









“Robo-advisors and investment decisions: Assessing the impact of the “snakebite” effect and social-emotional well-being & resilience”

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ARTICLE INFO	Niyaz Panakaje, S. M. Riha Parvin, Niha Sheikh, Shakira Irfana, Madhura K., Jeevan Raj and Tushar Soubhari (2025). Robo-advisors and investment decisions: Assessing the impact of the “snakebite” effect and social-emotional well-being & resilience. <i>Investment Management and Financial Innovations</i> , 22(1), 453-468. doi: 10.21511/imfi.22(1).2025.34
DOI	http://dx.doi.org/10.21511/imfi.22(1).2025.34
RELEASED ON	Tuesday, 25 March 2025
RECEIVED ON	Sunday, 08 December 2024
ACCEPTED ON	Tuesday, 04 March 2025
LICENSE	 This work is licensed under a Creative Commons Attribution 4.0 International License
JOURNAL	"Investment Management and Financial Innovations"
ISSN PRINT	1810-4967
ISSN ONLINE	1812-9358
PUBLISHER	LLC “Consulting Publishing Company “Business Perspectives”
FOUNDER	LLC “Consulting Publishing Company “Business Perspectives”



NUMBER OF REFERENCES

46



NUMBER OF FIGURES

5



NUMBER OF TABLES

7

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BUSINESS PERSPECTIVES



LLC "CPC "Business Perspectives"
Hryhorii Skovoroda lane, 10,
Sumy, 40022, Ukraine
www.businessperspectives.org

Received on: 8th of December, 2024

Accepted on: 4th of March, 2025

Published on: 25th of March, 2025

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Niha Sheikh, Shakira Irfana, Madhura
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**Conflict of interest statement:**

Author(s) reported no conflict of interest

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ROBO-ADVISORS AND INVESTMENT DECISIONS: ASSESSING THE IMPACT OF THE "SNAKEBITE" EFFECT AND SOCIAL-EMOTIONAL WELL-BEING & RESILIENCE

Abstract

Considering the snakebite effect experience of investors and their decision-making in the era of robo-advisors, this study focuses on examining the mediating role of the snakebite effect between the value of robo-advisors and investment decisions and assessing the moderation of social-emotional well-being and resilience among active investors. The research process began with an exhaustive review of existing literature and the development of a structured questionnaire. A further survey was undertaken by collecting 361 responses from active investors residing in the region of South India using robo-advisors, and finally, the mediation and moderation were analyzed utilizing confirmatory factor analysis (CFA) to check the model fit and Structural Equation Modelling (SEM) to test hypothetical relationships. The results validate the intervening role of the Snakebite Effect in the relationship between the value of Robo-Advisors and investment decision-making. Further, social emotional well-being and resilience of investors significantly lessen the negative impact of the snakebite effect on investment decision-making. The role of social-emotional well-being and resilience is vital as high tendency leads to a low snakebite effect, better effectiveness of robo-advisors, and investment decision-making. This study provides various theoretical, practical, and managerial implications for improved robo-advisory services and increased adoption among diverse investor segments. In particular, the study emphasizes that financial institutions should focus on hybrid advisory models that combine the analytical capabilities of robo-advisors with the empathetic, personal touch of human advisors.

Keywords

robo-advisors, snakebite effect, investment decisions,
social-emotional well-being, resilience

JEL Classification

G11, G23, D14

INTRODUCTION

Can artificial intelligence replace traditional financial advisors? With global assets managed by robo-advisors projected to reach \$2.8 trillion by 2025, the financial industry is witnessing a paradigm shift toward AI-powered investment solutions that offer cost-efficient and data-driven decision-making. These platforms have democratized access to financial markets, improving portfolio management and reducing behavioral biases. Yet, cognitive biases, such as the snakebite effect, where investors avoid risk due to past financial losses, continue influencing investment decisions, discouraging risk-taking even in favorable conditions. Understanding these biases and their interaction with robo-advisory services is crucial for financial institutions, fintech firms, and policymakers aiming to enhance investor confidence and market participation.

Despite the rise in robo-advisors' utilization, few studies have evidenced the impact of biases, such as the snakebite effect, or how social-emotional well-being and resilience can moderate investment decisions. Much of the literature discusses the technological efficiency of robo-advisors but does not explain how psychological traits influence the adoption of robo-advisors. This study investigates this gap by analyzing the mediating role of the snakebite effect and the moderating role of social-emotional well-being and resilience in investment decisions.

It also probes into three critical antecedents: the value of robo-advisors, regarded as one of the drivers of investors' trust in AI-driven financial advice; the snakebite effect, which refers to risk aversion resulting from past financial losses; and social-emotional well-being and resilience, each influencing decision-making. The study, informed by Prospect Theory and the UTAUT, develops a mediated moderated model to assess how investment decisions are made based on behavioral and psychological factors.

The present study investigates the snakebite effect, how it acts as a mediator, how its impact is moderated by social-emotional well-being and resilience, and provides theoretical and managerial implications on how the adoption of robo-advisors can be improved. This study bridges the gap between behavioral finance and fintech adoption by underlining that hybrid advisory models, which combine AI-driven analysis with human financial advisory support, are required to build investor confidence and facilitate informed decisions.

1. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Robo-advisors have changed the way investment decision-making is done, using the power of algorithm-driven automation to offer personalized, cost-effective, and financial advice. With the capacity to increase efficiency, reduce biases, and access financial advice for everyone, robo-advisors are more and more adopted (Bianchi et al., 2021). However, the Unified Theory of Acceptance and Use of Technology (UTAUT) creates a robust framework to understand the adoption and effectiveness of these technologies focusing on the following constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions (Belanche et al., 2019). As is revealed by studies such as improved risk-adjusted returns and portfolio rebalancing among users (Rachman & Sukmadilaga, 2022), robo-advisors adoption rates are driven by performance expectancy – the idea that robo-advisors improve investment outcomes. It has been empirically supported that robo-advisors reduce cognitive biases and increase the rationality of investment decisions indirectly (Back et al., 2021). Robo-advisors help in mitigating the snakebite effect, a behavioral bias when investors shun away from an investment based on previous loss due to the cold

distancing data-based advice (Darskuviene & Lissauskiene, 2021).

