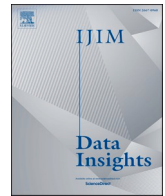




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A systematic review and future agenda on continuance intentions in mobile apps

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ABSTRACT

Technology changes at ever increasing speeds. Therefore, it is crucial for practitioners and academics to understand why users' intend to continue or discontinue their usage. This paper presents a current and comprehensive systematic literature review on continuance intentions for mobile applications. The review analyzes 119 studies from the Scopus database (January 2019–December 2023) using the PRISMA, SPAR, and TCCM frameworks. It identifies key theoretical models, determinants of mobile app continuance intention, research methods, existing gaps, and future research directions. Findings reveal that several well-recognised theoretical models are frequently applied in the literature on continuance intention. Consequently, the variables derived from these models are among the most commonly measured by researchers. Additionally, the majority of studies in this area employ quantitative methods, with structural equation modelling being most widely used. This review categorises the literature based on mobile application classifications and six distinct sets of factors influencing continuance intention: psychological, technical, social, behavioural, contextual, and barriers. Furthermore, it explores the outcomes associated with continuance intention. The paper identifies two primary areas for future research: the development of a conceptual framework and research design. It also highlights research opportunities related to emerging technologies and the gap between intentions and actual behaviours.

1. Introduction

The "mobile economy", where smartphones consume 96 % of users' time (Smart Insights, 2023) and generate US\$1 trillion in revenue (Sivakumaran & Iacopino, 2018), has made mobile devices popular among individuals and organisations. System-centric ecosystems dominate business life due to mobile device ubiquity. A "system-centric ecosystem" includes mobile apps and digital frameworks. Mobile operating systems like Android and iOS provide basic functionalities for mobile devices (Tiwana et al., 2010). Mobile apps allow users to perform specialised activities (Liu et al., 2014). However, recent trends suggest that many applications have transitioned from single-purpose apps—designed for specific services such as online shopping, food delivery, or ride-sharing—into multi-functional super apps. This evolution is particularly evident in social media and communication networks, e-commerce ecosystems, and mobility or ride-sharing services (Hasselwander, 2024a, 2024b; Steinberg et al., 2022). The term "super app" was used by Roa et al. (2021) to describe a type of mobile app that aims to meet several users' everyday demands simultaneously, all

without getting them to download separate apps.

Industry research indicates a staggering 218 billion app downloads on mobile devices in 2020 (TechCrunch, 2021). Furthermore, the global app market revenue of US\$540.8 billion in 2023 is projected to increase to US\$752.57 billion by 2027 (Statista, 2023). Global app revenue has experienced substantial growth recently, with user expenditure on iOS and Google Play totalling \$38 billion in Q3 2024 — an increase of approximately \$2 billion from the prior record in Q2 2024 (Sensor Tower, 2024). App markets have emerged as appealing and rapidly expanding markets as they have relatively low obstacles to entry and are saturated with several competing applications (Wang et al., 2018).

Hence, companies must possess the knowledge to effectively maintaining the profitability of applications in terms of the number of app downloads and sales in this intensely competitive industry. Prior research has systematically examined the factors influencing customers' intention to use or initially adopt various Industry 4.0 technologies. These include online banking (Montazemi & Qahri-Saremi, 2015), mobile applications in m-commerce (Chadha et al., 2024; Tang, 2019), mobile payment systems (Abdullah & Naved Khan, 2021), mobile

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wallets (Hopali et al., 2022), mobile health (mHealth) technologies (Binyamin et al., 2021; Jacob et al., 2022), wearable devices (Qureshi et al., 2023), fitness applications (Angosto et al., 2023), online food delivery services (Li et al., 2022), and the Internet of Things (IoT) (Kumar et al., 2023). Additionally, researchers have conducted literature reviews on various other digital innovations, including digital government (Güler & Büyükoçkan, 2023), fintech app payment services (Alkadi & Abed, 2023), digitalization in tourism (Jiang & Phoong, 2023), digital payment systems (Sahi et al., 2022), manufacturing execution systems (MES) (Mantravadi & Møller, 2019), enterprise internal control (Qin, 2018), and social media (Ronzhyn et al., 2023).

However, the primary source of app revenue is predominantly derived from sustained app usage (Adjust, 2020; Delisle, 2017). Sustained app usage is closely related to users' intention to continue to use an app, also known as continuance intention (CI). CI refers to the user's inclination to persist in utilising a service following their initial acceptance of it (Bhattacharjee, 2001).

Although continued use of an app is highly desirable from a business perspective, users typically do not use apps consistently. Recent figures indicate that app retention rates are consistently below 30%. Moreover, the majority of app users, over 70%, ceased using an app during the first three months (Iqbal, 2019). Furthermore, a quarter of app users only used an app once (Rodde, 2018).

Because of these low app usage statistics, it would be highly valuable to understand what variables impact users' CI of apps. Much research has investigated CI for apps but this body of knowledge is fragmented and results are sometimes conflicting. Only a limited number of studies have tried to consolidate this body of knowledge through a systematic review. Past research has mainly concentrated on specific areas such as mobile learning apps (Magsayo, 2023; Panigrahi et al., 2018), mobile health apps (mHealth) (Al-Blooshi et al., 2020; Khalil et al., 2020; Wang et al., 2022), digital museum (Zheng et al., 2024), social media platform (Kit-Fong et al., 2023) and general online technology (Yan et al., 2021). However, through their single industry focus these studies are unable to provide a complete understanding of the various factors that influence people's intention to continue using mobile apps across industries.

Hence, the present study aims to address this research gap by providing a comprehensive analysis of user's continuance intention and enhancing mobile app utilisation. This paper employs the PRISMA framework (Moher et al., 2010) and SPAR-4-SLR protocols (Paul et al., 2021) to conduct a systematic literature review, while incorporating the TCCM framework (Theories, Constructs, Characteristics, and Methods) proposed by Paul and Rosado-Serrano (2019a) to enhance the assessment section within SPAR-4-SLR, a combination rarely applied in prior CI research. This study follows a similar combined approach as used by Kumar et al. (2023), which focused on the Internet of Things (IoT). By employing the combination of those protocols, this paper aims to fill a gap in the literature, offering a more comprehensive exploration of continuance intention in mobile app users than earlier research. The main objective of this paper is to identify the determinants of users' CI for mobile applications. So, this study differs from previous research by integrating the PRISMA framework, SPAR-4-SLR protocols, and the TCCM framework to specifically examine the factors influencing customers' continued intention to use mobile apps. It encompasses both single-purpose apps and multi-functional super apps across various domains while excluding m-health, healthcare, and fitness apps; online learning, digital reading, e-books, libraries, and museum apps; government and public service applications, including digital contact tracing; wearable devices; mobile data service providers; online advertising; web-based programming tools; Manufacturing Execution Systems (MES) and corporate internal activity report applications; Social Networking Sites (SNS), social media, mobile instant messaging services, and online community platforms; NFC technology; and websites. These exclusions—including m-health, healthcare, and fitness apps; online learning, digital reading, e-books; wearable devices; and social media—are made because they have already been extensively explored in previous

research, as noted earlier. Additionally, library apps, digital contact tracing, museum apps, and government and public service applications are excluded since their usage is mandated by the government. Furthermore, corporate internal activity report applications, Manufacturing Execution Systems (MES), and other platforms that are not primarily mobile apps (e.g., online advertising, mobile data service providers, and web-based programming tools) are also excluded. These applications are not designed for general consumers but instead fall under the B2B category rather than B2C, making them less relevant to this study. The most recent SLR of online technologies included studies up to July 2019 (Yan et al., 2021). Therefore, this study summarizes research published from 2019 to December 2023 to provide updated insights into online technologies, with a particular focus on mobile apps. This paper investigates the following research questions:

1. Which research methods are used to investigate this topic?
2. Which theoretical models best explain the key factors that influence customers' continuous intention to use mobile apps?
3. Which determinant factors are frequently used to understand customers' continuation intention and usage behaviour afterwards?
4. What important research gaps remain and what avenues for future research exist?

This study is organised as follows: Section 2 presents the research methodology consisting of the process of selecting, classifying and categorising articles. Section 3 presents the details of the categories of the articles- the main theories and industry context studied, the factors examined, and the research methods used to provide a more comprehensive understanding of CI, will also investigate closely related phenomena, such as technology adoption and general usage of apps. Section 4 presents a detailed content analysis and discussion, while Section 5 outlines future directions. Section 6 sums up the paper with concluding remarks.

2. Methodology

This study employed the systematic literature review method by adopting the PRISMA framework (Moher et al., 2010) in conjunction with the "SPAR-4-SLR protocol" (Paul et al., 2021). The systematic literature review method is considered to be of great value due to its integration of cross-referencing among researchers and journals, comprehensive searches of research databases, and adherence to inclusion and exclusion criteria in a methodical, transparent, and iterative process (Kraus et al., 2022; Phillips et al., 2015). In addition, it identifies prospective research directions by facilitating the articulation of current knowledge gaps (Gopalakrishnan & Ganeshkumar, 2013).

2.1. PRISMA framework

The reason for including the PRISMA framework is its widespread use in prior research to establish a standardised screening procedure and review protocol (Kumar et al., 2023; Moher et al., 2010). The 2009 PRISMA statement (also known as PRISMA) is a statement on systematic reviews and meta-analyses. (Moher et al., 2009) provided a checklist of 27 items, reporting instructions, and exemplars for systematic review reporting, which have been extensively supported and implemented by scholars. Page et al. (2021b) revised PRISMA 2009 to PRISMA 2020 to incorporate current methods and language used in systematic reviews. Refer to the PRISMA 2020 statement for checklists, explanations, and flow diagrams, replacing the PRISMA 2009 statement (Page et al., 2021b). The 2020 PRISMA checklist has seven sections and 27 items from PRISMA 2009, some with sub-items. The seven sections include **Title** (item #1), **Abstract** (item #2), **Introduction, Methods, Results, Discussion** (item #23) and **other information**. The **introduction** section consists of rationale (item #3) and objectives (item #4). The **methods** section includes eligibility criteria (item #5), information

sources (item #6), search strategy (item #7), selection process (item #8), data collection process (item #9), data items (item #10), study risk of bias (item #11), effect measures (item #12), synthesis methods (item #13), reporting bias assessment (item #14), and certainty assessment (item #15). The **results** section covers study selection (item #16), study characteristics (item #17), risk of bias in studies (item #18), results of individual studies (item #19), results of syntheses (item #20), reporting biases (item #21), and certainty of evidence (item #22). The **other information** section includes registration and protocol (item #24), support (item #25), competing interests (item #26), and availability of data, code, and other materials (item #27) (Page et al., 2021b).

In this paper, items #1–4 are presented in the **Title, Abstract, and Introduction** sections, while items #5–15 will be covered in the **Assembling and Arranging** sections of the **SPAR-4-SLR protocol** in the next section. Additionally, items #16–22 will be discussed in the **Assessing** section of the **SPAR-4-SLR protocol** and further elaborated in **Section 3: Research Results and Analysis**. Item #23 will be addressed in **Section 5: Agenda for Future Research** and **Section 6: Conclusion, Contribution and Limitations**, while items #24–27 will be included in the **Appendix**.

2.2. SPAR-4-SLR protocol

Paul et al. (2021) created the "Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) protocol" to overcome the deficiency in the PRISMA framework by Moher et al. (2009, 2015), which lacked detailed rationales for researchers to justify their review choices. The "SPAR-4-SLR protocol" consists of three consecutive stages: "assembling", "arranging", and "assessing", which will be discussed next.

2.2.1. Assembling

The Assembling stage involves the identification and procurement of material for the purpose of performing a systematic literature review. The study employed the Scopus database to guarantee the inclusion of comprehensive and high-quality publications. Scopus is a comprehensive platform that offers convenient access to top-tier and current academic journals with a significant number of citations in various fields such as management, technology, finance, psychology, and others. Additionally, Scopus provides more extensive coverage of recent papers compared to other databases (Aghaei Chadegani et al., 2013; Falagas et al., 2008). These databases are commonly utilised and widely recognised in the research community (Abdullah & Naved Khan, 2021; Kumar et al., 2023; Yan et al., 2021).

