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The Meta-analysis based Modified Unified Theory of Acceptance and Use of Technology Model: A Systematic Review

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ABSTRACT

This study reviews state-of-the-art research on the application of the meta-analysis based Modified Unified Theory of Acceptance and Use of Technology model (Meta-UTAUT) to provide a comprehensive understanding of how the model has been applied across diverse contexts. From 1,881 citations of the original model, 36 Scopus-and Web of Science-indexed studies were analysed. Findings reveal that mobile payment is the most examined system, with financial technology as the predominant domain of application. Across studies, attitude consistently emerged as a strong determinant of behavioural intention and use behaviour, underscoring its central role in technology adoption. Behavioural intention and facilitating conditions were the most influential predictors of use behaviour, while performance expectancy and effort expectancy contributed substantially to shaping attitude. Many studies extended the Meta-UTAUT framework by incorporating external variables to enrich explanations of attitude, intention, and behaviour, deepening theoretical understanding of technology adoption. This review highlights recurring methodological limitations, including single-subject sampling, cross-sectional designs, and sampling methods, indicating the need for more rigorous approaches to strengthen theoretical refinement and improve generalisability. This study is the first to offer an extensive synthesis of Meta-UTAUT applications, providing valuable implications for researchers and guiding future inquiry toward more rigorous and contextually diverse investigations.

Keywords: Meta-UTAUT, Technology acceptance, Technology adoption, Methodological analysis, External variables, Weight analysis

1. Introduction

Numerous competing theories and models have been developed to better understand the acceptance and use of Information Systems/Information Technology (IS/IT). These frameworks provide valuable insights by examining contextual, technological, and personal factors that influence adoption decisions (Hawash et al., 2021; Wook et al., 2017). Their importance became evident as researchers and organizations increasingly recognized that technology implementations often fell short of expectations (Compeau & Higgins, 1995). Consequently, understanding these influencing factors has become a central concern for both management and IS/IT researchers, as it enables the development of more effective adoption strategies that leverage key motivators, address potential barriers, and ultimately enhance the success of technology adoption initiatives (Mukred et al., 2024).

The Unified Theory of Acceptance and Use of Technology model (UTAUT), introduced by Venkatesh et al. (2003), is a widely recognized framework that was developed based on eight prominent theories to provide a unified perspective on technology acceptance and address the limitations of earlier models. UTAUT includes four exogenous constructs, which are performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). PE, EE, and SI directly influence behavioural intention (BI), which in turn affects use behaviour (UB). Meanwhile, FC has a direct impact on UB. Additionally, its relationships are moderated by gender, age, experience, and the voluntariness of use.

UTAUT has been widely applied at both organizational and individual levels (Alsibhawi et al., 2023) due to its validity, reliability, and accuracy in predicting technology acceptance and adoption (Taherdoost, 2018). Its robustness stems from its parsimonious structure and high explanatory power (i.e., 70% of the variance in BI and 50% in UB) (Nooria & Jailanib, 2022), compared with other models, such as the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour Model (TPB) (Mukred et al., 2019). In addition, UTAUT offers a more comprehensive model compared to earlier models such as TAM, which primarily focuses on technological and personal factors while overlooking the role of social influences (Gunasinghe et al., 2019). Nonetheless, UTAUT has faced criticism for proposing relationships that may not be universally applicable, omitting potentially important linkages, and excluding key factors necessary for understanding IS/IT acceptance and use (Dwivedi et al., 2019). To address these limitations, researchers have introduced new versions of UTAUT. For Instance, Venkatesh et al. (2012) proposed Unified Theory of Acceptance and Use of Technology 2 (UTAUT2), which incorporates three additional factors that directly influence BI. This extension improved the model's explanatory power, increasing the variance explained to 74% for BI and 52% for UB, compared to the original UTAUT. Farooq et al. (2017) introduced Unified Theory of Acceptance and Use of Technology 3 (UTAUT3), an extension of UTAUT2 that incorporates a new factor, increasing the variance in UB to 68.2%. Recently, Dwivedi et al. (2019) proposed the meta-analysis based modified Unified Theory of Acceptance and Use of Technology model (Meta-UTAUT). This revised model incorporates attitude as a mediator between independent and dependent factors to address some of the shortcomings of the original UTAUT. However, despite growing interest in the model, no study has systematically synthesized or critically examined the empirical applications of the Meta-UTAUT framework, particularly in terms of its performance and methodological approaches, and contextual deployment. This gap limits a holistic understanding of the model's potential, practical relevance, and theoretical boundaries. To address this issue, the present study systematically reviews the emerging body of literature that applies Meta-UTAUT to examine individual IT/IS acceptance and adoption. Specifically, this review evaluates the model's effectiveness and validity, synthesizes key findings and limitations, and outlines potential directions for future research.

The remainder of this paper is structured as follows: Section 2 provides a brief overview of the UTAUT and Meta-UTAUT models. Section 3 describes the methodology employed, followed by Section 44, which presents the findings. Section 55 offers a discussion of the results. Finally, Section 66 outlines the conclusions, future work, and limitations.

2. Literature Review

Venkatesh et al. (2003) introduced the Unified Theory of Acceptance and Use of Technology (UTAUT) to consolidate fragmented perspectives on technology acceptance and address limitations of earlier theoretical models. The model was developed through a systematic comparison of similarities and differences among eight prominent theories and models derived from information systems, psychology, and sociology, namely: the Theory of Reasoned Action (TRA), the Theory of Planned Behaviour (TPB), the Technology Acceptance Model (TAM), the Motivational Model (MM), Social Cognitive Theory (SCT), the Model of PC Utilization (MPCU), the combined TAM-TPB model (C-TAM-TPB), and the Diffusion of Innovations Theory (DOI).

The original UTAUT framework comprises four core exogenous constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions, as shown in Figure 1. In addition, the model incorporates four moderators, gender, age, experience, and voluntariness of use, to enhance predictive accuracy (Venkatesh et al., 2003). UTAUT has demonstrated strong explanatory power, accounting for approximately 70% of the variance in behavioural intention (Venkatesh et al., 2003) and nearly 50% of the variance in technology use (Venkatesh et al., 2012), representing a substantial improvement compared with earlier models (Mukred et al., 2019).

UTAUT is widely recognised as a leading framework in IS/IT research due to its strong theoretical grounding, substantial explanatory power, and comprehensive structure. However, scholars have noted that some of the model's proposed relationships may not be universally applicable and that it omits potentially important constructs relevant to specific contexts (Dwivedi et al., 2019). Furthermore, many studies modify

the original UTAUT by altering constructs or removing moderators, often citing concerns regarding its complexity (Dwivedi et al., 2020).

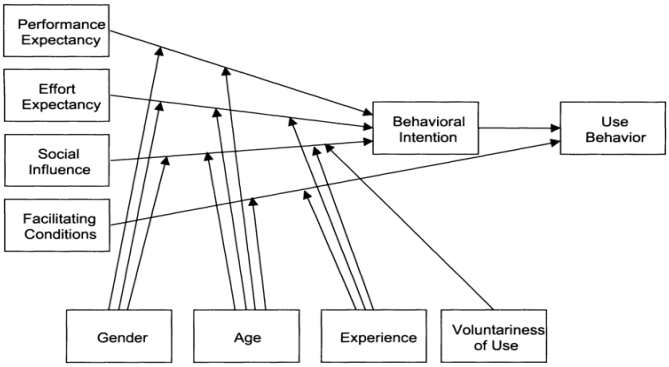

Figure 1. The unified theory of acceptance and use of technology (UTAUT) (Venkatesh et al., 2003)

Dwivedi et al. (2019) conducted a meta-analysis of 162 UTAUT-based empirical studies to develop an enhanced version of the model, known as the Meta-UTAUT model. The Meta-UTAUT model retains the four core exogenous constructs and the two endogenous constructs of the original UTAUT. Dwivedi et al. (2019) extended the original model by introducing attitude (ATT) as a key mediating factor, as depicted in Figure 2.