The snakebite effect is a psychological bias that people do not take risks because in the past they have lost money or because they have bitter memories of similar situations. Such a behavior becomes very important in investment decisions because past losses were discouraged not only in making further investments only when opportunities were not favorable but also even when they were (Rachman & Sukmadilaga, 2022). Empirical studies show how the snakebite effect for which a theoretical prototype is proposed mediates the relationship between robo-advisors and improved investment decisions. Prospect theory and further behavioral finance theories explain this phenomenon in that perceived losses count more when it comes to decision-making (Kahneman & Tversky, 2018). During periods of market volatility, however, robo-advisors save the day and help defend against biases such as the snakebite effect. By offering objective advice against emotional reactions, they help investors keep their long-term strategies (Liu et al., 2023). Robo-advisors reduce the psychological barriers that came before the investment losses, encouraging consistent and rational choices (Bonelli & Dongul, 2023). This makes them invaluable tools for first-generation modern investors navigating complex financial landscapes (Cheong et al., 2023).

With regard to social-emotional well-being, emotional regulation, resilience, and forming and sustaining positive social connections can buffer the negative consequences of previous financial failures (Singh et al., 2023). Having a high emotional intelligence, which is a crucial element of well-being, makes investors capable of reading past losses positively, and so involved in future investment opportunities in a more rational way (Siloam & Gunawan, 2023). They point out that emotional stability is positively related to the social environment, and studies show that the best way to balance risk and reward evaluation is when investors make use of the social environment (Yen Xuan, 2022). Investor decisions also depend on emotional labor, such as high emotional labor perceived as authentic passion or emotional displays to stimulate trust and willingness to invest (Singh et al., 2023). Wellbeing becomes fundamental in volatile financial environments where regulated emotions allow for resilience and retention of long-term strategies during short-term disturbances (Dardana & Elgeka, 2023). Social and emotional factors play a role in investment behaviors reinforcing rationality in decision-making processes, through social validation and emotional reinforcement (Husnah et al., 2023). As an example, investors in supportive networks are more likely to utilize advanced tools, including robo-advisors, to overcome emotional biases and optimize investment outcomes (Zhou et al., 2023). Similarly to well-being, resilience as a dimension of well-being also provides investors with the ability to make sense of previous setbacks so they may again understand and resolve risks constructively (Cahyono, 2023).

The Unified Theory of Acceptance and Use of Technology (UTAUT), and Prospect Theory, explain the techno adoption and the techno risk assessment processes shaping the investment decision process. UTAUT identifies four core factors influencing investment behavior: performance expectancy, effort expectancy, social influence, and facilitating conditions. With UTAUT and Prospect Theory, we derive a complex interplay between technological acceptance and psychological biases. Cumulative Prospect Theory goes beyond traditional loss aversion by introducing probability distortion, enhancing the way investors perceive risks in situations with unpredictability (Su & Sun, 2023). They use these insights by match-

ing the risk-reward profiles with the individual's psychological profile to build trust and perceived control, which in turn moderates the relationship between technology usage and financial decision making (Park & Oh, 2022). This integration shows that psychological and technological factors are quite important in making investment decisions.

Investment decision making is a field of extensive research, however, there are several gaps in the literature of understanding the interactive effects of psychological and technological factors, specifically at the intersection of frameworks such as Unified Theory of Acceptance and Use of Technology (UTAUT) and Prospect Theory. While UTAUT captures well the variables that drive the uptake of technologies like robo-advisors, the empirical evidence on how these factors interact with behavioral biases, whether investors in general or investors suffering from the Snakebite Effect that buy after losses are willing to take more risks. Just like that, Prospect Theory will offer vitally important means to understand the role that loss aversion and mental accounting play in this arena, but their integration with the technology-driven financial tools is not well explored. Although existing literature has largely neglected the manner in which robo-advisors mediate between risk-reward perceptions and individual cognitive biases, and across social-emotional well-being and resilience, much of the extant literature has overlooked this important area of mediation. In terms of observing social well-being and resilience, which influence psychological recovery from the impact of loss aversion and their subsequent adoption of advanced financial technologies, the advancement is largely underexplored. In addition, no study reviews the dynamic impact of facilitation conditions (e.g., user friendly platforms, real time data) that reduce emotional and psychologically barriers in a high stress marketplace. Trust, optimism, and perceived control have long been recognized as critical mediators of technology adoption and yet there has been little supporting empirical evidence of how Prospect Theory psychological constructs, such as loss sensitivity and framing, interact with their mediators.

This study investigates the effect of the effectiveness of robo advisors on investment decisions, focusing on the influence of past financial losses,

the well-known snakebite effect. Also, this search further explores how social emotional wellbeing, emotional resilience, mediate this relationship. It asks whether robo advice can bring data driven and therefore unbiased advice to investors which can help steer them away from emotional biases and towards more rational decision making when it comes to investing. The study also seeks to look into the extent to which emotional stability and supportive social factors help investors to overcome prior losses and reengage in making cash decisions. This study addresses these dynamics to encourage insights to improve robo-advisory tool design and effectiveness in environments that involve complex subjective experience and emotion. According to this, following hypotheses have been developed such as:

- H1: The value of robo-advisors significantly predicts investment decisions among investors.*
- H2: The value of robo-advisors remarkably impacts the snakebite effect among active investors.*
- H3: Snakebite effect has a negative influence on investment decisions.*
- H4: Snakebite effect mediates the relationship between the value of robo-advisors and investment decisions among investors.*
- H5: Social-emotional well-being and resilience lessen the negative impact of the snakebite effect on investment decisions.*

Based on the above concept, theory, and review, the following conceptual model is proposed (see Figure 1).

2. METHOD

2.1. Sample and data collection

The study addressed the mediating role of the Snakebite Effect between the value of robo-advisors and investment decisions with the moderation of social-emotional well-being and resilience among the active investors situated in the cities known for large number of active investors who use robo-advisors in the region of South India. These “emerging cities” were selected because they have growing digitalization, internet penetration, rich cultural heritage, which is believed to shift people from traditional ways of investing to online. Employing a Likert-type scale ranging from “strongly disagree” to “strongly agree” on a five-point scale, the structured questionnaire is designed to elicit responses from the sample. The structured questionnaires were administered to active investors through in person and online platforms such as email, online surveys, etc. A total of 361 responses were collected using a purposive sampling technique to select individuals with a minimum of five years of experience in stock trading, ensuring a diverse representation of investor profiles. Moreover, they are selected for their active engagement with digital financial platforms, especially the users of robo-advisors. The sample was chosen to understand the behavioral dynamics of tech-savvy investors in a rapidly digitizing economy.

