International Journal of Environmental Sciences
ISSN: 2229-7359
Vol. 11 No. 4,2025
https://theaspd.com/index.php

Analyzing The Factors Influencing The Adoption Of Artificial Intelligence-Based Robo-Advisory For Digital Financial Services

Yasmeen Ansari[a*], Rohit Bansal[b] Anand Kumar Mishra[c] Prince Kumar Maurya[d]
[a*] Corresponding Author, Assistant Professor, Department of Finance, College of Administrative and Financial Sciences, Saudi Electronic University, Saudi Arabia, y.ansari@seu.edu.sa
[b] Associate Professor, Department of Management Studies, Rajiv Gandhi Institute of Petroleum Technology, India. rbansal@rgipt.ac.in
[c] Assistant Professor, School of Business, Galgotias University, Greater Noida, Uttar Pradesh, India, 20ms0002@rgipt.ac.in
[d] Assistant Professor, School of Leadership and Management, Manav Rachna International Institute of Research and Studies, Haryana, India, bprince9729507@gmail.com

Abstract
Financial hardship can result from the lack of financial planning in an adverse event. Many individuals consider financial planning and management difficult due to investment management technicalities. As a result, they consult financial advisors for assistance. Robo-advisors (RAs) have been replacing human investment advisors over the past few years due to several concerns regarding factors such as high fees, behavioural bias, and conflicts of interest. We collected 799 responses from women in the Kingdom of Saudi Arabia (KSA) to determine the factors contributing to RA adoption. The usefulness, perceived benefits, and policy interventions of RAs influence women's adoption in the KSA. Additionally, latent variables and women's adoption intentions for RAs are mediated by risk and security. It provides a comprehensive behavioural framework to explain RA's adoption by Saudi Arabian investors while considering the governing authority's policy initiatives. To resolve the obstacles, the study recommends that the government convene all relevant stakeholders' parties, research institutes, and funding organizations. It is believed that this will speed up the future development of the financial ecosystem.
Keywords: *Robo-advisor; Adoption Intention; Usefulness; Risk & Security; Policy interventions.*

INTRODUCTION

Due to the presence of technology-based start-ups and FinTech companies, today's traditional banking industry faces fierce competition. Besides banking, capital management, crowdfunding, insurance, transaction, and payment processing, fintech also offer insurance, trading, and payment processing services (Brooks et al., 2019; Dorfleitner et al., 2017; Gomber et al., 2018; Thakor, 2020). Digital finance and FinTechs are two of the areas that have been identified (Gomber et al., 2017) and (Lucey et al., 2018). RAs provide investment advice and discretionary investment management through algorithms and asset allocation models. The service is less expensive than other investment advisory options and is able to assist private investors in investing in various asset classes even though they may lack a thorough understanding of finance and investing (Barroso and Laborda, 2022; Gomber et al., 2018; Samhale et al., 2024). Investors are recommended a strategy based on their risk, liquidity, and experience with financial mechanisms, investment prospects, and demographic characteristics. Additionally, automatic rebalancing and asset allocation may be performed depending on the automation level. Using big data applications such as ML and AI, we can facilitate this process (Belanche et al., 2019a; D'Hondt et al., 2020; Shanmuganathan, 2020; Tao et al., 2021)

According to (Davis, 1989) As indicated by the technology acceptance model (TAM), a new technology's usefulness and ease of use determine the likelihood of users adopting it. Various studies predict FinTech adoption, including cryptocurrency payments in the Netherlands (Jonker, 2019) and e-commerce (Smith et al., 2014). (Aldás-Manzano et al., 2009; Ghani et al., 2022; Shanmuganathan, 2020) according to some, the rise in popularity of new financial technologies and services can be partly attributed to consumer comfort alone, but this cannot be a complete explanation. Privatized customers are generally dissatisfied with their current financial institutions or prefer FinTech services due to a lack of

dissatisfaction (Maier, 2016; Mietzner and Molterer, 2018). FinTech could increase its market share by taking advantage of consumer dissatisfaction with traditional players by providing better service, thereby increasing customer satisfaction (Maier, 2016).

Contributing to the scant amount of literature available on adopting RA services, we fill this gap in the literature. In this study, we examine the various determinants of RA adoption to gain a deeper appreciation of the factors involved in their adoption (Ansari and Bansal, 2024). Our study involves a novel method of enhancing the tangible nature of an abstract service such as RA. The purpose of this exercise is to give women participants a better understanding of the capabilities of RA. Last, the findings are of managerial importance and may serve as a basis for improving RA service offerings to better meet women's needs. According to the findings, the most significant drivers of adoption intention among RAs are usefulness and risk & security. In addition, females have a lower intention for online banking, while participants with experience with investment funds or online banking show a higher intention to use online banking. Whether an RA has a renowned trademark or a banking license does not make a significant difference. RAs that are divisions of traditional banks do not appear more likely to be used by subjects.

This learning aims to examine the association between usefulness, benefits, policy interventions, and perceived trust among women's adoption of RAs. To understand the factors that might affect Saudi women's adoption of financial RAs and for insights into their intention to adopt them, the following research queries are presented: (1) Does the usefulness of RAs influence the Saudi women's willingness to adopt them? (2) What are the effects of perceived benefits and trust of RAs on the intention of women to adopt them?

During Section 1 of our study, we discussed the literature review and an overview of adoption intentions for RAs. Section 2 reports the results of the analysis and findings. Section 3 contains a discussion of the study. It is discussed in Section 4 identifies the study's limitations and makes recommendations for future research.

Theoretical background

It is the responsibility of RAs to behaviour perfect evaluations of the financial status of clients who wish to advance from a financial advisory perspective. However, some investors may be unable to profit from pursuing a high return (Jung et al., 2018a). It may be more important for some people to preserve their principal, RAs need to understand the different financial needs of their customers (Chen et al., 2022; Senyo and Osabutey, 2020; Wang et al., 2019). (Hildebrand and Bergner, 2021); in addition to humans being able to make such decisions intuitively, suitable investment robots can also perform them automatically (Tokic, 2018). While the UTAUT2 has been widely used in the research effort to understand the adoption of technology and how it is used (Baudier et al., 2020; Chopdar et al., 2018), As a result, it is more inclined towards drivers than other deterrents associated with technology that may be present (Aquino Shluzas and Leifer, 2014). Found variations in the variance accounted for in behaviour intention vs. actual technology usage (Venkatesh et al., 2003).

A major objective of this study is to extend the focus of existing research on RAs by some theoretical motives. In fintech, little research has been conducted concerning the conditions that can lead users to develop positive attitudes and intentions towards RAs, a key attribute of this technology. Most existing research has motivated consumer acceptance and mobile payment use of innovative technology. A person's approach toward a particular behaviour is strongminded by his or her personal beliefs concerning that behaviour. The likelihood of accomplishment of a particular behaviour increases when one has a strong intention to do it (Fishbein, M., & Ajzen, 1975).

Literature and related research were used to develop a conceptual model (Figure 1), the model illustrates the relationships hypothesized in the previous section. Several prior research studies have employed similar measures to investigate how technology is adopted and used across sectors (Ansari et al., 2024). While other studies use broader variables, their conclusions are generally more general. This is the first study where five independent variables have been used against women's adoption intention for RAs in KSA, namely usefulness, perceived benefits, perceived trust, and risk and security (Table 1).

