



## Human-computer interaction: Principle and impact on user experience

Kasireddi Sravanthi, Challa Revanth Reddy, Awwab Mohammad

Department of Computer Science and Technology, Manav Rachna University, Faridabad, Haryana, India

### Abstract

The Abstract of this paper mainly describes an overview of Human-Computer Interaction (HCI). HCI means it interacts with the humans and computers. The goal of HCI is to create technology that focuses on the user by understanding how people think, feel, and physically interact with devices, as well as the situations in which they use them. Different techniques and principles are developed to ensure that the interaction between humans and computers meets our expectations. HCI plays a vital role in our everyday lives. It is the result of continuous testing and improvement of design interfaces, which can greatly affect how users experience and use technology. Human-Computer Interaction (HCI) is an interdisciplinary approach to the design, evaluation, and implementation of interactive computing systems for human use. In this paper, the underlying principles of HCI like usability, user-centred design, consistency, feedback, and reduction of cognitive load and their influence on shaping user experiences are investigated. By analysing the ways users experience, engage with, and react to technology, HCI seeks to design simple and effective interfaces across fields such as education, healthcare, and entertainment. The influence of HCI reaches beyond functionality, affecting emotional satisfaction, accessibility, and long-term adoption of systems. This paper presents how HCI principles play a role in enriching user experience and enabling more accessible and enjoyable technological settings.

**Keywords:** Human-Computer Interaction, usability, user-centred design, cognitive load, emotional design, interface design

### Introduction

HCI primarily concentrates on the creation and application of computer technology. It especially describes the Interaction between Humans(users) and Computers. It analyzes how the people use the computer and how they come into being new innovations, let humans use them in Innovative ways. HCI can support in different ways like when the humans and computer be in communication. Human-Computer Interaction, focuses on understanding how people behave and think when they use computer systems. This means studying how users see, learn about, and interact with technology, as well as figuring out what different groups of user's need and what challenges they face.

Today, we often see graphical user interfaces (GUIs) in many places, like desktop applications, web browsers, mobile devices, and computer kiosks. These GUIs have evolved to allow people to interact with character agents, which are like virtual characters, in ways that other types of interfaces can't. Another type of interface is the voice user interface (VUI), which is used for systems that can understand and produce speech. This allows users to interact with technology using their voice, making it easier and more natural for many people. Overall, HCI is about making technology easier and more enjoyable to use by understanding how people think and behave. The contemporary world is heavily embedded with computer technologies that keep evolving all aspects of our existence. Human-Computer Interaction (HCI) examines how humans interact with computers, an area that has developed dramatically over the years. Instead of mere conventional command-based systems, contemporary HCI research is concerned with intelligent, adaptive, multimodal, and active interfaces. As technology keeps evolving, questions are

raised regarding its influence on our quality of life and what it is to be human in a technological world. This paper seeks to give a general overview of HCI, ranging from its definition, history, current technologies, and future directions.

Human-Computer Interaction (HCI) keeps developing with new paradigms that augment user experience, increase efficiency, and shape behaviour. At the core of this development are a number of core theories and technologies. Affordance theory, which was pioneered by psychologist James J. Gibson, examines how users interpret action possibilities provided by objects within an environment. The theory has been instrumental in developing intuitive user interfaces that match user expectations. Haptic feedback, which re-creates the sense of touch via vibrations or forces, plays an important role in the richness of multimodal interaction. It amplifies the perception of the user, particularly in virtual or restricted environments, by supplying tactile feedback that reinforces vision or hearing. Fitts's Law, a human motor behaviour predictive model, measures the time to move to and choose a target. It has been extensively used in interface design, especially in maximizing the size and location of interactive objects to reduce user effort and maximize performance efficiency. Persuasive technology describes systems that aim to alter users' attitudes or behaviour through interaction. Such technologies use psychological principles to shape decision-making, and their applications include health and sustainability. This research seeks to explore how these theories and technologies can be synergistically used to design more effective, intuitive, and behaviourally significant interfaces.