Particular emphasis was placed on ethical factors, such as gaining participants’ informed agreement and maintaining the confidentiality and anonymity of their responses. To further mitigate mistakes and biases throughout the data collecting process, rigorous quality control methods were used.

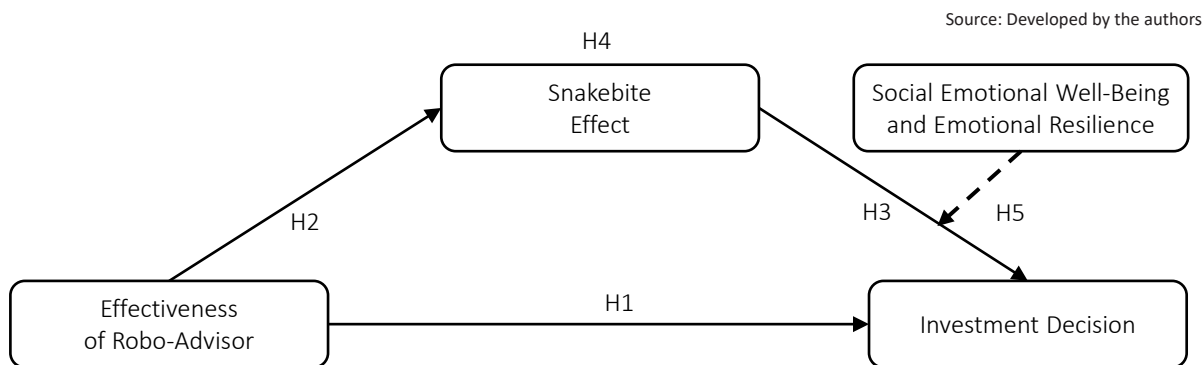


Figure 1. Proposed conceptual model

2.2. Description of participants (Sample profile)

Of the responses received, the majority (54.3%) of respondents were between the ages of 18 and 25, and 25.8% of investors were between the ages of 26 and 35. The largest number of male investors (61.5%) took part in the survey, the majority of respondents were postgraduate students (57.1%), and 30.2% were undergraduates. Moreover, most of the respondents were students (43.2%), followed by salaried professionals (36.8%), consisting majority of the investor's annual income below 3,00,000 (52.4%), living in urban (42.4%) area. In addition to that, single investors were found to be the highest (63.2%) compared to married (31.6%) who filled the survey. Moreover, the majority of investors (49.6%) have less than 1 year of stock market investment experience using robo-advisors, having Wealth Creation (37.4%) as the primary investment goal in the stock market (robo-advisors). Further, most investors, 49.9%, preferred the Groww application for Robo-Advisors for stock market investments, investing occasionally (24.9%) in the stock market using robo-advisors. Lastly, most of investors (28.76%) refer stock market analysts/reports, and 27.29% of them consider Financial News (TV, Newspapers, Websites) as their primary source of information for stock market investments (using robo-advisors).

2.3. Measurements

The study used a structured questionnaire, with part one covering sample demographics, and part two focusing on the value of robo-advisors, snakebite effect, investment decisions, social-emotional well-being, and resilience.

The role of robo-advisors (10-item scale) was measured using items from Yi et al. (2023). Snakebite effect (9-item scale) was measured using items from Kuo et al. (2013), Himanshu et al. (2021), and Soubhari (2023). Social-emotional well-being and resilience (7 item scale each) was measured using items from Saltalı et al. (2018). Investment Decision (5-item scale) was measured using items from Waweru et al. (2008), Qureshi (2012), Shahzad et al. (2024), and Soubhari (2023).

2.4. Data analysis techniques and tools

SPSS 26 and AMOS 23 were used for analysis, including percentage analysis, one-way ANOVA, Confirmatory Factor Analysis (CFA), measurement model, and structural equation modeling (SEM). AMOS was applied to evaluate the measurement model to test the psychometric properties and the structural model to assess the mediation of the snakebite effect and moderation of social-emotional well-being and resilience within a cross-sectional analysis framework. SEM was used to identify the contribution and assess the path between each variable indicated in the theoretical framework.

2.5. Reliability and construct validity

Hair et al. (2010)'s recommendations must be fulfilled to verify the validity and reliability of the constructs and dimensions. The measurement model assessment discovered the factor loadings above .60, the threshold, each indication that was provided was judged to be valid and could not be eliminated (Table 1). The results indicated a favorable index of goodness of fit, as recommended by Hu and Bentler (1999) (SRMR = 0.051; GFI = 0.911; AGFI = 0.913; CFI = 0.903; NFI = 0.903; RMSEA = 0.065). The construct validity test is a vital method used in research papers to figure out to what extent a measuring tool fits the theoretical construct it is aimed to examine (Strauss & Smith, 2009). This validation process has an instrumental function in verifying the congruence between the data gathered and the provided research objectives, strengthening the overall validity and reliability of the study (Segars & Grover, 1998). Two different aspects are commonly examined, particularly in the realm of construct validity, which are convergent validity and discriminant validity. Composite reliability was utilized to assess the reliability of variables. Firstly, the factor loading for each factor was computed and all the items were preserved since the factor loading was greater than 0.600. Table 2 demonstrates the results of reliability and validity for each and every item where CR values for all the variables were more than the recommended value of 0.700. Furthermore, the Average Variance Extracted (AVE) values and CR values were more or close to 0.500 and 0.700, respectively, that declares convergent validity (Shrestha, 2021).

2.6. Discriminant validity

Fornell and Larcker criterion is the most commonly recognized method for assessing the discriminant validity, it investigates the correlation between constructs and their average variance extracted. The values of Average Variance Extracted are all greater than the threshold value, that is 0.50 (Fornell & Larcker, 1981). Additionally, conforming discriminant validity

is the evidence that these significant inter-construct correlations, nevertheless moderate to high, are less than the square roots of the AVEs (Fornell & Larcker, 1981). Overall, the constructs are reliable and valid for assessing their respective categories, as per this comprehensive evaluation. Table 2 and Figure 2 depict that discriminant validity is not an issue since the highlighted diagonal values are greater than the correlation between the constructs.

