

Evaluating the Impact of AI-Driven Banking and Financial Tools on Decision-Making Accuracy and Risk Mitigation Using Tam Model : A Study Among Individuals in Hyderabad.

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Abstract: -

The finance industry has seen a rapid transformation with the emergence of artificial intelligence (AI), which makes data analysis, modelling, and decision-making more effective and efficient. Artificial intelligence enables the financial sector to analyse vast amounts of data, recognize intricate patterns, and produce predictive insights that were once impossible to achieve using traditional analytical methods. The rapid advancement of Artificial Intelligence (AI) in banking and financial services has transformed how individuals manage their finances, make informed decisions, and handle risks. AI-powered tools such as chatbots, fraud detection systems, robo-advisors, and financial tracking applications provide users with real-time insights, automation, and enhanced security. This study aims to explore the impact of AI-driven financial tools on decision-making accuracy and risk management among individuals in Hyderabad. TAM model is used for the conceptual study . By analysing user awareness, adoption levels, perceived reliability, and overall effectiveness, this research seeks to determine whether AI improves financial decision-making and helps mitigate financial risks. The objective of the survey conducted on 100 customers of Hyderabad to gather data on users' trust, security concerns, and challenges faced while using AI-enabled financial services. By analysing these customers insights, the study provides the actionable recommendation in the role of AI in modern financial management and its potential to enhance financial security and stability in decision making and risk mitigation among customers.

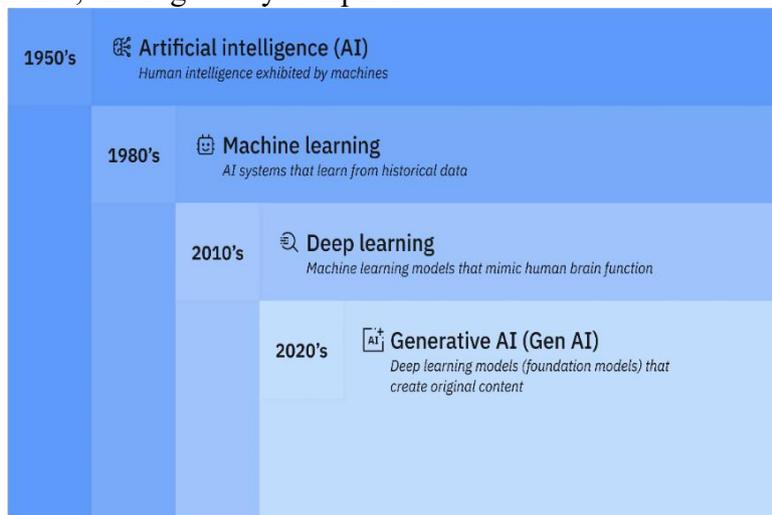
Keywords: - Artificial Intelligence, Advancement of Artificial Intelligence (AI) in Banking and Financial Service, Decision making accuracy, AI in Risk Mitigation.

Introduction: -

Financial technologies, or fintech's as they are sometimes called, have become increasingly prevalent in the global economy and have revolutionized almost every aspect of business and finance (Alfonso-Sánchez et al., Citation2024). Fintech businesses are in a competitive market with traditional financial institutions, striving to transform financial services through innovation and contemporary technology (Porfirio et al., Citation2024). Many cutting-edge financial services like digital banking, wealth management, insurance, mobile payments, and digital currencies go hand in hand with this (Gozman & Willcocks, Citation2019; Yap, Citation2023). The digital revolution has led to the rapid replacement of various traditional types of borrowing by platforms, commonly referred to as online lending P2P platforms (Sunardi et al., Citation2022; Zhu & Wu, Citation2025). Artificial intelligence (AI) is a technology that enables computers and machines to simulate human learning, comprehension, problem solving, decision making, creativity and autonomy. AI is recognized as a combination of new technologies, processes, and methods with an increasing importance for the current and future development of our societies and economies. AI is applied today in various diverse sectors such as medical diagnostics, optical character recognition, automotive autonomous driving, and financial services. Already today large corporates and small

and medium enterprises are using AI technologies. AI has become a part of daily life for millions of consumers. The application of AI is seen as a potential driver of disruptive technological development and innovation.

