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# EXPLORING INVESTOR EXPERIENCES WITH AI-DRIVEN TECHNOLOGIES IN THE PAKISTAN STOCK EXCHANGE: A QUALITATIVE NARRATIVE STUDY ON STAKEHOLDERS

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## Abstract

This paper examines the experiences of stakeholders as traders in the Pakistan Stock Exchange (PSX) in the era of artificial intelligence (AI) in stock exchange and investment decisions. Detailed interviews were conducted using a qualitative narrative research design with 18 investors, brokers, and analysts in Karachi and Lahore selected using purposive sampling. The results reveal four prevailing themes: conditional trust in AI, anxiety-driven resistance stemming from displacement, cautious human collaboration with AI, and ethical dilemmas rooted in religious and cultural imperatives. On the one hand, people appreciate AI tools for strengthening technical analysis and increasing trading speed. However, numerous participants have shared concerns about the lack of transparency, control, and consequences that AI tools have on employment and traditional investment approaches. Instead of an investment decision being fully automated, AI in PSX is being utilized to supplement human judgment, which is a key component of their so-called hybrid intelligence systems. This paper contributes to the emerging debate on responsible AI by emphasizing the social, emotional, and cultural aspects of digital change in the context of emerging markets. It also provides useful tips for financial institutions, regulators, and technologists who aim to integrate AI innovation with local investor demands.

**Keywords:** Artificial Intelligence, Pakistan Stock Exchange, Narrative Research, Investor Experience, Human-AI Collaboration.

## Introduction

The financial services industry is undergoing rapid change due to Artificial Intelligence (AI), whether globally or locally. The worldwide market for AI in the financial sector has already exceeded USD 40 billion. It is expected to reach USD 150 billion by 2030, driven by the exponential growth in machine learning, predictive analytics, and natural language processing tools (PwC, 2023; Statista, 2024). In Pakistan, the financial sector has begun to adopt AI in various forms, including algorithmic trading, sentiment analysis hubs, robo-advisor platforms, and fraud prevention systems. The main equity market in the country is located at the Pakistan Stock Exchange (PSX), which has recently experienced a high level of technology-centered activities. According to the Annual Market Review (2023) by PSX, the number of active investor accounts has grown by 37.7 percent year-on-year, with the spread of mobile trading applications, digital Know Your Customer (KYC) and onboarding services, and the advancement of artificial intelligence-powered brokerage

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dashboards topping the causes. More than 300,000 retail investors interacted with the PSX in 2023, and almost all institutional actions were facilitated by AI-driven trade execution (PSX, 2023).

Several Pakistani brokerages, including AKD Securities and Arif Habib Ltd., have launched AI pilot programs. These systems utilize automated technical analysis, producing buy/sell signals through neural networks, and optimize portfolios for potential clients based on past information and risk profiles (AKD Securities, 2024). The Securities and Exchange Commission of Pakistan (SECP) has also acknowledged AI as a boundary regulatory issue and is addressing guidelines of AI transparency, bias regulation, and consumer harmonization (SECP, 2023). Said, however, that these advancements notwithstanding, this area in academic investigation into how investors, in general, and in emerging markets like Pakistan, perceive and react to AI is so far lacking. Although the current literature on the present-day application of AI primarily focuses on technical effectiveness and market efficiency (Li et al., 2022; Shabbir & Anwer, 2021), the emotional, ethical, and identity-related aspects of AI integration are rarely considered.

Even though AI tools are becoming popular in the financial sector of Pakistan, their penetration can be seen through the rise of PSX investors, AI-trade routes, and regulation discourse. The study lacks an understanding of the personal experience and meaning-making process of market actors in these AI tools. The past research, however, discussed technological functionality and macro adoption indicators (Syed et al., 2024; Mumtaz et al., 2025), but does not provide much detail in the accounts of trust, cultural resistance, ethical concern, and identity negotiation that investors and brokers experience when dealing with algorithmic interaction. Under socioculturally complex economic conditions, in which aspects of Islamic morals, communal trading practices, and online literacy influence thoughts on the subject, we need to understand how human agents think and behave emotionally in response to AI. The given research thus attempts to address this empirical and theoretical gap through offering rich, narrative accounts (PSX participants) by providing illuminating insights into how AI is not merely redefining trading strategies, but also self-conception as investors and notion of job identity and ethical boundaries (Rahman, 2020; SECP, 2023; Mumtaz et al., 2025).