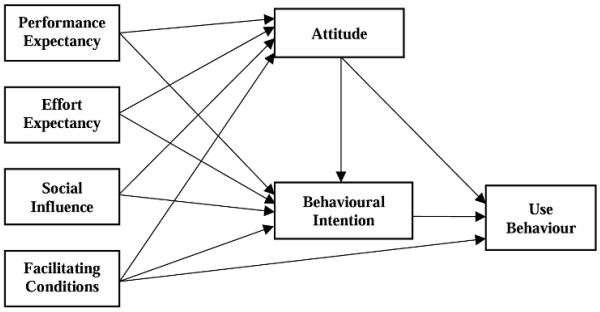

Figure 2. The meta-based modified model of the unified theory of acceptance and use of technology (Meta-UTAUT) (Dwivedi et al., 2019)

According to Venkatesh et al. (2003), PE refers to the degree to which an individual believes that using a particular system would improve his/her job performance. EE is defined as the degree of ease associated with using a system. SI is the degree to which a user perceives that important others believe he/she should use the new system. FC is defined as the degree to which an individual perceives that adequate organizational and technical resources are available to enable the effective use of a system. ATT has defined an individual's positive or negative feelings regarding performing a target behaviour (Davis, 1989). The four exogenous constructs directly influence ATT, in addition to their impact on BI. Additionally, ATT directly affects BI and UB. Moreover, the model excluded moderators, since they are not always applicable across different contexts (Dwivedi et al., 2019). Incorporating ATT into the theoretical model significantly enhances its explanatory power, as it increases the variance explained in BI from 38% to 45% and in UB from 21% to 27%, without and with the inclusion of ATT, respectively (Dwivedi et al., 2019).

Although Meta-UTAUT has received increasing attention within IS/IT research, a comprehensive synthesis of its application, performance, and contextual relevance remains limited. To date, only two reviews have examined the model. Dwivedi et al. (2020) conducted a systematic review that classified studies citing the original Meta-UTAUT article in Scopus, while Gulia and Singh (2024) carried out a bibliometric analysis of Meta-UTAUT publications, examining publication years, countries, subject areas, authors, and citation counts. While these studies provide valuable insights into citation patterns and the growing interest in Meta-UTAUT, they do not offer a detailed assessment of how the model has been operationalised in empirical

research, its effectiveness in predicting user attitudes, behavioural intentions, and technology use, or the methodological and contextual challenges encountered across various domains. As a result, understanding the model's empirical robustness and practical applicability remains limited. Addressing this gap is essential, as a comprehensive review can identify the strengths and limitations of Meta-UTAUT and provide guidance for its refinement and adaptation in different IS/IT contexts. Therefore, this study systematically examines the application of Meta-UTAUT, evaluates its predictive performance, and synthesises current evidence regarding its effectiveness, limitations, and potential areas for improvement. The study is guided by the following research questions:

RQ1: What is the distribution of countries from which research participants in Meta-UTAUT studies were recruited?
RQ2: What systems and domains have the Meta-UTAUT model been applied to?
RQ3: What research methodologies were employed by studies using Meta-UTAUT?
RQ4: What are the most frequently applied models in conjunction with Meta-UTAUT?
RQ5: What are the results of hypothesis testing for internal variables in Meta-UTAUT studies?
RQ6: What external variables have been integrated with Meta-UTAUT?
RQ7: What are the major limitations of Meta-UTAUT studies?

3. Methodology

This systematic review was conducted in accordance with the guidelines of Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Moher et al., 2009). This protocol is recognized for its conciseness and standardized workflow, making it widely adopted across various studies, including in IS research (Maryati et al., 2020). The following steps describe the workflow of the review and are illustrated in Figure 3.

1. **Identification:** All studies citing the original article (Dwivedi et al., 2019) up until 20 February 2025 were retrieved from Scopus and Web of Science (WoS). These trusted academic sources ensure broad and current research coverage. This approach was chosen to ensure comprehensive coverage of relevant research, as Meta-UTAUT initially lacked a unique name. For instance, some studies (Elprama et al., 2020; Kannan et al., 2018; Udang et al., 2023) referred to it as the "revised UTAUT", while others (Sangeeta, 2021) labelled it the "modified UTAUT". Some (Huseynov & Özkan Yıldırım, 2019; Wiafe et al., 2020) had no specific name for it. Search focus was solely on journal articles and conference papers written in English. Resultantly, out of 2026 records, a total of 1881 studies were retrieved from Scopus (1040) and WoS (841). Metadata was managed using Microsoft Excel.
2. **Screening:** In the first screening, 733 duplicates were removed, leaving 1148 studies. By applying the inclusion and exclusion criteria reviewed (see Table 1), titles, abstracts, and keywords were then reviewed. Subsequently, different types of review papers, studies focusing on system design, development and implementation, and experimental research were excluded during this phase, leading to the removal of 115 studies and keeping 1033 studies for more detailed examination.

Inclusion	Exclusion
Studies that: Proposed, developed, and/or validated a model utilizing Meta-UTAUT as its theoretical lens	Studies that: Proposed, developed, and/or validated a model by utilizing theoretical models other than Meta-UTAUT or without relying on any foundational model
Were written in English	Suggested Meta-UTAUT as a model for future use
	Meta-UTAUT was utilized either to support research findings or to justify causal relationships within their conceptual frameworks
	Focused on reviewing technology adoption and acceptance models

Table 1. Inclusion and exclusion criteria were used in this study

3. **Eligibility:** A total of 37 studies met the inclusion criteria. The 996 studies that were excluded used other models, such as TAM, the Task-Technology Fit (TTF) model, UTAUT, the Artificial Intelligence Device Use Acceptance (AIDUA) model, and TPB. A second round of eligibility screening was

conducted by thoroughly reviewing the full texts of the previously identified studies to determine those that explicitly employed the Meta-UTAUT model as a foundational framework. In conclusion, the final sample of this stage yielded 36 papers, as a duplicate model was introduced in two studies.

4. **Included:** The final selection for this review comprises 36 studies, all of which met the criteria and were deemed appropriate for the analysis.