Human-Computer Interaction (HCI) is at the core of defining the manner in which individuals engage with

computer-based systems across multiple domains. With continued advancements, applications are increasingly being integrated into daily life, presenting cutting-edge solutions to improve usability, accessibility, and overall user experience. In education, HCI enables the creation of inclusive and interactive learning spaces through new technologies like virtual reality (VR), augmented reality (AR), artificial intelligence (AI), and natural language processing (NLP). They enable learning to be more interactive and accessible for people of all ages and abilities. In healthcare, HCI leads to better patient care and drug management through user-friendly interfaces that assist users in monitoring and organizing prescriptions effectively. In addition, HCI is institutionally part of everyday interactions—be it through smartphone use, online searching, or interactions with voice assistants—rendering digital tools intuitive and user-friendly. Also, the principles of HCI favor ergonomic design such that systems and devices not only work but are also comfortable and effective to use. These varied applications illustrate the significant influence of HCI in improving human interaction with technology in various industries.

### Literature Review

In 2010, Sinha <sup>[1]</sup>. study highlights that Human-Computer Interaction (HCI) is in a state of constant change, propelled by new technological advancements. Upcoming breakthroughs in computing are anticipated to blur the distinction between humans and machines, leading to interactions that are more natural, effective, and engaging. The advent of systems that are touch-sensitive, voice-activated, powered by artificial intelligence, and controlled by the brain is poised to transform the way people engage with technology. Human Computer Interaction is a field of study focused on the creation, assessment, and application of interactive computing systems for human use, as well as the exploration of important phenomena related to these systems.

In 2011, Alex Roney Mathew <sup>[2]</sup>. study Human -Computer Interaction (HCI) is crucial for creating systems that are both effective and easy to use. The success of any system hinges on achieving a balance between its functionality and usability. Developments in HCI, such as adaptive and intelligent interfaces, have enhanced user experience by tailoring interactions and anticipating user requirements. New technologies like speech recognition, sensor-based interfaces, and multimodal systems further boost accessibility and efficiency. As HCI continues to advance, it will be instrumental in shaping the computing systems of the future.

In 2020, Yina Liu <sup>[3]</sup>. discusses the integration of design psychology with Human-Computer Interaction (HCI) in order to serve users' psychological and cognitive needs better. HCI is a cross-disciplinary science that includes computer science, psychology, sociology, and design for the purpose of designing user-friendly systems. Design psychology is concerned with the comprehension of user behaviour, cognition, and emotions in order to make interface design better. The authors have suggested techniques involving analysis of user populations, cognitive functions, and self-efficacy to enhance usability and user

experience. The present paper presents a novel HCI interface design approach based on design psychology, which presents new options for accommodating the changing needs of today's technology

In 2016, Paolo Rocchi <sup>[4]</sup>. has been extensively studied in numerous fields such as e-learning, e-commerce, and games. With interfaces now accessing the varied global population, HCI more and more uses the principles of psychology, sociology, and cultural studies. User-centred design (UCD) has come to be at the forefront of designing successful interfaces. Education has seen an increase in interactive technologies lead to the demand for HCI training, particularly among professionals who are creating software for the varied kinds of users. But practical technical skills alone are insufficient—conceptual knowledge is also required for students to design appropriate interfaces. This was the problem solved by the creation of a vocational course in Object-Oriented Analysis and HCI, with both theory and practice.

In 2023, Jain <sup>[5]</sup>. emphasizes the significance of Human-Computer Interaction (HCI) in making contemporary technology more accessible and user-friendly. It discusses HCI's application in different domains including education, entertainment, and healthcare. Through methods such as user-centred design and usability testing, HCI makes technology user-friendly. In education, for example, HCI assists in developing interactive learning systems that are more engaging and effective for students.

In 1987, Suchman <sup>[7]</sup>. took insights from conversation analysis, which is usually focused on interpersonal communication, and applied them to the study of Human-Computer Interaction (HCI). She viewed the interaction between people and computers as a form of conversation. By using methods from social psychology, like field studies and ethnography, Suchman created theories that help address specific challenges in HCI. This approach highlights the importance of understanding user interactions in a more nuanced way.

In 2001, Bevan <sup>[7]</sup>. emphasizes in his article that usability research should go beyond just how a machine is used. It should also focus on the entire development process, the design of the user interface, and how effectively users or organizations can operate the technology. This holistic approach ensures that usability is considered at every stage, making technology more user-friendly and effective.

