Promoting the use of Design Evaluation techniques within Software Development

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This paper introduces the dEv framework. This framework was designed to encourage greater integration of design principles and design evaluation methods in software development. Subsequently, a design Evaluation resource (dEv) is also introduced. This resource was developed to enable software engineers to rapidly access and apply core techniques and tools from design evaluation.

1. INTRODUCTION

The importance of evaluating the design of software is essential to the success of the final software product. Design evaluation is widely used within the Human Computer Interaction (HCI) community. Note, that the American Evaluation Association (AEA) defines design evaluation as the systematic approach to the gathering and analysis of data to define requirements, to assess the merit, worth and significance of the item undergoing evaluation (Administrator-2014).

The concepts underpinning design evaluation are well known within the Human-Computer Interaction (HCI) community. There are many techniques (Folmer-2004) used to assess, and evaluate the design of software products. With the advent of User Centred Systems Design (UCSD), it has been established (Gulliksen-2003) that having the user involved during the development of software is highly advantageous. Substantial efforts has been made to integrate the topic of HCI with Software Engineering (Salah-2011). So, the importance of evaluating the design of software products is unquestionable.

Back in 1989, Nielsen introduced his concept of “lite” design evaluation. This version of design evaluation selected the most efficient and effective techniques from design evaluation and bundled them together under the umbrella term of discount usability. Discount usability is based on three main principles; they are ‘to simplify user testing’, ‘to narrow-down prototypes’ and ‘to use heuristics evaluation’ (Nielsen-2009). Thus, the case for design evaluation, even if it is only “lite” design evaluation, is established.

2. THE VALUE OF DESIGN EVALUATION

The overall value of using design evaluation is unclear within the software engineering community. In our initial research, a combination of both questionnaires and focus groups sessions were used to assess how much our participants knew about design evaluation. Note, that all of the participants were undergraduate and postgraduate Computing students studying software engineering as a major part of their studies.

Based on the feedback from these sessions, it was clear that many new software engineers may not encountered design evaluation. Furthermore, it is sometimes the case that they perceive evaluation to be an “additional” and “optional” part of software development. Hence, there appears to be a common misunderstanding and misrepresentation of what design evaluation is and what it can deliver for a software engineer.

It is our belief that it is possible to draw upon the core principles of discount usability to provide developers with a lite (“cheaper”) version of design evaluation. This research project aims to correct the misunderstanding of what design evaluation is, so that software engineers can exploit its richness to develop improved products.

3. THE dEv FRAMEWORK

The dEv framework is shown in Figure 1. This framework has been defined to encourage software engineers to adopt design evaluation throughout the software development process. It is built upon the core concepts of discount usability as specified.
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by Nielsen (Nielsen-1993; Kheterpal-2002). In addition to these, the dEv framework also includes two other efficient and easy-to-use methods namely the use of questionnaires and focus groups.

The framework has been designed to highlight how design evaluation can support each stage of the software development process.

3.1 The dEv resource

The design Evaluation resource (known as dEv) was developed to help evaluate our research into promoting the adoption of design evaluation by software engineers. Fundamentally, the dEv resource is an online eLearning resource.

The requirements for this resource were collected by running several focus group sessions. Subsequently, this resource was evaluated using focus groups made up of the same (original) participants again for continuity.

Its content is shown in Figure 2. It defines all the techniques incorporated in dEv: Questionnaires, Focus Groups, Heuristic evaluation, Scenario testing and Thinking Aloud. It is hypothesised that this combination of core discount usability techniques alongside both the use of questionnaires and focus groups will support the promotion of design evaluation to the software engineering community.

The dEv resource supports developers by reducing the costs associated with “doing” design evaluation. The aims of the resource were to support developers are

(i) To discover the limitations of their product.

(ii) To manage the perceived costs of adopting design evaluation as part of the software development process.

(iii) To extend the software engineers’ knowledge and skills regarding design evaluation and

(iv) To support the integration of design principles and evaluation methods.

5. REFERENCES


