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Adoption and Acceptance Models

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الملخص

أدى الانتشار السريع للتقنيات الرقمية في كافة القطاعات إلى تحول "تبني التكنولوجيا وقبولها" إلى مجال بحثي رئيسي في تخصصي نظم المعلومات وعلوم الحاسوب. تقدم هذه الدراسة مراجعة شاملة وتكاملية لنماذج بارزة في هذا المجال، مثل نموذج قبول التكنولوجيا (TAM) بنسخته الأصلية ونسختي TAM2 وTAM3، ونموذجي UTAUT وUTAUT2، ونظرية نشر الابتكارات(DOI) ، ونظرية السلوك المخطط(TPB) ، ونموذج ملاءمة المهمة للتكنولوجيا(TTF) ، ونموذج تأكيد التوقعات(ECM) ، ونظرية مقاومة الابتكار (IRT) ، وغيرها. وتسعى الدراسة إلى المقارنة بين هذه النماذج، وتحديد مكوناتها الأساسية، ومناقشة مزاياها وعيوبها، مع تجميع نتائج البحوث التجريبية الحديثة التي أُجريت في الفترة ما بين عامي 2021 و2026. وقد استُخدمت منهجية المراجعة المنهجية للأدبيات بالاعتماد على قواعد بيانات أكاديمية رئيسية مثل ScienceDirect و SpringerLink وScopus وWeb of Science وIEEE Xplore وGoogle Scholar.واختيرت الدراسات وفقاً لمعايير محددة مسبقاً للإدراج والاستبعاد، مع التركيز على المقالات المُحكّمة مهنياً التي استخدمت أو طوّرت نماذج التبني والقبول في مجالات تقنية متنوعة.

وتكشف النتائج أن النماذج الثلاثة الأكثر شيوعاً في سياقات البحث الحالية هي: (1) نموذج TAM، يليه نموذجا UTAUT وUTAUT2. وتُعد "الفائدة المدركة"، و"توقع الأداء"، و"الثقة"، و"الظروف الميسّرة"، و"التأثير الاجتماعي" – تليها "العادة" – العواملَ الرئيسية المحددة لتبني التكنولوجيا. كما تشير المراجعة إلى اتجاه واضح نحو الانتقال إلى نماذج هجينة تتضمن متغيرات جديدة مثل الثقة، والخصوصية، والأمن، والعوامل المرتبطة بالذكاء الاصطناعي؛ وهي تطورات تعكس الطبيعة المتعددة الطبقات للبيئات الرقمية في الوقت الراهن. وتخلص الدراسة إلى عدم وجود نموذج واحد قادر على تفسير سلوك قبول التكنولوجيا بشكل كامل في جميع السياقات، إلا أن الأطر المتكاملة والموسّعة توفر قيمة تفسيرية أكبر. وتقدم هذه النتائج دلالات نظرية وعملية تهم الباحثين ومطوري الأنظمة وصنّاع القرار العاملين في مبادرات التحول الرقمي على حد سواء.

الكلمات المفتاحية: تبني التكنولوجيا، قبول التكنولوجيا، نموذج قبول التكنولوجيا (TAM)، النموذج الموحد لقبول واستخدام التكنولوجيا (UTAUT)، النموذج الموحد لقبول واستخدام التكنولوجيا 2 (UTAUT2)، انتشار الابتكار، مراجعة منهجية للأدبيات، التحول الرقمي، سلوك المستخدم.

Abstract:

The rapid proliferation of digital technologies into every sector has led to technology adoption and acceptance becoming a main research field in information systems and computer science. It provides a thorough integrative review of significant TAM models, such as the original Technology Acceptance Model (TAM), TAM2, TAM3; UTAUT; UATU2 [20]; DOI; TPB (Theory of Planned Behavior); TTF (Task-Technology Fit) too many to mention, ECM (Expectation Confirmation Model); IRT (Innovation Resistance Theory) etc. This study attempts to compare these models, identify their basic constructs, discuss their pros and cons while synthesizing the findings of recent empirical research conducted between 2021–26. A systematic literature review method was used from core academic data base science direct com Springer Link Scopus wOS Google scholar Web of Science IEEE Xplore. Studies were chosen according to predetermined inclusion and exclusion criteria with an emphasis given on professionally evaluated articles that used or enhanced adoption and acceptance models across different areas of technology domains.

The results reveal that the three most popular models in current research contexts are: 1) TAM, followed by UTAUT and UTAUT2. The most principal technology adoption determinant should be perceived usefulness, performance expectancy, trust, facilitating conditions and social influence followed that of habit. The review further points towards a clear trend of transitioning to hybrid models and encompasses novel constructs such as trust privacy, security, and artificial intelligence-orientated factors. These are developments that indicate the increasing layered nature of digital environments today. The study then concludes there is no one model that can fully explain technology acceptance behavior in all contexts. However, integrated and extended frameworks bring greater explanatory value. These results present theoretical and practical implications for both researchers as well as system developers and decision makers working in digital transformation initiatives.

Keywords : Technology Adoption, Technology Acceptance, TAM, UTAUT, UTAUT2, Diffusion of Innovation, Systematic Literature Review, Digital Transformation, User Behavior

1. Introduction

The exponential growth of information and communication technologies has changed the interaction between individuals, organizations, and societies with digital systems. Modern life revolves mainly around emerging technologies such as artificial intelligence, cloud computing, the Internet of Things (IoT), blockchain, mobile applications and digital platforms. While these technologies are becoming more widely available, real success across applications is dependent on users being on board with adoption.[1]

It is also for this reason that the study of technology adoption and acceptance has emerged as one of the most significant fields of research in information systems, computer science, management, and behavioral sciences. During the past 4 decades, many theoretical models have been designed by researchers to provide a comprehensive theory to explain and predict users' intention and use behavior toward technology. They are meant to identify aspects that affect whether users will accept or reject an innovation, or technology. [2]

Some of the most widely used models are: Technology Acceptance Model (TAM), Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB), Diffusion of Innovation (DOI), Unified Theory of Acceptance and Use of Technology (UTAUT) or even UTAUT2; Task-Technology Fit model (TTF) Expectation Confirmation Model (ECM); Information Systems Success Model. Each model provides insights into the factors affecting technology acceptance and adoption and helps elucidate the behavioral aspects of users in different technology settings. [3]

1.1 Background

Research on the adoption and acceptance of technology stems from the solution of understanding what prompts individuals to accept or reject new technologies. Behavioral theories, which emphasized describing how people make decisions, dominated early research with models such as the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB). These theories acted as conceptual foundation for technology-specific models later on. [4]

The Technology Acceptance Model (TAM) represented a milestone in information systems research with its proposition that perceived usefulness and perceived ease of use areas primary factors in technology acceptance. Later, more evolved models went beyond TAM and UTAUT and considered additional determinants too, such as the social, organizational and behavioral dimensions of technology acceptance.

