

Usability Engineering and HCI Based Information Systems in inside and outside of Home: A Contemporary Conceptual Study

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Abstract

Human Computer Interaction is one of the important domain and aspect of Information Science. HCI is treated as most vital and valuable gradients in Usability Engineering. HCI and Usability Engineering both are uses for interface designing of portal and other electronic gadgets. Human Computer Interaction is rapidly uses in general computers, laptop, mobile, I-Pad, ATM, Information Kiosk and other portal which are uses by large number of users from several field and segments. Usability Engineering and HCI are close and related field but out of them, Usability Engineering is broad field and HCI is treated as just activity and principles for interface designing and development. This paper is talks about HCI and Usability Engineering which includes their application and contemporary features. Papers also talks about future potentials of using such technologies for common people and community, industries.

Keywords: Human Computer Interaction, Information Systems, Usability Engineering, Usability Experience Design, Community Informatics, Knowledge Dissemination

Usability Engineering began as a concept during 1980's and as an important field of academics with academic programme and specialization from the last decade [09, 12]. Usability Engineering is an important aspect to display information system more clear, up to date and informative. According to Wikipedia, the term Usability Engineering [*in contrast to interaction design and user experience design*] implies more of a focus an assessing and making recommendations to improve usability than it does on design, through Usability Engineering may still engage in design to some extent, particularly design of wire frames

or other prototypes. Information Science is a field information activity which is mainly deals with Information System Design and development and hence Usability Engineering and HCI have wonderful potentials in healthy and sophisticated information unit, display system and overall information infrastructure development. Virtually in today's age Usability Engineering are mainly engaged to improve usability of software graphical user interface, web based interface and voice user interface [13, 18].

Objective

The main aim as well as objective of this conceptual study is includes nut not limited to as follows-

- ❑ To know basic about Usability Engineering and its basic nature and features;
- ❑ To learn about the role and importance of contemporary Usability Engineering and HCI Systems;
- ❑ To know basic about the advantages of Human Computer Interaction based interface on conventional information system design and development;
- ❑ To know basic about the Human Computer Interaction and its wider application to the community and public access system;
- ❑ To know basic about the HCI and Usability Engineering based contemporary tools and system requirement in brief manner.

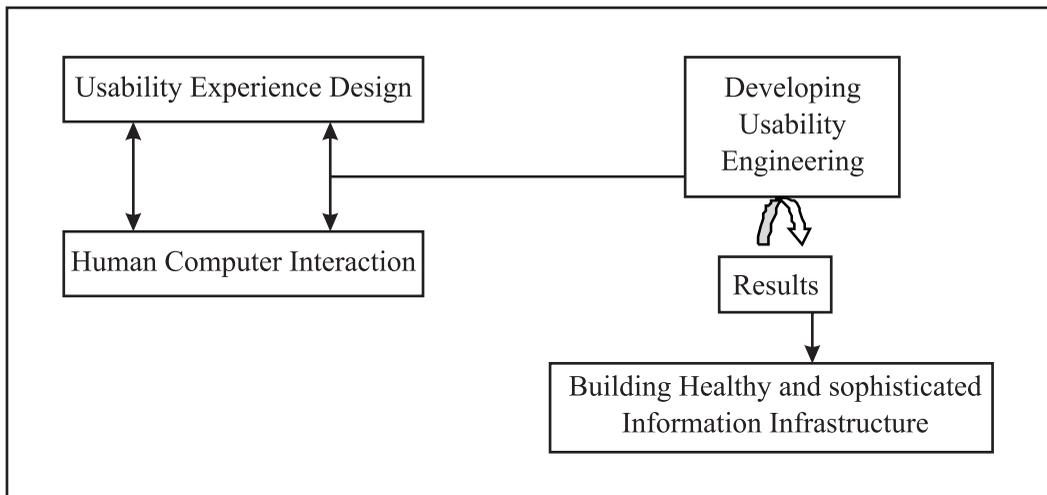


Figure 1. Depicted Usability Engineering and its basic by schematic Diagram

HCI and Usability Engineering: Fundamentals and Requirement:-

Human Computer Interaction is the interdisciplinary field incorporated with computer science, information science and psychology. Fundamentally Usability Engineering based HCI is important for design and development of new user interface with better usability and interaction [15, 19].

