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Usability of information systems software in Pakistan in users perspective

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ABSTRACT

The growth of a software industry is rapidly high due to the advancement of the new technology. Software projects have to maintain their quality and user friendly characteristics in order to compete with the competition environment. Therefore, no one can deny the significant role of human computer interaction in the improvement and development of the information System Softwares. Human interaction properties such as perception, usability, efficiency and cognitive play an important role to deliver the customer oriented information system. This study aims to express the perception of Information Systems Usability with respect to end users. Usability means the use of system by end users with easiness to achieve their goal. Results show that in Pakistan, mostly information system developers did not concern about the Usability property of HCI in software development process which was the root cause of unfriendly and low quality Information system's production. The overall usability of information systems in Pakistan is very low. It is suggested that a merging of Usability during the life cycle of software development could make more customer oriented, successful, user friendly and better quality information system.

Keyword: Software projects; software usability; customer oriented; human computer interaction; HCI; software development; information systems;

1. INTRODUCTION

The Software industry is like an umbrella which covers almost every part of human life and contributing in the development of software products. These software products are being used from the health sector to banking, from the education institute for civil products and for marketing and production of products [1]. To develop accurate and usable software products is now mandatory for these software development companies. Human Computer Interaction (HCI) plays an important role in the edifice of the human interaction system and computer in this arena of technology. Two terms are very important in HCI, one is the functionality and the other one is Usability. The efficiency of the system depends on the proper balance between these two components of HCI [2]. To complete the task of good software systems, the standards of Software Engineering and HCI should be merged and implemented. Improvements are made both in Software Engineering (SE) and HCI to meet the requirement of dynamic customers [3]. SE is mainly concerned about gathering of the requirements and understanding user needs to develop a process model in the design phase. Whereas, HCI deals especially with user review and develop user's center process model [4]. Efficiency, effectiveness and satisfaction of a product are three corners of paragon of HCI according to the ISO 9241-11.Usability is an important term in the space of HCI.The main purpose of Usability is to make the system easy to learn for people, ensures the system functionality facilitates the task of people and make easy to use system [5]. The main objective of usability is Utility, Efficiency, Learnability, Attitude, Predictability, Synthesizability and Generalizability. For the measurement of system usability, System Usability Score (SUS) is adopted in this research. The system usability score was designed by John Brooke. It was a simple ten item Likert scale questionnaire that is used as subjective assessment of the system. It was a commonly used scale globally to measure the overall usability of the systems [6]. Usability has emerged to deal with problem of user frustration with faulty design Systems. HCI give more importance to human psychology and merge it with computer technology. The main aim of usability is to develop a user oriented system with full understanding of the users [7]. For the information system interface, usability plays a vital role.When users confront an unfriendly system, they feel a cognitive stress and unable to use the system effectively. System usability is very important in this rapid technology arena. But in Pakistan it has not given attention what it deserves. The main objective of this study is to perform usability testing on different information systems to uncover the problems relating to usability.

2. LITERATURE REVIEW

Usability is the cornerstone of the paragon of Human Computer Interaction (HCI). Useless interfaces will cost a large amount for the companies because users could not use the system more effectively to complete their tasks [8]. HCI enhances the system efficiency with the help of user oriented design. Users will not able to get enough information form the useless interfaces. E-Learning organizations cannot implement the user usability on their websites and increase frustration on the behalf of users and administration [9]. In Usability, utility means users can attain their task which they want to carry out. Efficiency means ease of system, so that the user can carry out their task with minimum error. Learnability deals with the user's ability to run the system with full competency to achieve maximum performance. Robustness means support for users toward their directed goal [10]. The properties of good user interface of the system are flexible, error recovery procedure, minimum training requirement and easy to adopt [11].With the invention of 3D, the complexity of the user interaction with the system is increasing. Usability problem leads to many problems like user's cast off the system and the frustration of the user. The error rate is increasing with less usability [12]. Usability can be defined as in term of numerous attributes, but Nilsen considered Learnability, Efficiency, Memorability, Low Error and Satisfaction as the most significant attributes [13]. According to Rubin and Chisnell [14], usability may be included Usefulness, Efficiency, Effectiveness, Satisfaction and Accessibility attributes. Usability is an instrument that is used to quantify the user perception about the system. These systems consist of a website, or software systems and application interfaces or a software, operating device and management information systems [15]. Usability plays an important role in the success of the system or product. If a system functions well, but it has low usability, then system is on the edge of failure [16]. In this customer oriented era, end users decide the fortune of any system because at the end system is used by them and evaluated on the basis of usability. The acceptance of any system by its users is now built on the foundation of usability. If the system is not user friendly and difficult to use, users may reject this. The Quality of the system is interrelated with usability [17]. The System Usability Scale (SUS) is normally utilized after the respondent has had a chance to evaluate the system being used. Respondents ought to be requested that record their quick reaction and experience about the system. One of the advantages of the SUS is that it can be used to measure the usability of small sample size [18]. SUS consisted of two factors, namely usable item and learnable item. SUS is very popular instrument for the subjective assessment on end of test [19].