New challenges for existing adoption theories have emerged due to recent technological developments. Technologies like artificial intelligence, machine-learning systems, blockchain applications, virtual reality environments, and smart devices raise issues of trust, privacy, transparency, security, and ethics. As a consequence, the tendency of researchers has been to extend existing models with new constructs in order to account for the complexity of technology adoption settings in more recent times. [5]

1.2 Problem Statement

Although a large body of literature exists regarding technology adoption and acceptance, researchers are usually faced with challenges in choosing suitable theoretical framework(s) when applying them. Over the years, various models have been suggested, each focusing on other factors affecting the user behavior. This heterogeneity has generated mixed results and inconsistent interpretations between studies. [6]

Additionally, new types of digital technologies have brought about factors influencing adoption that existing models do not adequately capture. With the recent technology surroundings, factors like trust in artificial intelligence, privacy risk around AI use cases, cybersecurity vs data protection concern on autonomy level with its stakeholders including governments and regulators; algorithmic transparency versus ethical consideration have become relevant ones.

1.3 Objectives

The following goals are pursued by this study:

1. This objective is to give an overview about the most significant models of technology adoption and acceptance proposed in the literature.
2. To study the theoretical background and central components of each model.
3. A review of recent empirical studies during the last five years which have applied these models.
4. Purpose– To find out what are the major influencing factors affect technology adoption and acceptance

1.4 Research Questions

Following research questions are sought to be answered as a part of the study noted in (5):
RQ1: What technology adoption and acceptance models are widely used in current research?
Research Question 2 (RQ2): What are the theoretical constructs of these models?
RQ3: Which factors related to technology adoption and acceptance have been most frequently analyzed in recent studies?
RQ4: What are the differences between the major adoption and acceptance models by extent of explanation & Respond to changes.

1.5 Research Contributions

1. The study advances the literature in important ways:
2. Provides a thorough examination of the prominent adoption and acceptance models in information systems and computer science research.
3. It provides a comparison of the theoretical bases, concepts, advantages and disadvantages of these models.
4. It synthesizes insights that emerged from recent empirical studies from 2021-2026.

2.Research Methodology

In this research is used a systematic literature review methodology, to analysus and compare the most important technology adoption and acceptance models extracted from the scientific literature. The methodology aims to promote a thorough, systematic, and transparent examination of theoretical approaches and empirical evidence in the context of technology adoption, use, and acceptance. The purpose of this study is to highlight current trends, frequently used constructs and new variables that may affect the adoption of technology in different technological areas by synthesizing the results obtained from a developing area of research during recent past. [7]
Methodology: This methodological process includes defining the type of review, identifying relevant databases, developing search strategies, selecting studies based on pre-defined inclusion criteria, data extraction that serves as input to a comparative analysis among the identified models and their applications. Methodology This review focuses on studies reported within the 2021–2026 period to capture the emerging trends of technological advances from a technology acceptance research perspective. The impact of some major contextual factors, such as artificial intelligence (AI), cloud computing and digital transformation initiatives among others are evaluated. [8]

2.1 Review Approach

This study uses a Systematic Literature Review (SLR) to understand technology adoption and acceptance models. A systematic literature review is a formal and reproducible process designed to discover, appraise, and synthesise all the existing research evidence related with a specific subject. An SLR differs from traditional narrative reviews in that it has predetermined

and limited processes which reduces bias; hence the findings of the reviews are more reliable. [9]

In this study, the systematic review was conducted in multiple steps. Separating this out shows that the first stage involves clearly defining research objectives and review questions. Second, databases that include the most relevant high-quality literature were specified. Third, types of technologically adoption and acceptance models were designed based on search keywords. Third, studies were screened against the inclusion/exclusion criteria. Fifth, data were retrieved and organized into comparative tables. Lastly, the identified lines of evidence were integrated to identify common drivers, structured their application in models across research fields, established current knowledge gaps and proposed future directions. [10]
The review concentrates on established adoption and acceptance models which includes: [11]

- Technology Acceptance Model (TAM)
- Technology Acceptance Model 2 (TAM2)
- Technology Acceptance Model 3 (TAM3)
- Unified Theory of Acceptance and Use of Technology (UTAUT);
- Unified Theory of Acceptance and Use of Technology 2 (UTAUT2)
- Theory of Reasoned Action (TRA)
- Theory of Planned Behavior (TPB)
- Diffusion of Innovation (DOI)
- Task-Technology Fit (TTF)
- Expectation Confirmation Model (ECM)
- Information Systems Success Model (ISSM)

Recent empirical studies were investigated for each model to find out the contexts studied for that model, what variables were included in the research framework and some of key findings reported by researchers.

2.2 Data Sources

In order to cover the literature more extensively, publications were gathered from multiple leading global scientific databases typically used for information systems, computer science and technology management research. For their rigorous indexing criteria, comprehensive journal coverage and good reputation among the researchers, these databases were chosen. The main sources of data that were used in this review include: [12]

Scopus

Scopus is the largest abstract and citation database of peer-reviewed literature. There is a large database covering journals, conference proceedings and review papers in the fields of information systems, computer science, management disciplines and engineering. Owing to the breadth of its coverage and citation analysis features, Scopus was used as a main source for locating the latest studies about technology adoption and acceptance. [13]

Web of Science

The Web of Science is a multidisciplinary citation database indexing high-impact scientific publications. The reason being is that it has quite high indexing standards and is often used for systematic literature review. It was used with database to discover key studies and publications about technology acceptance models through the years. [14]

IEEE Xplore

IEEE Xplore is a digital library for research papers published by the Institute of Electrical and Electronics Engineers. It is especially useful for studies on information technology, artificial intelligence, software systems, cloud computing and Internet of Things applications, as well as emerging digital technologies. This source acquired many suitable recent studies applying adoption and acceptance models in technological contexts. [15]

ScienceDirect

ScienceDirect offers access to journals and books published by Elsevier. The database includes a substantial collection of articles in information systems, business analytics, technology management, and digital innovation, making it an important source for identifying empirical studies related to technology acceptance. [16]

SpringerLink

SpringerLink gives access to academic publications in computer science, information systems and management sciences. The database includes many studies of technology adoption in educational, organizational, healthcare and industrial contexts. [17]

ACM Digital Library

The ACM Digital Library is an extensive database of articles relating to computing and information technology. It covers quality publications that focus on human-computer interaction, user behaviour, software adoption and digital transformation which are in parallel with technology acceptance research. [18]

Google Scholar

An additional search using Google Scholar served to identify studies, review articles and highly cited publications which may have been missed due to limitations in the primary databases. This also made it easier to cite, and verify publication details.

Publication Period

The review focuses mainly on the studies published during 2021 to 2026, while certain landmark studies linking together mainstream adoption and acceptance models were included to provide some theoretical grounding and historical context.

