

Leveraging Artificial Intelligence and Machine Learning for Enhancing Automated Financial Advisory Systems: A Study on AIDriven Personalized Financial Planning and Credit Monitoring

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Abstract:

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The bulk of literature to date in the area of automated financial advice systems focuses on the accuracy and consistency, compliance, and reliability of technology-based robo-advisory systems. However, in line with the call for pioneering research on personalization and improved reliability through technology development, this study intends to address these major needs unmet with the existing research. Hence, the study focuses on the development of AI-driven personalized financial planning and credit monitoring systems consisting of a future financial plan algorithm and a future credit activity monitoring mechanism. Through the implementation and subsequent use of a quantitative research method and the analysis of structured data received from 112 online participants, the findings provided insights into: (i) how the system-driven disclosure of future plans can enhance the perceived performance of automated financial advisory systems, and (ii) to what extent a future credit activity monitoring mechanism could increase user trust in technology-based financial advice services.

In the Research Communities, above-average to high importance is attached to the studies on the development and implementation of AI-powered personalization systems and technological advancements that enhance the robustness and reliability of automated financial advice services. The large part of the subsequent development in automation in this area will, in line with this perspective on the importance of research issues, focus on the development of the AI-driven future financial plan creation and future credit activity monitoring mechanism. Closing the literature gap on the AI-driven financial plans design and the future monitoring of credit activity will allow a broader understanding of automated financial advice systems for a better-quality design of such tools. Providing insights into the willingness to adopt these

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tools among potential stakeholders, the research will contribute to the literature related to the adoption of AI and ML in the provision of financial services to a better understanding of the societal impacts of these systems.

Keywords: Artificial Intelligence, Blockchain, credit monitoring, Deep Learning, Fintech, free cash flow, Machine Learning, Natural Language Processing, personal finance, savings, Stock-Based Loan, stock volatility.

1. Introduction

Artificial Intelligence (AI) and Machine Learning (ML) are starting to shape a plethora of fields and services of the new digital era. Complicated fields of services, such as consulting, law and financial services, have already been affected by these smart technologies. The FinTech (Financial Technology) sector has risen due to fast technological development. It is transforming the traditional business environment, especially in banking, asset management and insurance industries. Among FinTech innovations, digital investment advice (known as „robo-advisors“ or „automated financial advisors“) is one of sophisticated features that AI can offer. The role of AI in credit decisions, risk management, fraud prevention, trading and personalised banking has rapidly increased in financial institutions. AI has also found wide applications in individual credit score monitoring or decision making in the industry, as well as in financial technology startups („Fintech“ enterprises) that provide peer-to-peer lending platforms requiring credit scoring decisions based on machine learning approaches. For personal finance, examples include intelligent saving (by monitoring individual spending) or personal financial planning. There are several systems and models searching for the best individual portfolio based on machine learning algorithms. Clamp and Curiobot are chatbots that provide some help in personal finance like spending overview or saving tips tailored to individual expenditure. With the growth of the on-line lending industry, entities like Nervve develop trading bots that help to co-fund in the market based on individual preferences. Nowadays, banks are using AI to improve and personalize their on-line offer and for credit score monitoring. Some solutions could automatically increase credit after monitoring individual spending behaviour. There is a strong move from customer service or mobile interface optimization towards the implementation of personal finance on-line tools.

AI also plays a more and more important role in borrowing risk analysis, especially in the wake of the global „credit crunch“ in 2008. Now, in modern credit institutions like banks, scoring systems are commonly applied to assess the creditworthiness of an individual before granting a loan. Using customers' credit card information, investment and expenses, large-scale datasets in different fields such as real estate, private insurance and retirement were shared and analysed to prepare a more accurate and efficient personalized financial plan.

