

ECMA

EUROPEAN COMPUTER MANUFACTURERS ASSOCIATION

USER INTERFACE TAXONOMY

ECMA TR/61

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Brief History

ECMA/TC35 was set-up in 1990 to develop an architectural reference model for the user system interface. The main purpose was to use the developed model to identify the standards required for this interface and also to improve the communication on user interfaces in generally providing a common framework and terminology.

Work started by examining the currently available user system interfaces and the relevant work already in progress in other standardisation bodies. A number of meetings were dedicated to the consideration of user interfaces either commercially available or under development, and liaison was maintained with other standardisation bodies, in particular with ISO/IEC JTC1/SC18 WG9 and ISO/TC159/SC4 WG5.

In addition to the ECMA user interface reference model, this ECMA Technical Report contains a set of forms (see annex A), permitting the classification of a user interface according to the ECMA taxonomy. This annex contains examples of completed forms.

The work of NIST was considered, and annex B describes the relationship between the interface in this Technical Report and the one described in FIPS 158.

Annex C describes a set of input, output and input/output devices.

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1 Scope

User interface design is an area where research and standardization are still in progress. Therefore, this technical report cannot be exhaustive.

Most existing work on user interface models has focussed on the technical aspects, with particular emphasis on implementation issues. By contrast, this report attempts to concentrate on conceptual aspects. For this reason, it is not always easy to relate the model described in this technical report to those proposed by others.

This ECMA Technical Report describes user interface elements and concepts and their relationships and dependencies. It should support the description of existing user interfaces and the specification of future ones in terms of these elements and concepts and their structure.

It is not the purpose of this ECMA Technical Report to give value judgement on the choices for specific user interfaces.

This ECMA Technical Report should assist in improving communication on user interfaces in general by providing a common framework and terminology. It might also assist:

- the designer/implementor of user interfaces and of user interface management systems;
- the vendor when describing user interfaces of software products;
- the procurer/buyer when defining user interface requirements;
- standardisation groups.

2 References

ISO 9241 Ergonomic requirements for office work with visual display terminals (VDTs) - Multi-part Standard

FIPS 158 The user interface component of the application portability profile (NIST - 1991)

3 Definitions

For the purpose of this ECMA Technical Report the following definitions apply.

3.1 Dialogue

A two-way communication between a user and a system to achieve a particular goal.

3.2 Dialogue control function

A function supporting the user progressing through a dialogue.

3.3 Dialogue technique

A specific method to implement a dialogue.

3.4 Presentation of information

The coding and formatting methods used to support the user progressing through a dialogue.

3.5 Coding

The use of a code which assigns meanings to a variety of sensory signals to convey information between system and user.

3.6 Formatting

The arranging and structuring of coded information to assist the user in encoding input signals and decoding output signals.

3.7 Input/Output device

A physical mediator between the user and the system.

3.8 Guidance function

Information or capabilities that guide the user's interaction with the system.

3.9 Metaphor

Abstraction of familiar everyday objects or actions to be applied to user interface objects or actions by analogy.

NOTE 1:

The usual definition of metaphor (see e.g. Collins dictionary) reads: "A figure of speech in which a word or phrase is applied to an object or action that it does not literally denote in order to imply a resemblance."

4 Acronyms

CAD	Computer Aided Design
CASE	Computer Aided Software Engineering
CSCW	Computer Supported Cooperative Work
DTP	Desktop Publishing
I/O	Input/Output
UIRA	User Interface Reference Architecture
WYSIWYG	What You See Is What You Get

5 User interface structure

Classification of user interfaces is made easier by the identification of commonalities, like engineering and ergonomic principles.

Another dimension of viewing user interfaces results from their domains of applicability. It divides into three categories: the application area itself (e.g. office, control rooms), the user characteristics (e.g. expert, novice, casual), and the constraints (e.g. technology, economics).

5.1 Integrated approach

With this approach the user views the interaction as one homogeneous integrated dialogue with the system where the individual components are not exposed. However, from a system point of view, these individual components are identifiable. Logically, six main components can be identified as shown in figure 1.

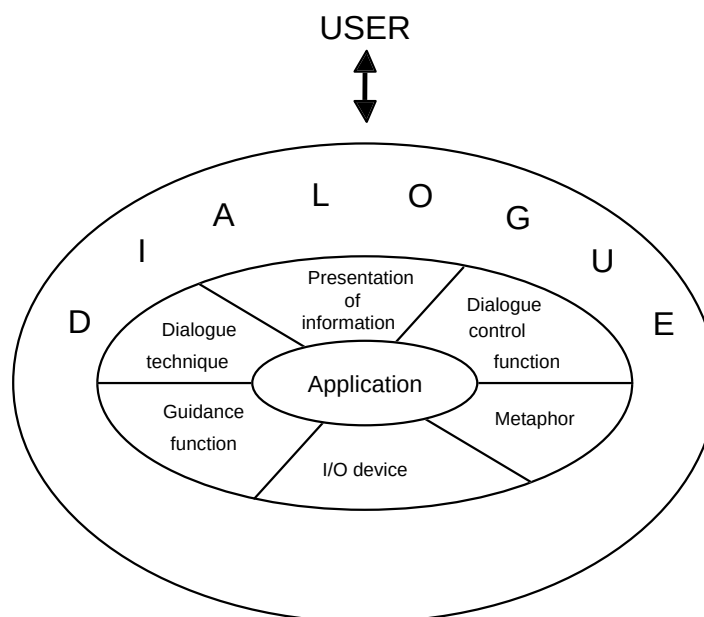


Figure 1 - User interface overview