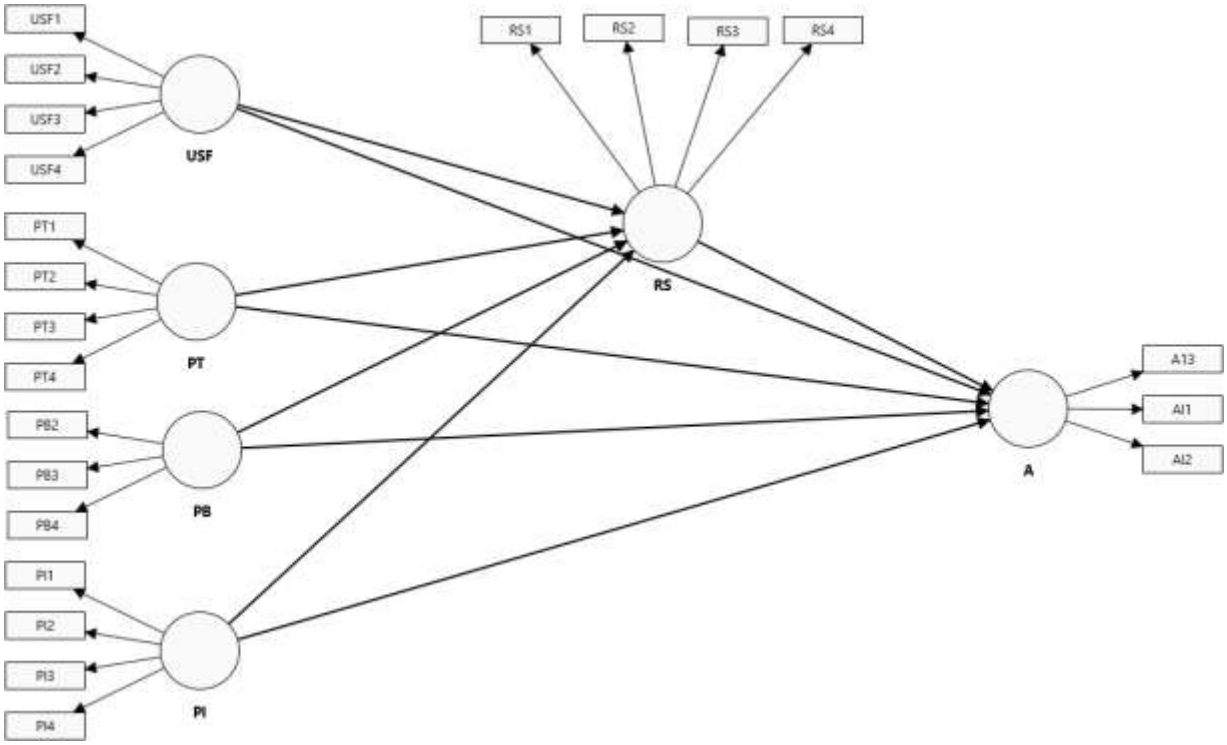

Fig 1: Conceptual framework

REVIEW OF LITERATURE

The concept of RAs is something you may want to explore, as well as how they work. The term RA is not generally defined, but it is commonly understood as a digital platform that provides financial investment services based on algorithms online; however, there is no official definition for one. In order to minimize costs and risks, they often automate and optimize passive indexing strategies, which limit the amount of rebalancing of the investment portfolio by minimizing costs and risks. Investors might be attracted to RAs for several motives, including the fact that these firms tend to have lower costs, are more accessible, and are transparent, among others.

As a result, they are offering investment services for a lower fee and a lesser opening balance than human financial advisors, thus reducing entry barriers for the general public to access financial advice (Belanche et al., 2019a; Gomber et al., 2018; Howcroft et al., 2002; Isaia and Oggero, 2022; Jünger and Mietzner, 2020; Rios et al., 2018) Behavioural biases are also mitigated (Aldossari and Sidorova, 2020; D'Acunto et al., 2019). Researchers have limited research on the relationship between demographic profiles and intentions to utilize digital financial services (Aldossari and Sidorova, 2020; Comin and Mestieri, 2014; Hentzen et al., 2022).

Despite the numerous opportunities created by FinTech AI applications, very little research has been conducted on introducing RAs. (Iost Filho et al., 2020), Ignoring the customer's perspective, although this would enable the services to be extended to a greater number of users. As a result of the limited research on RA designs (Jung et al., 2018b). It has been determined that these systems should be made more usable to facilitate users' interaction with them. Incorporating artificial intelligence into frontline services poses several challenges (Hussain et al., 2024; Mehrabioun, 2024). Artificial intelligence and robot-based systems profoundly affect economic, social, and labour domains (Huang, 2016). As a result of a theoretical perspective, (Yeh et al., 2023) predicted that automated knowledge would lead to the development of mechanical intelligence first.

One study examined RA acceptance among users in the USA and UK. The study focused on the effects of the technology adoption approach (Belanche et al., 2019a). As an external factor, subjective norms are found to be important. In addition, most prior fintech research has provided essential lessons regarding factors affecting user adoption (Baudier et al., 2020; Faradynawati and Söderberg, 2022; Northey et al., 2022; Tao et al., 2021; Wang et al., 2019), in most cases, the motivations for adopting RAs

have been studied (Rühr et al., 2019). Financial products and managers are less trusted due to negative (Tokic, 2018).

(Mishra et al., 2023; Rios et al., 2018), Individuals' intentions to adopt m- m-banking are affected by social influence, financial cost, expectation, and perceived credibility. (Chao, 2019; Hoque and Sorwar, 2017), Among the behavioural intentions to use m-learning from the consumer's perspective were perceived benefits, satisfaction, and trust. (Erjavec and Manfreda, 2022) In decision-making scenarios based on UTAUT, herd behaviour can affect behavioural intentions of online purchases, according to a study by (Kar et al., 2022; Wang et al., 2024).

There is a limited amount of academic literature on RA, but it is rapidly developing (Dorfleitner et al., 2017; Gomber et al., 2018) and (Thakor, 2020) A better understanding of the different business models and services can be gained by providing overviews (Belanche et al., 2019b; Bhatia et al., 2020; Brenner and Meyll, 2020; Choudrie et al., 2018; D'Hondt et al., 2020; Jünger and Mietzner, 2020; Litterscheidt and Streich, 2020; Shanmuganathan, 2020; Tao et al., 2021). RAs have been found to be more popular among investors who distrust human advisors than those who don't. These findings were replicated in a study of 1,762 U.S. investors (Bai, 2021). (Hildebrand and Bergner, 2021) further understand how RAs establish trust. In addition, another pool of literature related to behavioural finance asserts that the rules of asset allocation are capable of mitigating investors' behavioural biases, To this end, (Bhatia et al., 2020) A survey was conducted among 34 Indian experts from the financial services sector. Based on the structured interviews, it has been determined that RAs are currently focusing on educating investors and fostering trust to increase the adoption of digital investment among investors.

(Tao et al., 2021), in the period 2016 through 2019, RAs achieved significantly better risk-adjusted returns than money market funds, as well as hybrid funds. Based on the analysis of AI-based alter egos matched to a sample of 22,972 Belgian retail investment firms, we found that (D'Hondt et al., 2020) have demonstrated that RA benefits investors with lower education levels. The barriers posed by technology make it difficult for new entrants to enter the banking and financial services industry. Thus, there is intensifying competition within the conventional banking sector (Seiler and Fanenbruck, 2021). As a result of technological innovation and digitization, in recent years, the financial sector has witnessed substantial innovation (Ghani et al., 2022).

(Jünger and Mietzner, 2020), It was stated that robo-technology was becoming the mainstream support for goal-based decision-making due to the demand for flexibility. Using RAs is a convenient, easy, and convenient way for lay investors to make sustainable investments (Brenner and Meyll, 2020). It has been observed that when consumers are actively involved in an investment, they tend to use personalised and tailored financial advice to relying solely on automated or digital advice, such as RA (Northey et al., 2022). On the other hand, according to (Faradynawati and Söderberg, 2022), It is important to note that Swedish, Norwegian, and Finnish users of RA aspire to become sustainable investors.

Table 1: The variables used to establish the hypothesis (Scale) were selected from the literature.

Variable	References
Usefulness	(Wang et al., 2024)
Risk & Security	(Belanche et al., 2019a)
Policy interventions	(Mishra et al., 2022)
Perceived Trust	(Zheng et al., 2022)
Perceived benefits	(Noppers et al., 2015)
Adoption Intention	(Shrestha et al., 2021)

Usefulness

Intentional behaviour is not directly affected by perceived useful customisation. A customer's intent to use technology in their purchasing depends on the use, trust, and customer involvement in purchasing (Akram et al., 2021). (Gan et al., 2021) found that PLS-SEM did not apply to investment management from the perspective of productivity and effectiveness. The respondents in this study ranged in age from 18 to 80 years old, representing three generations. Among the factors that predict behaviour to adopt RAs, attitudes are the most important, followed by usefulness, subjective norms, perceptions of behavioural, and risk (Zheng et al., 2022).

H_{1a} USF is significantly related to RS.

H_{2b} RS mediates the linkage between USF and AI.