In 2003, Carroll <sup>[8, 27]</sup>. describes this period as "the golden age" for Human-Computer Interaction (HCI), marking a time when theories about how we interact with technology began to take shape. During this era, HCI emerged as a formal discipline, gaining recognition and importance. The Association for Computing Machinery (ACM), a leading professional society in computing, acknowledged HCI as one of the nine key areas in computer science. This recognition helped to solidify HCI's role in shaping the future of technology and user experiences.

In January 2008, Chandragupta Borkotoky, Swapnil Galgate and S.B. Nimbekar Professionals et.al <sup>[9]</sup>. in ACM digital library and well known in Computers they describe human computer interaction: Mobilize the human computer interaction of P300 potential brain waves for the proof of individuals. Here, they present innovative ideas for the

people's brain - "Thoughts". The aim of the brain is that the thought system can extract the useful data from the people's brain signals and transmit through thoughts. Brain signals can be accurate in Solving Complicated problems and in software such as Matlab.

In 2018, H Bansal <sup>[10]</sup>. - Professional organ of research in computers. The technology has developed in the computer has provided a route to the human computer interaction. Many experiments in human computer interaction involved the people who are at a young age group are well educated. The people are aware of HCI and well informed. The central point of this paper is mental model in Human Computer Interaction. There are some various features that highlight the instant approach. The review gives the outcomes in the HCI in detailed way in the approach.

In 2021, P Chate <sup>[11]</sup>. journal of research in the computer. The development of computers has given a stand up to the interfaces of Human Computer Interaction. This article mainly describes about the outline of the Human Computer Interaction. The view encloses the definitions, fundamentals, current status of HCI, summary analysis, and the applications on HCI. This review paper which includes the list of methods in the field of HCI.

In 1987, Ben Shneider man <sup>[12]</sup>, Human-Computer Interaction (HCI) has come a long way since its official inception in the 1980s. One of the early classics in the discipline is *Designing the User Interface* by which provided the foundation for understanding human interaction with computer systems. Shneider man highlighted principles like consistency, feedback, error prevention, and user control, which became central to designing intuitive and effective user interfaces. It introduced the idea of direct manipulation too, where end-users interact directly with objects being displayed on-screen using gestures like clicking and dragging, creating more of a perception of engagement as well as mastery. This paper was a shift from technical development of systems strictly to a focus on user-focused design philosophy to make designers develop interfaces that promote usability, learnability, as well as access. Shneider man model still pervades contemporary HCI practices, specifically in the construction of interactive systems on desktop, web, and mobile platforms.

In 1988, Don Norman's <sup>[13]</sup>. *The Design of Everyday Things* is a classic to Human-Computer Interaction and design psychology. In the book, Norman decries bad design and how mundane objects—be it doors, switches, or computer interfaces—typically fail because they neglect the user's mental model. He introduces key concepts such as affordances (the perceived and actual properties that suggest how an object can be used), signifiers, constraints, mapping, feedback, and conceptual models, which are now central to user-centred design. Norman points out that when design is consistent with how people think and act, it results in intuitive and error-resistant systems. His work changed the paradigm of design towards user empathy, promoting that systems should accommodate human limitations instead of expecting users to accommodate machines. This view still influences contemporary interface and product design, particularly in usability engineering and cognitive ergonomics.

In 1993, Nielsen <sup>[14]</sup>. study early books placed user-centred design and the importance of usability in the foreground. Following this momentum, researchers in the 1990s, in particular Jakob Nielsen, made progress by establishing usability heuristics and focusing on pragmatic means of assessing user interfaces. established a crisp, actionable mechanism for measuring the usability of digital systems. These heuristics—like visibility of system status, match between system and the real world, user control and freedom, consistency and standards, and error prevention—came to form the basis of usability engineering. Discount usability testing, which demonstrated that significant usability problems could be revealed through low-cost, simple assessments with only a few users, was also espoused by Nielsen. His emphasis on website usability during the internet's explosive growth served to influence user-friendly websites and online platforms, confirming the value of planning with the end-user in mind.

In 2003, Jameson <sup>[15]</sup>. classified adaptive interfaces as those that can dynamically adapt aspects such as layout, feedback, or functionality without explicit user intervention. For example, an adaptive system may simplify an interface for a beginner or provide shortcuts to an expert. This idea is intended to minimize cognitive load, maximize personalization, and enhance overall efficiency by adapting interactions to individual users and situations.