Table 1. Factor loadings, reliability, and convergent validity results

Source: Output of primary data using AMOS.

Item Code	Statements	Component				Mean ± S.D.	CFA Loading
		1	2	3	4		
Construct							
RA6	I feel more secure knowing that robo-advisors are involved in my financial decision-making process.	.806				3.7895 ±.91894	.842
RA7	I am confident in using robo-advisors to achieve my financial goals.	.803				3.7119 ±.93696	.817
RA9	Robo-advisors provide timely updates and recommendations that enhance my stock market investment decisions.	.780				3.7618 ±.96826	.807
RA8	I would recommend robo-advisors to friends and family for investment management.	.777				3.7452 ±.93178	.817
RA5	I trust that robo-advisors prioritize my financial interests and offer honest advice.	.768				3.7562 ±.93474	.818
RA2	I can closely monitor and manage my financial affairs using robo-advisors.	.745				3.8615 ±.93255	.764
RA10	Robo-advisors effectively monitor market trends, helping me achieve better results in stock market investments.	.744				3.7922 ±.93008	.800
RA4	Robo-advisors enhance my productivity and effectiveness in managing my stock market investments.	.742				3.8089 ±.91562	.788
RA3	Robo-advisors provide investment advice relevant to my risk tolerance and financial goals.	.742				3.7729 ±.92101	.775
RA1	Using robo-advisors has reduced the time I spend managing my stock market portfolio.	.628				3.9861 ±.88965	.661
Role of Robo-Advisors: Mean = 3.7986, S.D. = 0.9279, C.R = 0.899, Square root of AVE = 0.790, AVE = 0.625							
SB4	I don't want to invest in high-risk stocks though they bring huge returns.		0.755			3.6814 ±1.01429	0.680
SB6	When the price drops temporarily, I sell the stocks to prevent losses.		0.734			3.5734 ±1.09329	0.658
SB3	I try to avoid buying stocks in which I had incurred losses earlier.		0.695			3.6842 ±.97183	0.657
SB9	I am not ready to challenge my bright future by investing in inappropriate stocks.		0.653			3.8449 ±.97939	0.771
SB5	I search for opportunities for repeated buying of such stocks in which I made gains earlier.		0.627			3.8476 ±.88289	0.714
SB7	I believe in the saying, "Fool me once – shame on you, fool me twice – shame on me".		0.609			3.6898 ±.98496	0.684
SB2	When considering changing my equity portfolio, I spend time thinking about options but often end up changing nothing sometimes.		0.599			3.9086 ±.85956	0.749
SB8	Having lost my investments initially, I am very much cautious in my further decisions.		0.518			3.8476 ±.90465	0.757
SB1	The pain of financial loss is at least two times stronger than the pleasure of financial gain.		0.508			4.0554 ±.79738	0.724
Snakebite effect: Mean = 3.7925, S.D. = 0.9431, C.R = 0.902, Square root of AVE = 0.712, AVE = 0.506							

Table 1 (cont.). Factor loadings, reliability, and convergent validity results

Item Code	Statements	Component				Mean ± S.D.	CFA Loading
		1	2	3	4		
Construct							
SEW4	I maintain a positive outlook on future investments even after setbacks.			.763		4.0000 ±.87560	.805
SEW7	I remain focused on long-term goals, even when short-term investments perform poorly.			.756		3.9086 ±.88817	.793
SEW3	I can effectively manage my emotions when market volatility affects my portfolio.			.750		3.9612 ±.92715	.708
SEW5	I seek advice or alternative strategies when my investments do not perform as expected.			.739		3.8975 ±.92076	.790
SEW2	I can recover quickly from stress caused by investment failures.			.735		3.9252 ±.92042	.711
SEW1	After experiencing financial losses, I remain calm and composed.			.618		4.0471 ±.91621	.641
SEW6	I am able to adjust my investment strategy without becoming overly anxious after a financial loss.			.617		3.9363 ±.89990	.711
Social Emotional Well-Being and Resilience: Mean = 3.9537, S.D. = 0.9069, C.R = 0.893, Square root of AVE = 0.739, AVE = 0.546							
ID2	I make investment decisions based on a well-balanced portfolio that aligns with my financial goals.				.739	4.1247 ±.80172	.708
ID4	I am confident in my ability to make informed decisions regarding my investments.				.719	3.9252 ±.86760	.756
ID1	I carefully assess the risk and potential returns before making any investment decisions.				.713	4.2548 ±.82757	.713
ID5	I base my investment choices on data and analysis rather than emotion or external influences.				.710	4.0388 ±.87790	.753
ID3	I consider past performance and market trends when making investment decisions.				.700	4.0970 ±.80209	.749
Investment Decision: Mean = 4.0881, S.D. = 0.8353, C.R = 0.855, Square root of AVE = 0.736, AVE = 0.542							

Note: VRA: Value of Robo-Advisors; SBE: Snakebite Effect; ID: Investment Decisions; SEW: Social Emotional Well-Being and Resilience.

Table 2. Discriminant validity using the Fornell-Larcker criterion

Source: Output of primary data using AMOS.

	VRA	ID	SEW	SBE
VRA	0.790			
ID	0.531***	0.736		
SEW	0.563***	0.620***	0.739	
SBE	0.621***	0.657***	0.579***	0.712

Note: VRA: Value of Robo-Advisors; SBE: Snakebite Effect; ID: Investment Decisions; SEW: Social Emotional Well-Being and Resilience.

3. RESULTS

First, a one-way ANOVA was carried out to examine the variation in the Investment Decision, Snakebite effect, and Value of Robo-Advisors factors among investors with varied levels of Social-Emotional Well-Being and Resilience. Subsequently, the direct effect of the Value of Robo-Advisors on the Snakebite Effect and investment decisions, the direct effect of Social-emotional well-being and resilience on investment

Table 3. Disparity between social-emotional well-being and resilience

Source: Output of primary data using SPSS.