Perceived Trust

Due to the self-service nature of RAs and AI services, trust is crucial (Ostrom et al., 2019). It is apparent that self-service technology does not facilitate social bonding with clients and developing relationships (Bock et al., 2020). Despite this, it is unlikely that new technology will be adopted when it is not useful and appears to pose a high level of risk to the system (Yi et al., 2023); discussed financial information is highly sensitive and personal, which is why new technologies must be trusted to protect their financial information from security breaches (Howcroft et al., 2002). As well as this, references (Tajul Urus et al., 2022) show that trust and intentions to adopt fintech are positively related. Moreover, it has been discovered that trust is important in commercialising the Internet to adopt digital banking services (Setiawan et al., 2021).

H_{2a} PT is significantly related to RS.

H_{2b} RS mediates the linkage between PT and AI.

Perceived Benefits

Potential customers will perceive RA as beneficial and easy to use, leading to its continued growth (Northey et al., 2022). When people are convinced that the technology they are provided will enable them to accomplish something they need or want, they tend to begin adopting new technologies into their daily lives. Compared to traditional human advisory, RAs are characterized by a greater degree of 'personalization' than traditional human advisory (Heinrich and Schwabe, 2018). A previous study (Faloon and Scherer, 2017) also demonstrated that adopting RA increases customers' understanding of personal finance and investment decision-making (Belanche et al., 2019a). It has been found that technological advancements and digitalization have greatly increased the availability of wireless internet-enabled gadgets, along with the pandemic environment, as a consequence of technological advancements and digitalization (Akram et al., 2021).

H_{3a} PB is significantly related to RS.

H_{3b} RS mediates the linkage between PB and AI.

Policy interventions (PI)

Research studies (Ghani et al., 2022; Isaia and Oggero, 2022) Studies in several countries have shown that PI influences individuals' inclination to adopt RAs (Hanafizadeh et al., 2014), following the successful adoption of RAs via monetary and nonmonetary incentives (Malaquias et al., 2018). The USA and the UK, the biggest markets for RAs globally, are implementing various policies to support this technology. There is a difference between these policies and those the administration implements for supporting RAs (Belanche et al., 2019a).

The government often uses incentives and subsidies to encourage companies to adopt secure digital technologies (Northey et al., 2022), such as RAs. Tax credits, rebates, grants, subsidies, infrastructure investments, and research and development funding are some examples of incentives available to companies (Beketov et al., 2018). Various collaborative R&D projects, technology demonstrations, pilot programs, and public-private partnerships are funded by public funds to improve the technology and infrastructure of RAs and speed up innovation (Isaia and Oggero, 2022).

H_{4a} PI is significantly related to RS.

H_{4b} RS mediates the linkage between PI and AI.

Risk & Security (RS)

Risk perception is important in shaping behaviour regarding advancing technologies, such as block-chain technology and digital transactions. Furthermore, psychological constructs play a substantial role in the adoption intentions of individuals, along with perceived risk and innovativeness (Gursoy et al., 2019). This technology might also be hindered by concerns regarding performance, reliability, and resale value that may prevent its widespread adoption in the future (Fan et al., 2021). Since AI may cause harm or have repercussions on the financial sector, the use of AI for asset management is a topic that gets a lot of discussion in the sector.(Weld and Bansal, 2019).

After implementing the congestion fee in Brazil, respondents are more positive about the benefits and costs. Early adopters evaluated RAs following implementation and found them more capable and safer than conventional manual transactional methods (Malaquias et al., 2018). In order to influence

consumers' adoption of RAs to be effective, consumers' perceptions of safety risk must be taken into consideration. The safety and volatility of RAs, as well as their accuracy and safety potential, may be a concern for consumers (Ostrom et al., 2019).

H_5 RS mediates the linkage between latent variables and AI.

Adoption Intention towards Robo-Advisors

Usdigitizationtisation advantage in daily life, Individual wealth advisors or managers were developed to disintermediate conventional wealth managers (Jung et al., 2018b). As a result, there are fewer overhead expenses associated with the automated investment process (Mishra et al., 2023). Due to the perceived market irrelevance of RAs owing to millennials' higher income levels, they began appealing to a wider audience of investors rather than targeting only the wealthy and high-net-worth crowd. Traditional investment advisors are highly involved in human dialogues but limited to full-service investors. RA is a useful investment tool that is becoming increasingly popular among individuals, as shown in Figure 1 (Hentzen et al., 2022). There is a decrease in information asymmetry, resulting in reduced transaction costs. Investors nowadays have access to fully automated investment vehicles (Mishra et al., 2022). The findings reported in (Zhang et al., 2021) Customers prefer exceptional human, financial managers who are highly proficient in financial matters over algorithms based on robotics.

Research Design

As part of the study, quantitative methodology and non-probability sampling methods were used. To answer the research questions, quantitative techniques were used to test hypotheses. It is appropriate to use a nonprobability sampling approach when collecting data from millennials who have at least some savings and investing experience or have heard about RA. Survey forms for Saudi women born between 1981 and 1996 were sent online using Google Forms to conduct the survey. In order to ensure the confidentiality of the data collected, the survey was carried out under movement control. I found that an online Google form was the most effective way to reach respondents and to reach them as quickly as possible.

It is important to point out that the non-probability sampling method involves not giving all the members of the target population an equal opportunity to participate in the study. When nonprobability sampling is used, individuals whose inclusion may not be possible as part of a random sample can be incorporated into the sample (Etikan, 2017)). When researchers conduct social science training, they often use this sampling technique to get participants to voluntarily indicate their interest in participating in the study once it is announced by the researcher (Stratton, 2021). According to (Avkiran et al., 2018; Hair et al., 2017) this sampling aims to select a sample of participants capable of providing valuable feedback regarding the RA service. Potential respondents may include users of the RA service who have expressed interest in the service.

Across 799 respondents, 799 responses were obtained, of which 26 did not respond, resulting in 799 responses. In this regard, 96.8% of the respondents responded to the study. The sample size was sufficient to meet the minimum sample size requirement following G*Power, which was 128 (Hair et al., 2018). For calculating sample size, most studies use a G*Power analysis (Hair et al., 2017; Sarstedt et al., 2022.

Our study attempts to understand the process of adopting RA digital solutions from women's perspective using the UTAUT. We propose a framework for using RA solutions using the UTAUT theory. This study identifies the factors for adopting RA solutions in financial organizations with a well-established theory of UTAUT (Venkatesh et al., 2012). Usefulness, Risk and Security, willingness to adopt, Perceived Trust, Perceived benefits, Policy Interventions and various demographic factors. Besides some demographic questions, the structured questionnaire had 26 statements of 6 constructs with a 5-point Likert scale ranging from "strongly disagree" to "strongly agree" (Appendix A).

Data Analysis

The study adopted exploratory and explanatory research to understand the variables responsible for adopting RA. The first step was to identify factors of RA using factor analysis. The approach enhanced the validity of the conceptual model by ensuring the data quality and sufficiency. The second step was to test a framework, which ensured the adoption process.

This study is accompanied by CB-SEM using SMART PLS version 4.2.1. The questionnaire designed included five-point Likert scales for respondents to rate. These ranged from (1) strongly disagree, (2)

disagree, (3) neutral, (4) agree, and (5) strongly agree. The items in this study have been adapted from previous research to make them suitable for the RA context in which they were developed. An existing questionnaire may be improved by adapting it to meet users' needs better.

Table 2: Reliability and validity matrix

Construct	Cronbach's alpha	Composite reliability	Average variance extracted (AVE)
Adoption Intention	0.935	0.958	0.884
Perceived Benefits	0.944	0.964	0.899
Policy Interventions	0.959	0.970	0.891
Perceived Trust	0.905	0.933	0.777
Risk & Security	0.945	0.960	0.858
Usefulness	0.966	0.975	0.906

While loading each item, the threshold limits prescribed by each author were compared to the outcome of loading each item. Because several factors had minimal loading on the scales, they were eliminated from the scales. After removing the items from the construct, it was necessary to reassess the remaining items. This was to ensure that the constructs were valid and reliable when removed from the construct.