In 1999, Oviatt <sup>[16]</sup>. illustrated how multimodal integration can enhance communication accuracy and user satisfaction, especially in difficult or hands-free situations. Multimodal interaction became the focal point in virtual reality (VR), augmented reality (AR), and accessibility design in the 2010s, enabling physically or cognitively impaired users to interact better with systems.

In 2004, Don Norman's <sup>[17]</sup>. *Emotional Design* was a turning point in this transition in that it underscored the point that good user experience needs to extend beyond usability and encompass emotional reactions. For Norman, users engage with products through logic and cognition but also through feelings, memory, and emotional responses. He introduced the three levels of design—visceral, behavioural, and reflective—each shaping the way people experience and appreciate a product. Norman believed that delighting users emotionally can build loyalty and satisfaction even if there are small usability flaws. This emotional aspect of design has now become one of the central tenets of contemporary HCI, particularly in fields such as user experience (UX), persuasive technology, and interactive product beauty. By incorporating affective considerations, designers can design interfaces that are not only useful but also enjoyable, memorable, and engaging on a more psychological level.

In 2020, Chen Hong <sup>[18]</sup>. proposed a novel HCI design approach based on cognitive load management and analysis of user behaviour patterns, specifically for self-service terminal contexts such as kiosks and ATMs. The study centered on how excessive cognitive requirements such as too much step-structure, confusing labels, or unfamiliar navigation can hamper usability and deter users. Chen suggested solutions like making interfaces simpler, presenting distinct visual signals, and synchronizing task flows with user expectations in order to decrease mental effort. Through observation and imitation of user behaviour,

the system adapts dynamically to the needs of the users, thus improving interaction efficiency and satisfaction. This method is particularly beneficial in public environments where users differ considerably in age, technical expertise, and levels of confidence.

In 2020, Wang Jiahao [19], investigated the role of self-efficacy—the user's perception of being able to complete tasks successfully—in use of new digital interfaces. He found that those with greater self-efficacy are more inclined to try features, learn new systems, and accomplish tasks without assistance, while those low in confidence avoid or struggle with unknown interfaces. To encourage user confidence, Wang proposed design methods like progressive disclosure, guided onboarding, and positive feedback loops, which enable users to develop competence step by step. By developing user self-efficacy, designers can enhance short-term usability as well as long-term adoption of digital systems.

In 2018, Zhang *et al* [20], dated the history of design psychology back to its roots in ergonomics in the 1940s, when the accent was laid mainly on physical comfort and task effectiveness in human-machine systems. Design psychology has become an inter-disciplinary field drawing on knowledge from cognitive science, sociology, aesthetics, and behavioural psychology over the decades. This more comprehensive focus allows designers to take into consideration not only functionality and usability, but also user perception, emotion, cultural context, and aesthetic preferences. Zhang *et al.* had contended that contemporary HCI design needs to embrace this multidisciplinary perspective to develop systems that engage users at various levels—intellectually, emotionally, and socially.

**Methodology**

The methodology used in the study is a systematic literature review and analytical synthesis of existing and recent work on Human-Computer Interaction (HCI) from the past. This review approach is aimed at identifying, comparing, and assessing major advances, paradigms, and trends in HCI based on a multidisciplinary approach.

**a. Literature Selection**

A collection of academic sources pertinent to the problem was selected from extremely high-quality journals, conference papers, and online databases, specifically the IEEE Xplore and ACM Digital Library repositories. Early influential works like Norman's cognitive psychology-informed design principles [13], Nielsen's usability guidelines

[14], and Suchman's ethnographic work [6], were selected to establish historical foundations. Recent research on adaptive and intelligent systems [15], gesture and gaze interactions [22], and multimodal systems [16], was incorporated to indicate current trends.

**b. Analytical Framework**

The review was undertaken through qualitative content analysis, searching for common patterns and salient findings within the literature. The Stimulus-Organism-Response (S-O-R) model [21], served as a psychological framework to evaluate user reaction to interface stimulus. Comparative analysis informed understanding of how different HCI methods interact with different technological environments (e.g., desktop, mobile, ubiquitous computing).

**c. Evaluation and Synthesis**

To synthesize results, the literature under review was compared against contemporary HCI needs like inclusivity, personalization, and natural interaction. Models like Carroll's design science model [8, 27], and Bevan's holistic usability lifecycle [7], were used to interpret how HCI developed into a more holistic and user-aware field.