In recent years, the financial industry has experienced considerable transformations spurred by the integration of artificial intelligence (AI) and data analytics. These technologies have become pivotal in improving operational efficiency, decision-making, and risk management strategies. Financial institutions, particularly banks, encounter increasingly complex risks, encompassing credit and market volatility, cybersecurity threats, and regulatory pressures. The implementation of AI and advanced analytics has empowered banks to identify, assess, and mitigate these risks more proficiently by processing extensive amounts of data in real time, enhancing prediction accuracy, and enabling more informed decision-making. The transformative potential of AI in financial risk management is rooted in its capability to address multidimensional and evolving risk factors. By utilizing machine learning algorithms, financial institutions can automate risk assessments, improve fraud detection, and optimize investment strategies while concurrently identifying emerging risks in a dynamic market environment. However, as AI-driven solutions progress, financial institutions must navigate a delicate balance between adopting innovation and ensuring security, particularly regarding data privacy, governance, and regulatory compliance.



Types of AI Technologies Applicable in Finance: - For organizations to grow in the financial sector, it is imperative that they become acquainted with the various AI technologies developed to optimize operations and improve analytical competencies. These technologies can be generally classified into several principal categories: machine learning, natural language processing (NLP), and robotic process automation (RPA). Each of these categories offers distinct benefits and possibilities, facilitating financial institutions in their efforts to adapt and innovate to more effectively meet the needs of their clients.

AI Technology	Description
Machine Learning	Algorithms that enable systems to learn from data, allowing for predictive analytics and improved risk assessment
Natural Language Processing	Technologies that facilitate the understanding and interpretation of human language to enhance customer service and sentiment analysis.

Robotic Automation	Process	Automation of repetitive tasks through software robots, streamlining operations and reducing costs.
AI-Driven Chatbots		Conversational agents that provide immediate customer support, answering queries and performing transactions.
Fraud Algorithms	Detection	Systems designed to detect unusual patterns or anomalies indicative of fraudulent activities in real-time.

Objective of the study: -

1. To analyse the impact of AI-driven banking and financial tools on decision-making accuracy among individuals in Hyderabad.
2. To assess the effectiveness of AI-powered financial applications in mitigating financial risks such as fraud detection, budget overspending, and investment risks.

Need of the Study: -

The Artificial Intelligence (AI) in the financial sector has brought a rapid change in decision-making, risk management, and user interactions where the banking services are more efficient. AI-powered tools such as chatbots, robo-advisors, fraud detection systems, and predictive analytics enhance financial security, improve decision-making accuracy, and offer personalized financial advice to the investors. However, the effectiveness and reliability of these tools in real-world are useful in financial decisions making and mitigating the risk. This research investigates the awareness, adoption, perceived reliability, and effectiveness of AI-driven financial tools among individuals in Hyderabad.

Hypotheses of the study: -

H₁: - AI-powered financial tools significantly improve users' financial decision-making accuracy.

Related Questions: 10, 11.

H₀:- (Null Hypothesis): AI-powered financial tools do not significantly improve users financial decision-making accuracy.

Artificial Intelligence: - The digitalization of financial services – from the advent of ATMs (automated teller machines) and online banking to the widespread use of mobile apps– transformed the industry from all perspectives: providers, customers, employees, regulators and other stakeholders. Artificial intelligence (AI) is poised to have at least as profound an impact, albeit with important differences. According to the father of Artificial Intelligence, John McCarthy, it is “The science and engineering of making intelligent machines, especially intelligent computer programs. The financial sector is one with the big spenders towards using AI services. Usage of AI applications in finance are growing at a pace by offering a wide range of advanced services. AI applications have now infiltrated other areas within the financial industry such as banks, insurance companies and different Fintech platforms.

