

CHAPTER 6

CONCLUSION

6.1 Introduction

This chapter concludes the thesis. It summarizes the previous chapters that discussed various aspects of Human Computer Interaction, Usability issues, User interface tools etc.

The research work is focused on the development of Human Factor Based user interface using user interface tool. Designing such a system is a difficult task and our tool is intended to handle such cases. In user interface design, quality is defined as a high level of usability. In order to provide concept of usability in user interfaces, we have developed a new framework **HFBUIT (Human Factor Based User Interface Tool)**. It gives structure to various aspect of user interface designing.

Having defined our design goal, the design activities need to be defined. We started the design process by doing a thorough analysis of the problem situation. In the case of user interface design this means an analysis of the users, their work and their environment. Performing an analysis and using the gained knowledge effectively in design is not trivial. It is important to know what aspects of the usability are relevant and hence need to be described. Such clear conceptualizations help designers to see the important things when they are designing the user interface.

This thesis discusses Human Factor Based User Interface Tool. Starting with an overview of HCI [4][2][6], Human Factors[7], User interface designing[3] and User Interface Tool[1][5] etc.

Chapter 1

Chapter 1 provides an overview of the basic concept of HCI. It defines HCI technologies and discusses about future directions in HCI. It also gives an overview of the Human factors, Interactive software and Role of human factors in interactive software. Finally, it describes user interfaces, user interface tools and the importance of user interface tools.

Chapter 2

Chapter 2 discusses about problem analysis and background study. It also defines motivation and present state of the research and finally tells about objective of our research.

Chapter 3

Providing a better understanding of what usability is. **Chapter 3** of this thesis is entirely devoted to this issue. User Interface design is about designing the computer system, by modifying computer system according to the people and not modifying people according to the system. Therefore the designer has to consider a lot of factors. The factors can't only be analyzed individually because many factors invariably interact with each other. The usability attributes were identified on the basis of literature survey.

Chapter 4

We have conducted an empirical study in **chapter 4**[see Research Methodology: Empirical Study in chapter 4] to find out how human factors affect on the performance of the system. This study was conducted with the help of questionnaire which was prepared on the basis of usability attributes identified in previous chapter [questionnaire mentioned in appendix I]. We asked a set of users of different categories to perform some tasks on the identified User Interface. After the completion of tasks we got feedback of these users on their experience on performing task on this interface [questionnaire mentioned in appendix I].

Chapter 5

This chapter is divided into 3 phases **Proposal of HFBUIT Framework, Implementation of Suggestion Tool and Validation of Suggestion Tool:**

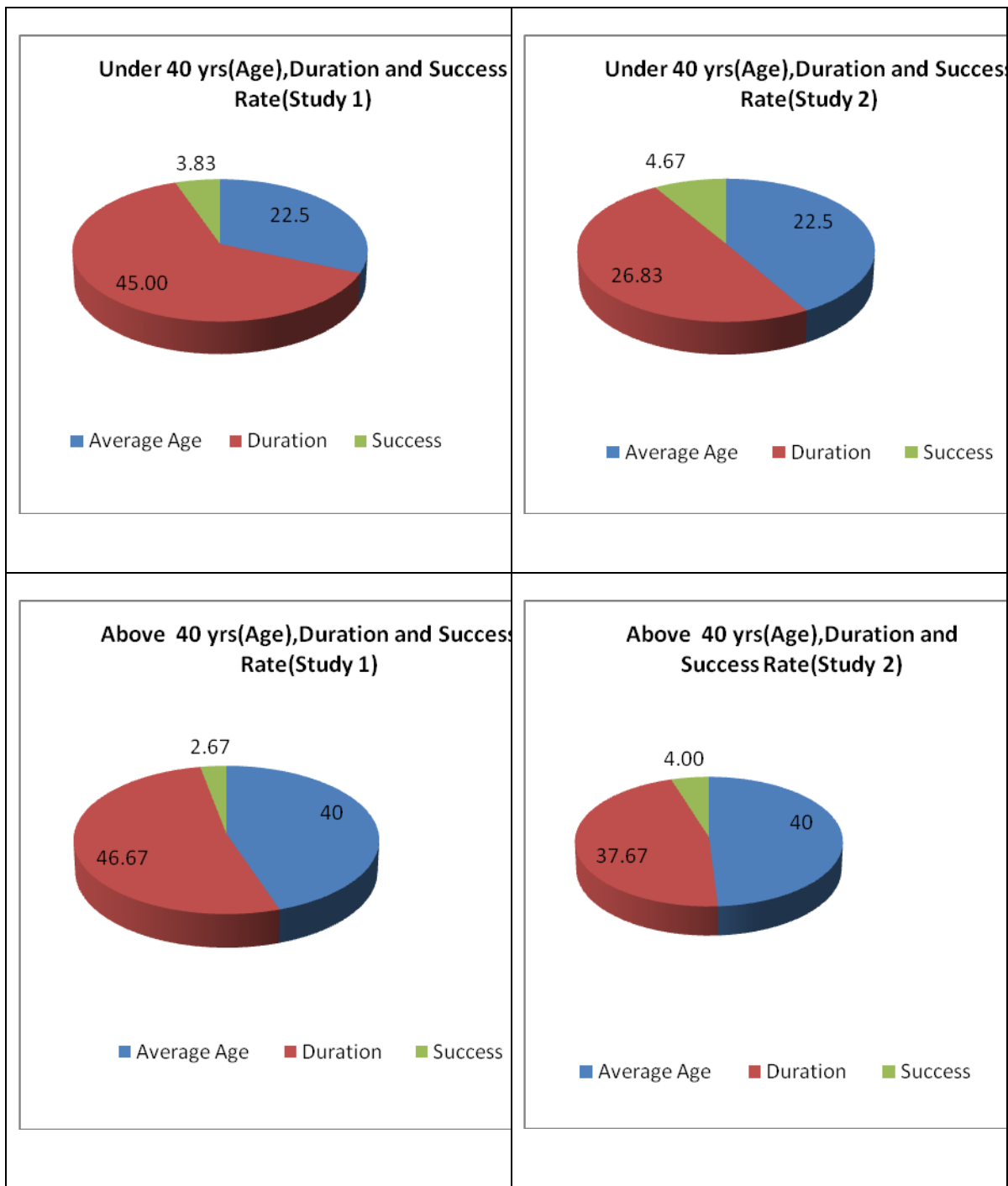
On the basis of observation, which we got from the results of study I, we have developed a framework **HFBUIT (Human Factor Based User Interface Tool)**[see figure 5.1, chapter 5]. The HFBUIT framework consists of 5 Tools: **Collection, Suggestion, Quick Designer, Evaluation and Documentation Tool**. All these tools are interconnected. This toolset will help the designer to design highly usable Human Factor Based User Interface.