3. METHODOLOGY

A deep literature review is carried out to understand all the concepts associated with this research. Then the attributes about software system evaluation are filtered. This research is based on two stages. In a first step a questionnaire survey is conducted from different information systems users. Questionnaires were prepared for obtaining quantitative data. An online questionnaire was designed so that the users can find it over the internet and respond instantly. John Brooke System Usability Score is Evaluation Criteria. In a questionnaire 10 items with five responses are used for evaluating respondent's response. Apply minus 1 from the scale position for odd items like 1, 3, 5, 7, and 9. Apply 5 minus the scale position for the even items such as 2, 4, 6, 8 and 10. The result is multiplied by 2.5 to get the overall usability of the system [20]. A survey questionnaire based on the SUS is shown in Figure 1.

Sample size was of 100 different software system users from different cities of Pakistan. Each information system was evaluated from the users' prospective in this scale. Demographies about the type of the selecting different systems are shown in Table 1.

Table.1 Information System Type

Type of information system	Frequency	Percent
MIS	48	48.0
DSS	15	15.0
Expert System	12	12.0
Artificial Intelligence System	4	4.0
TSS	21	21.0
Total	100	100.0

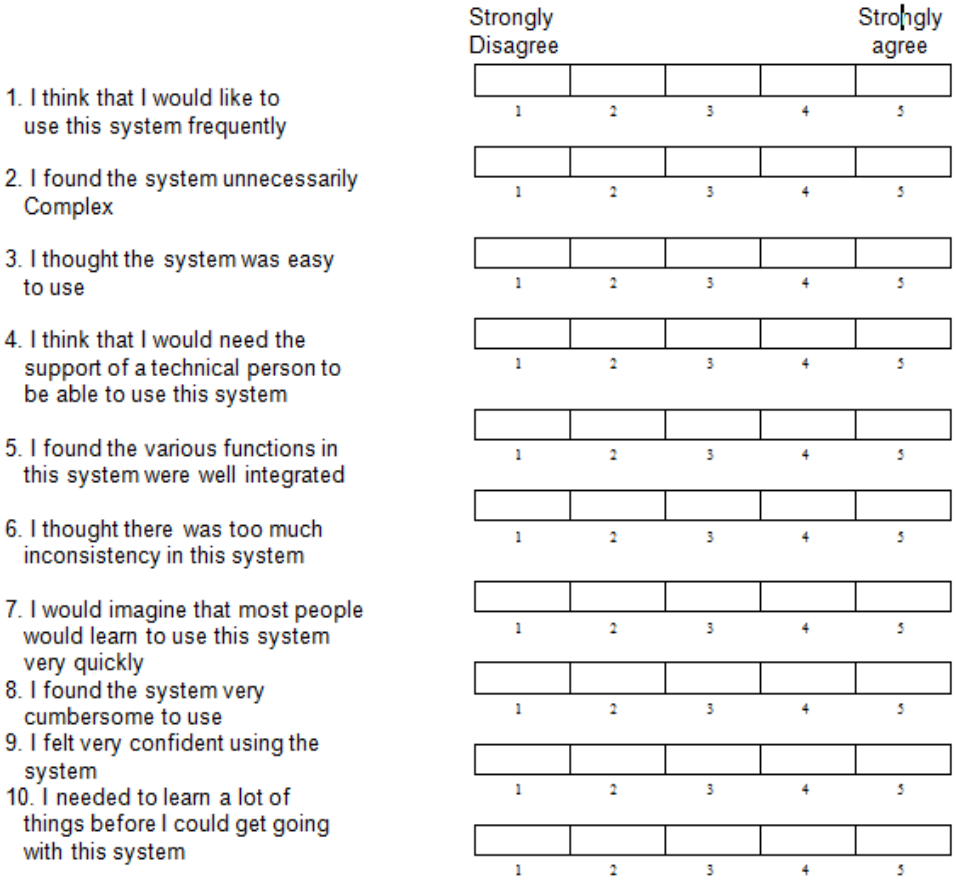

Figure.1 System Usability Score

4. RESULTS AND DISCUSSIONS

4.1 How an information system is used frequently?

Respondents were asked about the usage of the system, It was found that 37% reported as strongly disagree, 6% reported as disagree, 3% neutral , 7% agree and 47% reported as strongly agree as shown in Table 2.

Table. 2 How frequently system is used?

	Frequency	Percent
Strongly disagree	37	37.0
Disagree	6	6.0
Neutral	3	3.0
Agree	7	7.0
Strongly Agree	47	47.0
Total	100	100.0

The graph of the system usage is shown in Figure 2.

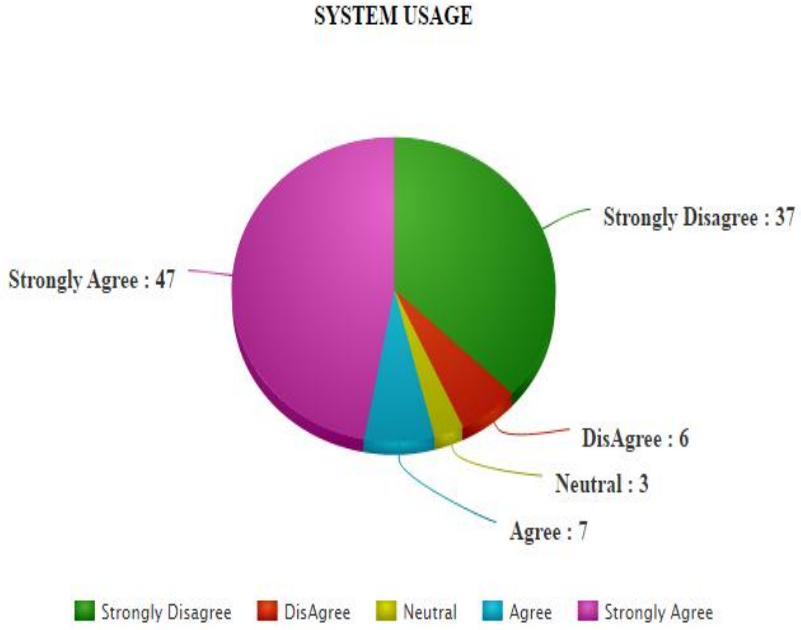

Figure. 2 Information system usage

4.2 Complexity of the information system

Users should feel comfortable while using the system and this is possible only when the system is not complex.Table 3 shows that majority of the respondents strongly agreed about the complexity of the system. Only 16% respondents strongly disagreed. Figure 3 illustrates the respondent's response in graphical form.

