

EXPLORING USER ACCEPTANCE OF FINTECH INNOVATIONS: A SYSTEMATIC REVIEW OF THEORETICAL MODELS AND EMPIRICAL STUDIES

LIBINA BABU AND GIREESH KUMAR G S

ABSTRACT. This paper presents the findings of a systematic review and bibliometric analysis aimed at exploring theoretical models and empirical studies on user acceptance of fintech innovations. Following the PRISMA guidelines, 58 studies published after 2020 were identified through a comprehensive search of the Scopus database. The literature reflects a strong reliance on established models, such as the Technology Acceptance Model and the Unified Theory of Acceptance and Use of Technology; and extensions of these theories/models included study variables such as trust, perceived risk and regulatory impacts. Empirical findings consistently highlight perceived usefulness, ease of use, trustworthiness, and the regulatory environment as important factors that affect user acceptance in a variety of Fintech domains, including mobile payments. The review emphasizes the importance of contextual factors, the perceptions of the users, and the regulatory framework in the driving influence of acceptance behavior. Such longitudinal studies, combined with the examination of emerging fintech innovations, will lead to a further richness of theoretical frameworks and applied practices.

1. INTRODUCTION

FinTech, the integration of finance and technology, has attracted increasing attention from governments, businesses, and academia since the 2008 global financial crisis due to its transformative potential (Sharma et al., 2024; Amnas et al., 2023). It enables the automation of investment processes, the launch of innovative lending platforms, the customization of insurance policies, and the modernization of banking services. Today, FinTech is reshaping the financial landscape and redefining the focus of the banking and financial services industry. It aims to improve and digitize the delivery of financial services, and is rapidly being adopted—especially among younger generations as a mainstream solution (Winanti & Fernando, 2024). Numerous FinTech firms, some publicly listed on stock exchanges such as India's, now offer diverse services including asset management, money transfers, insurance, and personal or business financing on unified platforms (Chuang et al., 2016). These companies are also playing a key role in supporting government-led initiatives for financial inclusion and digitization.

1.1. Overview of fintech innovations and their impact on financial services. From 1866 to 1967, the financial sector was an analog industry, but it was also partially influenced by technology (Peng, 2023). Between 1697 and 2008, the financial sector transitioned from analog to digital, with electronic payment systems becoming widespread. In 1980, internet banking and ATMs were introduced in America, primarily catering to wealthy nations. Since

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Phd Student, Research Scholar, Nirmala College Muvattupuzha, India. E-mail: libina776@gmail.com (Corresponding Author).

PhD, Principal & Research Supervising Guide, Henry Bakery College, Melukavu, India. E-mail: gireeshkartha@gmail.com.

2008, FinTech has become increasingly prevalent in both developed and developing economies, offering financial institutions a new competitive edge through technological advancements. New technology companies are entering the financial services market, and established providers are competing or collaborating with FinTech companies to offer digital products (Suharyati et al., 2023; Yang, 2021).

Fintech is a business segment that makes use of technology to enhance service quality and management efficacy, which has the potential to increase the reach of financial services within the banking sector (Antonio et al., 2024). Fintech, the combination of financial services and technology, is driving innovation and increasing GDP, revolutionizing the modern period. Fintech companies are leading the way in offering basic financial services to historically marginalized people, particularly in developing nations, despite technological developments (Ryu and Ko, 2020). Digital wallets, mobile payment gateways, and P2P lending are technologies democratizing financial participation, providing sophisticated tools for prudent financial management. This includes saving and investing, leading to greater economic growth and dynamism due to increased involvement in the financial system (Chen and Jiang, 2022; Hussain, 2023). The growth of research on agility in FinTech literature from 1984 to 2022 using bibliometric analysis and co-citation analysis. It identifies significant disparities between authors, publication influences, and keyword occurrences, emphasizing the importance of combining databases in bibliometric studies (Sahid et al., 2023). A combination of finance and information technology, significantly impacts financial markets and services. It offers benefits like increased operational effectiveness, cost reduction, and strategic disintermediation. The empirical research is divided into performance analysis and science mapping, using common bibliometric indicators like authorship, active institutions, citation analysis, geographic distribution, keywords analysis, co-citation analysis, bibliographic coupling, thematic analysis, and cluster analysis (Gupta et al., 2023).

1.2. Importance of understanding user acceptance in fintech. The definition of user innovation in this review is the degree to which a person adopts a particular innovation early on or is willing to test new products, services, or technologies. Those with high levels of innovation can handle uncertainty and seek to make better use of their inventions. FinTech is the term for technological advancements that pose a threat to traditional financial and banking institutions (Savitha et al., 2022).

Understanding the factors influencing their acceptance and utilization is crucial. The most widely used TAM model in the literature on technology acceptance is the most effective approach (Amnas et al., 2024; Putri et al., 2023). The retail sector and telecom providers are embracing fintech to provide innovative financial services beyond traditional banking and investment funds. Despite numerous providers offering and improving fintech services, only a few are widely used. Users' opinions significantly influence their acceptance and use of FinTech services, making TAM constructs a suitable tool for examining consumer perceptions of this innovative retail format.

1.3. Objectives of the systematic review. The major objectives of the review are as follows:

- To review and synthesize existing theoretical models and frameworks used to study user acceptance of fintech innovations.
- To conduct a bibliometric analysis to map the trends in research publications related to user acceptance of fintech innovations over time and across different geographical regions.
- To critically assess the methodologies employed in empirical studies examining user acceptance of fintech innovations, focusing on their strengths and weaknesses.
- To summarize and integrate empirical findings regarding factors influencing user acceptance of fintech innovations across various studies.
- To identify gaps in the current literature on user acceptance of fintech innovations, particularly in terms of theoretical underpinnings, methodological approaches, and empirical evidence.

- To investigate how cultural and regional factors influence user acceptance of fintech innovations, based on the geographical distribution of included studies.
- To offer practical recommendations for researchers, policymakers, and practitioners to enhance the understanding and implementation of fintech innovations based on user acceptance insights.

1.4. Literature review. A literature review exploring the adoption and regulatory frameworks of Islamic Financial Technology (Islamic FinTech) between 2020 and 2024. Key factors influencing adoption include trust, religious orientation, and technological readiness. Challenges include Shariah compliance, regulatory frameworks, and consumer protection. The study emphasizes the need for a comprehensive regulatory framework that balances technology with Shariah compliance and consumer protection (Suswanto et al., 2025). The study examined trust in the Technology Acceptance Model (TAM) framework using 892 journal articles from a Web of Science and Scopus data set. It reveals rapid growth in trust research, particularly in China. The most researched subjects are TAM and trust, with emerging topics like e-commerce, motivation, and perceived risk indicating an interdisciplinary approach in the corporate domain (Asif et al., 2025).

2. METHODOLOGY

A Systematic Literature Review (SLR) is a methodological assessment of research findings to produce objective, repeatable, and auditable findings on a specific topic. It classifies previous studies and helps create evidence-based guidelines for study professionals. The SLR's main goal is to prove the work's originality relative to current knowledge. The paper selection process is illustrated in Figure 1.

