ROLE OF AI IN IMPROVING RISK MANAGEMENT PRACTICES IN PERSONAL FINANCIAL PLANNING

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ABSTRACT

"Artificial Intelligence (AI) is transforming personal financial planning by offering advanced risk management tools, enhanced decision-making capabilities, and greater user customization. This study explores the impact of AI tools on individuals' ability to identify and assess financial risks compared to traditional methods. The research also investigates the role of trust in AI-driven tools and its influence on their adoption and user satisfaction. Primary data was collected from 150 respondents, categorized based on age, gender, occupation, and experience with financial tools. Using two-way ANOVA without replication, the hypotheses were statistically tested.

Results revealed no significant difference in the perception of AI tools' capability to assist with understanding and accurately analyzing financial risks. Similarly, trust in AI-based tools did not show a statistically significant correlation with user satisfaction or adoption levels, although a weak trend toward higher satisfaction with increased trust was observed. These findings suggest that while AI offers potential, its perceived effectiveness is not yet distinctively superior in the public eye. The limited experience of respondents with AI tools may have influenced the results.

This paper contributes to the ongoing discourse on AI integration in finance by providing empirical data from Indian users. It highlights the necessity for greater awareness, trust-building, and education about AI applications in personal finance. The study calls for deeper and more targeted research to examine long-term user behavior, perceptions, and actual financial outcomes from AI-based planning tools."

Keywords: Improving Risk Management, Financial Planning, decision-making capabilities etc.

INTRODUCTION

The emergence of Artificial Intelligence (AI) has ushered in a new era in financial technology, dramatically altering how individuals manage their personal finances. Traditionally, financial planning involved manual analysis, static tools like spreadsheets, and guidance from financial advisors. However, these methods often lacked personalization, were time-consuming, and prone to human error. AI-based financial tools—ranging from robo-advisors and algorithmic budgeting apps to predictive analytics platforms—now offer dynamic, data-driven insights into risk management, expenditure, investments, and future planning.

Effective financial risk management is central to achieving long-term financial goals. It includes identifying possible threats such as income loss, market volatility, inflation, or debt default and developing appropriate mitigation strategies. AI contributes significantly in this

regard through real-time data processing, scenario simulation, and predictive modeling, enabling more accurate forecasting and customized financial recommendations.

This study focuses on evaluating the role of AI in enhancing risk management practices among individuals. Specifically, it investigates whether AI tools improve users' ability to identify and assess financial risks better than conventional approaches. Furthermore, the study examines whether user trust in AI-driven tools translates to increased satisfaction and widespread adoption.

The significance of this research lies in its practical implications. As financial environments become increasingly complex, individuals seek accessible yet intelligent tools to manage their wealth. AI appears to bridge this gap. However, concerns around trust, data security, algorithmic bias, and lack of transparency persist and could hinder adoption.

By surveying 150 respondents from diverse occupational and age backgrounds in India, this research employs statistical analysis to test two key hypotheses: (1) the comparative effectiveness of AI tools versus traditional methods, and (2) the relationship between trust in AI and its adoption or satisfaction. Results provide insight into the evolving role of AI in financial planning and inform future directions for both developers and policymakers in FinTech.

The study contributes academically by filling the gap in literature specific to the Indian context and practically by offering a data-backed perspective on AI's application in individual risk management. This is crucial for stakeholders—including AI developers, financial planners, and educators—looking to foster financial literacy and promote responsible adoption of intelligent tools.

REVIEW OF LITERATURE

1. **Agrawal, A., Gans, J., & Goldfarb, A. (2018)** – *"Prediction Machines"* Explores how AI reduces the cost of predictions and can improve decision-making in finance, but warns about the need for high-quality data and trust.

2. **Stern, T. (2020)** – *"AI in Personal Finance: Opportunities and Limitations"* Highlights the benefits of robo-advisors and automation but stresses user concerns about accuracy and privacy.

3. **Jung, D., et al. (2018)** – *"Trust and satisfaction in robo-advisors"* Found that trust and transparency significantly affect satisfaction and likelihood of adoption in digital financial planning.

4. **Deloitte Insights (2019)** – *"AI and Risk Management in Financial Services"* Suggests AI can enhance risk detection and fraud prevention but must be integrated with proper governance frameworks.

5. **PwC Global FinTech Survey (2020)** Indicates that 60% of financial institutions are investing in AI, expecting improvements in customer insights and risk mitigation.

6. **Huang, M., &Benyoucef, M. (2013)** – *"User-centered design in FinTech AI"* Advocates for usability and human factors in AI tool adoption, particularly in non-tech-savvy user segments.

7. **Gomber, P., Koch, J.-A., &Siering, M. (2017)** – *"Digital Finance: Challenges of AI Adoption"* Discusses resistance to AI in finance due to perceived complexity, despite its benefits in efficiency and risk analysis.

8. **McWaters, R. (2016)** – *World Economic Forum Report on FinTech* Emphasizes the disruptive potential of AI in personal finance and stresses ethical and regulatory challenges.

