# International and Regional Standards for Usability and User Experience

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**Abstract.** This article makes an investigation on international and regional standards highly related to the usability and user experience through looking up relevant committees and sub-committees and by key words and standard-tracing on the websites of the main organizations for standardization, including ISO, ISO/IEC, IEC, ETSI, ITU, etc., and briefly introduces and analyzes the history, status and trend of development for the usability and user experience standardization.

**Keywords:** Standards · Standardization · Usability · User experience

## 1 Definition of Usability and User Experience in Standards

Since 1990s, ISO began to make standards about usability and user experience. In 1998, the definition of usability was made by ISO 9241-11:2008 [1] of ISO/TC 159/SC4 [2]. Later, the concept of user experience was first introduced in ISO standard system by ISO 9241-210:2010 [3]. The object in the definition of usability in ISO 9241-11 is very broad, while the definition in ISO/IEC, ITU and ETSI is restricted to software and ICT products. They use the term quality in use and quality of experience rather than usability.

## 2 Relevant International and Regional Organizations

At present, the main influential international organizations for standardization including ISO [4], ISO/IEC [5], IEC and ITU [6], and some regional organizations for standardization related to science and technology including CEN [7], ETSI [8], 3GPP [9], all began to formulate the standards of usability and user experience and established the related committee and working team (see Fig. 1).


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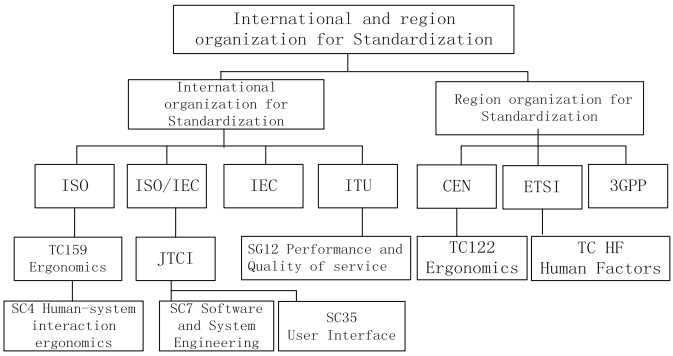


**Fig. 1.** International and regional organizations for standardization related to usability and user experience

## 3 Current International Standards for Usability and User Experience

Through looking up relevant sub-committees, key words and standard tracing in several websites of organization for standardization, we can find standards highly related to usability and user experience. These key words include human factors, ergonomics, usability, user experience, interaction, user interface, quality of experience, quality in use, accessibility, and etc. By the end of 2014, there were a total of 113 standards. Among these standards, the number of standards in ISO is highest, which accounts for 46 %. The second is ETSI, accounting for 27 %. In the perspective of its established time (see Fig. 2), the standard numbers began to increase since 2000, reached the highest from 2006 to 2011 and fell a little from 2012 to 2014.

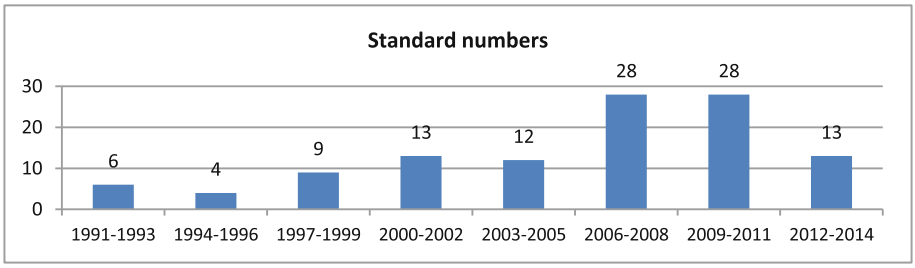


**Fig. 2.** Numbers and publication time for usability and user experience standards

## 4 Classification of Standards for Usability and User Experience

According to the function of standards in product life cycle and the perspective of objected-oriented, international standards for usability and user experience can be mainly divided into 5 categories and 6 categories respectly (Table 1).

**Table 1.** Categories of international standards for usability and user experience

| From the function of standards | From the object-oriented |
|---|---|
| General design standards | Barrier free design or general design |
| Standards for specific fields or products | Software & Internet |
| Standards for specific module or factor | Daily necessities |
| Standards for the process | ICT products |
| Standards for the assessment | Mobile terminal |
| | Medical products |

## 5 Characteristics of Standards in Different Organizations for Standardization

### 5.1 Standards in ISO/TC159/SC4

There are 11 working teams under the leadership of the sub-committee of SC4. The ISO 9241 standards were compiled by ISO/TC 159/SC 4. The ISO 9241 standards have had more impact. With the development of science and technology as well as human-computer interaction, these standards have been revised for several times since their release in 1992 and becoming more complete and extensive (Table 2).

