White Paper

Do AI products need therapy?

Leveraging psychology for
better AI product development

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Introduction

In today's digital product development landscape, a prevailing trend revolves around the ubiquitous integration of artificial intelligence (AI) into various applications. Companies across industries are eager to incorporate AI into their products, often without clearly defining the underlying problem they aim to solve or assessing the necessity of using AI in their solutions. Instead, there is a rush to adopt AI technologies merely for the sake of the "AI-powered" label.

With the global AI market projected to grow at a compound annual growth rate of 36.6% from 2024 to 2030, we can anticipate the continued expansion of AI products across various sectors. While companies are excited to develop and release AI-powered digital products, the question arises: **Does AI actually improve these products or guarantee their success in the market?**

The short answer is no. Across industries, markets are dotted with AI products that have failed. McDonald's AI-assisted drive-thru ordering system is a notable example. Customers grew frustrated as the AI system struggled to understand orders, causing longer waiting times and ultimately driving the company to abandon the initiative. Another example is iTutor, an online education company that used AI-powered recruiting software to help with hiring. After its AI system exhibited age discrimination against older candidates, the company had to pay $365,000 to settle its lawsuit. These and similar examples underscore the necessity for a thorough evaluation of AI systems and their potential impacts, with a strong emphasis on comprehensive research before launching.

The missing piece in AI product development

So, what are companies missing? Prior to the design and development of AI products and solutions, it's crucial to answer the *why*. In other words, what problem is your product looking to solve and is AI necessary to do so? The answer to these questions lies in an obvious place — human behavior research and psychology.

In this paper, we'll explore the causes and effects of uncritical AI use in product design and development and highlight how human behavior researchers, particularly psychologists, can play a crucial role in developing more impactful AI-powered products. Our goal is to help companies properly incorporate AI into their products and create standout solutions in a market overrun with unnecessary AI.
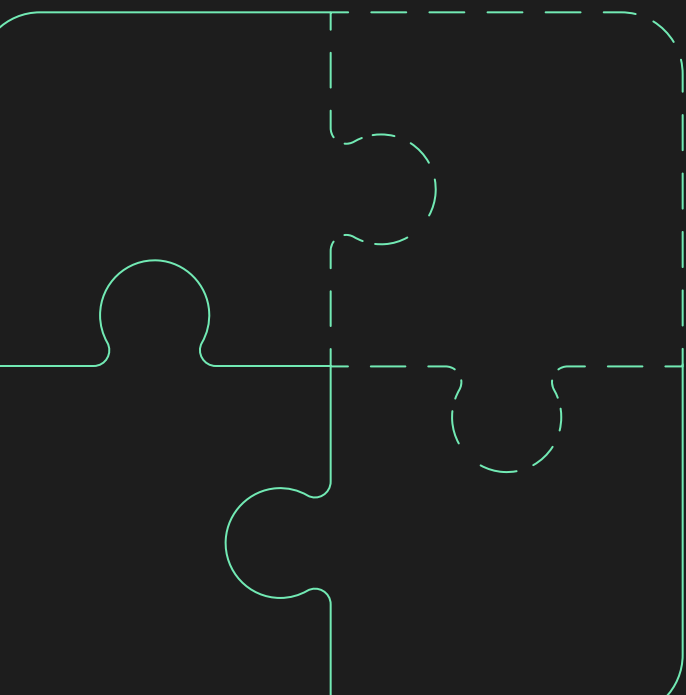
The temptation of instant solutions:

Rushing into AI product development

The appeal of incorporating AI into products is understandable, given the promising statistics highlighting its potential to <u>enhance workers' performance by nearly 40%</u>, streamline operations, and improve user engagement. Additionally, features such as personalized experiences, data-driven insights, and automation of routine tasks suggest that AI products can resonate well in the market.