9. **Chen, H., Chiang, R., & Storey, V. (2012)** – *"Business Intelligence and Analytics: From Big Data to Big Impact"* Underlines how AI and analytics aid decision-making but rely heavily on user interpretation and trust.

10. **Narayan, S., &Kshetri, N. (2021)** – *"Adoption of AI in Emerging Markets"* Notes that trust, cultural factors, and digital infrastructure are key barriers in AI adoption for financial services in India.

RESEARCH OBJECTIVE

1. To examine how AI tools, assist individuals in identifying and assessing financial risks.

2. To evaluate user trust, adoption, and satisfaction with AI-based financial tools.

RESEARCH HYPOTHESIS

Hypothesis 1

Null Hypothesis (H_0):AI tools do not significantly improve individuals' ability to identify and assess financial risks compared to traditional methods.

Alternative Hypothesis (H_1):AI tools significantly improve individuals' ability to identify and assess financial risks compared to traditional methods.

Hypothesis 2

Null Hypothesis (H_0): There is no significant relationship between trust in AI-based tools and their adoption or user satisfaction.

Alternative Hypothesis (H_2): Higher trust in AI-based financial tools leads to greater adoption and user satisfaction in personal financial planning.

DATA ANALYSIS

Gender of the Respondents

The gender-wise distribution of respondents shows that 57% were male and 43% were female, indicating a moderately male-dominated sample. This balance reflects a diverse perspective in the study, enabling analysis of financial risk perception and AI adoption across both genders in personal financial planning.

Gender	Frequency	Percentage
Male	83	57%
Female	67	43%
Total	**150**	**100%**

Age of the Respondents

The age-wise distribution indicates that the majority of respondents (60%) are between 18 and 35 years, with 29.3% aged 18–25 and 30.6% aged 26–35. This suggests that younger individuals are more engaged in personal financial planning and the use of AI tools, reflecting evolving financial behavior trends.

Particulars	Frequency	Percentage (%)
18 to 25 Years	44	29.3
26to35 Years	46	30.6
36 to 45 Years	37	24.6
46 to 60 Years	13	8.6
Above 60 Years	10	6.6
Total	**150**	**100**

OCCUPATION

The occupation-wise distribution shows that working professionals (30%) and business owners (25.3%) form the majority of respondents, followed by others (22%) and students (17.3%). Retired individuals constitute only 5.3%. This indicates that economically active groups are more involved in or impacted by AI-based personal financial planning tools.

Particulars	Frequency	Percentage (%)
Business Owner	38	25.3
Others	33	22
Retired	8	5.3
Students	26	17.3
Working Professional	45	30
Total	**150**	**100**

EXPERIENCE IN FINANCIAL TOOLS

The data on experience with financial tools reveals that 41.6% of respondents have never used such tools, while 26.6% have less than one year of experience. Only a small segment (14.6%) has over three years of experience, indicating limited long-term familiarity with financial planning technologies among the respondents.

Particulars	Frequency	Percentage (%)
Never	62	41.6
Less than 1 year	40	26.6
1–3 years	22	16.6
3 – 5 Years	14	9.3
More than 5 years	8	5.3
Total	**150**	**100**

HYPOTHESIS TESTING

Hypothesis 1

Null Hypothesis (H₀): AI tools do not significantly improve individuals' ability to identify and assess financial risks compared to traditional methods.

Alternative Hypothesis (H₁): AI tools significantly improve individuals' ability to identify and assess financial risks compared to traditional methods.

AI tools provide more		**AI-based financial tools help me understand potential financial risks more clearly**					
		Strongly Agree	**Agree**	**Nutral**	**Disagree**	**Strongly Disagree**	**Total**
	Strongly	5	7	2	8	1	**23**

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accurate financial risk analysis than traditional methods.	Agree						
	Agree	9	4	7	3	10	**33**
	Nutral	8	8	6	7	3	**32**
	Disagree	2	10	6	8	4	**30**
	Strongly Disagree	14	3	3	4	8	**32**
	Total	**38**	**32**	**24**	**30**	**26**	**150**

Anova: Two-Factor Without Replication

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
Strongly Agree	5	23	4.6	9.3
Agree	5	33	6.6	9.3
Nutral	5	32	6.4	4.3
Disagree	5	30	6	10
Strongly Disagree	5	32	6.4	22.3
Strongly Agree	5	38	7.6	20.3
Agree	5	32	6.4	8.3
Nutral	5	24	4.8	4.7
Disagree	5	30	6	5.5
Strongly Disagree	5	26	5.2	13.7

ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	13.2	4	3.3	0.268292683	0.894	3.0069
Columns	24	4	6	0.487804878	0.745	3.0069
Error	196.8	16	12.3			
Total	234	24				

VARIABLES

Dependent Variable:

The ratings/responses given by participants (Strongly Agree, Agree, etc.) to the statements/questions.
This is quantitative, reflecting how much people agree/disagree with each statement.

