Chapter XVII

Interface Design for Web Learning

Lorna Uden, Staffordshire University, UK

Introduction

“Usability rules the Web!” (Nielsen, 2000). It is very easy to recommend that a Web-learning application should be usable, but it is often a difficult design objective to achieve. We believe that usability can be achieved by bringing the interface closer to the user’s way of thinking and working. It is important to design applications that are based on the mental models of users in order to achieve high usability. Designing high usability can be achieved by adopting user interface design models and an object-oriented approach. We have developed a methodology—the Web user object modelling (WUOM) method—to guide designers to develop Web learning applications that have high usability. This chapter describes the WUOM method to develop a Web application for learning circuits based on WUOM. Evaluation of the Web application shows that it has high usability.
Models are Useful

The design of a product’s user interface is critical to its user acceptance and success. Without a well-designed user interface, even a system with outstanding features will not be successful. The best way to give a user a better product interface is to design with the user’s beliefs, wants, needs, experiences, and expectations in mind. The way we interact with things around us is determined by our past experiences with those objects (and other objects like them) and our expectation of how things should work when we use them. We believe that models are useful for designing and analysing the user interface of a Web application. Models can be used to describe an interface in terms of objects, properties, beliefs, and relationships between objects. Models can provide a framework for communication, understanding, and decision making. Three models are relevant to the design and implementation of a user interface. Each model provides a different perspective on the interface, beginning with the user’s perspective and including the designer’s perspective and the implementing programmer’s perspective. The user’s conceptual or mental model, the designer’s model, and the programmer’s model, as well as their importance, are well documented in the IBM Common User Access (CUA) guidelines (IBM, 1992).

Designer’s Role

The user interface designer’s role is to create a designer’s model or blueprint of the user interface, just as the architect creates a blueprint of a house. To do this, the designer must understand the user’s conceptual model. Just as an architect would understand a client’s needs and expectations, the user interface designer must understand users, their tasks, and their expectations. An architect must use basic principles that apply to housing design. Similarly a user interface designer needs to have a knowledge of accepted and proven principles in interface design. In addition, just as an architect knows the strengths and weaknesses of building materials and the skills of the tradespeople who will build the house, the user interface designer must understand the capabilities and restrictions of operating systems, the skills of the programmer, file systems, programming toolkits, and so forth. It is essential that we create a designer’s model (blueprint) that reflects the architect’s understanding of these requirements.

User Interface Design Models

The user’s conceptual models or mental models of a system are mental images that each user subconsciously forms as he or she interacts with the system. Research by Norman and others indicates that users’ conceptual or mental models play an important role in the design of high usability user interfaces (Redman-Pyle & Moore, 1995). A mental model (or conceptual model) is an internal representation of how users understand and interact with a system (Mandel, 1997). It helps people to predict what will happen next in a given situation and serves as a framework for analysis, understanding, and decision making.
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