Such methodology will provide a strong and academic assessment of HCI's history, current paths, and future directions from a variety of but related views in science, design, and psychology.

**d. Thematic Categorization**

In order to organize the varied findings of the literature under review, the research studies were grouped into six major thematic areas. This grouping assists in determining prevailing research patterns and areas of focus in the discipline of Human-Computer Interaction (HCI). Each group represents a unique yet interrelated domain that contributes to user-oriented interface design.

The literature was thematically categorized into the following dimensions:

- Usability and User-Centred Design [13].
- Design Psychology and Emotional Experience [18].
- Multimodal Interaction [16].
- Adaptive and Intelligent Systems [15].
- Technological Accessibility and Adoption [10].
- Social and Cognitive Perspectives [6].

Each theme was assessed according to its ability to enhance user experience (UX), accessibility, efficiency, and system usability.

**Table 1:** Comparative significance of main HCI Themes

Theme	Authors & Contributions	Highlights	Implications
Usability and User-Centred Design	Norman (1988) [13], Cognitive ergonomics and user-centred design principles.	UX: 40%, Accessibility: 20%, Efficiency: 30%, System Usability: 50%	Presented cognitive psychology concepts, emphasizing intuitive design and user-friendliness.
Design Psychology and Emotional Experience	Chen (2020) - Cognitive load theory in HCI interface design for self-service terminals.	UX: 60%, Accessibility: 30%, Efficiency: 50%, System Usability: 50%	Enhanced self-service terminals by concentrating on minimizing cognitive load for users.
Multimodal Interaction	Oviatt (1999) - Myths and realities of multimodal interaction.	UX: 80%, Accessibility: 40%, Efficiency: 70%, System Usability: 60%	Disproved misconception and explained the viability of multimodal systems (e.g., speech, touch)

Adaptive and Intelligent Systems	Jameson (2003) [15]. Adaptive interfaces and agents in HCI.	UX: 80%, Accessibility: 30%, Efficiency: 70%, System Usability: 90%	Adaptive systems facilitate customized user interactions, improving usability in various situations.
Technological Accessibility and Adoption	Bansal (2018) [10]. Review of mental models in HCI for enhanced accessibility.	UX: 40%, Accessibility: 80%, Efficiency: 40%, System Usability: 60%	Mental models influence accessibility, affecting how users comprehend and engage with technology.
Social and Cognitive Perspectives	Suchman (1987) [6]. Ethnographic approach to human-machine communication	UX: 70%, Accessibility: 60%, Efficiency: 50%, System Usability: 60%	Emphasize contextual and social elements in HCI, highlighting the social interaction between users and machines.

**Principles of Hci**

▪ **Usability and User-Centred Design**

**Principle:** Systems should be designed around the needs, goals, and limitations of users. User-centered design secures that the interface is intuitive, effective, and supports real-world tasks. It incorporates ongoing user feedback and testing through the course of the design process.

▪ **Cognitive and Emotional Consideration**

**Principle:** Interfaces should appeal to both cognitive and emotional components. Design should facilitate mental processes such as attention and memory, and create positive emotions. Engaging emotionally leads to greater satisfaction and loyalty to users.

▪ **Adaptivity and Intelligence**

**Principle:** Systems need to adapt to and learn from the behaviour of the user in real time. By incorporating AI, interfaces can customize content and functionality based on use patterns. This results in increasingly intelligent, responsive experiences over time.

▪ **Multimodal Interaction**

**Principle:** Integrating modalities (voice, gesture, gaze) increases interaction. Multimodal systems offer versatile input choices that simulate human-to-human communication. They enhance accessibility and create more engaging experiences.