A better HCI and Usability Engineering needs so many principles need to follow for better display and interface building; some of them are—

- It is essential that the display legibility should be usable and modern according to user need;
- A better and proper signal and top down processing are very much important;
- It is better to remove the simplicity in between the objects or numbers;
- There should be proper arrangement of cost of designing as well as time for designing and development of interface systems;
- A menu checklist and similar kind of display may be helpful to the user to number any objects or interface;

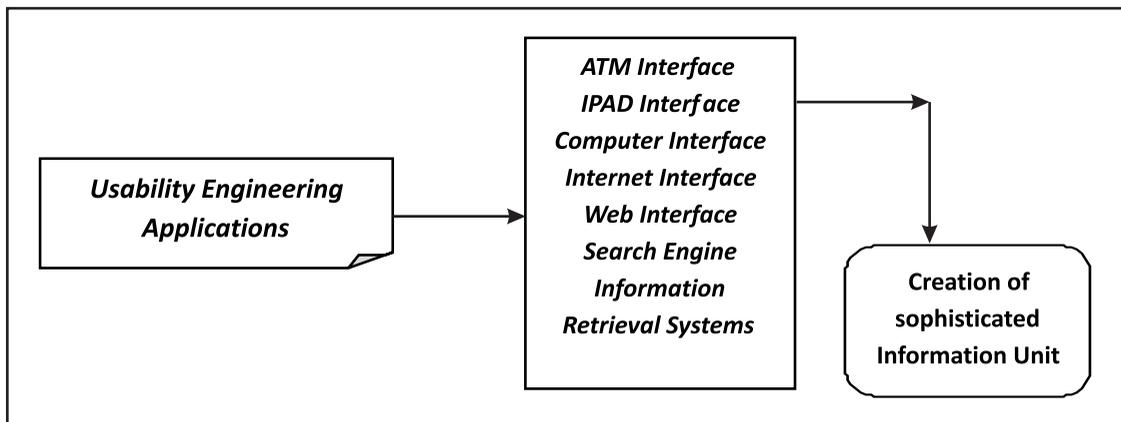


Figure 2. The wider application and utilization of Usability Engineering and HCI

- If moving part is essential that is needed the move in a pattern and direction compatible with the users actual expectation or mental models;
- A proper possibilities on access of information across various sources;
- It is better and required that the display should look like the variable that is represents.

Usable Portal: Possibilities and Zone wise application

There are so many areas and places where it is possible to use HCI and Usability Engineering principles—

- ❑ Design and development of Food Information System and deals with user's directly information delivery from the good looking interface and hence such display unit may be established as common public places with several Nutritional Information with picture and if possible with Voice or Audio System[20-23];
- ❑ Internet is most important aspects in today's age and hence Government may establish Public Internet portal for information sharing and various topic and field and from such internet point one can get his/her needed information. Here huge possibilities are there design and development of HCI supported interface and web system design in which one can access information with out any external assistance;
- ❑ Today Government of many countries are providing equivalent facilities to each and every one and hence people with disabilities may avail the benefits of voice user interface for information collection and further user;
- ❑ In many countries, Right to Information Act enacted and thus Public Information Display with RTI Information may be provides;
- ❑ Like Food Information System, General Internet based Information Kiosks, RTI Kiosks, another important possible area where HCI may be installed is- Agricultural Information System. In such Information Systems, information may be offer on Agricultural and allied domain, like market price of any vegetable, corn and so on. here picture wise price and feature may be prepare inn HCI based interface and even video of production of vegetable, corn depending upon user internet[24];
- ❑ Building Community Information Centre is another important possible zone where HCI may be involved. In such centre pre loaded information on various topic and field such as Agriculture, Education, Business, Market Price, Tourism, politics and text and with Video or voice; if needed or possible. Such Community Centre may also offer mobile based information service for the registered user and here is such mobile based service interface may also design as per user demand and keep in mind that the service being offered by the mobile or small devices;
- ❑ More interactive ATM for banking activities is another important and possible example in this field. Such ATM may be based on proper Usability Engineering and with text, audio, video system. In saving and withdrawal ATM designing, HCI and Usability Engineering principle will be helpful to introduce;
- ❑ As far as Home is essential, Usability Engineering based machine may be much more utilizable with interactive TV, Interface design, DVD/VCD player's interface design, Computer Interface design, and Laptop/Tablet interface design and so on[21, 24].

