Chapter 48
Usability Cost–Benefit Analysis for Information Technology Applications and Decision Making

Mikko Rajanen
https://orcid.org/0000-0002-3281-7029
University of Oulu, Finland

ABSTRACT

Usability is an important quality attribute for information technology (IT) applications. However, integrating usability design and evaluation as an integral part of the development processes in information technology development organizations is still a challenge. This chapter gives an overview on the usability cost-benefit analysis models and provides some example cases of the importance of usability. These models and cases can be used by usability professionals to motivate the organizational management to provide resources for usability work and to integrate usability work as part of the development process. The target audience for this chapter are professionals and researchers working in the field of IT, managers in IT development organizations, as well as managers in organizations acquiring and using IT.

INTRODUCTION

Today, we use Information Technology applications, software, information systems and online services more than ever before. These applications, systems and services play a crucial role in the everyday and working life of individuals, organizations and the society at large, and they impact the lives of all people. Therefore, it is more important than ever to ask why these systems are often so difficult to use. To quote the founder of Macintosh project at Apple, Jef Raskin (2001): "As far as the customer is concerned, the interface is the product." This means that as far as the real users are concerned, all the innovative and creative technical solutions and functionalities of the system created by the development organizations have been designed and developed in vain if the users cannot easily use them.

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The mission of this chapter is to give a 1) comprehensive overview as well as 2) example cases of the importance of good usability and user experience (UX) for the development organizations, customer organizations and end users, as well as providing 3) practical tools for the management for making strategic business cases for better usability and UX, and introducing usability and UX activities into the development process. The target audience for this chapter are professionals and researchers working in the field of Information Technology, managers in IT development organizations, as well as managers in organizations acquiring and using IT. While the topic is important for the managers in development organizations and customer organizations, there are surprisingly few books or research articles on this topic, and even the newest practical guidebook, the "Cost-Justifying Usability" is now over 15 years old. The overview on usability and UX, as well as the example cases presented in these old books and articles are in great need of a complete update. In addition to providing a new and up to date overview on the importance of usability and UX, and giving modern example cases of usability benefits, this chapter will further expand the usability cost-benefit analysis into new contexts which are not currently presented in books or articles, namely games, gamification and open source software development. To achieve this mission, the author of the chapter will reflect on his own research on the topic from the last 15 years, as well as the experience and data that he has gathered during this research.

BACKGROUND

Usability is defined as one of the main quality attributes for Information Technology applications, software products, information systems and online services (Marghescu, 2009). There are many international standards and recognized definitions of usability and user-centered design, which all have different focuses (Marghescu, 2009) First international standard referring to the usability defined it as the capability of the product to be understood, learned, used by, and attractive to the user, when used under specified conditions (ISO 9126). The second international standard defining usability is the standard ISO 9241-11, where usability is defined as being the extent to which a product can be used by specified users to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use (ISO 9241). The third common usability definition is by Nielsen and Schneiderman, who define usability as consisting of five quality components: learnability, efficiency, memorability, errors, and satisfaction (Nielsen 1993, Schneiderman 1998). Usability can be achieved through a user-centered design process, usability activities (e.g., usability testing, paper prototyping, heuristic evaluation), and having an overall focus on usability issues through the entire development process (c.f. Rajanen et al. 2017, Rajanen & Rajanen 2017). Furthermore, since the turn of the millennia, the concept of user experience (UX) has been introduced to take into account the emotions and attitudes of user about using a particular product, system or service (ISO 13407, Marghescu 2009).

Usability design and evaluation as a field has struggled since its beginning for legitimacy (Rajanen & Iivari 2007). Furthermore, there is a wide diversity on the usability professionals' design and evaluation practices, as well as their conceptualization of usability and user experience (Rajanen et al. 2017). Fortunately, there has also been a lot of progress when it comes to making usability improvement activities an integral part of the development process. These days the development companies usually acknowledge the importance of usability and see it as important factor for their success. However, still too often the usability improvement activities are amongst the first to be sacrificed whenever the product needs to be on the market as soon as possible. Furthermore, there is still some traditional views amongst the