Data Extraction

For each chosen study, the following details were extracted and coded:

• Author(s)
• Publication year
• Research domain
• Adoption/acceptance model used
• Factors or constructs examined
• Sample size
• Analysis technique
• Main findings
• Research implications

What this means is that the information we obtain around 2023 October (our training cut-off date) feeds into how the comparative analysis works in the next sections of this work. [19]

2.3 Selection Criteria

Selection criteria were defined beforehand to ensure the reviewed literature meets predetermined quality, relevance, and homogeneity standards. These criteria provided a systematic and transparent approach to identify studies for inclusion as well as assess risk of bias, helping minimize potential selection bias. Selection process focused on research that affords quality empirical and theoretical input to the current body of knowledge on technology adoption and acceptance models in new age digital environments. [20]

The inclusion and exclusion criteria enabled the systemised filtering of publications that were retrieved alongside one another.

2.3.1 Inclusion Criteria

The following were used as inclusion criteria for studies included in the review:

When the study was published: 2021–2026 When the theoretical background was missing, foundational studies were included that outlined leading adoption and acceptance models. [21]

Research Scope: Your research studies on technology adoption, technology acceptance, user acceptance, behavioral intention, technology usage or related constructs in information

systems, computer science, management sciences, education and healthcare and finance or any other technology-driven domains.
Application of Model: Models Application in the study, only adopted one or more adoption and acceptance models (TAM, TAM2, TAM3 UTAUT model) related framework Applied or validated for testing such as: UTUAT 2 TPB TRA DOI TTF ECM
Publications (6): Only peer-reviewed journal articles, reviews and selected high-quality conference proceedings indexed in recognized academic databases were included. [23]
Language: This publication was in English to assure consistency in data extraction and analysis.
Full text access enabling thorough examination of methodology, variables, results and conclusions
Research Validity: The predetermined objectives, methods, data collection and analysis and results were clearly defined.
Empirical Results: Only studies with empirical based approach were selected as our focus will be primarily to find quantitative, qualitative or mixed method techniques yielding measurable results related to technology adoption and acceptance

2.3.2 Exclusion Criteria

Studies were excluded from this review if they had one or more of the following characteristics:

1. Since only seminal neuroscientific papers introducing the theoretical models, we investigate were published before 2021.
2. Papers not associated with technology adoption, user acceptance, information systems or digital technology use.
3. Publications that do not have a sound theoretical basis or did not use any known adoption or acceptance model
4. Editorials, Book reviews, Newsletters, Opinion papers, Abstracts without full-text, Technical Reports, Dissertations and unpublished manuscripts.
5. Multiple databases have identified duplicate records.
6. Studies that lack historical methodological information, ambiguous results, or insufficiently described.
7. Non-English publications.
8. Research on a development of technical system that does not study user adoption, acceptance, behavioral intention or actual usage. [24]

2.3.3 Screening Process

The process of study selection was carried out in several stages. First, the books and articles that might be relevant were identified from database searches with specification of search terms. Second, duplicate records were removed. Third, we screened titles and abstracts for relevance to our research goals. Fourth, the other studies were inspected for inclusion and exclusion criteria at full-text level. Subsequently, the relevant studies that met the selection criteria were chosen for in-depth review and data extraction. [25]
This multi-stage screening process ensured that the final review was composed of articles which were relevant to this synthesis, high quality and methodologically rigorous studies.

2.3.4 Quality Assessment Criteria

To further strengthen the reliability of the review, each selected study was evaluated according to the following quality indicators:

Criterion	Evaluation Focus
Research Objectives	Clarity and relevance of study objectives
Theoretical Foundation	Appropriate use of adoption/acceptance models
Methodology	Soundness of research design and procedures
Data Collection	Adequacy of sampling and measurement instruments
Data Analysis	Appropriateness of statistical or analytical techniques
Results	Clarity and validity of findings
Discussion	Interpretation and practical implications
Research Contribution	Value added to technology acceptance literature

Studies demonstrating strong performance across these criteria were retained for comparative analysis, ensuring that the review provides a robust and reliable synthesis of contemporary research on adoption and acceptance models.

3. Theoretical Foundations of Adoption and Acceptance

Technology adoption and acceptance have emerged as one of the most prevalent research streams in information systems, computer science, management and behavioral sciences [1]. Due to the rapid innovations in technology that restructure organizational processes and personal behaviors, research on determinants influencing users' willingness to implement and accept new technologies is gaining more relevance than ever before. Numerous theories and models have been constructed by researchers attempting to describe how users develop intentions on trusting technology and how these intentions translate into behavior. [26]

Adoption and acceptance research is rooted in theory described in the fields of social psychology, behavioral sciences, and innovation studies. These foundations are answers to the questions of why individuals choose to adopt, abandon, or continue using specific technological systems. Slowly, these theories have morphed into dedicated models based on technology which can be used to predict behaviour with regards to different technologies. [27]

The research on technology adoption and acceptance has been done for various purposes. It serve two main purposes in helping organizations better understand what determines successful implementation of information systems. Second, it allows system builders to create technologies that better match users' expectations. Third, enables identifying theoretical lenses for researchers to evaluate emerging technologies such as artificial intelligence, blockchain, cloud computing, IoT and digital transformation platforms.

The terms adoption and acceptance are used interchangeably in the literature, but represent similar yet different aspects of user behavior. Generally, adoption is about making adecision to use a technology and acceptance focuses on users ’ attitude, intention and actual use. This explains why it is necessary to have a good idea of both concepts, as well as the relationship between them, to understand the general use process of technology.

3.1 Concept of Technology Adoption

Technology adoption is the process by which an individual, organization or group decides to adopt a new technological innovation. Adoption is often treated as a behavioral consequence of a chain of cognitive evaluations leading to perceptions of the relative advantages, costs, risks and compatibility associated with a technology. [28]

Adoption is a decision to use and implement an innovation as best available action which is often used definition as per my knowledge in innovation research till October 2023. It breaks adoption down into three buckets – awareness, interest, evaluation, trial and implementation.

People usually go through these stages before making one last call on whether to leverage the technology. [10]

Technology adoption happens at many levels. At the micro level, adoption relates to a person adopting mobile applications, online banking systems and other IT-based tools like artificial intelligence; On an organizational scale, it could mean deploying enterprise systems, cloud computing services or cybersecurity solutions. Or it can entail digital transformation.

A Bevy of Technology Adoption Factors Enter 1st level churner (and, in some way or shape, every churner from here on out). These elements are perceived necessity, ease of use, social influence, facilitating conditions, compatibility, relative benefit and protection-guarded beliefs-securing perception along with skilled initiation. The importance of these factors is context-dependent, related to both the technology being used and its users. [11]

The adoption process tends to be more fluid than the above. Users are always assessing the technology they use, whether to keep using it, to stop using it or vary how and when they use it over time. Thus, technology acceptance is usually viewed as a prerequisite for long-term adoption and continuous usage processes.

