

A Review of Current Trends in Usability Evaluation Methods

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Abstract — This paper will discuss on Current trends in Usability Evaluation Methodology and evaluates these methods based on some set of parameters. This paper provides an overview of two different methods by presenting their characteristics and functionality and then provides a comparison and discussion of their respective merits and drawbacks.

Keywords— Human Computer Interaction, Usability Engineering, Usability testing or User Acceptance Testing.

I. INTRODUCTION

The concept of Usability is not new in the field of computer science. 'Usability' is one of the important quality attribute of Human Computer Interaction. In olden days only IT professionals use to work on computer systems but this has changed over the period of time when personal computing has evolved. With boom in personal computing personal software's, websites, mobile and tablet application have made everyone in the world a potential user. Usability always emphasis on user centric designs, which means the applications built for users should be usable and user friendly. Hence usability can be treated as a quality attribute for a application. A good quality usable software application is easy to learn, easy to memorize, easy to interact with is the first priority of a user. A user should feel satisfied on using the application and it will happen when the application will help user to accomplish his intended task with an ease. This review paper will throw light on recent current trends on usability evaluation methods which help to maintain the usability of applications being developed.

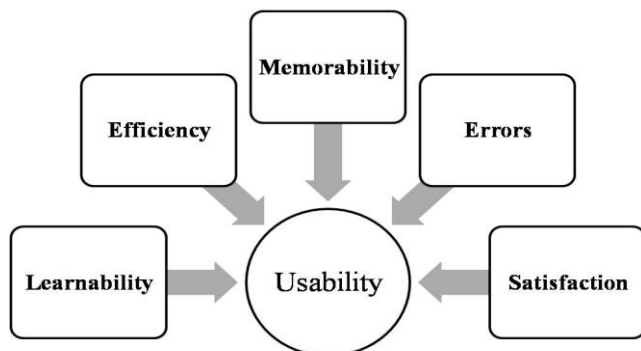


Figure 1: Five Quality attribute of Usability

II. EXPLORING INEXPERIENCED USER PERFORMANCE

First methodology which we are looking into is “Exploring inexperienced user performance” In this paper they conducted their study specific for mobile tablet application. This paper they have emphasis on combination of two techniques ‘Prototyping’ & ‘Usability testing’. Here they have developed an application on First aid, In this methodology the first stage was of Prototyping. They have approached for a user centric design where the user is at the center of designing a prototype of application.

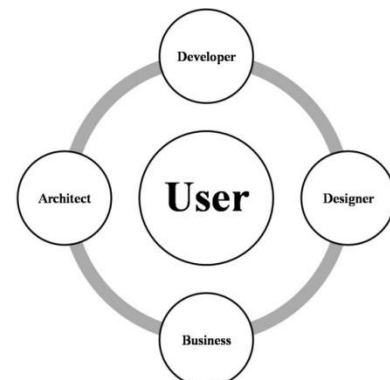


Figure 2: User Centric Design

Here they have selected few novice/ inexperienced users of the applications from different age groups having a basic knowledge of personal computing who can operate tablet. Then one by one sits with the designer and moderator for the process. User is provided initially basic knowledge about the application. Then he will be presented with three prototypes one after another for evaluation. Here the first prototype is the one which the designer has modified and designed with help of users. For example majority of users preferred tile shaped icons instead of textual contents I the application. User is provided with specific set of tasks to be performed, for example launching the application and navigating to main menu. User's activity is being captured through use of camera, moderator and simultaneously noting down the issues if any. Users are provided with three prototypes and all information about user's are recorded for further analysis of results. Below are the three prototypes.