However, the perceived allure of AI's instant results and ready-made solutions has created a dangerous overconfidence among companies. Many organizations rush to develop AI products without conducting thorough user research to understand their target audience's actual needs. This oversight leads to a disconnect between innovation and practicality, resulting in products that may be technologically advanced but fail to address real market problems.
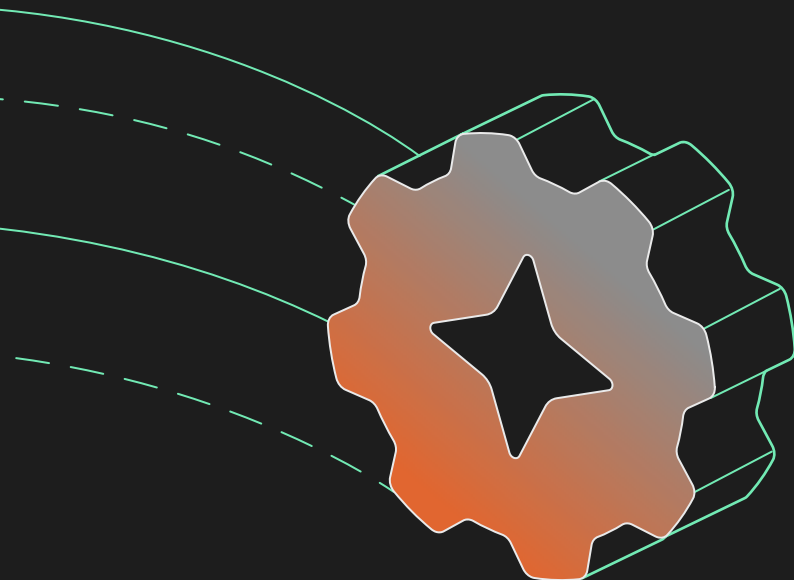
The root cause of unnecessary AI in products:
Building solutions in search of a problem

Failing to understand and address actual user needs while creating a product will likely result in poor product adoption, as product design and development will be driven by assumptions rather than knowledge. In contemporary product discourse, companies that limit their research to surface-level anecdotes risk building a solution in search of a problem. Why? They're often missing crucial psychological/behavioral elements that can positively influence product design.

Surface-level product research doesn't invest the time and money necessary to identify a market pain point and develop a product. In-depth product research requires multiple rounds of testing and research with diverse groups of users. Companies should also conduct thorough interviews and observational studies of users interacting with existing market products. Moreover, deciding where and how to add AI to a product requires an additional level of consideration (i.e., an understanding of how AI will help reduce the probability of user errors and cognitive load).

Sacrificing in-depth research for faster product development and release can lead to poor adoption rates and low user satisfaction. Furthermore, AI product teams often spend more time and resources trying to correct a product after its release. This lack of research shows in market success. By some estimates, <u>more than 80 percent of AI projects fail</u> — twice the failure rate for information technology projects that do not involve AI. The same research also revealed that many AI projects fail due to miscommunication and misalignment between stakeholders about the actual problem to be solved. Overall, there's a tendency to prioritize cutting-edge technology over addressing real user needs and making the mistake of applying AI to problems that are too simple or complex for the technology to handle.
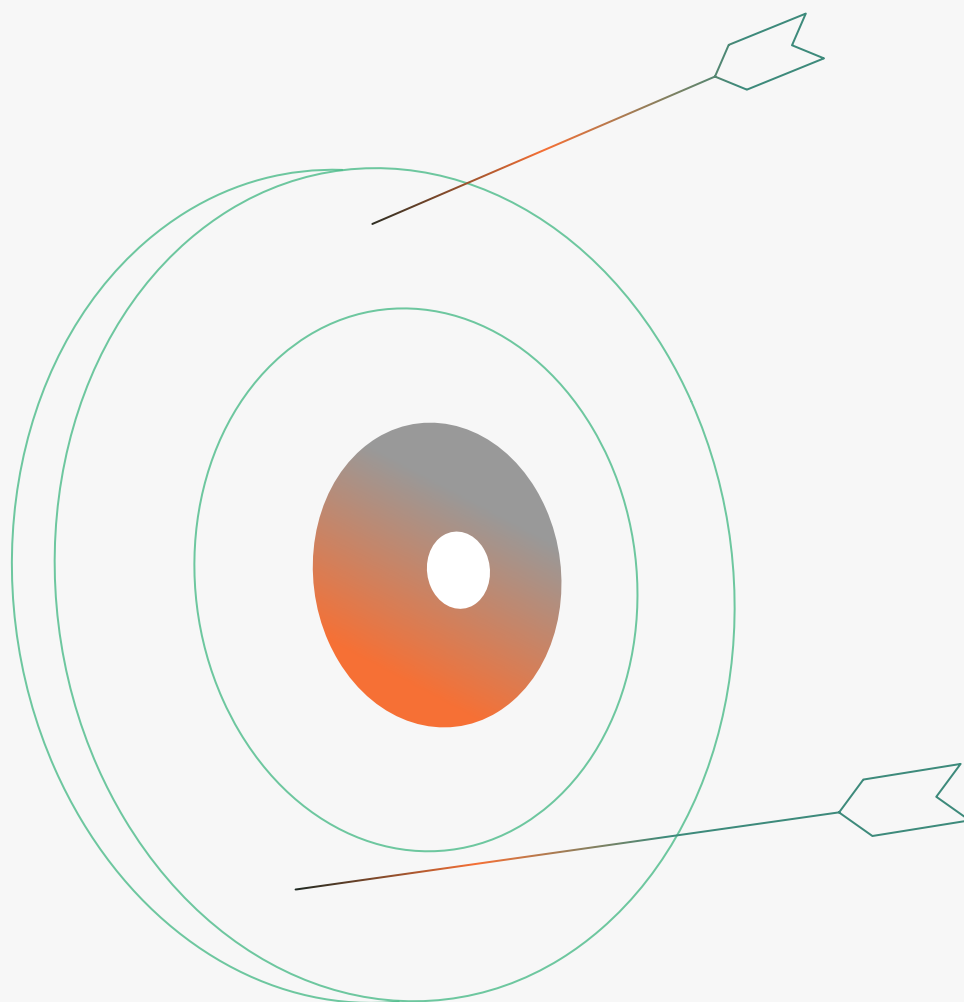
The guessing trap

