

# Usability Engineering – Quality Approach (ISO 13407)

Anjoo Navalkar  
ISO Process Consultant

## Introduction

**Usability Engineering** is the newest buzz word of the millennium. Today's customer is well aware of his requirements and is unwilling to compromise. He wants value for his hard-earned money. Whether he purchases a mobile phone, a microwave oven, or a washing machine – the focus has now shifted from features offered, to the ease and convenience of operation, and how fast the gadget can be mastered – i.e. the focus is now on the “**USER INTERFACE**”.

When someone buys any device, say a mobile phone, besides the aesthetics and the looks, the user today checks on issues like how many key strokes are required to perform a regular task. Are the flow of key strokes and help guides intuitive enough or are they confusing? Is there ambiguity in achieving a task? Does operating the device leave you flustered. In other words, the User is reviewing “**USABILITY**” as one of the parameters while deciding the choice of equipment.

“**Usability Engineering**” is a science which studies how to understand and systematically address the usability demand of a customer. Thus, usability engineering deals with design of Web sites, computer portals, computer keyboard design, car dashboard design, TV remote key layouts, washing machine front panel layout, etc.

## Usability principles

**Usability** is defined in ISO 9241 part 11 (a standard giving guidance on usability on requirements for office work with visual display terminals) as the extent to which a product can be used by specified users to achieve specified goals with **effectiveness, efficiency, and satisfaction in a specified context of use**. This means that usability is the way in which a particular person and system interact.

The important features of usability are:

**Effectiveness** : How well the user achieves the goals they set out to achieve using the system.

**Efficiency** : The resources consumed in order to achieve their goals.

**Satisfaction** : How the user feels about their use of the system

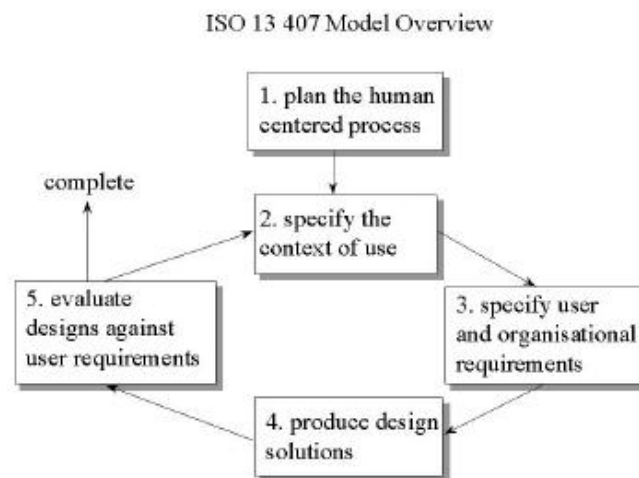
It is important to realise that usability applies to a specified context of use only. For example, the car steering wheel's usability requirement (effectiveness, efficiency, and level of user satisfaction) for a normal driver and for a disabled driver would have different expectations.

Hence it is extremely important to design and devise the user-centric process based on an in-depth, clear-cut understanding of the context of use and the expected nature of user. This would result in the achievement of effectiveness, efficiency and satisfaction.

The forthcoming ISO 13407 standard provides a framework for user-centered development activities that can be adapted to numerous development environments: i.e., from a straight waterfall type of development process to an iterative type of environment.

## The Usability Model

The Usability Model is comprised of five stages, four of which are implicitly joined in a loop. The model is graphically depicted in Figure 1.



*Fig.1 : ISO 13 407 Model Overview*

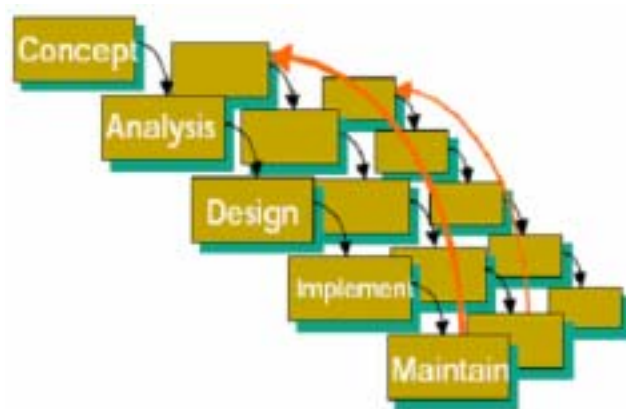
The Usability Model is similar to the Software Engineering Iterative Model. However, it need not always be so.

The Model can be broken up into a Single Waterfall Model (as depicted in Figure 2), where Concept (requirements), Analysis, Design, Implementation (development), and Testing processes follow in a sequence.



*Figure 2: The Waterfall MODEL*

The Usability Model could also be considered as a series of waterfalls, popularly called the Evolution Model (as depicted in Figure 3), iterating until the final desired objective is achieved.



*Figure 3: The Evolution MODEL*

It is important to stress that the transition from each stage to the next is a very crucial step in the successful implementation of the process, and it is important not to progress to the next step until you are satisfied that all aspects and information have been covered, and the objectives set out to be achieved for the given context are entirely fulfilled.

## The Schaffer Method™

Over more than 20 years, the technical staff at Human Factors International, Inc. has developed the best practice for optimizing user experience and performance. Led by Dr. Eric Schaffer they have created a method that is efficient, systematic, scientific, and wholly practical.

The Schaffer Method is the foundation of efforts to institutionalize usability assurance. The Schaffer Methodology is a process standard which is explained briefly in the following steps:

- 1. Plan Project.**  
Identify the main activities and adequate staff and time. Establish the extent of usability work required.
- 2. Evaluate the Current Applications.**  
Identify potential improvements.
- 3. Know What the Organization Wants.**  
Identify business rules and directions before actual design.
- 4. Know What the Users Want.**  
Understand different users and their needs to help build a solid foundation.
- 5. Design the Structure.**  
Ensure that users can understand what is offered, find things quickly, and navigate efficiently.
- 6. Check Standards.**  
Use standards to save time, improve design quality, provide consistency and help concentrate creativity.
- 7. Design Screens.**  
Create screen designs once the navigation and standard templates are in place.
- 8. Support Implementation.**  
Hand over the functional specification to the implementation team.
- 9. Evaluate Usability.**  
Complete a full simulation test. Maintain an ongoing process of monitoring site performance.

**10. Localize the Application.**

Create localized versions of the design to accommodate additional cultural contexts if required.

**Usability Engineering** is here to stay. ISO 13407 would be extensively used in a wide spectrum of industries for different products, providing scope to human imagination to be applied systematically depending on context of use.

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**Acknowledgements**

- 1. ISO 13407 Standards*
- 2. Human Factors International for reference to the Schaffer Method*