Advancement of Artificial Intelligence (AI) in Banking and Financial Services: AI has revolutionized banking and financial services through automation, risk assessment, fraud detection, and personalized financial advice. The integration of AI-driven chatbots, robo-advisors, and predictive analytics has enhanced financial decision-making, operational efficiency, and security. This refers to the continuous evolution and integration of AI technologies in banking and financial institutions.

Decision-Making Accuracy: AI-driven financial tools improve decision-making accuracy by analysing large datasets, identifying trends, and providing data-driven recommendations. These tools minimize human errors and biases, allowing individuals and institutions to make more informed and precise financial decisions and that which improves accuracy in the financial decision making and investment decisions.

AI in Risk Mitigation – AI's role in identifying and minimizing financial risks such as fraud, market fluctuations, and investment losses. AI-driven algorithms analyse patterns, detect anomalies, and automate risk assessment processes, ensuring better financial security and stability.

Theoretical Framework: -

Artificial Intelligence is the science and engineering of making intelligent machines especially computer programs /software work. Artificial Intelligence has concern with similar task of using computer to understand human intelligence. Artificial Intelligence is associated with computer enhanced learning, reasoning, language translation, speech recognition, decision-making and perception that often requires human intelligence. The implementation of artificial intelligence is largely responsible for the development of the banking sector.

With the rapid expansion of digital transactions, securing identity verification has become a major concern. Conventional authentication methods, such as passwords and security questions, are increasingly vulnerable to cyber threats like phishing, credential theft, and account takeovers. As cybercriminals refine their attack strategies, businesses and financial institutions must implement advanced security measures to safeguard user identities and prevent fraud. Artificial Intelligence (AI) has emerged as a crucial tool in digital identity protection, enhancing security through machine learning (ML), behavioural analysis, and biometric authentication. AI-driven identity protection utilizes ML algorithms to detect fraudulent activities in real time by analysing user behaviour patterns, anomalies, and irregularities. Unlike traditional rule-based security systems that depend on predefined attack signatures, AI-based solutions continuously evolve, adapting to new threats while improving detection accuracy and minimizing false alarms. By tracking transaction history, login behaviours, and device usage, AI can proactively identify suspicious activities and mitigate security breaches before they escalate into major risks.

AI is a viable addition to risk management frameworks in the banking industry because it allows institutions to evaluate enormous volumes of data in real-time, finding patterns and anomalies that may point to possible problems. Conventional risk management techniques frequently depend on past performance and established guidelines, which may not be enough to recognize new or changing dangers. Financial institutions may improve their predictive analytics skills and foresee and reduce risks before they become a reality by utilizing AI. AI-driven features are being incorporated into enterprise software more and more, which improves productivity and decision-making. Advanced data analytics, predictive insights, and automation in risk management software are made possible by this integration, which greatly improves overall risk mitigation techniques and the ability to identify possible threats.

Research Gap: -The rapid growth of the Artificial Intelligence (AI) in banking and financial services has increased drastically. The usage of the AI in all the fields have been increasing day to day there is a lack of comprehensive study on assessing the impact on decision making accuracy and risk mitigation. Therefore, the target group and the geographical location of Hyderabad is chosen for the study.