With the high failure rates of AI products, companies building AI solutions in search of a problem are at risk of falling into a circular "guessing trap." In the guessing trap, companies start by making assumptions about market needs without clearly understanding user pain points or how AI can effectively alleviate their cognitive load. They proceed to design and build the product, only to discover after release that it fails to meet key performance indicators (KPIs) and struggles with adoption. At this point, instead of addressing the root causes, companies often go back to the drawing board and make another round of guesses about what users actually need.

This cycle of trial and error comes at a significant cost — not just in terms of wasted development time and resources but also in the damage it can inflict on a company's reputation. Failed products can erode customer trust, weaken the brand, and ultimately lead to lost revenue, as consumers are less likely to engage with future offerings from a company that hasn't delivered on its promises.
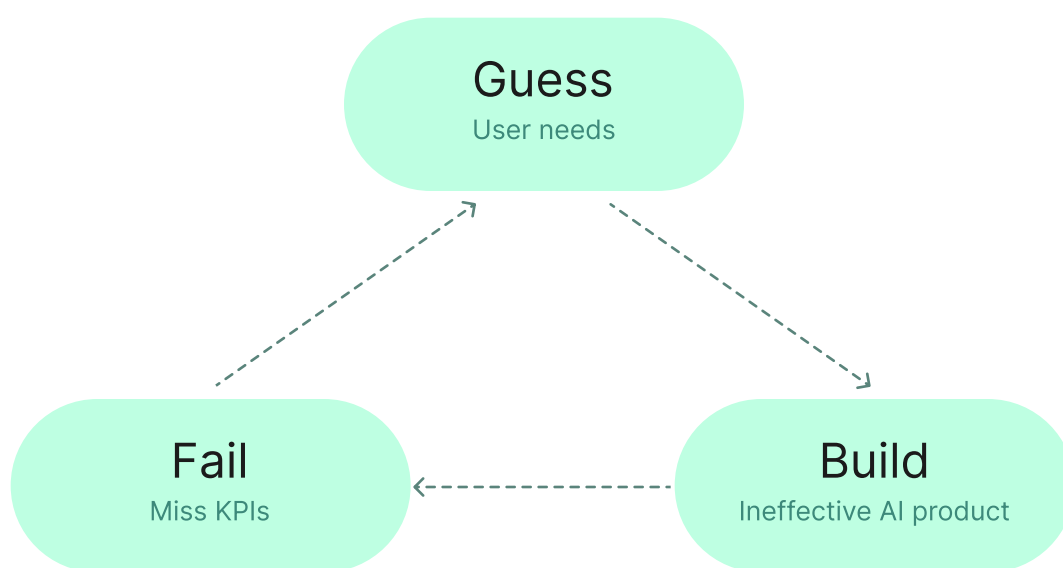
Fig. 1. Illustration of the guessing trap leading to iterative failure in AI product development