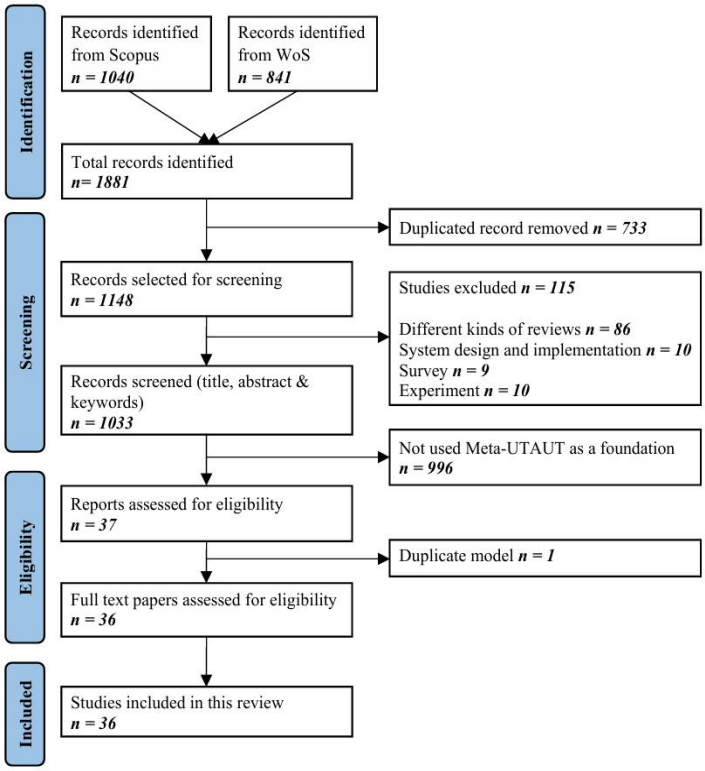

Figure 3. The flowchart of the systematic review (Moher et al., 2009)

4. Findings

The analysis shows that all the studies empirically validated their models, except for Sarker et al. (2020). The validation process crucially confirms the validity of the model, consistency, and relevance to the research problem (Creswell & Creswell, 2018). This analysis reviews Meta-UTAUT publications from 2019 to February 2025, showing growth since its debut. The peak was in 2022 (10 studies), followed by 2024 (nine studies) and 2023 (seven studies), as shown in Figure 4.

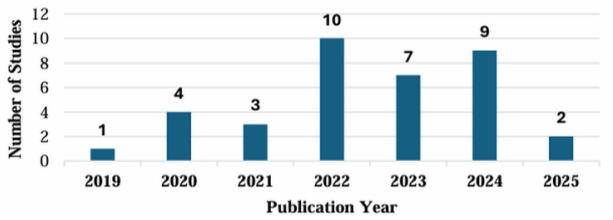

Figure 4. Distribution of studies per year

4.1. Sources of primary data by country

Primary data analysis was based on 33 studies, excluding one without empirical testing (Sarker et al., 2020) and two without country specification. Findings show Meta-UTAUT research spans 22 countries, as indicated in Table 2. The majority of the reviewed studies were conducted within a single-country context, with only two adopting a multi-country approach. India accounted for the largest proportion, contributing eight studies, followed by Indonesia with five and Vietnam with three. Other countries were represented minimally, appearing only once or twice in the dataset.

Country	Studies
India (8)	(Balakrishnan et al., 2022; Chatterjee et al., 2021; HM et al., 2024; Patil et al., 2020; Razi-ur-Rahim et al., 2024; Sangeeta, 2021; Tamilmani et al., 2022; Upadhyay et al., 2022)
Indonesia (5)	(Alfarizi & Sari, 2022; Hakim et al., 2023; Hermanto et al., 2022; Kurniawan et al., 2023; Nur & Gosal, 2021)
Vietnam (3)	(Nguyen Trong et al., 2022; Nguyen, 2024; Pham & Nguyet, 2023)
Bangladesh (2)	(Hossain et al., 2019; Sarker et al., 2025)
Ghana (2)	(Issaka et al., 2024; Wiafe et al., 2020)
Gulf Countries (1)	(Alkhowaiter, 2022)
Australia (1)	(Roy et al., 2021)
Kenya (1)	(Soehnchen et al., 2023)
Kenya, Nigeria, and South Africa (1)	(Olamijuwon & Odimegwu, 2022)
Malaysia, Indonesia, Thailand, and the Philippines (1)	(Atiqah et al., 2024)
Mauritius (1)	(Gunnoo et al., 2023)
Netherlands (1)	(Polyportis & Pahos, 2025)
Pakistan (1)	(Hassaan & Yaseen, 2024)
Saudi Arabia (1)	(Abed, 2024)
Spain (1)	(García de Blanes Sebastián et al., 2024)
Taiwan (1)	(Yang et al., 2022)
Thailand (1)	(Udang et al., 2023)
USA (1)	(Wu et al., 2024)
N/A (3)	(Elprama et al., 2020; Sarker et al., 2020; Wanner et al., 2022)

Table 2. Countries used for primary data collection

4.2. IS research systems and domain examined

Table 3 summarizes the systems examined in the studies and their domains. The results reveal that the mobile payment systems were the most frequently analyzed in studies that applied the Meta-UTAUT model across various domains, especially in finance. Additionally, chatbots appeared in three studies across different sectors. On the other hand, financial technology (Fintech) emerged as the top domain with nine studies, followed by educational technology (EdTech), with five studies. E-health and marketing have been examined in four studies each.

Domain	System examined
Financial technology (9)	Digital banking (Alfarizi & Sari, 2022; Kurniawan et al., 2023)
	Mobile payment (Alkhowaiter, 2022; Gunnoo et al., 2023; Hassaan & Yaseen, 2024; Patil et al., 2020; Upadhyay et al., 2022)
	Unified payments interface (Razi-ur-Rahim et al., 2024)
	E-wallet (Hakim et al., 2023)
Educational technology (5)	ChatGPT (Polyportis & Pahos, 2025)
	Mobile-Assisted Language Learning (MALL) (Nguyen, 2024)
	Online classes (Udang et al., 2023)

	Online teaching (Atiqah et al., 2024; Sangeeta, 2021)
E-health (4)	Electronic health record (EHR) (Hossain et al., 2019)
	Sexual health education digital tool (Soehnchen et al., 2023)
	Sexuality information on social media (Olamijuwon & Odimegwu, 2022)
	Telemedicine (Wu et al., 2024)
Marketing (4)	Smart retailing (Roy et al., 2021)
	AI-customer relationship management (Chatterjee et al., 2021)
	Social commerce (Sarker et al., 2020; Sarker et al., 2025)
E-government (3)	AI-chatbots (Abed, 2024)
	Online business registration service (Nguyen Trong et al., 2022)
	Online tax return reporting (Hermanto et al., 2022)
Industry (2)	Exoskeletons (Elprama et al., 2020)
	Intelligent industrial maintenance systems (Wanner et al., 2022)
E-service (1)	Chatbot-based services (Balakrishnan et al., 2022)
Agricultural technology (1)	Sustainable intensification practices (Issaka et al., 2024)
Construction (1)	E-procurement (HM et al., 2024)
E-commerce (1)	Mobile payment in online shopping (Nur & Gosal, 2021)
Journalism and media (1)	Blockchain (Pham & Nguyet, 2023)
Maritime industry (1)	A multicarrier booking and shipping (Wiafe et al., 2020)
Mobile technology (1)	Smartphone (Yang et al., 2022)
Sustainable transportation (1)	Electric vehicles (García de Blanes Sebastián et al., 2024)
Tourism and hospitality (1)	Airbnb (Tamilmani et al., 2022)

Table 3. Systems examined and their domains applied Meta-UTAUT

4.3. Theoretical foundation

Among the 36 studies reviewed, 27 employed the Meta-UTAUT model independently, without integrating it with other established frameworks, as detailed in Table 4. However, some studies combined Meta-UTAUT with original UTAUT or its extensions. Five studies integrated it with the original UTAUT, one study combined it with both UTAUT and UTAUT2, and another study incorporated it with UTAUT2. Additionally, one study integrated Meta-UTAUT with models such as TAM plus, the Theory of Reasoned Action (TRA), TPB, UTAUT, and UTAUT2. Expanding Meta-UTAUT through such integrations can provide deeper insights and help address its limitations in studying adoption behaviours and emerging technological environments.