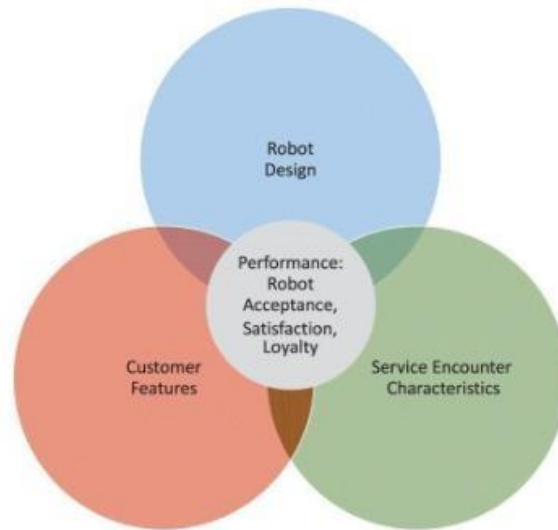


Fig 1: Artificial intelligence empowered financial advisory services

1.1. Background and Significance of AI and ML in Financial Advisory Systems

Nowadays, financial advisory services are getting widespread, and computer aided financial consulting services are preferred in finance. It is better to evaluate customers' private financial information before making a personalized financial plan for them. Branches of banks, private consulting companies and free advisory portals on the Internet are most commonly used channels for personalized financial planning consultancy. Although all the private financial information of the customer should be submitted to the banks and consulting companies to get personalized consultancy services, it is not enough to evaluate the most important part of the private data of the customer. In addition, in traditional consulting techniques, it is only possible to create a fixed or limited number of scenarios and evaluate customer return based on these principles. Because of data privacy, knowledge and data are not shared between different financial consulting service providers, so it is difficult to create a customized, comprehensive and flexible financial consultancy service for customers. There is also an automatically updated mobile and online application financial planning tool to help customers who prefer to use Internet advisory tools. However for accurate planning, a detailed analysis of the customer's financial situation should be taken prior. Technical progress has enabled the generation of huge volumes of data each year with the development of information and communication technologies and the increase in the use of the Internet. Thus, the idea of benefiting from lots of historical personal financial data of customers to enhance the quality of financial advice was identified.

Equ 1: Personalized Financial Planning (Investment Optimization)

Where:

- R_p is the return of the portfolio.
 - $\mathbb{E}[R_p]$ is the expected return of the portfolio.
 - $\text{Var}(R_p)$ is the variance of the portfolio's returns
 - λ is the risk-aversion coefficient.
- Maximize: $\mathbb{E}[R_p] - \lambda \cdot \text{Var}(R_p)$

2. Literature Review

This section starts with a literature review summarizing what has been done through the existing research on AI-driven automated financial advisory systems, followed by the modeling approach, problem definition, and motivation. To understand the contribution of the research, it reviews the literature on the application of artificial intelligence and machine learning on financial advisory services and highlights the potential role that the AI technology has in financial services. Robo-advisors are defined as “a computer program which is able to give investment instructions tailored to private customers using public data on the algorithm trading system,” having the added value of being faster, less influenced by emotions, theoretically more cost-effective, and available 24 hours a day, 7 days a week. Meanwhile, from the study, it was found that it is possible to enhance predictive accuracy by utilizing artificial intelligence and machine learning in credit risk prediction. In the related work section, various studies that have been done in this research area are discussed, encompassing the development of AI-driven automated financial advisory systems, credit scoring models, and credit monitoring applications.

This research begins with a standard financial planning model. Mainly based on the consumers’ conservative investment preferences, this model formulates static investment capital allocation plans based on long-run historically expected returns. In this traditional financial planning, the recommendation is based on the assumption that the past performances repeatedly reflected in the future. This static financial strategy yields expected yields from a long-run perspective only when the consumer’s wealth is substantial enough and the market predictions are entirely true, which is a major task for AI-driven personalized financial planning. Thus, personalized financial planning will be proposed, considering the short and medium-run adjustment of the actual performance and expected return and accurate estimation of the performances, as well as expected returns of individual assets. Consumers typically aim to achieve their financial goals by managing available riskier capital in conservative assets classes. For many, these asset types come in the form of savings accounts and bonds. Most financial advisors suggest that it is better to start with less risky forms of savings to limit investment losses.