Conceptual Research Model: -

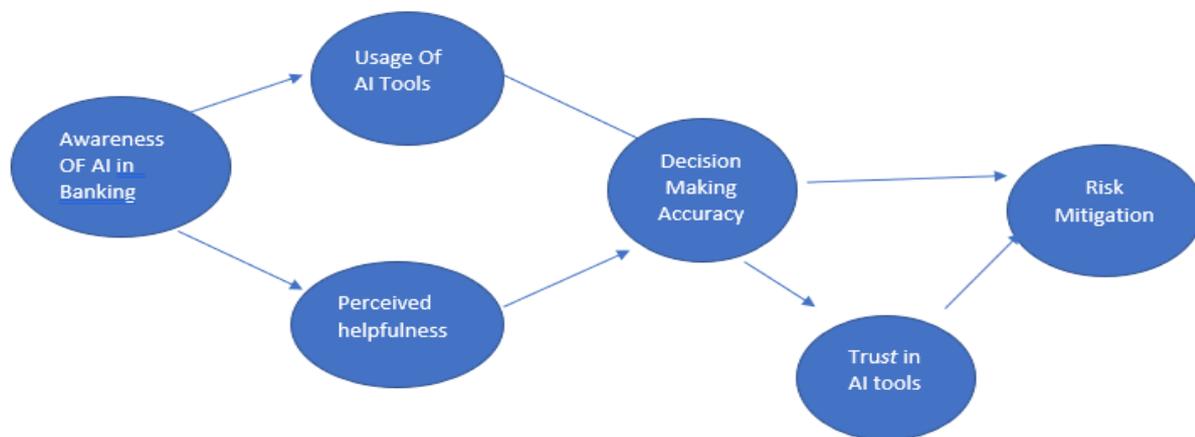
The conceptual research model -TAM (Technology Acceptance Model) Shows the relationship between AI-driven financial tools and their impact on decision-making accuracy and risk mitigation among individuals in Hyderabad. The model is structured around key factors influencing the adoption and effectiveness of AI-powered banking applications. This model helps to analyse the adoption patterns, effectiveness, and trust levels associated with AI-driven financial services, offering insights

into how AI is shaping modern banking and financial decision-making.

TAM (Technology Acceptance Model) -The Relationship between AI-driven financial tools in Decision Making and Risk Mitigation

Review of Literature: -

- Bottazzi, M., Ruggeri, V., & Mabilia, A. (2023). Artificial Intelligence in Finance: A Comprehensive Review Through Bibliometric and Content Analysis. *SN Business & Economics*, conducts a comprehensive analysis of AI's applications in market prediction, risk management, and Robo-advisors. Emerging ethical concerns, data security, and explain ability require attention for responsible AI integration.
- Ruggeri, V., Bottazzi, M., & Mabilia, A. (2022). Artificial Intelligence and Financial Inclusion: A Systematic Literature Review. *Journal of Business Ethics*, explores AI's potential to offer personalized financial services and improve credit scoring for underserved populations. Ethical considerations and digital literacy gaps must be



addressed for equitable financial access.

- Ganesh, S., Kumar, S., & Manoharan, P. (2022). Artificial Intelligence & Machine Learning in Finance: A Literature Review. Retrieved from ResearchGate, reviews AI's increasing role in finance, focusing on risk management, fraud detection, and personalized finance solutions. It highlights the growing adoption of AI and machine learning technologies in the financial sector
- Integrating AI in Bank Digitalization: Strategies, Challenges, and Future Perspectives by Isabelle Oprea and Daniela Duță (2024), published in *Legal Perspectives in the Modern Era of Technological Transformations*, discusses how artificial intelligence (AI) is revolutionizing banking digitalization. The paper highlights AI's role in automating customer services, fraud detection, and providing personalized financial advice. Yet, banks are facing significant challenges such as data privacy concerns, high investment costs, and the risk of digital exclusion. The study found that AI has the potential to enhance operational efficiency and financial inclusion, only if there are proper guidelines being ensured and ongoing improvement in AI technologies.
- Adedoja Fabuyi, Adebayo Y. Balogun, et al. (2024), published in the *International Journal of Science and Research Archive*, explores AI's role in improving compliance, risk management, and financial administration. The study emphasizes the AI-powered anti-money laundering (AML) systems, showcasing how AI can improve financial monitoring and regulatory oversight. The findings highlight that AI enhances efficiency, accuracy, and adaptability in banking supervision.