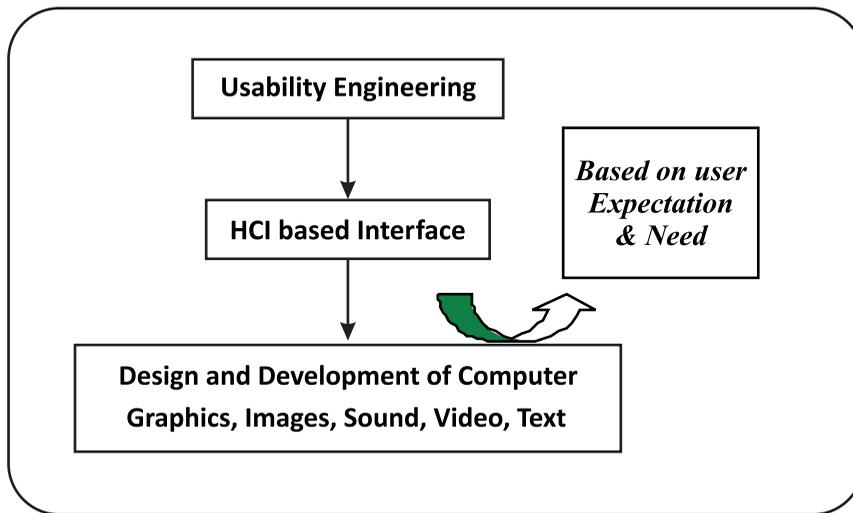


Figure 3. Better experience and satisfaction through HCI

Opportunities and Challenges

- ❑ Human Computer Interaction is widely using in almost all the interface and hence mental caliber is also very much essential;
- ❑ It is very much essential that the device should be very easy to use and simple because all the communication will be lead by these devices;
- ❑ ATM, Mobile interface are the most emerging application field of HCI and Usability Engineering[20];
- ❑ For designing user interface and computer Icon or Graphical interface;
- ❑ It is important and valuable for healthy and sophisticated information use through the better information design based on healthy information architecture;
- ❑ Modern researcher is in this field designing new design methodologies, experimenting with new hardware devices;
- ❑ The activities of Information Science is including Information Transfer Cycle, Information System building and so on; hence in so many organization and information foundations, Usability Engineering and HCI principles is possible to use;
- ❑ The main problem in HCI and Usability Engineering is including unwillingness to install such facilities, Government staff awareness of such facilities are important [14, 19].

Conclusion

HCI or Human Computer Interaction is responsible for methodologies and process for designing interface methods for implementation of interface. The professionals in this field basically design and develop website, graphical interface interaction. HCI is practiced recently in the wider community which includes Psychology, Computer Science, and Information Science and so on. Virtually, it is very much important that, proper implementation of modern HCI principles during the design of HCI and Usability Engineering [21]. Actually the modern interface display should be large and display should support the modern graphics as well.

References

- Cohen, E. B. (2004). Applying the Informing Science Framework to Higher Education: Knowledge Development, Management, and Dissemination. Konferencja Pozyskiwanie wiedzy i zarządzanie wiedzą (Proceedings of the Knowledge Acquisition and Management Conference) May 13-15, 2004 Kule, Poland.
- Cohen, Eli B. and Nycz Malgorzata (2006). Learning Objects and E-Learning: an Informing Science Perspective. *Interdisciplinary Journal of Knowledge and Learning Objects* 2: 2006
- Martin, S.B. (1998). Information technology, employment, and the information sector: Trends in information employment 1970–1995. *Journal of the American Society for Information Science*, 49(12): 1053–1069.
- Michael Buckland and Ziming liu (1995).History of information science. *Annual Review of Information Science and Technology* 30: 385-416.
- Prantosh Kumar Paul, (2012). "Information Scientist: Roles and Values with special Reference to their Appropriate Academic Programme and its availability in India:" *International Journal of Information Dissemination and Technology*, 2(4): 245-248.
- Paul, Prantosh Kumar, D Chaterjee, R Bhatnagar, Uma Pricilda (2012). "Information Scientist: Contemporary innovative techno management roles with special reference to Information Scientist Vs Information Technologist: A Study", *Indian Journal of Information Science and Applications [IJISA]* 2(1), Academic Research Publication, New Delhi, 47-50, ISSN-2249-3689
- Paul,Prantosh Kumar , D Chatterjee, M Ghosh "Neural Networks: Emphasizing its Application in the World of Health and Medical Sciences" *Journal of Advances in Medicine*, 1(2): 17-23, New Delhi Publisher, New Delhi.
- Prantosh Kumar Paul, Ashok Kumar, Dipak Chaterjee (2012). " Health Informatics and its Practice: Emerging Domain of Information Science-Indian Scenario" in *Current Trends in Biotechnology and Chemical Research*, 2(2): 83-87.
- Prantosh Kr. Pau1, K L Dangwal, Asok Kumar Garg "Education Technology and Sophisticated Knowledge Delivery" *Techno-Learn-International Journal of Education Technology*, ND Publisher, New Delhi, 2(2): 169-175.
- Prantosh Kr. Pau1, K L Dangwal and Dipak Chaterjee, (2012). "Information Technology and Advance Computing and their interaction for healthy Education, Techning, and learning: The IKM Approach" *Asian Journal of Natural and Applied Sciences*, ISSN-2186-8468, 1(4): 70-77. Leena and Luna International, Oyama, Japan
- Paul,Prantosh Kumar, M K Ghose, (2012). "Cloud Computing: Possibilities, Chalenges, and opportunities with special reference to its emerging need in the academic and working area of Information Science", *ICMOC, Procedia Engineering*, 38: 2222-2227.
- Prantosh Kr. Pau1, K L Dangwal and Ramana Chettri, (2013). "Quadrple Play Network: Emphasizing its possibilities for smarter University Educaation especially online knowledge delivery model" *Learning Community-International Journal*, 4(1) NewDelhi-Publishers, New-Delhi.

