International Journal of Engineering Research & Management Technology
(Peer-Reviewed, Open Access, Fully Refereed International Journal) ISSN: 2348-4039
Volume 12, Issue-2 March-April- 2025 Impact Factor: 7.09
Email: editor@ijermt.org www.ijermt.org

HUMAN VS AI IN UX DESIGN

Jaya Shrivastava

ABSTRACT

The collision between artificial intelligence (AI) and user experience (UX) design denotes one of the most revolutionary changes to recent digital innovation. There are no substitutes to the AI in terms of speed, scalability, data analysis, and automation and it can be used as a means to optimise the workflows of wireframing, A/B testing, content generation and usability tracking. Nevertheless, even having such strengths, AI does not have human abilities of empathy, emotional intelligence, cultural awareness, and ethical thinking the main principles of human-centric UX design. This paper looks critically at the complementing but contradicting roles of AI and human designers in creation of user experience. Although AI is very efficient in determining patterns and refining the interface through the use of quantitative data, the system is not able to grasp the emotional or psychological intricacies a user has to go through when interacting with devices. The comparative analysis allows the research to demonstrate that the outcomes of UX are to be the most effective not by substituting human designers with AI, but through the application of AI as a potential helper. Human designers appear to be un-substitutable in terms of understanding the emotional responses of the users, application of cultural knowledge, making it accessible, and meeting the ethical requirements of design. The data makes it clear that the future of UX is in balancing analytical capabilities of AI and empathy-driven skills of human designers who make sure that the emotional essence of design is not lost but rather its efficiency is pumped through intelligent automation.

Keywords: *Empathy in design, Artificial Intelligence, UX Design, Human-centered Design, Emotional Intelligence, Ethical UX, Human-AI collaboration*

1. INTRODUCTION

The ever-changing environment of digital product development is important as User Experience (UX) design determines the experience of the customer when handling technology (Abedin, 2022). A highly humanistic UX design in traditional terms, UX design is a very humanistic practice based on knowing about users and their behaviours, feelings, motivations and what causes them pain. It demands a human capacity to be empathetic, have intuition, be culturally aware, and able to solve problems creatively (Chromik, 2021). With the emergence of Artificial intelligence (AI) however, the design process has started to change. In AI, work is already being done to automate anything, analyze data of users, develop design possibilities, and streamline interfaces (Fronemann, 2022). With this swift adaptation of AI in UX

processes, a question has emerged: Given the ability of the process, can AI create user experience to the same extent as physical humans, or can it excel them?

AI thrives in areas which require pattern recognition, predictive analytics and data-driven optimisation (Hartikainen, 2022). Machine-learning-driven tools are able to analyze the behaviour of users on a scale that could not be handled by even the largest group of humans due to the automation of assessment of usage trends and usability flaws with an unprecedented sense of precision and time consumption (Jin, 2021). As another example, AI can convert thousands of user sessions to locate drop-off points within a conversion funnel or create interface elements using successful design patterns. Such features have great benefits regarding efficiency, scale and objectivity (Liao, 2021). Because of this, AI has emerged as an effective tool in UX process that optimises elements ranging anywhere between wireframing and prototyping to A/B testing and personalisation.

Nevertheless, regardless of these potentials, AI has limitations in such aspects that determine the core of UX design: empathy, emotional intelligence, creativity, and ethical reasoning (Liao Q. V., 2023). On the one hand, AI is able to replicate what humans tend to say and make recommendations on design shift on the basis of how users interact with it, but, on the contrary, AI cannot have the lived experience, an inner sense, and cultural awareness that human designers possess (Lu, 2022). AI will not have a feeling of frustration with an excessively long form and a sense of humour that the user is checking a task with ease. It goes about interpreting behaviour using algorithms as opposed to interpersonal connection or emotional comprehension (Margetis, 2021). This restriction is deadly since an excellent UX design is not always related to resolving the technical issues but it concerns people deep inside.

In addition to that, human introduces the moral reasoning and ethical consciousness to the design process, becoming pivotal in the modern complex digital world (Prati, 2021). Accessibility, inclusivity, privacy, and long-term emotional effects are the considerations that must be made with designers but AI without special training and monitoring cannot cover adequately (Rong, 2023). To take an example, a human designer will understand instinctively that the language used by a chatbot may seem insensitive in a mental health application, where AI may miss these details unless taught how to identify them.

Hence, it is not the issue of replacing but of collaboration. The brightest future hides in combining AI in the form of a tool that complements the abilities of the human designer instead of replacing them (Stige, 2024). AI can be used by human designers to make routine activities more efficient, produce preliminary design concepts, and process the feedback of users on a mass scale, but it will be up to human designers to be in charge of the mental and emotional part of the design (Wang, 2023). The cooperation gives UX the

quality of being user-centered, manages existing in a certain culture, and emotion smart features that cannot be perfectly recreated by any single conduit.

