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"A Review on the role of Robo-advisory service in transforming Personal Finance in the Digital- Era"

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ABSTRACT

In this particular study an attempt is being made to explore how financial technology (fintech) innovations are changing the personal finance landscape in the digital world. As conventional financial advisory services are taking a back seat , robo-advisors are seizing the limelight. The study is focused on exploring how Robo-advisors have made tremendous contributions in terms of availability, cost -effectiveness and user-friendly means of managing personal finances by its users. The study also sheds light on the influence of Robo-advisors on investor behaviour, solid portfolio building and financial awareness through a systematic literature review. It also explores the downside of this disruptive technology, with respect to issues like regulatory issues, cybersecurity, biased algorithms and its impact on existing financial service firms. The findings of the study will provide insight into how personal finance is changing and emphasize how important Fintech innovations are in enabling people to make wise financial decisions in the digital era.
Keywords: robo-advisors, financial technology, financial literacy, Investment awareness, personal finance, Investor behaviour.

Introduction

Robo-advisor is a very recent breakthrough innovation in the field of Financial Technology. And it is one of the fast-growing segments in fintech business, that uses Artificial Intelligence and Machine Learning (ML) technologies to provide robotic personal finance advice to its users. Robo-advisory is an online service that uses quizzes, surveys and assessment forms to collect information from its clients and then apply algorithms to generate highly customized investment portfolios that will align with the client's financial goals, preferences and risk profiles.

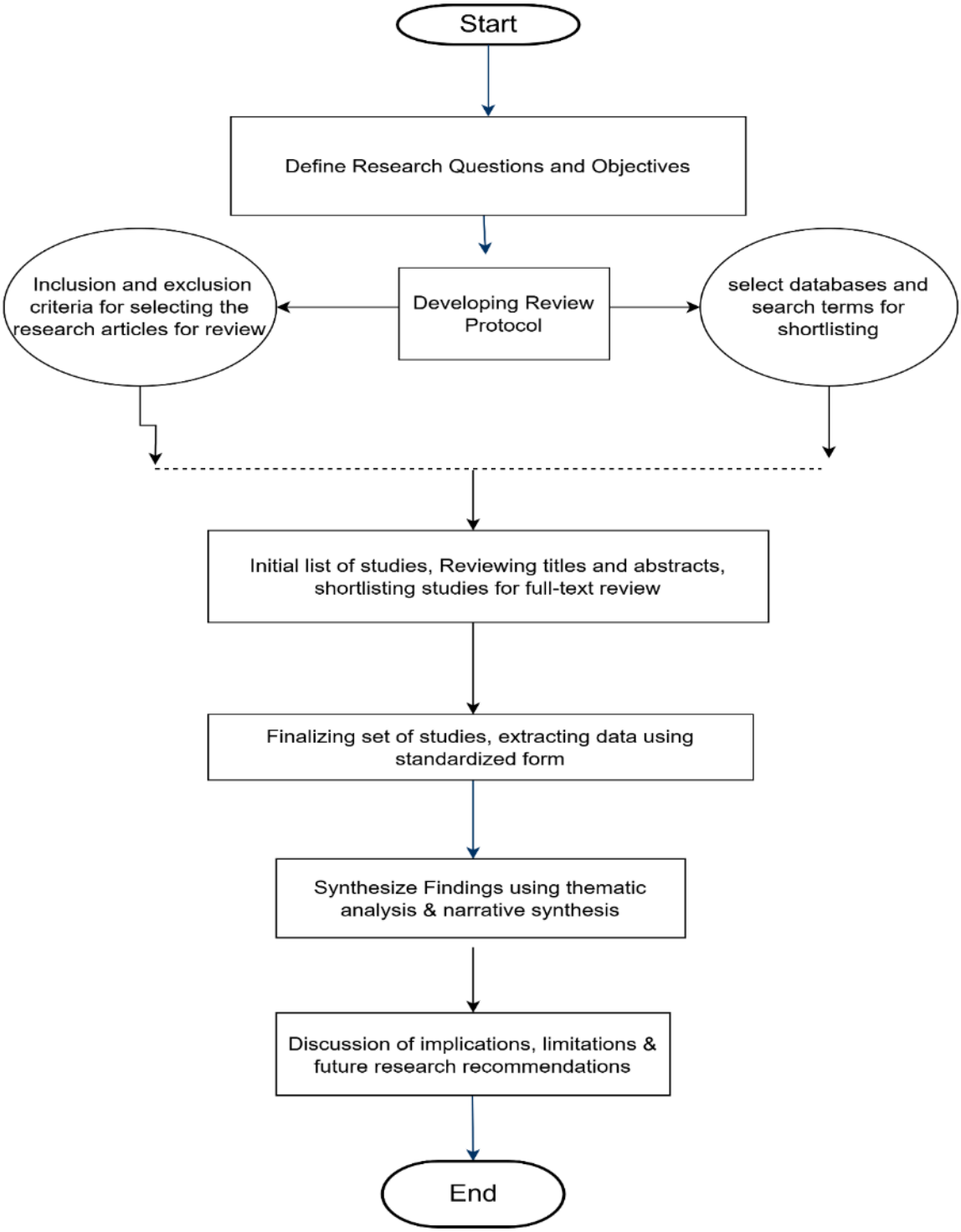
The idea of Robo-Advisors came into being in the early years of 1990s, and it became more popular due to emergence of availability of online financial services . Even though the Robo-advisors concept is still in its emerging stage in Indian Financial sector, but it has garnered wide attention and has demonstrated huge growth potential in coming years. Currently there are 39 Fintech companies who are running robo-advisory services in India as per the Tracxn data analytics. And the robo-advisory market in India is expected to grow by 9.21% in the next 5 years and the assets under management (AUM) is forecasted to reach $53.9 bn by 2025, growing at a rate of 43.8% CAGR(cumulative annual growth rate) from 2020 to 2025 as projected by Statista.com. The increased smartphone usage and availability of low-cost internet data, the growing middle-class population, the increased awareness towards having secured financial life and knowledge of investment products and conducive regulatory framework are some of the reasons driving the need for robo-advisory in India.