2.1. Historical Development of AI and ML in Finance

In a historical context, since the establishment of stock markets, investors have endeavored to leverage technology to improve investment returns. Artificial intelligence (AI) and machine learning (ML) can

facilitate the automation of decision-making processes. Financial institutions and FinTech firms have launched myriad start-ups focused on AI-powered services to achieve further automation in financial markets. The nascent AI and ML technologies in the finance industry will strengthen algorithmic trading, risk management and fraud detection. This brief overview of historical developments in AI and ML reveals that future trends in financial services and research will be influenced by technological advances and stringent regulations.

In recent years, there has been an upsurge in policy adaptation to the swift expansion of AI and ML applications across various economic sectors. Notable cases include the introduction of the General Data Protection Regulation (GDPR) by the European Union (EU) and the establishment of an AI national program by the Chinese government. In the finance industry, the rising popularity of AI-driven financial services has prompted national and supranational agencies to take necessary measures to mitigate potential risks associated with unfair discourses or transparency. In an attempt to understand and address regulatory challenges, financial policymakers have strived to engage interdisciplinary teams of technologists and financial experts. The implications of AI and ML on financial markets have attracted increasing attention from scholars. As a wider deployment of AI and ML in the finance industry becomes more prevalent, there are growing concerns about potential risks associated with so-called „black-box“ machines making important financial decisions. High frequency and algorithmic trading have to be coupled with the transparency and surveillance mechanisms increasing the accountability of players in financial markets.



Fig 2: AI and ML in Finance

2.2. Current Applications of AI and ML in Financial Advisory Systems

Experiences with and the market for machine-based automated financial advisory systems are increasing, and thereby making their characteristics evolve and their elements become more intricate. AI and ML have the capacity to affect the change in automated financial advisory systems. A lot of new ML methods in a niche portion of financial technology have been evolving rapidly. This discussion presents AI-driven personalized financial planning and highly specific credit monitoring. A comparison of 17 AI-backed and 30 non-AI-backed automated financial advisory systems focuses on banking services, and works well for micro- and macroeconomic statistics from both developed and developing countries.

To facilitate a wide but at the same time reasonably comprehensive view, previous work discusses them in five sections, covering robo- and algorithm-based advisory systems, implied volatility as input for option pricing models, X-ray imaging for credit scoring, private sentiments usage for capital structure evolution analysis, and a range of different startup selections in the scope of FINTech. Machine learning is presented from further fresh viewpoints, such as Fairness and Non-discrimination in Machine Learning, computational

epidemiology, cognitive services for innovation management, circuit complexity, and entropy and statistical learning. The upsurge of work on artificial intelligence (AI) and machine learning (ML) in the financial field is also conspicuous in this selection. From a review of earlier publications, nonetheless it turns out that most of them do not refer too deeply to automated financial advisory systems.

3. Theoretical Framework

Automation and artificial intelligence (AI) have significant potential for disruption across a wide spectrum of sectors and applications, especially the online services sector. At present, the increasing availability of digital data on customer interactions with the marketplace, combined with advances in algorithmic methods involving machine learning and AI, is making it possible to develop more flexible and personalized approaches to the delivery of different services. In this context, considerable interest centers on the development of automated financial advisory and personal financial management systems. Online financial advisory services allow consumers to explore different markets, receive financial information, and make decisions regarding the purchase and management of financial products. The effectiveness of online advisory systems can be improved by developing AI-driven systems that provide automated financial planning and credit monitoring services and recommending beneficial credit products. Automated portfolio management systems can assist clients in making investment decisions in accordance with their risk preferences and financial goals.

The development of such systems has applied a hybrid methodology developed through the integration of decision rules and machine learning schemes. A combination of metaheuristic optimization techniques, support vector machine models, and radial basis function neural network models was used to develop an innovative and flexible system architecture. Decision rules are used to extract knowledge regarding the operation of bank clients from a wide variety of training data samples. Machine learning algorithms are trained separately on the basis of the extracted rules. In the testing phase, the relative profitability of any new client is evaluated and the proposed financial plan is personalized. Furthermore, a diverse set of validation experiments allows investors to customize the system based on their risk preferences and financial objectives.