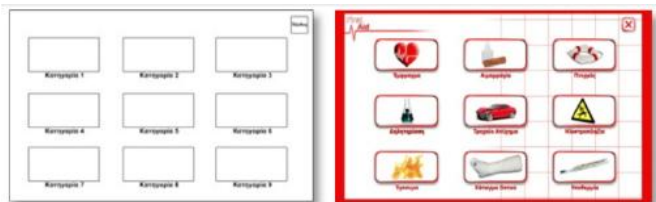


Figure 3: Prototype 1 [1]

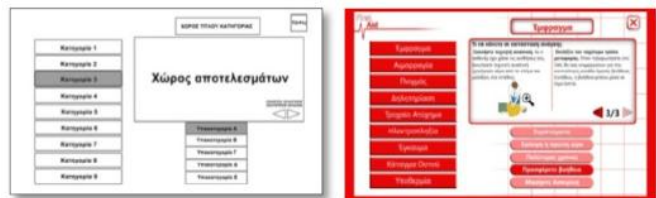


Figure 4: Prototype 2 [1]



Figure 5: Prototype 3 [1]

PARTICIPANTS TASKS

Task 1	Turn on the mobile tablet device and select the icon “first aid”.
Task 2	Find the information on Cardiopulmonary resuscitation (CPR.)
Task 3	Enlarge the image in order to see details.
Task 4	Select information on heart attacks.
Task 5	Find the information on symptoms of broken bones. Turn off the mobile device

Figure 6: Sample tasks [1]

The entire process lasted for 80 mins in which for each prototype task completion and SUS questionnaire 20 mins each. The aim of SUS questionnaire to record the users preference, their feelings while using the application, difficulties encountered etc. to be captured and to be utilized by designers to finalize a prototype and refine it to improve the usability of application. The main aim of this approach is to study effectiveness, efficiency and user satisfaction. how "well" a system performs its task for which it is built to be. Efficiency is defined by how well the application helped user to perform its task. Over all the following approach is based on Time efficiency of the application. A prototype with less time consuming to learn, perform a specific tasks, user friendly etc. is the one which is accepted by users widely and best way to choose the application with better interaction. In this approach user and users feedback played a vital role to enhance the usability of mobile based application. Hence the aim of this approach is to see that involving inexperienced user in interface designing during the interaction enhances the usability of the application.

III. HYBRID USABILITY METHODOLOGY

As the name suggests Hybrid this method is combination of usability evaluation techniques. Usability testing is an integral part of Software Development Life Cycle (SDLC). But normally it is in the later stage of cycle where only critical defects and issues related to usability are addressed. Various usability testing techniques are as follows Heuristic Evaluation, Informal Usability Testing, Usability Testing in a Lab, Remote and Moderated Usability Testing, Satisfaction Surveys, Remote Unmoderated Usability Testing, Accessibility Testing, Eye Tracking etc. out of which first three methods are the most used. In Hybrid Usability Method authors are using the combination of Heuristic Evaluation and Lab Based Usability Test. These two methods are selected since Heuristic Evaluation method captures the defects related to usability with maximum coverage and the LBUT covers the expressions of users, eye tracking, moderated testing, satisfaction questions etc. HUM approach is as below it is applied across SDLC as shown below iteratively.

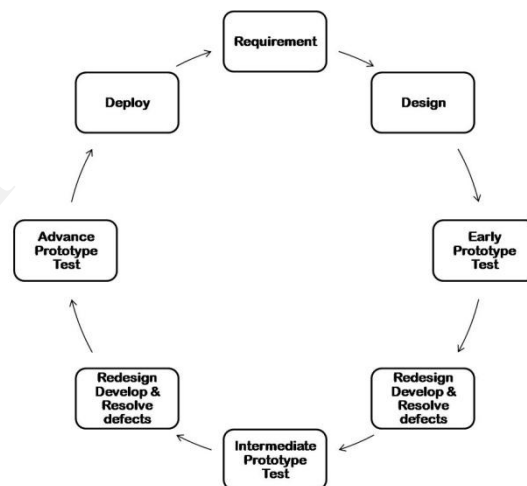


Figure 6: EHE and LBUT experiments across the SDLC [2]

The combination of HE and LBUT is applied at early, intermediate and advanced stages of SDLC. Heuristic Evaluation covers almost 83% [2] of defects and remaining are covered by LBUT .

