Human Computer Interaction

Diya Vijay Ambede[1], Siddhi Shashikant Kalekar[2], Prof.Netranjali SandipMahadik[3]
[1, 2] Dept of Computer Science
[3]Asst. Professor, Dept of Computer Science
[1, 2, 3] DUBSS College, Dapoli,

Abstract- *Human-Computer Interaction (HCI) is the design and implementation of interactive computing systems that users can interact with computer. HCI is useful in many social uses like Health care,Education, Banking, Networking,HCI involves a multidisciplinary approach, drawing from psychology, design, computer science, and ergonomics fields.*

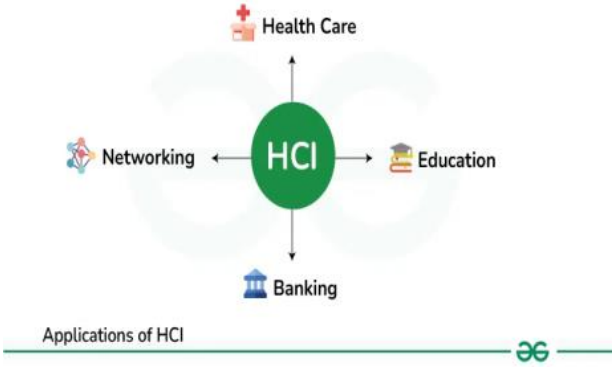
Keywords- Human-Computer Interaction (HCI), techniques, principles, design, Computer Human Interaction (CHI), Applications,Uses Cases (HCI), Advantages & Dis-Advantages, Lifecycle (HCI).

I. INTRODUCTION

The interface between computers and humans is essential to enabling the various ways in which humans and computers communicate. Other names for HCI include computer-human interaction (CHI), man-machine interaction (MMI), and human–machine interaction (HMI). User happiness, also known as End-User Computing happiness, is a crucial component of HCI. It continues by saying that human–computer interaction pulls on both machine and human supporting knowledge since it examines communication between a human and a machine. On the machine side, methods related to operating systems, programming languages, development environments, and computer graphics are pertinent. Communication theory, the fields of visual and industrial design, linguistics, social sciences, cognitive psychology, social psychology, and human aspects such computer user satisfaction are all pertinent from a human perspective.

II. APPLICATION OF HCI IN DIFFERENT DOMAINS

It includes the design and development of application. This application includes desktop application, websites and mobile apps. These applications are used in different domains it includes healthcare, banking, education, networking and many more.



1) Health care

Nowadays, patients have a plethora of options. With the aid of a mobile application, they may schedule doctor's appointments and purchase medications online. Surgical procedures used to be extremely dangerous, but they are now being transformed by augmented reality (AR) and virtual reality (VR). The process can now be seen by the doctor via 3D animations. New surgeons can be trained with it.

2) Education

Any concept is now easier for kids to understand. These days, there are a ton of resources on the internet. Thanks to smart courses, classroom instruction is now highly engaging. Students may quickly visualize any idea with the aid of AR and VR technology.Online learning is an alternative for students. Students were unable to leave their homes during COVID-19. In this case, they can choose to study.

3) Banking

Ordinary folks no longer have to wait in lengthy bank lines. With Net Banking or Mobile Banking, they can obtain banking solutions at the comfort of their own homes. Additionally, these applications offer users a safe atmosphere to prevent online crimes.

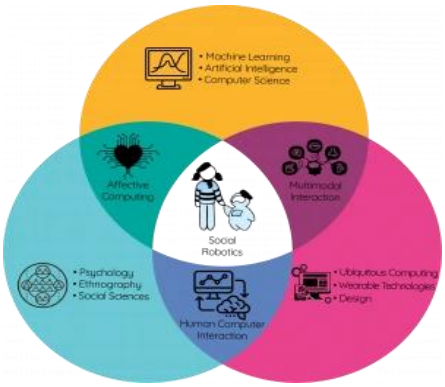
4) Networking

These days, networking is fairly simple. It encompasses both commercial and social media networking.

We may now connect and exchange ideas with anyone very easily. It makes the job search process more efficient.

III. WHAT IS HUMAN COMPUTERINTERACTION?

Human-Computer Interaction, or HCI, is the study and design of human-computer interaction and other technological systems. It includes creating user-friendly, effective, and pleasurable interfaces and interactions as well as comprehending user behavior, needs, and preferences' involves a multidisciplinary approach, drawing from psychology, design, computer science, and ergonomics fields. By considering factors such as usability, accessibility, and user experience, HCI aims to create user-centered technology that enhances human capabilities, ultimately improving the interaction and communication between humans and machines.



IV. USE CASES OF HCI

1.Smart home: One definition of a "smart home" is a residence that has been equipped with communication technology to allow for some level of automation or remote control. Voice-activated commands or smartphone apps can be used to control the heating, cooling, and lighting. In order to notify inhabitants in the event of a burglary, home security systems are also equipped with communication technologies.

2.Biometric Sensors: These are devices that employ human biometrics in a variety of technology contexts. It can be applied to access controls, such as allowing users to access a security system or computer network.

3.Autonomous vehicle:A car that can drive itself is called an autonomous vehicle. One business that led the way in the development of autonomous driving cars is Tesla. Because of its sophisticated autopilot technology, navigation updates are available in real time.

4.Virtual assistants: The intelligent virtual assistant, often known as the intelligent personal assistant, is another modern innovation. It is a software agent that, when given instructions or queries, can carry out tasks, provide services, or act independently. These virtual assistants are able to understand human speech and react vocally.