Table 3: Discriminant validity (Heterotrait-monotrait ratio (HTMT))

Construct	A	PB	PI	PT	RS	USF
Adoption Intention						
Perceived Benefits	0.626					
Policy Interventions	0.611	0.722				
Perceived Trust	0.714	0.705	0.693			
Risk & Security	0.589	0.629	0.650	0.665		
Usefulness	0.561	0.662	0.611	0.641	0.498	

Measurement model assessment

The CR and CV of the constructs in the measurement model were tested using established measures such as alpha, CR, and AVE to determine their CR and CV (Table 2). As a result, at least three of the four constructs exceeded the benchmark of 0.70, indicating that all constructs are internally consistent and reliable. As a result, the AVE values for all constructs exceeded the threshold of 0.50, indicating convergent validity (Sarstedt et al., 2017). According to Table 3, all constructs had HTMT ratios less than 0.85 and respected the benchmark. Furthermore, the AVE for all constructs was greater than 0.50, inter-construct correlation, confirming DV. A DV assessment of the measurement model was carried out in (Table 4).

Table 4: Fornell-Larcker criterion

Construct	A	PB	PI	PT	RS	USF
Adoption Intention	0.940					
Perceived Benefits	0.588	0.948				
Policy Interventions	0.579	0.687	0.944			
Perceived Trust	0.657	0.818	0.646	0.882		
Risk & Security	0.554	0.595	0.860	0.616	0.926	
Usefulness	0.533	0.632	0.588	0.599	0.476	0.952

Table 5: Collinearity statistics for Variance inflation factor (VIF) & Outer loadings

Construct: items	Outer loadings	Construct: items	VIF
A13	0.951	A13	4.757

AI1	0.924	AI1	3.317
AI2	0.947	AI2	4.477
PB2	0.948	PB2	4.529
PB3	0.953	PB3	4.043
PB4	0.944	PB4	4.209
PI1	0.926	PI1	4.467
PI2	0.950	PI2	4.018
PI3	0.952	PI3	3.863
PI4	0.947	PI4	3.558
PT1	0.881	PT1	2.649
PT2	0.865	PT2	2.462
PT3	0.888	PT3	3.051
PT4	0.893	PT4	3.118
RS1	0.914	RS1	4.140
RS2	0.944	RS2	4.441
RS3	0.938	RS3	4.704
RS4	0.909	RS4	3.610
USF1	0.943	USF1	4.354
USF2	0.948	USF2	4.797
USF3	0.962	USF3	3.894
USF4	0.955	USF4	4.867

A (VIF) quantifies how much the variance has been inflated. But what is a variance? Previously, we were taught that estimating the coefficients has an inflated variance if multicollinearity exists in the data, leading to inflated standard errors. Whenever a multiple regression model is used, a variance inflation factor is associated with each predictor. There is no multicollinearity problem in the model as long as each item has a value less than three and all the items have a value less than three. First-order measurement models use an outer loading to indicate how strongly observed variables relate to their latent variables (Hair et al., 2019). According to (Richter et al., 2016), It is considered acceptable if the outer loading is at least 0.7 (Table 5).

Table 6: Path coefficients: Mean, STDEV, T statistics, P values

Construct	Sample mean	Standard deviation (STDEV)	T statistics	P values
PB -> A	-0.003	0.056	0.051	0.959
PB -> RS	-0.097	0.044	2.212	0.027
PI -> A	0.099	0.066	1.511	0.131
PI -> RS	0.846	0.024	35.687	0.000
PT -> A	0.412	0.056	7.374	0.000
PT -> RS	0.194	0.044	4.352	0.000
RS -> A	0.138	0.057	2.431	0.015
USF -> A	0.163	0.040	4.044	0.000
USF -> RS	-0.076	0.025	2.995	0.003

*1% significance level

Findings

The current research determines to advance a framework encompassing the determinants of behaviour toward women's adoption of RAs. In light of recent advancements in RA services, such as risk and security,

perceived trust, and perceived benefits in the rapidly evolving digital realm of financial services delivery, we extended the UTAUT & TAM framework to integrate pertinent factors (Table 6). The result of the current study established that attitude towards using RAs is significantly associated with all the predictors (PT, USF, and RS) other than PB & PI. Consequently, H_1 (**β**=-0.163), H_2 (**β**=0.412), and H_5 (**β**=0.138) are supported, whereas H_3 (**β**=-0.003) and H4 (**β**=-0.099) are not supported. A significant positive association of USF & PT with RS towards using RA is congruent with prior studies (Belanche et al., 2019b; Yeh et al., 2023). It implies that customers' trust and usefulness in effectively managing personal finance through RAs would positively affect using RAs (Fig: 2). Because PB & USF are advanced technologies with digital transactions conducted through robotics, the negative relationship between the two can be understood. Individuals with small amounts of capital can invest and receive professional advice on many platforms due to their low minimum investment requirements. It is possible to create a hybrid approach by combining RAs with human advisors, enhancing the overall client experience by combining automated efficiency with personalized human advice, enhancing the overall client experience through a hybrid approach.

Also, RS has been mediating fully between latent variables and the adoption intention of RAs. Various factors, including perceived benefits, perceived trust, and security concerns, have influenced the adoption of RAs in the financial services industry. To determine the adoption intention of potential customers in the adoption process, risk and security considerations play a significant role in influential their inclination to adopt.

Because sustainable production, consumption, and investment practices continue to be emphasized, the current study's findings may be relevant to the current situation. The cost and difficulty of investing in sustainable investments may make it difficult and expensive for individual clients (Hentzen et al., 2022; Northey et al., 2022). People adopt RAs for several reasons, including benefits, trust, and security. The benefits of RAs, which include cost-effectiveness, convenience, and personalized advice, may seem overshadowed by the risks associated with financial, technology, privacy, and security risks, which may overshadow the advantages of these products in terms of their cost-effectiveness, convenience, customized advice, as well as their convenience and customization. Effective risk management and robust security measures can reduce these issues' likelihood. It is possible to foster greater trust and encourage broader adoption of RAs as financial institutions become more familiar with RAs and ensure security practices are transparent and reliable.

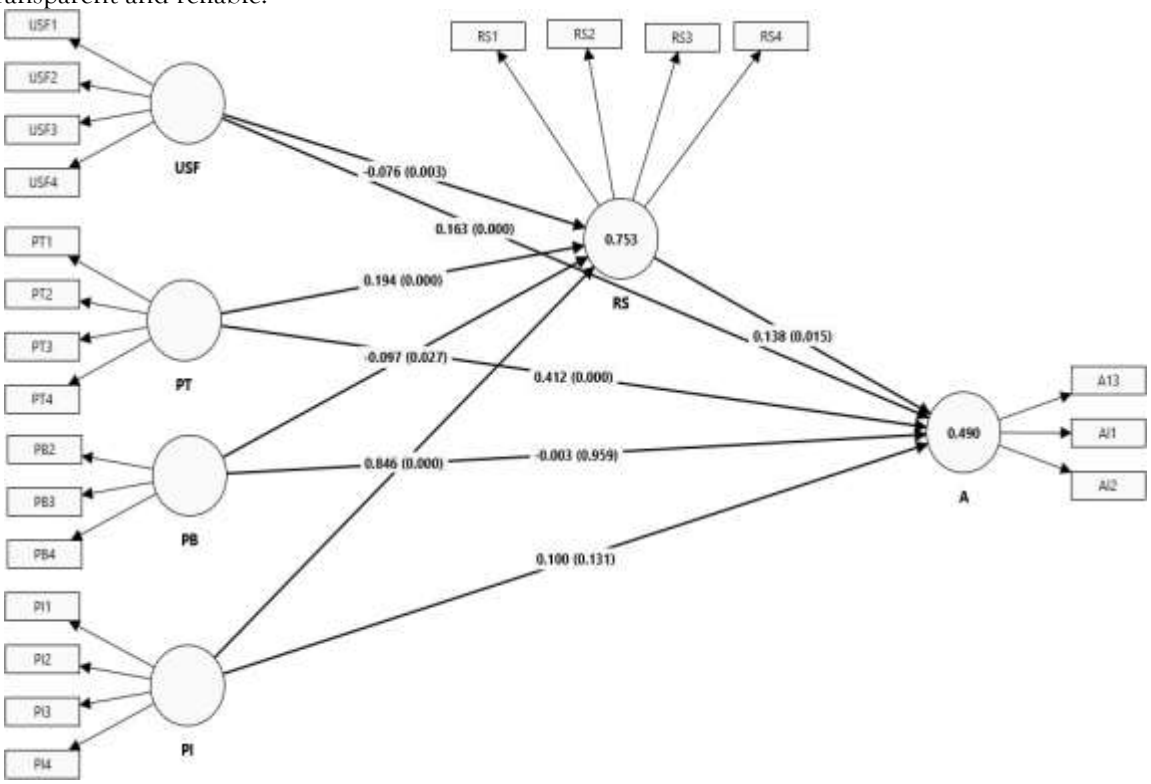

Fig 2: A path analysis

Table 7: Importance-performance map analysis (IPMA) Construct total effects for Quality criteria

Construct	LV Performance	Importance to the Adoption RA
PB	-0.016	48.392
PI	0.217	47.373
PT	0.439	52.844
RS	0.138	46.296
USF	0.153	49.797

Furthermore, its implementation is grounded on three motivations: IPMA enhances management decision-making by providing a more rigorous approach. It is a powerful tool for managers to establish more effective priorities and allocate limited resources more efficiently. Additionally, IPMA offers standards for performance evaluation that benefit both the company and its investors. In addition to the PLS-SEM results of a structural model, IPMA enhances the interpretation of these results by utilizing a four-quadrant diagram, as shown in Figure 3.