The PRISMA-style flow diagram illustrates a systematic literature review process for identifying, screening, and including relevant academic articles related to Fintech adoption. The process is divided into four main phases Identification, Screening, Eligibility, and Inclusion. In the Identification phase, 175 documents were retrieved from the Scopus database, with 48 articles excluded due to missing keywords. In the Screening phase, 127 documents related to Fintech innovation, banking, UTAUT, TAM, and mobile technology were selected, with 16 non-English language articles excluded. 111 articles with preferred keywords were chosen, with 19 being notes, textbooks, or unpublished working papers, and 24 not relevant. In the Eligibility phase, all 68 full-text articles were reviewed, with 10 excluded due to discontinued journals and one published before 2018.

The relevance of empirical studies in this systematic review was determined through a structured screening process guided by predefined inclusion and exclusion criteria. Studies were considered relevant if they focused explicitly on user acceptance of fintech innovations, were published between 2018 and 2024, were written in English, and appeared in peer-reviewed academic journals. During the eligibility phase, articles were further assessed based ensure that only those contributing meaningful empirical insights into fintech adoption were included. While formal bias-reduction tools such as the Cochrane Risk of Bias tool or GRADE were not explicitly mentioned, the review adopted best practices aligned with PRISMA guidelines to enhance objectivity. Duplicate studies, non-peer-reviewed literature, and articles lacking methodological rigor were excluded. Additionally, by using a systematic data extraction protocol and applying consistent criteria for evaluating study quality and relevance, the review minimized selection bias and enhanced the reliability of its findings.

2.1. Inclusion and exclusion criteria for studies. The study was selected for publication based on its evaluation criteria, with the inclusion-exclusion parameters compiled in Table 1. The study was also excluded from related material and duplicate studies due to the significant role fintech innovation plays in consumer adoption.

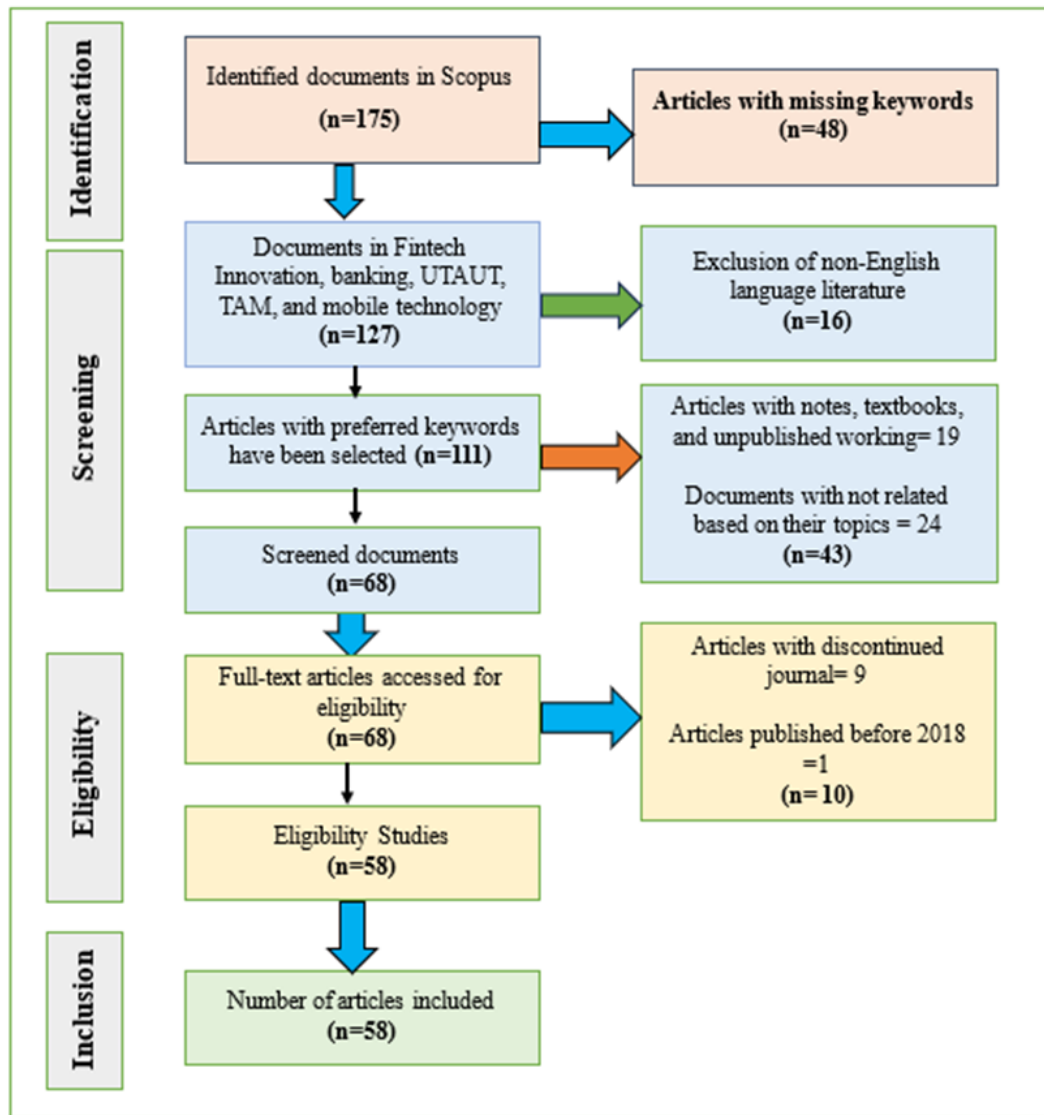


FIGURE 1. Flow diagram of the Systematic Literature Survey

Search strategy. The identification procedure entails searching for related terms, synonyms, and variants of the study's main keywords, which are shown in Table 2.

This study improves principal keywords by incorporating references from encyclopedias, thesaurus, earlier research, and reputable databases like Scopus. It aims to provide additional possibilities for specific databases seeking related articles, chosen for their relevance and access to prestigious publications on knowledge map topics. To facilitate translation, the search was limited to English-language publications, as choosing studies in languages the researchers don't speak could lead to misunderstandings, poor comprehension, and increased time and money required for the study. The selection process eliminated non-English documents to access influential materials and sources in the study. After identifying all relevant keywords, 111 items were successfully retrieved by the current research.

The study selection process involved a systematic search using predefined keywords related to fintech innovations, user acceptance, and theoretical models like TAM and UTAUT in the

TABLE 1. The inclusion-exclusion provisions for the precise protocol

Criterion	Coherent
Inclusion 1: Research is conducted in Fintech Innovation of user acceptance	Full-text PDF articles have been incorporated. The chosen articles contain the desired keyword.
Inclusion 2: English language papers	The only articles selected to offer more feasibility are those written in English.
Inclusion 3: Academic research projects	Only scholarly answers are pertinent to this study.
Exclusion 1: Reason for research that does not include the articles	Non-English articles, articles with missing abstracts, notes, textbooks, and editorials. Articles that have been published before 2018.
Exclusion 2: Research that does not consider the article the fintech innovation	This paper will solely focus on research that presents innovations in financial technology; other terminology that is related to it will be ignored.

TABLE 2. Related Keywords for Article Selection

Database	Keywords	No. of Articles	Selected Articles
Scopus	("FinTech innovation" OR "TAM") AND ("FinTech" OR "Online Banking" OR "UTAUT") AND ("User acceptance" OR "TAM" OR "UTAUT" OR "FinTech financial") AND ("FinTech innovation" OR "Mobile banking" OR "security" OR "online banking").	175	58

Scopus database. After removing duplicates, the review is screened against criteria like publication date, language, peer-reviewed status, and topical relevance. After passing this screening, studies were subjected to a full-text review to assess methodological rigor and alignment with the study's objectives. A standardized coding process is applied to extract key information, ensuring only studies providing reliable insights into fintech adoption were included in the review.

