Chapter 12
Usability Engineering
Methods and Tools

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ABSTRACT
Usability engineering is a field that focuses on the human-computer interaction and exclusively in making the GUI’s with high usability. A Usability Engineer validates the usability of an interface and recommending methods to improve its purview. This chapter elaborates various techniques to improve usability of websites: software graphical user interfaces (GUIs). It includes details on assessing and making recommendations to improve usability than it does on design, though Usability Engineers may still engage in design to some extent, particularly design of wire-frames or other prototypes. They conduct usability evaluations of existing or proposed user-interfaces and their findings are fed back to the designer.

INTRODUCTION
Usability engineering is a cost-effective, user centered process that ensures a high level of effectiveness, efficiency, and safety in complex systems. (Andrew, 2000; Nielsen, 1998) This chapter discusses a usability engineering approach for the design and the evaluation of interactive systems, focusing on practical issues. A list of methods has been presented, considering a user-centered approach. This chapter describes the evaluation methodologies following the temporal phases of evaluation, according to a user-centered approach. Today’s customer is well aware of his requirements and is unwilling to compromise. Whether customer purchases a mobile phone, a microwave oven, or a washing machine – the focus has now shifted from features offered, to the ease...
and convenience of operation, and how fast the gadget can be mastered – i.e. the focus is now on the “USER INTERFACE”.

LITERATURE REVIEW

Down the time usability has been studied and discovered by great researchers and scholars. It is a multidimensional concept that opens areas for research. It has evolved over time and has got its relevance in many aspects.

“Usability Engineering” is a science which studies how to understand and systematically address the usability demand of a customer (Jacko & Andrew, 2000) Thus, usability engineering deals with design of Web sites, computer portals, computer keyboard design, car dashboard design, washing machine front panel layout, etc. Even people who are already experts in the application of usability methods are aware of potential adaptations and extensions to the methods when applied to systems that are designed to incorporate significant use of AI. According to (Lieberman & Jameson 2009), some of the ways in which systems that incorporate intelligence tend to differ from systems that do not, both in terms of their potential to help users and in terms of possible side effects. These and other properties of usability systems can affect the application of design and evaluation methods in various ways, some of which are illustrated in the case studies by (Czerwinski, Horvitz, & Wilhite, 2009) which yield records of user activities at set points throughout the day and are useful for gathering evidence about the nature and duration of users’ activities. Questionnaires can ask about many different types of users’ needs, though the data collected is not always as reliable and informative as the more direct methods just listed.

The first, and very important, aspect (Marca, 2012) about usability modeling with today’s commonplace methods is that UML, Agile Software Development and Usability Engineering have their origins rooted in software systems. When used in combination, these methods have a strong track record for developing software for many kinds of problems and domains. The tools, techniques and technology (Clark 2011) for usability experts today is creating a win-win outcome. Inzunza, Juarez-Ramirez, & Mejia (2011), in their paper discuss that Usability can be attended from early phases by incorporating task and user analysis with framework’s components. This fact benefits also the development of mobile applications, obtaining more usable systems tailored to the needs of a specific user with unique characteristics.

Seffah & Metzker (2009) discussed several usability cost/benefits and demonstrated the importance of usability while highlighting the current gap between usability and software engineering methods and tools. In this introductory chapter we outline the importance of usability as a software quality attribute as well as the importance and fundamentals of its engineering and integration into the mainstream software development lifecycle. Usability Engineering (Durrani & Qureshi, 2012) is being partially followed in organizations. In planning phase, usability activities are not estimated and it propagates the absence of usability tasks in next phases. User involvement in SDLC phases is limited to requirement gathering and testing phase. In requirement phase, main focus is on the functionality of the system. User profiling is largely missing in organizations. In design phase, usability factors are somehow explored and organizations intend to do detailed designing. Usability testing is not focused by many organizations and this leads to post-release defects. To convince management regarding benefit of usability practices it may be a better idea to perform videotaped usability tasks of some recently developed system and share the results with development and management teams. (Gardner-Bonneau D. 2010), talked about the software system’s capability to sustain the changes in the technical prospects without hampering the usability effectiveness. (Jennifer C. Romano Bergstrom 2011) carried out