Breaking the guessing trap

To avoid falling into the guessing trap, companies must consider where AI is needed and how it can help the most. To begin, it's important to know AI's current and near-future applications as well as its limitations. Such understanding is crucial because it allows companies to identify where AI can genuinely improve efficiency or decision-making while avoiding the trap of applying AI to problems that are too simple, complex, or outside its current capabilities. This is where knowledge gathering, including user and market research, comes into play. While it seems like an extra step or waste of time in the development process, it actually saves you time lost in the guessing trap.
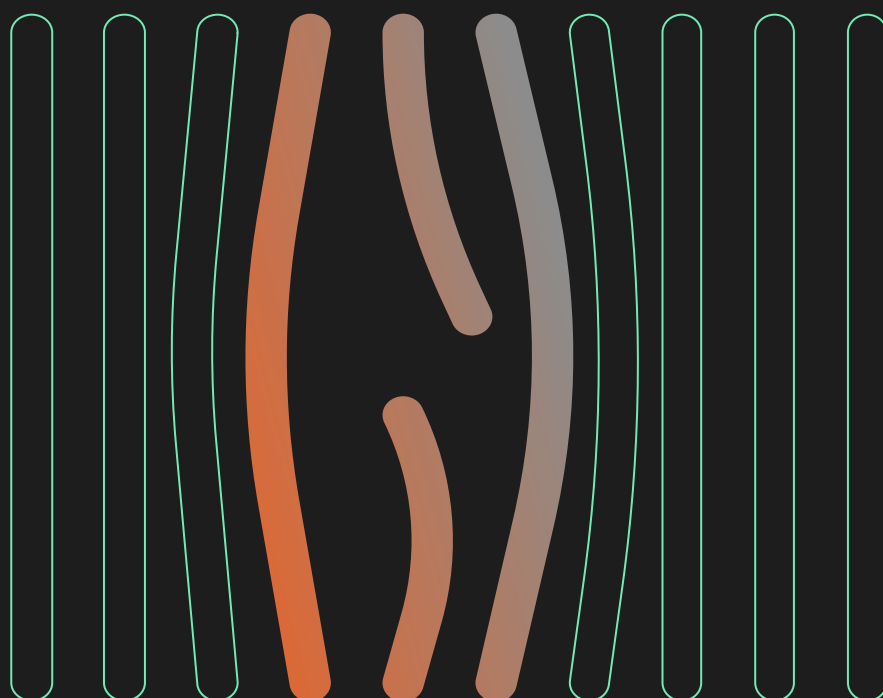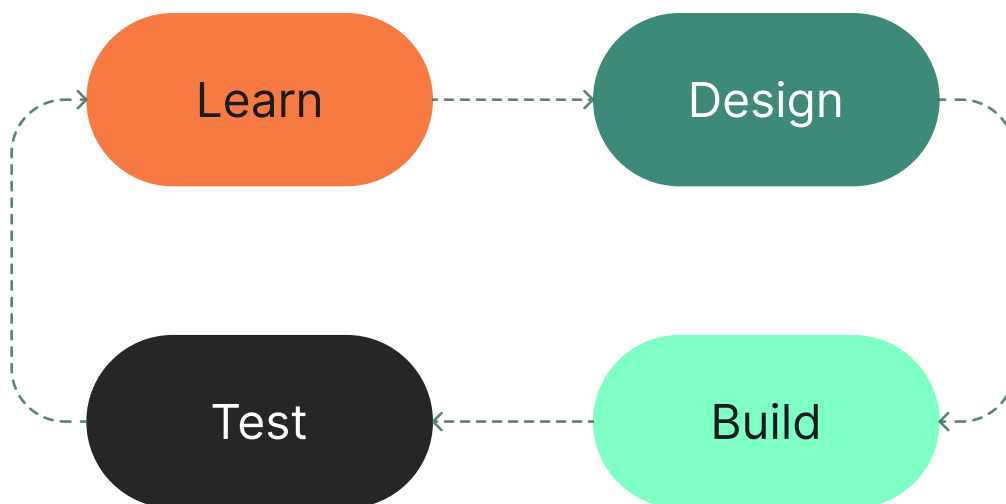
Fig. 2. Illustration of how adding knowledge gathering to the development cycle improves product outcomes

With an understanding of AI's current applications and limitations, companies can focus on the next crucial step — understanding people in their context. This should go beyond surface-level research to dive into the behavioral and psychological drivers that shape users' perceptions of and interactions with technology.

There are two key questions to consider at this point. The first is how can we use data and AI to improve or build new products for our users? The second is how can we incorporate new AI products into existing processes to improve the quality of people's lives or professional performance?

These complex questions call for a multidisciplinary approach, uniting product designers and engineers with an often overlooked but indispensable group — research psychologists.

Taking the guesswork out of AI product development with psychology

To develop products that use AI in an effective and impactful way, companies should spend considerable time in the knowledge-gathering phase. The success of this phase depends on the early involvement of research psychologists and a foundation of psychological and behavior-based principles and research. Here are a few of the key benefits psychologists offer during the knowledge-gathering phase:

Task analysis based on qualitative research

By conducting observational studies, psychologists break down complex tasks into components, highlighting steps users take, the physical and mental demands involved, and places in the process where users encounter difficulties and inefficiencies. Psychologists are trained to study and understand the underlying mechanisms of human thought, learning, and behavior. Consequently, they know how people perceive specific information in given contexts, process tasks, and respond to cognitive load. This insight enables psychologists to assess how users interact with a system and why they behave in a certain way under specific conditions. Task analysis is essential for identifying subtle, often unconscious factors that influence how people use technology, identifying habitual responses, error-prone behaviors, and hidden frustrations.

