IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 3, May 2023

Human-Computer Interaction (HCI)

Shubham Saini, Sandeep Singh Rauthan, Rohit Yadav
Students, Department of Computer Science and Engineering
Dronacharya College Of Engineering, Gurugram, Haryana, India.

Abstract: *The multidisciplinary discipline of human-computer interaction (HCI) examines how people and computers interact. It focuses on creating, analysing, and putting into practise computer systems that are clear, simple, and effective. The creation of technology that enhances user productivity and quality of life is the aim of HCI. Human-computer interaction (HCI) research examines a number of computer interface-related topics, such as user experience, user-centered design, human factors, and usability assessment. It uses theories, concepts, and techniques from disciplines like psychology, engineering, computer science, and design to build efficient and user-friendly computer systems. In addition to highlighting some current trends and issues in this area, this paper provides an overview of the key concepts and methodologies used in HCI research.*

Keywords: HCI

I. INTRODUCTION

Due to our increasing reliance on technology in our daily lives, the interdisciplinary topic of human-computer interaction (HCI) has attracted a lot of attention recently. It entails the investigation of how users engage with computers and other electronic gadgets with the aim of developing more efficient and user-friendly computer systems. Researchers in the field of human-computer interaction (HCI) develop theories, models, and procedures for creating and assessing user interfaces by combining ideas from a variety of fields, including as psychology, computer science, engineering, and design.

With the advent of new technologies, the emergence of the internet, and the rise of mobile devices, the field of human-computer interaction (HCI) has expanded quickly since its founding in the 1980s. As a result, designing interfaces that are simple to use, centred on the needs of the user, and open to a variety of users has become more important. In addition, the development of cutting-edge technologies like robotics, artificial intelligence, and augmented and virtual reality has become more dependent on HCI research.

This presentation presents an overview of the fundamental ideas and methods used in HCI research, emphasising the value of user experience, usability, and user-centered design. In addition, some of the current difficulties and trends in the industry will be discussed, including the need to address concerns about privacy, security, and issues of diversity and inclusion in computer system design. This presentation will offer suggestions on how to develop technology that improves users' productivity and quality of life, which is the ultimate goal of HCI research.

II. METHODS

A variety of techniques are used in the Human-Computer Interaction (HCI) study to create, assess, and evaluate user interfaces. These techniques incorporate ideas from many different academic fields, including as psychology, computer science, engineering, and design. The following techniques are some of the most popular ones in HCI research:

- **User-centered design:-** The requirements and preferences of users are put front and centre during the design process using the user-centered design approach. The process usually include performing user research to learn about user behaviour and preferences, then using this knowledge to guide the creation of user interfaces.
- **Usability testing:-** Usability testing entails assessing how simple it is for users to carry out particular tasks when using a computer system. It often entails watching people as they do activities and gathering feedback on their experience.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 3, May 2023

- **Think-aloud protocol:-** In this technique, users are prompted to explain their ideas out loud as they operate a computer system. This can help identify any areas of difficulty or confusion and also shed light on how users interact with interfaces.
- **Cognitive walkthroughs:-** In this technique, user interactions with a computer system are simulated in order to spot any potential trouble spots or regions of uncertainty.
- **Heuristic evaluation:-** This process involves assessing a user interface in accordance with a predetermined set of rules or criteria, as those produced by Nielsen's heuristics.
- **A/B testing:-** Comparing two iterations of a user interface to see which one performs better is known as "A/B testing." It often entails gathering information on user preferences and behaviour while randomly allocating individuals to one of the two interfaces.
- **Eye tracking:-** When a user interacts with a computer system, eye tracking includes utilising specialised equipment to track the movements of the user's eyes. This can reveal information about the parts of the user interface that they are paying attention to and how they are processing the information.

III. DISCUSSION

In the design and development of computer systems, human- computer interaction (HCI) research is a vital area of study. HCI researchers strive to build interfaces that are simple, effective, and easy to use for a variety of people by utilising a variety of techniques, such as user-centered design and usability testing.

The significance of user experience (UX) and user-centered design is a major topic of discussion in HCI research. It is crucial to design interfaces that prioritise users' needs and preferences as technology develops and permeates more aspects of our daily lives. This entails keeping things like usability, accessibility, and inclusivity in mind as well as making sure that user interfaces are created with these in mind.

The need to address concerns of inclusion and diversity is a key topic of discussion in HCI research. Computer systems ought to be created so that everyone may use them, regardless of their age, level of aptitude, or cultural background. When creating interfaces, this entails taking into account elements like language, cultural norms, and accessibility features.

In HCI research, privacy and security are also significant factors. As technology develops, it is more crucial than ever to make sure that computer systems are built with security and privacy in mind. This entails taking precautions to safeguard user data, making sure that user interfaces are safe from hacking, and giving users access to and control over their data.

Finally, the ethical aspects of computer system design must be taken into account in HCI research. When building interfaces, this entails keeping factors like bias, responsibility, and transparency in mind. It also entails being aware of any potential unintended impacts of computer system design and taking preventative measures to lessen any undesirable outcomes.

In summary, HCI research is a crucial area with enormous ramifications for the creation of computer systems. HCI researchers can design interfaces that are more effective, efficient, and user-friendly for all users by putting the user experience first, addressing issues of diversity and inclusion, assuring privacy and security, and taking ethical considerations into account.

IV. CONCLUSION

The findings suggest that HCI is a dynamic and evolving field that requires interdisciplinary collaboration, user-centered design approaches, and rigorous evaluation methods to ensure the development of effective and usable interactive systems. The implications of this study include the need for ongoing research and development in HCI, the importance of involving users in the design process, and the potential of emerging technologies to enhance human-computer interactions.

Overall, this research paper contributes to the ongoing discourse on HCI by providing insights into key issues and challenges facing the field and proposing recommendations for future research and development. It is hoped that this study will inspire further research and innovation in HCI, leading to the creation of more effective and user-friendly interactive systems that enhance the quality of human-computer interactions.