As this review focuses on the determinant factors influencing consumers' continuance intention toward mobile apps, studies on unrelated thematic topics were not considered. The document search was conducted within the title, abstract, and keywords fields of the Scopus database. The decision to focus on these fields rather than searching all fields during the initial screening was based on the PRISMA 2020 statement, which suggests that "Study selection is typically a multi-stage process in which potentially eligible studies are first identified from screening titles and abstracts, then assessed through full-text review" (Page et al., 2021a, p. 7). Additionally, a study by Mateen et al. (2013) found that screening via titles and abstracts together achieves higher precision than a title-only approach when filtering citations before full-text review. This approach allows for the retrieval of only relevant documents focused on specific keywords, while also reducing the time and cost of the systematic review without compromising its quality (Han & Kim, 2021; Mateen et al., 2013). This study does not use general keywords like "platform" but instead directly applies more specific terms such as "application," "apps," "online," or "mobile" in the initial screening. These keywords are closely aligned with the research question and are essential for identifying relevant studies. If retrieved articles contain general terms (e.g., "platform") but lack primary elements related to the research question (e.g., "mobile apps") in their titles, abstracts, or keywords, they

are considered irrelevant due to their overlap with unrelated topics (Bramer et al., 2018).

Therefore, specific keywords are used in the "title, abstract, keywords" field to conduct a search for pertinent publications from January 2019 to December 2023 using the following Boolean:

```
TITLE-ABS-KEY (( user AND continu* AND ( us* ) AND intent* ) )
AND TITLE-ABS-KEY ( "factor*" OR "determinant*" OR "variable*" ) AND
TITLE-ABS-KEY ("apps" OR "application*" OR "online" OR "mobile").
```

2.2.2. Arranging

The arranging step has two distinct sub-stages, namely "organising" and "purification." (Paul et al., 2021). During the assembling stage, the study first obtained 1262 publications by searching the Scopus using the Boolean specified above in December 2023. Further, papers are selected according to the following criteria: The analysis excludes papers that are not published in Q1 and Q2 journals based on SJR ranking (Scientific Journal Rankings), written in a language other than English, done outside the years 2019–2023 and do not primarily address the sustained usage intention of mobile application platforms. In the next stage, the papers underwent a second round of screening, with a greater focus on the title and abstract. The goal was to exclude studies related to m-health (including healthcare, fitness apps, and wearable devices), online learning (including digital reading, e-books, and libraries), government-based apps (including public service applications and museum apps), corporate internal apps (including Manufacturing Execution Systems (MES), digital contact tracing, and corporate internal activity report applications), Social Networking Sites/SNS (including social media, mobile instant messaging services, online community platforms), and non apps (including websites, web-based programming tools, online advertising, NFC technology, mobile data service providers). These topics were excluded as they have already been extensively explored in previous research, as noted in the introduction. Additionally, some topics, such as corporate internal apps and non-app platforms, are not specifically related to mobile apps used by general consumers, as outlined in the research question. All data were collected and reviewed by one author, while simultaneously being verified by the other authors.

Furthermore, this study utilised the criteria set forth by Paul and Rosado-Serrano (2019b) and Paul et al. (2021) to refine the choice of research, specifically focusing on papers listed in the "Q1/Q2" category in SJR. This approach was taken to ensure that only literature of superior quality was included in the review.

To assess the quality of the primary studies, we developed a set of quality assessment questions for each collected article, ensuring relevance to the research questions. These included: "Do the articles specifically discuss mobile apps, mobile app users, and the determinant factors influencing users' continuance intention?", "Do the articles clearly specify the theories and research methods used in their studies?", and "Do the articles explicitly state recommendations for future research?". The purpose of the questions was to evaluate the significance of the selected individual research during the synthesis of results. After applying the inclusion and exclusion criteria, a total of 119 articles met the eligibility requirements and were individually reassessed for quality using the established assessment questions. All 119 articles satisfactorily addressed these questions, confirming their suitability for full-text review. Ultimately, these articles were acquired and analyzed for synthesis and comprehensive evaluation. The full-text assessment focused on the depth of analysis and insights into the relationship between various factors and consumers' continuance intention to use mobile apps. The study's flowchart is constructed using the "SPAR-4-SLR" methodology (Paul et al., 2021) and the "PRISMA framework" (Moher et al., 2010) as depicted in Fig. 1.

2.2.3. Assessing

Employing recognized frameworks to systematically examine the existing literature is recommended for conducting a comprehensive

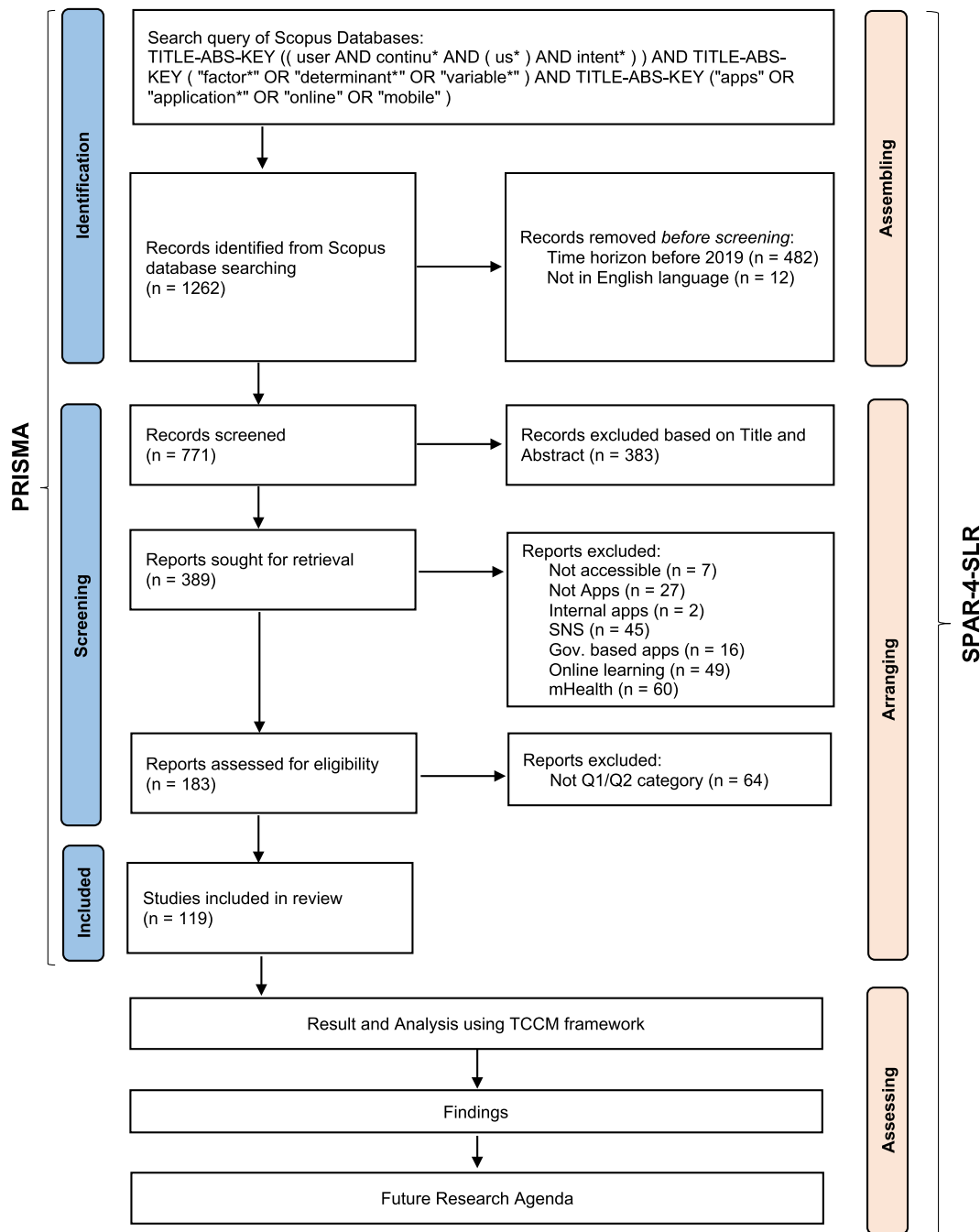


Fig. 1. Overview of how PRISMA and SPAR-4-SLR were used in this study.

analysis (Paul et al., 2021). Several techniques were developed by some scholars for utilising framework-based review, such as the Antecedents, Decisions, and Outcomes framework (ADO), the Theories, Contexts, and Methods framework (TCM), the Theories, Constructs, Characteristics, and Methods framework (TCCM), and the What, Why, Where, When and How framework (5W1H) (Kumar et al., 2023).

To arrange the systematic literature evaluation, this study employed the TCCM framework (Theories, Constructs, Characteristics, and Methods framework) proposed by Paul and Rosado-Serrano (2019a). Researchers have used the TCCM framework extensively in systematic literature review due to its suitability for conducting a comprehensive analysis of existing knowledge, identifying research deficiencies, and suggesting future research directions about theories, characteristics, contexts, and methodology concerning the continuous usage intention

of technology (Al-Blooshi et al., 2020; Kumar et al., 2023; Yan et al., 2021) as pictured in following Fig. 2. TCCM provides a fresh perspective on the continuance intention (CI) literature, particularly in the context of mobile apps, where it has not been widely applied before.

3. Research result and analysis

This section will provide a brief analysis of the search results, relating to theories and methods used by prior scholars and highly cited publications on CI topic. This review includes a total of 119 studies, as outlined in Table 1 in the Appendix.

Theories (T) (Existing)	Contexts (C) (Existing)	Methods (M) (Existing)	Characteristics (C) (Existing)
<ul style="list-style-type: none"> Extended Expectancy Confirmation Model /Post-Acceptance Model (PAM) of information systems continuance/ IS continuance model (Bhattacharjee, 2001) Technology Adoption Model (TAM; Davis, 1989) Unified Theory of Acceptance and Use of Technology,UTAUT2 (UTAUT, UTAUT2) (Venkatesh et al., 2003, 2012) IS Success Model (Information Systems Success Model) (DeLone and McLean, 2002, 2003) Technology Continuance Theory (TCT) (Liao et al., 2009) Theory of Planned Behavior (Ajzen, 1991) Task-Technology Fit (TTF) (Goodhue and Thompson, 1995) Stimulus-Organism-Response (S-O-R) model (Mehrabian and Russell, 1974) Expectation Confirmation Theory (ECT) (Oliver, 1980) Uses And Gratification (U&G) theory (Katz et al, 1973) service quality model (SERVQUAL)(Parasuraman, Zeithaml, & Berry, 1985) Trust Transfer Theory (Stewart, 2003) Diffusion of Innovation Theory (DOI)(Rogers, 1983, 2003) Self-Determination Theory (Deci & Ryan, 1985, 2000). Social Cognitive Theory (Bandura, 1982) Technology Readiness Index (TRI) (Parasuraman, 2000) Technology Affordances and Constraints Theory (TACT) (Majchrzak and Markus, 2012) Innovation Diffusion Theory (IDT) (Rogers, 1995) MAU (Mobile Application Usability) (Hoehle and Venkatesh, 2015) Expectation-Disconfirmation Effects on Web-Customer Satisfaction (EDEWS) (McKinney et al, 2002) IS-adapted SERVQUAL (Ketinger & Lee, 1997) Cognitive Load Theory (Sweller, 1988) Theory Of Technology Readiness And Acceptance Model (TRAM) (Lin et al., 2007) Social Impact Theory (Latané, 1981) Value-based Adoption Model (VAM) (Kim et al., 2007). Flow Theory (Csikszentmihalyi, 1997) Appraisal Tendency Framework (ATF) (Lerner and Keltner, 2000, 2001). Norm-Activation Model (NAM) (Schwartz, 1977) Context-Awareness Theory (Schilit et al., 1994) E-Commerce Systems Success Model (ESS model) (Wang et al., 2018) Privacy–Trust–Behavioral Intention Model (C. Liu et al., 2005) Theory Of Perceived Interactivity (Hoffman and Novak, 1996). Social Response Theory (Moon, 2000) Transaction Cost Economics (TCE) theory (Coase, 1937) Cognition-Affect-Conation (C-A-C) framework (Oliver, 1997, 1999) Construal Level Theory (Trope and Liberman, 2010) Self-Service Technology (SST) service quality (SSTQUAL) (Lin & Hsieh, 2011) Push–Pull–Mooring (PPM) (Bansal et al., 2005). Commitment-Trust Theory (CTT) (Morgan and Hunt 1994) Health Belief Model (HBM) (Hochbaum, 1957) Technology Readiness And Acceptance Model (TRAM) (Lin et al, 2007) Resistance Theory For New Innovations (Sheth and Ram, 1989) Perceived Value Theory (Zeithaml, 1988). Self-Control Theory (Khan, Dhar and Wertenbroch, 2005) Online Purchase Decision-Making Process (Liang and Lai, 2002) Decomposed Theory Of Planned Behavior (DTPB) (Taylor and Todd, 1995) National Culture dimensions (Hofstede, 2001) 	<p>Countries</p> <ul style="list-style-type: none"> China India Indonesia Thailand Taiwan Malaysia USA South Korea Vietnam Pakistan Jordan Turkey Portugal Egypt global Spain Canada European Bangladesh Saudi Arabia UK Italia Ghana Finland Germany Australia South Africa Singapore 	<p>Data Collection</p> <ul style="list-style-type: none"> Survey Interview <p>Data Analysis Tools</p> <ul style="list-style-type: none"> Partial Least Squares-SEM (PLS-SEM) Covariance Based-Structural Equation Modeling (CB-SEM) Structural Equation Modeling (SEM) PLS-MGA IPMA ANN approach Fuzzy-Set Qualitative Comparative Analysis (fsQCA) Bootstrapping PLS Necessary condition analysis (NCA) SEM-Generalized Structured Component Analysis (SEM-GSCA) Potential Growth Modeling (PGM) correlation cross-temporal correlation Time-lagged regression regression analyses multiple regression analysis t-test Sobel test Hierarchical Ordinary Least Squares (OLS) Regression Hayes process 	<p>Variables</p> <ul style="list-style-type: none"> Antecedents Mediators Moderators <p>Year-wise publication</p> <p>Publishers</p> <ul style="list-style-type: none"> Elsevier Ltd Emerald Group Holdings Ltd. Emerald Publishing Multidisciplinary Digital Publishing Institute (MDPI) Routledge SAGE Publications Inc. Frontiers Media SA Cogent OA Elsevier B.V. Taylor and Francis Ltd. IGI Global Springer Growing Science John Wiley and Sons Ltd MDPI AG Korea Distribution Science Association (KODISA) Palgrave Macmillan VGU Springer Science and Business Media B.V. Taylor and Francis Inc. Sage Publications India Pvt. Ltd Bellwether Publishing, Ltd. Association for Information Systems Emerald Group Publishing Ltd. Faculty of Engineering, Universitas Indonesia California State University, Long Beach Springer Verlag Australasian Association for Information Systems Springer New York LLC International Association of Online Engineering
	<p>Area</p> <ul style="list-style-type: none"> fintech e-commerce banking service food delivery service travel/tourism ride-hailing service Augmented reality-based services (ARBS) mobile apps in general Online task-oriented check-ins (i.e. OTOCs) online games video streaming news smart urban mobile event application (MEA) Cryptocurrency Exchanges real estate cloud service 	<p>Citations</p>	