In the vertical axis, the performance of the qualities is represented, ranging from low to high. A horizontal axis shows the relative significance of the qualities, ranging from insignificance to great significance. According to (Martilla and James, 1977), the building of the importance map involves dividing it into four quadrants: Q1 (Management is satisfactory), Q2 (Something important that requires improvement), Q3 (Excessive performance for a non-important issue), and Q4 (Irrelevant and no performance). The quadrants are defined based on the average values of performance and importance, as indicated in the IPMA results in Table 7. Findings indicate that the adoption intention for perceived trust is significantly influenced. Therefore, RAs service providers must prioritize and concentrate on this structure to effectively utilize RAs. In addition, its performance surpasses that of other structures. The usefulness of RAs can be observed, and risk and security also significantly impact their performance.

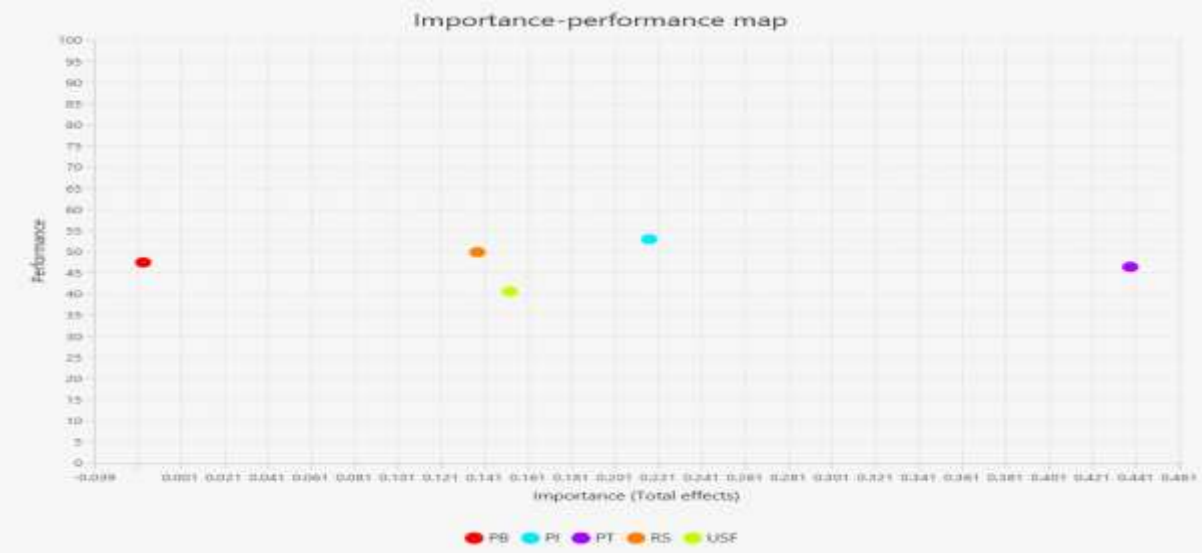

Fig 3: IMPA Analysis

CONCLUSION

Efforts should be made to collaborate with financial institutions and fintech companies to ensure that digital financial literacy initiatives reach all segments of society, including underserved populations. The government can provide grants, tax benefits, and other financial support to encourage fintech businesses to invest in digital financial literacy. Educating the public about online financial fraud risks and safe browsing practices can be accomplished through public awareness campaigns. It may also be necessary to establish a cybersecurity centre under the direction of professionals in the field. By disseminating consistent and accurate information about financial fraud prevention, the centre would provide resources, training, and support to individuals and businesses. Fintech platforms must be subject to stringent cybersecurity and data protection regulations. It is to

ensure the security of customer financial information. Moreover, customers should be able to contact the support team at any time to report suspicious activities or potential fraud incidents, and a designated channel should be available for this purpose. Users will be able to become more vigilant and confident about detecting scams if they can identify and respond to potential threats in simulated fraud scenarios. People skeptical about RAs, especially technophobic ones, should be reassured that they retain full control and autonomy over their investments. Further, RAs are designed to assist and support the participants in making financial decisions.

To attract new customers, a competitive price is one of the most crucial factors, while the distinctiveness of the offering and the quality of services provided play an equally crucial role in retaining current customers. Pricing is one of the most important aspects of the product and service offering, as many clients look at insurance policies based on their affordability. A number of digital tools have been introduced in recent years that have made it easier for consumers to compare products and services. The advent of digital comparison tools has enabled consumers to compare and evaluate insurance offerings based on price and services, thereby getting the best deal for their insurance needs. In addition, for an organization to be successful, consumers must trust the organization. Consequently, companies should protect the privacy and personal information of policyholders. A large amount of consumer data can potentially guide insurance companies' retention strategies. In order to remain competitive and maintain the highest level of loyalty, insurers must continuously innovate. Companies must utilize digital platforms to deliver timely, efficient, and individualized service.

DISCUSSION

This study addresses gaps in the literature by extending previous readings to examine the experiences that promote the adoption of RAs. This article discusses two theoretical perspectives. The TRA, on the other hand, focuses on the cognitive and behavioural characteristics of the service users. The idea of UTAUT is presented as a model for RAs in this study by integrating TRA with consumer cognitive behaviour. Therefore, we incorporated: what factors lead to RA adoption, and to what extent do trust-related factors influence RA adoption? The study examines how trust grows when people think RAs are safe and private. It does this by asking fintech-experienced users in China to fill out a questionnaire about their thoughts and plans for fintech services. The questionnaires are analyzed using PLS-SEM, focusing on people's feelings about accepting integrated technologies as RAs. We are contributing to the fintech literature by filling in the research gaps that have been identified. We first examine the factors responsible for attitudes towards and usage of RAs to examine the antecedent factors. Our insights into RA systems may provide the field with in-depth theoretical and practical implications since most existing research focuses more on cognitive behaviour in general-purpose RA systems.

Secondly, we empirically examine the interaction between perceived benefits and trust for RAs concurrently with UTAUT as the trial provider TRA. By analyzing the implications of both behavioural and technological viewpoints, we contribute to a wider awareness of RAs and fintech. In this study, structural equation testing confirmed several findings. The findings of this study support four hypotheses concerning the factors contributing to user adoption of fintech RAs. A statistically significant relationship was created between security and risk and user trust formation in the fintech RA.

It was concluded by the third conclusion of the research that, among the hypotheses regarding concurrent consideration, perceived benefits positively influenced the toward RAs, while usefulness, which was also influenced by security and risk, trust and women's adoption intentions for RAs as well. Despite this, policy interventions did not significantly affect facilitating conditions or attitudes. As a result, it appears that Saudi women respond more strongly to trust and usefulness regarding fintech RAs than to policy initiatives. As such, Saudi fintech managers would be more appropriate to emphasize various protective measures that increase trust concerns and highlight security issues.