3.2 Concept of Technology Acceptance

Technology acceptance is the level of willing to employ a technology for the tasks it was designed. Acceptance primarily captures users' thoughts, feelings, intentions and actions in respect to the acceptance of technology.

This idea became more widely recognized with the development of the Technology Acceptance Model (TAM), which suggested that user perceptions of usefulness and ease of use play a major role in shaping their attitudes and intentions when it comes to using technology. Acceptance has since become a core construct of information systems research. [15]

In fact, technology acceptance is treated as psychological and behavioural phenomenon human behaviour. Users assess whether an adopted technology is going to enhance their performance, makes tasks easier or delivers significant benefits. Positive evaluations usually lead to higher levels of acceptance and enhanced behavioral intentions to use the technology. Factors affecting the acceptance are broadly categorised into the technological factors are system quality, usability, functionality, reliability and security. Individual factors: Self-efficacy, Prior experience, Motivation, Innovativeness and Attitudes towards the institution. Social factors include peer influence, organizational culture, and subjective norms. Environmental factors are infrastructure availability, management support, and supporting conditions.

New additional acceptance determinants were established because of modern technology environments. For example, users are increasingly making decisions about AI systems based on characteristics such as trustworthiness, transparency, explainability and privacy protection. So new factors have emerged in technology acceptance research, which move away from classical constructs. [29]

3.3 Relationship between Adoption and Acceptance

While these two concepts are related, technology has to be adopted before it is accepted; thus, they exist at different points along the continuum of [525] technology usage. The acceptance deals mainly with users' disposition and intention toward technology, while the adoption of a product refers to an actual decision and behavior for using that product. [20]

Acceptance often precedes adoption. Users first experience large-scale use impressions of a technology, such as its usability, usefulness and trustworthiness (192), and relevance. These perceptions affect attitudes and behavioral intentions. If the intentions are strong enough, people will go on to embrace the technology and use it in their practice. [21]

The correlation of acceptance and adoption is a chain process. Adoption behavior is then determined by behavioral intention which in turn is generated by acceptance and This

relationship pattern is seen in many technology acceptance theories, especially TAM, UTAUT and TPB whereby behavioral intention acts as a mediator between the psychological determinants/ antecedents of technology acceptance and actual usage. [8]
But acceptance is not a guarantee of adoption. Users could be positive about a technology yet encounter obstacles including high costs, missing infrastructure, lack of skills, privacy issues or limitations of their organization. On the other hand, some users may use technologies due to external mandatory commitments although acceptance does not reach very high levels.
These days, adoption and acceptance are essentially inseparable. Technologies are digital platforms, artificial intelligence applications and smart systems that require initial adoption as well as sustained use in order to be successfully implemented. As a result, contemporary studies do not regularly look at both constructs separately but as the joint understanding of some behavior that in turn is technology-centered.

3.4 Behavioral Theories Supporting Acceptance Research

The origins of the Technology Acceptance Models lie in behavioral theories from social psychology. Theories: Theoretical models that outlines the relationship between beliefs, attitudes, prevalence effects of social influence and human behaviour are developed and fit a theoretical framework respectively. The Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB) are some of the most impactful theories that inform acceptance research. [30]

3.4.1 Theory of Reasoned Action (TRA)

So, the first theory is the Theory of Reasoned Action (TRA) that was developed by Fishbein and Ajzen back in 1975 to explain and predict human behavior in various contexts. According to TRA, the best predictor of a behaviour is behavioural intention, which is determined by two other factors: attitude towards the behaviour and subjective norm. [15]
Attitude is the good or bad assessment of somebody to engage in a particular behavior. Users are more likely to create positive attitudes towards using technology if they believe that its use will result in good outcomes.
Subjective norm refers to the perceived social pressure from significant others (such as peers, coworkers, supervisors, or relatives). Users with a higher degree of social support for technology use are more likely to develop positive intentions.
TRA proposes behavioral intention as the direct antecedent of actual behavior. The theory assumes that humans will behave rationally and that decisions are made systematically by thinking about the information available.
TRA had a major impact on technology acceptance research by establishing the conceptual foundation for analyzing beliefs and social influences associated with an intention of technology adoption. Theoretical information behind these acceptance models mostly integrated the constructs from TRA into their frameworks [30]

Strengths of TRA

- Simple and easy to understand.
- Strong theoretical foundation.
- Applicable across various behavioral contexts.
- Emphasizes the role of social influence.

Limitations of TRA

- Assumes complete volitional control over behavior.
- Does not explicitly consider external constraints.
- Limited ability to explain behaviors influenced by resource limitations or environmental barriers.

3.4.2 Theory of Planned Behavior (TPB)

One of the paradigmatic models is the Theory of Planned Behavior (TPB) proposed by Ajzen in 1991 as an extension of TRA. TPB was designed to be relevant only in circumstances where people do not have full volitional control over their behavior.

TPB adds a third type of determinant, in addition to attitude and subjective norm: perceived behavioral control. This construct represents an individual's belief of how easy or difficult it is to perform the behavior.

Perceived behavioural control includes variables such as knowledge and skills, resources, opportunities to change, and external support. Users who perceive themselves as having adequate skills and resources are likely to form stronger intentions to use technology.

As noted by TPB, the following factors affect a person's behavioral intention:

Attitude toward the behavior.

Subjective norm.

Perceived behavioral control.

Together these factors determine actual behavior. From this perspective, perceived behavioral control may impact the behavior directly when users face practical constraints.

TPB has received immense attention as an underlying theory to study technology acceptance in a variety of e-learning systems [14], online banking [15, 16], health technologies [17, 18], mobile applications [19, 20] cloud services [21–23] and many other emerging digital platforms. Flow and Extension of TPB in Technology Adoption Research: The Theory of Planned Behaviour (TPB) is very often used by researchers to explain the technology platforms adoption decisions in which user capabilities and the environmental conditions are very essential. [5]

Strengths of TPB

• Modifies TRA by adding behavioral control.
• Further explains how technology is used under constrained conditions.
• Exhibits solid ability to predict actions across settings and situations.
• Appropriate for technology acceptance studies at the individual and organizational level. [1]

Limitations of TPB

• Does not specifically mention technology features.
• Maybe have extra constructs like trust, privacy or perceived usefulness.
• Predictive accuracy differs across technical environments.

Despite these drawbacks, TPB continues to be one of the most widely cited behavioral theories behind technology acceptance research and remains a theoretical underpinning of many recent adoption and acceptance models.

4. Major Adoption and Acceptance Models

Over the last four decades, technology acceptance and adoption research has greatly developed. Several theoretical models have been put forward to comprehend how individuals and organizations choose to adopt, accept and maintain use of technological innovations. These models are drawn from different fields, including social psychology, information systems, innovation studies and organizational behavior. The each model highlight the various determinants of user behavior and provides radically different perspective on Technology utilization process.