- **AI Advances: Enhancing Banking Security with Fraud Detection** by F. Johora, Rakibul Hasan, Syeda Farjana Farabi, et al. (2024), published in the First International Conference on Technological Innovations and Advance Computing (TIACOMP), focuses on AI-driven fraud detection mechanisms. The study highlights how deep learning, neural networks, and Natural Language Processing (NLP) enhance fraud prevention by identifying fraudulent transactions in real time. AI is also being combined into KYC verification, biometric authentication, and chatbot-based fraud reporting systems, making banking transactions more secure.

Research Methodology: -

Primary data is collected by sharing a structured questionnaire from a sample of 100 banks customers from Hyderabad region. A random and convenient sampling method is used for collecting responses.

Secondary data is taken from various reports available on websites, research articles, and others. This study is descriptive in nature and attempts to understand the financial decision-making accuracy, mitigating financial risks such as fraud detection, budget overspending, and investment risks. For analysing the collected data simple percentages, bars & pie charts have been used and for hypothesis testing Multiple Regression analysis statistical tool is being used and ANNOVA for checking the Degree of Significance Level.

Results and Analysis: - An online survey is conducted using the Google forms containing structured questions related to demographics, Awareness and Usage of AI in Banking and Financial Services, AI tools, Financial Apps in decision making and to avoid the risk. The analysis has been presented in 3 sections Viz Section I deals with the demographic information, Section II & III deals with the statistical analysis using the SPSS- ANOVA and Co-efficient Correlation relating to the Hypothesis followed by the by the summary of findings and conclusion.

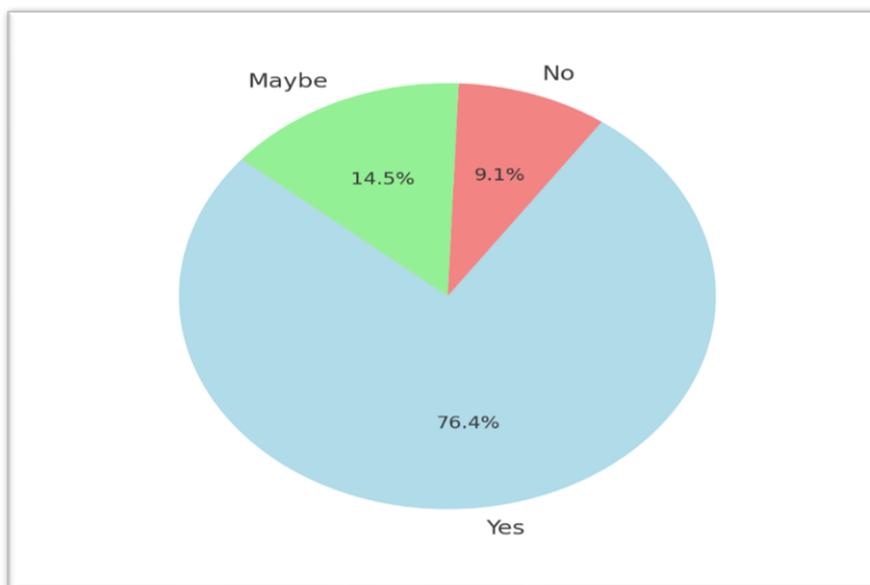
Characteristic		Frequency	%
Age :-	18–25	49	49.0%
	26–35	12	12.0%
	36–45	20	20.0%
	46–55	5	5.0%
	56 and above	7	7.0%
	Total	100	100%
Educational Qualification	Graduate	24	24.0%
	Postgraduate	67	67.0%
	Other	9	9.0%
	Total	100	100%
Primary Occupation	Salaried Employee	53	53.0%

	Self-employed	3	3.0%
	Student	22	22.0%
	Retired	4	4.0%
	Other	1	1.0%
	Total	100	100%

Interpretation:-

From the above it can be inferred that majority of the respondents belong to 18-25 years age group, nearly 1/4th of the respondents belongs to 36-45 years and the rest belong to 46-55 years and above age groups. As per educational majority of the respondents are post graduates and graduates. It can also be inferred that more than 3/4th of the respondents is salaried employee and the rest are students.