Although financial services are driving innovation through AI in the form of RAs, it is difficult for these services to survive without the trust of their customers. There is a need for more extensive research and studies in the field of fintech, as it is still in its infancy research on the impact that trust has on attitudes and adoption of fintech services (Mishra et al., 2022; Riedel et al., 2022; Shi et al., 2016; Zhao et al., 2021) In a similar way, there is an insufficient amount of research on behavioural precedents that support or oppose RA technology. Information technology and the behaviour of users are closely intertwined when it comes to fintech technologies (Peng and Kim, 2014; Ruvio et al., 2008). Despite this study, very

few studies have examined RA adoption from the perspective of acceptance theory. In order to understand how RAs develop from a divergent theoretical perspective, it would be useful to examine the factors preceding their development

Practical implications

Concerning recent advancements in RAs, this study significantly contributes to the existing literature on RA adoption. In the current study, trust and usefulness are integrated into the UTAUT & TAM frameworks as interpreters of behavioural intentions. It is important to remember this since globalization has encouraged producers, consumers, and investors to make environmentally friendly investments, consumption, and production practices. Sustainable investment is growing worldwide, and individual investors can benefit from RAs offering sustainable portfolios. First, an individual investor would otherwise have had difficulty screening sustainable investments and spent considerable time and money on the process. In addition, the study considers the development of the conversational features of RAs and the consequential anthropomorphism that follows. A prediction of behavioural intention toward RAs has been introduced in this study by the concept of anthropomorphism.

Overall, the current study provides an important contribution to ongoing research on adopting RAs. As a result of its comprehensive review, the paper provides a sound foundation for future research in the domain of RAs and the wider FinTech industry in general. In addition, some of the contributions made in this study might be replicated in other service industries that use AI-based systems to deliver services. As part of its efforts to increase the adoption of RAs, the finance services industry is actively promoting them. It is important to remember that when it comes to RA services in financial planning, policymakers formulate policy guidelines about policy guidelines for RAs. According to their clients' needs, providers of RA services formulate strategies for segmentation, targeting, and positioning. A RA's goal is to improve the quality of life of the general public by providing economic, financial, and wealth management services.

Limitations and future research directions

The authors have attempted to address the most significant aspects and valuable opinions relevant to the study, but there are still flaws. A study on possible consumers of RAs in the KSA was conducted with limited applicability to this particular technology. Further, it is imperative to note that inherent limitations may be associated with the sample size and sampling method used in this study. They did not include demographic characteristics in their analysis because the authors didn't believe they were relevant to the study's goal.

To gain insight into the actual behaviour of early adopters in the future, rather than relying on their intentions to adopt RAs, it might be helpful to focus some of our efforts on obtaining insights into their actual behaviour. As a result, we would be able to gain a better understanding of their behaviour. There is a possibility that studies that investigate the intention to use RAs may involve a sample size of over two thousand individuals. The results would be significantly more accurate as a result. Future research might be conducted in cross-cultural settings to gain additional insight into customers' behaviour. Stakeholder analyses will provide researchers with a deeper understanding of RA ecosystems in the future. This will enable them and achieve a thorough understanding of the ecosystem.

Funding Details: The authors extend their appreciation to the Deanship of Scientific Research at Saudi Electronic University for funding this research (8234-AFS-2023-1-202301-1).

Disclosure statement:The authors report there are no competing interests to declare.

Author Contributions statement

Dr Yasmeen Ansari: Conceptualization; Supervision; Project administration Funding Acquisition, Resources, Writing – review & editing. **Dr. Rohit Bansal:** Methodology; Software, Formal analysis; Roles/Writing - original draft. **Anand Kumar Mishra**–Validation; Visualization; **Prince Kumar Maurya** Investigation; Data curation.

Data availability statement

Data will be provided upon request.

REFERENCES

1. Akram, U., Fülöp, M.T., Tiron-Tudor, A., Topor, D.I., Căpuşneanu, S., 2021. Impact of Digitalization on Customers' Well-Being in the Pandemic Period: Challenges and Opportunities for the Retail Industry. Int. J. Environ. Res. Public Health 18, 7533. https://doi.org/10.3390/ijerph18147533
2. Aldás-Manzano, J., Lassala-Navarré, C., Ruiz-Mafé, C., Sanz-Blas, S., 2009. The role of consumer innovativeness and perceived risk in online banking usage. Int. J. Bank Mark. 27, 53–75. https://doi.org/10.1108/02652320910928245
3. Aldossari, M.Q., Sidorova, A., 2020. Consumer Acceptance of Internet of Things (IoT): Smart Home Context. J. Comput. Inf. Syst. 60, 507–517. https://doi.org/10.1080/08874417.2018.1543000
4. Ansari, Y., Bansal, R., 2024. Robo-advisory financial services and the dynamics of new innovation in Saudi Arabia. J. Open Innov. Technol. Mark. Complex. 10, 100397. https://doi.org/10.1016/j.joitmc.2024.100397
5. Ansari, Y., Bansal, R., Kumar Kar, S., 2024. An empirical analysis of Saudi Arabian women's intentions to adopt hydrogen fuel cell cars. Transp. Res. Interdiscip. Perspect. 28, 101269. https://doi.org/10.1016/j.trip.2024.101269
6. Aquino Shluzas, L.M., Leifer, L.J., 2014. The insight-value-perception (iVP) model for user-centered design. Technovation 34, 649–662. https://doi.org/10.1016/j.technovation.2012.08.002
7. Avkiran, N.K., Ringle, C.M., Low, R., 2018. Monitoring transmission of systemic risk: application of partial least squares structural equation modeling in financial stress testing. J. Risk. https://doi.org/10.21314/JOR.2018.386
8. Bai, Z., 2021. Does robo-advisory help reduce the likelihood of carrying a credit card debt? Evidence from an instrumental variable approach. J. Behav. Exp. Financ. 29, 100461. https://doi.org/10.1016/j.jbef.2021.100461
9. Barroso, M., Laborda, J., 2022. Digital transformation and the emergence of the Fintech sector: Systematic literature review. Digit. Bus. 2, 100028. https://doi.org/10.1016/j.digbus.2022.100028
10. Baudier, P., Ammi, C., Deboeuf-Rouchon, M., 2020. Smart home: Highly-educated students' acceptance. Technol. Forecast. Soc. Change 153, 119355. https://doi.org/10.1016/j.techfore.2018.06.043
11. Beketov, M., Lehmann, K., Wittke, M., 2018. Robo Advisors: quantitative methods inside the robots. J. Asset Manag. 19, 363–370. https://doi.org/10.1057/s41260-018-0092-9
12. Belanche, D., Casaló, L. V., Flavián, C., 2019a. Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers. Ind. Manag. Data Syst. 119, 1411–1430. https://doi.org/10.1108/IMDS-08-2018-0368
13. Belanche, D., Casaló, L. V., Flavián, C., 2019b. Artificial Intelligence in FinTech: understanding robo-advisors adoption among customers. Ind. Manag. Data Syst. 119, 1411–1430. https://doi.org/10.1108/IMDS-08-2018-0368
14. Bhatia, A., Chandani, A., Chhateja, J., 2020. Robo advisory and its potential in addressing the behavioral biases of investors — A qualitative study in Indian context. J. Behav. Exp. Financ. 25, 100281. https://doi.org/10.1016/j.jbef.2020.100281
15. Bock, D.E., Wolter, J.S., Ferrell, O.C., 2020. Artificial intelligence: disrupting what we know about services. J. Serv. Mark. 34, 317–334. https://doi.org/10.1108/JSM-01-2019-0047
16. Brenner, L., Meyll, T., 2020. Robo-advisors: A substitute for human financial advice? J. Behav. Exp. Financ. 25, 100275. https://doi.org/10.1016/j.jbef.2020.100275
17. Brooks, C., Sangiorgi, I., Hillenbrand, C., Money, K., 2019. Experience wears the trousers: Exploring gender and attitude to financial risk. J. Econ. Behav. Organ. 163, 483–515. https://doi.org/10.1016/j.jebo.2019.04.026
18. Chao, C.-M., 2019. Factors Determining the Behavioral Intention to Use Mobile Learning: An Application and Extension of the UTAUT Model. Front. Psychol. 10. https://doi.org/10.3389/fpsyg.2019.01652
19. Chen, Y., Chiu, J., Chung, H., 2022. Givers or Receivers? Return and volatility spillovers between Fintech and the Traditional Financial Industry. Financ. Res. Lett. 46, 102458. https://doi.org/10.1016/j.frl.2021.102458
20. Chopdar, P.K., Korfiatis, N., Sivakumar, V.J., Lytras, M.D., 2018. Mobile shopping apps adoption and perceived risks: A cross-country perspective utilizing the Unified Theory of Acceptance and Use of Technology. Comput. Human Behav. 86, 109–128. https://doi.org/10.1016/j.chb.2018.04.017
21. Choudrie, J., Junior, C.-O., McKenna, B., Richter, S., 2018. Understanding and conceptualising the adoption, use and diffusion of mobile banking in older adults: A research agenda and conceptual framework. J. Bus. Res. 88, 449–465. https://doi.org/10.1016/j.jbusres.2017.11.029
22. Comin, D., Mestieri, M., 2014. Technology Diffusion: Measurement, Causes, and Consequences. pp. 565–622. https://doi.org/10.1016/B978-0-444-53540-5.00002-1
23. D'Acunto, F., Prabhala, N., Rossi, A.G., 2019. The Promises and Pitfalls of Robo-Advising. Rev. Financ. Stud. 32, 1983–2020. https://doi.org/10.1093/rfs/hhz014
24. D'Hondt, C., De Winne, R., Ghysels, E., Raymond, S., 2020. Artificial Intelligence Alter Egos: Who might benefit from robo-investing? J. Empir. Financ. 59, 278–299. https://doi.org/10.1016/j.jempfin.2020.10.002
25. Davis, F.D., 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. MIS Q. 13, 319. https://doi.org/10.2307/249008
26. Dorfleitner, G., Hornuf, L., Schmitt, M., Weber, M., 2017. FinTech in Germany. Springer International Publishing, Cham. https://doi.org/10.1007/978-3-319-54666-7
27. Erjavec, J., Manfreda, A., 2022. Online shopping adoption during COVID-19 and social isolation: Extending the UTAUT model with herd behavior. J. Retail. Consum. Serv. 65, 102867. https://doi.org/10.1016/j.jretconser.2021.102867
28. Etikan, I., 2017. Sampling and Sampling Methods. Biometrics Biostat. Int. J. 5. https://doi.org/10.15406/bbij.2017.05.00149
29. Faloon, M., Scherer, B., 2017. Individualization of Robo-Advice. J. Wealth Manag. 20, 30–36. https://doi.org/10.3905/jwm.2017.20.1.030
30. Fan, L., Tu, Z., Chan, S.H., 2021. Recent development of hydrogen and fuel cell technologies: A review. Energy Reports 7, 8421–8446. https://doi.org/10.1016/j.egyr.2021.08.003