Bibliometric analysis was employed as a key methodological approach to quantitatively assess the research landscape surrounding fintech adoption and user acceptance. This approach involved systematically collecting bibliographic data from the Scopus database, including information on authorship, publication sources, keywords, citations, and collaboration networks. The data is then analyzed using specialized bibliometric software tools to identify publication trends, influential authors, key journals, and emerging themes within the field. Co-occurrence analysis of keywords enabled the detection of thematic clusters, revealing dominant research topics and their interconnections. Citation analysis helped determine the impact and relevance of specific studies and theoretical frameworks within the fintech domain. Additionally, collaboration mapping provided insights into the geographic and institutional distribution of research efforts. This comprehensive bibliometric approach allowed for an objective overview of the field's evolution, highlighting research gaps and guiding the systematic review's focus on empirical studies that contribute meaningful knowledge to fintech user acceptance.

Citation trends were analyzed to track the growth and influence of research within the fintech adoption domain over time, revealing patterns such as increasing scholarly interest or the emergence of key publications that have shaped the field. Co-citation network analysis is used to identify relationships between studies frequently cited together, which helped uncover

foundational works and intellectual structures underlying the research area. By examining these networks, clusters of interconnected papers were detected, representing distinct research themes or schools of thought. Clustering analyses of keywords and co-citation data further refined the understanding of these thematic groups by grouping related topics and concepts, thereby highlighting prominent areas of focus, such as technology acceptance models, user behavior, and regulatory impacts in fintech.

2.2. Screening process. The study used screening to select 68 articles for review, utilizing the database's automatic sorting feature. This method expedited the research process, ensured clear communication, and improved understanding of the chosen material, as reviewing every published article is challenging, thus determining the appropriate study period. Only after the 2018 release in wealthy and developing nations did the screening procedure change. Since the Internet banking industry came into being, traditional banks have started implementing Fintech and digital applications. In addition to removing items before to 2018 publications, this method rejected 43 articles. The eligibility procedure employed the remaining ninety-six articles.

2.3. Data extraction and synthesis methods. The eligibility stage involves a selection process based on criteria like publications published between 2018 and 2024, focusing on recent online English works on digital banking and research topics, and including articles from national journals and international proceedings. The selection process for new papers in English-language journals with greater publication rates is part of the criteria for journals, which aim to keep them relevant. The evaluation focuses on the title, abstract, keywords, techniques, possibilities, and difficulties in streamlining the study. 58 papers were chosen as preliminary research for the systematic survey, excluding books, chapter books, and scientific works that take more time to study.

3. THEORETICAL FRAMEWORKS OF USER ACCEPTANCE IN FINTECH

Fintech sustainability is under investigation, despite growing concerns. Most research on adoption focuses on technology advantages, like UTAUT, Diffusion of Innovation, and TAM (Roh et al., 2024). Technology adoption theories must integrate trust and security, despite the importance of technological features.

This review provides a comprehensive analysis of fintech adoption, integrating multiple models and empirical findings across various fintech domains. It also considers cultural, regulatory, and demographic factors, providing a deeper understanding of user behavior. The use of bibliometric analysis helps map the intellectual structure of the field, revealing underexplored areas for future research. This review offers a comprehensive overview of user acceptance of fintech innovations, combining theoretical synthesis and bibliometric analysis. It emphasizes the evolving complexity of user behavior, integrating contextual and demographic dimensions. The study presents a unique conceptual framework and bibliometric analysis, highlighting the need for longitudinal and cross cultural studies and encouraging a more nuanced, globally aware research agenda. Table 3 shows that the Comparative Summary of Key Theories in Fintech Adoption Research.

3.1. Technology Acceptance Model (TAM). The TAM is one of the commonly employed paradigms in the assessment and explanation of individual acceptability of technology use. The original TAM presumes only two factors that affect users decisions to accept any IT: perceived usefulness and perceived ease of use (Tian et al., 2023; Alnsour, 2022). The TAM model is used to study the factors affecting users' acceptance of technology, highlighting that perceived benefits and conveniences shape a user's attitude towards technology use. This attitude influences behavioural motivation and ultimately leads to actual use. The TAM model is a useful tool for assessing individual acceptance of technology (Sundjaja and Tina, 2019). Figure 2 depicts the basics of the TAM model.

TABLE 3. Comparative Summary of Key Theories in Fintech Adoption Research

Theoretical Model	Core Variables	Limitations
Technology Acceptance Model (TAM)	Perceived Usefulness (PU), Perceived Ease of Use (PEU), Attitude, Behavioral Intention	Ignores social and contextual factors; limited consideration of trust and risk elements
Unified Theory of Acceptance and Use of Technology (UTAUT)	Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions	Requires extensions (e.g., UTAUT2) for consumer contexts; underrepresents cultural/regulatory factors
Extended TAM (e.g., TAM + Trust/Risk)	PU, PEU, Trust, Perceived Risk, Security, Privacy	Often lacks standardization; model complexity increases; context-specific applicability varies
Diffusion of Innovation (DOI)	Relative Advantage, Compatibility, Complexity, Observability	Abstract application; less emphasis on individual psychological or behavioral intent
Theory of Planned Behavior (TPB)	Attitude, Subjective Norms, Perceived Behavioral Control	Limited direct linkage to technological or financial service attributes
Extended-ECM (Expectation Confirmation Model)	Confirmation, Perceived Usefulness, Satisfaction, Continuance Intention	More applicable post-adoption; less effective in initial adoption scenarios
Trust-based Models	Trust in system/provider, Perceived Security, Reputation, Risk Perception	Trust is context-sensitive and hard to measure uniformly across platforms and regions