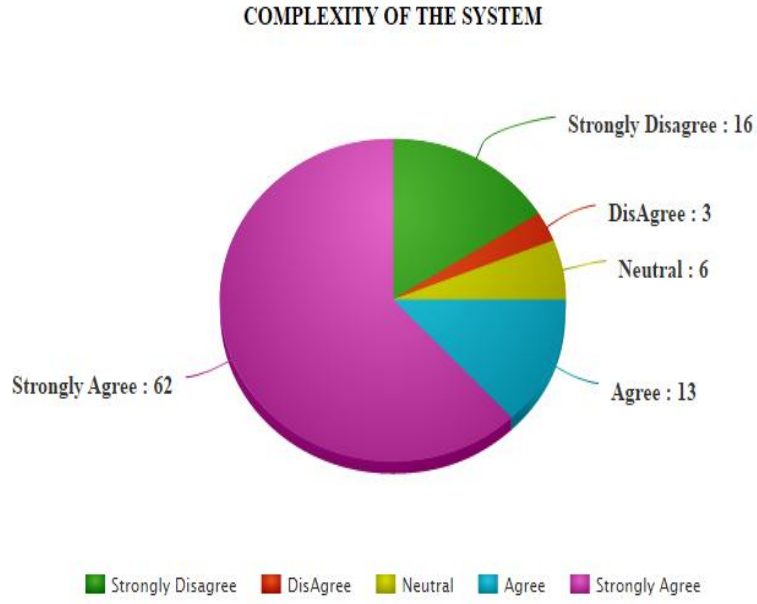

Figure. 3 Information system complexity

Table. 3 Complexity of the system

	Frequency	Percent
Strongly disagree	16	16.0
Disagree	6	6.0
Neutral	3	3.0
Agree	13	13.0
Strongly Agree	62	62.0
Total	100	100.0

4.3 Easy to use

Respondents were asked about the easiness of the system. Only a small number of users agreed on the ease of system in use. The 32% of respondents reported strongly disagree, 16% as disagreed, 21% were neutral and 26% strongly agreed as shown in the Figure 4.

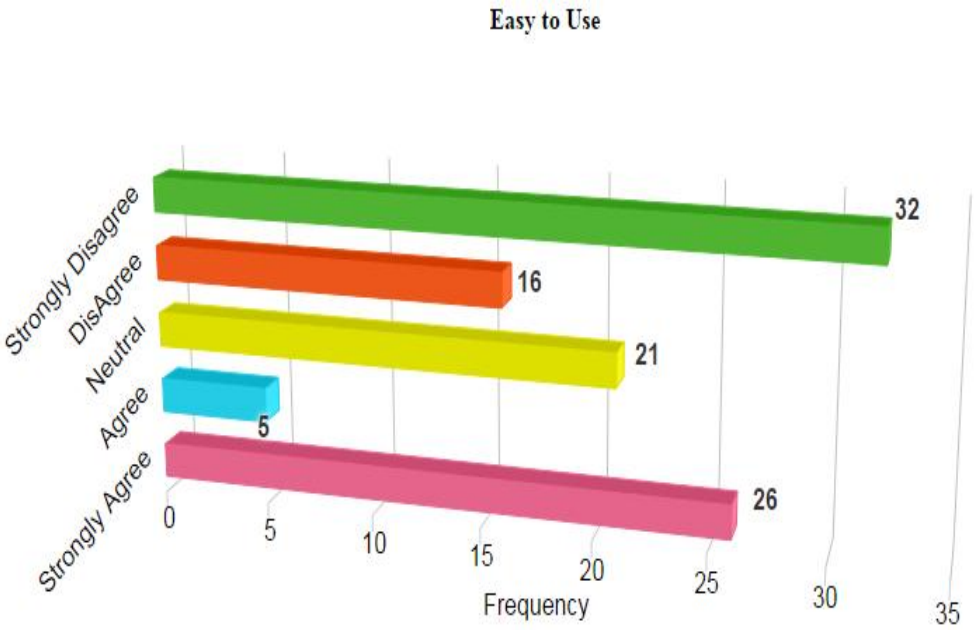

Figure. 4 Easy to use

This result indicates that the Software developer has remained failing to cater the need of users.

4.4 Need of technical person

Survey results indicate that there is need of extra effort to understand the system .They required a technical person to understand the system. Figure 5 shows that 48% were admitted to the need of a technical person while using the system and 25% were not required any technical help.