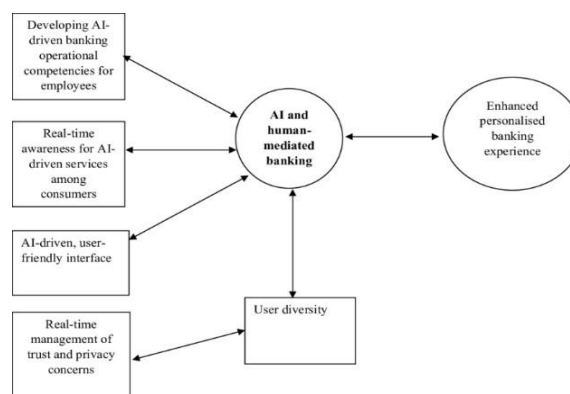


Fig 3: Conceptual framework

3.1. Key Concepts in AI and ML for Financial Advisory Systems

Financial advisory system is the integration of elements of budgeting, investing, saving, insurance and retirement, with the help of the professionals. With the advancement of Machine Learning (ML) and Artificial Intelligence (AI) technologies, the financial sector has seen a rise in automated financial advisory systems. A number of experiments and projects have been carried out in order to develop automated financial advisory systems, in which AI and ML technologies are used to provide personalized financial consultancy to the customers. The aim of this study is to investigate the key concepts, methodologies and tools in recent studies over the role of AI in developing AI-driven financial advisory systems. In order to address the research aim, a review of the last five years of studies and developments in AI-driven automated financial planning and credit monitoring systems is presented.

AI and ML technologies have recently grown in the financial industry to improve or to support innovative services that meet the financial needs of the customers. Robo Advisor is an automated financial planning tool that provides consultancy on the financial activities of customers by using complex programmed algorithms. Robo Advisor can give advice on investing, budgeting, saving, as well as on the expenses, pension allocations, insurance policies, the balance of loan, credit score management and tax proposals. Although it has a high potential, the existing study uses the AI and ML systems only in order to be limited to asset management policies. In 2021, the primary focuses were Robo Advisor's methodologies. Data mining-based methodologies were trending for Robo Advisor. In 2022, a higher interest was given to the credit monitoring systems. While AI-based innovative tools have been applied, Automated Financial Planning and Credit Monitoring Systems have been target areas. Generally, current applications were limited to the Robo Advisor and Credit Monitoring Systems. A comprehensive framework that gives in-depth software and hardware information of the Robo Advisor and Credit Monitoring Systems is still inadequate in the existing literature.

Equ 2: Predicting Asset Prices with Time Series Forecasting (ARIMA/Deep Learning)

Where:

- h_t is the hidden state at time t .
 - x_t is the input at time t (e.g., historical prices).
 - W_h, W_x are the weight matrices.
 - b is the bias term.
- $$h_t = \sigma(W_h h_{t-1} + W_x x_t + b)$$

4. Methodology

Due to high interdependence of technology and financial information, recent advancements in Artificial Intelligence (AI) and Machine Learning (ML) have been properly applied to enhance automated financial advisory systems. This study is steered towards leveraging state-of-the-art interdisciplinary AI applications in considering the individual's characteristics and financial attitudes for the assignment of automated AI-driven personalized financial planning service. The main motivation is to create a sufficient decision-making system that affords an

individual with their tailored future-state financial planning profile considering personal characteristics such as employment, housing products, needed insurance policies, and liabilities. Within the proposed methodology, a case study for automating real-life application is also provided, where credit scoring and comprehensive financial attitudes of the individuals are observed by utilizing financial microcredit.