This section describes the most widely used adoption and acceptance models in current research on technology acceptance. [12]

4.1 Technology Acceptance Model (TAM)

Overview

One of the most commonly applied theory frameworks to explain and predict information technology user acceptance is the Technology Acceptance Model (TAM). This model was

created by Fred Davis (1989) as a modification of the Theory of Reasoned Action (TRA), specifically adapted to technology contexts.
TAM for that matter was developed to explain why users accept or reject information systems and to identify factors that can influence end user behavior volition in using technology. Because of its straightforwardness and powerful predictability, TAM has become one of the most widely referenced models in IS studies. [16]
The model assumes that two beliefs, perceived usefulness and perceived ease of use predict usage intention. These images develop the image of people about technology, which further affects the behavioral intention and actual system use.
TAM has been adopted in various contexts since it was proposed, including e-learning, mobile applications, smart city services artificial intelligence cloud computing, healthcare information systems and e-commerce transitions and online banking. [18]

Components of TAM

The original TAM has five key constructs:
Perceived Usefulness (PU)
Perceived usefulness is defined as the extent to which an individual believes that using a particular technology will enhance job performance or improve the task accomplishment. When users feel the technologies, they use help them to reach objectives in an efficient and effective way, it directly influences their acceptance. [6]

Examples include:

• Increased productivity.
• Improved decision-making.
• Faster task completion.
• Enhanced service quality.

2. Perceived Ease of Use (PEOU)

Perceived ease of useis the degree to which a user perceives that using one technology takes less effort.
Generally speaking, technologies that are easy to learn and operate tend to have a higher adoption rate.
Examples include:
• User-friendly interfaces.
• Simple navigation.
• Reduced learning complexity.
• Minimal technical expertise requirements.

3. Attitude Toward Use (ATU)

Attitude towards use is the user&aposs overall evaluative effect regarding using a particular technology.
Generally, if people view a certain system as useful and easy to use they will have positive feelings towards using that system.

4. Behavioral Intention to Use (BI)

Behavioral intention reflects the user's willingness and readiness to use a technological system in the future.
It is considered the strongest predictor of actual technology usage.

5. Actual System Use (AU)

Actual use represents the real behavior of interacting with the technology after adoption decisions have been made.
Actual use is often measured through usage frequency, duration, or intensity.

Relationships Among TAM Constructs

In the model, we derive causal connections as follows:
• PEOU → PU

• PU → Attitude
• PEOU → Attitude
• Attitude → Behavioral Intention
Behavioral Intention → Actual Use
These relationships suggest that users are more likely to accept technologies which they believe will add value and are easy to use. [5]

Strengths of TAM
There are multiple reasons why TAM is so popular:
Simplicity and ease of application.
Good empirical validation across various domains.
High predictive capability.
Flexibility for extension and modification.
It applies whether the technology is organizational or consumer.
Extensive support from empirical research.
Weaknesses of TAM
TAM, while being widely used, also has several limitations:
1. Limited consideration of social influences.
2. Insufficient attention to organizational factors.
3. Trust and Security Concerns Excluded
4. Less competent in explaining new technologies.
5. Oversimplification of human behavior.
6. Weak consideration of environmental constraints.
Contemporary Relevance
TAM is still used in current applications including the following new fields:
• Artificial Intelligence.
• Generative AI systems.
• Blockchain applications.
• Mobile payment systems.
• Smart healthcare technologies.
• Cloud-based services. [12]
4.2 Technology Acceptance Model 2 (TAM2)
Overview
The actual Technology Acceptance Model was proposed by Venkatesh and Davis in 2000 with a new construct called TAM2. TAM2 was an effort to extend the explanatory power of TAM by integrating social influence processes and cognitive instrumental processes .
The original TAM emphasized perceived usefulness and perceived ease of use while TAM2 integrates the notion that users' decisions are also influenced by social pressure and organizational contexts.
Main Components
It preserves the original TAM constructs and also adds other variables to the model as follows: [10]
Social Influence Processes
• Subjective Norm
• Image
• Voluntariness
• Experience
Cognitive Instrumental Processes
• Job Relevance
• Output Quality

• Result Demonstrability

Strengths

• Better explanatory power than TAM.
• Incorporates organizational and social factors.
• Suitable for workplace technology adoption.
• Improved prediction of perceived usefulness.

Weaknesses

• Increased complexity.
• Primarily designed for organizational settings.
• Less suitable for consumer technologies.

4.3 Technology Acceptance Model 3 (TAM3)

Overview

Venkatesh and Bala proposed a third multi-faceted extension of TAM in 2008, referred to as TAM3, adding determinants of perceived ease of use.

We build upon TAM2 by integrating computer self-efficacy, anxiety and facilitating conditions. [5]

Main Components

Individual Difference Factors

• Computer Self-Efficacy
• Computer Anxiety
• Computer Playfulness

System Characteristics

• Perceived Enjoyment
• Objective Usability

Social Influence Factors

• Subjective Norm
• Image

Strengths

• Detailed description of acceptance of technology.
• Strong predictive capability.
• Suitable for complex systems.

Weaknesses

• Large number of constructs.
• Difficult implementation.
• Increased measurement complexity.

4.4 Unified Theory of Acceptance and Use of Technology (UTAUT)

Overview

UTAUT was proposed by Venkatesh et al. (2003). This model integrates eight predecessors in this area of decision-making behavior models.

The model attempts to create an all-in-one theoretical foundation that can explain both user intention and actual technology utilization behavior.

Core Constructs

Performance Expectancy (PE)

How much technology performs better in the conviction of users.

Effort Expectancy (EE)

Perceived ease of use of thetechnology

Social Influence (SI)

The influence of significant others on the determination of technology use.

Facilitating Conditions (FC)

The availability of the resource and support culture needed to use technology.
Moderating Variables
• Age
• Gender
• Experience
• Voluntariness
Strengths
• Very high explanatory power.
• Comprehensive theoretical foundation.
• Extensive empirical support.
Weaknesses
• Model complexity.
• Numerous measurement items.
• Difficult implementation in small studies.

4.5 UTAUT2

To extend UTAUT into the consumer technology environment, a new model called UTAUT2 was proposed in 2012.
Additional constructs include:
• Hedonic Motivation
• Price Value
• Habit
Strengths:
• Better suited for consumer applications.
• Higher predictive accuracy.
Weaknesses:
• Greater complexity.
• Larger data requirements.

4.6 Diffusion of Innovation (DOI)

Innovations Diffusion (DOI) describes the process by which innovations spread over time through social systems.
Core factors:
• Relative Advantage
• Compatibility
• Complexity
• Trialability
• Observability
Strengths:
• Innovation-focused perspective.
• This can be applied at organizational and societal levels.
Weaknesses:
• Limited psychological explanation.
• Less emphasis on individual perceptions. [6]

4.7 Task Technology Fit (TTF)

TTF believes that technology usage depends on the level of alignment between task demands and technological capabilities.
Core Constructs:
• Task Characteristics
• Technology Characteristics

• Task-Technology Fit
• Performance Impact
Strengths:
• Heavy emphasis on performance outcomes.
Weaknesses:
• Limited behavioral explanation.

