights of the Child (the Convention) is supported by this standard. While different jurisdictions may have different laws and regulations in place, the best practice for designing digital services that impact directly or indirectly on children is offered by this standard. It sets out processes through the life cycle of development, delivery and distribution, that will help organizations ask the right relevant questions of their services, identify risks and opportunities by which to make their services age appropriate and take steps to mitigate risk and embed beneficial systems that support increased age appropriate engagement. One in three users online is under 18, which means that this standard has wide application.

Keywords: age appropriate, age appropriate design, age appropriate services, child, children, children's data governance, children's rights, data protection, digital rights, IEEE 2089™, online protection, online safety, published terms, terms and conditions, terms of service, youth

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Participants

At the time this draft standard was completed, the Age Appropriate Digital Services Framework Working Group had the following membership:

Katina Michael, *Chair*
Beeban Kidron, *Vice Chair*
Gisele Waters, *Secretary*
Ali Hessami, *Technical Editor*

Roba Abbas
Teki Akuetteh
John Carr
Gökçe Çobansoy Hizel
Lorna Cropper
Rys Farthing
Miles Hastie
Rachel Higham

Victoria Jaynes
Natasha Jetha
Muhammad Khurram
Khan
Ansgar Koene
Ephraim Luwemba
Brooke Nelson

Stephanie Nguyen
Towela Nyirenda-Jere
Martin Schmalzreid
Genevieve Smith-Nunes
Jeremy Weissman
John Wyllie
Yu Yuan
Jun Zhao

The following members of the individual Standards Association balloting group voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

Ali Hessami
Werner Hoelzl
Piotr Karocki
Beeban Kidron

Ansgar Koene
Ting Li
Katina Michael

Rajesh Murthy
Pablo Rivas Perea
Gisele Waters
Yu Yuan

When the IEEE SA Standards Board approved this standard on 9 November 2021, it had the following membership:

Gary Hoffman, *Chair*
Jon Walter Rosdahl, *Vice Chair*
John D. Kulick, *Past Chair*
Konstantinos Karachalios, *Secretary*

Edward A. Addy
Doug Edwards
Ramy Ahmed Fathy
J. Travis Griffith
Thomas Koshy
Joseph L. Koepfinger*
David J. Law

Howard Li
Daozhuang Lin
Kevin Lu
Daleep C. Mohla
Chenhui Niu
Damir Novosel
Annette Reilly
Dorothy Stanley

Mehmet Ulema
Lei Wang
F. Keith Waters
Karl Weber
Sha Wei
Howard Wolfman
Daidi Zhong

*Member Emeritus

Introduction

This introduction is not part of IEEE Std 2089-2021, IEEE Standard for an Age Appropriate Digital Services Framework Based on the 5Rights Principles for Children.

This standard for an age appropriate digital services framework is based on the 5Rights Foundation principles in order to help build the digital world young people deserve. Organizations are becoming increasingly aware of the need to treat children as a separate user group to support their engagement in the digital world. Children and their parents and responsible adults have established rights, and specific vulnerabilities associated with their age which require special consideration. Organizations make decisions and take actions that affect not just their financial bottom line, but also the rights and needs of children and young people. This Standard offers organizations the opportunity to create services that uphold children and young people's rights and support their evolving capacity. For the purposes of this standard, a child is any person under the age of 18.

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IEEE Standard for an Age Appropriate Digital Services Framework Based on the 5Rights Principles for Children

1. Overview

1.1 Scope

This standard is the first in a family of standards focused on the 5Rights principles and establishes a set of processes for developing age appropriate digital services for situations where users are children. The framework centers around the following key areas as follows:

- a) Recognition that the user is a child
- b) Consideration for the capacity of and upholds the rights of children
- c) Offers terms appropriate to children
- d) Presents information in an age appropriate way
- e) Offers a level of validation for service design decisions

This standard provides a specific impact rating system and evaluation criteria and explains how vendors, public institutions, and the educational sector can meet the criteria.

This standard sets normative requirements for published terms, design, and delivery that can recognize and respond to the needs of children and young people.