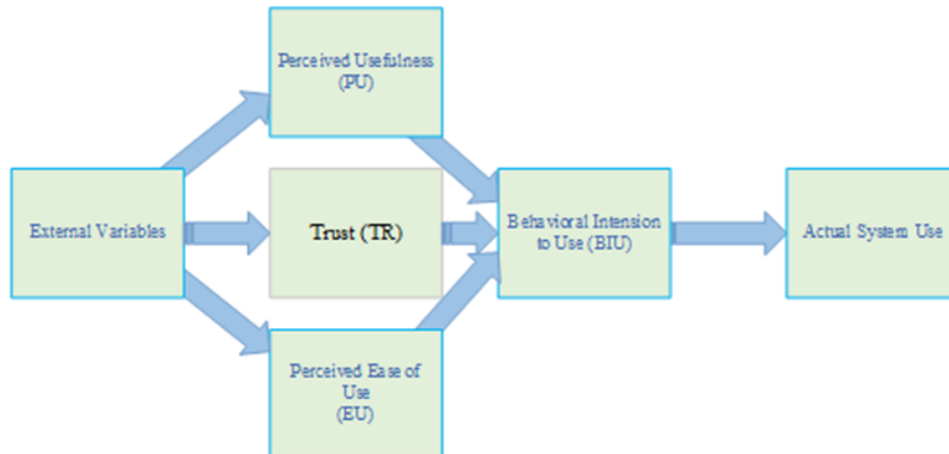


FIGURE 2. Basic TAM model

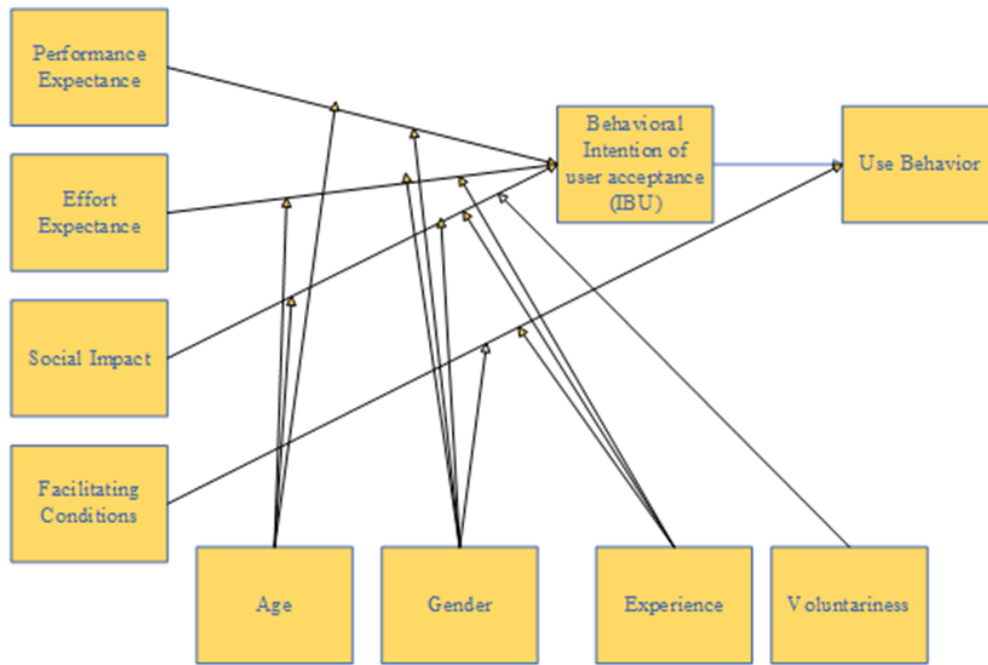


FIGURE 3. Basic UTAUT model

3.2. Unified Theory of Acceptance and Use of Technology (UTAUT). A theoretical paradigm called UTAUT was created to comprehend technology use and user acceptance. It was developed from eight earlier models, which included the Social Cognitive Theory, the Theory of Planned Behavior, the Motivational Model, the Theory of Technology Acceptance, and the Model of PC Usage (Lim et al., 2018; Doraisamy et al., 2022). Enabling factors, performance expectancy, effort expectancy, and societal effect make up the original UTAUT. To improve its applicability in organisational and consumer situations, UTAUT2 was rebranded. It clarifies a broader spectrum of technological use and behavioural objectives. As FinTech services become more popular, the UTAUT model can be used to examine how these services affect consumers' behavioural intention to use them (Karim et al., 2022; Shamini, 2022). The model includes components such as social influence, enabling settings, performance expectancy, and effort expectancy. Figure 3, illustrates the basic function of the UTAUT model.

3.3. Extended TAM models in the fintech context. The TAM is utilised in FinTech to analyse advancements in financial services and mobile payment. The Analytic Hierarchy Process (AHP) is a popular method for assessing options based on predetermined standards. This study uses the AHP to enhance the TAM and validate the weights and priorities of essential biometric parameters in FinTech apps, focusing on multi-objective problem solutions (Tarigan et al., 2022; Ispriyahadi et al., 2022).

3.4. Other relevant theoretical frameworks. FinTech has a major impact on financial inclusion, as evidenced by several studies, especially in developing countries. The importance of agents' credibility and customer service was emphasised by (Akbar et al., 2021) in highlighting the function of mobile money services in boosting digital financial inclusion. As per (Slazus and Blick, 2022) mobile money in Africa lessens economic inequality by enhancing the accessibility of financial services, especially for impoverished and rural people. FinTech can help unbanked individuals make profitable investments and engage in entrepreneurial activities, promoting economic growth and stability by formalizing aspects of the informal economy.

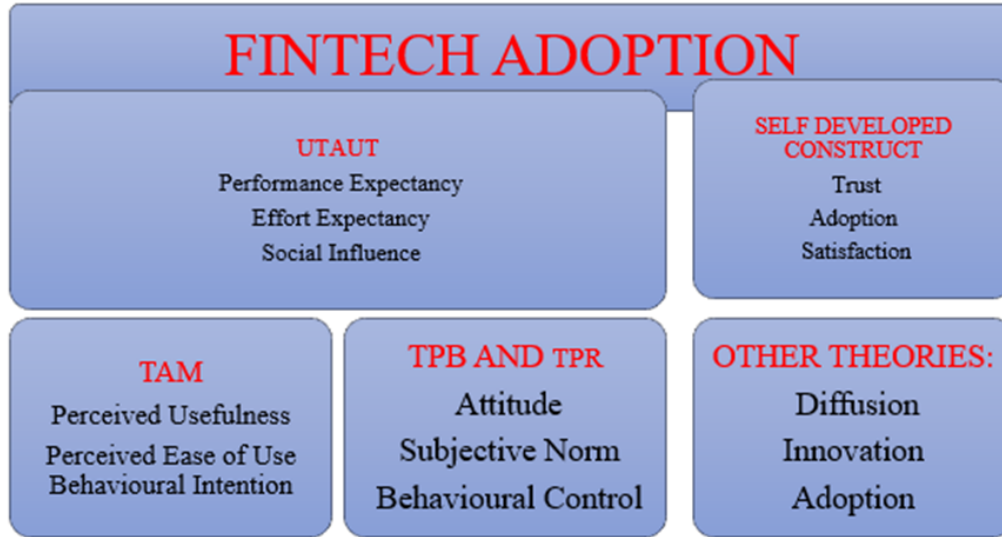


FIGURE 4. Proposed framework of fintech adoption determinants in literature

The proposed framework of fintech adoption based on the selected literature is given in Figure 4.

The research suggests that mobile financial services in developing countries reduce the informal sector's size, increase productivity and profitability, and improve credit access. This formalizes economic and financial inclusion by building weak and vulnerable groups, including females, ethnic minorities, and migrants, through entrepreneurship. (Setiawan et al. 2021) discussed the digital financial inclusion of informal micro, small, and medium-sized companies in Indonesia. While digitization promotes financial inclusion, it also presents challenges for budgetary management and informality regulation, leading to inconsistencies with other policies (Alshari and Lokhande, 2022). However, it may offer opportunities for economic integration and assistance from formal financial institutions in (Candra et al., 2020).

4. EMPIRICAL STUDIES ON USER ACCEPTANCE OF FINTECH INNOVATIONS

4.1. Categorization of empirical studies based on fintech.

- **Lending Platforms:** FinTech is disrupting retail banking by introducing a "shadow banking system" that encourages loan generation and maturity transformation services, similar to traditional banks and credit unions but not inspected by the government (Mahmud et al 2023; Kini & Basri, 2022). This has led to a doubled market share in mortgage origination from 30% in 2007 to 50% in 2015, Fintech lenders that automate the procedure are driving this trend. Online applications are used by Quicken Loans Inc., the biggest online retail mortgage lender, to gather client information.
- **Payment Systems:** Mobile fintech service providers such as Apple Pay, Samsung Pay, Alipay, Palpay, Wechatpay, and Starbucks app are used by millions of customers and fall into the following categories: financial institutions, payment platform providers, operating system makers, and hardware manufacturers. This has led to a need for FinTech organizations to understand consumer preferences and improve service delivery, as customers find these systems appealing (Rani, 2021; Mohamed et al., 2023).
- **Robo-advisors:** Robo-advisors are internet-based financial advisory firms targeting small investors who prefer a more automated approach to financial advice (Lal et al.,

2020). Regulatory bodies like FINRA and the SEC warn against these firms, claiming their investment recommendations may not be suitable for investors due to their reliance on assumptions not entirely relevant to their financial situation. These firms are typically recommended for clients who prefer a more automated approach (Hoque et al., 2023).