Fig. 2. Key TCCM insights in mobile app CI usage (listed by frequency).

3.1. Theories used

Previous researchers have utilised various theories to understand consumer behaviour and explain the phenomenon of continuance intention in technology use. To enhance their comprehension of the Continuance Intention (CI) studies, they frequently utilised extensions, modifications, or a blend of models. To examine the respondents' Continuance Intention (CI) in mobile applications, 47 distinct theories, frameworks, and models were employed (Table 2, Appendix).

The findings revealed that researchers commonly utilise the Expectancy Confirmation Model (ECM)/post-acceptance model (PAM) of information systems continuance /IS continuance model (Bhattacharjee, 2001)(28 articles), the Technology Adoption Model (TAM) (Davis, 1989) (25 articles), the Unified Theory of Acceptance and Use of Technology (UTAUT, UTAUT 2) (Venkatesh et al., 2012) (20 articles) and the Information Systems Success Model (ISSM) (DeLone & McLean, 2002, 2003) (18 articles) as the primary theories to elucidate mobile apps' CI.

Bhattacharjee (2001) IS continuance model/ECM is a further development of the Expectation Confirmation Theory (ECT) (Oliver,

1980) and TAM frameworks. The IS continuance model argues that after initial adoption, a user's pleasure in the technology and perceived usefulness of the system may alter, prompting them to either repeat the behaviour or discontinue use of the technology (Bhattacharjee, 2001). This model was referenced 7 times in the literature. Additionally, it was coupled with other theories in 21 instances namely UTAUT (7), TAM (5), ISSM (3), TTF (2), SERVQUAL (1), EDEWS (1), VAM (1), U&G (1), TPB (1), ECT (1), TCE (1), SCT (1) and TRI (1). This model has been applied in several domains, such as fintech (9), e-commerce (7), food delivery service (6), travel (2), video streaming (1), ride-hailing service (1), Online Cryptocurrency Exchanges (1) and unspecified mobile apps (1). The widespread use of Bhattacharjee (2001) IS continuance model suggests that it is more effective in explaining customers' continuance intention in using technology compared to other models.

The majority use of the Extended Expectancy confirmation model /post-acceptance model (PAM) of information systems continuance /IS continuance model and the Technology Adoption Model" is consistent with the findings of Yan et al. (2021). However, the use of UTAUT and ISSM seems to be more popular in the mobile apps' CI studies compared to the general online technology context conducted by Yan et al. (2021).

This popular use of UTAUT and ISSM is consistent with the finding of [Khalil et al. \(2020\)](#) in the context of m-health apps.

The prevalence of the Expectancy Confirmation Model (ECM)/Post-Acceptance Model (PAM) and the Technology Adoption Model (TAM) is mostly due to its fundamental contribution to elucidating consumer pleasure, perceived utility, and sustained usage behaviour. These theories are firmly established in consumer behaviour and information systems research, rendering them dependable frameworks for examining mobile app customer interaction. ECM/PAM especially addresses post-adoption behaviour, which closely correlates with continuation intention, rendering it an ideal framework for academics examining sustained app engagement.

The increased significance of UTAUT and ISSM in mobile app continuous improvement studies, relative to their general applicability in online technology research, indicates a theoretical change influenced by the complexity and diverse character of mobile app interaction. UTAUT, with its comprehensive constructs (e.g., social impact, conducive circumstances, hedonic incentive in UTAUT2), may more effectively encapsulate the environmental and behavioural factors influencing mobile app utilisation. ISSM, which evaluates system quality, information quality, and service quality, is especially pertinent in mobile app environments where usability, dependability, and content quality profoundly influence user retention.

This tendency corresponds with the findings of [Khalil et al. \(2020\)](#) for m-health applications, where system performance, trust, and service quality are important factors. Mobile applications, especially in sectors such as m-health, education, and financial services, necessitate a more service-oriented and quality-focused theoretical perspective, resulting in the growing prominence of ISSM and UTAUT in CI research.

3.2. Methods employed

A wide range of research methods have been applied in the study of continuance intention (CI) in mobile applications, as outlined in [Table 3](#). Among the 119 studies reviewed, 118 employed quantitative methods, while only one used a qualitative approach (semi-structured interviews) and two adopted a mixed-methods design. The majority of quantitative studies (115 out of 118) utilised Structural Equation Modelling (SEM), with Partial Least Squares SEM (PLS-SEM) being the most frequently applied technique. PLS-SEM was used in 67 studies, while Covariance-Based SEM (CB-SEM) appeared in 35 studies. Only three studies did not apply SEM, instead employing correlation analysis, regression analysis, *t*-tests, or Sobel tests.

Table 3
Most commonly used data analysis techniques (listed in descending order).

Data Analysis Technique	No. of Records
PLS-SEM	67
CB-SEM	35
SEM	10
PLS-MGA	9
IPMA	6
ANN approach	4
FsQCA	3
Bootstrapping	3
PLS	2
Necessary condition analysis (NCA)	2
SEM-GSCA	1
PGM	1
Correlation	1
Cross-temporal correlation	1
Time-lagged regression	1
Regression analyses	1
Multiple regression analysis	1
<i>t</i> -test	1
Sobel test	1
Hierarchical Ordinary Least Squares (OLS) regression	1
Hayes process	1

Among SEM-based studies, several integrated additional analytical methods. PLS-SEM was combined with Importance-Performance Map Analysis (IPMA) in four studies, Multi-Group Analysis (PLS-MGA) in seven studies, Fuzzy-Set Qualitative Comparative Analysis (fsQCA) in three studies, Bootstrapping in two studies, Necessary Condition Analysis (NCA) in one study, and Artificial Neural Networks (ANN) in four studies. Similarly, CB-SEM was combined with ANN in one study and moderation analysis using the Hayes Process in another. Generalised Structured Component Analysis (GSCA) was applied in one study as an alternative to SEM. In addition to these techniques, Potential Growth Modelling (PGM) was utilised in one study to examine changes in constructs over time and their influence on continuance intention.

The predominant dependence on quantitative methods, especially SEM (PLS-SEM and CB-SEM), indicates that researchers in the mobile app CI domain have favoured hypothesis testing rather than exploratory insights. Although SEM is useful for validating theoretical relationships and testing established models, the absence of qualitative research and conceptual studies reveals a notable gap in comprehending the deeper psychological, contextual, and experiential dimensions of CI. The prevalence of SEM-based methodologies suggests that researchers primarily operate within established theoretical frameworks, which may lead to the neglect of unstructured, emergent, or context-specific factors affecting continuance intention. The reliance on pre-determined constructs may restrict the field's capacity to produce new insights and adjust to evolving user behaviours.

The absence of qualitative research indicates a limited understanding of CI. The review indicates that only one study utilised a purely qualitative approach, while two employed mixed-methods, suggesting a significant dependence on established theoretical frameworks and quantitative methodologies among scholars. This methodological preference may overlook significant insights that could arise from more exploratory approaches. Qualitative methods, including longitudinal interviews, ethnographic studies, and user journey mapping, can enhance understanding of the temporal shifts in continuance intention and the influence of emotional and situational factors on user decisions. In the absence of these methods, research is limited to structured survey-based approaches, which may not adequately reflect the dynamic and changing characteristics of mobile app engagement.

A significant limitation is the absence of conceptual research, as the majority of studies have utilised deductive reasoning—mainly assessing existing models instead of formulating new theoretical frameworks. This trend aligns with concerns articulated by scholars such as [Jaakkola \(2020\)](#) and [Yadav \(2010\)](#), who contend that conceptual work is crucial for the advancement of a field. [Jaakkola \(2020\)](#) asserts that conceptual articles are essential for the development of new theoretical frameworks that elucidate emerging phenomena. In contrast, [Yadav \(2010\)](#) notes a decline in conceptual articles and cautions that research may become incremental rather than transformative in their absence. In the mobile app CI domain, the emphasis on model confirmation over theory development may lead researchers to overlook opportunities for investigating new variables, mechanisms, or perspectives that more accurately reflect the complexity of mobile app CI.

Future research in mobile app continuous integration should integrate qualitative methods, including grounded theory, phenomenological research, and case studies, to reveal new constructs and contextual insights that are lacking in existing quantitative models. Furthermore, the adoption of mixed-methods designs is recommended, as they enable researchers to validate relationships while also capturing user experiences and contextual variations. Moreover, a transition towards conceptual research would promote the advancement of novel theoretical perspectives instead of merely evaluating existing models. Integrating alternative analytical techniques, such as fsQCA, ANN, and longitudinal modelling, enables researchers to more effectively capture complex causal relationships and the evolving patterns of CI over time. Expanding the methodological scope of CI research in mobile applications will yield a comprehensive understanding of the factors influencing users'

sustained engagement.

4. Content analysis

To successfully understand customers' continuous usage intention, it is crucial to identify constructs that can either hinder or facilitate this intention. This systematic literature review has identified that previous studies have utilised a wide range of constructs to examine CI in mobile applications. The following sections provide a classification into categories, such as antecedents, mediators, moderators, and outcomes. Fig. 3 provides an overview of the range of antecedents, mediators, moderators and outcomes that have been used in the field of CI for mobile apps.

4.1. Antecedents of continuance intention (CI) of mobile apps

Due to the large number of studies which were part of this SLR (119 studies), many antecedents of CI in mobile app usage were identified. Because of the timeframe of data collection of this SLR (studies had to be published between 2019 and December 2023), there were some contextual factors closely related to the Covid19 pandemic, namely, Social contingency/social distancing/perceived social isolation (4), perceived anxiety (2), perceived lack of shopping mobility (1), perceived Infectability (1), fear of COVID-19 (1), susceptibility to COVID-19 (1), severity of COVID-19 (1) and Cyberchondria (1).

Among the antecedents of CI examined in this SLR, Satisfaction (57), perceived usefulness (44), perceived ease of use (36), Trust (31), attitude (29), confirmation of expectation (28), Social influence (including interpersonal influence and peer influence)(24), Service quality (23), information quality (20), Performance expectancy (20), Perceived security/safety (18), Situational influence/facilitating condition/context (18), Effort expectancy (19), Perceived risk (18), system/platform quality (17), perceived value/benefit or relative advantage (18), Perceived enjoyment (14), Economic/price/monetary/financial benefits/value or savings or economic efficiency (13), habit (13), Hedonic motivation (12), and Convenience (12) are the most frequently mentioned factors in relation to the continuous usage intention of mobile applications.