This study examines how human and AI are stronger and weaker in designing UX (Wiberg, 2023). It points out that each of them has a distinct role in the design process, and why the input of the human designer will always be required, particularly when it concerns the development of genuinely touching, comforting and all-encompassing user experiences.

2. REVIEW OF LITERATURE

Bingley et al. (2023) explored the conflict between anthropocentric commitments and a trend towards more automation of UX design procedures with artificial intelligence (AI) (Bingley, 2023). In their paper, they pointed to an increasing gap between the interests of developers and the demands of the final users. Developers were mostly concerned with efficiency and functionality, whereas users were referring to emotional intelligence, empathy, and build-up confidence in AI systems. The researchers demonstrated that even though there were plans to develop human-centred AI, there were numerous design decisions that did not involve deep engagement of the user or empathy-related approach. This is a piece that emphasised the role of a high degree of human activity in AI enhanced systems and in the context of user experience design.

Bødker (2021) provided an essential view on the technique of designing user interface based on human activity theory (Bodker, 2021). She pointed out that it is not enough to design the interface but what happens to the user, the societal interaction, and practical usage. Her way of thinking viewed technology as a moderator of human lives whereby users interface with the systems depending on their agendas, space, and feelings. This theory offered an apt reminder that the design of UX must start with an appreciation of the human users and not just the possibilities of technology. The observations of Bodker place the empathy and the awareness of context as the most critical aspects of designing meaningful interactions and this statement can be commonly opposed to data-driven thinking of AI.

Fan et al. (2022) investigated the possibilities of human-AI cooperation in relation to user experience assessment and tested how explanation-mechanism and synchronisation-method influenced the effectiveness of collaboration between machine and human (Fan, 2022). They found that when AI systems accompanied their suggestions with clear explanations of their reasoning most human designers could understand, criticise and replicate AI suggestions more easily. Nonetheless the study also discovered the drawback in such area as AI capacity to read subtle feedback of human being or react to the emotional signs and it resulted sometimes in inefficiencies or miscomprehensilities during the design process. The

authors also concluded that, despite great potential to improve UX workflows with AI tools, its effective cooperation still depended on human intuition, understanding, and morality greatly.

Joseph and Murugesh (2020) examined the use of eye-tracking measures as good parameters to the measurement of the cognitive load related to the area of human-computer interaction (HCI). Their paper gave a full picture of the possible eye-tracking parameters that may include the fixation duration and saccade frequency, and pupil dilation that were associated with the changes of the mental workload of users. They focused their emphasis to the fact that these metrics might provide objective information on the cognition of the user in the interaction with the interface, thus offer better designed interfaces that are friendly to the user with an efficient cognition. The second point that the authors covered is the merits of utilizing real-time eye-tracking data to understand the complexity and usability of digital interfaces.

Li et al. (2024) explored the practical use of generative AI technologies perceptions among UX design professionals. In interviews and observational studies, they were able to find out that designers liked the fact that AI allowed quicker prototyping, ideation and content generation (Li, 2024). Nevertheless, the vast majority of the participants shared the opinion that AI is unlikely to comprehend the context of the user, his/her emotional requirements, or the cultural peculiarity. The research showed that there was a general attitude that although AI tools may help in the creative process, the tools should not make design choices and especially in those subjects that need ethical awareness or profound understanding of users. The results of their study confirmed the idea that artificial intelligence is to be regarded as a partner, not a designer, of the UX creative process.

Lu et al. (2024) conducted reviews in the field of application of the human-centered AI in the UX design (Lu Y. Y., 2024). The review that they conducted consolidated the findings of various studies to classify the manner in which AI systems were helping UX activities including wire framing, use of usability tests, and personalisation. They pointed out that in spite of its potential to largely improve efficiency and scalability, AI had a rather difficult task when it came to qualitative judgment or empathy. The survey came to the conclusion that the successful results of UX work were conditional upon the inclusion of AI as an aid to human designers instead of substituting them. Their report highlighted the significance of transparency, trust of the user, and the concept of the ethics design in the UX workflows implementation of AI.

3. THE ROLE OF EMPATHY IN UX DESIGN

The core of efficient user experience (UX) design is empathy. It is not merely the ability to know what users are doing; it is about an emotional connection to how users feel, their reasons in doing so and what silent needs or frustrations which might be the driving forces behind the way they interact with a product

or a service. Empathy facilitates the designer to experience the world through the eyes of the user, and by being able to share the mind of this user, smart and impactful design choices can be made. This attribute is particularly essential when the interface or product would be targeting vulnerable groups, emotionally delicate spheres (e.g., mental fitness apps), and cross-cultural communities.

Design based on empathy does not end with aesthetics or practical usability. It will make the users feel that they are heard, seen, and appreciated in the process of interaction. By being empathetic, the designers have the opportunity to pinpoint minute emotional cues like trepidation when completing a form or relaxedness when operating a layout with which they were familiar and respond to it using intentional design principles. Empathy is what makes inclusivity possible, so the issue is that products are not only available, but they are emotionally sensitive and supportive as well.