▪ **Inclusivity and Accessibility**

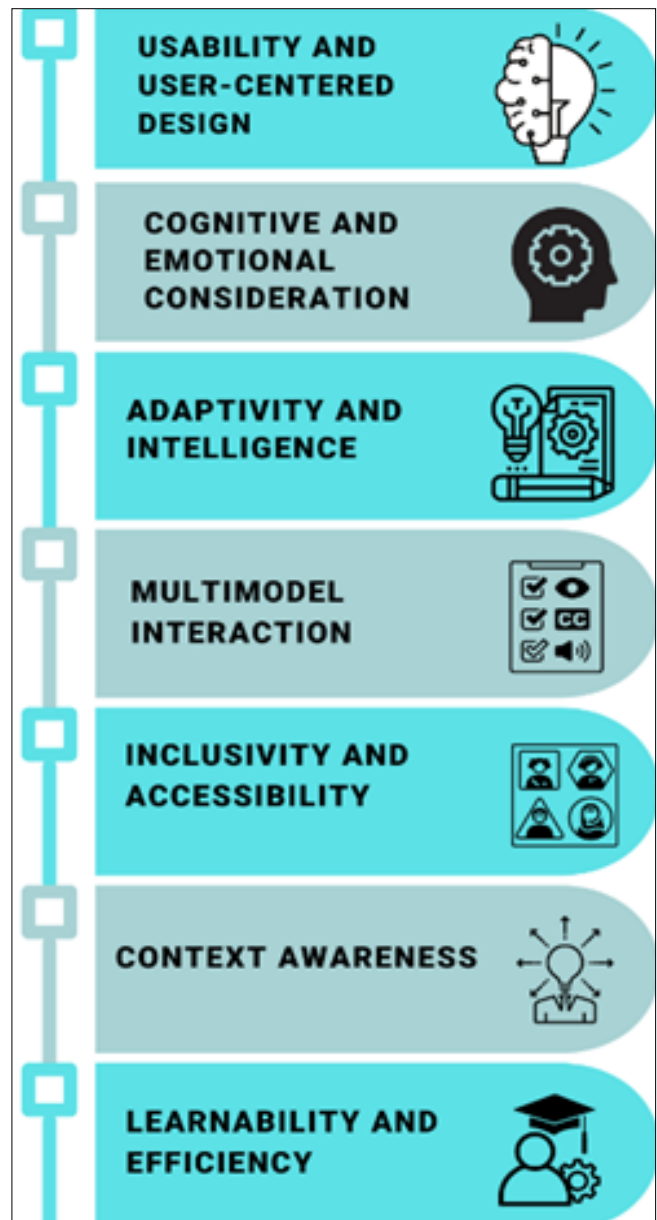
**Principle:** Interfaces should accommodate users with varying capacities and environments. Accessible design caters to users with impairments, varied devices, and surroundings. Inclusive systems serve all by providing equal use and access.

▪ **Context Awareness**

**Principle:** Systems need to adapt according to environmental and situational context. Context-aware interfaces react to location, time, or activity in order to provide contextually relevant content. This promotes usability within dynamic or mobile contexts.

▪ **Learnability and Efficiency**

**Principle:** Interfaces should be simple to learn and efficient to use. Design should reduce the learning curve by being consistent and having clear instructions. Efficient interfaces enable users to accomplish tasks more rapidly with fewer efforts.



**Fig 1:** Principles of HCI

HCI emphasizes usability and user-centred design, thoroughly taking into account cognitive and emotional consideration while aiming for adaptability and smart features to customize experiences. Utilizing multimodal interaction and promoting inclusivity and accessibility in a context-awareness system ultimately results in interfaces that prioritize both learnability and efficiency for every user. This comprehensive strategy seeks to develop technology that is not functional but also intuitive, pleasurable, and effortlessly woven into individuals' everyday lives.

### 1. Significance and Influence of Human-Computer Interaction on User Experience

Human-Computer Interaction (HCI) is a driving force behind shaping and improving the overall user experience (UX). Properly designed interfaces allow for effortless, intuitive, and enjoyable interactions that reduce user frustration and increase satisfaction and productivity. Based on numerous researches [7, 8], HCI guidelines help create interfaces that are user-friendly and effective, thus greatly enhancing the UX in various platforms and systems. One of the key goals of HCI is to provide greater accessibility by creating systems that support a wide range of user capabilities. These include users who have physical, sensory, or cognitive disabilities. By focusing on inclusivity, HCI supports universal access to technology, making digital systems fair and accessible to all users [7]. Such an approach is not only morally required but also needed for broader technology adoption. Furthermore, good HCI makes workers more productive and efficient. Usability-focused systems allow for faster and error-free completion of tasks. Bevan points out that usability considerations in the development phase guarantee effective long-term outcomes and cost savings across a product's life [7]. Workplace environments also experience the advantages as enhanced systems decrease training time while making workflows faster.