In this phase we have developed one of the tools: Suggestion tool. Suggestion Tool uses screens to ask questions, provide explanation on the system's reasoning and display results. Backend component of Suggestion Tool is Knowledge Base. This Knowledge Base contains

user's details that allow designers to conduct analysis and design in a way that result in a knowledge base, which can later be used to make informative decisions.

The tool has been validated for its usability by an empirical study conducted on a set of users [see Evaluation of Suggestion Tool, chapter 5]. New set of participants were given the same tasks as in study1 but worked with redesigned version of the system. Suggestion Tool was used by Software Designers of Think computers which enabled them to redesign User Interface according to the target users. The Results of study 2 show that overall usability improved significantly for all users.

Figure 6.1: Shows effects of age attribute on the completion of tasks



It is quite obvious from the results that success rate in performing the task has improved; task duration was reduced after the User interface redesigned as suggested by my tool.

6.2 Conclusion & Future Work

The generic aspects of HFBUIT can be used in the development of many different kinds of real time software system. By making easy access to previous work, work once done can be reused and there is a possibility that more innovative ideas will come. The reviews with users of their requirements, use of prototypes and the design of the final product in an iterative manner makes the user an active part of the process and results in a higher level of the system usability and user satisfaction, since designers are continually working according to their needs. Our objective here is to lay out the foundation of tools that helps the designer to design Human Factor Based User Interface, in order to tackle usability issues of modern systems.

During the period of this research, No other framework of similar comprehensiveness has been found. Other approaches may be similar in some areas; however they do not cover the overall breadth of the development of user interface. Most approaches during development of User Interface do not consider users aspects. Thus, it is necessary to design human factor based user interface to suppress the frustration of the user while using the interface that is not according to them.

Further development of HFBUIT Tools is probably the most pressing area of future work. Suggestion Tool has been evaluated at a medium sized organization, the efficiency of the same has to be evaluated for the large scale business houses having bigger and complex projects. The most important thing in human factor based user interface design is the central position of the users and their task. The research described in this thesis uses that viewpoint to create better tools and techniques. We feel that we made a small step forwards but still a lot more progress is needed to fully achieve our goals.

REFERENCE

- [1] Myers Brad, Hudson Scott E., Pausch Randy(1999), Past, Present and Future of User Interface Software Tools, ACM Transactions on Computer-Human Interaction , Carnegie Mellon University , pp.1,32-33
- [2] Preece Jenny (1994), Human Computer Interaction, Addison Wesley pp.6,26,
- [3] Myers, B. & Rosson M. (1992), Survey on user interface programming,Proceedings SIGCHI'92: Human Factors in Computing Systems, 195-202
- [4] Evertsson Gustav(2001), Human Computer Interaction pp.6-8
- [5] Obrenović Željko , Starčević Dušan(2006),Adapting the Unified Software Development Process for User Interface Development, ComSIS,pp.34-35
- [6] Karray Fakhreddine et al(2008), Human-Computer Interaction: Overview on State of the Art, International Journal On Smart Sensing And Intelligent Systems, Vol. 1, NO. 1 pp.1-3
- [7] Carrol, J.M. (1997), Human-Computer Interaction: Psychology as a Science of Design, Annual Reviews, Inc., USA,pp.48, 61-83