For example, psychologists can discern when a user's dissatisfaction is due to a mismatch between the system's design and the user's mental model rather than a simple usability flaw. This insight enables them to identify and map the cognitive processes and decision-making pathways users follow, providing a foundation for AI design that aligns closely with human thinking patterns.

Download our ebook, **Understanding the Value of Cognitive Jobs in AI-Augmented Design**, to learn more about how an AI-based "cognitive design" approach can help create hyper-personalized, effective products rooted in how people think and make decisions.
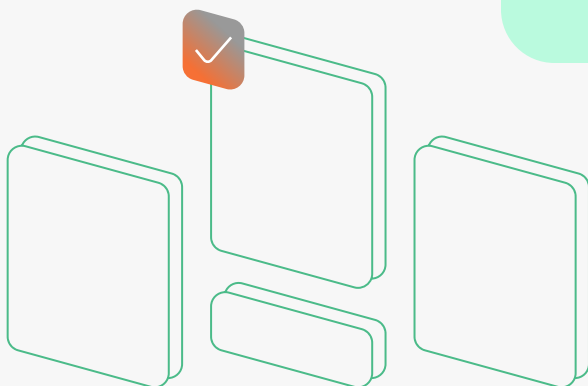
User profiling and segmentation

Psychologists bring a unique and in-depth approach to user profiling and segmentation in AI product development. They focus on understanding users' motivations, needs, problems, mental models, and expectations to build rich, nuanced personas. Unlike approaches that rely solely on surface-level insights, psychologists apply a wide range of qualitative analysis techniques — from phenomenological analysis and grounded theory to discourse and narrative analysis — to delve deeply into users' lived experiences.

These methodologies can help development teams construct detailed profiles that capture why users behave in a certain way and how they think. By uncovering users' mental models and expectations, psychologists create personas that represent the full complexity of the average users' cognitive and emotional landscapes. This level of understanding provides a solid foundation for product development that truly resonates with the intended audience.

Furthermore, psychologists are uniquely qualified to quantify these profiles and segment the market through rigorous sampling science and expertise in psychometrics. They apply psychometrics principles to build valid and reliable surveys that measure what they're intended to — reducing bias and error in data collection. With the survey data, psychologists apply statistical knowledge and quantitative analysis to interpret data rigorously, identify significant and insignificant patterns, and draw actionable conclusions. This level of analysis drives feature development, marketing strategies, and prioritization and can be used to provide data-backed insights to secure funding from investors who value hard numbers over anecdotal evidence.

Measuring the psyche

Psychologists are trained in instrument-based psychological measurement. In AI product development, this skill can be used to objectively assess users' emotional responses, cognitive load, attitudes, and perceptions (visual and non-visual). These objective assessments produce precise and comparable data on how users interact with a product and how they feel about it. For instance, by measuring cognitive load and perception, psychologists can identify interfaces that are unnecessarily taxing for the users. They can also make recommendations on where and how AI can be used to reduce complexity and improve usability.

A great example of a measurement scale often used by psychologists is the NASA Task Load Index (TLX). NASA-TLX is a validated scale that measures cognitive load during interactions with data dashboards. If results show high mental and temporal demand, such as users struggling to interpret data or navigate the dashboard efficiently, then psychologists can interpret the results to help guide redesign efforts.

Psychological instruments are also powerful tools for benchmarking through longitudinal or repeat-measures studies. By employing the same scales across multiple product iterations (or across a set of competing products), psychologists can track changes in user perceptions and experiences over time, providing a clear picture of the product's evolution in users' eyes. Changes can be objectively measured to see how well the new AI feature actually improves usability and reduces cognitive load. For AI products, where user trust and seamless interaction are paramount, longitudinal insights are invaluable in ensuring sustained user satisfaction and alignment with evolving user needs.