Another key advantage of HCI is its ability to eliminate steep learning curves. Interfaces designed with a user-centred approach allow new users to understand and operate systems with minimal effort. As Carroll [8, 27], observes, HCI's emphasis on intuitive design and consistency plays a vital role in making digital tools easier to learn and adopt. From a business standpoint, firms such as Apple, Google, and Microsoft have shown how giving priority to HCI can result in higher customer satisfaction and brand allegiance. By making usability and creative interface design investments, these firms stay ahead of the competition and continuously draw in a wide user audience [8, 10]. In safety-critical applications like healthcare, aviation, and finance, HCI design is critical for reducing human error and improving reliability. Interfaces supporting clear, timely, and accurate interaction lead to better decision-making and operational safety [7, 10]. This renders HCI a critical concern in systems where failure or delay would have dire consequences. Lastly, HCI supports wider technological use by making the system accessible and easy to understand, particularly to non-technical individuals. As argued by Bansal [10], and Chate [11], intuitive design reduces the threshold to entry and makes more individuals use new technology. This boosts digital transformation across industries and population groups.

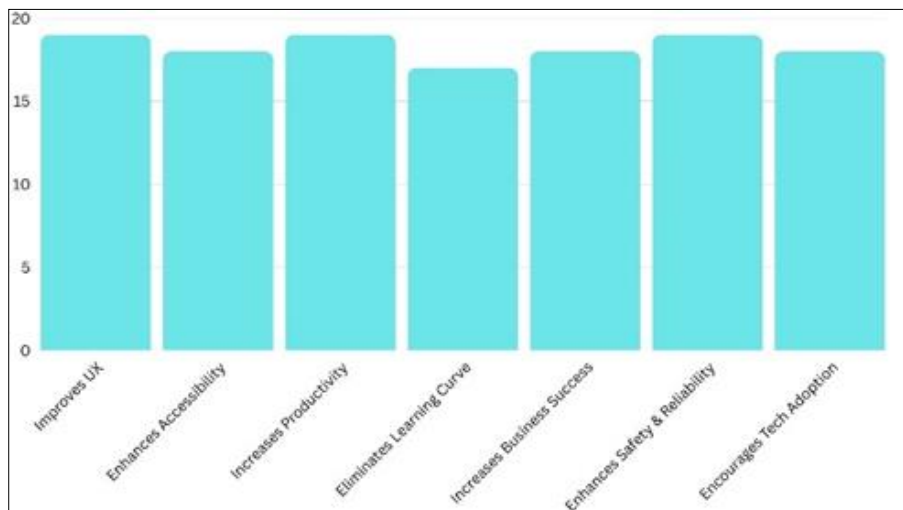


Fig 2: Key benefits of Human Computer Interaction

It highlights various important advantages of specific emphasis indicating that it greatly enhances UX, boosts accessibility, and increases productivity, with all scores approaching top values. Although its learning curve business success, improves safety reliability, and promotes tech adoption, these demonstrate slightly lower, yet still significant, positive effects. In general, the data indicates a significant positive relationship between this emphasis and various beneficial results in user experience, efficiency, and business metrics.

### Conclusion

Human-computer interaction (HCI) is a crucial aspect of system design. The way users comprehend and engage with a system significantly impacts its effectiveness. Therefore, enhancing HCI designs has become increasingly important. Current research is shifting focus from traditional

interaction methods to more sophisticated approaches that are adaptive, intelligent, and feel more intuitive. One intriguing area within HCI is known as the Third Wave or context-aware computing. This method aims to seamlessly integrate technology into our daily surroundings, making it feel more organic and less intrusive. Additionally, virtual reality is emerging as a potential standard for future technology interactions. This paper provides an overview of these subjects and includes references for further exploration. For many individuals, particularly in the United States, interaction with technology has become a vital part of everyday life. Researching websites with an emphasis on user interaction indicates that web designers must prioritize HCI when developing sites. However, the objective should extend beyond merely enhancing interactions for the average user; it should also focus on making websites more accessible for everyone. The websites examined are well-

crafted for typical users, yet there remains significant potential for improvement to enhance usability for all.