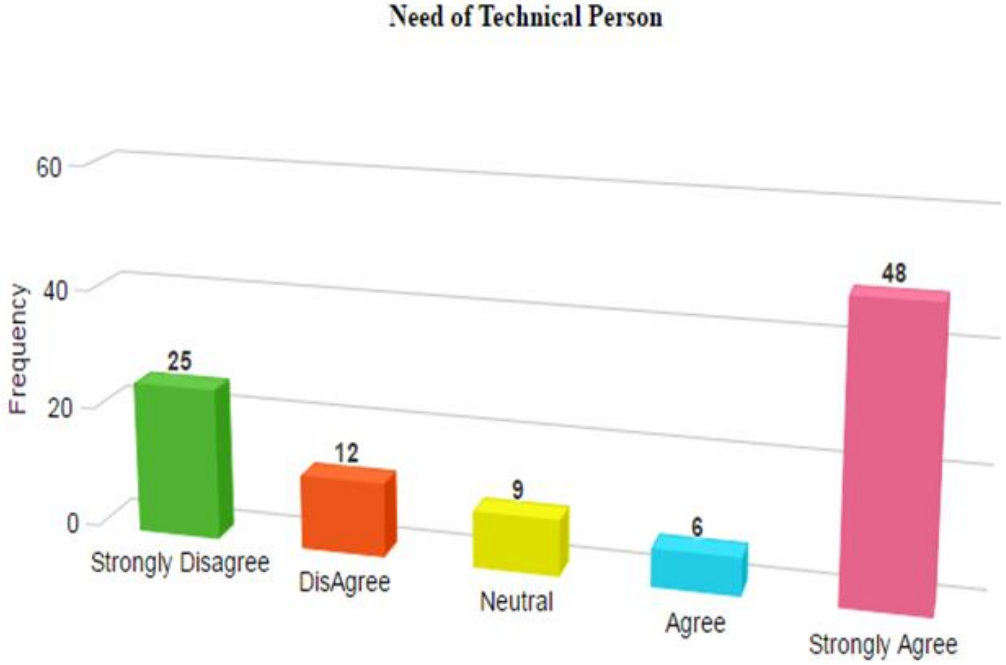

Figure. 5 Need of technical person

4.5 Integration of the function

Integration of the function means that all the component of the system working well and coordinates each other. Survey findings showed that out of 100, 48 % users were agreed on the integration as inference from Table 4.

Table. 4 Integration of the function

	Frequency	Percent
Strongly disagree	18	18.0
Disagree	11	11.0
Neutral	13	13.0
Agree	10	10.0
Strongly Agree	48	48.0
Total	100	100.0

4.6 Inconsistency in the system

25% were disagreed,8% disagree.10% neutral,18% agree and 39 % were strongly agreed on the about the issue of inconsistency of the system as shown in the Figure 6. This showed that majority of the users feeling inconsistency regarding the system.