The exceptional alignment of financial record data becomes more accessible with the enhancement of the financial sector. Banks and other financial institutions developed comprehensive financial services that allow income and investment details to be more transparent, thereby the opportunity to apply AI and ML methods to estimate the potential of the individual for financial planning. A credit monitoring system is deployed for online ML investigating a comprehensive list of financial products within the novel Turkish credit market, with a study of 4 years. The system is designed to grant individuals extensive personal financial advice based on their financial record and financial market data, together with the discriminative criteria. Furthermore, the proposed system is combined with a personalized financial planning service that proposes to the individual specific financial movements to enhance their planned financial life by achieving the assigned criteria. For that purpose, AI-driven stress testing is implemented where various financial conditions are considered under standard Dynamic Mixture Proportional Distributions modeling. A real-life application is also presented to the respondent institutions indicating the financial state of the individual and proposing necessary financial products to advance their monetary condition using state-of-the-art ML algorithms.

4.1. Data Collection and Preprocessing Techniques With the rapid growth in the availability of online data, it is necessary to extract specialized rules and restrictions from a large amount of information. This technique has many applications in financial services, such as stock market forecasting, credit card fraud detection, and credit management. Therefore, there are plans to analyze saving banks and propose new results to identify credit-restrictive points that cause losses in saving banks.

The plan of this research study is to determine any efforts related to this technique, research, and possibly identify other types of discrimination that arise in saving banks. In this context, it contributes to the following overlapping concepts: Supporting financial advisory systems equipped with artificial intelligence and machine learning to provide individuals with industry-relationship personalized advice and to safeguard losses, given the abundant life patterns of each individual. Safeguards that can be advised to the customer and company, related to the presence and behavior of individuals in legal relationships, such as financial statements, inquiries, and transactions. Pretrained predictive models based on actions extracted from a plurality of wearable devices and portable computing devices, such as smart watches, smart glasses, smart pens, mobile phones, and portable computers.

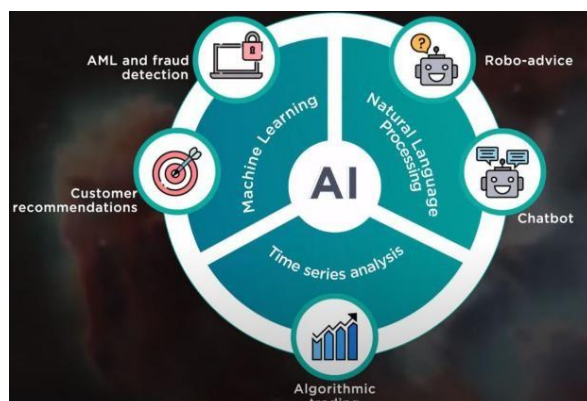


Fig 4: Data Collection and Preprocessing Techniques

4.2. AI and ML Algorithms Used in Financial Planning and Credit Monitoring

In the last two decades, financial advisory services have been increasingly used. Among the services, financial planning and credit monitoring have been popular demanding services for one's asset and liability management. Financial Planning is a process of setting goals and developing a strategy to achieve those goals. It covers the asset side of the balance sheet. Credit Monitoring is important for the individual as it closely impacts their whole financial activities and credit worthiness. Many of the earlier works have used a classical regression-based approach to the financial planning, and it also used a rule-book-based approach for the credit monitoring. However, with the recent advance of AI/ML technologies, a more complex and robust advice can be rendered for the services. As a case study on the financial advisory services for individuals, AI-driven solutions for personalized financial planning advice and for automatic personal credit monitoring are introduced. The overview of the AI and ML algorithms and methodologies used for the financial planning cases and the credit monitoring cases are introduced.

Identifying Cross-cutting Advantages: Automated Investment and Credit Monitoring Solutions based on a hybrid methodology are underlined through case studies of AI Personalized Financial Planning solutions and AI Credit Monitoring solutions. Markets for financial assets are becoming highly regulated and competitive. These changes are leading to the optimization of the asset allocation portfolios. To achieve high returns with low risk, it is essential to monitor financial assets on a continuous basis. However, manual checking is burdensome, and it is difficult to consider many factors. Powered by deep learning, a method that compares simple moving averages and relative strengths has led to a new indicator. While existing indicators require a single input, the proposed indicator considers many factors. Machine learning is increasingly important in financial services. This paper examines five binary classification tasks focused on the cryptocurrency market. Machine learning can be especially beneficial for the verification of anti-money laundering regulations due to the ability to detect diverse non-linear relationships and interactions in input data.