Awareness and Usage of AI in Banking and Financial Services: -



It is evident from the above chart that majority (76.4%) of the respondents are aware of usage of AI in banking and financial services.

- All the remaining data were analysed using the SPSS statistical tool- ANNOVA & Co-Relation Co-efficient tools for achieving the objective of the study.

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	46.617	3	15.539	16.324	.000 ^b
	Residual	91.383	96	.952		
	Total	138.000	99			

a. Dependent Variable: 10. Do you find AI tools reliable for financial decision-making?

b. Predictors: (Constant),
 9.How helpful are AI-powered tools (e.g., chatbots, robo-advisors) in providing financial advice?,
 6. Awareness and Usage of AI in Banking and Financial Services. Are you aware that AI powers features like chatbots,
 5, and financial advice in banking apps?,
 8.How frequently do you use AI-powered features in banking or financial apps (e.g., chatbots, investment suggestions)?

Interpretation:- The F-value (16.324) shows that there is high significance on AI usage and reliability in decision making. Where P-value (0.000) which is below 0.05 where the independent variables (AI awareness, frequency of AI usage, and helpfulness of AI tools are more significantly and has an impact on the dependent variable (i.e. reliability of AI tools).

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-1.109	.698		-1.588	.116	-2.495	.277
	6. Awareness and Usage of AI in Banking and Financial Services. Are you aware that AI powers features like chatbots, 5, and financial advice in banking apps?	.284	.161	.160	1.771	.080	-.034	.603
	8.How frequently do you use AI-powered features in banking or financial apps (e.g., chatbots, investment suggestions)?	.213	.087	.226	2.440	.017	.040	.386

9.How helpful are AI-powered tools (e.g., chatbots, robo-advisors) in providing financial advice?	.907	.158	.566	5.757	.000	.594	1.219
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a. Dependent Variable: 10. Do you find AI tools reliable for financial decision-making?

Co-Relation Coefficient Matrix:-

Variables	AI Reliability	Awareness of AI	Frequency of Usage	Helpfulness of AI Tools
AI Reliability	1.000	0.160	0.226	0.566
Awareness of AI	0.160	1.000	-	-
Frequency of Usage	0.226	-	1.000	-
Helpfulness of AI Tools	0.566	-	-	1.000

Interpretation: -

1. The most influential factor affecting the reliability of AI tools in financial decision- making where (B = 0.907, p < 0.001). This suggest that the AI tools are helpful in financial decision making and in risk mitigation.
2. The frequency of AI tool usage has a significant impact and are more reliable and the regular usage increases the trust in AI tools for financial decision making here (B = 0.213, p = 0.017).
3. The frequency of AI tool usage has a significant impact and are more reliable where (B = 0.213, p = 0.017) and the regular usage increases the trust in AI tools for financial decision making.
4. AI awareness is positively correlated with trust (B = 0.284), but it is not statistically significant at the 5% level (p = 0.080).
5. The correlation implies that AI’s role in decision making will be beneficial when the user uses the financial tools effectively.

The below ANOVA and co-relation analysis is for Q11:-

Model		Sumof Squares	df	Mean Square	F	Sig.
1	Regression	26.577	3	8.859	16.174	.000 ^b
	Residual	52.583	96	.548		
	Total	79.160	99			

a. Dependent Variable: 11.To what extent have AI-driven banking apps improved your financial decision-making accuracy?

b. Predictors: (Constant),

9.How helpful are AI-powered tools (e.g., chatbots, robo-advisors) in providing financial advice?,

6. Awareness and Usage of AI in Banking and Financial Services. Are you aware that AI powers features like chatbots,

5, and financial advice in banking apps?,

8.How frequently do you use AI-powered features in banking or financial apps (e.g., chatbots, investment suggestions)?

