

## 4.2.6 Usability

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### 4.2.6.1 About

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**Usability** is defined by [ISO/IEC 25010:2011 SQuaRE -- System and Software Quality Models](#) as the degree to which a product or system can be used by [Stakeholder](#) (i.e., specified users) to achieve specified [goals](#) within a specified context.

#### Goals

The goals are<sup>1)</sup>:

1. **Effectiveness** - The accuracy and completeness with which users achieve specified goals
2. **Efficiency** - The resources expended in relation to the accuracy and completeness with which users achieve goals.
3. **Satisfaction** - The comfort and acceptability of use.

- **Note:** See also

#### Sub-Characteristics

This characteristic is composed of the following sub-characteristics<sup>2)</sup>:

- **Appropriateness Recognizability** - Degree to which users can recognize whether a product or system is appropriate for their needs. (1)
- **Learnability** - Degree to which a product or system can be used by specified users to achieve specified goals of learning to use the product or system with effectiveness, efficiency, freedom from risk and satisfaction in a specified context of use. (1)
- **Operability** - Degree to which a product or system has attributes that make it easy to operate and control. (1)
- **user\_error\_protection** - Degree to which a system protects users against making errors. (1)
- **user\_interface\_aesthetics** - Degree to which a user interface enables pleasing and satisfying interaction for the user. (1)
- **Accessibility** - Degree to which a product or system can be used by people with the widest range of characteristics and capabilities to achieve a specified goal in a specified context of use. (1)

See:

- [ISO/IEC 25010:2011 SQuaRE -- System and Software Quality Models](#)
- <https://iso25000.com/index.php/en/iso-25000-standards/iso-25010/61-usability>
- [ISO/IEC 9241-210:2019 Ergonomics of human-system interaction](#)

## 4.2.6.2 Metrics

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Usability as a characteristic is often considered a subjective quality and left to “interpretation”, however, there are metrics which use to quantify these sub-characteristics. Before we delve into the definition of the specific metrics, it is important to understand why we need metrics rather than just rely on intuitive evaluations.

A core reason to collect Usability Metrics is to provide a data about stakeholder's understanding about a product's usability rather than the developer's understanding of usability. When the two understandings (i.e., interpretations) converge everyone is happy and a way forward can result. That result may be to either continue in the same direction or to have a reassessment of the user's needs.

The metrics must quantify that the system meets the [goals](#) of the overall system:

1. The [Effectiveness Metrics](#) of the communication between the system and the users
2. The [Efficiency Metrics](#) of the users use of the system to accomplish their work
3. The [Satisfaction Metrics](#) of the users that the [sub-characteristics](#) of the system are met.

Ultimately, the primary objective of usability metrics for evaluating a system or product is properly engineered (i.e., neither under- or over-engineered).

- [4.3.6.1 Effectiveness Metrics](#)
- [4.3.6.2 Efficiency Metrics](#)
- [4.3.6.3 Attitude / Satisfaction Metrics](#)

## DDS Specifics Metrics

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1)  
Justin Mifsud, [Usability Metrics – A Guide To Quantify The Usability Of Any System](#), Accessed 18 November 2020, <https://usabilitygeek.com/usability-metrics-a-guide-to-quantify-system-usability/>

2)  
[International Organization for Standardization \(ISO\)](#), [Usability](#), ISO25000, Accessed: 17 November 2020, <https://iso25000.com/index.php/en/iso-25000-standards/iso-25010/61-usability>

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