

User Interface Design and Usability Testing of a Reinforced Concrete Design (RCD) Beam Interface

L. O. Yusuf^{1*}, O. Folorunso¹, A. T. Akinwale¹, I. A. Adejumobi²

¹Department of Computer Science, University of Agriculture, Abeokuta, Nigeria

²Department of Electrical and Electronics Engineering, University of Agriculture, Abeokuta, Nigeria

Abstract

This paper describes the design outcomes and user evaluation of a Reinforced Concrete Design (RCD) interface for Beams from a user-centric point of view. The design began with a user interface proposal that was shown to Reinforced Concrete Designers to gather first reactions. Based on feedback the style evolved and eventually interaction diagrams were made to make sure that the functionality was both possible and logical to implement. The interaction diagrams were presented to usability RCD experts to be initially evaluated and commented upon. The design decisions were implemented using Microsoft Visual Studio 2010 and AutoCAD 2010. A prototype was produced to test the theories in practice and to gain information about the RCD users. The implementation itself took advantage of emerging technologies such as WCF which make it possible to use Service Oriented Applications through the web services. A total of twenty-five RCD experts were recruited to perform various tasks on both Structural Analysis and Design (STAAD) Software Product and the prototype RCD applications and rate their experiences. The outcomes of the user-study were positive, with the majority of the users (twenty-two out of twenty-five) preferring the prototyped interface to the existing and fully working solution. This was considered a good result given the qualitative feedback from the users. Some of the findings emphasized the importance of the holistic experience and look-interact-and-feel over a pure set of technical features and merits.

Keywords: RCD, RCD Beam, AutoCAD, WCF, user-centred design, usability, design interface, visualization mashing;