This is expected as the majority of the records analysed in the study are based on the top four theories most used among 121 reviewed publications, namely the IS continuance model (Bhattacharjee, 2001), Technology Adoption Model (TAM; Davis, 1989), Unified Theory of Acceptance and Use of Technology, UTAUT2 (UTAUT, UTAUT2) (Venkatesh et al., 2003, 2012) and the IS Success Model (DeLone & McLean 1992, 2002, 2003) so that the variables in their models are measured frequently. The commonly used variables derived from the top four theories include Satisfaction (57), Perceived Usefulness (44), Perceived Ease of Use (36), Attitude (29), Confirmation of Expectation (28), Social Influence (which includes Interpersonal Influence and Peer Influence) (24), Service Quality (23), Information Quality (20), Performance Expectancy (20), Situational Influence/Facilitating Condition/Context (18), Effort Expectancy (19), System/Platform Quality (17), Perceived Enjoyment (14), Economic/Price/Monetary/Financial Benefits, Value, Savings, or Economic Efficiency (13), Habit (13), and Hedonic Motivation (12).

Heavy reliance on a small set of theories has advantages and disadvantages. An advantage is that it deepens insights with regards to those theories within the studied context. A disadvantage is it may limit our understanding of the phenomenon of interest (CI off mobile apps) because only a relatively small set of variables are considered in the nomological network that surrounds the focal variable. Future research would do well to consider other theories and variables and how these may affect CI in mobile apps. Doing so would allow researchers to arrive at a more well-rounded understanding of the nomological network around CI in mobile apps.

The IS continuance model/ECM (Bhattacharjee, 2001) stated that a user's intention to continue using the system or product is determined

by the level of satisfaction which is determined by their perceived usefulness and confirmation. Bhattacharjee (2001) IS continuance model/ECM is an extended model of the Expectation Confirmation Theory (ECT) (Oliver, 1980) which core constructs include expectation, perceived performance, confirmation, satisfaction and repurchase intention. Oliver (1981, p. 29) defined satisfaction as "the summary psychological state resulting when the emotion surrounding dis-confirmed expectations is coupled with the consumer's prior feelings about the consumption experience." Confirmation pertains to the consumer's perception of the congruity between their anticipated usage outcomes and the present actual outcomes (Bhattacharjee, 2001).

The Technology Acceptance Model (TAM; Davis, 1989) was extended from the Theory of Reasoned Action (TRA; Ajzen & Fishbein, 1980) which the core construct includes attitude toward behaviour, and subjective norm. In the process of developing TAM, David (1989) excluded the attitude construct to provide a more concise explanation of the concept of intention (Venkatesh, 2003). The main factors of the original TAM (Davis, 1989) namely perceived ease of use (PEOU), perceived usefulness (PU), intention to use and usage behaviour. In his work published in 1989, Davis (pp. 320) defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance." He also defined perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" (pp. 320). The subsequent expansion referred to as TAM2 (Venkatesh & Davis, 2000), comprised five further exogenous variables (including subjective norm, image, job relevance, output quality and result demonstrability) and two moderators (experience and voluntariness). The following extended model is referred to as TAM 3 (Venkatesh & Bala, 2008). In the TAM 3 model, Venkatesh and Bala (2008) propose that actual behaviour is determined by behavioural intention. Behavioural intention, in turn, is influenced by perceived usefulness and perceived ease of use, both of which have a range of factors that precede them. The factors influencing the perception of usefulness consist of subjective norm, image, job relevance, output quality, and result demonstrability, which has remained consistent since the TAM2 model was introduced by Venkatesh and Davis in 2000. The model introduced novel factors that directly influence the perceived ease of use. These factors consist of computer self-efficacy, perception of external control, computer anxiety, computer playfulness, perceived enjoyment, and objective usability (Venkatesh & Bala, 2008).

The UTAUT1 model (Venkatesh et al., 2003), commonly referred to as the original UTAUT model, presents four determinant variables of intention to utilise a certain technological product or service. These constructs are performance expectancy, effort expectancy, social influence, and facilitating conditions. The first UTAUT model was subsequently enhanced by incorporating three supplementary variables, specifically hedonic motivation, price value, and habit, resulting in UTAUT2 (Venkatesh et al., 2012).

Based on a comprehensive analysis of many definitions and measurements of IS (Information System) success from different perspectives, DeLone and McLean (1992) categorised these definitions into six primary categories to offer a complete and inclusive definition of IS success. Consequently, a multidimensional measurement model was developed, incorporating interdependencies among many success factors (DeLone & McLean, 1992). The original constructs of the IS Success Model (DeLone & McLean, 1992) include system quality, information quality, usage, satisfaction, individual impact and organizational impact. In response to DeLone and McLean's need for additional refinement and verification of their model, other researchers have endeavoured to expand or redefine the initial model. DeLone and McLean introduced an updated IS success model a decade after their initial model was published. This new model was developed by evaluating numerous contributions made to the original model (DeLone & McLean, 2002, 2003). The revised model has six interconnected characteristics of IS success: information quality, system quality and service



Fig. 3. Integrated conceptual model.

quality, intention to use, usage, user satisfaction, and net benefits. The arrows illustrate the suggested connections between the dimensions of success. The model can be understood in the following manner: The evaluation of a system can be based on its information, system, and service quality. These attributes have an impact on the following usage or intention to use, as well as user satisfaction. By utilising the system, specific advantages will be obtained. The overall impact of the net advantages will directly affect user satisfaction and the continued use of the information system.

Particularly in mobile apps where trust, responsiveness, and support influence user retention, recent IS success study highlights service quality as a critical component (DeLone & McLean, 2003; Petter et al., 2008). While early studies concentrated on system and information quality, recent research emphasises the need of service quality in maintaining involvement (Urbach & Müller, 2012). The emphasis on user-centric net gains above conventional organisational performance measures marks even another change. Particularly in digital services, IS success is today judged by usability, convenience, engagement, and client loyalty (Gable et al., 2008; Wang & Liao, 2008). The IS Success Model is progressively combined with UTAUT (Venkatesh et al., 2012) to account for social and behavioural factors (Dwivedi et al., 2019) and ECM/PAM (Bhattacharjee, 2001) to explain post-adoption behaviours including satisfaction and expectation confirmation (Thong et al., 2006). Industries include e-commerce, banking, and healthcare increasingly give real-time system performance top priority while usability, security, and AI-driven personalisation shapes IS success (Seddon, 1997; Petter et al., 2013). Future studies could hone IS success models to fit changing digital and mobile experiences (DeLone & McLean, 2016).

In addition to the variables mentioned in the popular theories, other commonly used variables in the CI literature, as recorded in this SLR, include Trust (31), Perceived Security/Safety (18), Perceived Value/Benefit or Relative Advantage (18), Perceived Risk (18), and Convenience (12).

Perceived Value (PV) has been extensively examined in mobile application research, especially in contexts where users assess the balance between advantages and costs related to ongoing usage (Zeithaml, 1988). Research primarily examines three elements of perceived worth: utilitarian value, emotional value, and social value (Fan et al., 2018). Utilitarian value is frequently associated with practical advantages, like convenience, cost-effectiveness, and efficiency. In the realm of mobile payments, scholars often emphasise economic advantages and effortless transactions as primary motivators for sustained use (Fan et al., 2018). Conversely, emotional value is intricately linked to characteristics such as trust and perceived security, which are essential in mobile banking, e-commerce, and mobile payments (Singh, 2020). When consumers experience security and trust in the system, they are inclined to perceive more value, resulting in a higher probability of sustained usage. Social value, although less examined than the other two, has been investigated in circumstances where social influence affects technology adoption. Research indicates that dimensions like social identity and peer influence are especially pertinent in apps including social networking or community-driven components (Fan et al., 2018).

Perceived value moderates users' evaluation and continued use of mobile applications. The influence on continuous intention (CI) is generally favourable, albeit its intensity fluctuates based on contextual variables. In mobile payments and e-commerce, customers who recognise substantial value—be it in convenience, cost efficiency, or security—are more inclined to persist in utilising the application (Fan et al., 2018; Ozturk et al., 2017). In service-oriented applications like ride-sharing and food delivery, convenience and perceived advantages markedly affect customer intention (Pal et al., 2021). Subscription-based and freemium models significantly depend on users' evaluations of perceived value, which influence their readiness to persist with or transition to premium services. Nonetheless, there are instances where photovoltaic (PV) systems exert a restricted influence on carbon

intensity (CI). For instance, when apprehensions about trust and security surpass imagined advantages, customers may be reluctant to persist in utilising an application, even if they acknowledge its ease or cost-effectiveness (Jaiswal et al., 2021). Likewise, for frequent users of applications like social media platforms, continuous engagement may be influenced more by routine than by perceived advantages (Singh, 2020). In certain cases, perceived value (PV) may be entirely irrelevant, such as in compulsory enterprise applications where users are obligated to utilise the software, or in platforms exhibiting significant network effects where users persist in using the application solely due to the presence of their social networks, irrespective of their individual assessment of value (Ozturk et al., 2017).

Unexpected results concerning perceived value indicate that an increased perception of value does not necessarily correlate with a greater customer intention. Although perceived value (PV) is often a robust indicator of sustained usage, several studies indicate that users with elevated perceived value may nonetheless cease usage owing to other variables such as app weariness, privacy apprehensions, or perceived hazards (Jaiswal et al., 2021; Wang et al., 2020). Research on mobile payment systems indicates that while consumers acknowledge substantial benefits, elevated perceived risk, especially regarding fraud and data security, might considerably diminish customer intention (Nurlaily et al., 2021; Yin & Hsu, 2023). Another unforeseen discovery is that social worth may occasionally surpass utilitarian and emotional value. Although perceived value (PV) is conventionally associated with functional and emotional advantages, social determinants like peer influence and social identity have emerged as significant motivators in specific mobile application categories, especially those incorporating community-oriented functionalities, such as fitness tracking applications or social commerce platforms (Fan et al., 2018). In certain instances, users persist in utilising an application not due to its perceived value, but rather because their friends and social networks engage with it. Furthermore, studies indicate that consumers may continue utilising an application despite poor perceived value if the costs of switching are substantial. Users may persist in using an application despite a low perceived value due to lock-in effects or substantial switching costs, as exemplified by ecosystems like Apple's digital services or digital banking platforms (Park & Oh, 2019).

Overall, perceived value is a pivotal element in consumer interaction research for mobile applications, with utilitarian, emotional, and social values assuming varying significance based on the programme type and user anticipations. Nonetheless, its significance is not unequivocal, since elements such as perceived danger, habitual behaviour, and network effects may occasionally supersede its effect. Subsequent studies may investigate the interplay between perceived value, application weariness, perceived risk, and user engagement patterns to yield a more thorough comprehension of consumer interaction in mobile applications.

4.2. Moderators of continuance intention (CI) of mobile apps

Moderators are variables that influence the relationship between two factors (Paul et al., 2021). Moreover, they influence the robustness of the relationships between the antecedents, mediators, and effects (Lim et al., 2022). The literature on IS continuance in mobile apps has examined several moderators. The moderators most frequently utilised are gender (9 occurrences), age (6 occurrences), education (6 occurrences) and usage experience (5 occurrences). In addition to demographic variables, the study also considers the influence of technology proficiency (2 instances), personalization (2 instances), usage frequency (2 instances), and habit (2 instances) for the continuance intention of mobile apps. The rest of the moderators used by other scholars including attitude, satisfaction, perceived safety, customer focus, attractiveness of alternatives, user's profession, provider's profession, social image, travel purposes, app types, sedentary behaviour, social media dependence, recreational consciousness, perceived usefulness, perceived severity of security

threats, level of interest in the games, average time spent on Olympic material, app usage time since the initial installation, app usage duration per session, app membership, individualists vs collectivists, perceived demonetisation regulation, generation (Gen Z, Gen Y), and length of usage contributed 1 article each in this domain.

In addition to contextual and demographic factors, a meta-analysis by [Chauhan et al. \(2022\)](#) highlights that cultural orientation (e.g., collectivism vs. individualism) and user types (e.g., students vs. non-students) significantly moderate continuance intention in mobile commerce. Furthermore, [Franque et al. \(2020\)](#) emphasize that methodological factors such as sample size, along with cultural dimensions derived from Hofstede's framework—namely power distance, individualism, masculinity, uncertainty avoidance, long-term orientation, and indulgence—also exert significant moderating effects on various relationships in studies examining continuance intention to use information systems. This finding underscores the importance of incorporating such moderators into CI models to gain a more nuanced understanding of user behaviour.