Key Empathetic Design Methods

To incorporate empathy meaningfully into UX workflows, human-centered design employs several qualitative research methods:

- **User Interviews:** These are face to face interviews with the user where the designer gets to get to the textural issues, fears, aspirations and personal context. To give an example, a customer can complain that he is not satisfied with such a colour of a button but rather with the fear of filling in a bad designed form and at the same time attend to a variety of issues. This information is almost undetectable by AI with minimal training except on such a massive scale that it requires specific training on emotional behaviours detected in very large databases, and it is still not with that much of an understanding.
- **Persona Creation:** Personas are imaginary characters of real user groups that are symbolic of their interests, irritants, and behavioural traits. In a case where personas are made with empathy, designers can take account of emotional states, accessibility needs and individual culture that enable the individualisation of products to a given life experience. To illustrate, a character of an older customer, who is not well versed in the digital environment, may bring about the simplification of UI and supportive messages, which AI could inefficiently pursue through data optimisation instead.
- **Journey Mapping:** The method is able to map out the experience of a user of a good over a period, and also at points of contact, focusing on the highs and the lows, and giving them an emotional connotation. The Journey maps assist the teams to figure out the pain point where the user becomes frustrated, confused, or overwhelmed where the design can be adjusted to work with these emotions. AI could be aware that a client abandons an attempt on a payment page, but cannot infer as to the

reasons, be it financial unease, vague copy or mistrust prompted by design style that is identified by a human.

Empathy: Human Capacity vs AI Limitations

Artificial Intelligence is increasingly being used in UX design to analyze huge amounts of user behaviour data and provide recommendations using trends and interactions. Although this has a potential to enhance efficiency and scalability, it devoid of conscious experience of emotions and psychological cognisance that human designers harbour by default. In fact, AI does not understand what its users feel; it just extrapolates patterns of behaviours and estimates presumption upon prior-labelled emotional records or language processing.

For example, AI could tell that a significant portion of users who have visual impairments cannot read some interface and recommend to increase the size of the font or contrast ratios. It is possible, however, that the designer (a human being) could hear about the costs of digital exclusion (feeling dependent on others, or frustrated by overly technical instructions) after having a live interview with a visually impaired person. Consequently, the designer can not only modify the visual design but also incorporate empathy-based element such as storytelling, voice-based navigation, or less-degrading micro copy to respect the dignity of the user.

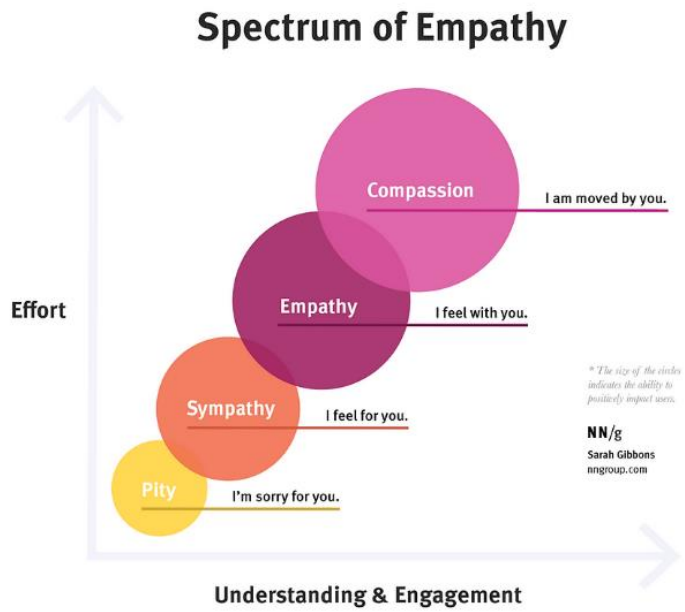

Figure 1: Spectrum of Empathy

Source: (https://www.linkedin.com/posts/sarahegibbons_sympathy-vs-empathy-in-ux-activity-6526160166780489728-MSJO)

This Spectrum diagram represents Spectrum of Empathy in UX Design and it goes on scale; on one end is emotional distance or sympathy/ detached understanding and on the polar opposite is emotional engagement or true empathy. At one of the extremes is AI, which can recognise patterns but which cannot actually understand emotion. At the other extreme here are human designers who have the ability to feel and can empathise with users pain. The picture is driving the point that, although AI might be able to guess what people want, human beings are the only ones who can intuitively, relate to user emotions, design with empathy and be able to get people excited with their experience.

4. AI IN UX DESIGN: STRENGTHS AND USE CASES

Artificial Intelligence (AI) has already become an efficient instrument in the contemporary UX design process when it helps designers accelerate, scale, and make sense of data. Not to substitute human designers, AI acts as a productivity tool that makes the processes faster, provides real-time information, and widens its realms of experimentation of the design processes. Since machine learning, deep learning and natural language processing (NLP) AI technologies improve, their usage in UX design has liberalised, as well, including usability analytics, content generation.