Variable	DS	Low (107)	Moderate 140)	High (103)	Total (114)	F	P
Investment Decision	Mean	3.6822	4.0843	4.4737	4.0881	49.647	.000
	S.D.	.76625	.50384	.49009	.66508		
Snakebite Effect	Mean	4.1530	3.7770	3.4289	3.7926	38.879	.000
	S.D.	.69781	.48248	.66213	.67188		
Value of Robo-Advisors	Mean	3.3551	3.8064	4.2053	3.7986	43.288	.000
	S.D.	.71497	.60278	.73060	.75445		

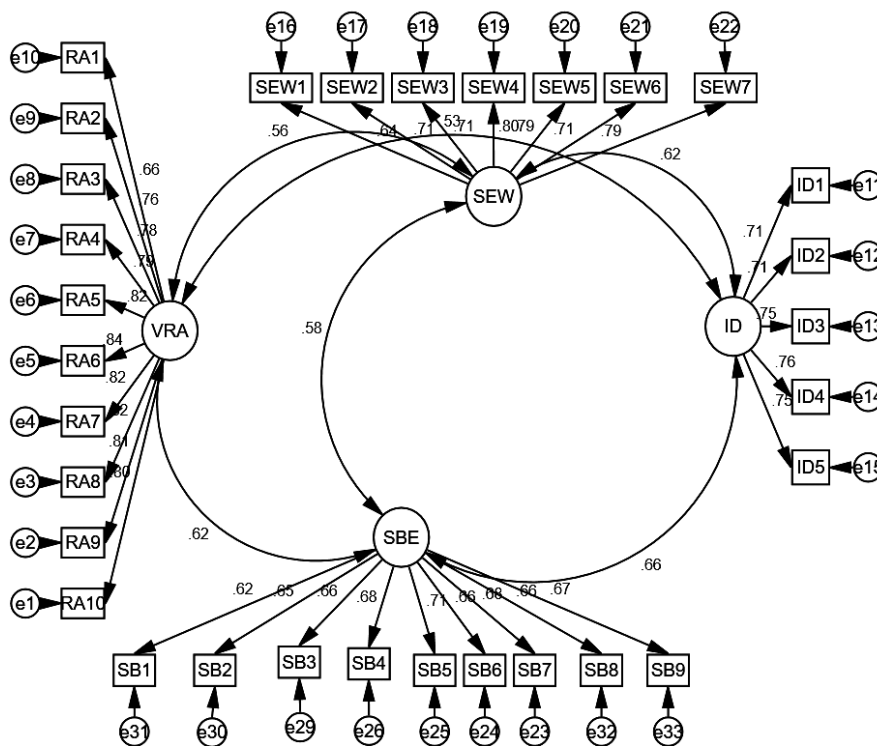


Figure 2. Confirmatory factor analysis

decisions, and the mediating role of the Snakebite Effect were examined. Besides that, a moderation role of Social-emotional well-being and resilience was also examined.

The level of Social-Emotional Well-Being and Resilience was examined using one-way ANOVA (see Table 3). The results indicated those who have a high level of Social-Emotional Well-Being and Resilience resulted in better Investment Decision Making ($M = 4.4737$; $SD = .49009$), and investors facing low Social-Emotional Well-Being and Resilience indicate a moderate level of Investment Decision Making ($M = 3.6822$; $SD = .76625$), depicting significant differences between various levels of Social-Emotional Well-Being and Resilience in investors' Investment Decisions ($M = 4.0881$, $F = 49.647$, $p = 0.000$). Similarly, investors with low Social-Emotional Well-Being and Resilience result in a high Snakebite effect ($M = 4.1530$; $SD = .66213$), where in contrast to that, investors consisting high Social-Emotional Well-Being and Resilience result in a moderate level of the Snakebite effect ($M = 3.4289$; $SD = .66213$), whereby, the Snake-bite effect significantly differs among the various levels of investors' Social-Emotional Well-Being and

Resilience ($M = 3.7926$, $F = 38.879$, $p = 0.000$). Moreover, those who have a high level of Social-Emotional Well-Being and Resilience, high value of Robo-Advisors ($M = 4.2053$; $SD = .73060$) and investors facing low Social-Emotional Well-Being and Resilience value Robo-Advisors moderately ($M = 3.3551$; $SD = .71497$), indicating significant differences in the Value of Robo-Advisors among various levels of investors' Social-Emotional Well-Being and Resilience ($M = 3.7986$, $F = 43.288$, $p = 0.000$).

3.1. Structural model assessment

SEM is the most extensively utilized statistical approach for analyzing the complex relationship between the conceptual framework's hidden and observable variables. While incorporating measurement error into account and predicting numerous connections in a single model, it allows researchers to evaluate causal relationships between variables, facilitating hypothesis testing.

3.2. Direct effect

SEM is employed in this study to examine the direct correlation between the Value of Robo-

Table 4. Direct effect of the value of robo-advisors and snakebite effect

Source: Output of primary data using AMOS.

Hypothesis	Relationship	Standardized Regression Estimate	S.E.	C.R.	P	Label
H1	VRA → ID	.605	.039	15.513	***	Highly Significant
H2	VRA → SBE	.587	.041	14.317	***	Highly Significant
H3	SBE → ID	-.488	.047	-10.383	***	Highly Significant

Note: VRA: Value of Robo-Advisors; SBE: Snakebite Effect; ID: Investment Decisions.

Advisors and investment decisions, as well as between the Snakebite Effect and investment decisions. Further, the mediating role of the Snakebite Effect in the relationship between the Value of Robo-Advisors and investment decisions was examined.

Table 4 shows that the Value of Robo-Advisors significantly predicts investment decisions among investors ($\beta = .605$, $t = 15.513$, $p = 0.000$) (*H1* is proved), since they supply data-driven, personalized insights, which increases investor confidence and decision-making effectiveness. Also, the Value of Robo-Advisors remarkably impacts the Snakebite Effect among investors ($\beta = .587$, $t = 14.317$, $p = 0.000$) by supplying independent advice, which could reduce fear caused by past losses and foster smarter investing choices (*H2* is proved). Moreover, the Snakebite Effect has a negative influence on investment decisions ($\beta = -.488$, $t = -10.383$, $p = 0.000$) because it creates an emotional bias that enables

investors to be overly cautious and resistant to take calculated risks even in favorable situations (*H3* is accepted).

3.3. Mediation analysis

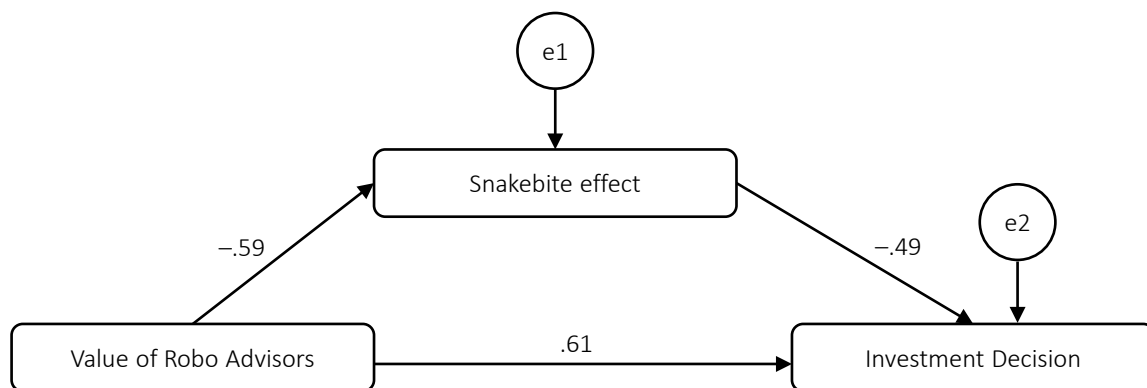
To test the mediating role of the Snakebite Effect, a mediation analysis was carried out. Table 5 and Figure 3 show that the Value of Robo-Advisors directly impacts investment decisions among investors (direct effect: 0.286) by rendering clear and unbiased guidance to the investors. Additionally, the Value of Robo-Advisors mitigates the Snakebite Effect, which could be by reducing emotional biases and fear from past loss experiences (Indirect effect: -0.287), therefore, the Snakebite Effect mediates the relationship between the Value of Robo-Advisors and investment decisions among investors. In addition, the overall effect of the Value of Robo-Advisors indicates (Total effect: 0.319) their crucial role in improving rational investment decisions (*H4* has proved to be true).

Table 5. Mediating effect of the snakebite effect (*H4*)

Source: Output computed using AMOS.

Hypothesis	Path	Total Effect	Direct Effect	Path	Indirect Effect	P value	Remarks
H4	VRA → ID	.319	.605	VRA → SBE → ID	-.287	.000	Supported

Note: VRA: Value of Robo-Advisors; SBE: Snakebite Effect; ID: Investment Decisions, SBE: Social Emotional Well-Being and Resilience.

**Figure 3.** Mediating role of the snakebite effect in the relationship between the value of robo-advisors and investment decisions

Moderating effects of social-emotional well-being and resilience.

The moderating role of Social-Emotional Well-Being and Resilience on the interconnectedness between the Snake-bite effect and Investment Decision has additionally been examined. The findings depicted the direct and negative impact of the Snakebite Effect on investors' investment decisions ($\beta = -.323$, $t = -7.512$, $p = 0.000$), which means that a higher Snakebite Effect by itself results in hesitant behavior, which causes lower investment decisions. However, Social-Emotional Well-Being and Resilience among investors notably influence investors' investment decisions ($\beta = .581$, $t = 11.857$, $p = 0.000$), which implies that an individual who possesses greater emotional resilience tends to be slightly risk averse and thus is more likely to invest despite the impact of previous financial losses. Moreover, the significant but negative moderating influence of the Snakebite Effect on the interconnectedness between the Value of Robo-Advisors and investment decisions ($\beta = -.156$, $t = -3.805$, $p = 0.000$) was witnessed by the results which suggest that the negative impact of the Snakebite Effect on investment decisions

is partially mitigated by Social-Emotional Well-Being and Resilience, supporting *H5* (see Table 6 and Figure 4).

Figure 5 summarizes the moderation impact of the Snakebite Effect. The results suggest that investors with high Social-Emotional Well-Being and Resilience indicated higher investment decisions (4.06 to 3.102) even when the increase in the Snakebite Effect is identified as compared to those having a high negative Snakebite Effect, depicting lower investment decisions (2.586 to 2.252). This implies that higher Social-Emotional Well-Being and Resilience lessen the negative impact of the Snakebite Effect on investment decisions.

To sum up, as demonstrated in Table 7, the Value of Robo-Advisors significantly predicts investment decisions among investors ($\beta = .605$, $t = 15.513$, $p = 0.000$) by providing unbiased, fact-based guidance. Also, the Value of Robo-Advisors helps mitigate the Snakebite Effect, (Indirect effect: -0.287) indirectly. Additionally, social-emotional well-being and resilience lessen the detrimental impact of the Snakebite Effect on investment decisions. Similarly, the Snakebite Effect is highly negative

Table 6. Moderating effects of social-emotional well-being and resilience

Source: Output of primary data using AMOS.

Hypothesis	Path	Beta	S.E.	t	P Value	Remarks
<i>H5</i>	SBE → ID	-.323	.043	-7.512	.000	Supported
	SWBR → ID	.581	.049	11.857	.000	Supported
	Intercept → ID	-.156	.041	-3.805	.000	Supported

Note: VRA: Value of Robo-Advisors; SBE: Snakebite Effect; ID: Investment Decisions; SWBR: Social Emotional Well-Being and Resilience.

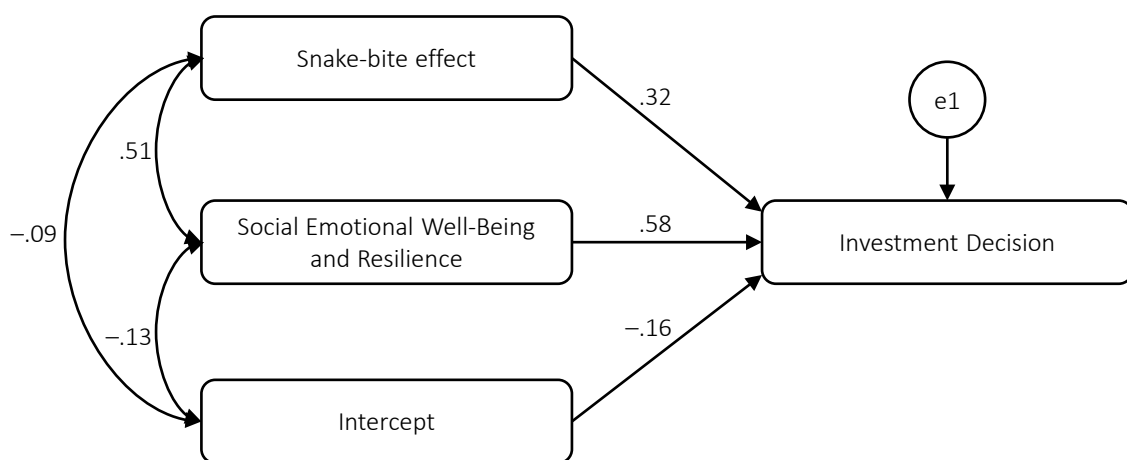


Figure 4. Moderating effects of social-emotional well-being and resilience

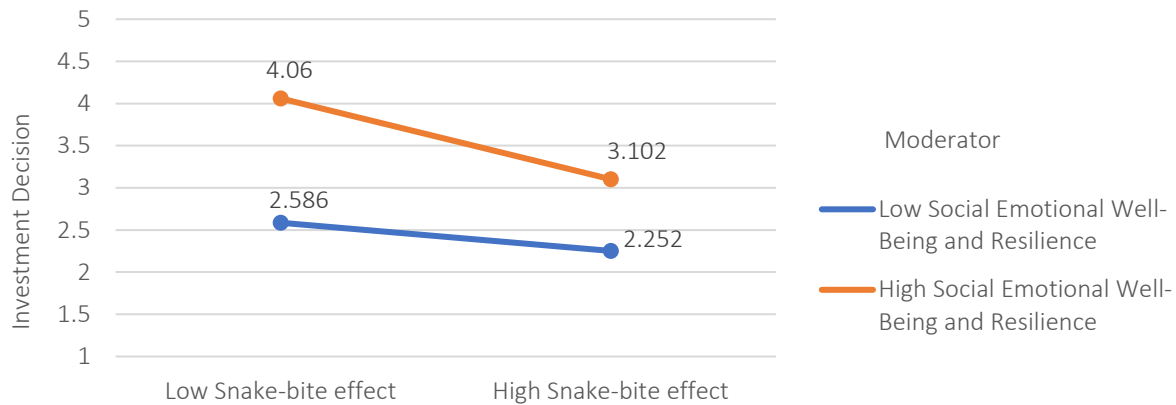


Figure 5. Moderating role of social emotional well-being and resilience in the relationship between snakebite effect and investment decision

Table 7. Summary of path estimate

Source: Output of primary data using AMOS.

Effect	Path Coefficient	P Value
Direct Effect		
Value of Robo Advisor → Investment Decision	.605*	0.000
Indirect Effect		
Value of Robo-Advisors → Snakebite effect → Investment Decision	-.287*	0.000
Snakebite effect → Investment Decision	-.488*	0.000
Moderating Effect		
Social Emotional Well-being and Resilience (MMV)		
Level		0.000
Low	-.668*	0.000
Moderate	-.493*	0.000
High	-.408*	

when social-emotional well-being and resilience are low (-0.668^*); however, when the negative effects get lesser, the social-emotional well-being and resilience rise to moderate (-0.493^*) and high (-0.408^*) levels. In general, robo-advisors and high social-emotional well-being and resilience are significant factors in boosting better investment decisions.

4. DISCUSSION

The findings of this study highlight the subtle influence of social and emotional well-being (SEW) and resilience on the investment decision-making process through a snakebite effect and the adoption of robo-advisors. Investors with higher levels of social-emotional well-being and resilience have a better potential to reduce the negative impacts of past financial losses, thus enabling rational and

confident decision-making (Bai, 2023). This aligns with Ensz (2024), who established that resilience allows people to turn failures into an opportunity to learn and thus increase their capacity to cope with risk. Emotional stability has been known to promote coherence in decision-making so that one eases off on investment strategies in the long term despite short-term fluctuations in the market.

The results of the study further substantiate this relationship, highlighting the pivotal role of social-emotional well-being and resilience in shaping investment decisions. Investors with high SEW and resilience demonstrated significantly better investment decision-making outcomes compared to those with low SEW and resilience levels with the disparity being statistically significant. This difference can be attributed to the ability of emotionally resilient individuals to manage stress and maintain composure, allowing them to assess financial

risks more objectively and make well-informed decisions. Moreover, high SEW and resilience levels were associated with lower susceptibility to the snake-bite effect, whereas those with low SEW and resilience experienced significantly higher levels of this emotional bias. This suggests that psychological stability and emotional regulation are critical in reducing the impact of past financial losses, which often deter investors from pursuing favorable opportunities.

Robo-advisors were also found to significantly enhance investment outcomes, with their perceived value varying notably based on the investors SEW and resilience levels. Investors with high SEW and resilience viewed robo-advisors more positively than those with low SEW and resilience, a statistically significant difference. This disparity can be explained by the fact that individuals with higher SEW and resilience are more likely to trust and engage with technology, recognizing its ability to provide unbiased and data-driven guidance. Conversely, those with lower SEW and resilience may harbor skepticism or find it challenging to rely on automated tools, reflecting their emotional hesitation and reduced adaptability to new financial technologies. These findings underline the necessity of integrating psychological support with technological solutions to maximize the effectiveness of robo-advisory platforms.

This would mitigate the snakebite effect with the unbiased data-driven advice provided by robo-advisors. This study's findings corroborate those of Back et al. (2023), who pointed out that such tools minimize cognitive and emotional biases to facilitate wiser investment decisions. Similarly, Xia et al. (2023) pointed out that robo-advisors can stabilize investors during periods of turbulence in the market and save them from emotional moves that disrupt long-term goals. However, contrasting views exist, with Tan (2020) suggesting that the extreme use of robo-advisors will make investors alienate from the fundamental financial literacy that might reduce their capacity to self-sufficiently determine an opportunity for investment over time.

The results of this study concerning moderation by social-emotional well-being and resilience are supported by the fact that Roongruangsee and

Patterson (2023) mentioned that psychological comfort and emotional stability enhance the efficiency of robo-advisors. This would fall in line with the UTAUT model whereby performance expectancy has a direct relation to the adoption and placing of trust in technology. However, Belanche et al. (2014) confirmed that social validation is indeed one of the most important factors that can lead to increased trust in technology, as reflected by Pimentel et al. (2019). However, as considered by Hodge et al. (2021), anthropomorphizing robo-advisors for such a role may have the adverse effect of increasing user biases, which then contributes to diminishing the objectivity of the advice being given.

The negative moderating effect of the snakebite effect on investment decisions ensures the need to implement psychological frameworks into technological solutions. This is further set into place by Aw et al. (2024), who prove a recorded fact that structured intervention within robo-advisors favors the recovery of rational choice processes that come after financial losses. By reducing emotional biases caused by loss aversion, robo-advisors empower investors to overcome the psychological barriers inhibiting optimal investment behaviors. However, this idea is qualified by Brenner and Meyll (2020) in stating that although robo-advisors may reduce biases, a perceived lack of empathy relative to human advisors may reduce their adoption for some demographics.

Consistency with these results using theoretical frameworks such as Prospect Theory by Kahneman and Tversky (2013) certainly underlines other key elements in framing effects and emotional regulation regarding financial decision-making processes. By emphasizing objective, data-driven advice, robo-advisors offset particularly well the biases in Prospect Theory, a precept brought to the fore by Bhatia et al. (2022). Despite these formidable strengths, the study by Salinas (2024) mentioned transparency and trust as two essential ingredients upon which long-term efficacy will be dependent. This integration of psychological insights with technological interventions is where the next frontier in investment behavior understanding would be, but it points to some imminent areas of refinement.

CONCLUSION AND IMPLICATIONS

The purpose of this study is to determine the role of robo-advisors in reducing the snakebite effect and influence investment decisions, and also probe whether social emotional well-being and resilience moderate the relationship between robo-advisors and investment decisions. This study provides evidence on how social-emotional well-being (SEW) and resilience, in interaction with robo-advisors, shape investment choices. Those subjects with higher levels of SEW and resilience showed a significant weakening of the snakebite effect, which implies more rational and confident investment behavior. Nonbiased robo-advisors can make data-driven observations, thus playing an instrumental role in minimizing emotional biases, including loss aversion. That is one sure way of demonstrating that these robots may act as an important catalyst for change in modern wealth management, particularly during the periods of turmoil that face financial markets. The research also puts into perspective a psychologically oriented framework for integrating financial technologies toward improved investor outcomes.

This study helps confirm and extend some vital theories in behavioral finance, such as the Prospect Theory and the UTAUT model, that are necessary in developing a theoretical framework for financial decision-making in the digital era. The findings also provide practical and managerial implications for the improvement of robo-advisory services and increased adoption among diverse investor segments.

THEORETICAL IMPLICATIONS

This contribution is considerable in both behavioral finance and technology adoption theories. By integrating the snakebite effect into the Prospect Theory of Kahneman and Tversky (2018), this study extends prior knowledge on how financial technology robo-advisor adoption interacts with loss aversion. The findings underlined the moderating role of emotional regulation and resilience as two new dimensions of behavioral finance models, especially on the snakebite effect. This study further extends the UTAUT by demonstrating the mediation and moderation effects of psychological factors, such as social-emotional well-being and resilience, in influencing technology adoption. This finally provides a foundation for the integration of psychological well-being into fintech solutions; hence, a framework for future study in the area of interaction between emotional factors and technological acceptance is provided. This integration encourages further investigation into psychological-techno interventions, thus extending the theoretical understanding of financial decision-making.

PRACTICAL IMPLICATIONS

The study further provides a number of practical insights that could be applied to improve the robo-advisory service. In this regard, developers can enhance robo-advisors by introducing features that take care of psychological biases, such as loss aversion. Emotional intelligence tools and real-time feedback mechanisms can be implemented so one can deliver confident and rational decisions as an investor. Besides, financial institutions can lead investor education by conducting workshops and making available resources like webinars and tutorials to teach emotional regulation and resilience for maintaining long-term investment strategies. Also, the customization of robo-advisory platforms to specific demographic groups, such as millennials or first-time investors, will go a long way in increasing the adoption rates and usability of the technology. Behavioral and emotional profiling make recommendations even more personal, increasing user satisfaction and investment outcomes.

MANAGERIAL IMPLICATIONS

From the manager's perspective, one has to incorporate insights from behavioral finance into robo-advisory. Every financial institution has to address emotional bias issues, such as the snake-bite effect, in an advisory model so that investors' psychological needs are satisfied. In this respect,

transparency and impartiality have to be built into trust and help investors to believe in using technology. Managers should also be concerned with improvement in customer engagement by communicating and highlighting the success and reliability of robo-advisors through success stories and case studies. Besides, social influence, explained by UTAUT, should be employed to promote peer-to-peer adoption and further normalize robo-advisors. Finally, financial institutions should focus on hybrid advisory models that merge the analytical capabilities of a robo-advisor with the empathetic personal touch of human advisors. This will ensure that multiple investors' various preferences are met.

LIMITATIONS AND DIRECTION FOR FUTURE STUDY

Further research is needed on how long-term social and emotional well-being and resilience influence investment behavior in particular, under changing market conditions. Longitudinal studies can explore in more depth how sustained psychological effects contribute to the adoption and effectiveness of robo-advisors. Further research on cross-cultural and regional issues in the adoption and usage of robo-advisors will help explain how socio-cultural contexts interact with psychological and technological interactions. Other interesting lines of inquiry concern how advanced AI can continue to enhance the robo-advisory service. Further areas could include the investigation into the role that machine learning models play in dynamic personalization and predictive analytics, which would permit further adaptation of robo-advisors to investors' behavioral patterns and conditions of the market. The possible cross-sector applications of robo-advisors, in health or education investment planning, for instance, are another aspect that needs critical examination in light of broader potential and limitations. Interacting between psychological well-being and the growing technologies of blockchain and DeFi platforms might be an interesting area of research. In the end, deeply analyzing how these technologies can overcome a range of psychological obstacles and biases will lead to a fuller understanding of investor behavior in the emergent digital financial space. With the identification and discussion of the aforementioned research gaps, the theoretical and practical dimensions of Fintech and Behavioral Finance can be furthered by future studies.

ETHICAL STATEMENT

The questionnaire used in this study was approved by the Scientific Review Board at the 2nd Meeting (YIASCM/SRB-02/COM/06/2024) of YIASCM, Yenepoya (Deemed to be University), Mangaluru in accordance with the university's research policy and procedures on 12-07-2024.

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Writing – review & editing: Niha Sheikh, Shakira Irfana, Madhura K., Jeevan Raj, Tushar Soubhari.

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