Based on these findings, it can be summarised that moderators play a critical role in shaping the strength and direction of relationships between key variables, impacting how strongly antecedents and mediators influence outcomes like Continuance Intention (CI). In the context of mobile apps, these moderators, such as demographic factors, technology proficiency, and personalisation, help explain variations in user behaviour and commitment to app use. Understanding these moderators enhances insights into how different user groups and situational factors affect continuance intention, offering valuable implications for app design and user retention strategies.

4.3. Mediators of continuance intention (CI) of mobile apps

Prior research has employed diverse variables as mediators to elucidate the process by which two elements are interconnected. Previous research has utilised certain antecedents and outcomes as mediators, depending on the specific environment. The most frequently mentioned mediators in the context of mobile app continuance are satisfaction (15 occurrences), trust (4 occurrences), perceived value (3 occurrences), performance expectancy (3 occurrences), attitude (2 occurrences) and hedonic motivation (2 occurrences). The remaining mediators contributed 1 article each including intimacy, perceived benefit, effort expectancy, habit, perceived value co-creation, participation, mobile users' awareness, calculative commitment, affective commitment, intention to continue use, perceived ease of use and perceived usefulness.

The dominance of satisfaction, trust, perceived value, and performance expectancy as mediators in mobile app continuance studies reflects their strong role in user retention. Satisfaction is the most frequent mediator, aligning with Expectation-Confirmation Theory (ECT) ([Oliver, 1980](#)) and ECM/PAM ([Bhattacharjee, 2001](#)), as it directly influences repeat usage.

Trust is crucial in security-sensitive contexts like mobile banking and e-commerce, where perceived risk affects user retention ([McKnight et al., 2002](#)). Perceived value, based on Value-Based Adoption Models ([Kim et al., 2007](#)), mediates how users balance benefits and costs, particularly in freemium and service-based apps.

Performance expectancy, from UTAUT ([Venkatesh et al., 2003](#)), is key for productivity apps, influencing continued use based on perceived effectiveness. Attitude, rooted in TAM ([Davis, 1989](#)) and TPB ([Ajzen, 1991](#)), shapes perceptions of an app's usefulness, while hedonic motivation, from UTAUT2 ([Venkatesh et al., 2012](#)), is critical for entertainment and social apps driven by enjoyment.

Less common mediators, such as habit and commitment, are context-dependent. Habit is relevant for high-frequency apps like social media, while commitment is stronger in subscription-based models ([Limayem et al., 2007](#)).

The widespread use of satisfaction, trust, perceived value, and

performance expectancy underscores their broad applicability in mobile app continuance research. Future studies may explore context-specific mediators to refine retention models.

From these results, it can be inferred that mediator variables are critical in explaining how and why certain factors influence continuance intention in mobile app use. By bridging the relationship between antecedents and outcomes, mediators like satisfaction, trust, and perceived value provide deeper insights into the underlying mechanisms driving user behaviour. Understanding these mediators helps to clarify the pathways through which users develop their intention to continue using mobile apps, offering valuable implications for enhancing user engagement and retention strategies.

4.4. Outcomes in the continuance intention (CI) research model

Outcomes are the consequences that are influenced by the antecedents, moderators, and mediators. Our systematic literature review (SLR) indicates that previous studies have examined multiple outcomes. The concept matrix was used to bring together various outcomes that had comparable meanings. Almost all the studies employed continuous use intention (118 instances) as the outcomes within the framework of mobile app continuance. Some of the studies also used other constructs namely continued actual usage (4 instances), Word of Mouth/WOM/sharing intention (4 instances), actual usage (2 instances), mobile application loyalty (2 instances), purchase intention (2 instances), commitment (1 instance), price sensitivity (1 instance), brand attitude (1 instance) and mApp engagement (1 instance) together with continuous use intention construct as the outcome in their model. Only one scholar ([Koghut & Al-Tabbaa, 2021](#)) employed discontinuance intention (1 instance) as the outcome in the model. In their paper, [Koghut and Al-Tabbaa \(2021\)](#) employed Poor system quality, Poor information quality, Poor service quality, usage frequency and behavioural intention to discontinue constructs in the model. Their findings indicate that the Poor system quality, Poor information quality and Poor service quality acting as deterrents, have a direct impact on consumers' intent to discontinue usage. Significantly, the usage frequency has been determined to have no moderating impact on the elements that discourage the intention to continue using m-payments. This supports the idea that negative factors can have distinct and unequal effects on technology usage compared to positive factors.

4.5. Control variables of continuance intention (CI) of mobile apps

Control variables are essential as they significantly improve the internal validity of an experiment. Non-experimental control variables exhibit similarities. However, these methods are primarily designed to confirm and verify observations of natural occurrences, with a specific focus on human behaviour. Non-experimental variables are beneficial in cases where it is neither feasible nor acceptable to eliminate potential confounding factors (such as income, age, and gender) from the samples. Instead, they oversee or counteract data related to established causes. The control variables most commonly stated in the context of mobile app continuance are gender (12 occurrences), income (10 occurrences), age (10 occurrences), education (10 occurrences), usage frequency (2 occurrences), number of mobile apps in use (4 occurrences) and location (3 occurrences). The remaining control variables each contributed one article, covering topics such as occupation, usage time, hedonic value, utilitarian value, use experience, game knowledge, achievement, App age, App size (MB), In-app purchase, App type, App complexity and App platform.

Drawing from these findings, it can be concluded that control variables play a crucial role in enhancing the internal validity of research on mobile app continuance intention by accounting for confounding factors that might influence user behaviour. These variables, such as gender, income, age, and education, help isolate the true effects of the primary variables being studied, ensuring more accurate and reliable findings

regarding continuance intention in mobile app use.

5. Agenda for future research

The following sections identify a future research agenda relating to two broad groups of variables: antecedents of CI and outcomes of CI. Lastly, a third section will discuss recommendations for future research related to research techniques.

5.1. Framework development

Although replication-based research holds significance, several hypothesised associations have already been firmly established and provide limited additional knowledge. Hence, we propose that future studies on CI should endeavour to transcend the examination of recognised and frequently obvious associations, and instead explore and elucidate more intricate and unforeseen connections. Furthermore, we recommend that further research employ the concepts outlined in this study to be evaluated using sample data, so contributing new insights to the field.

5.1.1. Opportunities for future research related to antecedents of CI

This section provides a summary of potential areas for further research, based on the Systematic Literature Review (SLR). This summary focuses on six categories of factors: psychological, technological, social, behavioural, contextual, and barriers.

5.1.1.1. Psychological factors. Prior studies have primarily focused on psychological aspects. For future research, several scholars suggest considering additional constructs in the model of continuance intention. In terms of emotion, some scholars offer to add “prejudice of current situation”, “continuance perception in the first phase of the decision-making process” and “continuity of mood leading to the post-sales process” in the model to understand factors affecting online shopping decisions (Petcharat & Leelasantitham, 2021, p.08169) or the “impact of job stress (the mental health aspect) on employees’ consumption behaviour” (Yao & Li, 2024, p.103609). In addition, other scholars suggest deconstructing particular factors such as perceived enjoyment of app operation and system content (Hung et al., 2021), the cognitive processing construct to reflect Consumer Engagement’s pros and cons (Hepola et al., 2020), individual set of skills (such as Privacy and Financial Literacy) (Kaewkitipong et al., 2022), the negative traits of heavy viewing addiction construct in relation to streaming services’ continued use (Singh et al., 2021) and the reward construct in psychological mechanism (Ashfaq et al., 2022). In terms of motivation, several scholars suggest including other motivational factors like self-efficacy, intrinsic motivation and extrinsic motivation (Rahi et al., 2021) and actual motive (Garrouch, 2021). In terms of perceived value, some scholars suggest considering the impact of Confucian values (namely benevolence, righteousness, propriety, wisdom, and trustworthiness) ((Gao, 2009; Zhao & Roper, 2011) on Satisfaction and Continued Use Intention (Liu, Li, Edu, & Negricea, 2023), “the effect of five dimensions of psychological distance (perceived synchronicity, localization, homophily, ease of use and design aesthetics) on cognitive consequences (such as purchase decision making)” (Hsieh et al., 2023, p.577), and “the role of embeddedness, personal investment (including financial (free vs paid apps) and non-monetary aspects (such as time, energy, effort) on customer decision to use or reuse mobile apps” (Choi et al., 2019, p.140). In terms of perceived privacy, Choi et al. (2023) suggest examining the impact of perceived privacy by especially addressing privacy concerns that pertain to the collection, control, awareness, and unauthorized use of personal information by adopting The Communication Privacy Management Theory (Petronio & Durham, 2008).

These results indicate that many scholars recommend a shift towards a more holistic understanding of user behaviour in digital environments,

such as mobile apps. This approach should incorporate emotional and cognitive aspects, motivational factors, cultural and value-based elements, and privacy-related concerns, which could significantly enhance the predictive power of continuance intention models. Incorporating emotional constructs offers a more dynamic understanding of decision-making processes, particularly in online shopping or post-sales phases. Additionally, cognitive factors can help capture user engagement more accurately, especially for long-term usage. Furthermore, the inclusion of motivational factors could provide deeper insights into why users continue using mobile apps beyond just satisfaction or perceived ease of use. In addition, the emphasis on cultural and contextual factors can be particularly valuable for businesses aiming to tailor their services to specific regions or cultural backgrounds. Finally, the increasing emphasis on privacy-related factors reflect the heightened sensitivity around personal information. The adoption of frameworks like the Communication Privacy Management Theory can provide a structured way to address privacy concerns, which are becoming critical in the digital age.

Despite these advancements, the influence of AI-driven personalisation, algorithmic bias, and ethical considerations on mobile app continuance is still insufficiently examined. AI-driven recommendation systems influence user engagement; however, the literature has not thoroughly explored their effects on satisfaction, trust, and perceived value (Jia et al., 2023). Algorithmic bias in mobile applications can result in content filter bubbles, which may influence user trust and long-term engagement (Bandy & Diakopoulos, 2021). Additionally, ethical issues regarding AI transparency and fairness in automated decision-making may affect privacy perceptions and user retention (Shin & Park, 2022). Future research should examine user perceptions of AI-driven personalisation, data-driven recommendations, and automated decision-making, as these elements are likely to influence the subsequent development of continuance intention models. Addressing these gaps will yield a more comprehensive framework for understanding digital consumer behaviour in AI-enhanced mobile applications.

5.1.1.2. Technological factors. In terms of technological context, some scholars suggest adding some antecedents from the supply side context and customer side context. From the supply side, several antecedents could be added to the mobile apps CI model namely access to the internet and institutional/regulatory influence (Savitha et al., 2022) and operational and strategic evolution (Liu et al., 2021), gamification elements and app-level change (Pandey & Ansari, 2024), structural assurance (Phuong et al., 2020), product variety (Foroughi et al., 2023a), different effectiveness between technology-mediated solutions and traditional ones after the Covid-19 pandemic period (Nguyen et al., 2022), communication about security and new features to customers, training videos and frequently asked questions (Foroughi et al., 2019) and type of task (Putra et al., 2022). From the customer side context the additional antecedents suggested in the CI model such as the importance of ease of use and user experience (Silva et al., 2022), and perceived biometrics technology (Kassim & Haruna, 2020). On the other hand, Liu et al. (2021) recommend adopting either the developer’s viewpoint or considering both the developer’s and user’s viewpoints to provide a more thorough understanding of how the success of app evolution influences the intention to continue using an app. In addition, other scholars suggest deconstructing particular factors such as perceived usefulness of gamified apps (Foroughi et al., 2023a), a different dimension of task-technology fit, system and information quality (such as clarity and ease of understanding) (Kaewkitipong et al., 2022), mobile banking service quality (Saibaba, 2023), perceived security (Kassim & Haruna, 2020), and other AR app dimensions (such as wow effect, reality congruence, and aesthetics) (Foroughi et al., 2023a).

These results suggest that many scholars advocate for a more comprehensive approach that includes both supply-side and customer-

side antecedents, as well as a deconstruction of key factors. Incorporating supply-side antecedents can significantly influence user experience and engagement, enhancing retention by making apps more interactive and reliable. Additionally, customer-side antecedents are essential for understanding user preferences and satisfaction, which directly impact users' intentions to continue using mobile apps. Moreover, adopting a holistic perspective that considers both developers and users can provide valuable insights into how app evolution affects user intentions. Finally, deconstructing key factors can yield deeper insights into user engagement and satisfaction.

Notwithstanding these contributions, one inadequately examined technical element that may affect the ongoing aim of mobile applications is the effect of artificial intelligence (AI) and adaptive personalisation. Although gamification and security measures have been investigated, AI-driven personalisation, including predictive suggestions, real-time support, and automated content curation, is still insufficiently explored. AI-driven functionalities can augment user experience by adaptively modifying application interfaces, recommending pertinent information, and enhancing customer service, thereby promoting sustained engagement (Huang & Rust, 2021). Furthermore, AI-driven automation, including chatbots and voice assistants, may significantly alleviate friction in user interactions and enhance overall application usability (Lu et al., 2023). Future studies may explore the impact of the depth and precision of AI-driven personalisation on user happiness and assess if adaptive intelligence might alleviate prevalent obstacles to app retention, including information overload and choice fatigue (Gursoy et al., 2022).