Figure 7: Heuristic Evaluation process flow [2]

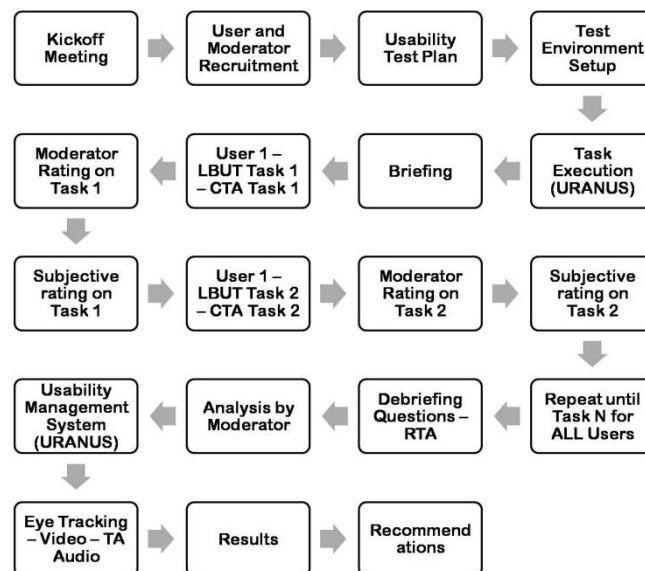
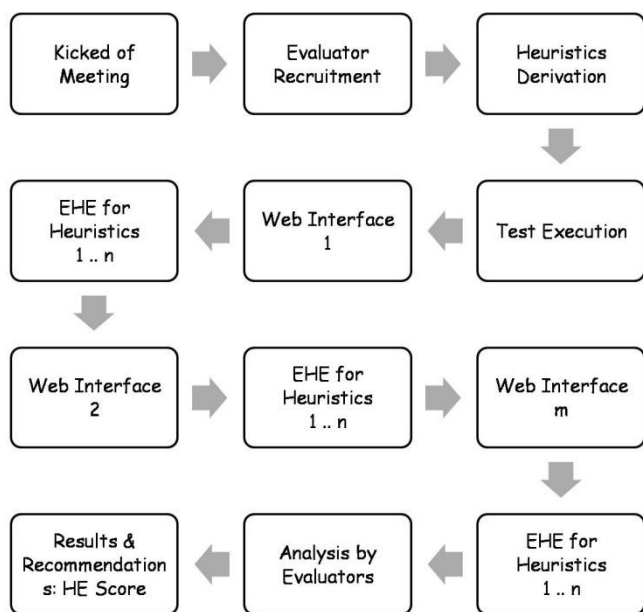


Figure 8: LBUT process flow [2]

IV. REVIEW

	Methodology	Technique	Variables & parameter	Tools	Pros	cons
1	Exploring inexperienced user performance	Prototyping and Usability Testing	Time to complete tasks Effectiveness, efficiency and user satisfaction.	SUS Qutionniare, Feedback	User Centric, simple, involvement of novice user in prototyping and testing	Prone to error
2	Hybrid Usability Methodology	Heuristic Evaluation And Lab Based Usability Test (expressions of users, eye tracking, moderated testing, satisfaction questions)	Defect, Resource Requirement, Cost, Workload, ISO9241-11 Metrics and Coverage factors	Uranus tool, Post test questions.	Implemented across SDLC, Detects more usability issues, Iterative	Prone to false alarms

V. CONCLUSION

Hence from above two approaches we can conclude the current trend of usability evaluation is a mixed approach towards user centric and scientific approach. Both the methods shows involvement of user benefits in designing a usable interface for application and the Hybrid usability Methodology thoroughly ensures that the usability defects are detected in the early stages of SDLC so that the design is more refined and usable.

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