Theory/model	Studies
Meta-UTAUT (27)	(Abed, 2024; Alkhowaiter, 2022; Balakrishnan et al., 2022; Chatterjee et al., 2021; García de Blanes Sebastián et al., 2024; Hakim et al., 2023; Hassaan & Yaseen, 2024; Hermanto et al., 2022; HM et al., 2024; Issaka et al., 2024; Nguyen Trong et al., 2022; Nguyen, 2024; Nur & Gosal, 2021; Olamijuwon & Odimegwu, 2022; Patil et al., 2020; Polyportis & Pahos, 2025; Razi-ur-Rahim et al., 2024; Roy et al., 2021; Sangeeta, 2021; Sarker et al., 2020; Sarker et al., 2025; Soehnchen et al., 2023; Tamilmani et al., 2022; Udang et al., 2023; Upadhyay et al., 2022; Wiafe et al., 2020; Yang et al., 2022)
UTAUT and Meta-UTAUT (5)	(Atiqah et al., 2024; Elprama et al., 2020; Hossain et al., 2019; Pham & Nguyet, 2023; Wanner et al., 2022)
Meta-UTAUT and UTAUT2 (1)	(Kurniawan et al., 2023)
TAM, TRA, TPB, UTAUT, UTAUT 2, and Meta-UTAUT (1)	(Gunnoo et al., 2023)

UTAUT, Meta-UTAUT, and TAM plus (1)	(Alfarizi & Sari, 2022)
UTAUT, UTAUT2 and Meta-UTAUT (1)	(Wu et al., 2024)

Table 4. Theories/models applied with Meta-UTAUT

4.4. Methodological analysis

The findings indicate that 32 studies relied solely on a quantitative survey research method. In contrast, one study (Issaka et al., 2024) adopted a mixed-method approach by conducting a focus group followed by a survey. While another combined a survey with the System Usability Scale (SUS) (Soehnchen et al., 2023), and a third collected both qualitative and quantitative data within a survey (Udang et al., 2023). Additionally, one study (Sarker et al., 2020) developed a conceptual model based on a literature review without conducting empirical research. Therefore, the total number of studies analysed in this section is 35.

Regarding the analysis methods and tools, Table 5 reveals that the majority of the studies employed Structural Equation Modelling (SEM), with PLS-SEM (n = 18) and CB-SEM (n = 15) being the most commonly used statistical analysis methods, while one study utilized ESEM. Additionally, one study used the multinomial logit model, which is used for predicting categorical dependent variables when there are more than two unordered outcomes (Nguyen Trong et al., 2022). In terms of analysis tools, the findings in Table 6 indicate that SPSS (15 studies) and SmartPLS (14 studies) are the most used analysis tools.

Analysis method	No
Partial Least Squares Structural Equation Modeling (PLS-SEM)	18
Covariance-Based Structural Equation Modelling (CB-SEM)	15
Exploratory Structural Equation Model (ESEM)	1
T-test	3
Multinomial Logit Model	1
ANOVA	1
N/A	1

Table 5. Data analysis methods used in the selected studies

Analysis tool	No
Statistical Package for the Social Sciences (SPSS)	15
SmartPLS	14
AMOS	9
R	3
STATA	1

Table 6. Data analysis tools used in the selected studies

4.5. Analysis of internal variables

This review evaluates the effectiveness and applicability of the Meta-UTAUT model's internal variables across various domains, drawing on findings of 35 empirical studies. Following the guidance of Jeyaraj et al. (2006), a statistical analysis was conducted to estimate the relative weight of each predictor.

$$Weight\ of\ predictors = \frac{Total\ no.\ of\ significant\ relationships}{Total\ no.\ of\ relationships\ examined}$$

The results show that none of the studies confirmed all of the Meta-UTAUT relationships, as explained in Table 7. This is because some studies did not test all proposed relationships, whereas others expanded the Meta-UTAUT model by introducing external variables or integrating it with other models. Additionally, one study (Olamijuwon & Odimegwu, 2022) used BI more than once, slightly increasing the result counts to 36. Moreover, another study (Alfarizi & Sari, 2022) adopted the Meta-UTAUT model but did not examine any of the relationships among the variables specified in the original model.

Author	PE-ATT	PE-BI	EE-ATT	EE-BI	SI-ATT	SI-BI	FC-ATT	FC-BI	FC-UB	ATT-BI	ATT-UB	BI-UB
Razi-ur-Rahim et al. (2024)	Yes	X	Yes	X	X	Yes	X	Yes	X	Yes	X	Yes
Soehnchen et al. (2023)	X	Yes	X	No	X	No	X	Reverse	X	Yes	X	X
Kurniawan et al. (2023)	Yes	No	Yes	No	X	Yes	X	No	X	Yes	X	Yes
García de Blanes Sebastián et al. (2024)	No	No	No	Yes	No	No	No	No	X	Yes	X	X
Yang et al. (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	X	Yes	X	X
Chatterjee et al. (2021)	Yes	Yes	Yes	Yes	X	X	Yes	Yes	Yes	Yes	Yes	Yes
Upadhyay et al. (2022)	Yes	X	Yes	X	X	No	X	Yes	X	Yes	X	Yes
Pham and Nguyet (2023)	X	No	X	Yes	X	X	X	Yes	X	X	X	X
Nguyen Trong et al. (2022)	X	X	X	X	X	X	X	X	Yes	X	No	X
Sarker et al. (2025)	Yes	X	Yes	X	X	X	X	X	Yes	X	Yes	X
Nguyen (2024)	X	Yes	X	Yes	Yes	X	X	X	X	Yes	X	Yes
Udang et al. (2023)	Yes	No	Yes	Yes	No	Yes	Yes	No	X	No	X	X
Sangeeta (2021)	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hassaan and Yaseen (2024)	Yes	Yes	No	Yes	No	Yes	Yes	Yes	X	Yes	X	Yes
Wiafe et al. (2020)	Yes	Yes	Yes	No	X	No	X	Yes	Yes	Yes	X	No
Tamilmani et al. (2022)	No	Yes	Yes	X	Yes	X	Yes	X	X	Yes	X	X
Alfarizi and Sari (2022)	X	X	X	X	X	X	X	X	X	X	X	X
Hossain et al. (2019)	X	No	X	No	X	Yes	X	Yes	Yes	X	X	Yes
Nur and Gosal (2021)	No	No	Yes	Yes	No	No	No	No	X	Yes	X	X
Roy et al. (2021)	Yes	X	No	X	Yes	X	Yes	X	X	X	Yes	X
Atiqah et al. (2024)	Yes	X	Yes	X	Yes	X	No	X	X	Yes	X	X
Issaka et al. (2024)	X	Yes	X	No	X	Yes	X	Yes	Yes	Yes	X	Yes
Olamijuwon and Odimegwu (2022) Use intention	Yes	Yes	No	Yes	Yes	Yes	X	Yes	X	Yes	X	X
Olamijuwon and Odimegwu (2022) Interact intention	Yes	Yes	No	Yes	Yes	Yes	X	Yes	X	No	X	X
Elprama et al. (2020)	Yes	Yes	Yes	Yes	No	Yes	Yes	No	X	Yes	X	X
Hermanto et al. (2022)	Yes	X	Yes	X	X	No	X	Yes	X	Yes	X	Yes
HM et al. (2024)	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	X	Yes	X	X
Hakim et al. (2023)	Yes	Yes	Yes	No	Yes	No	X	X	Yes	Yes	X	Yes
Wanner et al. (2022)	Yes	Yes	Yes	No	X	X	X	X	X	Yes	X	X
Gunnoo et al. (2023)	X	X	X	X	X	X	X	X	X	X	Yes	Yes
Balakrishnan et al. (2022)	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	X	Yes	X	X
Patil et al. (2020)	Yes	X	Yes	X	X	Yes	X	Yes	X	Yes	X	Yes
Polyportis and Pahos (2025)	Yes	Yes	Yes	No	X	Yes	X	Yes	No	Yes	Yes	Yes
Abed (2024)	Yes	X	Yes	X	X	No	X	No	X	Yes	X	Yes
Alkhowaiter (2022)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	X	Yes	X	Yes
Wu et al. (2024)	Yes	Yes	Yes	No	Yes	Yes	No	Yes	X	Yes	X	X
Notes: Yes: A significant and positive relationship was found.; No: A non-significant relationship was found; X: The relationship was not examined; Reverse: A significant but negative relationship was found.												