Strengths of AI in UX Design

- **Speed and Automation**

AI has one of the strongest preferences, repetitive time-consuming tasks can be done with extraordinary speed. A solution that uses AI is able to automatically create a wireframe, propose the changes to layout, and even automate A/B testing cycles. Some functions that previously required hours or even days of operations are now able to be done with merely a few minutes permitting the designer to move through the iteration process more quickly and concentrate on more strategic judgments.

- **Data-Driven Decision Making**

AI is particularly successful in processing large collection of user data noticing usage patterns, behaviour trends, and friction points. It allows teams to change the decisions based on their intuition and replace them with the ones relying on good evidence based on interaction with users. As an example, millions of clicks on the websites or sessions in the apps can be analyzed by AI and generate insights that can be used to act on, how many buttons are visible before a conversion goes up in a particular location or where to expect the drop off location on the apps.

- **Content Generation**

As generative AI has become more prevalent, it is now possible to automatically generate micro copy (e.g. button text, tooltips), icons as well as entire UI templates. It is especially useful at the early ideation phases where teams are testing various directions on design. These outputs are not yet at the stage of final human design but AI greatly diminishes the original creative effort.

Popular Use Cases of AI in UX

- **Heatmap Analysis**

Tools such as Hotjar or Crazy Egg can be used based on AI to give a visual image showing where users on an interface click, scroll and those who hover on a given interface. Those maps can assist in detecting the points of friction like problematic layout or the call-to-action buttons that are not taken into account. Although these tools point to the issue of "what is taking place", they still need human intelligence to discuss the issue of "why is it taking place."

- **Voice Assistants and Chatbots**

Chatbots and voice assistants that rely on NLP are AI-based technologies that have changed the nature of digital communication due to the ability to facilitate communication at any time of the day. The services are made easier to use by the use of these tools which explain the input given by the user and gives a response accordingly. Nevertheless, even when AI can give the answer to the question like, What time do you open? what it might have a problem responding to is emotionally coloured questions such as, I have had a bad experience with your service."

- **AI-Driven Prototyping**

Software such as Uizard, Galileo AI, and Figma AI enable designers to enter plain language hints (e.g. develop a log in page with forgot password option and sign up buttons), at which point the system creates interface elements matching that description. This makes early-stage prototyping democratic, particularly to non-designers, and makes insane speeds of iteration possible. Nevertheless, the emotional range or an artificial intelligence of the same sort of output is sometimes without the refinement that would be brought by a human designer.

The Empathy Gap in AI-Powered UX

AI also has its limitation in that it lacks emotions. When someone left a process of checkout, AI can show when and where it happened, but not why a person made such a decision through emotional calculations. Did they get confused by the design, fear they will not be charged securely, or just annoyed about pop-

ups? Such are the questions that cannot be answered by AI many times in an apparently meaningful way without a human context or some qualitative responses.

As an illustration, AI may notice that the users mostly back out when they see the two-factor authentication notice. It can advise it be removed on convenience. Nevertheless, a human designer can also see that even though the step introduces friction, it establishes trust and security, in particular in platforms such as healthcare or banking. The trade-offs can only be considered with compassion, vision, and moral conscience of a human being.

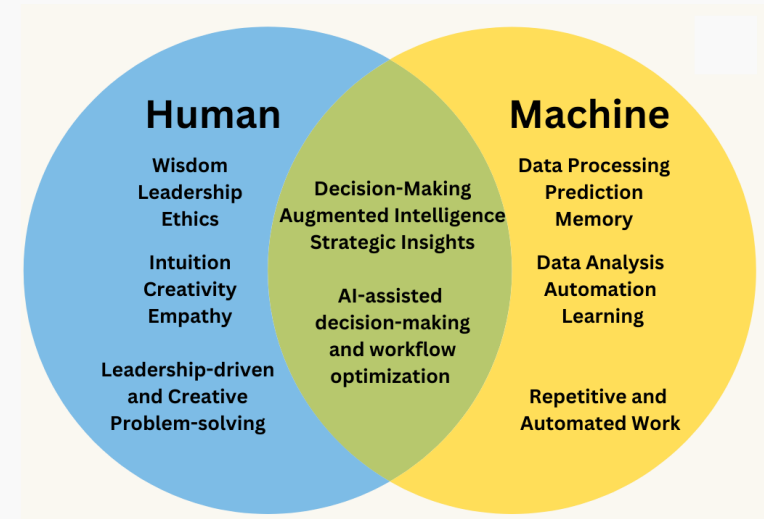

Figure 2: AI-Generated UX vs Human-Centered Design

Source: (https://projectskillsmentor.com/user-journeys/ai-and-human-collaboration-for-better-user-journeys)

The image-based comparison makes it clear the basic distinction between human-focused and AI-based UX design. The layout on the left created by AI demonstrates efficiency, structure, pattern-based logic, but it does not create emotional depth, narration, and sensitivity to cultures. The right-hand side layout created by a human being, in turn, takes into account the intuitiveness of spacing, a Hierarchy of visual elements, and emotional design, which speak to the user on a more personal level. It is an example that, although AI can build efficient and data-built structures, ultimately, UX design is an intricate task whose attractiveness lies in human intuition, compassion, and creative interpretation.

