

Antecedents of Implication of AI in the Capital Market

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ABSTARCT

The present study aims to investigate Generation Z investors' perceptions of using AI-powered trading platforms, specifically algorithmic trading. Reviewing the existing literature, we developed a theoretical model to establish the relationship between various factors. A self-administered questionnaire was used to survey Gen Z investors, and a confirmatory factor analysis was used to establish a relation in the measurement model. We utilized smart-pls 4 to analyse and evaluate hypotheses based on the observed data. Based on the data, there is a significant correlation between each of the factors. PEOU, POU, HLT, and Perceived Usefulness have significantly impacted the attitude toward adopting AI-enabled trading platforms (ATUAI). ATUAI has a beneficial and substantial impact on adopting AI-enabled trading platforms. The research gives potential investors, companies, and practitioners a distinctive and valuable understanding.

Keywords: Artificial Intelligence, Algorithmic finance, Antecedents, TAM Model

INTRODUCTION

According to the definition of dictionary of Merriam-Webster, “Technology is described as the implementation of scientific expertise and instruments to provide solutions to real-world problems and enhance people's lives. It entails the development and application of tools, methods, and procedures that improve productivity, efficacy, and the quality of life in a variety of fields including as industry, interaction, and daily life”. Technology is regarded as a basic component of the human existence, extending human capacities and reshaping human experiences, influencing how people engage with the outside world and one another [1]. AI is a substantial leap in the larger field of innovation. It uses computer power and advanced algorithms to build systems capable of learning from data, adapting to the new inputs, including accomplishing complicated tasks [2]. Systems that use artificial intelligence aren't exclusively limited to computer-based applications or process automation; they have applications in industries such as education[3], economics[4], agriculture[5], manufacturing[6], and processing[7]. As the government website invest India

published data on the expansion of AI throughout the years, it appears that artificial intelligence (AI) holds the key to quickening global commercial development. By 2030, artificial intelligence is anticipated to contribute up to \$15.7 trillion to the global economy, equivalent to China and India's combined GDP. Closer to home, India has enormous potential to contribute to the artificial intelligence revolution as the world's third largest source of AI talent and expertise, with investment in India's artificial intelligence (AI) capabilities increasing at a compound annual growth rate of 30.8% and expected to reach \$881 million by 2023.

AI has shown significant development and usage in finance as a sector as well [8][9]. In the various fields of finance AI has been implemented such as, portfolio management[10], market predictions[11], chatbots[12], risk assessment[13], fraud prevention [14] and algorithmic trading. Algorithmic trading can be referred as the application of computer algorithms for automating trading strategies as well as to execute directives in the securities market. These algorithms are capable of handling massive amounts of data and execute trades quickly, frequently making decisions according to predefined criteria, mathematical frameworks, or immediate information analysis [15] [16][17]. Algorithmic trading within India gained momentum in the beginning of the 2000s, when financial markets grew more sophisticated more technologically driven. The invention of computerized trading platforms, along with technological advancements, paved the path for the algorithmic trading tactics [18]. Significant technological along with regulatory developments have marked the growth in algorithmic trading across India. From the beginnings of the trading based on electronic devices to the development to trading at high frequencies and subsequent advances in artificial intelligence, algorithmic trading has grown into a vital part in India's securities markets. Technological improvements, changing regulatory frameworks, and increased market sophistication will all certainly have an impact on further growth [19][20].

There are studies conducted to comprehend the technological hurdles and effectiveness of AI in the arena of finance [21][22][23]. As an emerging subject of finance, there are fewer studies available that investigate the use of AI-based applications for algorithmic trading. As a result, this study seeks to examine the factors that influence the widespread acceptance of algorithmic trading for investing purposes. This study investigates the adoption of algorithmic trading for investment, which will assist companies along with applications in leveraging algorithmic trading technology for investing experiences and involvement by comprehending the factors influencing adoption.

This study seeks to focus on algorithmic trading for trading and investment planning, which includes services such as efficient investments, effectiveness, support, and trading. In accordance with the investor's preferences in real time. The following target has been created to address the indicated gap:

RO1. which are the antecedents of adoption of the AI-based algorithmic trading for investment?