31. Faradynawati, I.A.A., Söderberg, I.-L., 2022. Sustainable Investment Preferences among Robo-Advisor Clients. Sustainability 14, 12636. https://doi.org/10.3390/su141912636
32. Fishbein, M., & Ajzen, I., 1975. Belief, Attitude, Intention, and Behavior: An Introduction to Theory and Research. Addison-Wesley.
33. Gan, L.Y., Khan, M.T.I., Liew, T.W., 2021. Understanding consumer's adoption of financial robo-advisors at the outbreak of the <scp>COVID</scp> -19 crisis in Malaysia. Financ. Plan. Rev. 4. https://doi.org/10.1002/cfp2.1127
34. Ghani, E.K., Ali, M.M., Musa, M.N.R., Omonov, A.A., 2022. The Effect of Perceived Usefulness, Reliability, and COVID-19 Pandemic on Digital Banking Effectiveness: Analysis Using Technology Acceptance Model. Sustainability 14, 11248. https://doi.org/10.3390/su141811248
35. Gomber, P., Kauffman, R.J., Parker, C., Weber, B.W., 2018. On the Fintech Revolution: Interpreting the Forces of Innovation, Disruption, and Transformation in Financial Services. J. Manag. Inf. Syst. 35, 220–265. https://doi.org/10.1080/07421222.2018.1440766
36. Gomber, P., Koch, J.-A., Siering, M., 2017. Digital Finance and FinTech: current research and future research directions. J. Bus. Econ. 87, 537–580. https://doi.org/10.1007/s11573-017-0852-x
37. Gursoy, D., Chi, O.H., Lu, L., Nunkoo, R., 2019. Consumers acceptance of artificially intelligent (AI) device use in service delivery. Int. J. Inf. Manage. 49, 157–169. https://doi.org/10.1016/j.ijinfomgt.2019.03.008
38. Hair, J.F., Hult, G.T.M., Ringle, C.M., Sarstedt, M., 2017. A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM). Sage 165.
39. Hair, J.F., Risher, J.J., Ringle, C.M., 2018. When to use and how to report the results of PLS-SEM 31, 2–24. https://doi.org/10.1108/EBR-11-2018-0203
40. Hair, J.F., Risher, J.J., Sarstedt, M., Ringle, C.M., 2019. When to use and how to report the results of PLS-SEM. Eur. Bus. Rev. 31, 2–24. https://doi.org/10.1108/EBR-11-2018-0203
41. Hanafizadeh, P., Keating, B.W., Khedmatgozar, H.R., 2014. A systematic review of Internet banking adoption. Telemat. Informatics 31, 492–510. https://doi.org/10.1016/j.tele.2013.04.003
42. Heinrich, P., Schwabe, G., 2018. Facilitating Informed Decision-Making in Financial Service Encounters. Bus. Inf. Syst. Eng. 60, 317–329. https://doi.org/10.1007/s12599-017-0501-5
43. Hentzen, J.K., Hoffmann, A., Dolan, R., Pala, E., 2022. Artificial intelligence in customer-facing financial services: a systematic literature review and agenda for future research. Int. J. Bank Mark. 40, 1299–1336. https://doi.org/10.1108/IJBM-09-2021-0417
44. Hildebrand, C., Bergner, A., 2021. Conversational robo advisors as surrogates of trust: onboarding experience, firm perception, and consumer financial decision making. J. Acad. Mark. Sci. 49, 659–676. https://doi.org/10.1007/s11747-020-00753-z
45. Hoque, R., Sorwar, G., 2017. Understanding factors influencing the adoption of mHealth by the elderly: An extension of the UTAUT model. Int. J. Med. Inform. 101, 75–84. https://doi.org/10.1016/j.ijmedinf.2017.02.002
46. Howcroft, B., Hamilton, R., Hewer, P., 2002. Consumer attitude and the usage and adoption of home-based banking in the United Kingdom. Int. J. Bank Mark. 20, 111–121. https://doi.org/10.1108/02652320210424205
47. Huang, G., 2016. Moderating Role of Brand Familiarity in Cross-Media Effects: An Information Processing Perspective. J. Promot. Manag. 22, 665–683. https://doi.org/10.1080/10496491.2016.1154922
48. Hussain, K., Khan, M.L., Malik, A., 2024. Exploring audience engagement with ChatGPT-related content on YouTube: Implications for content creators and AI tool developers. Digit. Bus. 4, 100071. https://doi.org/10.1016/j.digbus.2023.100071
49. Iost Filho, F.H., Heldens, W.B., Kong, Z., de Lange, E.S., 2020. Drones: Innovative Technology for Use in Precision Pest Management. J. Econ. Entomol. 113, 1–25. https://doi.org/10.1093/jee/toz268
50. Isaia, E., Oggero, N., 2022. The potential use of robo-advisors among the young generation: Evidence from Italy. Financ. Res. Lett. 48, 103046. https://doi.org/10.1016/j.frl.2022.103046
51. Jonker, N., 2019. What drives the adoption of crypto-payments by online retailers? Electron. Commer. Res. Appl. 35, 100848. https://doi.org/10.1016/j.elerap.2019.100848
52. Jung, D., Dorner, V., Weinhardt, C., Pusmaz, H., 2018a. Designing a robo-advisor for risk-averse, low-budget consumers. Electron. Mark. 28, 367–380. https://doi.org/10.1007/s12525-017-0279-9
53. Jung, D., Dorner, V., Weinhardt, C., Pusmaz, H., 2018b. Designing a robo-advisor for risk-averse, low-budget consumers. Electron. Mark. 28, 367–380. https://doi.org/10.1007/S12525-017-0279-9
54. Jünger, M., Mietzner, M., 2020. Banking goes digital: The adoption of FinTech services by German households. Financ. Res. Lett. 34, 101260. https://doi.org/10.1016/j.frl.2019.08.008
55. Kar, S.K., Bansal, R., Harichandan, S., 2022. An empirical study on intention to use hydrogen fuel cell vehicles in India. Int. J. Hydrogen Energy 47, 19999–20015. https://doi.org/10.1016/j.ijhydene.2022.04.137
56. Litterscheidt, R., Streich, D.J., 2020. Financial education and digital asset management: What's in the black box? J. Behav. Exp. Econ. 87, 101573. https://doi.org/10.1016/j.socec.2020.101573
57. Lucey, B.M., Vigne, S.A., Ballester, L., Barbopoulos, L., Brzeszczynski, J., Carchano, O., Dimic, N., Fernandez, V., Gogolin, F., González-Urteaga, A., Goodell, J.W., Helbing, P., Ichev, R., Kearney, F., Laing, E., Larkin, C.J., Lindblad, A., Lončarski, I., Ly, K.C., Marinč, M., McGee, R.J., McGroarty, F., Neville, C., O'Hagan-Luff, M., Piljak, V., Sevic, A., Sheng, X., Stafylas, D., Urquhart, A., Versteeg, R., Vu, A.N., Wolfe, S., Yarovaya, L., Zaghini, A., 2018. Future directions in international financial integration research - A crowdsourced perspective. Int. Rev. Financ. Anal. 55, 35–49. https://doi.org/10.1016/j.irfa.2017.10.008
58. Maier, E., 2016. Supply and demand on crowdlending platforms: connecting small and medium-sized enterprise borrowers