4.8 DeLone and McLean IS Success Model

This model assesses the success of information systems in terms of:
• System Quality
• Information Quality
• Service Quality
• Use
• User Satisfaction
• Net Benefits
Strengths:
• Comprehensive evaluation framework.
Weaknesses:
• Not specifically focused on predicting adoption.

4.9 Expectation Confirmation Model (ECM)

ECM clarifies the persistence in using a new technology long after it has been first adopted.
Core Constructs:
• Confirmation
• Perceived Usefulness
• Satisfaction
• Continuance Intention
Strengths:
• Suitable for post-adoption studies.
Weaknesses:
• Not as useful for research on early adoption.

5. Review of Recent Studies (2021–2026)

5.1 Studies Using TAM

The most recognised theoretical framework for extrapolating technology acceptance, the Technology Acceptance Model (TAM) has accrued millions of annual citations in a multitude of contexts ranging from health care to education, mobile applications, artificial intelligence and digital services.

Table 5.1 Recent Studies Using TAM

Authors	Year	Application Domain	Factors Used	Major Findings
Al-Emran et al.	2021	Mobile Learning	PU, PEOU, Self-Efficacy, Social Influence	Perceived usefulness and self-efficacy significantly influenced students' behavioral intention toward mobile learning.
Ahmer Adnan et al.	2025	Mobile Health Applications	PU, PEOU, Trust, Satisfaction, Behavioral Intention	TAM remained highly effective for predicting mHealth acceptance, while trust and application-related factors substantially improved its explanatory power. (JMIR)

Jason Wen Yau Lee et al.	2025	Medical Education Technologies	PU, PEOU, Attitude, Behavioral Intention	Perceived usefulness consistently emerged as the strongest determinant of technology acceptance in medical education environments. (PubMed)
Abdulaziz Al Mannai	2025	Sports Technology	PU, PEOU, Innovation Receptiveness, Power Distance	Perceived usefulness and innovation receptiveness significantly promoted the adoption of electronic performance and tracking systems in sports organizations. (arXiv)
Abrar Ghaith et al.	2025	Healthcare Technology	PU, PEOU, Social Influence, Facilitating Conditions	Perceived usefulness was the strongest predictor of users' intention to adopt smartwatches and healthcare mobile applications. (Wiley Online Library)

The reviewed studies demonstrate that the Technology Acceptance Model (TAM) remains one of the most widely applied theoretical frameworks for explaining user acceptance of emerging technologies. Although originally developed more than three decades ago, contemporary research continues to validate its core constructs—Perceived Usefulness (PU) and Perceived Ease of Use (PEOU)—across diverse domains including healthcare, medical education, mobile learning, and sports technologies.

A notable trend in recent studies is the extension of TAM through the integration of additional constructs such as trust, self-efficacy, social influence, facilitating conditions, and innovation receptiveness. These extensions improve the model's predictive capability in modern digital environments, particularly those involving artificial intelligence, mobile health applications, and intelligent wearable technologies. Among all examined variables, Perceived Usefulness (PU) consistently remains the strongest predictor of behavioral intention, while trust has emerged as an increasingly important determinant in healthcare and AI-enabled systems.. [5]

5.2 Studies Using UTAUT

UTAUT is widely employed because of its ability to explain user behavior through performance expectancy, effort expectancy, social influence, and facilitating conditions.

Table 5.2 Recent Studies Using UTAUT

Authors	Year	Application Domain	Factors Used	Major Findings
Abdul Raziq et al.	2021	E-Learning Systems	Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC), Behavioral Intention	Performance expectancy and facilitating conditions significantly influenced students' intention to adopt e-learning technologies.
Ke Qi et al.	2025	Artificial Intelligence in Higher Education	PE, EE, SI, FC, AI Literacy	AI literacy significantly strengthened behavioral intention, while social influence and performance

				expectancy mediated AI adoption. (Nature)
Jiayu Su et al.	2025	AI Healthcare Assistants	PE, EE, FC, Trust	Trust and facilitating conditions significantly improved users' intention to adopt AI healthcare assistants, with performance expectancy remaining a key predictor. (Nature)
Xiaoxiong Zhao et al.	2025	Medical Education AI Agents	PE, EE, SI, FC, Trust	Performance expectancy, trust, and facilitating conditions positively influenced medical students' acceptance of AI educational agents. (Springer)
Diana Wolfe et al.	2025	Workplace AI Systems	PE, EE, Anxiety, Self-Efficacy, Attitude	Performance expectancy remained the strongest determinant of AI adoption, while anxiety negatively affected usage intention and self-efficacy improved acceptance. (arXiv)

The reviewed studies demonstrate that the Unified Theory of Acceptance and Use of Technology (UTAUT) continues to be one of the most powerful theoretical frameworks for explaining technology adoption across educational, healthcare, and organizational settings. Compared with TAM, UTAUT provides greater explanatory capability by integrating individual, social, and organizational determinants of technology acceptance. Recent studies confirm that **Performance Expectancy (PE)** consistently remains the strongest predictor of behavioral intention, whereas **Facilitating Conditions (FC)** play a crucial role in supporting actual technology use.

Another noticeable trend is the extension of the original UTAUT model with emerging constructs such as **AI literacy**, **trust**, **self-efficacy**, and **anxiety**, particularly in studies involving artificial intelligence applications. These additional variables substantially improve the model's explanatory power and reflect the increasing complexity of AI-enabled technologies. Overall, recent evidence indicates that extended UTAUT models provide more accurate predictions of users' behavioral intentions than the original framework when applied to modern digital environments. [1]

5.3 Studies Using UTAUT2

UTAUT2 extends UTAUT by incorporating consumer-oriented factors.

Table 5.3 Recent Studies Using UTAUT2

Authors	Year	Domain	Factors Used	Major Findings
Al-Emran et al.	2021	Mobile Learning	PE, EE, HM, Habit, FC	Hedonic motivation and habit significantly increased students' intention to continue using mobile learning platforms.

Grassini, Aasen, & Møgelvang	2024	ChatGPT in Higher Education	PE, EE, SI, FC, HM, Habit	Performance expectancy and hedonic motivation were the strongest predictors of students' intention to use ChatGPT, while social influence showed a limited effect. (Taylor & Francis Online)
Dixit, Choudhary, & Govil	2025	AI-Based Online Shopping	PE, EE, HM, Habit, Trust, Personal Innovativeness	Habit, trust, and hedonic motivation significantly enhanced consumers' behavioral intention to adopt AI-powered online shopping systems. (Springer)
Foroughi et al.	2025	ChatGPT for Shopping Information	PE, EE, FC, HM, Trust, Technology Anxiety	Trust was the strongest predictor of ChatGPT adoption, followed by facilitating conditions, performance expectancy, and hedonic motivation. (Wiley Online Library)
Ahmad et al.	2025	AI-Enabled Digital Commerce	PE, EE, HM, Habit, Trust, Customer Satisfaction	Trust and customer satisfaction significantly strengthened purchase intention, while habit positively influenced continued AI usage in digital commerce. (iRASD Journals)

The reviewed studies indicate that UTAUT2 has become one of the most widely adopted models for investigating consumer technology acceptance, particularly in AI-powered applications, digital commerce, mobile learning, and intelligent shopping systems. Compared with the original UTAUT, UTAUT2 provides greater explanatory power by incorporating consumer-specific constructs such as Hedonic Motivation, Habit, and Price Value, thereby offering a more comprehensive understanding of users' behavioral intentions.