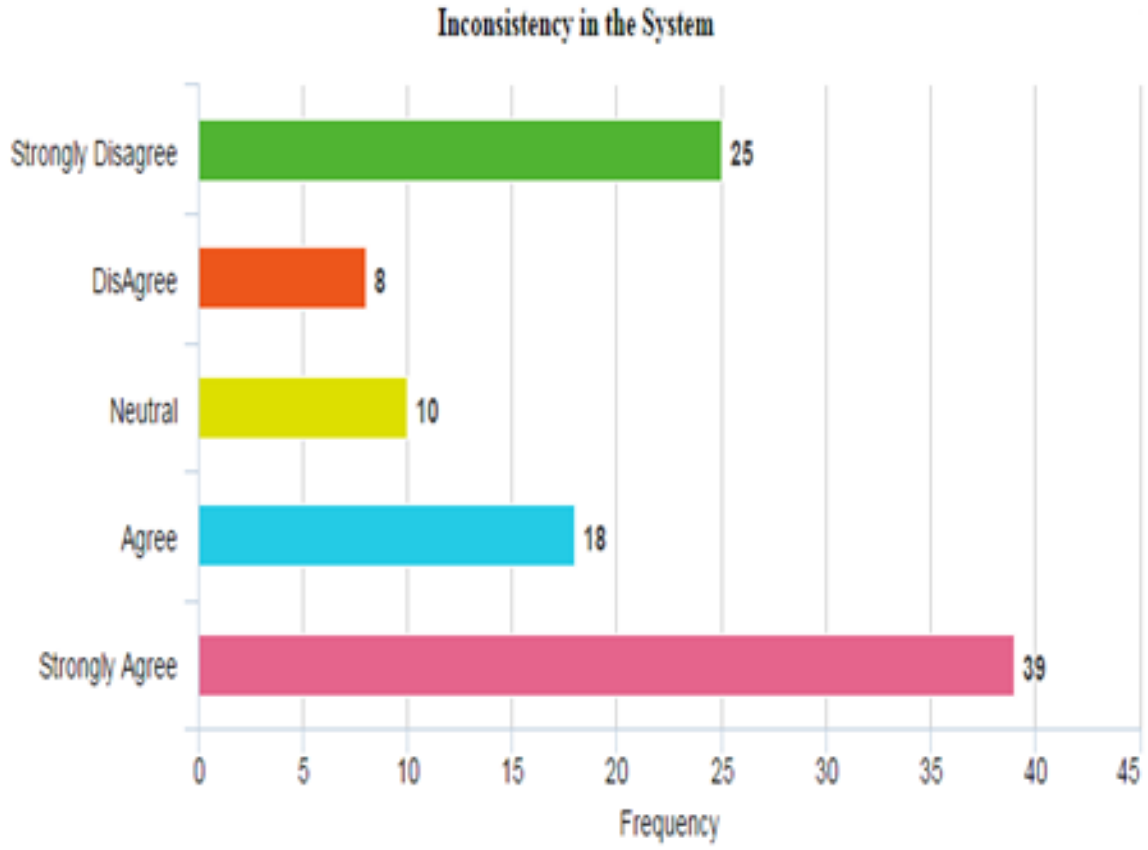

Figure. 6 Inconsistency in the system

For the development of good software system ,the developer should minimize the inconsistency in the System.

4.7 Learning of the system

A good interactive system is quick and easy to learn. Users can easily learn and perform their task. Finding shows that 36% were strongly disagreed on liability feature of the system and 30% were agreed on it as shown in the Table 5.

Table. 5 Learning of the System

	Frequency	Percent
Strongly Disagree	36	36.0
Disagree	11	11.0
Neutral	10	10.0
Agree	13	13.0
Strongly Agree	30	30.0
Total	100	100.0

4.8 Cumbersome to use

Users can not feel comfortable if the system is hard to use. There are required a lot time to understand the system, if the system is difficult. Figure 7 showed that 34% were disagreeing with the fact that the system was cumbersome and 30% were strongly agreed upon this.

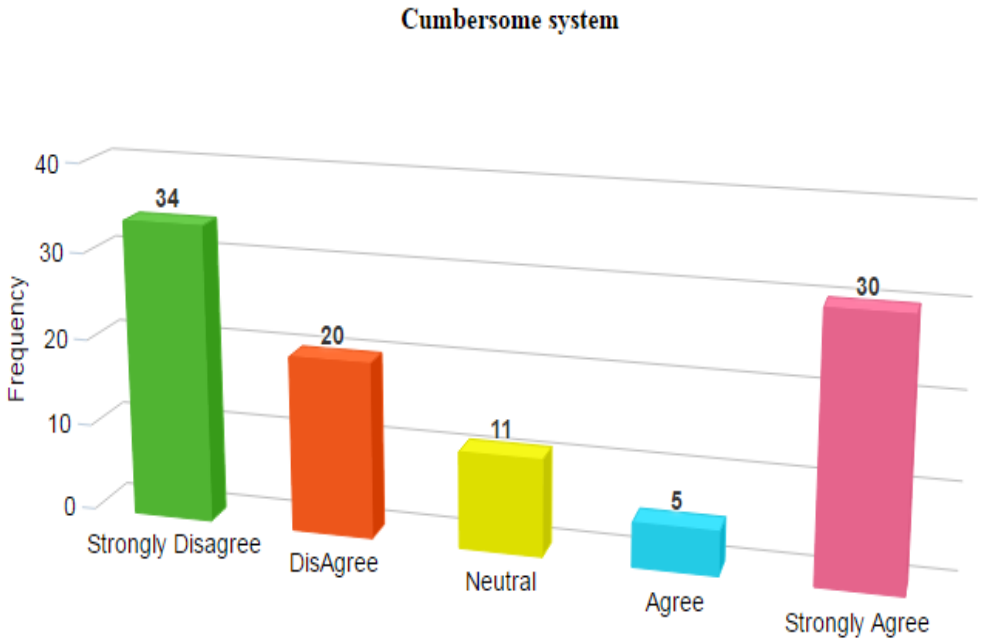

Figure. 7 Cumbersome system

4.9 Confident while using the system

Figure 8 shows that out of 100, 38% were not feeling confident while using the system and 29% were strongly agreed.