Table 7. Findings from hypothesis testing of Meta-UTAUT internal hypotheses

Among the relationships examined, ATT-BI was the most frequently tested, being reported in 29 studies, as shown in Table 8. This underscores the role of ATT in explaining BI. This was followed by the relationships PE-ATT and EE-ATT, each investigated in 28 studies, and FC-BI was reported in 26 studies. PE-BI and SI-BI were each investigated in 25 studies. Meanwhile, EE-BI was examined in 24 studies. These findings reflect the influential roles of PE and EE in shaping ATT, as well as the impact of PE, EE, SI, and FC on BI. Other relationships examined include SI-ATT in 18 studies, BI-UB in 17 studies, and FC-ATT in 15 studies, which makes each play a comparatively less substantial role. FC-UB and ATT-UB had the lowest testing frequencies, examined in nine and seven studies, respectively. This limited examination suggests a research gap concerning these relationships. Overall, BI remains the most frequently studied outcome in Meta-UTAUT research.

The findings indicate that ATT-BI was reported as significant in 27 studies, representing the highest frequency among all examined relationships. It is followed by PE-ATT (24 studies), EE-ATT (23 studies), PE-

BI (19 studies), and both SI-BI and BI-UB, each examined in 16 studies. In contrast, other relationships yielded less significant results, including EE-BI (14 studies), SI-ATT (12 studies), FC-ATT (11 studies), FC-UB (eight studies), and ATT-UB (six studies).

Hypotheses	PE-ATT	PE-BI	EE-ATT	EE-BI	SI-ATT	SI-BI	FC-ATT	FC-BI	FC-UB	ATT-BI	ATT-UB	BI-UB
Significant relationship	24	19	23	14	12	16	11	18	8	27	6	16
Non-significant relationship	4	6	5	10	6	9	4	7	1	2	1	1
Negative relationship	0	0	0	0	0	0	0	1	0	0	0	0
Not tested	8	11	8	12	18	11	21	10	27	7	29	19
Total	36	36	36	36	36	36	36	36	36	36	36	36
Total no. of relationships examined	28	25	28	24	18	25	15	26	9	29	7	17
Total no. of significant relationships	24	19	23	14	12	16	11	19	8	27	6	16
Weight of predictors	0.86	0.76	0.82	0.58	0.67	0.64	0.73	0.73	0.89	0.93	0.86	0.94

Table 8. Summary of internal relationship analysis in Meta-UTAUT

According to Jeyaraj et al. (2006), an independent variable is considered a strong predictor if its weight is at least 0.8. Among the internal relationships examined, six relationships out of 12 (PE-ATT, EE-ATT, FC-UB, ATT-BI, ATT-UB, and BI-UB) met this threshold, with ATT-BI demonstrating the highest weight significance. The remaining relationships played comparatively less significant roles. Figure 5 illustrates the weight significance among Meta-UTAUT constructs, where the thickness of the connecting lines represents the strength of the relationships.

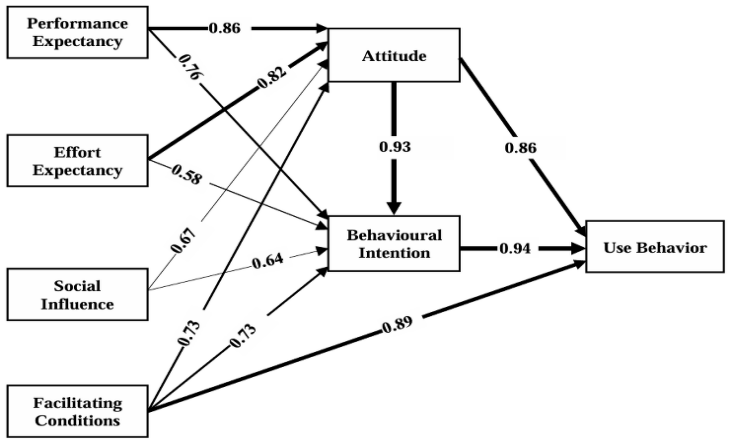

Figure 5. Weight significance of internal relationships in Meta-UTAUT

4.6. Analysis of external variables

Various external variables have been systematically incorporated into the Meta-UTAUT model. However, eight studies (Elprama et al., 2020; HM et al., 2024; Issaka et al., 2024; Olamijuwon & Odimegwu, 2022; Sangeeta, 2021; Soehnchen et al., 2023; Udang et al., 2023; Yang et al., 2022) relied solely on the model's core variables without adding external variables. Figure 6 provides a detailed mapping of how these external variables are integrated into the Meta-UTAUT model, highlighting their relationships with the core variables.