Interpretation :-

The F-value (16.174) shows that there is high significance on AI driven banking Apps for decision making accuracy. Where P-value (0.000) which is below the 0.05 independent variables (AI awareness, frequency of AI usage, and helpfulness of AI tools are more significantly and has an impact on the dependent variable (i.e., reliability of AI tools).

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.439	.530		.829	.409	-.612	1.490
	6. Awareness and Usage of AI in Banking and Financial Services. Are you aware that AI powers features like chatbots, 5, and financial advice in banking apps?	.241	.122	.179	1.981	.050	.000	.483

8.How frequently do you use AI-powered features in banking or	-.035	.066	-.049	-.524	.601	-.166	.097
financial apps (e.g., chatbots, investment suggestions)?							
9.How helpful are AI-powered tools (e.g., chatbots, robo-advisors) in providing financial advice?	.561	.119	.462	4.695	.000	.324	.798
a. Dependent Variable: 11.To what extent have AI-driven banking apps improved your financial decision-making accuracy?							

Co-Relation Coefficient Matrix: -

Variables	Awareness & Usage of AI	Frequency of AI Usage	Helpfulness of AI Tools
Awareness & Usage of AI	1.000	0.35	0.42
Frequency of AI Usage	0.35	1.000	0.29
Helpfulness of AI Tools	0.42	0.29	1.000

Interpretation: -

1. The most influential factor affecting AI in financial decision-making accuracy and in providing financial assistance where the (B=0.561, P<0.001) This suggest that AI tools play a significant role in enhancing the financial decision making and also in mitigating the risk.
2. The awareness and usage of AI in banking and financial service has a positive impact on financial decision-making accuracy where (B=0.241, P=0.050) among individuals. This shows a there is a significant impact of AI powered tools have improved the decision making
3. The frequency of usage of AI powered tools does not show an impact on financial decision making and accuracy where (B = -0.035, P = 0.601). This shows that the mere usage of AI powered tools does not have a significant impact on the decision making among individuals

4. The AI Awareness and financial decision making has a positive co-relation where ($B=0.241$ and $P=0.050$) indicating that that awareness alone may not be sufficient unless the users actively engage with AI tools.
5. The Co-efficient co-relation implies that AI's role in usage, awareness in AI powered tools has a significant impact in decision making among individuals in Hyderabad.

Results and Discussion: -**AI-Driven Banking and Financial Tools on Decision-Making Accuracy:-**

Overall, it can be inferred from the analysis that the majority of respondents are aware of AI-driven tools used in banking and financial services, with a significant portion finding these tools helpful in improving the accuracy of their financial decisions. The most influential factor impacting both decision-making accuracy and perceived reliability of AI tools is the usefulness of AI features like chatbots and robo-advisors, which provide relevant and timely financial advice. This reinforces the importance of perceived usefulness, a core element of the Technology Acceptance Model (TAM), over other factors like awareness or frequency of usage. FinTech companies, and government agencies intensify efforts to increase both awareness and trust in AI-driven tools through educational campaigns and digital literacy programs. Special emphasis should be placed on demonstrating the practical benefits and reliability of AI tools in areas such as fraud prevention, budgeting, and investment planning to mitigate financial risks. Furthermore, the development and deployment of more user-centric, personalized AI applications in banking services can significantly enhance user confidence. Financial institutions can also consider integrating interactive guidance or advisory features that help users better understand the logic behind AI suggestions, thus improving transparency and trust. To support this progress, organizations especially in urban and semi-urban regions should introduce AI literacy and financial empowerment programs to help individuals navigate digital tools effectively. These steps will not only promote the use of AI technologies in banking but also empower individuals to make more informed, accurate, and risk-mitigated financial decisions.

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