

# Human Factors

A presentation for

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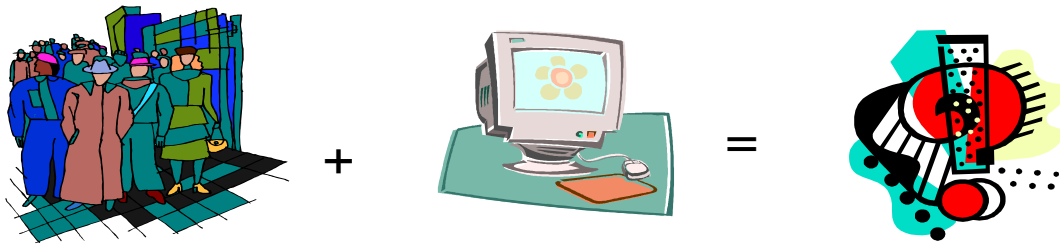
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## Human Factors Overview

### What is human factors?

Cognitive Ergonomics, or Human Factors, is a branch of science that aims to learn about human abilities and limitations and then apply that knowledge to improve people's interaction with products, systems and environments.

Ergonomics is a relatively new branch of science, which celebrates its 50th anniversary in 1999, but relies on research carried out in many other older, established scientific areas, such as engineering, physiology and psychology. In our context, we will be talking about Human Factors as it relates to how people interact with computers and with the information we present on computers.



It is clear that systems and products have to be designed to take account of many human and environmental factors if they are to be used safely and effectively. Ergonomics is the application of scientific information to the design of objects, systems and environment for human use.

#### For example

Some years ago, researchers compared the relative positions of the controls on a lathe with the size of an average male worker. It was found that the lathe operator would have to stoop and move from side to side to operate the lathe controls. An 'ideal' sized person to fit the lathe would be just 4.5 feet tall, 2 feet across the shoulders and have an arm span of 8 feet.

#### Or this...

Sound can also be a useful way to provide information, especially for warning signals. However, care must be taken not to overload this sensory channel. A recent airliner had 16 different audio warnings, far too many for a pilot to deal with in an emergency situation. A more sensible approach was to have just a few audio signals to alert the pilot to get information guidance from a visual display.

### What do human factors specialists do?

Human Factors specialists use information about people such as their ability to handle information and make decisions, their ability to see and hear and their ability to take in information to make decisions about technical communication products.

## Information Processing Strategies

Issue	Description
<b>Sensation and Perception</b>	How people interpret and handle data: recognition of groupings, shapes and potential causes of confusion.
<b>Learning</b>	How information is absorbed and retained by people with varying learning needs.
<b>Memory</b>	Human information storage and retrieval.
<b>Problem Solving</b>	How users solve problems and attain goals.

## Key Issues for Computer and Technical Communication Designers

Issue	Description
<b>Accessing Information</b>	What the 'subtext' of written information tells users; that is, how it influences information retrieval and sets up expectations by the use of visual and textual design clues. Also, allowing for different reading styles.
<b>User Partnerships</b>	Methods for "connecting with readers".
<b>Choosing a Medium</b>	The choice of medium has a profound effect on how information should be structured for users.
<b>Presenting Information</b>	The elements of information and the 'universals' for presenting them.

## 4 Information Architectures

Architecture	Description
<b>Receptive</b>	Assumes users can absorb information when they are exposed to it. Good format for information "briefing"
<b>Behavioural</b>	Assumes that retention and use of information occurs after a gradual bottom-up building of information and skills.
<b>Situated Guided Discovery</b>	Users create unique knowledge structures from information presented.
<b>Exploratory</b>	User controlled environment.

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## Writing and Design Tips

By coding language and numbers in sophisticated, striking images which flow into other strong images, we can accurately and reliably code both information and the structure of information to be easily recalled later.

### General tips

1. Sort Information: according to users' needs
2. Frequent review: allow multiple entry points or linkages
3. Use humor or exaggeration: involve emotions
4. Explore the senses: engage the "sensual" user
5. Color code: use standard accepted colour associations
6. Make visual aids: for the multi-modal user
7. Rehearse aloud: if it has a "voice", we are more likely to comply
8. Make it physical: for accelerated learning

### To Introduce New Concepts

**1. *State the idea or concept in the words of the reader***

It will not contribute to the readers understanding to simply memorize a definition given to them by another person. Try to restate the idea in words familiar and meaningful to them. How would you explain this to a friend? To a family member?

**2. *Think of positive and negative examples***

Be sure both positive and negative examples are given.

**3. *Use a variety of examples***

Think of how the concept may be of use to the reader in the future. You should have available in your head a large variety of examples. How large is large? Think about how you would explain the concept if you were teaching it. What would your user want to know?

**4. *Begin with essential characteristics***

Make lists of the most relevant characteristics of the concept. See if you can put them in order. State them in your own words. Make pairs of relevant and irrelevant characteristics as well as positive and negative examples. These pairs could turn into "compare and contrast" examination questions.