Further this section research followed with the Literature review, development of hypotheses, research methodology, data analysis along with results. Concludes with managerial and theoretical implications, conclusion and discussion, limitations, future scope of the study.

2. LITERATURE REVIEW

Many studies have been conducted worldwide in various situations to investigate the implications of AI and its implementation in the domain of finance [24][25][26]. The researches conducted for adoption and usage of AI technologies are for commercial banks [27], corporate finance [28], banking sector [29]. This study attempts to discuss the implication of AI in the trading and investment sector of finance. For the study of adoption of algorithmic trading for investment and trading, with the variables Perceived control AI (PCAI), HLT (Human-like trust) along with the TAM Model.

2.1 Theoretical basis and development of Hypotheses.

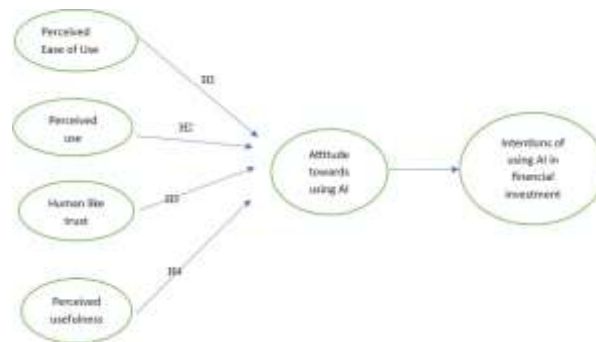


Fig 2.1. Proposed model of Hypothesis

2.1.1. Human like trust (HLT). Human-like trust theory has been formed from several academics' work, which seeks to examine how trust among AI systems and humans has built [30][31]. Several researches have attempted to implement this theory in the various fields while taking AI adoption into a consideration such as healthcare [32], Autonomous Vehicles [33]. The financial investors would use technology if they can trust it like humans for making financial investment choices, hence hypothesis has been formed as:

H1. HLT affects the ATUAI for investments.

2.1.2. Perceived control on AI (PEOU) refers to a user's conviction in their capacity to control, influence, or guide the behaviour and consequences of AI system. It includes the degree to which people believe they can engage in dealing with AI, adjust its operations, and comprehend or anticipate its activities. This perspective has a profound impact on the way users trust, embrace, and interact with artificial intelligence (AI) tools [34]. PEOU has been used as a component in the adoption of AI in the field of, online services [35], education [36]. Financial investors will embrace AI technology or algorithmic trading options if they believe they have control over the AI-based system they are adopting. As a result, the hypothesis is formulated as follows:

H2: PEOU affects the ATUAI for investments.

2.1.3. Technological acceptance model (TAM Model): Fred Davis developed this model in 1989 it is commonly used paradigm for understanding and predicting how users adopt and utilize technology. This model provides a better explanatory power for AI adoption [37][38][39].

2.1.3.1 Perceived ease of use (PEOU): It refers to the extent to which an individual believes that utilizing a specific technology would be effortless. Essentially, it determines how simple or complicated the technology is to operate [40][41]. Financial investors would be willing to employ technology based on artificial intelligence if they believed it was simple to use, and useful for investing and trading while making decisions. Algorithmic trading is developed and meant to be simple to utilize for trading purposes, consequently the hypothesis arises as follows:

H3: PEOU affects the ATUAI for investments.

2.1.3.2 Perceived usefulness (PUSFL) It refers to the extent to which an individual believes that employing a specific technology would improve their work efficiency or overall efficacy. It assesses the practical advantages which the technology appears to provide [42][43]. AI and algorithmic trading technology are intended to facilitate financial decision making and trend analysis for financial planning and investment strategy. Financial planning and trading using AI can also provide support 24 hours a day, seven days a week. Therefore, the hypothesis is formed as follows:

H4: PUSFL affects the ATUAI for investments.

2.1.4 Attitude towards using AI

Attitudes toward AI reflect an intricate and dynamic relationship, emphasizing the importance of carefully considering additionally its positive and negative aspects [44] This study concentrates on financial investors' perceptions of using AI for financial decision-making processes, as previous research has shown that individual attitudes play a significant role when integrating based on artificial intelligence decision-making platforms in organizations [45].

