

Effect of Usability and Human Factors in Software Development

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Abstract:-

In this paper, a detail is provided about usability and human factors. Concept of usability comes from the field of human factors. Human factor is study of human beings. Man power plays an important role in the software project management. How human performance is affected by environmental factors is measured by human factors. Usability is measurement of effectiveness, efficiency and satisfaction of something to achieve specific goals.

Keywords: Anthropometry, Psychology, Consistency.

I. Usability

Usability means ease to use. Usability is good design. When something is designed well, it works, it is usable. Good usability is no accident- it is a conscious and deliberate design goal. We usually don't notice good usability. But we almost always notice poor usability- we will look at some examples soon. According to ISO 9241 "Usability is a measure of the effectiveness, efficiency and satisfaction with which specified users can achieve specified goals in a particular environment". When we trying to design a product or application that is highly usable, we need to think about:

- **Effectiveness-** How well will this do the job?
- **Efficiency-** How easy and/or fast can users get things done with this?
- **Satisfaction-** Will users are satisfied with this? Will they like it?

We also need to know:

- **Specified users-** Who will be using this?
- **Specified goals-** What will their goals for using it be?
- **Particular environment-** What environment will they be using it in?

The five Es of usability

1. Effective

Completeness- Was the task fully completed? Were the user's goal met?

Accuracy –Was the task completed successfully? Did the user get the right or correct result? How well was the work done?

2. Efficient

Speed – Was the user able to complete the task quickly?

Effort – Was the user able to complete the task without undue cognitive effort?

3. Engaging

Pleasant- Did the user have a pleasant experience when working on the task?

Satisfying- Was the user satisfied by the way in which the application supported her work?

4. Error tolerant

Error prevention- Did the user interface help users avoid making errors? Were errors minor rather than major?

Error recovery- If the user made an error, did the interface assist them in making a successful recovery?

5. Easy to learn

Predictability- Was the user able to work with some certainty because the user interface built on her previous knowledge?

Consistency- Was the interface consistent, so that once a user learnt how to use part of application; they were able to easily learn how to use another part?

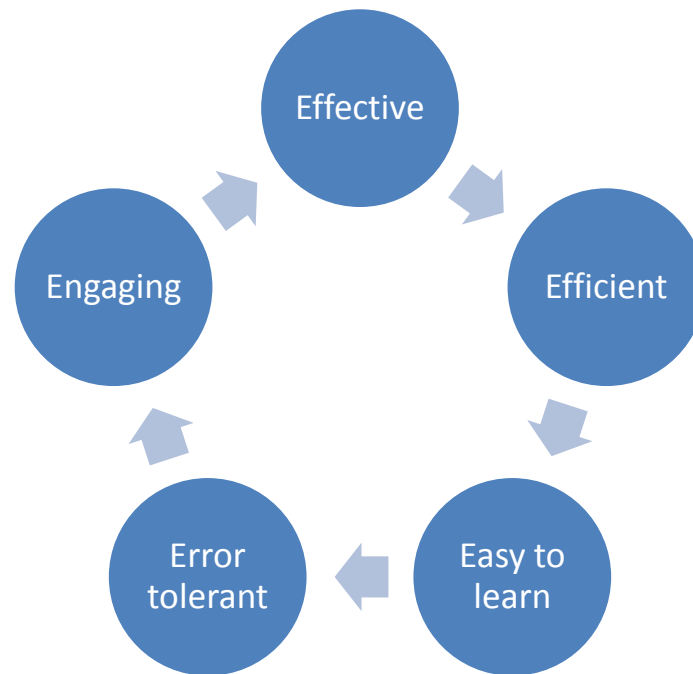


Fig. Main features of usability

II. Human Factors

Usability and the field of human factors

- Concept of usability comes from the field of human factors
- Human factor (also known as ‘ergonomics’) has its roots in psychology (now multidisciplinary)
- Human factor method and practices originated within the US military during World War 2
- Sophisticated weaponry had to be usable
- If it couldn’t be used, military objectives could not be met.
- If it was used incorrectly, would kill the forces using it rather than the enemy.

What is a human factor?

- Study of human beings
- Focus is on understanding the advantages and limitations of the human body and mind.
- Focus also on how human performance is affected by environmental factors.

III. Goals of human factors

1. Basic operational objectives

- Reduce errors
- Increase safety
- Improve system performance

2. Objective bearing on reliability, maintainability and availability (RMA) and integrated logistic support(ILS)

- Increase reliability
- Improve maintainability
- Reduce personnel requirements

- Reduce training requirements
- 3. Objectives affecting users and operators**
 - Improve the working environment
 - Reduce fatigue and physical stress
 - Increase human comfort
 - Reduce boredom and monotony
 - Increase ease of use
 - Increase user acceptance
- 4. Other objectives**
 - Reduce loss of time and equipment
 - Increase economy of production

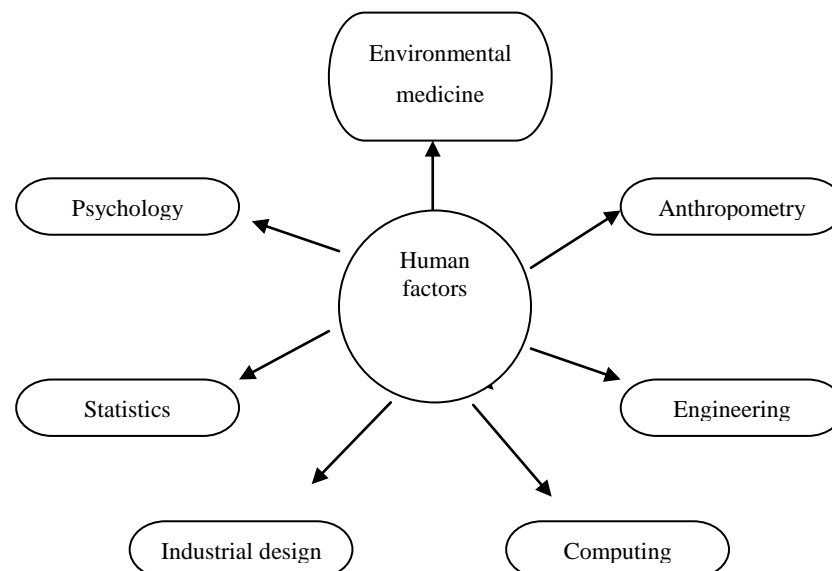
IV. Multidisciplinary of human factors

1. Psychology

- Human sensory capacities
- Human memory and cognitive processes
- Individual differences and their measurement.

2. Anthropometry

1. Concerned with the measurement of the physical features of people.
2. Used in the design of seats, chairs, tables, computer consoles, aeroplane and many other work stations.
3. **Environmental medicine:** Concerned with environmental factors and their effects on health and human performance.
4. **Engineering:** Provides with information on electrical, mechanical and chemical characteristics of elements and systems and principles of design, construction and operation of structures, equipment and systems.
5. **Statistics:** Used for summarizing large amounts of data on human measurements and human performance. Also used to design sampling schemes and experiments for the conduct of human studies and performance measurements.
6. **Industrial design:** Concerned with design, color, arrangement and packaging to combine functionality and as aesthetically satisfying appearance.
7. **Computing:** Human-computer interaction is concerned with human factors relevant to interactions with computers and software applications.



V. Conclusion

Human factors and usability is important for any software project to be managed in an organization. Usability concept provides information about the effectiveness, efficiency and satisfaction of user interfaces in an environment. Software management Process is human-centered activity. This fact highlights the impact of human factors on the management process and performance from different perspectives.

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