Data privacy and security are complex and highly regulated areas of law, particularly as related to children and young people. The relevant legal definitions and requirements are rapidly evolving, and may vary at the local, state, national, and regional level. No standard can provide unconditional consistency with all such laws and regulations. Users of this standard are responsible for referring to and observing all applicable legal and regulatory requirements, and should refer questions of compliance to competent legal counsel with expertise in the relevant jurisdiction.

1.2 Purpose

This standard provides a set of processes for digital services when end users are children, and, by doing so, aids in the tailoring of the services that are provided so that they are age appropriate. This is essential to creating a digital environment that supports, by design and delivery, children safety, privacy, autonomy, agency, and

health, specifically providing a set of guidelines and best practices and thereby offering a level of validation for service design decisions.

1.3 Use of the standard

The standard describes the set of processes by which engineers and technologists can consider children's rights and needs throughout the stages of concept exploration and development. It provides implementable processes to help align innovation management to make processes, system design approaches, and software engineering methods age appropriate and, in doing so, reduce risk and, wherever possible, amplify the benefits of the digital world for end users under the age of 18.

The standard sits on the values of 5Rights Foundation's principles and reflects the rights of children under the United Nations Convention on the Rights of the Child. Many digital systems impact children in intended or unintended ways and, therefore, should take them into account. All organizations for which that is the case are encouraged to use this standard to help make that engagement age appropriate. This standard can be used to create services that build the digital world that children deserve.

Before using this standard, it is necessary to consider that your product or service is likely to be accessed by children or engage with children either directly, indirectly, or deliberately in the course of their operations. Data analytics, independent research, research about similar services and products, or research from surveys and research with children may help identify if and how your products, services, or systems engage with children and/or their data. In each case, if children use your services and/or if you collect children's data; this standard aims to help organizations create services that benefit children. This standard is based on the foundation that the 'best interests' (see [Clause 3](#)) of the child are placed in primary focus during the design of digital services.

To reach this goal, this standard supports organizations in identifying how their products and services impact children and how to verify that engagement is age appropriate. It is applicable within any life cycle model or set of methods for systems and software engineering and/or new or modified product or service development including brokering children's data. If organizations have running systems that cause risks to children, then the processes in this standard can be used for reiteration of analysis and redress.

1.4 Process overview

The goal of this standard is to enable organizations to design and deliver systems with the rights and needs of children in mind. Age appropriateness includes a variety of values that support children. For example, values such as sustainability, privacy, usability, convenience, controllability, accountability, inclusivity, evolving capacity, and children's rights are realized by this standard. This standard also supports values or attributes in systems typically considered in system engineering, such as functionality, efficiency, and effectiveness. An overview of the key processes in this standard is depicted in [Figure 1](#).