5. Case Studies and Applications

Automated Financial Advisory Systems (AFASs) are a type of service provided by banks, credit companies, stockbrokers, investment funds or insurance agencies. They are an

interactive user interface for automated, algorithm-based information processing and decision-making on finances and investment. AFASs may combine communication with the user and data analysis, and they reduce human involvement without a complete withdrawal of the human element. As Artificial Intelligence (AI) advances, AFASs can produce more sophisticated decisions, for example, in automatising user income-risk analysis through predictions on the user's future income-risk changes using an advanced Machine Learning (ML) algorithm. An AFAS can be considered in terms of how well it supports the user in financial management, and a desirable future version would efficiently assist in the user's financial growth and risk management. AFASs can be personal or standard. Personal AFASs provide services explicitly designed for the user and usually require their data, while standard AFASs are not user-specific per se, for example, general stock trend predictions. For personal AFASs, privacy issues and data leakage must be considered. However, general public services often have privacy terms like data-sharing agreements; thus the extent of provided data must be negotiated.



Fig 5: Applications of Artificial Intelligence in Financial Services

5.1. AI-Driven Personalized Financial Planning Platforms

Many have experienced the situation where 500 euro remains at the end of the month and you want to deposit it in the account, but you do not currently know what to do with the capital. Selecting a suitable saving period or trying to avoid disappointment in the stock exchange. Consultations with a wealth manager have not helped because their recommendations are directed to other shares and participation in the fund has not been the most beneficial, is one automatically the highest commission in various ways. Despite the good advice on the benefits of proper investment as a family member, it has not been possible to find some ready-made, automated solution.

Wealth management and personal financial planning are traditionally presented as “highly personal” and “personal consultation” by a professional on a regular basis. However, great financial opportunities are being excluded from the majority because the need is not so urgent that financial advice would have been sought from financial institutions. With the development of technology and the emergence of the Internet, along with the analysis of movements in social networks and spending, it is possible to design a personal financial planning platform with Artificial Intelligence technologies. Data collection and methodology suitable for financial analysis, as well as AI and Machine Learning technologies, are used in

the design of the platform, taking into account possible banking service developments. Platforms will provide an opportunity to start automatically monitoring finances as needed, get basic advice on investing in financial markets, and change the behavior of weird decisions.

The objective of this article is to examine theoretical and practical aspects of AI and Machine Learning application possibilities for designing personalized, automatic financial advisory systems and all this will be applied to the platform. Sub-modules focusing on AI-driven Personal Financial Planning that will be found in the platform are: Spend analysis and financial accountability module - one so far, covering AI techniques and possible data sources; Robo Advisory Investment Module - points to a division of asset allocation and stock market monitoring, leads precisely into a detailed investment advice methodology; Intelligent Credit and Loan Monitoring Module - how it will monitor the recommended limit, offers the possibility of early intervention against the ceiling, prediction of credit wastage and loss lists. Each sub-module is also completed by a technical architecture, including the description of Machine Learning methodologies and algorithms that will be used.