## Reference

1. Sinha G, Shahi R, Shankar M. Human Computer Interaction. 3rd International Conference on Emerging Trends in Engineering and Technology, 2010.
2. Mathew AR, Al Hajj A, Al Abri A. Human-Computer Interaction HCI an overview. IEEE International Conference on Computer Science and Automation Engineering, 2011.
3. Liu Y. Human-Computer Interface Design Based on Design Psychology. International Conference on Intelligent Computing Human-Computer Interaction, 2020, 5–9.
4. Rocchi P. Introducing human-computer interaction: A didactic experience IEEE Global Engineering Education Conference, 2016.
5. Jain P, Gupta VK, Tiwari H, Shukla A, Pandey P, Gupta A. Human-Computer Interaction A Systematic Review International Conference on Advanced Computing Communication Technologies, 2023, 31–36.
6. Suchman LA, Plans Situated Actions the Problem of Human-Machine Communication. Cambridge University Press, 1987.
7. Bevan N. International standards for HCI usability. International Journal of Human Computer Studies, 2001;55(4):533–552.
8. Carroll JM, HCI Models, Theories, Frameworks: Toward a Multidisciplinary Science. Morgan Kaufmann, 2003.
9. Borkotoky C, Galgate S, Nimbekar SB, Human computer interaction: Mobilize the human computer interaction of P300 potential brain waves for the proof of individuals. ACM Digital Library, 2008.
10. Bansal H. Mental Models in Human Computer Interaction A. Review. International Journal of Computer Science Engineering Research, 2018;6(2):45–50.
11. Chate PA, Review on Human Computer Interaction: Fundamentals and Applications. Journal of Research in Computer Science, 2021;9(1):22–28.
12. Shneiderman B. Designing the User Interface: Strategies for Effective Human-Computer Interaction. Addison-Wesley, 1987.
13. Norman DA, The Design of Everyday Things. Basic Books, 1988.
14. Nielsen J. Usability Engineering. Academic Press, 1993.
15. Jameson A. Adaptive interfaces agents. In: Jacko JA, Sears A, eds. The Human-Computer Interaction Handbook. Lawrence Erlbaum, 2003, 305–330.
16. Oviatt S. Ten myths of multimodal interaction. Communications of the ACM, 1999;42(11):74–81.
17. Norman DA. Emotional Design: Why We Love (or Hate) Everyday Things. Basic Books, 2004.
18. Chen H. Design of HCI Interface for Self-Service Terminals Based on Cognitive Load Theory. Journal of Physics: Conference Series, 2020;1648(3):032012.
19. Wang J. The Influence of Self-Efficacy on Human-Computer Interaction in Intelligent Environments. International Journal of Human-Computer Interaction, 2020;36(3):215–228.
20. K, Zhang Liu Y, Tan F. From Ergonomics to Design Psychology: Interdisciplinary Fusion in HCI. International Journal of Human Computer Studies, 2018;117:47–60.
21. Li L, Xu Y. Visual perception in interface design based on the S-O-R model. Journal of Visual Languages and Computing, 2019;50:101–110.
22. Wachs JP, Stern H, Edan Y, Gillam M. Vision-based hand-gesture applications. Communications of the ACM, 2011;54(2):60–71.
23. Jacob RJK, the use of eye movements in human-computer interaction techniques What you look at is what you get. ACM Transactions on Information Systems, 1990;9(2):152–169.
24. Weiser M. The computer for the 21st century. Scientific American, 1991;265(3):94–104.
25. Cook D, Augusto J, Jakkula VR, Ambient intelligence: Technologies, applications, opportunities. Pervasive and Mobile Computing, 2009;5(4):277–298.
26. Newell A, Card SK, The prospects for psychological science in human-computer interaction. Human-Computer Interaction, 1985;1(3):209–242.
27. Carroll JM, Campbell RL, Articulating design space. Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 1989, 129–136.
28. Long J, Dowell J. Conceptions of the discipline of HCI craft, applied science, engineering. People Computers IV, 1989.
29. Preece J. Human-Computer Interaction. Addison-Wesley, 1994.
30. Dix A, Finlay J, Abowd G, Beale R. Human-Computer Interaction. 2nd ed. Prentice Hall, 1998.
31. Reeves B, Nass C. The Media Equation: How People Treat Computers, Television, and New Media Like Real People Places. Cambridge University Press, 1996.