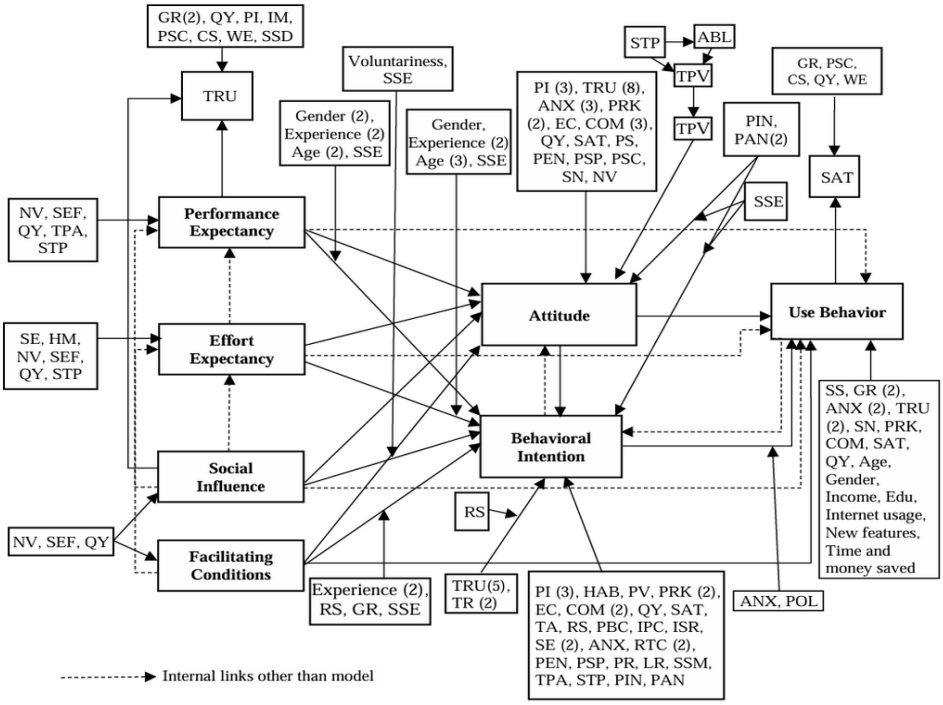

Figure 6. External variables incorporated with Meta-UTAUT

Table 9 summarizes 43 external variables that have been incorporated into the Meta-UTAUT model, along with their definitions and frequency of usage. The analysis indicates that the majority of external variables incorporated into the Meta-UTAUT framework were individual-level constructs, comprising 22 distinct factors that primarily reflect users' personal perceptions, psychological characteristics, and behavioural tendencies. Among these, trust was the most frequently examined variable, appearing in 13 studies, followed by anxiety (seven studies) and personal innovativeness (six studies). A comparison with Williams et al. (2015) reveals that constructs such as self-efficacy, trust, anxiety, personal innovativeness, and perceived risk have been frequently examined across UTAUT studies. In contrast, technology/system-related factors encompassed 11 distinct variables, with system/service quality appearing in four studies, compatibility in three, and perceived anthropomorphism in two. Institutional/regulatory factors included five variables, with grievance redressal examined in five studies. Similarly, contextual/environmental factors comprised five variables; however, most of these were reported in only a single study, such as price value.

Variable	Definition	Referred articles
Personal/Individual Factors		
Trust (TRU) (13)	The extent to which a party believes that another party will fulfil their expectations in performing a specific action	(Alfarizi & Sari, 2022; Alkhowaiter, 2022; Gunnoo et al., 2023; Hakim et al., 2023; Hermanto et al., 2022; Kurniawan et al., 2023; Patil et al., 2020; Pham & Nguyet, 2023; Polyportis & Pahos, 2025; Razi-ur-Rahim et al., 2024; Sarker et al., 2020; Sarker et al., 2025; Tamilmani et al., 2022)

Anxiety (ANX) (7)	An unpleasant emotional state that is often accompanied by subjective feelings of tension, apprehension, and worry	(Hakim et al., 2023; Hermanto et al., 2022; Nguyen Trong et al., 2022; Patil et al., 2020; Razi-ur-Rahim et al., 2024; Sarker et al., 2025; Wiafe et al., 2020)
Personal innovativeness (PI) (6)	An individual would like to try out new technologies	(Alfarizi & Sari, 2022; Hossain et al., 2019; Nur & Gosal, 2021; Patil et al., 2020; Razi-ur-Rahim et al., 2024; Sarker et al., 2025)
Self-efficacy (SE) (4)	An individual believes in their ability to perform a particular behaviour	(Balakrishnan et al., 2022; Tamilmani et al., 2022; Upadhyay et al., 2022; Wiafe et al., 2020)
Satisfaction (SAT) (4)	An individual's expectations regarding a product, service, or system are met or exceeded, resulting in an emotional or cognitive response based on their experience	(Abed, 2024; Alfarizi & Sari, 2022; Chatterjee et al., 2021; Nguyen Trong et al., 2022)
Perceived risk (PRK) (3)	A combination of uncertainty and the perceived seriousness of potential outcomes is involved	(García de Blanes Sebastián et al., 2024; Gunnoo et al., 2023; Sarker et al., 2020)
Technology readiness (TR) (2)	An organization possesses the necessary infrastructure and resources to enable its employees to adopt and effectively utilize new technology in the workplace	(Atiqah et al., 2024; Pham & Nguyen, 2023)
Novelty (NV) (2)	The degree to which technology is perceived as distinctive due to its innovativeness	(Polyportis & Pahos, 2025; Roy et al., 2021)
Perceived security (PSC) (2)	An individual's belief that technology is safe to use and adequately protects their personal and sensitive information from unauthorized access	(Alfarizi & Sari, 2022; Nur & Gosal, 2021)
Resistance to change (RTC) (2)	An individual's or organization's reluctance or opposition to adopting new ideas, behaviours, or processes	(Hossain et al., 2019; Nur & Gosal, 2021)
Technology affinity (TA) (1)	An individual's tendency to accept and adopt new technology	(Pham & Nguyet, 2023)
Habit (HAB) (1)	The manner in which users utilize a specific technology in their daily lives	(Kurniawan et al., 2023)
Perceived severity (PS) (1)	An individual believes they would experience serious consequences as a result of a specific threat or adverse event	(Upadhyay et al., 2022)
Perceived behaviour control (PBC) (1)	An individual's belief about how easy or difficult it is to perform a specific behaviour, shaped by their past experiences, perceived obstacles, and necessary resources	(Nguyen, 2024)
Hedonic motivation (HM) (1)	The degree of pleasure, enjoyment, or fun an individual experiences when using a particular technology	(Tamilmani et al., 2022)
Perceived enjoyment (PEN) (1)	The extent to which an individual finds using technology intrinsically enjoyable, regardless of any performance-related outcomes.	(Nur & Gosal, 2021)
Pedagogical readiness (PR) (1)	The familiarity with effective teaching methods	(Atiqah et al., 2024)
Lifestyle readiness (LR) (1)	The ability of an individual to work remotely and the flexibility	(Atiqah et al., 2024)

Trust propensity (TPA) (1)	An individual's general tendency or inclination to trust others	(Wanner et al., 2022)
Ability beliefs (ABL)	The perceived competence and knowledge base of the system in performing a given task	(Wanner et al., 2022)
Subjective norm (SN) (1)	An individual's perception of social pressure to perform or not a particular behaviour	(Gunnoo et al., 2023)
Islamic religiosity (ISR) (1)	An individual practices and adheres to the teachings, principles, and values of Islam	(Alkhowaiter, 2022)
Technology/System Factors		
System/service quality (QY) (4)	An individual's perception of how effectively a system meets the needs of its users	(Alfarizi & Sari, 2022; Chatterjee et al., 2021; Nguyen Trong et al., 2022; Roy et al., 2021)
Compatibility (COM) (3)	The degree to which an innovation is perceived as aligned with an individual's work style, beliefs, values, experiences, and needs	(Chatterjee et al., 2021; Gunnoo et al., 2023; Nur & Gosal, 2021)
Perceived anthropomorphism (PAN) (2)	An individual's belief that non-human entities possess human-like characteristics	(Balakrishnan et al., 2022; Polyportis & Pahos, 2025)
Perceived intelligence (PIN) (1)	An individual's belief that technology demonstrates human-like cognitive abilities	(Balakrishnan et al., 2022)
Cloud service (CS) (1)	Internet-based computing solutions that allow users to access, store, and process data on remote servers rather than on local devices	(Alfarizi & Sari, 2022)
Cloud service (CS) (1)	Internet-based computing solutions that allow users to access, store, and process data on remote servers rather than on local devices	(Alfarizi & Sari, 2022)
Work efficiency (WE) (1)	The greatest number of tasks and labour accomplished with the least amount of time and effort	(Alfarizi & Sari, 2022)
System sophistication and display (SSD) (1)	The perceived level of user interface quality of a system and how it presents information and interacts with users	(Alfarizi & Sari, 2022)
Technology System Bad Issue (TSBI) (1)	User-perceived negative aspects or failures of a technology system that raise concerns about the system	(Alfarizi & Sari, 2022)
System effectiveness (SEF) (1)	The extent to which individuals perceive a system as successfully achieving its intended goals or functions	(Roy et al., 2021)
Service smartness (SSM) (1)	An individual's belief that a system is intelligent	(Hakim et al., 2023)
System transparency (STP) (1)	The extent to which a technology openly conveys its functionality, decision-making logic, and data handling practices, thereby enabling users to comprehend and trust its operations	(Wanner et al., 2022)
Institutional/Regulatory Factors		
Grievance redressal (GR) (5)	The process through which individuals or groups can formally raise complaints or dissatisfaction regarding a service, product, or action and seek resolution or compensation	(Alfarizi & Sari, 2022; Hakim et al., 2023; Hermanto et al., 2022; Patil et al., 2020; Sarker et al., 2025)
Institutional privacy concerns (IPC) (1)	Individuals' apprehensions about the handling and protection of their personal or sensitive information by institutions	(Hassaan & Yaseen, 2024)
Institutional source reliability (ISR) (1)	The discrepancy between trustworthiness and credibility is attributed to information provided by institutions and the actual experiences of users	(Hassaan & Yaseen, 2024)

Regulatory support (RS) (1)	The set of rules, policies, and legal frameworks established by government bodies or regulatory authorities to promote the implementation, adoption, and operation of specific technologies, practices, or systems within an industry or sector	(Pham & Nguyet, 2023)
Institutional policy (POL) (1)	A formal set of rules and procedures established by an institution to regulate behaviour and operations within its domain, ensuring alignment with its values and objectives	(Polyportis & Pahos, 2025)
Contextual/Environmental Factors		
Price value (PV) (1)	The extent to which perceived costs influence the adoption or usage of a particular technology	(Kurniawan et al., 2023)
Environmental concerns (EC) (1)	Individuals are aware of ongoing environmental degradation	(García de Blanes Sebastián et al., 2024)
Social support (SS) (1)	The assistance, encouragement, and resources an individual receives from their social network to help them cope with challenges and stressors	(Sarker et al., 2025)
Image (IM) (1)	An individual believes that using innovation will enhance their status in their social system	(Alfarizi & Sari, 2022)
Perceived social pressure (PSP) (1)	An individual's response to the expectations, opinions, or behaviours of others concerning engagement in a specific behaviour	(Nur & Gosal, 2021)

Table 9. Summary of external variables in prior studies

4.7. The major limitations of Meta-UTAUT studies

The major limitations identified in prior studies (22 studies) reflect a narrow focus on specific subjects, such as particular communities, regions, countries, cities, organizations, educational institutions, individuals, or demographic groups (e.g., age, gender, or language). Additionally, seven studies highlighted issues with sampling methods, notably the use of non-probability techniques (e.g., purposive and convenience sampling), which introduced bias and constrained the generalizability of their findings. Moreover, an equal proportion of studies (seven) employed a cross-sectional design, which may constrain the ability to observe changes in technology usage over time and, in turn, may not accurately capture long-term behavioural patterns. Other reported limitations include the use of small sample sizes (six studies), exclusive reliance on quantitative methods instead of mixed-method approaches (five studies), lack of investigation into actual usage behavior (five studies), reliance on online surveys (two studies), voluntary participation (two studies), limited availability of related research for comparison (either on the topic or specifically applying the Meta-UTAUT model) (two studies), language bias in the questionnaire (one study), and absence of mediation analysis (one study).

5. Discussion

This review offers an in-depth analysis of studies employing the Meta-UTAUT model as a theoretical foundation. The findings reveal increasing research interest in the model, peaking in 2022 with the publication of 10 studies. This surge can be attributed to the rapid expansion and adoption of digital technologies, such as mobile payments and AI-driven services, trends that were further accelerated by the COVID-19 pandemic (Upadhyay et al., 2022). Furthermore, the increasing number of publications during this period likely underscored the model's relevance and applicability, thereby stimulating greater scholarly interest. As a result, this upward trend underscores its growing recognition as a robust framework for examining technology adoption and acceptance across diverse contexts. However, its theoretical application remains relatively limited, highlighting the need for broader use across varied technologies to further validate and strengthen its effectiveness.

The analysis of 33 studies reveals that research has been conducted in only 22 countries, with India emerging as the primary location for data collection. This prominence can be attributed to the rapid proliferation of digital technologies, including mobile payments, fintech platforms, and AI-enabled services, in emerging economies, where adoption continues to accelerate and is projected to expand substantially in the near future (Panetta et al., 2025). These regions also face distinct challenges such as varying levels of

digital literacy, infrastructure development, and regulatory maturity, making extended adoption models like Meta-UTAUT particularly relevant for understanding user behaviour, thereby increasing the need for exploratory theoretical studies (Adel, 2024). However, this highlights the importance of achieving broader geographical representation in future research. Mobile payment systems and the FinTech sector were the most frequently examined technologies and domains in studies employing the Meta-UTAUT model. FinTech continues to advance rapidly, fueled by ongoing innovation and strong support from both governments and businesses to promote cashless transactions (Hakim et al., 2023). This shift was particularly intensified in the post-COVID-19 era, leading to the widespread real-world applicability of mobile payment systems (Upadhyay et al., 2022). This has led to a marked increase in scholarly attention to user adoption behaviours of these systems (Hakim et al., 2023).

In terms of theoretical foundation, the Meta-UTAUT model has predominantly been applied in isolation in the reviewed studies. This preference is likely due to the incorporation of the individual attribute "attitude" as a mediating factor, which strengthens the model's explanatory power in capturing user acceptance behaviour compared to the original UTAUT, which does not account for personal characteristics (Kurniawan et al., 2023; Upadhyay et al., 2022; Yang et al., 2022). In addition, Hakim et al. (2023) and Kurniawan et al. (2023) reported that the model offers greater simplicity and flexibility than UTAUT, particularly due to the removal of moderators that may not be applicable across diverse research contexts. Its relative novelty also makes it well-suited for examining individual acceptance in the IS/IT domain, further contributing to the establishment of its validity (Kurniawan et al., 2023). Nevertheless, the Meta-UTAUT model has frequently been integrated with UTAUT and UTAUT2, and, to a lesser extent, with models such as TAM, TRA, and TPB. These integrations seek to address limitations within the Meta-UTAUT model and to provide a more comprehensive understanding of user behaviour by leveraging the complementary strengths of multiple theoretical perspectives. Integration of Meta-UTAUT with UTAUT2 or with other models, including TAM, TPB, and TRA, enhances its explanatory power, addresses theoretical limitations, and enables a more comprehensive understanding of technology usage behaviour, particularly in consumer contexts (Gunnoo et al., 2023; Kurniawan et al., 2023). Moreover, incorporating moderators such as age and experience, which are included in UTAUT and UTAUT2 but omitted in Meta-UTAUT, enhances the model's ability to capture contextual variation and addresses criticisms that Meta-UTAUT alone may inadequately reflect behavioural differences across demographic and experiential segments (Wu et al., 2024). In synthesis, these integrations suggest that while Meta-UTAUT offers flexibility and explanatory breadth, integrated frameworks are often necessary in specific contexts to provide richer, context-sensitive insights into technology adoption across diverse user populations.