Regulatory concerns persist in the adoption of fintech services, especially in countries where legal frameworks have not kept pace with technological advancements. The fragmentation of regulatory policies, uncertainty in compliance requirements, cross-border transaction rules, and data protection standards creates hesitation among consumers and hinders institutional investments. Cybersecurity risks pose significant threats to user trust and system integrity, as fintech platforms handle sensitive data. The lack of standardized security protocols across platforms exacerbates these risks. Blockchain-based fintech innovations offer enhanced security but also new regulatory complexities. While blockchain technologies promise transparency, immutability, and efficiency in transactions, their decentralized nature often bypasses traditional oversight, raising concerns about money laundering, fraud, and consumer protection. The long-term impact of these innovations depends on regulatory bodies' ability to adapt and ensure safe and sustainable integration into the broader financial system.

4.2. Synthesis of findings related to user acceptance. SLR aims to characterize FinTech activities, classify literature, identify significant issues in previous publications, and identify novel questions requiring further investigation (Laksamana, et al., 2022). The Fin-tech revolution in Pakistan is generating strategic and operational risks, leading to cautious adoption due to people's apprehension of the potential operational and regulatory concerns (Zhang et al., 2023). Financial services and innovations research covers the global financial system, local legislation, and industry regulation, integrating network externalities, blockchain, and security subcategories (Hasan et al., 2024).

4.2.1. *Factors Influencing User Acceptance.*

- **Perceived Trust (PT):** Trustworthiness is a key factor in determining the trustworthiness of someone, even if they are difficult to manage or monitor (Maharjan et al., 2022). Payment-type Fintech services enable consumers to conduct transactions anytime, anywhere, and with great convenience. Building initial confidence is crucial to remove clients' concerns about the risk of using Fintech payment services, as they may return to online banking if they don't trust the service (Irimia-Diéguez et al., 2023).
- **Perceived Usefulness (PU):** The term "perceived usefulness" describes a person's conviction that using and doing tasks more effectively with technology. High perceived usefulness leads to positive outcomes. Online banking services are popular due to their ability to enhance banking activities and facilitate financial transactions. Perceived usefulness is crucial for job productivity, performance, and effectiveness (Sharma et al., 2023; Rajan et al., 2022).
- **Perceived Ease of Use (PEU):** PEU of use refers to a person's belief that using technology requires no effort (Aggarwal et al., 2023). It is a crucial factor in influencing consumers' attitudes towards mobile internet usage, especially among beginners. Research on mobile context has identified PEU as a key factor in influencing users' attitudes towards using mobile internet (Jasti and Varalakshmi, 2023).

4.2.2. *Differences in acceptance across demographic or user segments.* The factors manipulating the acceptance and usage of self-service technologies by bank customers have been the focus of empirical research, primarily through the examination of the perceived qualities of these innovations and the traits of the most likely user groups (Das and Das, 2020). On the other hand, a symmetrical or linear relationship between the positive and negative aspects is assumed in a large amount of marketing research. That is, it is thought that they represent the opposing sides of a single dimension (Hasan et al., 2023). As such, the literature has not addressed the

broad range of non-adoption that includes resistance to differing degrees that can appear as different behaviours.

Fintech also promotes innovation and competition in the financial sector and helps conventional financial institutions to keep evolving (Mathur, 2020). Therefore, to maintain their competitive advantage in the mobile fintech sector and draw in new business, banks should concentrate on developing creative, tailored experiences and solutions (Igamo et al., 2024). Segmenting clients based on their psychographic and demographic characteristics helps improve these services. Segmenting customers based on their demographics is a common practice in the mobile industry. Businesses can create cross-departmental strategies that promote an improved customer experience by developing plans based on particular consumer demographics (Le, 2021).

4.2.3. Comparative analysis of acceptance across different fintech innovations. This stage aids in identifying other variables like age, income, and education level, that may have an impact on consumer segmentation when doing repeated comparisons. Based on the findings of the theoretical framework, businesses providing banking services should fit into one of the three categories that currently exist and describe varying degrees of digitalization: traditional banks with token digital services, digitally transforming banks with a noticeable commitment to digital services, and FinTechs, or specialized technology SMEs offering focused services (Senyo and Osabutey, 2020). In addition to these categories, a hypothetical digital bank was defined based on the trends that were discovered (Singh and Sharma, 2022; Swacha-Lech and Solarz, 2021). The theoretical sampling process of the case companies was not perfect, and there was a chance that some of the case companies were not as representative as desired due to convenience. Nevertheless, additional data analysis revealed that the case companies did fit the descriptions of the three types of digital transformation that were already in place fairly well, using secondary data to make up for the absence of primary data (Alhajjaj and Ahmad, 2022).

5. METHODOLOGICAL CONSIDERATIONS IN STUDYING USER ACCEPTANCE OF FINTECH

(Harnadi et al, 2023) examined the post-adoption of online banking in Indonesian banks using Extended-ECM and analysed the interest in investing in FinTech companies over time. It provided a comprehensive understanding of bank characteristics and core principles, both in the current context of fintech companies and in the past. The study analysed factors influencing X Generation youth's mobile payment adoption, finding that gender, age, nationality, education, and job level positively impact fintech adoption among this generation. (Chang et al., 2022) the study examined the factors influencing university students' discontinuance intention of FinTech payment services, finding a positive impact. It also highlighted technology trends in banking and payment systems in (Daragmeh et al., 2021), allowing for a comprehensive analysis of the effects of new technologies and the rise of fintech companies. The ADO-TCM framework for the literature analysed so far is given in Figure 5.

6. CHALLENGES AND FUTURE DIRECTIONS

6.1. Common challenges and limitations identified in the reviewed literature. The financial industry faces challenges owing to the emergence of fintech, especially in the banking industry. To meet the increasing demand for fintech products, the financial markets have changed (Khale et al., 2022). Fintech solutions are more effective and convenient since they make use of technology, particularly when it comes to offering banking services to underbanked or unbanked financial clients. This offers a comprehensive viewpoint on the prospects, difficulties, and revolutionary potential of this technology transformation, as well as insightful information about the diverse role that Fintech will play in reshaping banking services in the future.