- Prantosh Kr. Pau¹, S Govindarajan, Dipak Chatterjee, "Cloud Computing: Emphasizing Hybrid Cloud Computing on Android Computing Platform-An Overview" *International Journal of Applied Science and Engineering*, 1(1): 21-28 New Delhi-Publishers, New-Delhi.
- Paul, Prantosh Kumar, R Rajesh, D Chatterjee, M K Ghose (2013). "Information Scientist: Technological and Managerial Skill requirement in 21st century" in 'Information Studies' 19(1): 29-36, RCIS, Chennai, ISSN-0971-6726
- Paul, Prantosh Kumar, (2013). "MSc-Information Science [Geo Informatics]: Overview emphasizing two proposed curriculum for sophisticated Geo Spatial development" *International Journal of Pharmaceutical and Biological Research*", 4(5): 218-227.
- Paul, Prantosh Kumar, (2013). "Environment and Sustainable Development with Cloud Based Green Computing: A Case Study" *Scholars Academic Journal of Biosciences*, 1(6): 337-341.
- Paul, Prantosh Kumar, (2013). "Nutrition Information Networks: Possible domain and Future Potentials" *Scholars Academic Journal of Biosciences*, 1(6): 342-345.
- Prantosh Kr. Pau¹, K L Dangwal (2014). "Cloud Computing Based Educational Systems and its challenges and opportunities and issues" *Turkish Online Journal of Distance Education* 15(1): 89-98.
- Prantosh Kr. Pau¹, K L Dangwal, B Karn, (2013). "Engineering Academics, Departments and Community: Emphasizing Some Educational Perspective of Information Science [IS], *EDUCATIONAL QUEST: An International Journal of Education and Applied Social Sciences*, 4(2): 141-146.
- Prantosh Kr. Pau¹, K L Dangwal, A Kumar (2013). "Information Infrastructure and Academic and Education World: The Role and Opportunities in Contemporary Perspective" *International Journal of Education for Peace and Development*, 1(1): 31-36.
- Reichman, F. (1961). Notched Cards. In R. Shaw (Ed.), *The state of the library art* 04(01): 11-55. New Brunswick, NJ: Rutgers, The State University, Graduate School of Library Service.
- Saracevic, T. (1996). Relevance reconsidered. *Information science: Integration in perspectives*. In *Proceedings of the Second Conference on Conceptions of Library and Information Science* (pp. 201-218), Copenhagen, Denmark: Royal School of Library and Information Science.
- Saracevic, T. (1975). Relevance: A review of and a framework for the thinking on the notion in information science. *Journal of the American Society of Information Science*, 26(6): 321-343.
- Saracevic, T. (1979a). An essay on the past and future of information science education. I. Historical overview. *Information Processing and Management*, 15(1): 1-15.
- Saracevic, T. (1979b). An essay on the past and future of information science education. II. Unresolved problems of 'externalities' of education *Information Processing & Management*, 15(4): 291-301.
- Vakkari, S.P. (1996). *Library and information science: Content and scope*. In J. Olaisen, E. Munch-Petersen, & P. Wilson (Eds.), *Information science: From development of the discipline to social interaction*. Oslo, Norway: Scandinavian University Press.
- Vickery, B.C., & Vickery, A. (1987). *Information science in theory and practice*. London: Butterworths.
- Wersig, G., & Neveling, U. (1975). The phenomena of interest to information science. *Information Scientist*, 9: 127-140.
- White, H.D., & McCain, K.W. (1997). Visualization of literatures. *Annual Review of Information Science and Technology*, 32: 99-168.
- www.en.wikipedia.org
- www.infosci.cornell.edu/
- www.ischools.org
- <http://www.libsci.sc.edu/bob/istchron/ischnet/istchron.html>