and consumer investors. J. Retail. Consum. Serv. 33, 143–153. https://doi.org/10.1016/j.jretconser.2016.08.004
59. Malaquias, F., Malaquias, R., Hwang, Y., 2018. Understanding the determinants of mobile banking adoption: A longitudinal study in Brazil. Electron. Commer. Res. Appl. 30, 1–7. https://doi.org/10.1016/j.elerap.2018.05.002
60. Martilla, J.A., James, J.C., 1977. Importance-Performance Analysis. J. Mark. 41, 77–79. https://doi.org/10.1177/002224297704100112
61. Mehrabioun, M., 2024. A multi-theoretical view on social media continuance intention: Combining theory of planned behavior, expectation-confirmation model and consumption values. Digit. Bus. 4, 100070. https://doi.org/10.1016/j.digbus.2023.100070
62. Mietzner, M., Molterer, M., 2018. You might not get what you need: The discrepancy between financial advice and commissions in Germany. Econ. Lett. 162, 167–170. https://doi.org/10.1016/j.econlet.2017.11.004
63. Mishra, A.K., Bansal, R., Maurya, P.K., 2023. Investing for a better tomorrow: Values-driven antecedents of investment in socially responsible equity funds by Indian retail investors. J. Clean. Prod. 420, 138441. https://doi.org/10.1016/j.jclepro.2023.138441
64. Mishra, A.K., Bansal, R., Maurya, P.K., Kar, S.K., Bakshi, P.K., 2022. Predicting the antecedents of consumers' intention toward purchase of mutual funds: A hybrid PLS-SEM-neural network approach. Int. J. Consum. Stud. https://doi.org/10.1111/IJCS.12850
65. Noppers, E.H., Keizer, K., Bockarjova, M., Steg, L., 2015. The adoption of sustainable innovations: The role of instrumental, environmental, and symbolic attributes for earlier and later adopters. J. Environ. Psychol. 44, 74–84. https://doi.org/10.1016/j.jenvp.2015.09.002
66. Northey, G., Hunter, V., Mulcahy, R., Choong, K., Mehmet, M., 2022. Man vs machine: how artificial intelligence in banking influences consumer belief in financial advice. Int. J. Bank Mark. 40, 1182–1199. https://doi.org/10.1108/IJBM-09-2021-0439
67. Ostrom, A.L., Fotheringham, D., Bitner, M.J., 2019. Customer Acceptance of AI in Service Encounters: Understanding Antecedents and Consequences. pp. 77–103. https://doi.org/10.1007/978-3-319-98512-1_5
68. Peng, C., Kim, Y.G., 2014. Application of the Stimuli-Organism-Response (S-O-R) Framework to Online Shopping Behavior. J. Internet Commer. 13, 159–176. https://doi.org/10.1080/15332861.2014.944437
69. Richter, N.F., Sinkovics, R.R., Ringle, C.M., Schlägel, C., 2016. A critical look at the use of SEM in international business research. Int. Mark. Rev. 33, 376–404. https://doi.org/10.1108/IMR-04-2014-0148
70. Riedel, A., Mulcahy, R., Northey, G., 2022. Feeling the love? How consumer's political ideology shapes responses to AI financial service delivery. Int. J. Bank Mark. https://doi.org/10.1108/ijbm-09-2021-0438
71. Rios, R., Fernandez-Gago, C., Lopez, J., 2018. Modelling privacy-aware trust negotiations. Comput. Secur. 77, 773–789. https://doi.org/10.1016/j.cose.2017.09.015
72. Rühr, A., Berger, B., Hess, T., 2019. Can I control my robo-advisor? trade-offs in automation and user control in (digital) investment management.
73. Ruvio, A., Shoham, A., Brenčič, M.M., 2008. Consumers' need for uniqueness: Short-form scale development and cross-cultural validation. Int. Mark. Rev. 25, 33–53. https://doi.org/10.1108/02651330810851872
74. Samhale, K., Ladwein, R., Samhale, S., 2024. Exploring determinants of engagement in the use of IoT for healthcare during the COVID-19 pandemic: A fear-driven perspective. Digit. Bus. 4, 100072. https://doi.org/10.1016/j.digbus.2023.100072
75. Sarstedt, M., Ringle, C.M., Hair, J.F., 2017. Partial Least Squares Structural Equation Modeling, in: Handbook of Market Research. Springer International Publishing, Cham, pp. 1–40. https://doi.org/10.1007/978-3-319-05542-8_15-1
76. Seiler, V., Fanenbruck, K.M., 2021. Acceptance of digital investment solutions: The case of robo advisory in Germany. Res. Int. Bus. Financ. 58, 101490. https://doi.org/10.1016/j.ribaf.2021.101490
77. Senyo, P., Osabutey, E.L.C., 2020. Unearthing antecedents to financial inclusion through FinTech innovations. Technovation 98, 102155. https://doi.org/10.1016/j.technovation.2020.102155
78. Setiawan, B., Nugraha, D.P., Irawan, A., Nathan, R.J., Zoltan, Z., 2021. User Innovativeness and Fintech Adoption in Indonesia. J. Open Innov. Technol. Mark. Complex. 7, 188. https://doi.org/10.3390/joitmc7030188
79. Shanmuganathan, M., 2020. Behavioural finance in an era of artificial intelligence: Longitudinal case study of robo-advisors in investment decisions. J. Behav. Exp. Financ. 27, 100297. https://doi.org/10.1016/j.jbef.2020.100297
80. Shi, S., Chen, Y., Chow, W.S., 2016. Key values driving continued interaction on brand pages in social media: An examination across genders. Comput. Human Behav. 62, 578–589. https://doi.org/10.1016/j.chb.2016.04.017
81. Shrestha, A.K., Vassileva, J., Joshi, S., Just, J., 2021. Augmenting the technology acceptance model with trust model for the initial adoption of a blockchain-based system. PeerJ Comput. Sci. 7, e502. https://doi.org/10.7717/peerj-cs.502
82. Smith, A.A., Synowka, D.P., Smith, A.D., 2014. E-commerce quality and adoptive elements of e-ticketing for entertainment and sporting events. Int. J. Bus. Inf. Syst. 15, 450. https://doi.org/10.1504/IJBIS.2014.060397
83. Stratton, S.J., 2021. Population Research: Convenience Sampling Strategies. Prehosp. Disaster Med. 36, 373–374. https://doi.org/10.1017/S1049023X21000649
84. Tajul Urus, S., Kurniasari, F., Syed Mustapha Nazri, S.N.F., Utomo, P., Othman, I.W., Jimmy, S.Y., Abd Hamid, N., 2022. A comparative study of fintech payment services adoption among malaysian and indonesian fresh graduates: through the lens of UTAUT theory. Eastern-European J. Enterp. Technol. 5, 73–88. https://doi.org/10.15587/1729-4061.2022.265662
85. Tao, R., Su, C.-W., Xiao, Y., Dai, K., Khalid, F., 2021. Robo advisors, algorithmic trading and investment management: Wonders of fourth industrial revolution in financial markets. Technol. Forecast. Soc. Change 163, 120421. https: