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Review Paper on the importance of Usability in Agile Software Development

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ABSTRACT: *There are many software model are being used in industry like waterfall, rad, and scrum etc. Among all agile model is considered as fastest software development model. In agile, the software development is based on iterative cycle and the main objective is to deliver the software faster with on-going user participation. Traditional software development considered comprehensive feasibility documentation for the success of project where as requirement gathering and comprehensive feasibility report of project are not emphasized in the case of agile software development. Agile model provides rapid solution of software development which leads towards the absence of good design, and architecture and it is observed to be very expensive if followed. As a remedy, a proposed lifecycle for agile software development has been designed. The proposed lifecycle outlined in this paper integrates usability evaluation concepts and agile software methodologies for the development of interactive software. An experimental report will be provided in future after successful testing of proposed lifecycle in the software companies by developing an interactive desktop based application.*

Key words: usable software model, usability engineering, agile methods, software development

1. Introduction

Now a days usability is considers as an important feature in software products. Products which are lacking in poor design and usability results in the failure of software product. Therefore, one of the complications involved in software development is to observe users and analyse its participation in the design and development stages, their behaviour and effective, then to collect information idea for the ensuing development.

It is quite apparent that the development of better systems needs the collaboration of different professionals like HCI, SE, Stakeholder, Usability experts and User experience experts etc. Software Engineers, HCI experts and Users are the most important key players of the software development. Involving users in the software development is an important thought-provoking task. Neglecting HCI approaches from software development will affect the role of usability in the software and make the software difficult to learn, difficult to use and result in the dissatisfaction of the users. They need to cooperate with each other to create a software product that is usable and useful for the target audience. But, in reality, these three key players (Software Engineers, HCI experts and Users) do not cooperate as smoothly as they should. By the time this lack of cooperation is seen, big software projects may not provide what they promise; therefore, such projects often fall short [1]. Their failure can be in various forms. Sometimes, the delivered system isn't able to offer considerable specifications to the conventional

system that is top quality which would make it possible to actually set up the system. Sometimes, involvement of the user is introduced too late which produces a high impact on the software efficiency. Sometimes, the cost, time and resources are exceeded by large factors. Sometimes, the product is difficult to understand due to the lack of usability role in the development. The agreed upon factors for which software projects fail are many and various [2]. In this paper, a new agile software process is proposed where usability evaluation has been integrated in to agile software development method. The paper contains few sections. Section 2 focuses on the literature review; section 3 discussing on the proposed lifecycle; section 4 discussed about the experiment and future work and section 5 concludes with the paper.

2. Literature Review

The word agile means fast, lighter and nimble. Agile process is also considered as light weight process [11]. One the major catastrophe in many software projects was the time it took for development exceed from the deadline. To developed system faster with its limited time, agile software methods were developed. These methods develop system faster by less focusing on analysis and designing [12].

In [17] usability evaluation of university websites within the domain of Saudi Arabia. Particularly two kind of domains are discussed including government and private university websites and these domains are discussed on the basis of heuristic evaluation components. Within the scope of the paper almost seven HE components are considered in order to find the usability of university websites. Results predicted that the majority of websites have an acceptable level of usability practices and as compare to private universities, government universities have higher level of usability practices.

In order to provide the quality software, many usability issues must address at the time of design because software designing and usability both are really inter related concepts. Along with other quality attributes, usability must be done at the time of software design. HCI community has not reached to acceptable level of components that can be used for usability. But it must be kept in mind that usability is not the only quantity attribute to keep in mind for the successful software implementation [18].

Usability is highly considered in health software and information system these days [19]. Health information system has become the most invested field in the recent years and lot of money is being invested in this field in order to provide better health facilities to the common man. Different methodological approaches are studied in order to find out the evaluation based on the health information systems. Rapid development of biomedical based software has created the need of testing more about the usability of these applications. Usability inspection of clinical methods are also being employed, and these are the testing that are done by the analyst in terms of medical health care systems. And both usability testing and usability evaluation methods are applied on the patient health care system.

In security it is hard to find the usability evaluation of ITSM tool by using the conventional methods. Author proposes a set of ITSM usability heuristics techniques that are based on activity theory. These theories are supported by prior research work as well and consider the cooperative and complex nature of security management. In order to get evaluation of a commercial identity management system the Writers has made the comparison of the employment of the ITSM and Nielsen's heuristics based methodologies. Participants who used the Nielsen's heuristics based methodologies have less problems as compare to the ITSM. Evaluators analysed lot of problems while two data sets of heuristics, in different situations writers recommends both of them [20][22]. U-SCRUM methodology [13] is proposed by Singh to improve the usability. Unlike SCRUM having one product owner, U-SRUM has two product owners, one focused on the functionality and other focused on the usability. Result shows U-SRUM improve usability in the product then traditional SCRUM.

As mentioned in [3] the author claimed that user contribution at the design stage has a smaller footprint size because it contains specific or functional matters. Due to this purpose, software designers normally avoid

including users in the level. Olsson [4], in his research, claimed that users should be engaged in the design and development of systems. Users engaged in the application development process have an important responsibility towards the result of the application item [5]. Furthermore Carrol [6] strengthened that user participation is an important factor in the success of a project and is the best choice for many projects. Robert Pessagno [7] discussed the importance of usability in developing interactive software's. Results of the survey and usability test mentioned in his paper have shown that design is an important factor in determining a site's success because it creates it identity while simultaneously facilitating its usability.

As mentioned in [8], the modified heuristics are more efficient and capture more defects then the one proposed by Nielsen 10 heuristics. Also the research [9] shows that pitfalls of the HE and it seems useful to follow more than one method for software usability evaluation.

The methodology mentioned in [10] is to improve the problems with the agile process and focus on the software design approach. Agile software development is the most widely used software models in the software Industry. Its efficiency to handle rapid change in the requirement handling and involving user at every stage of development is valued. However, agile based projects fail due to insufficient quality attributes.

McInerney and Maurer mentioned in [14], the possibility of integration software engineer and usability experts in agile software development. As both are from different backgrounds having different domain knowledge helps to solve the problem that mostly occurred in software development, in their own ways and most importantly agile methods only focus in functional requirement and neglecting usability issues. the stakeholders of having the product near perfection.

3. Proposed Agile Model

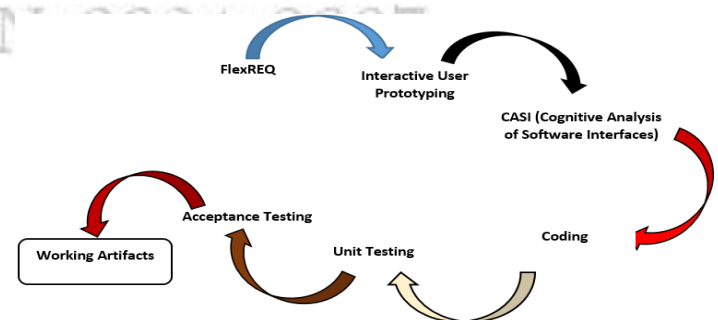


Figure 1: Proposed Agile Model

Figure 1 shows the agile lifecycle starting from FlexREQ [15] and ends at final product. Passing through various processes helps agile experts, usability experts and user to work together. FlexREQ [15] is a process develop product feasibility documents in a small amount of time unlike traditional soft model spend considerable amount

of time in documentation to achieve product quality at the end. Interactive User Prototyping consists of two further process user interface prototyping and architectural prototyping as shown in figure 2. The final requirements gathered from the FlexREQ phase are now in the phase of designing (IUP) where interface and architecture prototypes are refined according to the specified requirement.

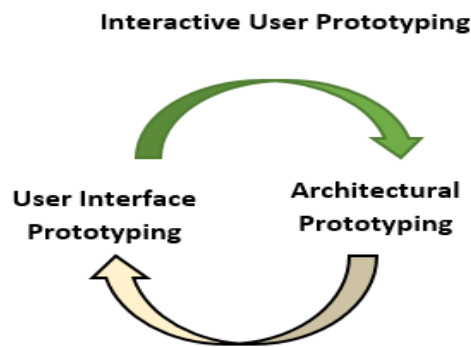


Figure 2: IUP Cycle

The resulted prototypes from the IUP phase will further tested for the Usability by using CASI [16]. CASI is a Usability evaluation method helps to improve the usability of software interfaces. Involvement of user and usability expert is highly important in this phase to find the usability defects. CASI keeps on the evaluating the interface until user fully satisfied. After CASI phase the coding starts and later unit and acceptance testing will be conducted to check final product satisfies all specifications and useful for the customer.

4. Experiment and Future work

The proposed lifecycle will be tested under software companies by developing interactive desktop based application. For the theoretical point of view the proposed lifecycle integrates both agile attribute and usability attributes in one lifecycle

5. Future work and conclusion

Evolving from non-agile software development methods to agile software development methods, agile development methods are the most flexible approach for software development where development team keeps on improving the software with ongoing involvement of user. But agile methods have not integrated with usability approaches which are crucial to achieve software usability. Incorporating usability process in agile software method is important to achieve which is an essential quality. This paper explored the key features of agile software development methods and Usability Evaluation methods. The literature mentioned in this paper highlights the importance of usability in agile methods. Furthermore the proposed lifecycle proves the possibility of integrating usability evaluation techniques

in agile software development methods. However from the literature and proposed life cycle it appears that there are many benefits that can be achieved by integrate usability in agile software model. In future the particle testing of this proposed lifecycle is required to identify at what level usability can be integrated in agile software methods.

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