**Table 2.** ISO 9241 standards system

| Past | Title |
|---|---|
| 1 | Introduction |
| 2 | Job design |
| 11 | Hardware and software usability |
| 20 | Accessibility and human-system interaction |
| 21–99 | Reserved numbers |
| 100 | Software ergonomics |
| 200 | Human-system interaction processes |
| 300 | Displays and display-related hardware |
| 400 | Physical input devices-Ergonomics principles |
| 500 | Workplace ergonomics |
| 600 | Environment ergonomics |

### 5.2 International Electrotechnical Commission (IEC)

The standards for usability and user experience made independently by IEC all possess specific industry application background and concentrate on one kind of equipment. For example, IEC 60601-1-6 standards are made for the regulation of medical electronic apparatus availability, IEC TR 61997 and IEC TR 62678 standards are made for the availability in the user interface of multimedia and system design.

### 5.3 ISO/IEC JTC1

ISO/IEC JTC1/SC7 and SC35 in this committee are closely related to the user experience. The Common Industry Format for usability of ISO/IEC 25060–25099 in ISO/IEC JTC1/SC35 lists many items of information about the usability of product availability. It can make a black box quantitative test, supporting human-centered design in human-computer interactive system.

### 5.4 International Telecommunication Union (ITU SG12)

At present, there are 13 research groups in International Telecommunication Union. With the development of 3G business, the SG12 research group works for property and quality of service (business). This group devotes to many research subjects such as terminal, multimedia and subjective evaluation, objective model and tool of multimedia quality assessment, multimedia QoS and QoE.

### 5.5 World Wide Web Consortium (W3C)

World Wide Web Consortium (W3C) is the most authoritative and influential technical standard organization with international neutrality. Among the Web standards published by W3C, WCAG 2.0 focuses on user experience in a broad sense. It can help domestic consumers to better use except free barrier.

### 5.6 European Committee for Standardization (CEN/TC122)

The European Committee for Standardization (CEN) has set up human ergonomics technical committee for standardization, which was named CEN/TC122. Now CEN/TC122 has seven working groups. Most standards made by CEN/TC122 can be directly changed into ISO standards.

### 5.7 European Telecommunications Standards Institute (ETSI)

The relevant standards are compiled by TC HF. TC HF will make thorough background research about human factor issues, which makes ETSI outstanding than other standard organizations and human factor businesses (Fig. 3).

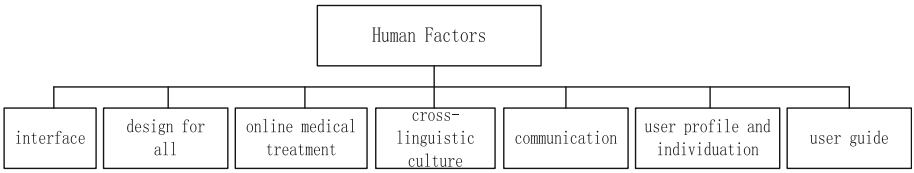


**Fig. 3.** Working groups in TC HF

### 5.8 3rd Generation Partnership Project

3GPP has made QoE index to PSS and end-to-end multimedia services. 3GPP PSS client will implement the quality assessment consistent with the definition of assessment, collect the client QoE observed value and send the observed value of the QoE transport protocol reports to the PSS server.

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## References

1. ISO 9241-11: Ergonomic requirements for office work with visual display terminals (VDTs) - Part 11: Guidance on usability (2008)
2. http://www.iso.org/iso/home/standards_development/list_of_iso_technical_committees/iso_technical_committee.htm?commid=53372
3. ISO 9241-210: Ergonomics of human-system interaction – Part 210: Human-centred design for interactive systems (2010)
4. http://www.iso.org/iso/home/standards.htm
5. http://www.iso.org/iso/home/standards_development/who-develops-iso-standards.htm
6. http://jtc1-sc7.logti.etsmtl.ca/
7. http://www.itu.int/en/ITU-T/about/groups/Pages/sg12.aspx
8. http://www.cen.eu/Pages/default.aspx
9. http://www.etsi.org/
10. http://www.3gpp.org/