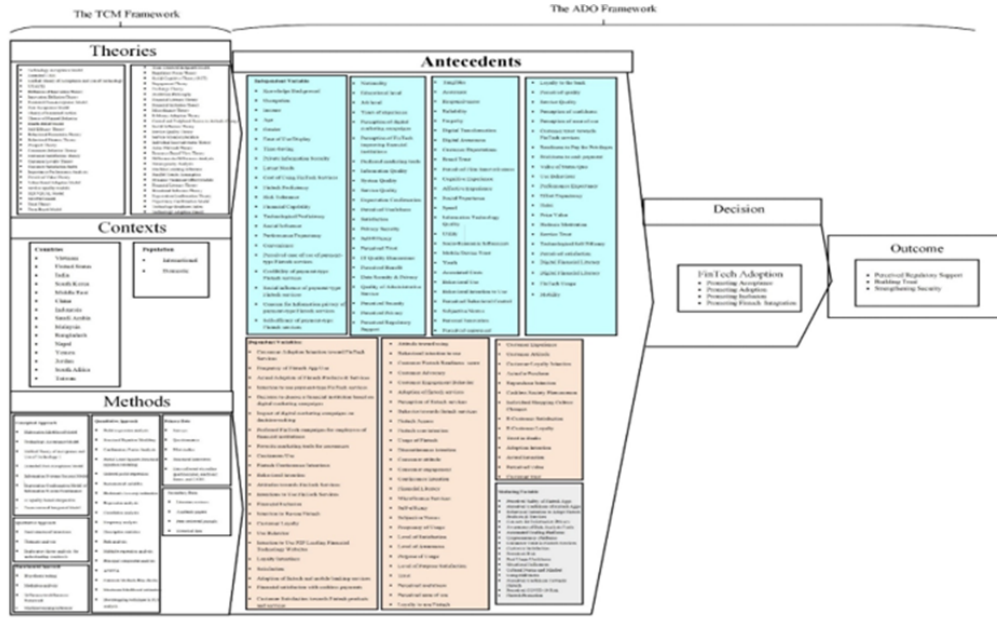


FIGURE 5. ADO-TCM FRAMEWORK

For banks, the explosive rise of financial technology brings both opportunities and challenges. They are seeking innovative ways to modernize services, such as smart automation of operations, token use, phone banking, and smart workflow systems, which will shape the future of banking and payment transactions (Akmal et al., 2023). Conversely, emerging businesses aim to find creative ways to fund lending operations and other financial and banking services to draw in the greatest number of bank customers, which stands at 78%. This is particularly true in the areas of payments and electronic commerce.

6.2. Gaps in current research on user acceptance of fintech innovations. This research focuses on the evolving fintech landscape, analysing the benefits and drawbacks of control frameworks. It acknowledges the potential for new developments in the field, and emphasizes the importance of balancing risk management with innovation facilitation, considering the current state of the industry. Fintech in the banking industry offers stability and competition, requiring financial institutions to adopt new technologies for improved automated digital banking experiences. International IT companies are competing to develop cutting-edge technology that could revolutionize financial services.

6.3. Suggestions for future research directions. The future scope areas that have been highlighted provide scholars, policymakers, and industry stakeholders with interesting opportunities to contribute to the continuing discourse and shape the trajectory of financial services in the digital era, as FinTech continues to change the banking sector. Future studies could look into how the quality of websites and information affects users' intentions and actual usage. Also, to increase the validity of the present gauging tool, it has to be improved in subsequent research. To generalize the findings, more product categories may be the subject of future research. The analysis suggests that as Fintech advances, banking services will increasingly focus on personalization, seamless user experiences, and decentralized, transparent systems. With over \$100 million in funding raised in the past decade and a double-digit increase in startups and capital investment by 2025, FinTech innovators must create platforms that fundamentally change the financial services industry.

7. BIBLIOMETRIC ANALYSIS

Even though bibliometric analysis was done with a variety of programs, including Bibliometrix, Citespace, VOS Viewer, BibExcel, etc., VOS Viewer was utilized in this work. Because of its robust visualization features and easy-to-use interface, VOS viewer is useful for bibliometric analysis. It makes it possible for scholars to effectively map and evaluate intricate networks of scientific literature to pinpoint important trends, significant writers, and hot-button issues. Its visual aids (the ability to overlay citation and co-citation networks with bibliographic data, and clustering algorithms aid with perceptive interpretations. Additionally, VOS viewer offers user-friendly graphical outputs and customizable choices for manipulating data, making it an invaluable resource for successfully investigating and disseminating bibliometric insights. The present study aims to analyze keyword statistics, author influence, and citation analysis along with Cluster analysis.

The bibliometric analysis was conducted using VOSviewer to visualize the co-occurrence of keywords and citation relationships among selected articles. Data was extracted from the Scopus database and the bibliographic information format was compatible with VOSviewer. A minimum threshold of five occurrences per keyword was set for keyword co-occurrence analysis, and a minimum citation threshold of 10 citations per document was applied for citation analysis. The fractional counting method was used to normalize link strength, and modularity optimization was used for clustering. The resulting network maps helped identify key research trends and influential studies in fintech adoption.

7.1. Author influence. In an increasingly competitive world, Fintech research is at an all-time high. In a similar vein, scholars are devoting their research to this field. Amnas, Setiawan, and Rani are the three authors who have a record of working in this field and producing a good number of articles (Each 2) about Fintech. Others only claim one item under their belt. Future researchers may find the work contributed to be a useful source of references.

7.2. Keyword Statistics. Keywords are the key components of search engines. A greater quantity of citations greatly depends on the proper keyword selection. When Fintech is the main keyword, the most prevalent keywords are listed below. Based on analysis, Table 4 shows the frequency of prevalence of the top-listed terms. Fintech (78) appears the most frequently, preceding Intention (46), Factor (35), and Fintech service (31).

TABLE 4. Top 10 Keywords

Keyword	Frequency
Fintech	78
Intention	46
Factor	35
Fintech service	31
Use	23
Fintech Adoption	23
Customer	21
Data	21
Research	20
Consumer	18

7.3. Citation analysis. The purpose of citation analysis is to evaluate and comprehend an author's contributions to a certain field of study. The citation analysis facilitated the review and appraisal of several published articles. Using network analysis, the frequency of citations for each article was examined. The aforementioned method determines the most important

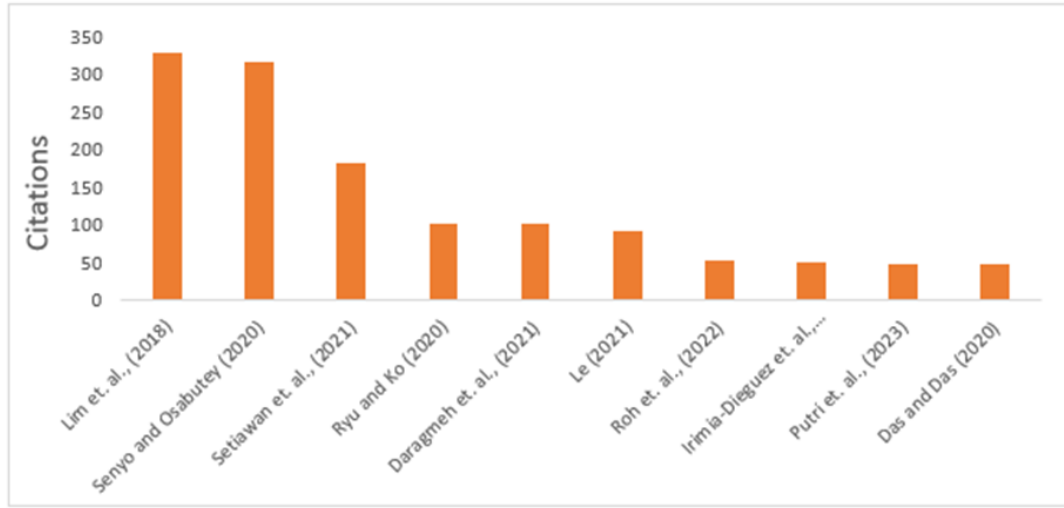


FIGURE 6. Top 10 cited articles

work and readers' acceptance of it. Based on the citation analysis, the top 10 authors for this work were determined (Table 5 and Figure 6). With 324 citations, (Lim et al., 2018) are in the lead in the race. The article explored the effects of knowledge and perceived security on ongoing intention to utilize mobile fintech services. Senyo and Osabutey (2020), (Setiawan et al., 2021), (Ryu and Ko, 2020), (Daragmeh et al., 2021), and (Le, 2021), are the next in order and have, respectively, 317, 182, 102, 102, and 92 citations. Financial inclusion, fintech innovation, fintech adoption, and an adjusted technology acceptance model are the other works cited more.