Therefore, hypothesis which has been formed is:

H5: ATUAI affects the ITUAI for investments.

3. Research Methodology

The data was collected with the help of self-administrative questionnaire as it is considered most appropriate method to collect primary data. It contains total 27 numbers of questions with the measures of 5point liquor scale, excluding demographic questions. We distributed total 700 questionnaires, out of which 461 responses were found suitable for our study[46]. Confirmatory factor analysis was applied to the measurement model. We used smartpls 4 for analysis and hypothesis tasting of the observed data.

Pearson correlation

	ATUAI	HLT	ITUAI	PCAI	PEOU	Usefulness
ATUAI	1					
HLT	-0.21	1				
ITUAI	0.313	0.191	1			
PCAI	0.141	0.445	0.364	1		
PEOU	0.128	0.503	0.362	0.537	1	
PUFL	0.184	0.291	0.161	0.243	0.401	1

Table 3.1. Pearson correlation Descriptive Statistics

The Pearson correlation stated the correlation and strength among the variables. All correlations are significant at 0.01. These finding stated possible dependencies on intention to use AI enable trading platform among the gen Z investors

Table 3.2 Reliability and validity test

Variables	Path	Std. Regression Weight	Standard deviation (STDEV)	T-statistics
Attitude to Use AI-enabled Trading	ATUAI1 <- ATUAI	0.739	0.029	25.203***
	ATUAI2 <- ATUAI	0.756	0.025	29.939***
	ATUAI3 <- ATUAI	0.743	0.024	30.402***
	ATUAI4 <-	0.768	0.024	31.746***

	ATUAI			
Human Trust	HLT1 <- HLT	0.799	0.023	34.116***
	HLT2 <- HLT	0.805	0.025	32.732***
	HLT3 <- HLT	0.753	0.035	21.748***
	HLT4 <- HLT	0.756	0.032	23.492***
	HLT5 <- HLT	0.721	0.038	18.919***
	HLT6 <- HLT	0.747	0.035	21.224***
Intention to Use AI	ITUAI1 <- ITUAI	0.862	0.022	38.609***
	ITUAI2 <- ITUAI	0.759	0.037	20.749***
	ITUAI3 <- ITUAI	0.816	0.03	27.552***
Perceived Control	PCAI1 <- PCAI	0.868	0.042	20.634***
	PCAI2 <- PCAI	0.885	0.042	21.321***
	PCAI3 <- PCAI	0.849	0.054	15.924***
	PCAI4 <- PCAI	0.88	0.037	24.13***
Perceived Ease of Use	PEOU1 <- PEOU	0.827	0.067	12.562***
	PEOU2 <- PEOU	0.882	0.057	15.412***
	PEOU3 <- PEOU	0.833	0.058	14.643***
	PEOU4 <- PEOU	0.805	0.069	11.946***
	PEOU5 <- PEOU	0.846	0.056	15.317***
Perceived Usefulness	PEU1 <- PEU	0.678	0.077	9.041***
	PEU2 <- PEU	0.752	0.064	12.005***
	PEU3 <- PEU	0.794	0.046	17.433***
	PEU4 <- PEU	0.837	0.043	19.473***
	PEU5 <- PEU	0.713	0.08	9.141***

*** Significant at .01

Table 3.2

All variables have Cronbach alfa more than .75, which validates their reliability for factor analysis and higher statistical tests.

Table no displays the factor loadings together with the standard regression weights, standard deviations,

and T statistics for every indication of the latent variables in the model. In that order, factor loadings for the Attitude to use ai-enable trading are 0.739, 0.756, 0.743, and .768 for ATUAI1, ATUAI 2, ATUAI 3, and ATUAI 4. Factor loadings for the Human-Like Trust (HLT) construct show the correlation between each indicator and the latent variable, varying from 0.747 to 0.805 for HTL1 to HTL6. The regression weight of all factors of Intention to Use AI(ITUAI) varying from 0.759 to 0.862 shows a strong correlation. Perceived control, perceived ease of use, and perceived usefulness show a strong correlation among them.

3.3 The Fornell and Larcker criteria

The Fornell and Larcker criteria were used to establish discriminant validity (Table 3.3). The square root of AVE for each construct surpasses the correlation among the other variables together, which provides discriminant validity of the construct.