Research Objectives

1. To probe the challenges before robo-advisors to gain acceptance in the market.
2. To determine the future trends in robo-advisory services and their impact on the personal finance landscape.
3. To synthesize the current findings, identify gaps and provide recommendations for future research.

Methodology

This systematic literature review, employs a structural and rigorous strategy to thoroughly examine and consolidate extant literature available on robo-advisors impact on personal financial management. This involves below steps, starting with formulation of research objectives, creation of a review procedure, execution of literature search, study screening and selection, extraction and quality evaluation of available information, synthesis of results and deliberation on future trends and implications.



This literature review explores the key dimensions of how robo-advisors are revolutionizing personal finance, based on reports drawn from recent academic studies, industry and market analysis. At first, a review protocol is established to ensure a systematic approach. The Inclusion Criteria was to use studies published in peer-reviewed journals, studies focusing on robo-advisors and personal finance, publications in English language and studies published between 2015 and 2024. And to exclude news articles such as opinion-based write-ups, editorials and those lacking empirical evidence. The literature search was conducted using the following databases: Scopus, Web of Science, Science Direct and Google Scholar. Following search terms & keywords were used; "Robo-advisor", "Fintech", "Automated financial advice", "Personal finance", "Algorithmic investment" and Search strings were adjusted to each database's syntax to maximize the retrieval process.

A screening process was used to identify potentially relevant papers from the abstracts and titles. Research that was redundant were excluded. And the full texts of the papers were examined in comparison to the inclusion criteria. Additionally, a synopsis of the key findings, methodologies and characteristics of the chosen research papers is provided in the form of Thematic Analysis, that focuses on issues related to accessibility, affordability, investment behavior, and challenges. Implications for future research directions, theoretical advancements, and real-world applications of the results were assessed.

Thematic Analysis and summarization of the study

The following thematic analysis highlights the transformational influence of robo-advisors and highlights their benefits, problems and future implications by synthesizing results from diverse research.

What is Robo-Advisor?