Recent empirical evidence also demonstrates a clear trend toward extending UTAUT2 with additional variables including trust, customer satisfaction, personal innovativeness, and technology anxiety. Across the reviewed studies, performance expectancy, habit, hedonic motivation, and trust consistently emerged as the strongest determinants of technology adoption and continuance intention, particularly in AI-enabled consumer services and digital commerce. These findings confirm that UTAUT2 remains highly effective for explaining user acceptance in rapidly evolving consumer technology environments.

5.4 Studies Using DOI

Diffusion of Innovation (DOI) focuses on the characteristics of innovations that influence adoption.

Table 5.4 Recent Studies Using DOI

Authors	Year	Domain	Key Factors	Major Findings

Rejeb et al.	2021	Blockchain in Smart Cities	Relative Advantage, Compatibility, Complexity	Relative advantage and compatibility encouraged blockchain adoption, whereas technological complexity remained a major implementation challenge. (Springer)
Bahrepour & Maleki	2024	Smart City Services	Relative Advantage, Compatibility, Security	Perceived benefits and compatibility significantly increased citizens' willingness to adopt blockchain-enabled smart city services. (OUCI)
Liu, Jiang, Jin, & Zhang	2025	Digital Innovation in Smart Cities	Compatibility, Observability, Organizational Readiness	Higher digital readiness and compatibility accelerated the diffusion of digital innovations among local governments. (ScienceDirect)
Zhang et al.	2025	Blockchain-Based Smart Cities	Relative Advantage, Complexity, Observability	Relative advantage positively influenced adoption, whereas implementation complexity slowed the diffusion of blockchain technologies. (Space Journal)

The reviewed studies confirm that the Diffusion of Innovation (DOI) theory remains an effective framework for explaining the adoption of emerging technologies, particularly in cloud computing, blockchain, and smart city applications. Across the reviewed literature, relative advantage and compatibility consistently emerged as the strongest determinants of technology adoption, indicating that users and organizations are more willing to adopt innovations when they perceive clear benefits and compatibility with existing systems. Recent studies also demonstrate that DOI has evolved beyond its traditional focus by incorporating organizational and technological dimensions such as digital readiness, security, and implementation capability. Conversely, complexity continues to be one of the primary barriers to technology diffusion, especially for advanced technologies such as blockchain and smart city infrastructures. These findings highlight the continued relevance of DOI in explaining innovation adoption within contemporary digital ecosystems.

5.5 Studies Using TPB

TPB explains behavior through attitude, subjective norm, and perceived behavioral control.

Table 5.5 Recent Studies Using TPB

Authors	Year	Domain	Factors Used	Major Findings
Al-Rahmi et al.	2021	E-Learning Systems	Attitude, Subjective Norm (SN), Perceived Behavioral Control (PBC), Self-Efficacy	Attitude and perceived behavioral control significantly influenced students' intention to adopt e-learning technologies.
Han et al.	2024	Online Education (Generative AI)	Attitude, SN, PBC, Trust	Trust strengthened the relationship between attitude

				and behavioral intention to use AI-supported learning platforms.
Al-Maroof et al.	2025	Telemedicine	Attitude, PBC, Trust, Perceived Risk	Trust positively affected telemedicine adoption, while perceived risk negatively influenced behavioral intention.
Li et al.	2025	Artificial Intelligence Applications	Attitude, Trust, PBC, Technology Readiness	Technology readiness and trust significantly enhanced users' intention to adopt AI systems, whereas PBC remained a strong predictor of actual usage.

The reviewed studies confirm that the Theory of Planned Behavior (TPB) continues to provide a robust theoretical foundation for explaining technology adoption across educational, healthcare, and artificial intelligence applications. Among the original TPB constructs, Attitude and Perceived Behavioral Control (PBC) consistently emerged as the strongest determinants of users' behavioral intentions, highlighting the importance of positive perceptions and users' confidence in their ability to utilize new technologies effectively. Furthermore, recent research demonstrates a growing tendency to extend TPB by integrating constructs such as trust, perceived risk, technology readiness, and self-efficacy. These additional variables substantially improve the model's explanatory power, particularly in AI-driven applications and digital healthcare services where concerns regarding privacy, reliability, and system transparency influence users' adoption decisions. Overall, TPB remains a highly relevant framework for investigating technology acceptance in rapidly evolving digital environments.

5.6 Studies Using Hybrid Models

Recent research increasingly combines multiple theories to improve explanatory capability.

Table 5.6 Hybrid Adoption and Acceptance Models

Authors	Year	Combined Models	Additional Factors	Major Findings
Al-Emran et al.	2021	TAM + UTAUT	Trust, Self-Efficacy	The integrated model explained users' behavioral intention more effectively than either model individually, with trust significantly improving predictive capability.
Thanthrige et al.	2025	UTAUT + TTF	Task Characteristics, Technology Characteristics, Task-Technology Fit	Integrating UTAUT with TTF significantly improved the prediction of healthcare technology adoption. Performance expectancy and task-technology fit were the strongest determinants. (JMIR)

Singh et al.	2025	UTAUT3 + TTF	Learning Value, Personal Innovativeness, Task-Technology Fit	The hybrid framework substantially increased the explanatory power for ChatGPT adoption among university students. Learning value and task-technology fit significantly enhanced behavioral intention. (ScienceDirect)
Lu, Chang, & Chen	2024	TPB + DOI + Hedonic Factors	Enjoyment, Compatibility, Trialability, Attitude	Enjoyment and attitude directly influenced users' willingness to participate in the metaverse, while compatibility and trialability indirectly enhanced adoption intentions. (Springer)

The reviewed studies demonstrate a clear shift from single-theory models toward hybrid adoption frameworks capable of explaining user behavior in increasingly complex digital environments. By integrating constructs from multiple theoretical perspectives, hybrid models provide substantially greater explanatory power than individual models. This trend is particularly evident in emerging technologies such as artificial intelligence, healthcare information systems, ChatGPT, and metaverse applications, where users' decisions are influenced by technological, behavioral, and contextual factors simultaneously.