In addition, future research should examine user-generated content and social influence within apps to better understand factors influencing user retention and loyalty. Techniques like topic modelling can help identify key review themes and predict their impact on user ratings (Yadav et al., 2024).

5.1.1.3. Social factors. Foroughi et al. (2023a) comprising several antecedents (personal innovativeness, satisfaction, attitude, and attractiveness of alternatives) accounted for 30.8 % of the variance in travellers' continued intention to use travel applications. They suggest adding social influence and technological proficiency together in the model of CI to augment the model's explanatory capacity. In addition, Huang and Lee (2022) suggest adding social desirability to the model of mobile applications CI.

These results indicate that integrating social factors, such as social influence and social desirability, into continuance intention models for mobile apps can offer a more nuanced understanding of user motivations. By acknowledging the impact of these social factors, researchers and app developers can create strategies that leverage social validation and peer recommendations, ultimately enhancing user engagement and retention. This comprehensive approach underscores the interconnectedness of personal and social dynamics in the digital landscape. The inclusion of technological proficiency alongside social influence in the CI model suggests that users' abilities to effectively engage with technology can amplify or moderate the effects of social factors. Users who are technologically proficient may be more likely to respond positively to social influence, as they are better equipped to navigate and evaluate app functionalities and features based on others' recommendations.

Although social influence and technological proficiency improve continuance intention models, the significance of digital identity and online community involvement is yet little examined. Applications including social networking, gaming, or collaborative functionalities leverage users' sense of belonging and digital self-representation, hence enhancing long-term retention (Zhang et al., 2023). Users may persist in utilising the application not just for its functionality but also to preserve their social presence, amassed material, or online reputation (Kim & Hall, 2021). Community-driven engagement can enhance network effects, whereby the app's worth escalates as a greater number of users

remain active (Treppe & Reinecke, 2023). Future study should investigate the influence of digital identity, online belonging, and self-presentation on user retention, especially in socially oriented mobile applications, to improve current continuance intention models.

In addition, while network effects theory plays a significant role in continuance studies on digital platforms, Faber and de Reuver (2019) found that few studies systematically compare network effects with other antecedents of digital platforms, such as platform quality. They observed that many scholars tend to focus heavily on network effects, with limited attention given to digital-specific factors like openness, governance, and control in consumer studies on adoption and continuance. This narrow focus risks promoting an overly economic view of value creation, overlooking the broader dynamics that drive platform success. Therefore, future research should address this gap by incorporating and comparing these digital-specific factors to develop a more comprehensive understanding of platform continuance.

5.1.1.4. Behavioural factors. In terms of behavioural context, some scholars suggest examining the supply side context, namely the behaviour of the system provider before establishing the mobile apps system (Petcharat & Leelasantitham, 2021), and the customer side context such as consumer's intention to continue posting the reviews (Filieri et al., 2021), incorporating loyalty and customer advice construct together in the CI model (Akel & Armağan, 2021) and examining the impact of perceived security on switching behaviours, advanced use, and recommended intention (Zhang et al., 2019). In addition, Tseng et al. (2022) suggest examining the customer behaviour pattern of using several apps instead of a single master app by employing the value-based adoption model (antecedents-value-reuse intention).

These results indicate that examining both supply-side and customer-side behavioural factors allows researchers and app developers to gain a more comprehensive understanding of the dynamics influencing continuance intention. Analyzing the behaviour of system providers prior to establishing mobile app systems underscores the critical role developers and service providers play in shaping user experience. This analysis can help identify factors that impact how apps are received and utilized by users. When providers prioritize user-friendly features and responsive customer support, it can lead to increased user satisfaction and a higher likelihood of continued app usage.

Additionally, incorporating customer-side behavioural factors such as the intention to continue posting reviews, customer advice, and recommendation intentions not only reflects user engagement but also serves as a form of social proof for potential new users, thereby enhancing the app's reputation and encouraging further engagement. Furthermore, ensuring robust security measures is essential for enhancing user retention and loyalty. Understanding how loyalty influences user decisions can provide deeper insights into the factors that drive continued app use.

Moreover, applying the value-based adoption model to examine customer behaviour patterns—especially the tendency to use multiple apps rather than relying on a single master app—suggests that users seek specific functionalities across various apps. This insight highlights the importance for developers to differentiate their offerings in order to capture and retain user attention effectively.

The influence of habit formation and digital fatigue on the continued use of mobile applications, despite an acknowledgement of customer and provider behaviours, has not been thoroughly investigated. Habit formation affects automatic mobile app usage, as users depend on these applications through routine rather than deliberate decision-making (Limayem et al., 2007). Excessive reliance on habitual usage may result in digital fatigue, subsequently diminishing engagement over time (Zhou & Bao, 2022). The impact of push notifications and personalised engagement strategies on maintaining user interest remains underexplored (Gonzalez et al., 2021). Notifications can promote re-engagement; however, excessive use may lead to notification fatigue,

causing users to mute or uninstall applications (Lemay et al., 2019). Future research should investigate the interaction between habit strength and digital fatigue within CI models, along with optimal notification strategies that maintain user engagement without causing overwhelm.

5.1.1.5. Contextual factors. The majority of prior studies evaluated in this paper suggest replicating the model in different cultural population contexts (60 instances), or different types of technology/apps/contextes such as in the growth of e-commerce, the COVID-19 progression, post-COVID-19 situation, response strategy in the pandemic, consumer responses of various operators, the context of peer-to-peer lending, InsureTech, and Robo-advisory services, different mobile apps platforms/merchants, different kind of stakeholders (e.g. business owners, service providers), user vs developer perspectives, additional contexts of the online-to-offline service industry (such as online real estate platforms and online-to-offline hospitality services), free vs paid app version, different styles of restaurants (quick-service/casual-dining) and cuisine types (e.g. rice, noodles, burgers and pizza), family condition (single-person and multiperson families), event types and usage length (long term vs short term user), and urban vs rural customers (42 instances). Other scholars suggest considering the relationship between situational normality and user's trust in the context of E-wallet usage (Phuong et al., 2020). In terms of the regulatory context, some scholars suggest adding regulatory environment (2 instances), perceived demonetisation regulation and different aspects of demonetisation or other such regulations on the mobile apps CI model (1 instance). Murillo-Zegarra et al. (2020) suggest examining the connections between incentives, perception, and intent to purchase.

A significant yet seldom-examined contextual factor influencing the sustained intention to use mobile apps is the need to focus on more distinct and often overlooked groups, such as persons with disabilities, migrant workers, marginalised communities, unbanked rural residents, and the older generation. Understanding the attitudes and continuance intentions of these socially and economically excluded populations, as well as identifying the barriers that inhibit their long-term adoption of mobile app technologies, remains a critical area for future research (KA & Subramanian, 2022).

These results indicate that the discussed studies reveal several key themes regarding the continuance intention (CI) of mobile apps across various cultural and contextual settings. Understanding cultural diversity is crucial for developing targeted marketing strategies that resonate with users' values and preferences. Replicating models across different technologies highlights the need for developers to adapt to evolving user motivations based on app functionality and context, necessitating ongoing assessment of user feedback and market trends.

Additionally, situational factors significantly influence user perceptions, informing design and marketing strategies that enhance confidence and engagement. External factors, such as regulations and perceived barriers (like demonetization), also impact user intentions, making it vital for developers to stay informed and compliant while addressing security and privacy concerns. Finally, examining the effect of incentives on user perceptions can help create more effective marketing campaigns, ultimately fostering long-term engagement with mobile applications.

Although previous research examines cultural and contextual differences, the influence of environmental sustainability on mobile app persistence is still inadequately investigated. The rise in digital consumption necessitates greater investigation of eco-conscious app usage behaviours and their effects on consumer innovation (Gleim et al., 2020). Consumers may choose applications that advocate for energy efficiency, ethical data use, and carbon footprint reduction; nevertheless, research regarding the impact of sustainability beliefs on user retention is scarce (Elliot et al., 2022). Moreover, eco-friendly app design and sustainable digital practices, such as dark mode for energy

efficiency and ethical AI for data transparency, may improve user trust and engagement (Benoit et al., 2023). Future studies should examine the influence of sustainability activities in mobile applications on user retention, especially within sectors such as banking, e-commerce, and digital media, where ethical considerations are progressively affecting consumer decisions.

Moreover, with the growing integration of AI across various industries, future research is recommended to explore its impact and usage, particularly in relation to the roles and behaviours of banking and retail customers, as well as potential gender differences in AI adoption (Shaikh et al., 2023).

5.1.1.6. Barriers. Prior studies analysed in the study suggest adding some barriers factors in the CI model including choice overload (Sthapit et al., 2020), cessation of the use of technology (Filiari et al., 2021), switching cost, switching barriers (e.g., available alternatives) and security level (Koghut & Al-Tabbaa, 2021), retailers' attitude concerning the approval of mobile wallets as a method of payment for the product or service being offered (Mombeuil, 2020) and barriers brought by Technology Readiness Index (TRI) based on dissimilar aspects of public health (Yang et al., 2023).

These results indicate that incorporating barrier factors into the continuance intention (CI) model for mobile apps can provide a more comprehensive understanding of user behaviour and decision-making processes. Choice overload highlights how too many options can overwhelm users, suggesting that simplifying interfaces may enhance usability. The cessation of technology use points to the need for regular updates and engaging content to retain users. Factors like switching costs and switching barriers indicate that users may hesitate to change apps due to perceived transition costs, so developers should showcase unique features. Additionally, retailers' attitudes towards mobile wallet approval can influence user experiences, underscoring the need for smooth transactions. Lastly, the Technology Readiness Index (TRI) highlights the importance of understanding users' readiness to adopt technology. Addressing these barriers can lead to more user-friendly experiences and promote continued app usage.

A significant but seldom examined obstacle to the sustained intention of mobile app usage is the inconsistency of experiences across devices and platforms. A multitude of users engage with mobile apps on many devices, including smartphones, tablets, and smartwatches, or transition between different operating systems and ecosystems (e.g., iOS and Android). Nonetheless, when applications lack smooth synchronisation, consistent user experiences, or unified accessibility across several platforms, it may lead to dissatisfaction and deter ongoing usage (Zhang et al., 2021). Challenges like as data loss, inconsistencies in feature availability, or compatibility constraints can significantly hinder user engagement, especially in productivity, financial, and entertainment applications where continuity is crucial (Kim et al., 2022). Notwithstanding studies on usability and interface design, the effect of fragmented cross-device experiences on user retention is still inadequately investigated. Subsequent research should investigate how enhancing interoperability, cloud-based synchronisation, and platform-agnostic accessibility might augment user pleasure and promote sustained application usage.

5.1.2. Outcomes

The outcomes of CI have been mostly overlooked and necessitate additional investigation. Various facets of outcomes should be looked at. Prior studies suggest examining the behavioural consequences of continuous use of Internet consumer finance platforms (ICFPs) (Chen et al., 2021) and technology continuance's impact on marketing outcomes, particularly brand equity and brand loyalty (Nguyen et al., 2022) for future research directions in terms of CI outcomes.

By examining the behavioural consequences of continuous use of online platforms can provide insights into user engagement and

retention strategies, enhancing the understanding of how prolonged usage affects consumer behaviour. Additionally, investigating the impact of technology continuance on marketing outcomes such as brand equity and brand loyalty could reveal how sustained app usage contributes to a stronger brand reputation and deeper customer relationships, ultimately influencing market performance. By focusing on these areas, researchers can better grasp the holistic effects of CI and guide practitioners in developing strategies that promote long-term user engagement and brand loyalty.