Psychologists' ability to design, develop, implement, and interpret these instruments with scientific rigor adapted to fast-paced agile environments makes them essential for creating commercially successful AI products.
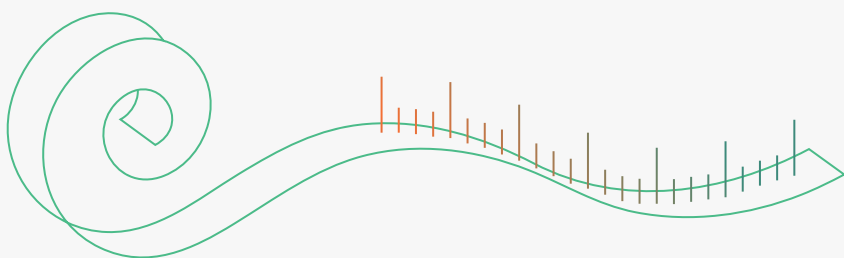
"The ultimate goal of AI personalization and prediction systems is to enhance the user experience. Psychologists collaborate with UX designers and data scientists to create interfaces that are not only technologically advanced but also psychologically intuitive. This involves considerations of cognitive load, emotional responses to recommendations, and the overall flow of user interactions. By incorporating psychological principles into the design process, psychologists contribute to the creation of seamless, user-friendly experiences."

Irena Pavlović, Senior UX/CX Researcher.

Understanding the ethical landscape of AI

The topic of ethics in AI has become increasingly important, with policymakers around the world doubling their efforts to establish robust regulations to address AI's societal impact. Recent studies show that discussions surrounding AI in legislative bodies worldwide have surged, with references in official proceedings rising from 1,247 in 2022 to over 2,100 in 2023. As AI progressively integrates into areas like healthcare, finance, and criminal justice, concerns about bias, privacy, and accountability are driving the need for frameworks that ensure fairness, transparency, and responsible use.

Before designing or integrating AI into a product, it is crucial for companies to consider the ethical implications. AI technologies have the potential to impact users in profound ways, from privacy concerns to issues of fairness and bias. Consider, for instance, how AI diagnostic tools trained on biased data may perpetuate unequal treatment. Namely, a study by the University of Michigan found that Black patients were systematically undertested in emergency departments compared to White patients. This led to AI models being calibrated to predict outcomes more effectively for populations receiving more tests, potentially disadvantaging undertested groups. Ensuring that AI is developed and deployed ethically means taking a proactive approach to identifying potential risks, such as reinforcing stereotypes, exacerbating inequalities, or violating user privacy.

Unfortunately, as the effectiveness of generative language models grows, so do the mentioned risks. A Stanford report found that a 280 billion parameter model developed in 2021 showed a 29% increase in toxic responses when compared to an older 117 million parameter model. It's clear that ethics-related challenges are here to stay — making upfront research and psychology-backed ethical insights increasingly important.
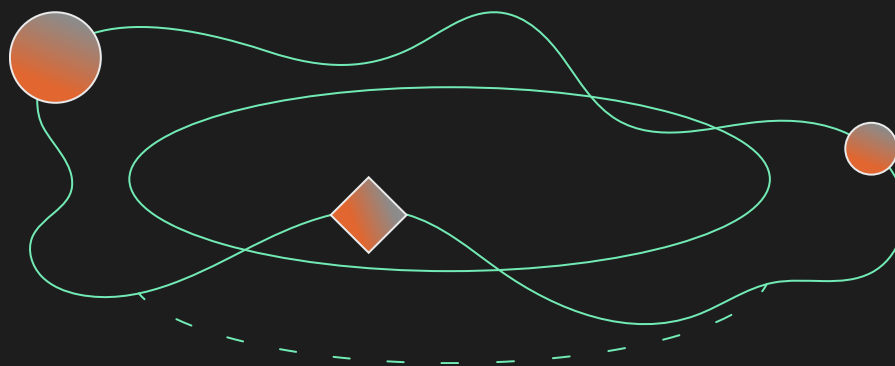
Building ethical AI with psychological research

Psychologists help design studies to reduce common research biases, like confirmation bias (favoring data that supports assumptions) or sampling bias (studying a non-representative user sample). They also help establish ethical guidelines and frameworks for AI product development by applying their expertise in human behavior, cognitive processes, and, most importantly, moral reasoning.