5. DESIGN IS NOT JUST PROBLEM-SOLVING: IT'S UNDERSTANDING PEOPLE

Problem-solving is one of the most fundamental objectives of UX design, but it needs to be the appropriate only part of it. There are more ideas that need to be considered to develop a meaningful and effective user experience. In its essence, UX design is not simply a method of memorising how to make something work better or higher converting it is comprehending people as they are emotional, social, and culturally

complex. In its turn, human-centered design focuses on the human person as the epicentre of the design process by taking into consideration emotions, values, capabilities and hidden needs. Human designers also view the situation at a higher level of comprehension with empathy and higher sense of responsibility than machines do with input/output as a stepping stone.

Designers must move beyond surface-level functionality to ask critical questions:

- What does this interface mean to the user in a moment of vulnerability?
- How will different demographics experience this design?
- What unintended harm might it cause if misinterpreted?

Such considerations make the design process more inclusive, ethical, and emotionally intelligent traits, and AI, however advanced it is, still cannot master them.

How Human Designers Integrate Deeper Understanding

- **Cultural Nuance**

Designs are not in the vacuum they bear meanings which are influenced by culture. The colour scheme or even a symbol can be perceived differently by people pertaining to diverse cultures. An example would be that white is a sign of peace in the Western world and part of Asia may show mourning. All these cultural cues are things that human designers are sensitive to and can adapt designs too and AI might not be trained to recognise it or even in cases where it is, fails to interpret the knowledge how to apply it in a useful way.

- **Accessibility and Inclusion**

Human designers (reflection of real-world awareness) create based on multiple abilities and degree of digital literacy. An individual who designs to serve older customers can capture a sense of what it is like to use tiny fonts, or how difficult navigation can be to a person with a cognitive disability. AI is able to process knowledge (such as WCAG), but does not understand the human experience on which guidelines are based. In this way, humanity will allow accessibility to be treated sensitively rather than as legislation to be followed.

- **Ethical Implications**

The user autonomy, privacy, and transparency require human judgment in making a balance. As an example, a recommender engine can be perfectly focused in engagement but when it is used to tempt vulnerable users into addictive behaviour or act intrusively against their privacy, that is where it creates

ethical red flags. Designers have to take the long term human impact and compare it to efficiency, which is not possible to AI on the ethical scale.

Why AI Falls Short in Understanding People

AI that is driven by large data and cutting-edge neural networks do not have context, emotional intelligence and lived experience. They can craft the beautiful interfaces or optimise to engagement but they are not able to understand why people act in a given way and how they feel when they undergo an experience. AI will never grasp trauma, shame, joy, nostalgia or cultural identity unless it is expressed in values of tagged training data and even then will fail in an experienced way and will only grasp it in a statistical way.

As an example, a human designer may carefully choose gentle shades and constructive micro copy, panel in helpful animation sequences in the construction of a mental health application. They make these decisions based on their emotional and psychological knowledge with regard to the vulnerability of the user. A non-AI, in comparison, might create a wellness app using design templates without considering a sensitivity of any kind to trauma, depression or trust-building, and a result that seems impersonal or even inappropriate to the user.

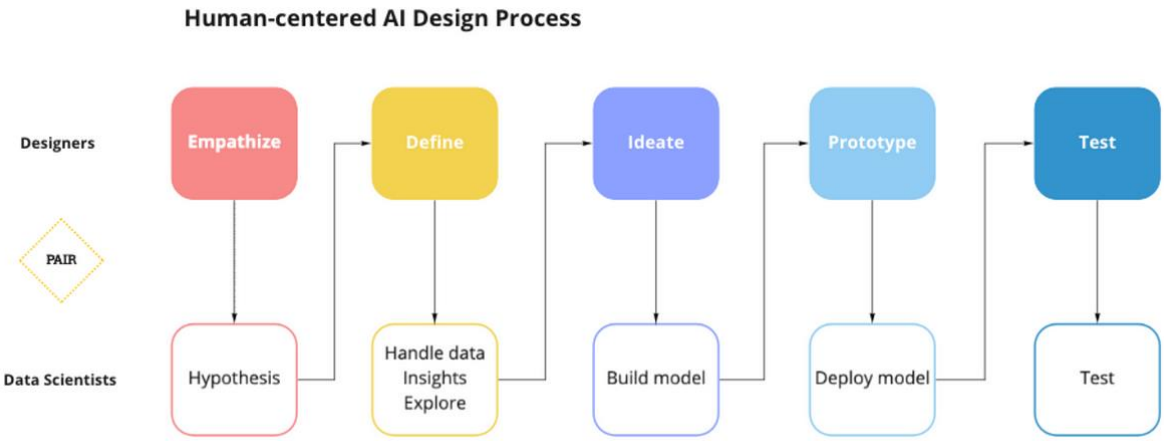

Figure 3: Human-Centered Design Process

Source: (https://medium.com/design-bootcamp/human-centered-ai-design-process-part-2-empathize-hypothesis-6065db967716)

The diagram of this workflow build clearly presents the steps of human centered design process which clearly states that the initial steps and most important phases of this process called empathising, defining and ideating are driven by the human designers. These stages entail penetrating emotional appreciation, problem structuring and an inexplicable sense of user needs and limitations. In most cases, AI will be

introduced later in the process, usually to the ideation, prototyping, or testing stages, and its advantages in speed, data processing, and generation may be exploited.