5.Smart phones for Visual Disabilities:
Some smartphones have features that make life easier for those with disabilities. As a screen reader, Voiceover essentially means that your phone will speak out and inform you of what is on the screen. It can be controlled by the user using specific touch movements. Magnification is one of the additional features.

V. HCI LIFE CYCLE

1. Requirements Analysis

The first stage of the HCI life cycle is requirements analysis, during which designers learn about the wants and needs of users. To find out how users engage with technology and what they anticipate from a system, this entails conducting surveys, interviews, and observations. The objective is to develop use cases, scenarios, and user profiles that will direct the design process and guarantee that the system satisfies the requirements of its target users.

2. Design

The goal of the design phase is to create a tangible user interface by converting the requirements acquired during the analysis phase. Designers produce designs and prototypes that show how the finished system will appear and work. Prototyping, wireframing, and sketching are frequently used in this stage to test various design concepts and make sure the interface is intuitive, efficient, and visually appealing.

3. Implementation

Following the finalization of the design, the implementation phase commences, during which the design is converted into tangible software or hardware. This process includes programming the user interface, conducting functionality and usability tests, and making adjustments based on user feedback. The objective of this phase is to develop a system that embodies the design principles and fulfills the requirements of users in practical scenarios.

4. Evaluation

The evaluation phase focuses on measuring the usability and effectiveness of the system. This can be achieved through usability testing, where users are invited to complete tasks using the system and share their feedback. Additionally, heuristic evaluations and user insights are employed to pinpoint usability challenges and opportunities for enhancement. The aim is to confirm that the system is user-friendly, efficient, and aligned with the needs of its users.

5. Deployment

After the system has undergone evaluation and refinement, it is prepared for deployment. This stage entails making the system available for the intended users and offering training, documentation, and support to facilitate effective usage. The deployment phase guarantees that users can access and utilize the system in a manner that satisfies their needs and expectations.

6. Maintenance

The maintenance phase encompasses continuous support and updates for the system. This may involve resolving bugs, incorporating new features, and ensuring that the system remains functional and pertinent over time.

VI. ADVANTAGES AND DISADVANTAGES OF HCI

Advantage and Disadvantage of Human Computer Interaction HCI stands for Human-Computer Interaction, which refers to the study, design, and evaluation of computer systems. Here are some advantages and disadvantages of HCI.

Advantages:

1.Improved usability: Human-Computer Interaction (HCI) contributes to the creation of user-friendly interfaces, facilitating easier interactions between users and computer systems or devices. This enhancement in usability leads to a reduction in errors.

2.Increased productivity aids in the development of intuitive and straightforward interfaces, which can significantly increase productivity by minimizing the time needed to accomplish tasks.

3.Enhanced user satisfaction: -HCI plays a vital role in designing interfaces that align with users' needs and expectations, thereby enhancing their satisfaction and overall experience with the system.

4.Improved accessibility: -HCI facilitates the design of interfaces that are accessible to a broader audience, including individuals with disabilities.

5.Better decision-making: -HCI assists in presenting data and information in a clear and comprehensible manner, which supports improved decision-making.

Advantage and Disadvantage of Human Computer Interaction HCI stands for Human-Computer Interaction, which refers to the study, design, and evaluation of computer systems and other technological devices that are meant to be used by humans. HCI plays a crucial role in ensuring that these devices are user-friendly, effective, and efficient. Here are some advantages and disadvantages of HCI:

Disadvantages:

Advantage and Disadvantage of Human Computer Interaction HCI stands for Human-Computer Interaction, which refers to the study, design, and evaluation of computer systems and other technological devices that are meant to be used by humans. HCI plays a crucial role in ensuring that these devices are user-friendly, effective, and efficient. Here are some advantages and disadvantages of HCI:

1.Time-consuming: -The design and evaluation processes in HCI can be quite time-consuming, particularly when multiple iterations of design and testing are involved.

Advantage and Disadvantage of Human Computer Interaction HCI stands for Human-Computer Interaction, which refers to the study, design, and evaluation of computer systems and other technological devices that are meant to be used by humans. HCI plays a crucial role in ensuring that these devices are user-friendly, effective, and efficient. Here are some advantages and disadvantages of HCI:

2.Costly: -The design and evaluation of HCI can incur significant costs, especially whenextensive user research, testing, and iterations are required.

3.Subjective: -The design and evaluation of HCI are often influenced by subjective factors, as they rely on the opinions and preferences of users, designers, and evaluators.

4.Limited scope: -HCI primarily concentrates on the interaction between humans and computers, often overlooking the broader social, economic, and cultural contexts that influence these interactions.

5.Rapidly evolving technology: -HCI must adapt to swiftly evolving technology, which can pose challenges in the design process.

VII. CONCLUSION

Human Computer Interaction is a vital field that seeks to understand and improve the interactions between humans and computers. By combining insights from psychology, computer science, design, and engineering aims to create systems that are intuitive, user-friendly and supportive of human needs and goals.

REFERENCES

[1] Human–computer interaction https://en.wikipedia.org/wiki/Human%E2%80%93computer_interaction

[2] Use Cases of HCI, Application of HCI in different domains https://www.geeksforgeeks.org/introduction-to-human-computer-interface-hci/

[3] Human Computer Interaction - brief intro https://www.interaction-design.org/literature/book/the-encyclopedia-of-human-computer-interaction-2nd-ed

[4] Advantage and Disadvantage of Human Computer Interaction https://www.studocu.com/ph/document/systems-plus-college-foundation/human-and-computer-interaction/advantage-and-disadvantage-of-hci/50193061