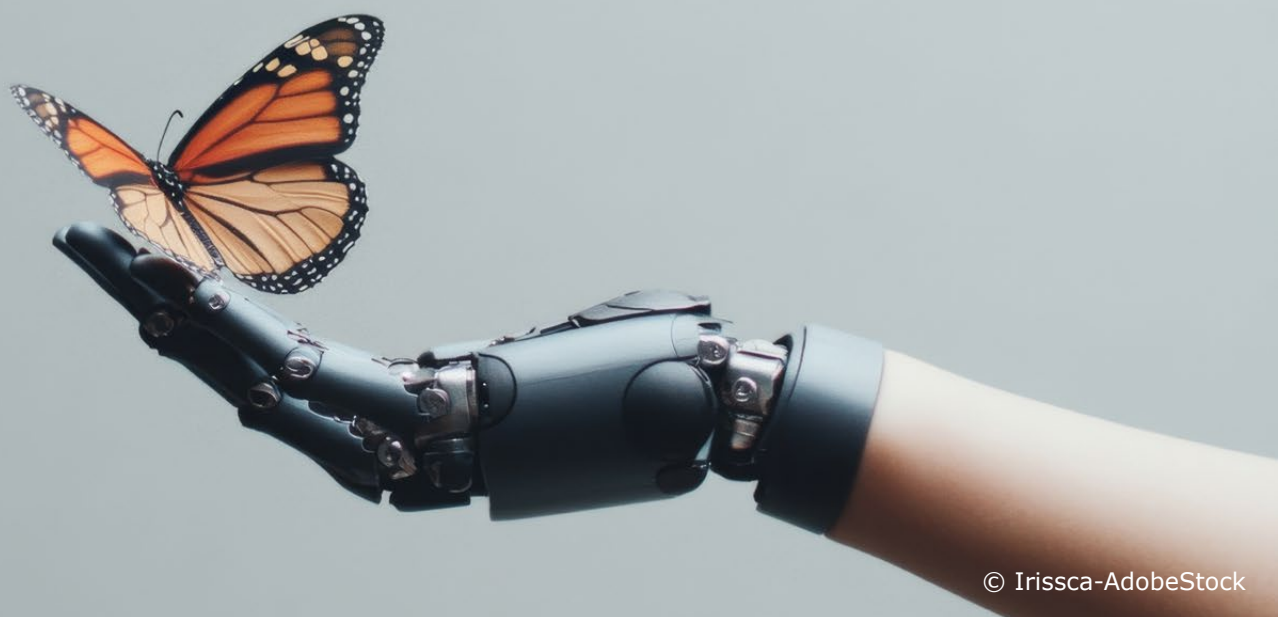




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LIGHTS - Human/Well being

Design Thinking and Human-Centered AI: a step towards a framework for ethical and creative AI integration in business

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[Design Thinking and Human-Centered AI: a step towards a framework for ethical and creative AI integration in business

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Abstract

This paper explores how Human-Centered Artificial Intelligence (HCAI) as a research stream and Design Thinking (DT) as a methodology can jointly address the challenges and opportunities presented by the rapid diffusion of artificial intelligence (AI) across industries. Drawing from a structured framework developed in recent interdisciplinary research, we analyze how DT can help align AI solutions with human needs, ethical norms, and organizational objectives. We argue that integrating DT into the AI lifecycle supports responsible innovation by embedding fairness, transparency, and accountability into intelligent systems. Through a synthesis of theoretical foundations and case study evidence, the paper demonstrates how HCAI promotes inclusive management, creativity, and trustworthy AI adoption. We conclude with implications for policy, practice, and business education, aligning our findings with ESCP's LIGHTS framework and offering actionable insights for leaders navigating the AI-driven future.

