

2 What is Human Factors?

As a unique scientific discipline, Human Factors and ergonomics systematically applies the knowledge of human abilities and limitations to the design of systems with the goal of optimising the interaction between people and other system elements to enhance safety, performance, and satisfaction. [1]

By applying this systematic approach to the design of products, we can enhance the usability for a chosen user group. To ensure that the products we design conform to the user as opposed to the user conforming to the product, we cast as wide a net as possible when conducting investigations. These investigations should be carried out using a wide variety of sources and techniques in order to draw out the true, genuine insight into human behaviour. It is therefore important to remember that the designer is not identical to the user and it is easy to make assumptions about the use based on your own experience. However by applying a range of human factors techniques, we can find the true reason for discomfort in operation.

To understand the human-system interaction, it's important to understand the ways that people perceive information from the system, interpret the information and make decisions about what to do, and manipulate the system, its components, and/or its controls. It's also important to understand the ways that systems React to input from the user, and then provide feedback to the user about the effects of their actions [Figure 1] [2]. This is especially important when dealing with a device designed to give feedback on home energy consumption aimed at the ageing population because as they grow older, their cognitive and physical abilities deteriorate, making it essential we determine exactly what makes the product uncomfortable to use and how to make it better.

This can be done using a variety of techniques such as task analysis, observational analysis, interviews, focus groups, questionnaires and many more. With the insights gained through these techniques, it is important to test through iterative design, including the original users throughout to gain feedback and adapt your design accordingly. By adopting Human Factors early in the design process, we can save money by making changes to the design early since the cost of changes rises exponentially as the design process carries on, as shown in Figure 2 [3].

Human factors is an incredibly dynamic, diverse and versatile design tool with a very wide application within the design process and I will attempt to show this throughout this project.

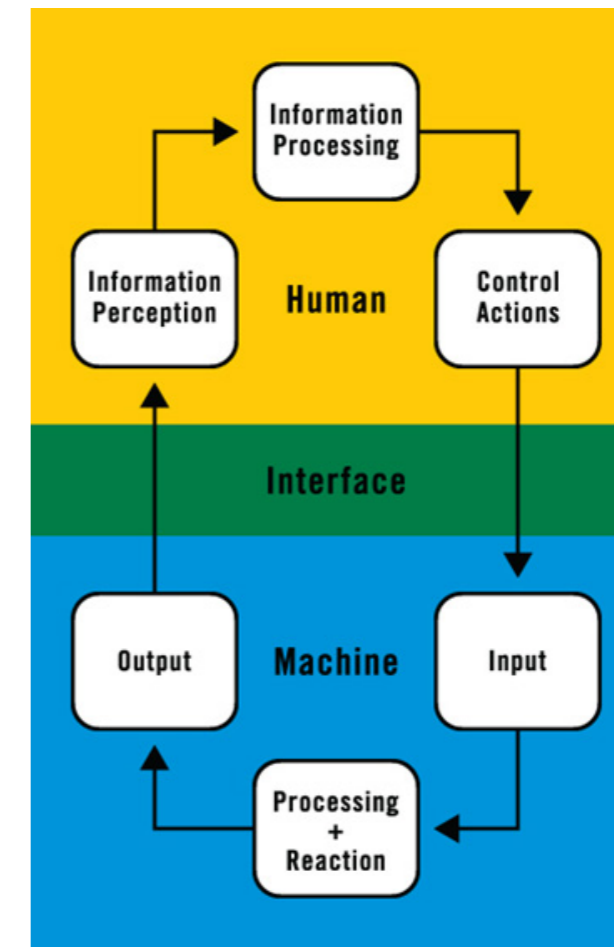


Figure 1: Flowchart of human factors relating to human - machine interaction

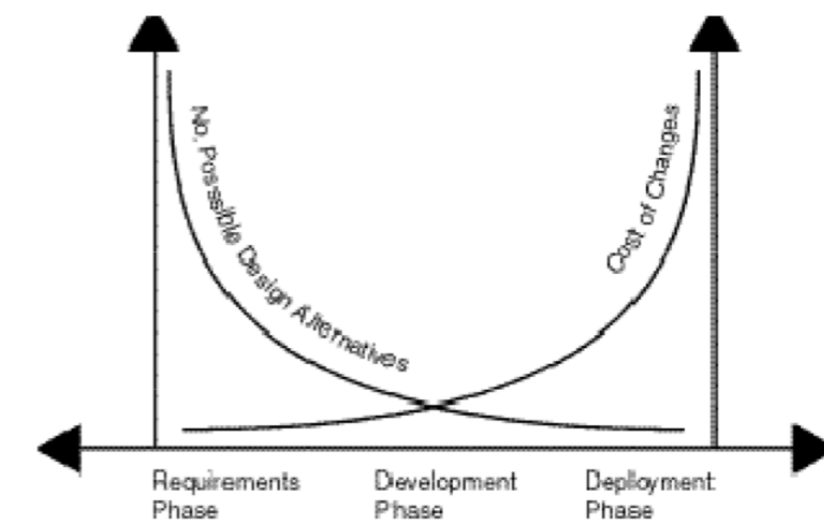


Figure 2: Cost of changing design vs stage of design process