Variable	Validity			Reliability (Fornell and Larcker criteria)					
	Cronbach 's alpha	Composi te reliability (rho_c)	Averag e varianc e extracte d (AVE)	ATU AI	HLT	ITUA I	PCA I	PEO U	PEU
ATUAI	0.745	0.839	0.566	0.752					
HLT	0.862	0.895	0.588	-0.21	0.767				
ITUAI	0.751	0.855	0.664	0.313	0.191	0.815			
PCAI	0.901	0.929	0.767	0.141	0.445	0.364	0.876		
PEOU	0.906	0.928	0.722	0.128	0.503	0.362	0.537	0.85	
PEU	0.834	0.878	0.59	0.184	0.291	0.161	0.243	0.401	0.768

Table 3.3

Hypothesis testing

Hypothesis	Hypothesis path	β	StDev	t-test	P values	Conclusion
H1	ATUAI -> ITUAI	0.318	0.037	8.517	0	Accepted
H2	HLT -> ATUAI	-0.451	0.046	9.522	0	Accepted
H3	PCAI -> ATUAI	0.205	0.055	3.638	0	Accepted
H4	PEOU -> ATUAI	0.17	0.057	2.814	0.005	Accepted
H5	PUFL-> ATUAI	0.207	0.043	4.671	0	Accepted

Table No. 3.4 Path Analysis and Hypothesis testing

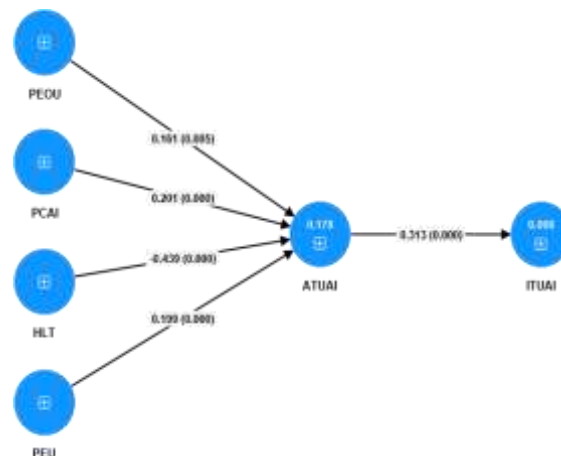


Fig.2.2

ATUAI influences the ITUAI positively in the hypothesis test. There may be a positive association because the path coefficient is positive (0.318). The statistical significance of the result is indicated by the p-value of (0.001), which is relatively high in the t-test value. As a result, hypothesis H1 is approved. The association between HLT and ATUAI is positively and significantly correlated, according to the testification of that relationship. Despite β (-0.451), the p-value is (0) and the t-test result is strong and positive, indicating that HLT has an effect on the ATUAI. The investigation of the link between PCAI and ATUAI indicates that there is a moderately strong positive relationship, as indicated by β (0.205). The analysis's T-test value (3.638) and p-value (0.0001) support the hypothesis's acceptance by showing a positive and statistically significant association. In examining the correlation between PEOU and ATUAI, β (0.17) indicates a moderately favourable impact. The statistical significance is confirmed by the t-test value of 2.814 and the p-value of (0.005), indicating that the hypothesis should be accepted. The moderate influence is indicated by the relationship analysis of β (0.207) between PUFL and ATUAI. The t-test (4.67) and P-value (0) indicate that the findings of this statistical test point in the direction of the hypothesis' acceptance. All of the assumptions in this analysis have been confirmed, suggesting that the relationship suggested by the research model is important. Positive impacts are seen across a

spectrum of variables on ATUAI and ITUAI.

Conclusion:

This study's foundation is a knowledge of how artificial intelligence (AI) is being adopted in the financial sector, using algorithmic trading platforms and users' observations. The research, which is specifically focused on the banking business, indicates that the use and implications of AI have been observed in the sector for a considerable amount of time. The research analysis indicates that PEU, PUFL, PEC, and HLT have a major influence on attitudes toward utilizing AI. In addition, this study aims to comprehend the connection between ATUAI and ITUAL. The study's findings indicate that the suggested model benefits from one another.

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