Keywords: Human-Centered AI, Design Thinking, responsible innovation, ethical AI, AI adoption

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Introduction

Human-Centered AI is a transformative force reshaping economies, industries, and social structures. Its capacity to optimize decision-making, automate complex tasks, and generate predictive insights offers unprecedented opportunities for business innovation and societal benefit (Bahn & Strobel, 2023). Yet, these gains are not without risks: issues of algorithmic bias, transparency, explainability, and ethical governance remain unresolved in many AI applications. Addressing these tensions requires a human-centered approach that aligns technological capabilities with societal values and business objectives.

Human-Centered AI, as defined by Xu et al. (2022), integrates three key dimensions—**Technology, Human Factors, and Ethics**—to ensure AI systems are not only technically robust but also socially aligned and ethically governed. Design Thinking, by contrast, originates from the creative industries (e.g., IDEO) and provides a **practical, iterative methodology** grounded in empathy and co-creation to develop user-centered innovations (Brown, 2009; Liedtka, 2018). While distinct in origin and emphasis, combining HCAI and DT offers a powerful, complementary framework: HCAI provides the **strategic guardrails** for responsible AI, while DT delivers the **process tools** to uncover needs, generate solutions, and validate them with users. Together, they enhance AI adoption, trust, inclusivity, and long-term sustainability.

This paper contributes to the 6th edition of the ESCP Impact Papers on “Artificial Intelligence for Impact,” addressing the intersection of ethics, creativity, and strategic transformation. We synthesize findings from the upcoming Handbook of Human-Centered AI’s chapter on Design Thinking and AI: Enabling HCAI Solutions and outline how the integration of HCAI and DT can support inclusive and responsible AI development across sectors.

Theoretical foundations

Design Thinking is an iterative, human-centered methodology aimed at solving complex problems through creative exploration, prototyping, and testing (Brown, 2009; Dunne & Martin, 2006). Originating in product design, it has since been adapted for use in organizational strategy, social innovation, and digital transformation (Verganti, 2020).

Human-Centered AI builds on these principles by embedding fairness, transparency, and accountability into AI systems (Shneiderman, 2020). While traditional AI approaches prioritize technical performance, HCAI expands the focus to include user trust, social values, and regulatory compliance.

A synthesis of these two perspectives reveals a compelling synergy: DT provides the tools to uncover user needs and validate solutions iteratively, while HCAI ensures that these solutions remain ethically aligned and socially robust. This interaction aligns closely with the HCAI framework proposed by Xu et al. (2022), emphasizing the interplay between technology, human factors, and ethics in designing responsible AI systems. The combination of DT and HCAI offers a structured pathway to balance technical feasibility with ethical integrity and human-centered design. Together, they form an integrative model of

intelligence design that serves business, society, and individual users by embedding ethical foresight, usability, and systemic accountability into AI innovation (Figure 1).

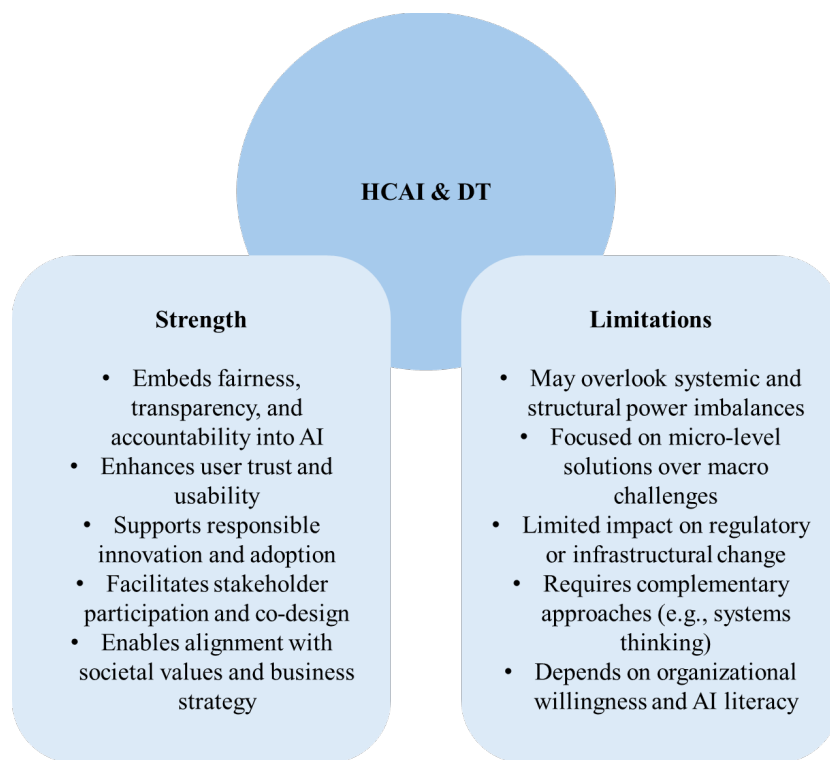


Figure 1: Strength and Limitations HCAI & DT

Integrating Design Thinking into the AI lifecycle

The AI lifecycle is often guided by technical frameworks such as CRISP-ML, which emphasize data-centric stages like data collection, model development, deployment, and monitoring. While effective for structuring the technical workflow, CRISP-ML and similar models often underrepresent human-centered dimensions, such as user trust, ethical reflection, and social impact. This data-dominant focus contributes to a high failure rate in AI initiatives, with estimates suggesting that up to 80% of AI projects do not reach successful deployment or adoption (Innoq, 2025). To address these shortcomings, embedding DT into each phase of the AI lifecycle offers a powerful way to overcome barriers such as low user acceptance, algorithmic bias, and system opacity (Böckle & Kouris, 2023). DT introduces iterative, empathy-driven, and ethically grounded practices that enable more inclusive and sustainable AI development.

Empathize: Empathy is the cornerstone of DT and the starting point for any human-centered design. In the AI context, this involves ethnographic research, stakeholder interviews, and journey mapping to understand how AI might interact with users, automate tasks, or augment human decision-making. Early ethical assessments—such as bias detection and transparency mapping—are critical in this stage.

Define: The define phase translates user insights into clear problem statements and intelligent behavior expectations. In AI projects, this means specifying desired model outputs, data requirements, and ethical boundaries. Tools like the AI Canvas and Data Landscape Canvas help ensure that the project is both technically and ethically scoped.

Ideate: This phase generates creative solutions and identifies potential AI use cases. Techniques such as the Desirability-Viability-Feasibility (DVF) framework and the Delta

Model help teams assess which AI features offer the most strategic value. Ethical considerations, such as fairness and explainability, are integrated into solution evaluation.

Prototype: Rapid prototyping and testing of AI models allow teams to validate assumptions and refine outputs based on user feedback. Technologies like SHAP and LIME are used to enhance model explainability, while iterative cycles ensure continuous alignment with user expectations and business goals, which is especially crucial when designing the user experience.

Test and Monitor: Testing involves evaluating the AI solution against technical KPIs and human-centric indicators such as usability, fairness, and trustworthiness. Post-deployment monitoring helps detect performance drifts, update models with new data, and maintain compliance with evolving regulations.

Case evidence: from concept to practice

The applicability and impact of integrating Human-Centered AI and Design Thinking can be most vividly illustrated through real-world case studies. These examples demonstrate how the combined framework translates into tangible benefits across diverse sectors, from public health to education and startup innovation.

Public health communication

In a time of widespread uncertainty and vaccine hesitancy, Novak et al. (2022) developed a user-centered framework to improve the public understanding of COVID-19 vaccine development. They applied techniques from explainable AI (XAI) and Design Thinking—such as contrastive reasoning, interactive storytelling, and empathetic framing—to translate complex medical data into accessible and emotionally resonant narratives. Their prototype featured conversational interfaces, visual metaphors, and user control options, enabling users to explore vaccine information at their own pace. Evaluation studies showed increased trust and comprehension, particularly among skeptical audiences. This case exemplifies how HCAI can bridge the gap between expert knowledge and public concerns through human-centered communication.

Interactive machine learning in startups

Aveni, a speech analytics startup, faced adoption challenges with their Interactive Machine Learning (IML) features. In response, the design team implemented a structured Design Sprint to better align IML functionality with the needs of quality assurance professionals (Poulter et al., 2022). By observing workflows, conducting interviews, and mapping user pain points, they designed prototypes that integrated seamlessly into existing tasks. They focused on low-friction feedback mechanisms and staged implementation to build familiarity and trust. The result was not only improved usability and engagement but also a cultural shift within the organization toward iterative, user-informed development. This case highlights the power of co-design in de-risking AI deployment and accelerating acceptance (Figure 2).

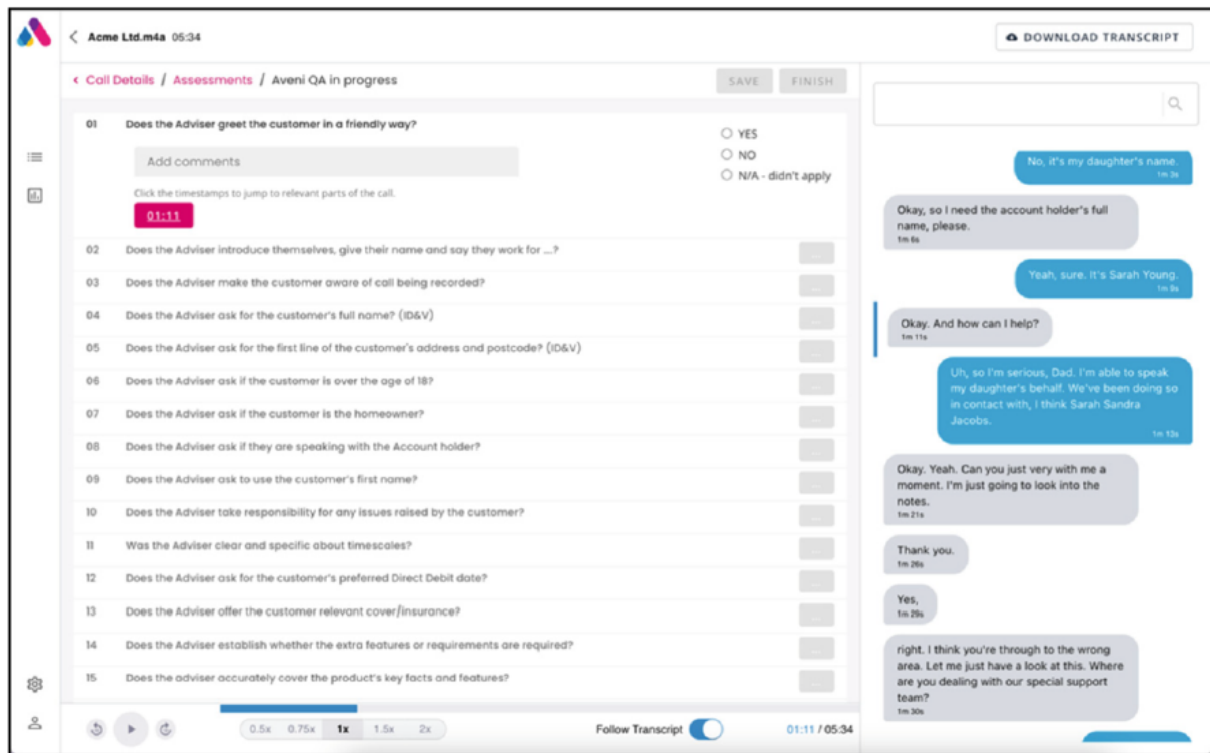


Figure 2: High Fidelity Prototype

Higher education chatbots

At ESCP, a university chatbot was developed using DT and HCAI principles to assist bachelor students with thesis-related queries. The design process followed key DT phases, beginning with *Empathize*—conducting in-depth consultations with faculty and gathering student feedback to identify recurring challenges such as formatting confusion, resource discovery, and academic anxieties. In the Define stage, these insights were translated into clear objectives: to deliver accurate, accessible, and timely support while reducing faculty workload.

During Ideation and Prototyping, core features like an open FAQ and a structured resource hub were developed and tested using scenario-based simulations to ensure the chatbot delivered relevant and supportive outputs. The solution was iteratively refined through the Test phase, incorporating user feedback to improve response clarity and system usability. The final chatbot employed a dual-model AI architecture (ChatGPT-4 and ChatGPT Mini) to provide scalable yet context-aware interactions. Usability tests confirmed high student satisfaction and a noticeable reduction in routine administrative inquiries.

Beyond automation, this case illustrates how applying Design Thinking holistically across the AI lifecycle—grounded in empathy, iteration, and ethical reflection—can empower self-directed learning and promote educational equity through trustworthy AI tools (Figure 3).



Figure 3: Chat interface and logic

Together, these case studies demonstrate the adaptability and value of the integrated DT-HCAI approach. Whether improving public trust, supporting startup innovation, or enhancing academic services, the framework facilitates ethical, inclusive, and strategic AI solutions grounded in real-world needs.

Implications for business strategy and leadership

The integration of HCAI and DT carries significant implications for the evolution of business strategy, leadership models, and innovation management. As organizations adapt to increasingly AI-driven environments, the fusion of these approaches offers a pathway to align technological advancement with core human values, ensuring long-term impact and resilience.

First, inclusive management becomes a strategic imperative. Empathy-driven design methodologies, central to DT, prioritize the experiences and needs of diverse user groups. When applied to AI development, this ensures that intelligent systems are designed to be equitable, accessible, and responsive to the realities of all stakeholders. By embedding inclusivity at the design phase, businesses can foster environments that support diversity, promote equity, and enhance overall well-being. This approach does not only mitigate exclusionary risks but also drives innovation by drawing on a broader spectrum of user insights and experiences.

Second, creative intelligence emerges as a critical capability in contemporary business strategy. The combination of human ingenuity and machine intelligence opens new possibilities for solving complex challenges. Design Thinking provides the tools for ideation and iterative experimentation, while AI contributes predictive and generative capabilities. Together, they enable the development of solutions that are both technologically feasible and humanly desirable. This synergy supports business model innovation, rapid prototyping, and the creation of differentiated value propositions in competitive markets.

Third, responsible innovation is reinforced through the intentional application of ethical principles from the outset of AI development. Organizations that incorporate transparency, accountability, and fairness into their AI strategies not only comply with emerging regulatory standards but also build trust among users, clients, and society at large. Design Thinking plays a key role here by facilitating participatory design processes and iterative feedback loops, which help uncover and address ethical blind spots early in the innovation lifecycle.

Finally, the convergence of HCAI and DT necessitates leadership transformation. Navigating the complexity of AI integration requires leaders who are not only technologically literate but also capable of fostering cross-functional collaboration. Their input is especially valuable at key stages of the AI and DT lifecycle. During the *Empathize* and *Define* phases, leaders help align user needs with strategic business processes and ensure that ethical priorities are reflected in problem framing. In the *Ideation* phase, leadership facilitates the selection and validation of AI use cases by balancing feasibility with organizational goals. Later, in the *Test and Monitor* stages, leaders play a crucial role in ensuring transparent evaluation, compliance with ethical standards, and continuous improvement through feedback loops.

Collectively, these implications resonate strongly with the ESCP LIGHTS framework, particularly in advancing leadership, human well-being, sustainability, and technological stewardship. By embracing the combined potential of HCAI and Design Thinking, organizations position themselves to lead responsibly in the face of AI-driven transformation.

Future Directions and Limitations for Research and Practice

As the integration of Human-Centered AI and Design Thinking continues to evolve, several promising avenues for future research and practical application emerge. These directions are vital not only to address current gaps but also to ensure the responsible and impactful development of AI systems across diverse contexts.

From a research perspective, there is an urgent need to develop normative frameworks that embed ethical principles throughout all stages of AI development. Such frameworks would guide the translation of abstract ethical values, such as fairness, autonomy, and justice, into concrete design decisions, helping developers and organizations operationalize responsible AI in practice. These frameworks should be interdisciplinary in nature, incorporating insights from philosophy, social sciences, and engineering.

Moreover, longitudinal studies are essential to understand the evolving dynamics of AI trust, usability, and organizational impact. Current assessments of AI performance often rely on static metrics or short-term evaluations, which fail to capture how user trust, system effectiveness, and organizational alignment develop over time. Future research should track these dimensions longitudinally to uncover patterns of adoption, resistance, and transformation.

In addition, policy experiments that blend technical regulation with participatory governance models can provide critical insights into how AI systems can be both effective and democratically accountable. Such experiments may include stakeholder panels, regulatory sandboxes, and co-creation workshops that bring together regulators, developers, and affected communities to shape AI governance structures in real time.

For practitioners, the path forward requires intentional investment in cross-functional training programs that bridge the knowledge domains of data science, user experience (UX) design, and business strategy. This holistic training enables teams to collaborate effectively across disciplinary boundaries and build AI solutions that are technically sound, user-centered, and strategically aligned.

Additionally, practitioners should increasingly leverage Design Thinking toolkits to support AI-related ideation, co-design, and validation activities. These tools provide structured yet flexible methods for engaging stakeholders, mapping user journeys, and iterating on solution concepts, thereby enhancing the human relevance and ethical integrity of AI systems.

Finally, sustained collaboration with external stakeholders—including academic institutions, civil society, policymakers, and users—is essential to ensure that AI development remains transparent, inclusive, and socially responsive. These partnerships help organizations stay attuned to emerging risks and expectations while benefiting from diverse perspectives that enrich the innovation process.

While Design Thinking offers powerful tools for fostering empathy, creativity, and user-centered innovation, it is not a panacea. Its focus on localized problem-solving and iterative prototyping may fall short when confronting deeper structural challenges such as institutional bias, global inequality, or the unintended societal impacts of large-scale AI deployment. Future research should therefore explore how Design Thinking can be complemented by systems thinking and critical theory to address these broader dynamics and ensure that ethical AI integration also contributes to systemic transformation.

Together, these future directions reflect a commitment to advancing AI that is not only powerful but also principled—designed with and for the people it is meant to serve.

Conclusion

Artificial intelligence is no longer confined to the realm of technical optimization—it is a deeply transformative socio-technical force that permeates all aspects of modern life. Yet, organizational challenges in end-to-end AI transformation remain substantial: research and industry reports highlight that the majority of obstacles lie not in algorithms or infrastructure, but in people, processes, and data readiness. In particular, issues such as fragmented data strategies, limited access to high-quality data, and a lack of alignment between technical goals and human needs frequently undermine AI efforts. To harness AI's full potential while mitigating its inherent risks, organizations must adopt a design philosophy that places humans at the center of the innovation process. The integration of DT with HCAI offers a compelling pathway to achieve this goal.

By embedding empathy, creativity, and ethical reflection into every phase of AI development, organizations can align technological innovation with human needs and societal values. Design Thinking provides the methodology to iteratively explore user experiences, co-create solutions, and prototype with purpose, while HCAI ensures that

these innovations help uphold transparency, fairness, and accountability. Together, they foster systems that are not only efficient but also trusted, inclusive, and context-aware.

The implications of this integrated approach are far-reaching. Businesses that adopt it are better positioned to lead responsibly, create meaningful user experiences, and navigate a rapidly changing regulatory and technological landscape. Moreover, such alignment directly supports the ESCP LIGHTS framework by contributing to leadership development, sustainable innovation, and human well-being.

As ESCP Business School and its partners continue to champion interdisciplinary, impact-driven research, the framework outlined in this paper offers both theoretical insight and practical guidance. It serves as a blueprint for building AI systems that respect the complexity of human life, advance ethical standards, and deliver lasting value across industries. The future of AI is not only about what we can build—but also about what we should build, and how. Embracing a human-centered perspective is the first step toward shaping that future responsibly.

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