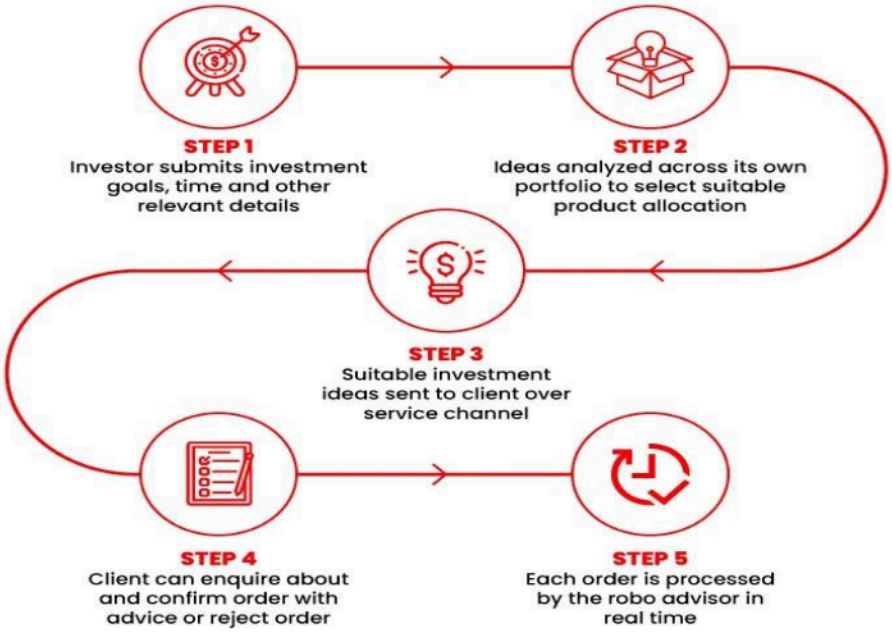
"Robo-advisor is an automated platform that provides investment advice and portfolio management services using algorithms and artificial intelligence". They have emerged as a disruptive force in the financial services industry, offering an alternative to traditional financial advisors by leveraging technology to deliver personalized investment recommendations at a lower cost.

Why choose Robo-Advisors over Human?

- Retail investors frequently turn to established financial institutions or financial consultants for assistance when getting started, particularly those who are young and inexperienced, but they seldom get the intended result.
- For starters, relatively few companies in this market do in-depth needs-based analyses and offer tailored solutions based on the results. Moreover, exceptional financial advice is expensive and not accessible to many small investors.
- In these situations, one can choose to use robo advisers, which assist users affordably and effectively to navigate the complicated world of financial investing.

How Robo-advisors Operate?

Robo-advisors employ algorithms to automate financial planning and investment management. They also give tailored advice based on risk profiles and provide easily accessible, reasonably priced services that have the potential to influence consumers' investment behavior and financial literacy.



Source: Inc42 .com

Types Of Robo Advisors operating in India

A: Based on Operational Models

Robo-advisors operating in India can be broadly classified into five types: Discretionary, Non-Discretionary, Hybrid Standalone and Bank-affiliated models.

Discretionary robo-advisors offer an automated approach to portfolio management by automatically managing investments depending on customer characteristics (D'Acunto, Prabhala, & Rossi, 2019; Lam, 2016). On the other hand, customers execute transactions by themselves in case of non-discretionary robo-advisors, who provide only recommendations (Baker & Dellaert, 2019; Fisch, Labouré, & Turner, 2019). In an effort to meet increasingly complicated financial demands, hybrid robo-advisors came into being, that combine the advantages of automation with human financial guidance (Deloitte, 2020; Rossi & Utkus, 2019). Independently operating, standalone robo-advisors prioritize affordability and ease of use for tech-savvy investors (Belanche, Casaló, & Flavián, 2019; Sironi, 2016). Lastly, to provide integrated services, bank-affiliated robo-advisors take advantage of the infrastructure and trust of well-known financial organizations (Gomber et al., 2018; Yan & Meier, 2020).

B: Based on Investment Focus

1. **Fund-Based Advisory**: Fund-based robo advisers provide clients with goal-based recommendations and risk profiling. Funds that are exchange-traded or managed specifically for a certain asset class are used for investments (D'Acunto, Prabhala, & Rossi, 2019). The primary source of income for these robo advisors is fund distribution commissions, which are fees collected from asset management firms (AMCs) or fund houses.