TABLE 5. Top 10 Cited Articles

Author (Year)	Citations
(Lim et al., 2018)	329
(Senyo and Osabutey, 2020)	317
(Setiawan et al., 2021)	182
(Ryu and Ko, 2020)	102
(Daragmeh et al., 2021)	102
(Le, 2021)	92
(Roh et al., 2022)	53
(Irimia-Díéguez et al., 2023)	50
(Putri et al., 2023)	49
(Das and Das, 2020)	47

7.4. Co-citation analysis. Co-citation analysis provides a citation matrix for the author, domain, journal, and keywords simultaneously, making it more difficult to comprehend and evaluate at first. Co-citation analysis uncovers the social links or interdependencies of authors' work, but it offers an analytical composition of a particular field of knowledge when applied to journal publications. Analysis verifies that papers with strong co-citation status and that are referenced or referred to together represent the same field of study. Table 6 and Figure 7 show that there are more articles in each cluster according to the co-citation analysis.

TABLE 6. Co-citation Analysis

Cited Reference - Author (Year)	Co-citations Count	Co-citation Score
(Hu et al., 2019)	16	38
(Davis et al., 1989a)	15	34
(Venkatesh et al., 2003)	17	34
(Fornell et al., 1981)	9	30
(Henseler et al., 2015)	10	25
(Podsakoff et al., 2003)	9	25
(Ryu, 2018)	9	24

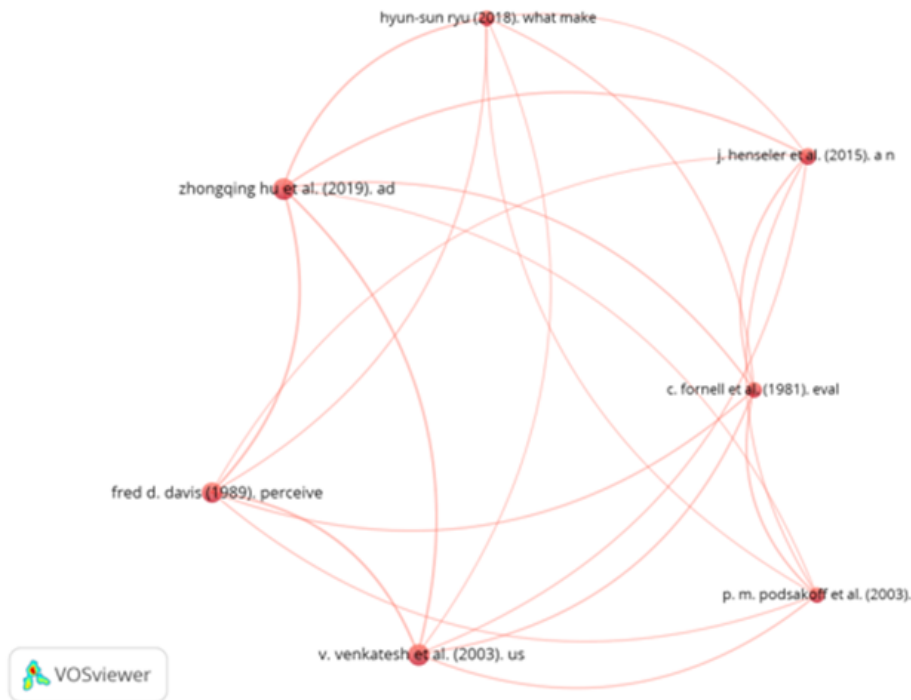


FIGURE 7. Co-citation Analysis

7.5. Cluster analysis. Combining articles with similar attributes is known as data clustering. Stated differently, it is the act of collecting items from the same domain in one location. Data clustering by VOS viewer has been done in this work. The configuration of nodes and edges indicates the cluster analysis method. robust connectivity across nodes that correspond to different clusters. Because each cluster has a distinct node thickness, different clusters are easily distinguished from one another. Moreover, connections made by edges verify how interconnected different clusters are. The three main clusters and the pieces that make up each are shown in Table 7, with each cluster elaborating on a distinct subject.

The cluster analysis in network visualization that illustrates the connectivity between the components in each cluster is shown in Figure 8. The density visualization of the items included in the clusters is given in Figure 9.

TABLE 7. Cluster Labeling

Cluster	Keywords	No. of Items
Cluster 1	Consumer, Factor, Fintech, Fintech adoption, Risk, Trust, Use	7 items
Cluster 2	Attitude, Fintech Service, Intention, Security, Service, Usefulness	6 items
Cluster 3	Adoption, Customer, Data	3 items