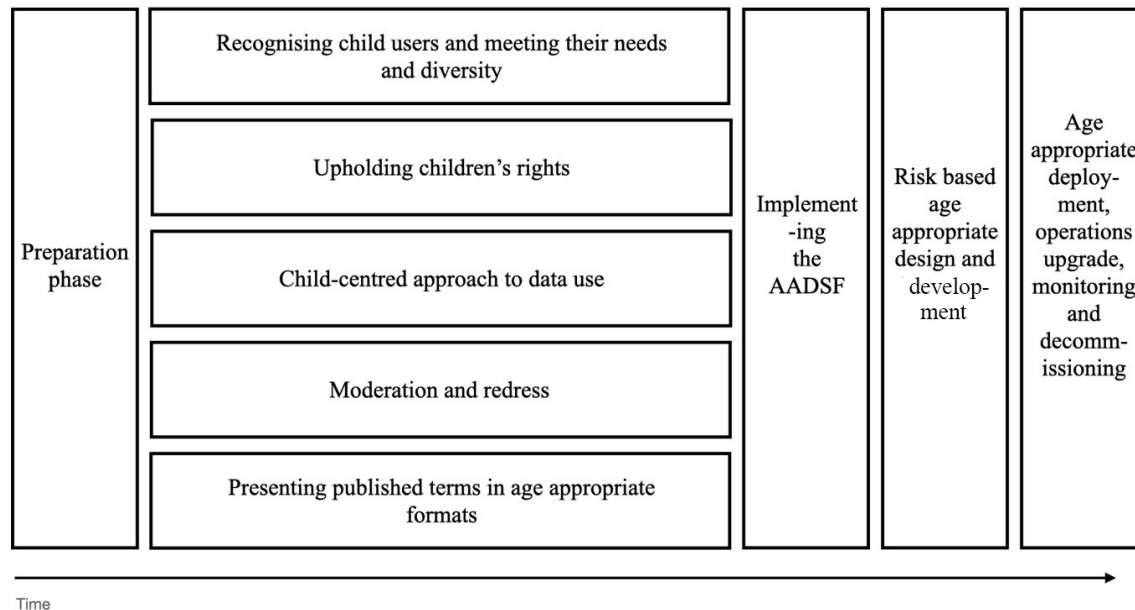


Figure 1—Relationship of processes and stages in IEEE Std 2089-2021

1.5 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (*shall* equals *is required to*).^{1,2}

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (*should* equals *is recommended that*).

The word *may* is used to indicate a course of action permissible within the limits of the standard (*may* equals *is permitted to*).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (*can* equals *is able to*).

2. Normative references

The following referenced documents are indispensable for the application of this document (i.e., they shall be understood and used, so each referenced document is cited in text and its relationship to this document is explained). For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

ISO Guide 73:2009, Risk management—Vocabulary.³

ISO 9000:2005, Quality management systems—Fundamentals and vocabulary.

¹The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.

²The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.

³ISO publications are available from the ISO Central Secretariat (<https://www.iso.org/>). ISO publications are also available in the United States from the American National Standards Institute (<https://www.ansi.org/>).

ISO 9000:2015, Quality management systems—Fundamentals and vocabulary.

ISO/IEC 25010:2011, Systems and software engineering—Systems and software Quality Requirements and Evaluation (SQuaRE)—System and software quality models. ^{4,5}

ISO/IEC/IEEE 15288:2015, Systems and software engineering—System life cycle processes. ⁶

ISO/IEC/IEEE 15289:2011, Systems and software engineering—Content of life-cycle information products (documentation).

ISO/IEC/IEEE 29148:2018, Systems and software engineering—Life cycle processes—Requirements engineering.

ISO/IEC/IEEE 42010:2011, Systems and software engineering—Architecture description.

UNCRC General Comment No. 14, Para.4, General Comment No. 5, Para. 12 CESCR General Comment No. 14: The Right to the Highest Attainable Standard of Health (Art. 12).⁷

United Nations Convention on the Rights of the Child (UNCRC), 1989.⁸

United Nations Committee on the Rights of the Child General Comment (25), 2021 on Children's Rights in Relation to the Digital Environment.⁹

Universal Declaration of Human Rights (General Assembly resolution 217 A), United Nations General Assembly, 10 December, 1948. ¹⁰

U.S. Code 230—Protection for private blocking and screening of offensive material, US Communications and Decency Act, 1996.

In addition to the normative references listed above, consideration needs to be given to meeting the relevant national and regional legislation and industry standards, in the jurisdictions(s) in which the service or product will be offered, but there are instances where the law does not go far enough and so this standard sets the baseline to prioritize the rights of children and may go beyond the requirements of the law. See also [Annex E](#) for examples of regulations at the time of publication of the standard.

⁴ISO/IEC publications are available from the ISO Central Secretariat (<https://www.iso.org/>). ISO/IEC publications are available in the United States from the American National Standards Institute (<https://www.ansi.org/>).

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⁷Available at: https://www2.ohchr.org/English/bodies/crc/docs/GC/CRC_C_GC_14_ENG.pdf.

⁸See <https://www.ohchr.org/en/professionalinterest/pages/crc.aspx>.

⁹Available at: https://tbinetnet.ohchr.org/_layouts/15/treatybodyexternal/Download.aspx?symbolno=CRC%2fC%2fGC%2f25&Lang=en.

¹⁰Available at: [https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_217\(III\).pdf](https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_217(III).pdf).

3. Definitions, acronyms, and abbreviations

3.1 Definitions

For the purposes of this document, the following terms and definitions apply. The *IEEE Standards Dictionary Online* should be consulted for terms not defined in this clause.¹¹

acquirer: A stakeholder that acquires or procures a product or service from a supplier.