2. **Equity-Based Advisory**: Only equity portfolios are the focus of these robo- advisers. These are appropriate for investors who have a moderate to aggressive risk tolerance and a fair grasp of stock markets, but who would rather defer to the advice of professionals in order to create the best possible portfolios (Madhavan, Sobczyk, & Ang, 2017). These platforms frequently choose equities with the potential for strong growth or dividend income by

using sophisticated algorithms and data analytics (Phillips & Gorse, 2018). Equity-based robo-advisors can customize portfolios to more specialized investing strategies and perhaps generate greater returns by concentrating on particular equities, but at a higher risk (Baker & Dellaert, 2019).

3. **Comprehensive Wealth Advisory**: They concentrate on calculating clients' net worth and determining their risk tolerance before providing all-inclusive wealth management services. These advisors handle every facet of a client's financial life and offer a comprehensive variety of financial planning services like portfolio construction, wealth & estate planning services etc. (Deloitte, 2020). According to Baker and Dellaert (2019), they use personalization strategy to develop an all inclusive plan, that can work better for short term and long term needs.

Stages of Development of Robo-Advisors

After the 2008 Global financial crisis, the desire for automated, transparent and affordable financial advising services gave rise to the idea of robo-advisors (Fisch, Labouré, & Turner, 2019). The single main objective of the first robo-advisors was to offer the regular customers with automated, algorithm-driven financial planning and investing services (Baker & Dellaert, 2019). In India, robo advisory business is presently in phase 3.0 and is predicted to go into phase 4.0, following the lead of established markets who have superior technology, such as the US, the UK and other developed nations.

Robo-Advisors have evolved through distinct stages:
Stage:1 Basic Portfolio Creation: where, initially they allocated clients to managed ETF portfolios based on individual preferences.

Stage 2: Enhanced Investment Logic: where, Robo-Advisors were able to translate client input into investment logic by considering factors like risk appetite and liquidity (Lam, 2016).

Stage 3: Complex Analytical Engines: Robo-advisors started to use data-rich analytical engines. Thereby, robo-advisors are able to make algorithm- based adjustments and re-balancing (Madhavan, Sobczyk, & Ang, 2017).

Stage 4: Personalization using AI & ML: Incorporating natural language processing and AI-enabled software to provide fully automated investment plans, smart algorithms, instant asset shifts and provision for personalized service (Rossi & Utkus, 2019).

Features and Functions of Robo-advisors

1. **Mechanized portfolio management:** Robo-advisors automate investment recommendations and client counseling using algorithms, improving the efficiency and accessibility of financial services. These systems manage portfolios through the use of Modern Portfolio Theory ideas and quantitative algorithms, which frequently provide internationally diversified portfolios.
2. **Budgeting & Asset allocation:** Robo-advisors provide effective financial assistance by adjusting to the risk profile of their clients based on economic situations, individual traits and market returns. To ensure proper mean-variance portfolio optimization, most of the robo-advisors adopt customer engagement and involvement strategies.
3. **Timely Adjustments & Re-balancing:** In order to reduce the impact of behavioral biases in investment decisions provided by robo-advisors, the behavioral aspects are taken into consideration, thereby reducing the negative impact of illogical and emotion driven decisions. And also work on frequent revisions and adjustments to the portfolios.
4. **Low-cost affordable services**: the latest data and statistics shows that, robo-advisors are able to provide best financial advices at a very cost-effective and reasonable manner to larger array of investors, particularly youth, women and less-affluent classes (Lam, 2016; Fisch, Labouré, & Turner, 2019).
5. **Consumer Behaviour**: Because of the ease of use, accessibility and customization provided by Robo-advisors, there have been notable changes in consumer behavior with relation to Fintech services. Users can manage their funds, make investments and complete transactions without vising banks, as compared to the latency of traditional banking, fintech solutions provide real-time updates and transactions, which is a major improvement. This promptness satisfies the need for immediate service that today's consumers have. Certain Fintech applications use

gamification strategies to enhance user engagement with financial management, therefore motivating users to save and invest more wisely.

6. **Future Developments and Integration of Technology**: Apart from AI, NLP and advanced algorithmic capabilities, future innovations may involve full-sized optimization, extended natural language processing and digital twin technology. Once fully automated robo-advisers become available, existing transaction costs will be further reduced, and the fee structure in the market will be rationalized based on three potential savings: capital expenditure, operating expenditure and staff management expenses (Gomber et al., 2018).
   Based on current trends, experts also expect that the country will soon witness the birth of a hybrid robo-advising model that combines the best aspects of digital and conventional services. These will basically be AI- and ML-powered robo-advisories that provide channels for communication with actual advisors.