5.2. Research design

The majority of prior studies analysed in this paper suggest considering conducting longitudinal data collection to examine the influence of future usage intentions on actual usage patterns over an extended duration (38 instances), collecting a larger sample to provide more beneficial empirical findings (8 instances), whereas for sampling techniques they recommend considering other techniques such as probability sampling (3 instances) or random sampling techniques (2 instances) other than convenience sampling. Some other scholars suggest incorporating some other survey methods, such as multi-domain questionnaires and previous-day recall to obtain more precise and comprehensive understandings (Yao & Li, 2024), combining the online and offline questionnaires (Goyal et al., 2023) or considering in-person participants when examining the low-income countries which have restricted access or knowledge of technology (Pal et al., 2020), a projective technique to enhance the conclusions (Savitha et al., 2022). In terms of research methodology, some scholars suggest employing a comparative study between different group settings (20 instances), experimental designs (7 instances), mixed-methods approach that incorporates both quantitative and qualitative research methodologies (6 instances), qualitative approaches (4 instances), examination of actual big data to obtain more precise findings (3 instances). In terms of analysing the data, some scholars suggest considering comparison analysis (20 instances), mixed analytical approach by combining linear methods (Structural Equation Modelling and multivariate analysis,) and nonlinear tools (artificial neural network, support vector machine, fuzzy set) (2 instances), preferences analysis (e.g. discrete choice experiments or conjoint analysis) (1 instance), or adopting Peirce's Abduction which involves employing decision tree modelling to test theoretically relevant assumptions (1 instance).

6. Conclusion, contribution and limitations

This paper examined the concept of CI (Continuance Intention) through a systematic literature review of 119 articles. The literature was categorised based on the year of publication, geographical, theoretical, methodological factors, and citations. Additionally, various groups of variables, such as antecedents, moderators, mediators, control variables, as well as outcomes of CI were analysed. This paper categorised antecedents into six distinct groups: psychological, technical, social, behavioural, contextual, and barrier.

Although continued app usage is highly desirable from a business perspective, users often do not engage with apps consistently. Given these low usage rates, it is crucial to understand the variables influencing users' continuance intention (CI) within the mobile app context.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jjime.2025.100352](https://doi.org/10.1016/j.jjime.2025.100352).

Appendix

1. Context of the Records

However, the existing body of knowledge on this topic is fragmented, with findings that are sometimes inconsistent. Only a limited number of studies have attempted to consolidate this research through a systematic review that provides a comprehensive understanding of the various factors influencing users' intention to continue using mobile apps. Additionally, previous research has not extensively examined CI across different industry sectors. This paper contributes to the continuance intention literature by exploring mobile app usage through a combined approach of PRISMA, SPAR-4-SLR, and TCCM, offering a more comprehensive analysis than previous studies. Specifically, this review proposes a theoretical framework for continuance intention (CI) by examining the key theoretical models and determinant factors commonly used to explain consumers' continued usage behaviour. Additionally, it explores research methods, identifies existing gaps, and highlights future research avenues, offering valuable insights for scholars aiming to advance research on mobile app continuance intention.

Papers were only gathered from a single database, Scopus. However, research on CI may have been published in sources that are not captured by Scopus. Furthermore, this study exclusively examines the context of mobile applications CI and does not encompass other developing technologies like social media, websites, blogs, blockchain, IoT, and AI. Therefore, future studies will address several of the research gaps in this study. However, we anticipate that the SLR and its associated research agenda outlined in this work will offer a valuable summary of the existing knowledge and guidance for future study.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT and QuillBot to improve the language of the manuscript. After using these tools, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

CRedit authorship contribution statement

Suryati Veronika: Writing – original draft, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.
Michael S.W. Lee: Writing – review & editing, Validation, Supervision.
Bodo Lang: Writing – review & editing, Validation, Supervision.
Pragea Putra: Writing – review & editing, Validation, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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The analysis across the various industry contexts provides several valuable insights. First, it reveals that CI of apps has been studied across 17 contexts. This indicates that CI of apps has been studied widely, which has the potential to provide us with a well-rounded understanding of this phenomenon. Specifically, having been studied across this many contexts may make it possible to ascertain which findings from individual studies may be more or less industry context dependent. In other words, it may be possible to distill more or less generalisable findings in the data. Second, the analysis shows that there is a big difference between the most studied and least studies contexts. This indicates that some contexts are of greater relevance to CI in apps.

We used an Excel file to tabulate 119 research papers based on study inclusion and exclusion criteria to answer research questions and ensure transparency. Fig. 4 showed the main context areas of mobile application’s continuance usage intention articles. The results from the predominant setting of e-commerce, e-service, online gaming, and online finance align with the findings of Yan et al. (2021). Nevertheless, between 2019 and 2023, several emerging contexts emerged that were not present in Yan et al. (2021) study. These include ride-hailing service apps, Augmented Reality-based service apps, Online Task-Oriented Check-ins (OTOCs) apps, smart urban apps, new apps, mobile event apps (MEA), Cryptocurrency Exchanges, and real estate apps.

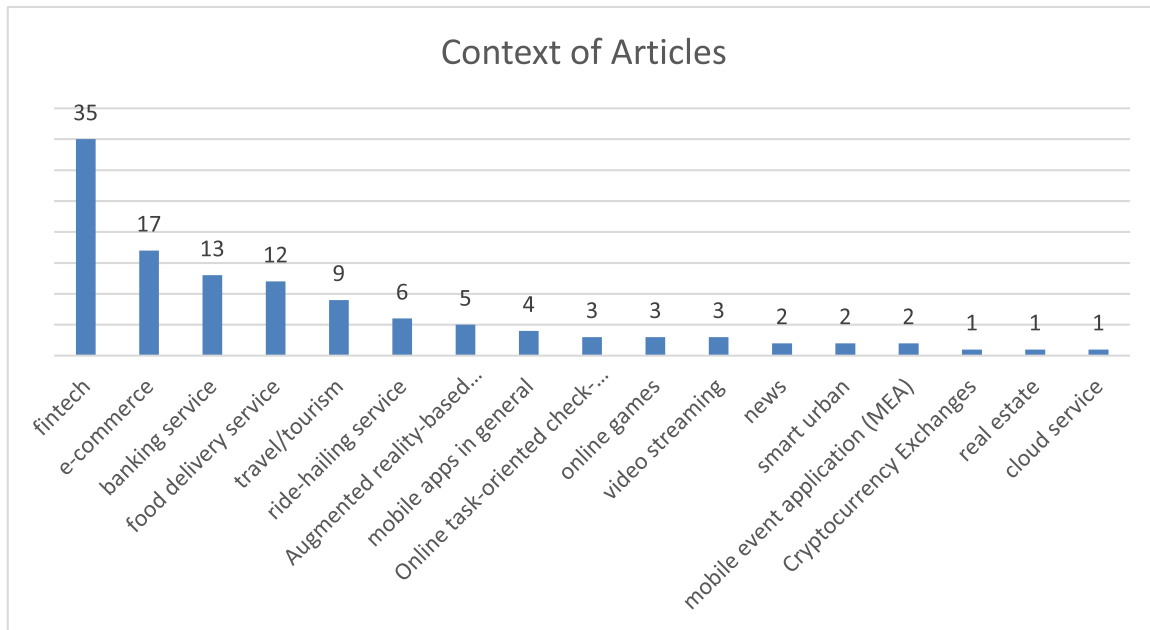


Fig. 4. Context of articles.

2. Year of Publication

Fig. 5 demonstrates that out of the 119 articles analysed in the study, in the year 2019 to 2023, the number of published articles increased significantly from 12 articles in 2019 to 34 articles in 2023. This indicates that research interest in CI in apps is growing. Compared to the results from Yan et al. (2021), which covered research up to July 31, 2019, there has been a notable increase in research on continuance intention (CI) from 2019 to 2021. This growth slightly tapered off in 2022 but saw a sharp rise again in 2023.

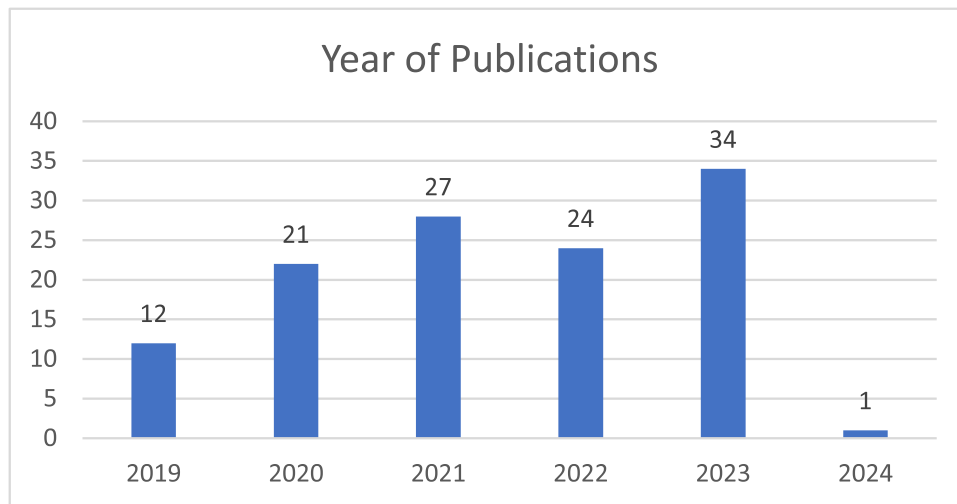


Fig. 5. Year of publication.

3. Country

Fig. 6 shows the geographic area referring to where the data was collected. Fig. 6 uncovered that almost 83.47% of the study has been carried out

in the Asian region, demonstrating a rising inclination towards Continuance Intention (CI) studies. Additionally, it is imperative to highlight that academics hailing from emerging and developing nations should delve into this subject matter and provide probable future pathways for Continuance Intention (CI) studies and their application domains.

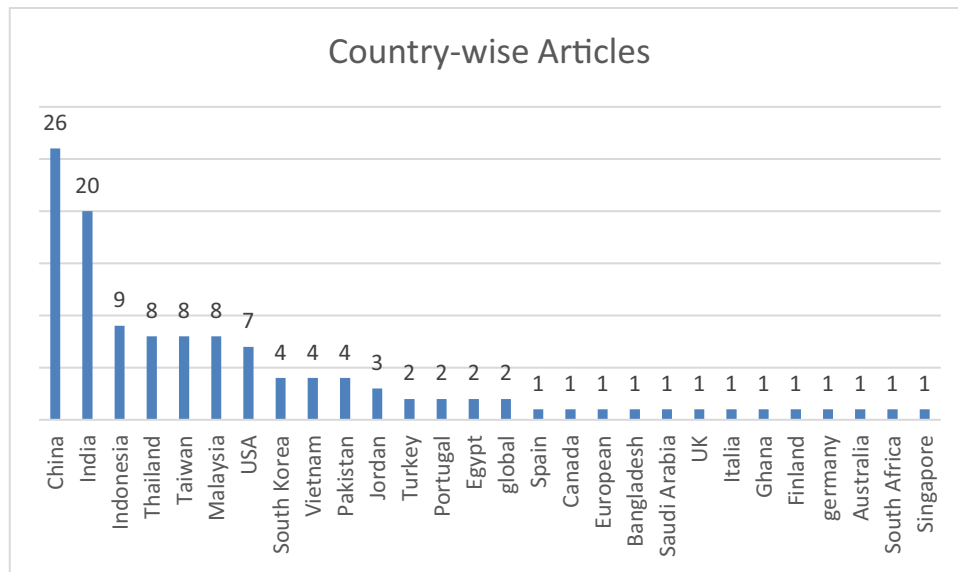


Fig. 6. Country-wise articles.

4. List of articles reviewed for SLR

Table 1, Table 2.

Table 1

Articles reviewed for the systematic literature review (SLR) (in chronological order).