Additionally, when incorporated into AI product development, psychologists offer crucial expertise in conducting ethical and human-centered research. One of the most significant advantages is their deep understanding of ethical frameworks, particularly in relation to sensitive topics that often arise in AI applications. With AI's increasing role in industries such as healthcare, finance, and automation, it is crucial to ensure that research processes protect participants and respect their privacy, emotional well-being, and autonomy. Psychologists are trained to establish clear, transparent, and informed consent processes. This ensures that participants are fully aware of how their data will be used, their right to withdraw consent at any time, and the measures in place to maintain their privacy and security. These practices create a safe environment for participants, fostering trust and encouraging more honest and meaningful feedback during research sessions.
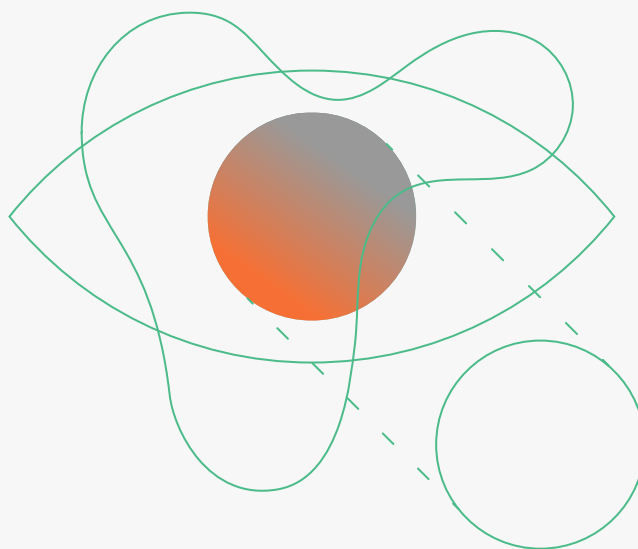
Using psychology for ethical confidentiality

Psychologists are also well-equipped to recognize and mitigate risks, particularly those related to emotional reactions that may arise during research. By identifying nonverbal cues and monitoring participants' comfort levels, psychologists can guide sessions to prevent distress, ensuring that research processes do not negatively impact participants. Their ability to adapt in real time allows them to maintain a supportive environment, which is essential when exploring complex and potentially sensitive topics, such as the implications of AI on job security or financial decision-making. Moreover, psychologists' expertise in confidentiality and data governance ensures that sensitive user information is handled ethically, anonymized properly, and securely stored. This helps companies maintain compliance with privacy regulations and research best practices.

Psychology-backed research to reduce bias

As discussed in the previous section, psychologists can help reduce bias in AI product development by carefully selecting diverse and representative research samples. Their ability to design studies that minimize bias helps ensure that AI systems are more inclusive and fairer, avoiding skewed insights or outcomes that could disproportionately affect (or ignore) certain populations. By applying psychological principles to research design and execution, psychologists help create AI products that are not only effective but also socially responsible, ensuring that these technologies have a positive and equitable impact on people's lives.
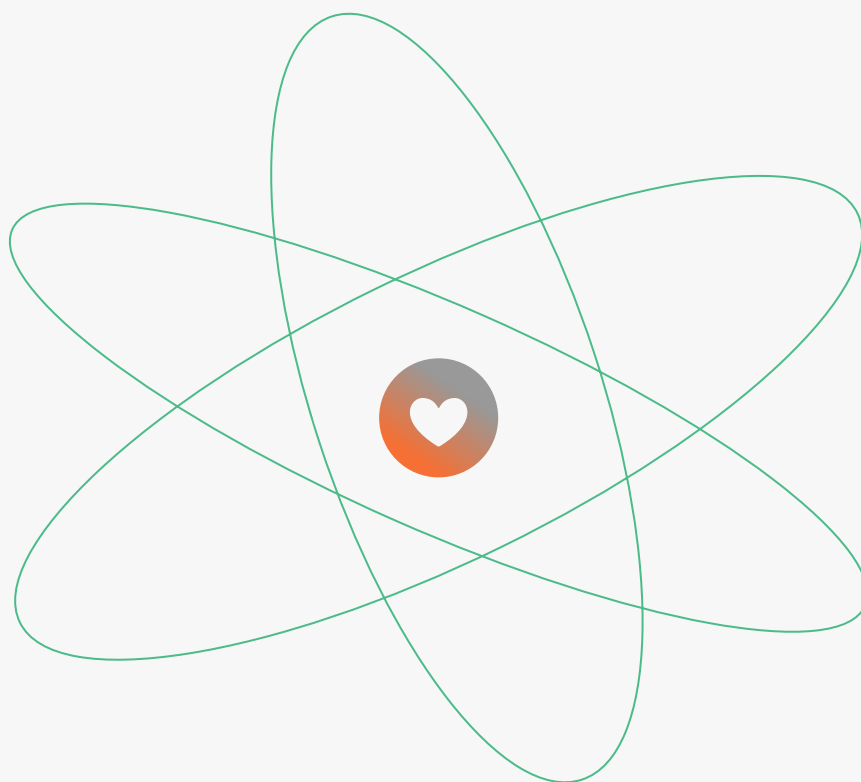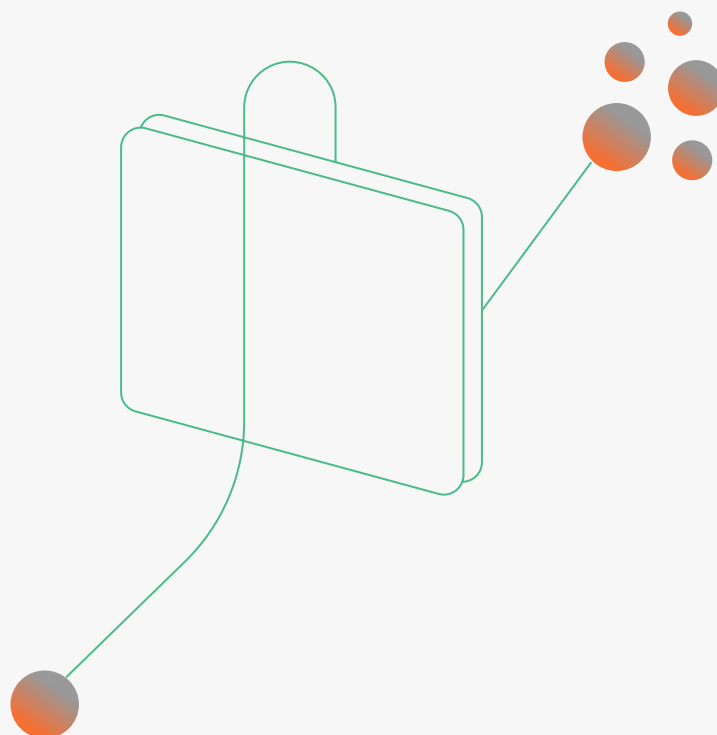
"The question of bias often takes a central place in ethics debates. Human language is deeply ingrained with bias, fallacies, and inconsistencies. Consequently, teams using AI in product development must be aware of the biases stirring their reason and judgment when building a tool that's supposed to be smarter than humans but uses imperfect language created by them."