Challenges and Concerns of Robo-Advisors

Though Robo-advisors have gained popularity in India, as cost-effective and accessible investment management tool. However, they face several challenges and concerns that need to be addressed for greater acceptance and success.

1. **Algorithm laid biases**: These are the biases that arise from the data and algorithms used in the robo-advisor development and training process. Because of heavy dependence on automation and training, it might lead to biased recommendations and false advice, and it may even lead to several behavioral finance biases. Such biases may arise out of the factors like algorithm trained on historical investor data, insufficient representative data, design & settings of the algorithm (Fuster et al.,2020) and user interface, biased user input of information into the system etc. such biases need to be addressed through frequent detection and correction of algorithms, periodic checks & audits and focus on hybrid designs (Meharabi et al.,2021).

2. **Data Security and Privacy concerns** : Because of lack of technological expertise on the part of the users can be a major hindrance to the adoption of robo-advisors. Dealing with critical and sensitive user information & financial data becomes challenging. Majority of the studies stress upon the need for and importance of data protection and ensuring strong measures against security breaches (Belanche, Casaló, & Flavián, 2019). As a remedy, one may look at simplifying the user interface and creating user-friendly experiences, and offering customer support and instructional tools to assist consumers understand and utilize the platform successfully helps bridge this gap. Investing in modern cybersecurity solutions and routinely conducting security audits can boost the confidence among users.

3. **Lack of human touch**: Indian investors have traditionally preferred personalized advice from human advisors. The dependability and legitimacy of robo-advisors are questioned. Efforts have to be taken to improve algorithms, so that it helps in understanding the distinct features and needs of investors (Yan & Meier, 2020). It can also be beneficial to include hybrid models that offer both automated guidance and access to human adviser for more personalized service experience.

4. **Compliance with Regulatory norms of the industry**: As the regulatory framework for robo-advisors in India is still taking a baby steps, this may hinder the pace of adoption of robo-advisory services. Therefore, a collaborative approach with regulatory bodies like SEBI could be beneficial to relax some of the stringent norms in terms of operations and expansion, yet ensuring safety of Investors. Proactively engaging with policymakers and ensuring continuous compliance with reforms in laws might help reduce this problem (Baker & Dellaert, 2019).

Impact of Robo-advisors on Personal Finance

Robo-advisors have the capacity to influence a person's way of managing his/her personal finances.

The impact can be assessed across 3-way dimensions:

1. **Impact on investors' financial behaviour:** Robo-advisors were able to bridge the gap for those investors were previously lacked access to the financial markets by removing obstacles to make investments, like complicated paperwork procedures and minimum investment size. Robo-advisers use algorithms to customize investment portfolios based on a client's level of tolerance for risk, investment objectives and time of investment (Bhattacharya et al., 2012). This degree of customization was very hard to achieve and was a very pricey affair. And even financial literacy has increased by the instructional tools and resources offered by many robo-advisors, which assist clients in comprehending their investments and the fundamentals of financial planning. The automated methods can assist investors in maintaining discipline by preventing impulsive choices prompted by emotions or volatile market trends, thereby assists in reducing typical behavioral finance mistakes.

2. **Robo-advisory Vs traditional investment advice**: Studies have proved that, by adopting newer strategies and cutting-edge technology, makes the process far more reliable and stress-free (Baker & Dellaert, 2019). Robo-advisors in contrast to human advisors, are not influenced by personal preferences or sentiments, which guarantees that investment plans are regularly carried out in accordance with pre-established algorithms. Make sure that judgments on investments are impartial and consistent.

   By automating processes like tax-loss harvesting, performance tracking and portfolio rebalancing, customers may concentrate on other areas of their lives without sacrificing their financial objectives. In addition to investment management, some platforms assist users manage their entire financial health by offering goal-setting, retirement planning and other financial planning services.

3. **Democratization of Investment services :** A wider range of people, including those who previously couldn't afford traditional financial advisers, may now obtain expert financial advice, thanks to robo-advisors. Studies like D'Acunto, Prabhala, and Rossi's (2019) highlight how robo-advisors can provide reduced consultation rates, because of automation & lower overhead expenses. The user-friendly interface, easy onboarding process and affordable services accompanied by lower investment requirements, make the process of investing convenient for individuals from diverse economic background.