No.	Year	References	Source title	SJR rank
1	2024	Yao and Li (2024).	Journal of Retailing and Consumer Services	Q1
2	2023	Sun et al. (2023)	Aslib Journal of Information Management	Q1
3	2023	Wu et al. (2023)	Frontiers in Psychology	Q2
4	2023	Teng et al. (2023).	Journal of Hospitality and Tourism Technology	Q1
5	2023	Wei et al. (2023)	Journal of Hospitality and Tourism Technology	Q2
6	2023	Lee and Sung (2023)	Information (Switzerland)	Q1
7	2023	Yang et al. (2023).	Sustainability (Switzerland)	Q1
8	2023	Li et al. (2023)	Electronic Commerce Research and Applications	Q1
9	2023	Jia et al. (2023)	Frontiers in Psychology	Q1
10	2023	Yin and Hsu (2023).	Internet Research	Q1
11	2023	Rahardja, Sigalingging, Putra, Hidayanto, & Phusavat, 2023	SAGE Open	Q2
12	2023	Cho and Jeon (2023)	International Journal of Contemporary Hospitality Management	Q1
13	2023	Jiang et al. (2023)	Kybernetes	Q2
14	2023	Foroughi et al. (2023a).	Service Industries Journal	Q1
15	2023	Anand et al. (2023)).	Tourism Planning and Development	Q1
16	2023	Choi et al. (2021).	Cornell Hospitality Quarterly	Q2
17	2023	Susanto et al. (2023)	SAGE Open	Q1
18	2023	Aprilia and Amalia (2023)	Global Business Review	Q1
19	2023	İlkan et al. (2023)	Asia Pacific Journal of Tourism Research	Q1
20	2023	Pandey and Ansari (2024)	Information Systems Frontiers	Q1
21	2023	Hsieh et al. (2023).	Journal of Product and Brand Management	Q1
22	2023	Huang and Nan (2023)	Sustainability (Switzerland)	Q2
23	2023	Chen et al. (2023)	International Journal of Technology	Q1
24	2023	Liu, Li, Edu, & Negricea, 2023	Journal of Hospitality and Tourism Research	Q1
25	2023	Saibaba (2023)	Journal of Internet Commerce	Q1
26	2023	Goyal et al. (2023).	Journal of Enterprise Information Management	Q1
27	2023	Kumar et al. (2023)	Journal of Research in Interactive Marketing	Q2
28	2023	Kumari and Biswas (2023)	International Journal of Bank Marketing	Q1
29	2023	Foroughi et al. (2023c).	Current Issues in Tourism	Q1
30	2023	Sharma et al. (2022)	International Journal of Human-Computer Interaction	Q1
31	2023	Abbasi et al. (2023).	Journal of Marketing Theory and Practice	Q2
32	2023	Foroughi et al. (2023b).	Electronic Library	Q1
33	2023	Foroughi et al. (2023d)	International Journal of Contemporary Hospitality Management	Q1
34	2023	Kilani et al. (2023)	Journal of Open Innovation: Technology, Market, and Complexity	Q1
35	2023	Timur et al. (2023)	Journal of Hospitality and Tourism Technology	Q1
36	2022	George and Sunny (2023)	Journal of Financial Services Marketing	Q1
37	2022	Elnadi and Gheith (2022).	Travel Behaviour and Society	Q1
38	2022	Putra et al. (2022)	Heliyon	Q1

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Table 1 (continued)

No.	Year	References	Source title	SJR rank
39	2022	Al Aminet et al. (2022).	Journal of Global Marketing	Q2
40	2022	Abdul-Halim, Vafaei-Zadeh, & Hanifah, 2022	Quality and Quantity	Q1
41	2022	Ashfaq et al. (2022).	Industrial Management and Data Systems	Q2
42	2022	Nguyen et al. (2022).	Journal of Consumer Behaviour	Q1
43	2022	Yu and Huang (2022)	Systems	Q1
44	2022	Purohit et al. (2022)	Journal of Consumer Behaviour	Q2
45	2022	Tseng et al. (2022).	International Journal of Retail and Distribution Management	Q1
46	2022	Yin and Lin (2022)	Economic Research-Ekonomiska Istrazivanja	Q1
47	2022	Huang and Lee (2022).	Computers in Human Behavior	Q1
48	2022	Jaiswal et al. (2022)	Marketing Intelligence and Planning	Q1
49	2022	Kaewkitipong et al. (2022).	Sustainability (Switzerland)	Q1
50	2022	Xiang et al. (2022)	Frontiers in Psychology	Q2
51	2022	Abbasi et al. (2022).	Technology in Society	Q2
52	2022	Nguyen Thi et al. (2022)	Cogent Business and Management	Q1
53	2022	Istijanto and Handoko (2022)	Spanish Journal of Marketing - ESIC	Q2
54	2022	Silva et al. (2022).	Journal of Open Innovation: Technology, Market, and Complexity	Q1
55	2022	Savitha et al. (2022).	Heliyon	Q1
56	2022	Chaveesuk et al. (2022)	International Journal of Data and Network Science	Q1
57	2022	Zhu et al. (2022)	Sustainability (Switzerland)	Q1
58	2022	Gharaibeh and Gharaibeh (2022).	International Journal of Interactive Mobile Technologies	Q2
59	2022	Wang et al. (2022)	Sustainability (Switzerland)	Q1
60	2021	Pal et al. (2021).	Research Policy	Q2
61	2021	Nguyen-Phuoc et al. (2021)	Transportation Research Part A: Policy and Practice	Q1
62	2021	Gaber and Elsamadicy (2021)	Cogent Business and Management	Q1
63	2021	Nurlaily et al. (2021).	Business: Theory and Practice	Q1
64	2021	Handarkho (2021)	Asia Pacific Journal of Marketing and Logistics	Q1
65	2021	Raman and Aashish (2021)	International Journal of Bank Marketing	Q2
66	2021	Nguyen and Ha (2021)	Cogent Business and Management	Q1
67	2021	Zhang et al. (2021)	Journal of Global Information Management	Q1
68	2021	Wu and Song (2020)	International Journal of Human-Computer Interaction	Q1
69	2021	Filieri et al. (2021).	International Journal of Contemporary Hospitality Management	Q1
70	2021	Liu et al. (2021).	Communications of the Association for Information Systems	Q2
71	2021	Wang et al. (2021).	Frontiers in Psychology	Q1
72	2021	Qin et al. (2021)	Journal of Retailing and Consumer Services	Q1
73	2021	Akel and Armağan (2021).	Multimedia Tools and Applications	Q2
74	2021	Naruetharadhol et al. (2021)	SAGE Open	Q1
75	2021	Rahi et al. (2021).	International Journal of Quality and Reliability Management	Q1
76	2021	Koghut and Al-Tabbaa (2021).	Administrative Sciences	Q1
77	2021	Garrouch (2021).	Journal of Decision Systems	Q1
78	2021	Hammouri et al. (2021)	International Journal of Data and Network Science	Q2
79	2021	Al-Hattami (2021)	Cogent Business and Management	Q1
80	2021	Lin et al. (2021)	Journal of Electronic Commerce Research	Q2
81	2021	Singh et al. (2021).	Expert Systems with Applications	Q2
82	2021	Chen et al. (2021).	Sustainability (Switzerland)	Q1
83	2021	Nelwan et al. (2021)	International Journal of Data and Network Science	Q1
84	2021	Petcharat and Leelasantitham (2021).	Heliyon	Q1
85	2021	Hung et al. (2021)	Technology in Society	Q1
86	2021	Shiau et al. (2021).	Journal of Global Information Management	Q1
87	2020	Zhao and Bacao (2020).	International Journal of Hospitality Management	Q1
88	2020	Wang et al. (2020)	International Journal of Human-Computer Interaction	Q1
89	2020	Jumaan et al. (2020)	Technology in Society	Q2
90	2020	Murillo-Zegarra et al. (2020).	Sustainability (Switzerland)	Q1
91	2020	Verma et al. (2020)	International Journal of Bank Marketing	Q2
92	2020	Siyal et al. (2021)	Data Technologies and Applications	Q1
93	2020	Cheng et al. (2020)	Information (Switzerland)	Q1
94	2020	Talwar et al. (2020).	Journal of Retailing and Consumer Services	Q1
95	2020	Hepola et al. (2020).	Journal of Retailing and Consumer Services	Q1
96	2020	Gupta et al. (2020)	International Journal of Information Management	Q1
97	2020	Ozturk et al. (2021)	Journal of Hospitality and Tourism Technology	Q1
98	2020	Tam et al. (2020).	Information Systems Frontiers	Q2
99	2020	Alhassan et al. (2020)	Journal of Systems and Information Technology	Q1
100	2020	Poromatikul et al. (2020)	International Journal of Bank Marketing	Q1
101	2020	Sthapit et al. (2020).	Tourism Review	Q1
102	2020	Lee and Kim (2020)	International Journal of Bank Marketing	Q1
103	2020	Jang and Liu (2020).	Information Technology and People	Q1
104	2020	Pal et al. (2020).	Information Technology for Development	Q1
105	2020	Kassim and Haruna (2020).	International Journal of Enterprise Information Systems	Q1
106	2020	Singh (2020).	Australasian Journal of Information Systems	Q1
107	2020	Mombeuil (2020).	Journal of Retailing and Consumer Services	Q2
108	2019	Foroughi et al. (2019).	Journal of Enterprise Information Management	Q1
109	2019	Choi et al. (2018)	Journal of Travel and Tourism Marketing	Q1
110	2019	Zhang et al. (2019).	Sustainability (Switzerland)	Q1
111	2019	Khayer and Bao (2020)	Bottom Line	Q2
112	2019	Li and Fang (2019)	Telematics and Informatics	Q1
113	2019	Siyal et al. (2019)	Data Technologies and Applications	Q1
114	2019	Rahi & Abd. Ghani, 2019	International Journal of Accounting and Information Management	Q1

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Table 1 (continued)

No.	Year	References	Source title	SJR rank
115	2019	Lee et al. (2019).	Sustainability (Switzerland)	Q2
116	2019	Yuan et al. (2019)	Information Systems and e-Business Management	Q1
117	2019	Hsiao et al. (2019)	Electronic Library	Q1
118	2019	Humbani and Wiese (2019).	International Journal of Bank Marketing	Q1
119	2019	Park and Oh (2019).	Cluster Computing	Q2

5. List of Theories/Framework/Models Used in Literature

Table 2

Theories/framework/models used in literature.

No.	Theories/Framework/Models	No. of articles
1	Extended Expectancy Confirmation Model /Post-Acceptance Model (PAM) of information systems continuance/ IS continuance model (Bhattacharjee, 2001)	28
2	Technology Adoption Model (TAM; Davis, 1989)	25
3	Unified Theory of Acceptance and Use of Technology,UTAUT2 (UTAUT, UTAUT2) (Venkatesh et al., 2003, 2012)	20
4	IS Success Model (Information Systems Success Model) (DeLone & McLean, 2002, 2003)	18
5	Technology Continuance Theory (TCT) (Liao et al., 2009)	9
6	Theory of Planned Behavior (Ajzen, 1991)	7
7	Task-Technology Fit (TTF) (Goodhue & Thompson, 1995)	5
8	Stimulus-Organism-Response (S-O-R) model (Mehrabian & Russell, 1974)	4
9	Expectation Confirmation Theory (ECT) (Oliver, 1980)	4
10	Uses And Gratification (U&G) theory (Katz, 1974)	4
11	service quality model (SERVQUAL)(Parasuraman et al., 1985)	2
12	Trust Transfer Theory (Stewart, 2003)	2
13	Diffusion of Innovation Theory (DOI)(Rogers, 1983,2003)	2
14	Self-Determination Theory (Deci & Ryan, 1985,2000)	2
15	Social Cognitive Theory (Bandura, 1982)	2
16	Technology Readiness Index (TRI) (Parasuraman, 2000)	2
18	Technology Affordances and Constraints Theory (TACT) (Majchrzak & Markus, 2013)	1
19	Innovation Diffusion Theory (IDT) (Rogers, 1995)	1
20	MAU (Mobile Application Usability) (Hoehle & Venkatesh, 2015)	1
21	Expectation-Disconfirmation Effects on Web-Customer Satisfaction (EDEWS) (McKinney et al., 2002)	1
22	IS-adapted SERVQUAL (Kettinger & Lee, 1997)	1
23	Cognitive Load Theory (Sweller, 2011)	1
17	Theory Of Technology Readiness And Acceptance Model (TRAM) (Lin et al., 2007)	2
24	Social Impact Theory (Latané, 1981)	1
25	Value-based Adoption Model (VAM) (Kim et al., 2007).	1
26	Flow Theory (Csikszentmihalyi, 1990)	1
27	Appraisal Tendency Framework (ATF) (Lerner & Keltner, 2000)	1
28	Norm-Activation Model (NAM) (Schwartz, 1977)	1
29	Context-Awareness Theory (Schilit et al., 1994)	1
30	E-Commerce Systems Success Model (ESS model) (Wang et al., 2018)	1
31	Privacy–Trust–Behavioral Intention Model (Liu et al., 2005)	1
32	Theory Of Perceived Interactivity (Hoffman & Novak, 1996)	1
33	Social Response Theory (Moon, 2000)	1
34	Transaction Cost Economics (TCE) theory (Coase, 1937)	1
35	Cognition-Affect-Conation (C-A-C) framework (Dai et al., 2020)	1
36	Construal Level Theory (Trope & Liberman, 2010)	1
37	Self-Service Technology (SST) service quality (SSTQUAL) (Lin & Hsieh, 2011)	1
38	Push–Pull–Mooring (PPM) (Bansal et al., 2005)	1
39	Commitment-Trust Theory (CTT) (Morgan & Hunt, 1994)	1
40	Health Belief Model (HBM) (Hockbaum, 1957)	1
41	Resistance Theory For New Innovations (Ram & Sheth, 1989)	1
42	Perceived Value Theory (Zeithaml, 1988).	1
43	Self-Control Theory (Khan et al., 2005)	1
44	Online Purchase Decision-Making Process (Liang & Lai, 2002)	1
45	Decomposed Theory Of Planned Behavior (DTPB) (Taylor & Todd, 1995)	1
46	National Culture Dimensions (Hofstede, 2001)	1

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