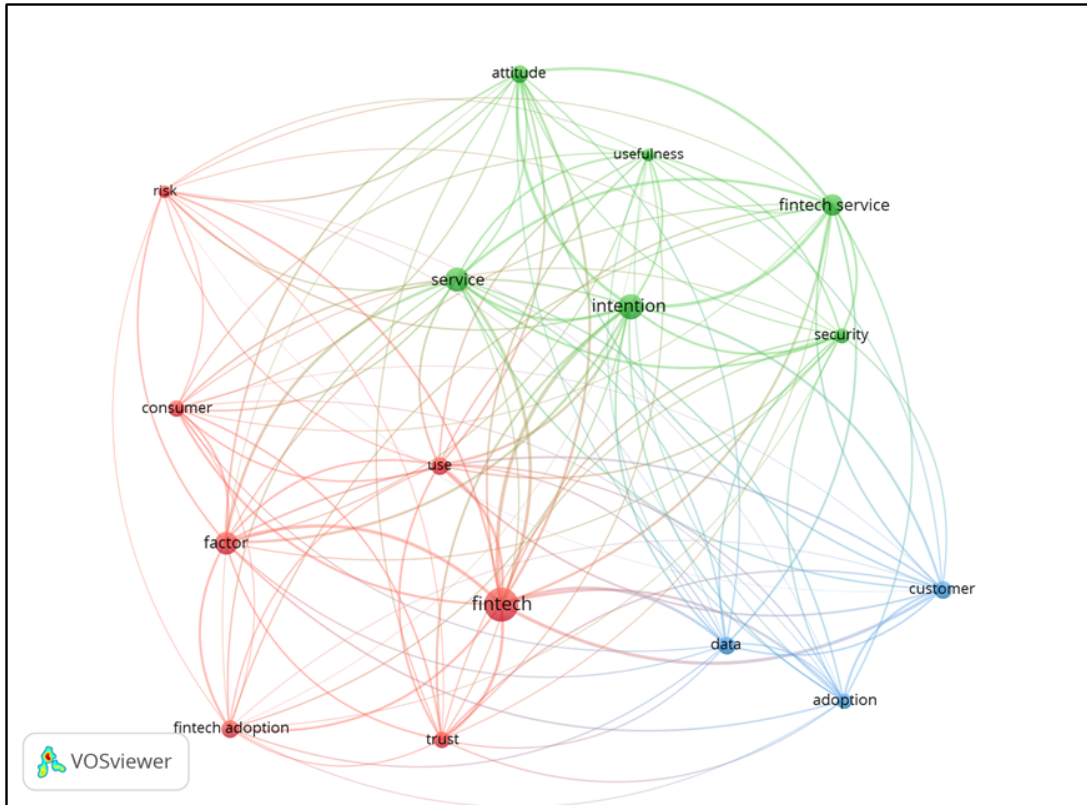


FIGURE 8. Cluster Analysis – Network Visualization

Artificial intelligence (AI), open banking, and decentralized finance (DeFi) are revolutionizing fintech adoption. AI enhances user experiences by providing personalized financial services, fraud detection, risk assessment, and automated customer support. Open banking, driven by regulatory initiatives like PSD2, empowers users by granting third-party providers secure access to financial data, fostering innovation in financial products and services. This collaborative ecosystem has accelerated fintech integration into traditional banking environments. DeFi offers financial services through decentralized blockchain platforms without intermediaries, promoting financial inclusion and autonomy. Despite challenges related to regulation, volatility, and security, its rapid growth highlights the growing interest in decentralized alternatives to conventional finance. These technological advancements are redefining financial services delivery, user expectations, and trust, ultimately influencing fintech adoption across different demographics and markets.

To enhance the clarity and accessibility of the reviews findings, a summary chart was developed to consolidate key empirical insights related to fintech adoption. This chart categorizes

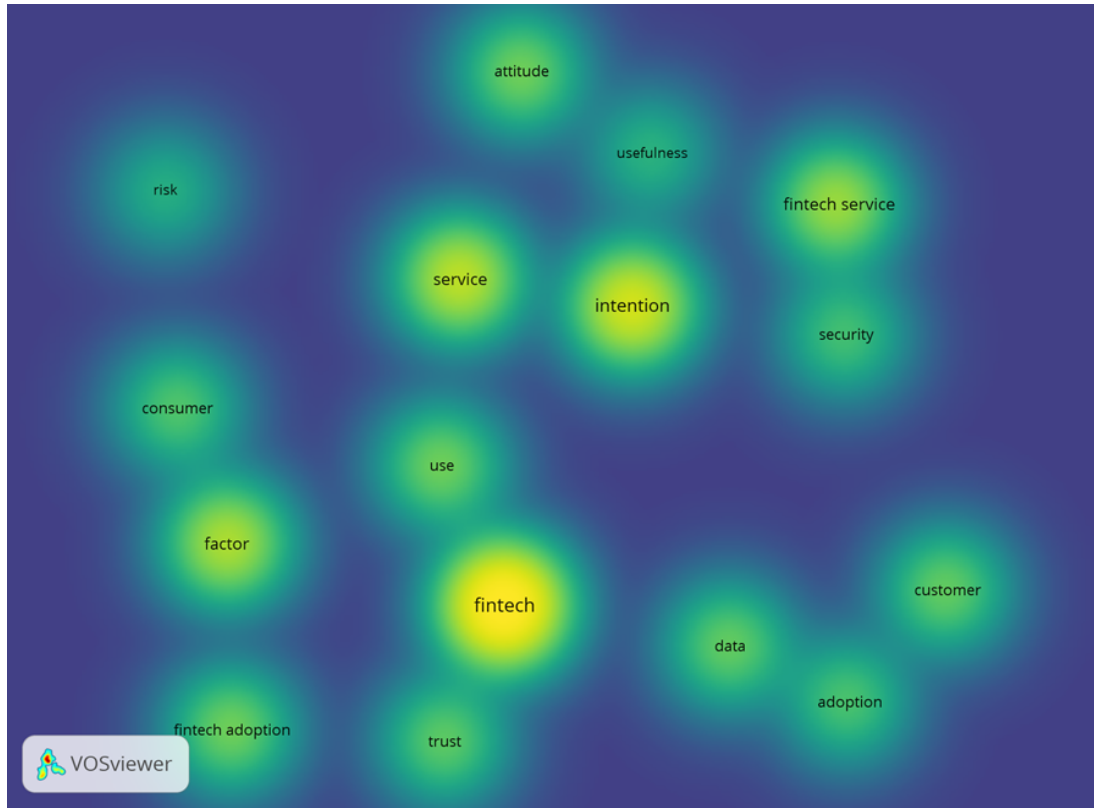


FIGURE 9. Cluster Analysis – Density Visualization

the main drivers, challenges, and sector specific variations observed across the selected studies. Adoption drivers commonly identified include factors such as perceived ease of use, trust, perceived usefulness, and digital literacy, which consistently influenced user acceptance across various fintech services. On the other hand, challenges such as privacy concerns, lack of regulatory frameworks, security issues, and resistance to technological change were frequently reported as barriers. The summary also highlights sector specific trends, illustrating, for example, how mobile payment adoption is largely driven by convenience and smartphone penetration, while sectors like cryptocurrency face hesitancy due to perceived risk and market volatility. By organizing these findings thematically, the summary chart provides a concise yet comprehensive overview that supports cross study comparisons and aids in identifying consistent patterns and unique sectoral dynamics within the broader context of fintech adoption.

8. CONCLUSION

8.1. Summary of key findings from the systematic review. This research examines the impact of demographic variables on customers' attitudes about and intends to use FinTech innovation in digital banking, using developed nations such as Indonesia, Kenya, and Taiwan as a case study. Nearly 175 hits from the Scopus database were acquired based on a PRISMA-based search. Based on the abstract and title, the articles were chosen. Analysis and an annotated bibliography were then used to assess the resulting 58 articles. Research on the uptake of fintech itself was the most prevalent theme. Finding fintech innovations, such as digital banking supported by national cultures, is the first issue in fintech research, according to the meta-analysis results. As a result, infrastructure and data security standards need to be regularly raised. At the moment, fintech companies must work together with more established financial institutions like banks. Following that, the study trend continues with the development

of a conceptual framework for the use of fintech. The TAM, the UTAUT, and extended models that take trust, perceived risk, and regulatory factors into account were among the many theoretical models included in the review to explain user adoption. Empirical research has brought to light important elements that influence user acceptability in a variety of Fintech sectors, including mobile payments, perceived utility, simplicity of use, trustworthiness, and regulatory environment.

The bibliometric analysis conducted in this systematic review underscores the growing interest and evolving landscape of research on user acceptance of fintech innovations. By mapping the trends in publication output, thematic focus, and geographical distribution of studies, this review illuminates the dynamic nature of the field. Moving forward, continued interdisciplinary collaboration and methodological rigour will be essential to deepen our understanding of the factors shaping user acceptance and to foster innovation in fintech development and implementation.

8.2. Implications for practitioners and policymakers. The Financial industry is rapidly changing, and consumers need to constantly adapt to new offerings. Therefore, to achieve successful adoption, FinTech service providers must fully understand and take into account customer wants and views. Behavioural aspects such as perceived ease of use, utility and social impact, trust, security, and responsiveness affect customers' decisions to use FinTech services. This will help FinTech service providers understand which UI elements are best for optimizing user behaviour. Additionally, tests of demographic traits were conducted to see how they affected Fintech innovation, which aids in a clearer explanation of the features and broadens the study's focus. As an additional developed country case study for Fintech innovation in digital banking, this review was applied in Indonesia, Kenya, and Taiwan. Developing nations on an equal footing can apply the review's conclusions. This research could be replicated in other industrialized nations for comparison in future studies.

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