This image supports the fact that as much as technology could help in honing and scaling the solutions, it is only human that can make out the user pain points, emotional stories, and cultures. That is why human empathy and ethical design thinking must be present at the very first step of the process and can always guide the process.

6. HUMAN DESIGNERS IN THE AGE OF AI: A COLLABORATIVE FUTURE

UX design is taking a different turn in terms of changing away with the appropriate issue of whether a human or an AI, and switching over to more pertinent and product-profitable question; that of a human and an AI. Artificial intelligence is not perceived anymore as a threat to human creativity, but a collaborative partner, one that enhances and complements the cleverness of designers, not a replacement of this ability. In this partnership strategy, AI plays the role of a catalyst of design work whose distinctive competence will be routine, analytical, data-intense, and all those functions leave open the domain of the human mind in terms of creativity, emotional responsiveness, morality, and strategy.

The Division of Labor: Humans and AI as Design Teammates

- **AI's Role in UX Design**

AI has been most appropriate in cases that demand speed, scalability, pattern recognition and optimisation. These include:

- **Information Architecture**: Grouping content on grounds of user flows and traffic patterns.
- **Data Clustering**: User behaviours or preferences clustering to personalise them well.
- **Predictive Analytics**: Predicting the trends on the basis of user interaction data.
- **Pattern Detection**: Possibility to detect usability problems with a clickstream or heatmap analysis.
- **Task Automation**: Auto-generation of templates, wireframes or A/B test variants.

The tasks enable designers to save time and mental burden as they have an option of letting the AI do the mechanical and computational parts of the job.

- **The Human Designer's Unique Contribution**

There is something that human beings add that cannot be substituted and what are these attributes are emotional intelligence, contextual awareness, ethical reasoning and creativity:

- **Design Strategy**: To align the design choices with user needs, brand vision as well as business outcomes.
- **Brand Identity**: Design of graphical language and tone representative of values and personality of a product or organisation.
- **Emotional Storytelling**: Planning the interface that would appeal to users on their experiences, aspirations or problems.
- **Ethical Evaluation**: Addressing privacy, well-being and inclusivity in design decisions.
- **Complex User Testing**: Arranging actual dialogues with customers and revealing non-obvious information that AI will not see.

These components are inherently human and cannot be substituted with algorithms, no matter how sophisticated they get.

AI as an Augmenting Tool, Not a Replacement

Instead of serving as a substitute to human designers, AI enhances their performance. As an illustration, the ideation stage could suggest that an AI tool can generate ten layout options immediately using the information on user behaviour and interface patterns. These choices, as comprehended and analyzed by a human designer would be what follows, with an understanding of cultural sensitivity, emotional tone and ethical consideration, consequent to which the most viable design to a given constituency would be chosen. The process of creativity is still a human one, and with the help of AI, the implementation and magnification are faster than before.

The synergy increases efficiency in a way that does not affect the human-centered integrity of the design. It allows organisations to experiment on more ideas within a shorter duration of time, improve the course of action based on evidence within a shorter time, and flexibly change designs on the basis of the need that arises as they do. Nevertheless, the human being is the ultimate decider, as the insights are being interpreted in a larger scope of empathy, context, and imagination.

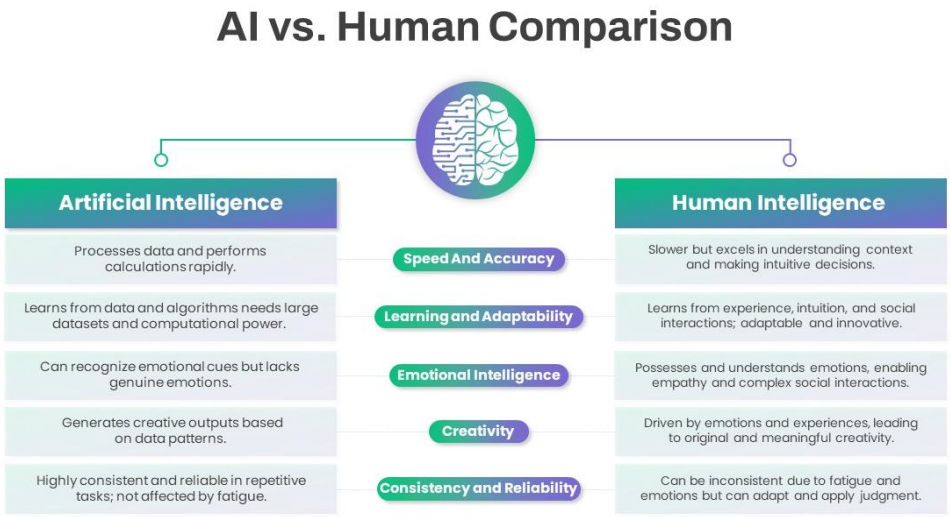

Figure 4: Collaboration Between Human and AI

Source: (https://slidebazaar.com/items/ai-vs-human-comparison-powerpoint-template/)

The Venn diagram is an effective way to show how the joint efforts of humans and AI in UX design can be more than the sum of each of them because of the strengths that each contributes to design. AI has specialised in the fields of speed, consistency, as well as data manipulation and processes technical, repetitive assignments effectively. Instead, human beings add that which is empathetic, creative, and based on moral thinking through emotional intelligence and experience. The shared are also marked by a united space of collaboration, in which both human expertise and AI work are united in such activities as ideation, user testing, and prototyping. It is important to note that this visual takes a cue that the future of UX should not be a race between machines and humans but a collaboration in which both refines what others have to offer to ensure better and more profound impacts in the design process.

7. LIMITATIONS OF AI IN UX

Despite the development of artificial intelligence technologies has become so dazzling in the field of design, yet AI has serious limitations when it is used in case of UX. The said weaknesses are acutely experienced in spheres where emotions, moral thinking, and novelty is crucial. Even when it creates an effective assistant in automating tasks and analysis of large data files, the presence of AI still demonstrates the need to have humans in the UX process.

1. **No Genuine Empathy:** AI is not a replica of a sympathetic person, who is able to interpret emotional undertones, the elements that trigger emotions, and subtle human psychology leading to a certain behaviour. Whereas AI can be used to simulate a response based on any information on behaviours or the use of sentiment analysis, it is unable to capture the whole essence of such data. To take an example, AI may experience a high rate of drop-offs, but it lacks the emotional connection to the

frustration and does not understand any urgency associated with it. This can be approached with empathy, use of the human designer to tune the tone, to assure and to re-arrange layouts without apparent emotions, which AI does not have.

2. **Bias in Training Data:** Historical user data influences AI, which may be biased either on societal or cultural grounds. This may cause AI system to gain knowledge and recreate such biases, which is dangerous to UX design. Bias AI models can develop interfaces that do not take into account the needs of specific demographics, which makes products less available or offensive. As an example, facial recognition software that is trained on light-skinned faces historically did not perform well on darker-skinned faces, thus an unbiased training data is needed.

3. **Limited Originality:** Pattern recognition is a limited capacity of AI to come up with innovative solutions. UX design usually entails novel interaction paradigms, projecting unseen scenarios and even breaking conventions. The productions of AI are subject to the past works, and it cannot suggest any disruptive or radically innovative solutions. Comparatively, a human designer is able to integrate various disciplines and user emotions to give specific solutions that suit those customers.

4. **Ethical Blindness:** An ethical blindness of AI is an essential problem since it is not able to foresee how its designs can affect the dignity, autonomy, or mental health of users. In one of such examples, recommendation engines powered by AI can be used to introduce new material to increase engagement which can lead to anxiety or reinforce bad habits. Although cross-functional and gender-neutral forms can be designed in UX, AI has left an important ethical consideration, often forgetting about non-binary users, a dangerous judgment that would not happen in a human.

Example: Let us discuss an AI-based form generator. Without express learning on the principles of inclusive design, the system can provide two distinct gender options only, namely: men and women, leaving out all non-binary and gender-fluid users. This indicates an absence of inclusiveness in awareness and sensitivity, which a human designer with awareness of the diversity of identities would inherently provide through having the options of selecting choices such as a checkbox containing the word other, or the choice of prefer not to say, or the deployment of free-text boxes. These design shortcomings may damage user confidence and cause a product to lose its major user groups, which AI by itself is incapable of mitigating.

8. CONCLUSION

While artificial intelligence keeps on transforming the UX design industry by providing tools to speed up the prototyping process, give data-driven intelligence, and automate rote functions, it is inherently

constrained in the ability to replicate what actually makes great user experience a reality: emotional touch, moral cognition and mission of human sensitivity. The human qualities of empathy, cultural awareness and ethical judgment of human designers cannot be adequately simulated by AI which works exclusively with automatised patterns, probabilities and past data. The study shows that UX design no longer holds the one-dimensional approach to create something that will be efficient and/or look good but it should be designed around people, react to their emos, and better yet should be inclusive, purposeful, and morally upright. Instead of presenting AI as a substitute to human creativity, it will do much better to think of AI as collaborative means, i.e., something that contributes to human-decision-making but does not dominate over it. This is the synergy that defines the future of UX: human understanding and AI intelligence meet and cooperate to produce designed user experiences that are both highly meaningful, at the emotional level and technologically productive.

REFERENCES

1. Abedin, B., Meske, C., Junglas, I., Rabhi, F., & Motahari-Nezhad, H. R. (2022). Designing and managing human-AI interactions. *Information Systems Frontiers*, *24*(3), 691-697.

2. Chromik, M., & Butz, A. (2021). Human-XAI interaction: a review and design principles for explanation user interfaces. In *Human-Computer Interaction–INTERACT 2021: 18th IFIP TC 13 International Conference, Bari, Italy, August 30–September 3, 2021, Proceedings, Part II 18* (pp. 619-640). Springer International Publishing.

3. Fronemann, N., Pollmann, K., & Loh, W. (2022). Should my robot know what's best for me? Human–robot interaction between user experience and ethical design. *AI & SOCIETY*, *37*(2), 517-533.

4. Hartikainen, M., Väänänen, K., Lehtiö, A., Ala-Luopa, S., & Olsson, T. (2022, October). Human-centered AI design in reality: a study of developer companies' practices: a study of developer companies' practices. In *Nordic human-computer interaction conference* (pp. 1-11).

5. Jin, X., Evans, M., Dong, H., & Yao, A. (2021, May). Design heuristics for artificial intelligence: inspirational design stimuli for supporting UX designers in generating AI-powered ideas. In *Extended abstracts of the 2021 CHI conference on human factors in computing systems* (pp. 1-8).

6. Liao, Q. V., & Varshney, K. R. (2021). Human-centered explainable ai (xai): From algorithms to user experiences. *arXiv preprint arXiv:2110.10790*.

7. Liao, Q. V., Subramonyam, H., Wang, J., & Wortman Vaughan, J. (2023, April). Designerly understanding: Information needs for model transparency to support design ideation for AI-powered user experience. In *Proceedings of the 2023 CHI conference on human factors in computing systems* (pp. 1-21).

8. Lu, Y., Zhang, C., Zhang, I., & Li, T. J. J. (2022, April). Bridging the Gap between UX Practitioners' work practices and AI-enabled design support tools. In *CHI Conference on Human Factors in Computing Systems Extended Abstracts* (pp. 1-7).

9. Margetis, G., Ntoa, S., Antona, M., & Stephanidis, C. (2021). Human-centered design of artificial intelligence. *Handbook of human factors and ergonomics*, 1085-1106.

10. Prati, E., Peruzzini, M., Pellicciari, M., & Raffaeli, R. (2021). How to include User eXperience in the design of Human-Robot Interaction. *Robotics and Computer-Integrated Manufacturing*, *68*, 102072.

11. Rong, Y., Leemann, T., Nguyen, T. T., Fiedler, L., Qian, P., Unhelkar, V., ... & Kasneci, E. (2023). Towards human-centered explainable ai: A survey of user studies for model explanations. *IEEE transactions on pattern analysis and machine intelligence*, *46*(4), 2104-2122.

12. Stige, Å., Zamani, E. D., Mikalef, P., & Zhu, Y. (2024). Artificial intelligence (AI) for user experience (UX) design: a systematic literature review and future research agenda. *Information Technology & People*, *37*(6), 2324-2352.

13. Wang, Q., Madaio, M., Kane, S., Kapania, S., Terry, M., & Wilcox, L. (2023, April). Designing responsible ai: Adaptations of ux practice to meet responsible ai challenges. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems* (pp. 1-16).

14. Wiberg, M., & Stolterman Bergqvist, E. (2023). Automation of interaction—interaction design at the crossroads of user experience (UX) and artificial intelligence (AI). *Personal and Ubiquitous Computing*, *27*(6), 2281-2290.

15. Bingley, W. J., Curtis, C., Lockey, S., Bialkowski, A., Gillespie, N., Haslam, S. A., ... & Worthy, P. (2023). Where is the human in human-centered AI? Insights from developer priorities and user experiences. *Computers in Human Behavior*, *141*, 107617.

16. Bodker, S. (2021). *Through the interface: A human activity approach to user interface design*. CRC Press.

17. Fan, M., Yang, X., Yu, T., Liao, Q. V., & Zhao, J. (2022). Human-ai collaboration for UX evaluation: effects of explanation and synchronization. *Proceedings of the ACM on human-computer interaction*, *6*(CSCW1), 1-32.

18. Joseph, A. W., & Murugesh, R. (2020). Potential eye tracking metrics and indicators to measure cognitive load in human-computer interaction research. J. Sci. Res, 64(1), 168-175.

19. Li, J., Cao, H., Lin, L., Hou, Y., Zhu, R., & El Ali, A. (2024, May). User experience design professionals' perceptions of generative artificial intelligence. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems* (pp. 1-18).

20. Lu, Y., Yang, Y., Zhao, Q., Zhang, C., & Li, T. J. J. (2024). AI assistance for UX: A literature review through human-centered AI. *arXiv preprint arXiv:2402.06089*.

******