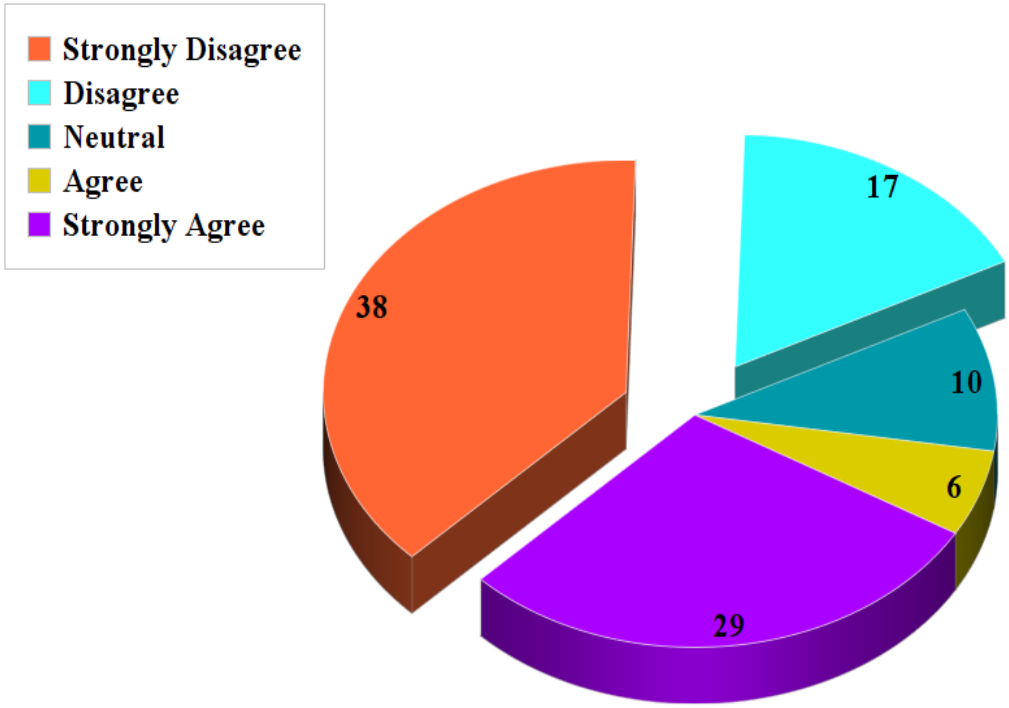

Figure. 8 Users confident while using the system

4.10 Learn a lot from the system

One of the characteristics of the successful system is that it can enhance the learnability of the users. 25% respondents did not get any advanced learning from the system,18% were disagreed,21% were neutral,13 were disagreed and 23 were strongly agreed as inference from Table 6.

Table. 6 Learn from the system

	Frequency	Percent
Strongly disagree	25	25.0
Disagree	18	18.0
Neutral	21	21.0
Agree	13	13.0
Strongly Agree	23	23.0
Total	100	100.0

4.11 Overall information systems usability

In SUS the system whose usability is greater than 68 are considered above average. Table 7 shows that only 7 systems are falling on the usability criteria which shows that in Pakistan, there is a strong need of implementing HCI in the development process of the information system.

Table. 7 Overall systems usability

	Frequency	Percent
Less than 40	56	56.0
Less than 60	37	37.0
Less than 80	7	7.0
Total	100	100.0