5.2. Credit Monitoring Systems Enhanced by AI and ML Personalized financial planning consists of the development of tailored financial advice for customers, considering their preferences and circumstances. Traditionally, this type of aid has been carried out by human financial advisors, but the rising computational capabilities, the increasing availability of data concerning household finances and the development of more sophisticated machine learning techniques have paved the way for the development of automated financial advisory systems. This is evident in the increasing number of financial institutions that offer robo-advisory services, in which personalized advice is delivered through online platforms based on customer input data. These automated services have the potential to democratize access to financial services, offering affordable and universally accessible financial advice, yet this requires their thorough validation. Hence, the development of AI-driven automated financial systems for personalized financial planning for households, aimed to provide an assessment of current financial behaviors and to identify potential financial bad practices that shall be addressed promptly, improving, in this way, people's financial health. The AI-driven financial systems were developed to provide automated financial advice, tailored to personal financial data, and also sensed attitudes toward it. The scheme and components of the proposed automated financial advisory system are shown in. The system integrates a solution to both generate financial advice and evaluate the user's compliance with it, combining AI and ML techniques. The deployed ML algorithm predicts the likelihood of suffering financial hardships based on personal finance-related features, as derived from the worked financial data. While considering the predicted likelihood, the AI-powered engine generates several personalized financial goals. Moreover, it monitors the compliance through the financial data sent periodically from the user's mobile devices, serving to offer financial advice regarding the achieved financial objectives.

Equ 3: Expected Return $\mathbb{E}[R_p]$ Calculation

Where:

$$\mathbb{E}[R_p] = \sum_{i=1}^n w_i \mathbb{E}[R_i]$$

- w_i is the weight of asset i in the portfolio.
- $\mathbb{E}[R_i]$ is the expected return of asset i .

6. Challenges

and Future Directions

1. Challenges Artificial intelligence, machine learning and automated advisory systems are at the very heart of innovation and the digitalisation of modern economies. Financial technology and the growing ecosystem of companies operating globally in different areas of the financial sector are reshaping the traditional business environment. AI-driven technologies create new market opportunities and foster competition and cooperation between incumbent financial institutions and new entrants. Robo-advisors are also involved in this financial revolution as an evolution of the wealth management and investment advisory model. The lack of personalised banking services in a technology-driven world has raised the interest of startups and international venture capital. Most innovative tools in personalised finance rely on machine learning algorithms to analyse financial, banking and consumption data. It is mainly on the automated stewardship of their assets that AI and machine learning algorithms could significantly innovate. At the same time, these innovations would also help to avoid the risk of over-indebtedness and monitor the effectiveness of public investment and consumption programs. However, the development and diffusion of robo-advisors and credit monitoring tools raises significant ethical, regulatory, and methodological challenges.

2. Future Directions It is this model that would be possible to try to realise a robo-advisor and a credit monitoring tool, proposing the construction of personalised financial planning as a middle ground. Such a perspective is also feasible to investigate the relationship between the automated system and personal financial advisor on a large dataset of anonymised bank accounts and credit reports. The emerging model from the theoretical elaboration of the data would be relevant for the regulatory authorities to introduce new guidelines for reallocating investment and consumer credit. Robo-advisors and credit monitoring tools can better tailor investment and consumer credit services to individual needs, history and context. The design and implementation of both these tools in the economical environment reinforces customer loyalty. This paper aims to provide financial institutions, investors and policymakers with new insights on the politics of AI-driven services in personal finance.