Future Trends and Implications

1. **Advancements in technology and digital infrastructure**: The advent of sophisticated digital infrastructure and technologies like Block-chain, has resulted in increased hybrid advising models that comes with human touch, which have succeeded in gaining acceptance and popularity among new age investors (Fisch et al., 2019). The attempts are in effect to enhance customer experience and engagement by utilizing cutting-edge technology like chatbots, virtual reality and natural language processing (NLP). With the help of these technologies, financial planning will become more dynamic and user-friendly, drawing in more users and increasing client retention. According to Madhavan et al. (2017), robo-advisors will become even more proficient and capable as AI and machine learning technologies continue to progress.

2. **Increased adoption and Market share**: Increased adoption rate of Robo-advisors among Indian investors is a result of growing knowledge of and confidence in digital financial products. The market for robo-advisors will grow intensely as a wider range of investors, particularly younger, tech-savvy investors and those from smaller towns and rural regions, begin to use them.

3. **Integration of services across platforms**: It is anticipated that robo-advisors would further connect with other financial services platforms to offer a comprehensive and highly inclusive one-stop place for personal financial management (Rossi & Utkus, 2019). Since the environmental, social and governance (ESG) issues are gaining investor attention, they are willing to match their portfolios with their values and social impact objectives, and robo-advisors are now able to integrate ESG variables into their algorithms. Micro-investing features are also

being introduced to enable users to make frequent small investments. Thereby fostering financial inclusion, reduced entry barriers and opening up investment opportunities to wider demographics.

4. **Implications for Financial Services Industry and Traditional Wealth Management Firms:** Robo-advisors are disrupting the market by providing low-cost, automated investment services that appeal to a wider range of investors (D'Acunto, Prabhala, & Rossi, 2019). As a result, traditional firms are under pressure to stay competitive by adopting digital technologies and reconsidering their service offerings and pricing (Belanche, Casaló, & Flavián, 2019). The role of human financial advisers may change to provide higher-value, more sophisticated advice services that call for empathy and human judgment. Big digital companies entering the robo-advisory market might upend established financial services, resulting in more competition and innovation.

According to the gap analysis and future trends of the industry, here are few breakthroughs and opportunities with respect to Research on Robo-advisors:

1. Research needs to be conducted on how, integration of robo-advisory with other fintech services, such as payments, lending, insurance and wealth management can offer a holistic and seamless financial solution to customers.
2. Focused research can be taken up on creating algorithms that dynamically adjust to investor emotions, cognitive biases and market sentiments.
3. Studies can be made on how ESG issues affect the performance of investments and create models for integrating sustainability into automated investing strategies.
4. Studies can be taken up on assessing the success of hybrid models in providing clients with more individualized, flexible and interactive services.
5. The extent of extension of robo-advisory services to the underserved and untapped segments of the market such as the rural, low-income and women investors, can also be studied.

Conclusion

This systematic literature review depicts how robo-advisors are dramatically changing personal finance by increasing the accessibility, affordability and customization of financial advice. Even if there are obstacles like algorithmic biases and worries about data security, they should be resolved with continued technical improvements and changing legal frameworks. There is a great deal of potential for innovation and development in the robo-advisory business in India, provided the obstacles in the Indian robo-advisory market in terms of extremely fragmented and controlled by a very few big firms; namely, Upstox, Zerodha, FundsIndia, 5Paisa and Scripbox, which can lead to inefficiencies like, lack of economies of scale and reduced bargaining power with customers.

In conclusion, the fintech sector in India is showing promise in the robo-advisory space, which has the potential to revolutionize how individuals manage their finances and make investments. In order to foster a competitive and supportive environment for the expansion and development of robo-advisory in India, stakeholders including investors and companies offering robo-advisors must work together and innovate to incorporate digital twin capabilities, that enhances Data Integration, User Interaction and a Dynamic Platform with comprehensive interactive elements can significantly assist users in making complex financial decisions. But maintaining the growth and acceptability of Fintech solutions still depends on fostering trust and resolving privacy issues. Fintech businesses may enhance user experience and promote an educated and inclusive financial ecosystem by comprehending and responding to these behavioral developments.

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