Regarding research methodologies, the majority of studies employed a quantitative design through questionnaire surveys. Quantitative methods are primarily used to examine relationships between variables and analyze causal effects (Creswell & Creswell, 2018). Additionally, questionnaire surveys are widely used in quantitative research due to their cost-effectiveness and efficiency in gathering large datasets from diverse samples and locations (Ranganathan & Caduff, 2023). However, quantitative surveys do not capture the underlying reasons behind participants' responses and often lack the depth to explain why certain findings occur. Therefore, to address this limitation, future research could integrate qualitative methods, such as interviews, alongside quantitative surveys. This mixed-method approach would provide richer, more nuanced insights into user behaviour, enabling a more comprehensive understanding of the factors influencing technology adoption (Creswell & Creswell, 2018).

The primary analytical method employed in the reviewed studies was SEM for its effectiveness in modelling latent variables (Creswell & Creswell, 2018). Among the SEM approaches, PLS-SEM is the most frequently utilized approach. This growing preference for PLS-SEM in recent research is largely due to its superior ability to handle complex models, accommodate smaller sample sizes, and manage non-normal data distributions, which are limitations often associated with CB-SEM (Hair et al., 2018).

Our weight analysis revealed that six of the 12 internal relationships (ATT-UB, BI-UB, ATT-BI, FC-UB, PE-ATT, and EE-ATT) met the threshold established by Jeyaraj et al. (2006) and were thus classified as the strongest predictors. It has confirmed the central role of ATT in adopting and using technology, particularly during the early stages of the adoption process (Balakrishnan et al., 2022; Patil et al., 2020; Upadhyay et al., 2022). However, the results also underscore the need for further examination of the remaining variables to evaluate their potential to meet the criteria for inclusion in the strongest predictor category.

The diverse range of external variables examined across the reviewed studies indicates that most focus on their influence on attitude, behavioural intention, and behaviour. This aligns with the core purpose of the Meta-UTAUT model, which is designed to evaluate attitude, intention, and usage behaviour. Additionally, Williams et al. (2015) demonstrated that these individual constructs are frequently examined within UTAUT-based studies, further reinforcing their importance in predicting adoption outcomes. Notably, individual-type

external variables predominate (22 factors), underscoring that research has primarily focused on personal perceptions, psychological characteristics, and behavioural tendencies as key drivers of user acceptance. This emphasis aligns with the central premise of technology adoption theories, which highlight the critical role of individual cognition and affective factors in shaping behavioural intention (Venkatesh et al., 2003; Venkatesh et al., 2012). Trust and anxiety are among the most frequently examined external variables in Meta-UTAUT models, reflecting deep and fundamental issues rather than merely recurring variables. The prominence of trust stems from the pervasive perceived risks inherent in contemporary digital systems, including security, privacy, institutional, and financial risks (Gunnoo et al., 2023). Incorporating trust into Meta-UTAUT frameworks highlights users' need for assurance not only regarding a technology's functionality and usefulness but also its security, reliability, and overall integrity (Tamilmani et al., 2022). Thus, trust becomes a prerequisite for adoption, particularly as digital technologies such as e-wallets, AI assistants, smart home systems, mobile payments, and digital banking become deeply embedded in everyday life (Hakim et al., 2023). Conversely, rapid digitalisation has intensified emotional barriers alongside cognitive assessments, which explains the increased scholarly focus on anxiety as a critical determinant within Meta-UTAUT-based adoption studies. Engagement with new and emerging technologies often provokes emotional responses such as fear, tension, and negative perceptions, manifesting in concerns about data loss, system errors, or misuse (Venkatesh, 2000). These anxieties are heightened when users perceive limited control over technological processes, prompting them to view technological events as potential threats (Rana et al., 2016). Importantly, anxiety persists even among experienced users, as ongoing apprehension and fear continue to influence behavioural responses, ultimately increasing the likelihood of resistance or discontinuation of use (Patil et al., 2020), particularly in contexts where technology adoption is voluntary (Mayr et al., 2023).

The limitations acknowledged by the studies in our review mainly centre on issues related to data collection. Common concerns include reliance on specific populations, lack of longitudinal research, the frequent use of non-probability sampling methods, small sample sizes, limited use of mixed-method approaches, and insufficient focus on actual use behaviour. Although Dwivedi et al. (2019) did not empirically examine the mediating effect of attitude, they underscored its significance. Similarly, most studies have not tested this mediating relationship, which constrains a full understanding of how attitude operates within the Meta-UTAUT model. The absence of such testing limits insight into the causal pathways through which attitude influences behavioural intention and use behaviour, reducing the accuracy of recommendations for technology adoption strategies. These observations highlight significant opportunities for future research aimed at addressing these limitations, thereby contributing to more rigorous and robust studies.

6. Conclusions, Future Work, And Limitations

This study is the first systematic review to present a comprehensive analysis of 36 studies that have cited the original Meta-UTAUT model (Dwivedi et al., 2019) up to February 2025. The growing adoption of the Meta-UTAUT model in IS/IT research underscores its relevance for understanding technology adoption and user behaviour. Nevertheless, despite its extensive citation, relatively few studies have empirically implemented the model (Dwivedi et al., 2020). A thorough synthesis of how Meta-UTAUT has been operationalized across diverse contexts, its predictive capabilities, and the methodological and contextual challenges encountered is still lacking. This gap constrains a full appreciation of the model's practical applicability, theoretical rigor, and areas requiring further refinement. Accordingly, this study systematically examines the empirical applications of Meta-UTAUT, assesses its effectiveness in predicting user attitudes, behavioural intentions, and technology use, and highlights both methodological limitations and avenues for future research. The findings are organized into six principal categories: the geographical distribution of research, domains of application and types of systems investigated, theoretical frameworks adopted, methodological approaches employed, analysis of internal and external variables, and identification of key limitations.

Our analysis identifies several promising avenues for future inquiry, as well as areas that remain underexplored. Although the original Meta-UTAUT study has been cited 1881 times, only 36 studies have applied the model, indicating its limited adoption as a theoretical framework. This presents substantial opportunities for further development in the field. In particular, there is significant potential for researchers in unrepresented countries and various technologies to conduct original, contextually grounded studies that examine cultural and environmental influences on Meta-UTAUT applications. The model continues to be refined and adapted, offering avenues for future research to incorporate new variables, integrate complementary theoretical frameworks, and explore alternative relationships among its core constructs across various contexts.

The limitations commonly acknowledged in the existing literature highlight several promising avenues for future research. Addressing these gaps may require the use of more rigorous and diverse study designs,

such as examining actual system usage, adopting probability sampling methods, utilizing larger and more representative sample sizes, and conducting longitudinal investigations to capture changes over time. Additionally, integrating mixed-methods approaches, rather than relying solely on quantitative data, would further enrich understanding. Equally importantly, testing the mediating effect of attitude is vital to achieve complete and theoretically sound explanations of technology adoption.

This study has certain limitations that should be acknowledged. The literature search was restricted to studies that cited the original Meta-UTAUT article within the Scopus and Web of Science (WoS) databases. However, expanding to other databases or publications like book chapters or dissertations could significantly enhance the comprehensiveness and depth of future reviews.

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