NOTE—Other terms commonly used for an acquirer are buyer, customer, owner, purchaser, or internal/organizational sponsor.¹²

acquisition: The process of obtaining a product, service, or system.

activity: A set of cohesive and purposeful tasks of a process.

age appropriate: Something that is suitable or appropriate for a person of a particular age. This concept is often, but not exclusively used in relation to children—a demographic who develop rapidly over a short space of time.

NOTE—In the digital context, the concept of age appropriate is most associated with the UK’s Age Appropriate Design Code that sets out data protection measures to benefit children [B3]¹³.

age appropriate register: An information repository created for clarity, unambiguity and traceability reasons for your product or service that contains data and insights gained in child impact exploration, prioritization, and traceability into product/service requirements.

age assurance: An umbrella term for both age verification and age estimation solutions. The word “assurance” refers to the varying levels of certainty that different solutions offer in establishing an age or age range.

age estimation: A process that establishes a user is likely to be of a certain age, fall within an age range, or is over or under a certain age. Age estimation methods include automated analysis of behavioral and environmental data, comparing the way a user interacts with a device with other users of the same age, and metrics derived from motion analysis or by testing their capacity or knowledge.

age verification: A system that relies on hard (physical) identifiers and/or verified sources of identification that provide a high degree of certainty in determining the age of a user. It can establish the identity of a user but can also be used to establish age only.

agreement: Mutual acknowledgment of terms and conditions under which a working relationship is conducted, for example, a contract or memorandum of agreement.

architecture: See ISO/IEC/IEEE 42010:2011.¹⁴

audit: See ISO/IEC/IEEE 15288:2015.

NOTE—The scope includes professional and industry codes of practice.

¹¹*IEEE Standards Dictionary Online* is available at: <http://dictionary.ieee.org>. An IEEE Account is required for access to the dictionary, and one can be created at no charge on the dictionary sign-in page.

¹²Notes in text, tables, and figures of a standard are given for information only and do not contain requirements needed to implement this standard.

¹³The numbers in brackets correspond to those of the bibliography in [Annex F](#).

¹⁴Information on references can be found in [Clause 2](#).

balancing: Where one right comes into conflict with another, they should be balanced so that the “best interests” of the child is paramount.

best interest: See: UNCRC General Comment No. 14, Para.4, General Comment No. 5, para. 12.

benefit: A positive outcome that is voluntarily or involuntarily created by an act, system or process.

NOTE—Benefits correspond to one or more underlying desired values.

child: For the purposes of digital services provided within the context of this standard, a child means every human being below the age of 18.

child-centered design: A design approach that prioritizes children's rights and needs in service design and governance, bearing children's best interests at the heart of any design process.

children's rights: A framework of legal and other obligations and ethical values covering civil, political, economic, social, and cultural rights afforded to every child.

NOTE—Documented in the United Nations Convention on the Rights of the Child.

concept of operations: A verbal and/or graphic statement, in broad outline, of an organization's assumptions or intent in regard to an operation or series of operations.

concern: See ISO/IEC/IEEE 42010:2011.

context of use: Intended operational environment for a system.

NOTE 1—The environment determines the setting and circumstances of all influences upon a system, including not only other systems but also people, settings, social, and ecological factors, etc.

NOTE 2—Context of use can be captured using a Context of Use Description (See ISO/IEC 25063.3 [B2]).

control: The ability to determine the nature, sequence and/or consequences of technical and operational settings, behavior, specific events and/or experiences.

NOTE—Control includes cognitive control; that is being informed about activities; decisional control: having choices over actions; and behavioral control; receiving feedback from actions.

design: (verb and noun) See ISO/IEC/IEEE 15288:2015.

environment: See ISO/IEC/IEEE 42010:2011.

NOTE—Also applies to products and services.

ethical: Supporting the realization of positive values or the reduction of negative values.

NOTE—In this definition, a system can be ethical or unethical in the sense that it bears value dispositions to cater to positive value creation or negative value prohibition.

evolving capacity: As children acquire enhanced competencies, there is a greater capacity to take responsibility for decisions affecting their lives.

fair terms: A concept that the terms of use for a product or service do not put the consumer at a disadvantage.