## Scope

This study examines the lived experiences of investors, brokers, and institutional actors at the Pakistan Stock Exchange (PSX) in relation to the integration of artificial intelligence (AI) in trading and financial decision-making. It explores the emotional, ethical, and cultural dimensions of AI adoption, moving beyond traditional performance-focused evaluations. The scope is limited to qualitative narrative insights from 18 participants located in Karachi and Lahore who actively engage with AI-based trading tools.

## Rationale

The growing reliance on AI in financial markets, including algorithmic trading, robo-advisors, and predictive analytics, necessitates an understanding of how market actors respond to such technologies in emerging economies. While global

literature emphasizes efficiency, trust, and performance, there is a lack of knowledge about how cultural and ethical considerations influence AI acceptance in contexts such as Pakistan. This research addresses that gap by investigating how AI impacts identity, trust, and moral reasoning among PSX stakeholders (Mumtaz et al., 2025; Khan et al., 2022).

## Problem Statement

Despite the rapid integration of AI in financial sectors globally and in Pakistan, limited research exists on the human-centric experiences of investors and traders. Most studies focus on technical performance and efficiency, overlooking how AI affects personal judgment, ethical concerns, and cultural compatibility. The lack of empirical studies addressing these non-technical dimensions—especially within an Islamic finance framework—limits the ability of developers and regulators to design responsible, culturally coherent AI tools (Ahmed et al., 2024; Rahman, 2020).

## Research Questions

1. How do investors, brokers, and institutional actors at the PSX experience the introduction of AI-driven financial technologies?

2. What kinds of trust, resistance, or adaptation are demonstrated in their narratives?

3. How do socio-cultural and ethical factors shape responses to AI in Pakistan's trading environment?

## Research Objectives

- To explore the emotional, ethical, and experiential dimensions of AI adoption in PSX trading.

- To examine how trust, resistance, and human-AI collaboration manifest among different investor groups.

- To understand how cultural, religious, and institutional values influence the perception of AI technologies in Pakistan's financial context.

## Theoretical Framework

This research is grounded in **social constructivism**, which views knowledge as socially and contextually constructed through human interaction (Clandinin & Connelly, 2000). The study also draws on **Polanyi's (1966) theory of tacit knowledge**, where non-codified, experience-based understanding shapes decision-making. The conceptualization of **human-AI symbiosis** by Jarrahi (2018) further informs the analysis, highlighting the balance between algorithmic predictions and intuitive human judgment. Finally, **explainable AI (XAI)** theory supports the analysis of trust and transparency concerns in algorithmic decision-making (Tjoa & Guan, 2020).

## Significance

The study contributes to the emerging body of research on human-AI interaction in developing markets by highlighting personal, ethical, and cultural dimensions. It is particularly significant in the context of Islamic finance, where regulatory and moral considerations shape investment behaviors. It also provides insights for financial regulators, technologists, and brokerage firms to make AI more ethically resonant and socially accepted in Pakistan (Rahman, 2020; Kapoor & Singh, 2022).

## Literature Review

### Trust in AI Tool

The concept of trust is a major aspect that drives the adoption and acceptance of AI in financial decision-making environments. During the past few years, trust has been demonstrated to have a profound impact on the intention to use an AI system: dimensional trust (in process functionality, including accuracy and consistency, as well as in anthropomorphism attributes) better predicts user adoption than either usability or attitude does (Choung et al., 2022). When used in a financial advisory setting, explainable AI (XAI) can increase trust by reducing perceived risk; users are more likely to follow algorithmic recommendations when they understand why and how the algorithm arrived at a given conclusion (Ben David et al., 2021). In the forthcoming AI ecosystem in Pakistan, familiarity, transparency, and institutional validation are key factors in establishing trust.

In empirical research conducted by Mumtaz et al. (2025), a significant correlation was found between increased user familiarity with AI and increased acceptance and satisfaction among fintech users in Pakistan. Equally, Ahmed et al. (2024) found moderate confidence in AI among Pakistani bank employees; however, they identified lingering issues of job displacement and data transparency, which undermined the systems, making them unpredictable or opaque. Trust is especially crucial in situations involving PSX. As investors, they must trust the signals generated by AI, including buy/sell messages and sentiment codes, without being aware of the underlying decision rationale. Trust will depend not only on the reliability and perceived accuracy of systems, but also on the exposure of algorithm design, audibility, and regulation, all fields in which the SECP and State Bank of Pakistan are increasingly showing an interest (Iqbal, 2025). Thus, the elements of trust encompass both psychological and institutional variables that moderate investor confidence in AI tools on the PSX.

### Human AI Collaboration

The process of human-to-machine collaboration in investment decisions involves interactivity between people and the machine, allowing insights generated by machines to be used in conjunction with human decisions, rather than replacing them. According to Jarrahi (2018), AI systems can supplement professional decision-making with predictions based on data; however, the human component will also be essential when it comes to contextual, ethical, and other intuitive aspects. This synergy in capital markets transforms into portfolio optimization, in-time trade and forecasting analytics.

Nonetheless, when professionals perceive that AI undermines their proficiency, opposition arises (Krafft et al., 2020). Individually, the anecdotal evidence in the PSX trades suggests that some brokers have developed the habit of using AI to support their strategy, rather than letting the system take the lead. This demonstrates an intermediate paradigm of interdependence versus replacement, which is typically driven by the cultural value of human judgment and responsibility in South Asian investment practice (Ahmed et al., 2024).

The reasons that professionals may oppose collaboration include the threat of deskilling, a lack of trust in AI transparency, or a cultural predisposition toward human decision-making.

The study conducted by Bajwa et al. (2023) indicates that in South Asian cultures of investment, collaborative approaches have become more acceptable with the advent of AI tools, which are likely to be adopted as support systems instead of decision-making agents. Likewise, when stating that a good human-AI team necessarily requires continuous learning, adaptability, and role clarification, a study by Kapoor and Singh (2022) demonstrates this using examples from individuals in the human-AI team. Moreover, the level of collaboration relies on the explainability of AI models; the more explainable they are, the clearer it is how any model arrives at its conclusion, and the more investors are willing to cooperate with it (Tjoa & Guan, 2020). In the case of Pakistan, the signs of transition are evident, as indicated by the brokers and the traders. Although robo-advisors and algorithm-based programs are becoming increasingly popular, they are perceived as a complementary innovation rather than a groundbreaking one. The paradigm of human-AI co-operation at hand represents an intermediate, as well as conservative, implementation model based on the overall social and technological setting.

**Ethical and Cultural Concerns**

The perceptions of ethics, such as fairness, transparency, and cultural congruence, can significantly influence users' views on AI in the financial sphere. Ethical concerns arising from algorithmic biases, opaque decisions, and apparent surveillance may emerge in competitive areas, such as stock trading. More general AI ethics literature highlights transparency, accountability, and fairness as key concerns in the field, both among practitioners and in legislation (Khan et al., 2022). In Pakistan, ethical issues also encompass aspects of both culture and religion. Other investors also question the practice of trading with the use of AI, as to whether it contravenes Islamic norms and standards in financial dealings or constitutes the sort of forbidden speculation (Rahman, 2020). Regulating agencies, such as the SECP and the State Bank, are investigating AI governance models to ensure responsible utilization, accountability, and transparency; however, loopholes exist in enactable regulations (Farrukh, 2024).

Empirical findings from the banking industry in Pakistan indicate moderate levels of AI preparedness, with concerns raised by the potential for fraudulent data use, biased loan-scoring models, and job losses, which are a concern to professionals (Ahmed et al., 2024). The fact that the mechanisms behind decision-making using AI tools often remain opaque can perpetuate skepticism among users, leading to a greater understanding of the significance of explainability in algorithm design (Ben David et

al., 2021). Ethical issues in the PSX trading setting could include unfairness in signal production, algorithmic bias, and the feasibility of machine advice in turbulent market regimes. Regarding local moral economies, users must ensure that the provided AI aligns with ethical norms and provides redress in the event of irrational AI behavior. This variable, therefore, encompasses the perception of system integrity and its correlation with the larger structural, cultural, religious, and regulatory principles.

## Methodology

The present study employs a qualitative narrative research design with the aim of discussing how investors and market professionals at the Pakistan Stock Exchange (PSX) perceive and feel about the use of artificial intelligence (AI) in trading. As an interpretivist approach, narrative inquiry examines the stories people develop to explain technological changes, institutional processes, and transformations of identity (Clandinin & Connelly, 2000). It is preferred due to the complexity and cultural integration of the subject of AI adoption in Pakistan, as this method leads to the acquisition of multifaceted and contextual knowledge that extends beyond functional performance. The research is based on social constructivism, which presupposes that knowledge is created through social interaction with other individuals and is shaped by the conditions of a cultural, historical, or institutional context. The philosophy is especially applicable to the perception of AI by Pakistani investors, who do not view it as a vehicle of high technology but instead as a socio-technological phenomenon, which implies ethical, religious, and emotional consequences. The inductive method employed in this study enables themes to emerge naturally from the participants' stories without requiring prior hypotheses.

The population consisted of 18 participants, chosen through a purposive sample, who lived in Karachi and Lahore, the two major financial centers in Pakistan. Participants included six full-time equity traders and five analysts from a brokerage. Four retail investors utilize AI-based apps, and three institutional asset management members. The inclusion conditions were: at least one year of active trading or investing on the PSX, as well as experience working with AI-based tools (e.g., robo-advisors, trading bots, predictive dashboards). The survey was conducted through semi-structured narrative interviews, which lasted approximately 45 to 75 minutes. Urdu and English were the languages used to conduct the interviews, during which consent was acquired before recording, and these recordings were to be transcribed. The students were asked to consider their introduction to AI applications in the trade sector. The first time they used AI tools in trading, Emotional reactions (e.g., trust, anxiety, empowerment) and Ethical or religious considerations arose. The feeling of being affected, whether in job positions or financial matters, and Perceptions towards human-AI partnerships. Guiding open-ended questions formed part of the interview protocol and included questions such as:

- Do you have a personal experience with the impact of an AI tool on any trading decisions you made?
- Did you ever disagree with an AI-generated suggestion and debate about it?
- Do you think AI tools effectively grasp the Pakistani market situation?

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- How do you think about AI replacing human analysts to do their jobs in that way?.

This was analyzed using thematic narrative analysis, as proposed by Riessman (2008), which emphasizes both the content and the way it is conveyed, considering structure and context. Inductive coding of the transcripts was conducted using NVivo software, whereby themes were identified through multiple readings of the transcripts. The analysis process continued in the following steps: getting to know one another, and line-by-line reading of transcripts to obtain the tone and chronology. Initial Coding: Creating codes based on emotions, actions and decisions (e.g., mistrust, overriding AI, algorithmic insight). Theme Organization - Codes were consolidated into larger narrative themes that included calibration of trust, displacement anxiety, religious reflections, and augmented decision-making. Structuring of Narrative – Individual cases have been arranged to form a coherent narrative, explaining the interaction between individual experiences and technological adjustments.

## Results and Findings

The results of the in-depth narrative interviews conducted with 18 investors in the Pakistan Stock Exchange (PSX), specifically 7 individual traders, 6 institutional analysts, and 5 brokers, are presented. Thematic analysis of the narratives conducted allowed the research to identify four main themes and twelve sub-themes, which provide a rich insight into the experience of investors using AI-powered trading technologies.

## Overview of Emergent Themes

| Theme | Sub-Themes | Frequency | Sample Quote |
|---|---|---|---|
| Trust in AI | • Reliability of predictions<br>• Data transparency | 14 | "Sometimes the system gives a call I would not trust — especially in volatile markets." |
| Human-AI Collaboration | • Validation of decisions<br>• AI as an assistant | 16 | "I do not let it decide everything — it just confirms my gut." |
| Ethical and Cultural Fit | • Islamic finance compatibility<br>• Fairness in automation | 9 | "AI cannot consider Shariah compliance unless we intervene manually." |

## Trust In AI

The interviewees were ambivalent towards AI technologies. Though agreeing that AI enables high levels of technical precision and speed, most participants reported a lack of confidence associated with the "black-box" character of algorithmic decision-making. Retail investors, in particular, complained about their unease with the inability of some AI tools to explain their reasoning regarding trading signals. One of our merchant friends in Lahore wrote:

"I ought to know the reason it is recommending a buy. I do not operate on blind trust of numbers." The presence of explainability features further increased the degree to which institutional investors had and were more ready to trust AI-driven systems. Nevertheless, they emphasized the importance of human verification,

particularly when markets are of a politically sensitive nature or during sudden and unpredictable volatility shocks.

### Displacement Anxiety

Among mid-career brokers as well as junior analysts, displacement anxiety was highly prevalent. Such professionals were concerned that AI tools might one day replace their jobs or diminish the value of their experience. One brokerage manager said, “There is permanent fear that AI could take away my job. Customers are also used to instant knowledge, and AI alone is able to provide it.” Such fear was coupled with the issue of a generational divide, where the younger cohort of professionals was perceived as more technologically savvy and therefore perfectly suited to leverage the benefits of AI instruments. Other respondents reported a rather slight change in workplace inequalities as people skilled in using AI tools became more noticeable and influential.

### Human AI Collaboration

Despite apprehension, almost every respondent reported an extent of AI tool use, with many indicating a complementary imbalance. The traders used to report that they use the signals generated by AI to validate the signals they form. One investor based in Karachi said, “The AI is useful to predict trades. I am not such a blind believer, but it helps me to become more sharp-minded.” Participants did not view AI as a surrogate but instead recalled it as an assistant or a digital colleague. This mixed usage was intentional, combining human judgment with machine output in cases of uncertainty or ambiguity.

### Ethical and Cultural Fit

Another theme that kept emerging was the incompatibility of AI systems with local cultural and ethical values. Research participants with Islamic finance backgrounds raised concerns about the consideration of Shariah compliance in AI systems. Some complained about the possibility of AI promoting speculative or high-frequency trading, which they considered incompatible with longer-term, value-oriented investment strategies. “The algorithm lacks knowledge of our cultural or religious limitations. It may advise something haram without its knowledge.” Issues of data privacy, fairness in automation, and the ethical design of algorithms used in local markets also fell within this theme.

## Discussion

The results of the present research provide a multilayered, culture-based account of investors' experiences in the Pakistan Stock Exchange (PSX) regarding the introduction of artificial intelligence into trading scenarios. Instead of viewing AI as an efficiency-maximizing objective and value-neutral tool, the participants explained it through the prism of a powerful but emotionally and ethically charged actor. This finding aligns with the existing literature, which emphasizes that technological adoption is a mediated process that involves both social and psychological aspects (Khan et al., 2022; Rahman, 2020). Investor confidence in AI was not determined solely by its predictive performance; rather, it required transparency, contextual

knowledge, and explainability criteria for AI output that aligned with the world literature analysis of explainable AI (Tjoa & Guan, 2020). Data-supported signals confirmed human intuition, as many traders relied on AI to enhance their decision-making. It is a combination of this, which Jarrahi (2018) refers to as symbiosis intelligence or the non-replaced human judgment, but redefined. Nonetheless, the black box viewpoint on AI has also created risks in terms of control and agency loss, particularly regarding older or less digitally connected investors.

Moreover, cultural, religious, and socio-economic aspects are highlighted in the narratives, without which the adoption of AI in the Pakistani financial environment cannot be discussed. The incompatibility of Islamic finance frameworks with AI, as articulated by several participants, is one such ethical limit that Western-centric models often overlook. As a case in point, respondents noted that unless localized, AI systems trained with data across different countries are likely to present instruments that are not compliant with Shariah. Anxieties about deskilling and job loss also led people to resist AI, as they had in other developing market contexts (Kapoor & Singh, 2022). Notably, the research suggests that the effective implementation of AI in rapidly developing economies, such as Pakistan, will require participatory design, clear regulations, and ethical alignment. The findings contribute to the growing body of literature validating human-oriented AI approaches that should be adopted in fintech and prompt an investigation into how stories and emotions influence the digital revolution in non-Western economies.

## Conclusion

The study concludes that AI in the PSX is not simply a technological tool, but a socio-cultural actor embedded in narratives of trust, anxiety, and ethical reflection. While most participants accept AI as a support system, they resist full automation due to concerns around transparency, job displacement, and religious incompatibility. The research suggests that AI adoption in Pakistan's financial sector is shaped more by emotional and cultural dynamics than by technological sophistication alone, aligning with Jarrahi's (2018) model of augmented decision-making and the broader literature on ethical AI (Khan et al., 2022).

## Recommendations

1. **Explainable AI Development**: Financial technology providers should invest in models that enhance transparency and provide users with understandable decision logic (Ben David et al., 2021).

2. **Culturally-Aligned Regulation**: Regulatory bodies like SECP must create AI policies that address Islamic finance concerns, data protection, and ethical fairness (SECP, 2023; Farrukh, 2024).

3. **Investor Education**: Programs to enhance digital literacy and build trust in AI among older and retail investors should be launched.

4. **Participatory Design**: Involving end-users in the design of AI tools can ensure better alignment with local ethical norms and user expectations (Bajwa et al., 2023).

## Limitation

The research is limited by its sample size (n = 18) and geographic scope (Karachi and Lahore), which may not capture the full diversity of investor experiences in Pakistan. Moreover, the reliance on self-reported narratives introduces subjectivity. The study also focuses on early adopters of AI tools, potentially overlooking the views of those entirely disengaged or technologically disconnected from such systems (Riessman, 2008; Braun & Clarke, 2006).

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