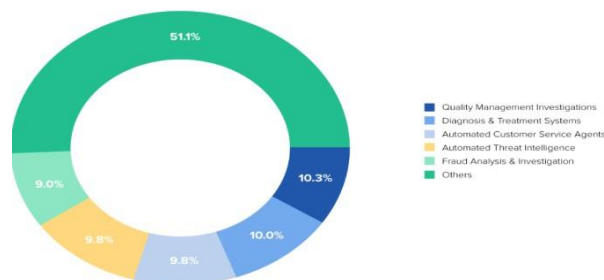


Fig : Artificial Intelligence Is Disrupting Finance

6.1. Ethical and Regulatory Challenges in AI-Driven Financial Advisory Systems

Introduction of artificial intelligence affects many areas of life and can also revolutionize financial services. Artificial intelligence offers excellent possibilities to revolutionize the wealth management industry with the emergence of fully autonomous intelligent investment entities. These entities can provide a variety of personalized services to meet users' financial needs using sophisticated learning machines. By incorporating state-of-the-art AI advances and utilizing a vast universe of financial data, user-centric intelligent investment platforms can accurately customize a diversified, consistent, and low-cost portfolio given users' financial goals, attitudes, and risk tolerance, and hence identify superior investment strategies. On the other hand, the rapid growth of artificial intelligence in the financial field can ease loans and exacerbate risk management challenges to ensure sustainable credit and financial conditions. New approaches of AI in the financial field can assist consumers in managing their expected or desired credit, and enable creditors to alleviate the risk of unintended credit dispossession or over-indebtedness. These rapid changes on the supply and demand sides present a substantial challenge for classical financial regulations and monitoring systems, which typically lag behind technological change. One option is to harness the potential of artificial intelligence to automate the adaptations and improve the monitoring of these systems. While this avenue of research is new, the potential developments raise tough questions about accountability when a regulator's artificial intelligence makes decisions. Such a regulatory AI may not be able to explain in intelligible terms the rationale behind a decision. To address this issue, an approach for the comprehensive testing of regulatory artificial intelligence is proposed, where authorities might find benchmarking different types of artificial intelligence against well-defined tasks a fruitful way forward. In order to face the regulatory challenges posed by artificial intelligence, the existing legal and regulatory frameworks need to be adapted. Overall, discussions about the use of artificial intelligence in financial regulations are necessary to formulate appropriate responses to these threats. These discussions, however, remain at an initial stage, and the ultimate risk is that artificial intelligence becomes irreplaceable and a source of systemic risk before appropriate responses are formulated.

7. Conclusion and Recommendations

The rise of FinTech implies the emergence of AI-driven robo-advisors in personal finance and credit-related services. The aim of this study is to evaluate the impact of AI-driven financial applications on personalized financial planning approaches and credit monitoring systems. The current state of development of AI-driven automated advisory services in personal finance and its implications for global credit market restructuring are discussed. The study also analyses the design and operations of the AI-based financial planning and credit monitoring system. The development and execution process of AI financial advisory applications are presented. Finally, the potential risks and preventive guidelines are proposed on the growing role of AI in the global financial services industry.

With the rapid advancement of technologies and the digitalization of the global economy, the concept of FinTech and RegTech has been gaining remarkable interest. Various kinds of

pioneering financial applications and cyber risk management schemes are emerging with the advent of disruptive technologies. In particular, the rise of Artificial Intelligence (AI) and Machine Learning (ML) have been found to influence the most complicated fields concerned with the provision of financial services for the industry and consumers. In the field of personal finance, AI is now extensively utilized in the provision of automated financial advisory systems. Such AI-driven advisory services or so-called robo-advisories offer personalized financial planning recommendations for clients to secure their financial position. By contrast, the utilization of AI and its algorithms in credit-related services is quite new. The major principal banking systems have recently been using AI algorithms to enhance credit monitoring practices.

7.1. Future Trends

Financial sector automation has been driven by the increasing use of technology, and emerging trends applied in practice are closely related to artificial intelligence in financial sector technology. The use of financial services has developed rapidly over the past few years through technology, and several companies provide AI-driven financial services. Innovations in financial technology include offering new and advanced financial services in the sector. The use of Artificial Intelligence has grown over the years, and it has been used widely in the financial sector. As a part of fintech, several companies provide automated financial services in the form of personalised financial planning and credit monitoring. Trading stocks using robots has also grown in popularity in recent years.

There are several trends related to financial technology and automation in financial services that can be predicted to impact the financial sector. Firstly, it is likely that AI-driven services will be widely used in complex fields, such as consulting, legal fields, and increasingly in the financial sector, where there will be numerous possibilities for the use of AI in practice. The second prediction is that the digital revolution will penetrate the traditional business environments of the banking, asset management, and insurance entities. This phenomenon especially affects small players in the industry; the financial sector is transforming rapidly, and the traditional business model is no longer secure. The third trend is the emergence of cooperation between financial and non-financial service providers. In this way, the knowledge of the customer is utilized more in the context of realistic risk assessment, for instance. Also, offering credit and insurance products will be more customer-centric in future trends.

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