**Notes - Design - Usability**

- Dr Nick Hayward

A brief intro to usability relative to application and interface design.

**Contents**

- Intro
- Scissors
- End of learning
- Efficiency
- Experience
- User experience
- Resources

**Intro**  What do we mean by the term *usability*?

We often define an application, product, piece of software as usable if it fulfills the following heuristics,

- can be efficiently operated
- provides an overall pleasant usage experience
- can be easily learned

However, it is often particularly difficult to judge the usability of a product, or its design, as each of these three general rules and considerations are inherently subjective in nature. Each one will also vary greatly, or at least have the potential, depending upon the individual user of the product. These users will often have very different skill sets, existing knowledge, and previous experience to draw upon.

We can also see that each user's expectations, opinions, and general preferences often affect how the product will be perceived. Naturally, some users are more curious, patient, and persistent with a given product than others.

User experience may also be affected by the attitudes and experiences of their friends and contemporaries, general moods, stress levels, distractions, and fatigue.

**Scissors**  For example, right-handed scissors are designed so that a right-handed user can easily see the line being cut along, whereas a left-handed user may not be able to see as well. A right-handed action with such scissors tends to force the blades together, producing a more effective and cleaner cut, whereas a left-hander's cutting action may force the blades apart, reducing the effectiveness and often resulting in a ragged or creased cut. The molding of the handles may also be less comfortable for a left-hander than a right-hander.

Image of left handed person using standard scissors...



Figure 1: Scissors

- Source - RightLeftRightWrong

**End of learning**   We can often define a product or design as easy to learn, for example, if it meets the majority of the following considerations:

- functionality and general operations for the product should be clearly evident, with appropriate visible controls and labels
- available, possible navigation options and paths, and indeed the user's own current location, are clearly presented
- memorisation and recall is kept to a minimum, and sequences of commands or actions are easily memorable
- the product, application encourages exploration and experimentation
- mistakes are easily recoverable, and operations can be retried if necessary
- assistance and help is easily accessed, and such information is clear, correct, and relevant…
- interaction behaviour, visual layout, terminology should be consistent to encourage a user to form a correct mental model
- few, if any, unexpected surprises in the way the application &c. works or behaves…
    - less for the user to memorise and learn
- where possible, a user is guided through steps to complete complex tasks…
- clear feedback is provided when a user performs an action
- current status of the system is clearly presented and labelled
- the overall application, system, or product should form a coherent whole that makes sense to the user

**Efficiency**   We can also consider a product relative to its perceived efficiency.

For example,

- is it straightforward or easy for an experienced user to repetitively perform actions or complete tasks. In effect, they should not have to repeatedly refer to instructions.
- a user should be able to perform routine application tasks without a great deal of deliberate or strenuous thinking…
- the product should enable and encourage a user to enter a state of **flow**. Effectively, a state of high focus, productivity, creativity, and so on.
- the product should allow a skilled, experienced user to achieve a low error rate with clear notification and detection of limited errors and mistakes
- the product's reliability and performance should be stable enough to prevent delays and hindrances for the user, which might break their sense of *flow*
- the product should have minimal, if any, surprises and inconsistencies in its interaction and design patterns…

**Experience**   Likewise, it is possible to consider a product or application relative to its experience, and in particular whether it is a pleasant experience or not.

- although often highly subjective, is the application's design and interface pleasant and appealing for our users
- does it promote and encourage positive productivity, thereby allowing a user to be as productive as possible
- if we consider games, for example, does the application's experience provide enjoyment for our users, challenge them relative to their abilities, and provide general entertainment and distraction
- does the user feel rewarded and positive for tasks and actions completed
- again, is the product stable, reliable, and trusted by users
- likewise, are the delays sufficiently limited to avoid delays and frustrations for users
- is the product free of unnecessary annoyances and frustrations, again to help promote user satisfaction, reduce cognitive overload, and help achieve and maintain a sense of flow for users

**User Experience (UX)**   User experience is a pretty broad and over-arching concept. If we consider a user's reactions to an application, both positive and negative, their general experience with our application,

from the design and interface to the interaction and potential results and outcomes, then we start to consider the overall user experience for our application.

It is not simply a consideration of the design or it's look and feel. It is also a consideration of the functionality and, effectively, what it can actually do for our users. For example, does the application solve a problem, and hopefully a problem it was designed for or marketed towards. What can it help the user to achieve? What entertainment value does it provide, if any?

Physical products provide even further scope for such considerations. Was it well designed, built, packaged, presented, and so on. How do these aspects contribute to the overall user experience with a product or device.

For a software application, this user experience will also be influenced by its acquisition. Was it easy to find, download, install, update?

If there's a fault with a product, was the support and technical assistance prompt, courteous, and correct?

If you try to sell your application or product, there is a lot more to consider than simply the design and user interaction.

This sense of usability and product preferences also inherently forms a part of the user's identification of an *acceptable* product.

For example, in 1991 Shackel argued that users tend to find a product acceptable when its utility, its general defined functionality, and its usability and attraction were judged sufficient relative to the involved costs for acquisition, learning, and using.

Naturally, if the product was considered not acceptable the vast majority of users would simply seek market alternatives.

Therefore, UX is an inherently important aspect of our goal to develop and provision a successful application, product, and service.

**Resources**

- Being left handed in a right-handed world - YouTube
- Card, S.K., Moran, T.P. and Newell, A. *The psychology of human-computer interaction.* Lawrence Erlbaum Associates. 1983.
- Google Art Project
- Usability - RightLeftRightWrong