Independent Variables:

There are two independent variables (also called factors in two-way ANOVA):

- *"AI-based financial tools help me understand potential financial risks more clearly."*

- *"AI tools provide more accurate financial risk analysis than traditional methods."*

These are the two different statements or conditions under which participants rated their agreement.

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Each level of the independent variable is the degree of agreement (Strongly Agree, Agree, etc.).

Interpretation

- **P-value for Rows = 0.8941**

- Since this is much higher than 0.05, **we fail to reject the null hypothesis**. → This means that there is **no statistically significant difference in responses across the different levels of agreement**.

- **P-value for Columns = 0.7446**

- Again, this is greater than 0.05, so **we fail to reject the null hypothesis** for columns as well.

- → This indicates that there is **no significant difference in responses between** *"AI-based financial tools help me understand potential financial risks more clearly"***and***"AI tools provide more accurate financial risk analysis than traditional methods"*.

CONCLUSION

There is **no significant difference** in how participants responded to:

- ("Understanding potential financial risks using AI tools"), and

- ("Accuracy of AI tools compared to traditional methods").

Also, the **level of agreement** (Strongly Agree to Strongly Disagree) does **not significantly affect the overall result**.

Final Conclusion:

Based on the two-factor ANOVA without replication, there is **no statistically significant difference** in the perceptions of respondents regarding AI tools' role in financial risk understanding and analysis. Both statements were rated similarly across all levels of agreement.

Hypothesis 2

Null Hypothesis (H₀): There is no significant relationship between trust in AI-based tools and their adoption or user satisfaction.

Alternative Hypothesis (H₂): Higher trust in AI-based financial tools leads to greater adoption and user satisfaction in personal financial planning.

I trust the recommendations provided by AI-based financial tools.							
I feel satisfied with the outcomes I get from AI-powered financial tools.		**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**	**Total**
	Strongly Agree	5	10	5	4	8	**32**
	Agree	9	4	6	8	9	**36**
	Nutral	5	1	7	6	9	**28**

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Disagree	4	2	4	7	7	**24**
Strongly Disagree	6	4	6	6	8	**30**
Total	**29**	**21**	**28**	**31**	**41**	**150**

SUMMARY	*Count*	*Sum*	*Average*	*Variance*
Strongly Agree	5	32	6.4	6.3
Agree	5	36	7.2	4.7
Nutral	5	28	5.6	8.8
Disagree	5	24	4.8	4.7
Strongly Disagree	5	30	6	2
Strongly Agree	5	29	5.8	3.7
Agree	5	21	4.2	12.2
Nutral	5	28	5.6	1.3
Disagree	5	31	6.2	2.2
Strongly Disagree	5	41	8.2	0.7

ANOVA Test						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Rows	16	4	4	0.993789	0.439218	3.006917
Columns	41.6	4	10.4	2.583851	0.076842	3.006917
Error	64.4	16	4.025			
Total	122	24				

Variables

- **Dependent Variable**:

- **Ratings/responses** reflecting adoption or satisfaction (Strongly Agree to Strongly Disagree).

- **Independent Variables**:

- Trust in AI-based financial tools (statement 1: *"I trust the recommendations…"*).

- Satisfaction with AI tools (statement 2: *"I feel satisfied with the outcomes…"*).

Interpretation

Row-wise (Trust in AI tools):

- **P-value = 0.4392 > 0.05**

- → Fail to reject H_0

- → **No statistically significant difference** in satisfaction levels **across different trust levels**.

Column-wise (Satisfaction responses):

- **P-value = 0.0768 > 0.05 but < 0.10**

- → Marginally significant at the **10% level**, but **not significant at the 5% level**.

- → This indicates a **weak trend**: satisfaction levels may vary slightly with trust, but the evidence isn't strong enough to confirm the alternative hypothesis with high confidence.

CONCLUSION

Based on the ANOVA test results:

- There is **no strong statistical evidence** to support a significant relationship between **trust in AI-based financial tools** and **user satisfaction or adoption**.

- However, the **marginal significance** in column variation suggests a **possible weak trend—higher trust might lead to higher satisfaction**, but more data or a different method (e.g., correlation or regression) would be needed to confirm this relationship confidently.

SUGGESTIONS

Based on the findings, several suggestions are proposed. First, financial literacy campaigns should incorporate awareness about the functioning and benefits of AI-based financial tools, particularly targeting age groups less familiar with such technologies. Developers of AI tools must ensure transparency, explainability, and user control in their systems to foster trust. Simplifying user interfaces and providing scenario-based demonstrations can help bridge the trust gap and encourage adoption.

Further, integration of human-AI collaboration models, where advisors work alongside AI tools, can provide users with reassurance and higher satisfaction. Finally, future studies should explore longitudinal effects of AI tool usage on actual financial outcomes and emotional responses like trust and confidence. Combining quantitative with qualitative research methods will offer a more nuanced understanding of AI's role in personal financial planning.

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