Irena Pavlović, Senior UX/CX Researcher.

Innovating responsibly with impactful AI

It's clear by now that AI is here to stay – but also that the hype around it has started to settle. It's no longer enough to attach a "powered by AI" label to a product and expect users to be impressed. Today's users demand real value, which means AI solutions must deliver practical benefits without compromising privacy, ethics, or trust. As AI evolves, the focus must shift from flashy claims to meaningful, responsible innovation that truly enhances the user experience.

All of this might sound a bit overwhelming — with so many different research psychology approaches and methodologies to consider, most companies don't know where to start. Additionally, many organizations are worried about the negative impact of extensive research on their project's timeline and budget. It's important to remember that upfront research is an investment in your AI project, one that can help you avoid more costly delays or even complete project failures down the road.
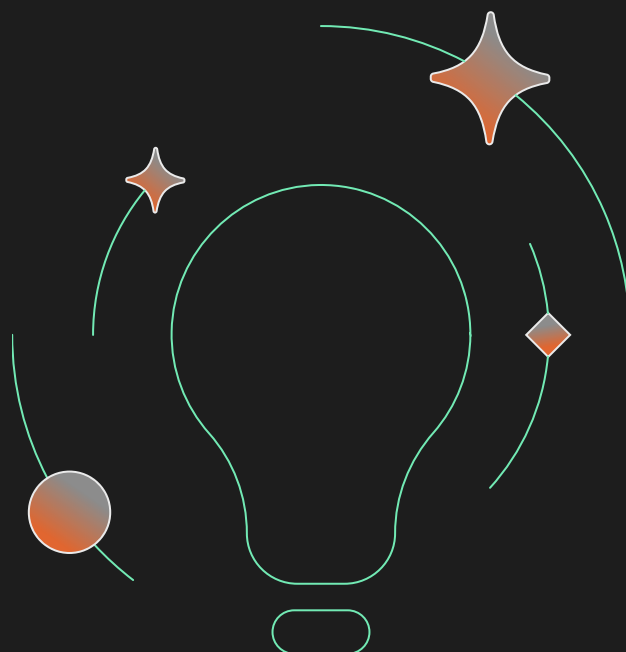
Intentional and ethical
AI product development
with HTEC

HTEC has developed a specialized modular AI solutions framework, StepFrame AI, to help you reach your goals quickly and confidently. This approach includes sophisticated research methods such as cognitive interviews and walkthroughs to gain insight into users' thought processes, decision-making patterns, and challenges, ensuring the final solution aligns precisely with user expectations and your organization's business objectives.

In addition to AI and machine learning experts, HTEC has a team of psychologists working as part of our Product & Design team. These experts meticulously study all aspects of human behavior to help design user-centric solutions while conscientiously operating user data.

Ready to make an impact with comprehensive AI solutions?

→ Connect with an expert to learn more.

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