Chapter II
Patient-Centered E-Health Design

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ABSTRACT

This chapter introduces a series of techniques and tools useful for developing patient-centered e-health. As information technology (IT) is revolutionizing health care delivery, a wide range of personal health information management tools have become available to the patients. The variety and quality of information delivered by these tools will determine how useful consumers find them. Equally important is how the information is delivered. To create quality e-health, designers must attend to the needs and wants of users by engaging them in the design and testing processes. User-centered design (UCD) is a formal approach to ensuring that new products address the needs, wants, skills, and preferences of the user throughout the tool's development. UCD is a design and evaluation process which pays special attention to the intended users, what they will do with the product, where they will use it, and what features they consider essential. This iterative approach ensures that users' needs and wants are met and ultimately increases the likelihood users will accept the final product. This chapter focuses on UCD methods and techniques, giving examples of how to use them and when.

INTRODUCTION

E-health use by patients is steadily increasing, perhaps due to the patients being empowered by physicians and the health system itself (Andreassen, Trondsen, Kummervold, Gammon, & Hjortdahl, 2006; Baker, Wagner, Singer, & Bundorf, 2003; Coulter, 1997; Eysenbach & Kohler, 2003; Street, 2003). Personal health records, patient portals, and pathology-oriented information are just a few areas of growth in patients' use of e-health. However, to be useful these applications must be easy to use and meet patients' real needs and capabilities. This is a major challenge for the development of new interfaces and systems.

Designing usable systems is difficult, and designers need effective and accurately-tested tools. Nowadays there are multiple user-centered design (UCD) methods which make system design more efficient and effective. Inquiring, inspection and testing methods are essential when planning a UCD, and although there is plenty of information about the importance of UCD in software development, many development programs fail to comply with key principles. When failing to comply, the software can be difficult to use, and this paves the way to failure. This failure can be observed both in software which is not completely put into use or is rejected due to user dissatisfaction.

When developing interfaces and designing software for medical patients to use, developers must thoroughly understand patients' needs and capabilities. Sometimes patient's needs are difficult to assess. Patients can become seriously frightened or anxious when diagnosed with a disease and they may hide important information. Lack of health literacy is another factor that makes it difficult to assess patients' needs. In any case, patients are known to have *unrecognized needs and capabilities* which are important to be considered when developing e-health. The concept of patient-centered design is intended to identify patients' needs and capabilities through tailored application of UCD principles to the context of e-health.

UCD is a highly structured, comprehensive software development methodology that is driven by clearly specified, task-oriented business objectives, and recognition of user needs, limitations and preferences (Mauro, 2000). Information collected using UCD analysis is scientifically applied in the design, testing, and implementation of products and services. When rigorously applied, a UCD approach meets both user needs and the business objectives of the sponsoring organization, such as managing risks (Siegel, 2003). UCD can make the difference between success and failure of software applications and can contribute to innovation by revealing unsuspected opportunities for innovative design, including aspects that would not emerge in other forms of idea generation.

APPLYING UCD TO DESIGN OF PATIENT-CENTERED E-HEALTH

UCD is a design philosophy and a process where the user is the design cornerstone, and his/her limitations, hopes and objectives are given extensive attention at each stage of the design process. UCD seeks to answer questions about users and their tasks and goals, and then uses those findings to drive development and design (Katz-Haas, 1998). The chief difference from other interface design philosophies is that user-centered design tries to optimize the user interface around what people may need and what their capabilities are in order to fulfill a task, rather than force them to adapt to designers' preferences.

There are countless methods, tools and techniques intended to help designers evaluate a target product or service (for brevity these are referred to hereafter simply as *products*) from the point of view of the user. By choosing an appropriate method, it is possible to learn in just a few hours