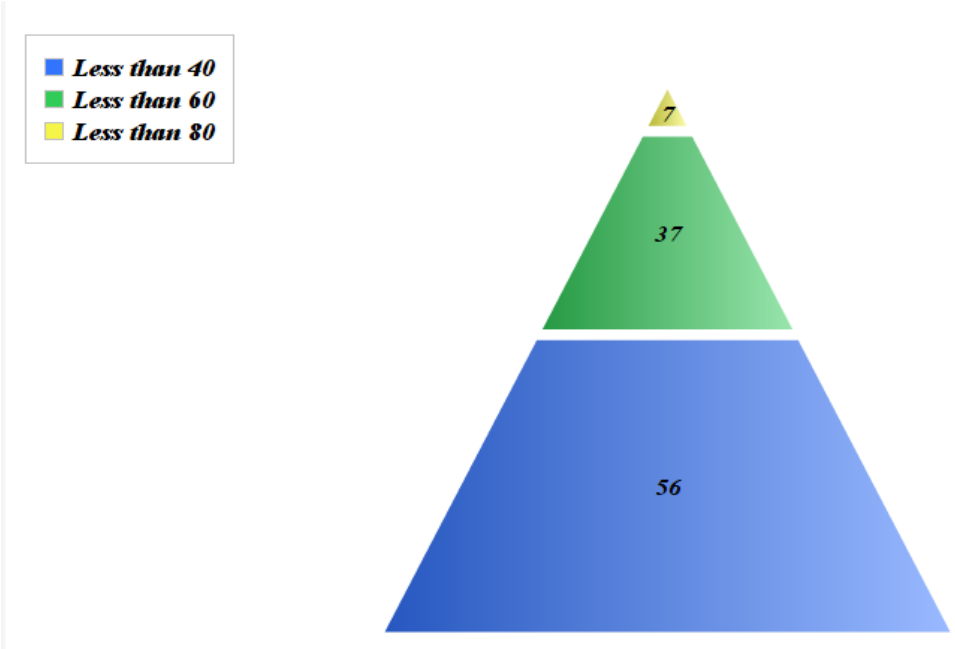

Figure. 9 Overall systems usability

5. CONCLUSION AND RECOMMENDATIONS

Results show that in Pakistan, usability of Information systems are very low. The main reason of this low usability is that rules of interaction were applied in the late stages of information system development. The User Center Design approach should be implemented in the process of information system development as shown in Figure 10. Involvement of the users will be enhanced and in the same time usability of the projects will also increase. The main goal of the user Centre design approach is to reflect the usability of the systems in terms of users prospective. ISO standard number 13407 approved the UCD for the interacting systems.

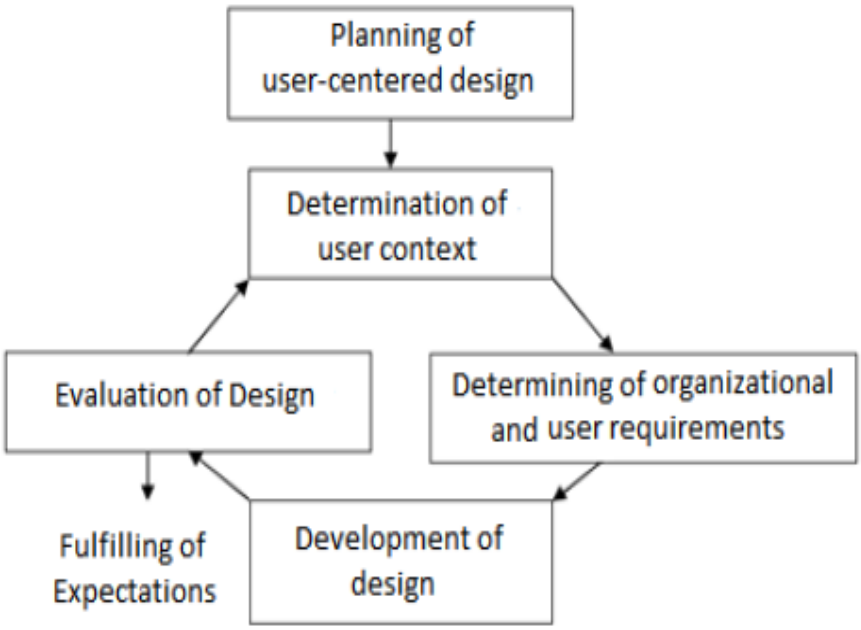

Figure. 10 User centre design approach

Thus, it is clearly revealed that the usability of the systems can be achieved by merging HCI, user centered approach with the traditional software development life cycle. In the development process, the user is like a foundation which should not be forgotten. Users participation, Experiences, cognitive and psychological feature must be considered.

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