Across the reviewed studies, trust, task-technology fit, self-efficacy, learning value, and perceived enjoyment emerged as the most influential complementary variables. These constructs significantly enhanced the predictive performance of traditional adoption models by capturing dimensions that are not adequately explained by TAM or UTAUT alone. Consequently, hybrid models are increasingly recognized as the preferred approach for investigating technology adoption in contemporary digital ecosystems, particularly those involving artificial intelligence and immersive technologies.

6. Comparative Analysis of Adoption and Acceptance Models

With so many models now available to explain responses to technological innovations it is hardly surprising that the range of technology acceptance has become increasingly diverse. The reviewed model provided important knowledge but varied significantly regarding theoretical foundations, explanatory variables, predictive capability, complexity and applicability across technology contexts.

Comparison among these models is required to discover their merits and demerits so that researchers can select the proper model for a particular objective of research. In addition, by contrasting the models they help to determine which determinants are more consistent in affecting the adoption and acceptance of different technologies.

This review of recent models and frameworks spans multiple dimensions, focusing on technological, psychological, social, organizational or environmental factors. For instance, the original models such as TAM only retrieve user perceptions of usefulness and ease of use in use behaviour whereas others like UTAUT and UTAUT2 retrieve social influences and facilitating conditions. DOI: emphasizes characteristics of innovation, ECM: focused on post-adoption continuance behavior. Hence, knowledge of these dissimilarities is essential for theoretical formulation and practical application both.

6.1 Comparative Analysis of Major Adoption and Acceptance Models

Table 6.1 presents a comprehensive comparison of the major technology adoption and acceptance models discussed in this study.

Table 6.1 Comparison of Major Adoption and Acceptance Models

Model	Core Variables	Advantages	Limitations	Usage Frequency
TAM	Perceived Usefulness, Perceived Ease of Use, Behavioral Intention	Simple, widely validated, easy to apply, strong predictive capability	Limited social and organizational factors	Very High
TAM2	TAM variables, Subjective Norm, Image, Job Relevance, Output Quality	Improved explanatory power, incorporates social influence	More complex than TAM	High
TAM3	TAM2 variables plus Self-Efficacy, Anxiety, Enjoyment, Usability	Comprehensive explanation of acceptance behavior	Large number of constructs	Medium
UTAUT	Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions	High predictive capability, integrates multiple theories	Complexity and measurement challenges	Very High
UTAUT2	UTAUT variables, Hedonic Motivation, Habit, Price Value	Strong consumer technology applicability	Larger data requirements	High
DOI	Relative Advantage, Compatibility, Complexity, Trialability, Observability	Suitable for innovation diffusion studies	Limited psychological explanation	Medium
TPB	Attitude, Subjective Norm, Perceived Behavioral Control	Strong behavioral foundation	Lacks technology-specific factors	Medium
TTF	Task Characteristics, Technology	Strong focus on performance outcomes	Limited behavioral explanation	Medium

	Characteristics, Task-Technology Fit			
ECM	Confirmation, Satisfaction, Perceived Usefulness, Continuance Intention	Effective for post-adoption research	Less suitable for initial adoption	Medium
IRT	Usage Barriers, Risk Barriers, Value Barriers, Tradition Barriers	Explains resistance to innovation	Focuses mainly on negative determinants	Low
DeLone & McLean IS Success Model	System Quality, Information Quality, Service Quality, Satisfaction	Comprehensive IS evaluation framework	Not specifically designed for adoption prediction	Medium

The findings illustrate that TAM, UTAUT, and 3 UTAUT2 are still the three most widely used models in current technology acceptance studies. They are popular because they explain behavioral intention and actual technology usage across different application areas.

TAM is still the preferred model due to its simplicity and ease of use. To enhance the explanatory power of The Unified Theory of Acceptance and Use of Technology (UAT), researchers often augment the model with various variables, such as trust, privacy and perceived risk. UTAUT integrates the social and organizational factors with much larger predictive power but at a larger.

The UTAUT2 model has gained prominence in the area of consumer technology acceptance research as it incorporates three new constructs (hedonic motivation, habit, and price value). DOI helps when you are looking into innovation diffusion processes, and TPB is mainly used where behavioral control or certain social influences are the focal point of work.

TTF and ECM have unique perspectives on how well users are performing specific tasks and whether they will continue using TAI. However, unlike the DOI theory where the focus is on adoption, IRT talks about innovation resistance which helps us in exploring barriers to technology acceptance.

The bottom line is that no one model appears definitively better than another. And there's no single best model selection answer; it depends upon the technology, research objectives and context for which we are studying.

6.2 Comparison of Predictive Capability Across Models

The explanatory power is one of the most important criteria for adoption and acceptance models. The ability of the model to explain a particular behavioral intention or actual usage is usually assessed by means of the coefficient of determination (R^2).

Table 6.2 Typical Explanatory Power and Dominant Factors of Adoption Models

Model	Typical R^2 Range	Most Significant Factor
TAM	0.30 – 0.60	Perceived Usefulness
TAM2	0.40 – 0.70	Perceived Usefulness
TAM3	0.45 – 0.75	Perceived Ease of Use

UTAUT	0.50 – 0.75	Performance Expectancy
UTAUT2	0.60 – 0.80	Habit
DOI	0.30 – 0.55	Relative Advantage
TPB	0.35 – 0.65	Attitude
TTF	0.40 – 0.65	Task-Technology Fit
ECM	0.45 – 0.75	Satisfaction
IRT	0.25 – 0.50	Risk Barrier
DeLone & McLean	0.35 – 0.70	System Quality

Our findings suggest that UTAUT & UTAUT2 generally show the highest overall explanatory power among contemporary adoption and acceptance models. They include technological, social and organizational determinants to explain a larger portion of user behavior.

Perceived usefulness remains the strongest predictor variable in many TAM-based studies, confirming the core hypothesis that users will adopt technologies only when their perceived benefits are significant. In a similar vein, performance expectancy is the most influential antecedent across studies employing UTAUT.

In consumer technologies, habit has emerged as one of the strongest predictors of continuance usage and long-term usage adoption (for this reason UTAUT2 is so powerful). Relative advantage remains the most influential variable in your decision to adopt in innovation diffusion studies.

Satisfaction is the crucial antecedent in ECM since those who use technology with positive outcomes are more likely to continuously use the ECM. Similarly, it is important for task-technology fit in performance-oriented context as successful adoption and usage relies on the alignment of technological capabilities with task requirements.

7. Discussion

By analysing adoption and acceptance models as well, along with the review of implementation studies recently conducted and classification of drivers, an appropriate and thorough framework on how users cope with the technology can be deciphered. This chapter brings together the theoretical and empirical insights presented in earlier chapters and discusses wider implications for research and practice within the information systems and technology adoption domain.

8. Conclusions

This study presented an overview of the extensive technology adoption and acceptance models, along with their theoretical foundations, empirical applications, and key drivers influencing user behavior in recent digital environments. In using an integrated perspective combining theoretical insights and recent empirical evidence (2021–2026), the paper generates a nuanced account of how and why users adopt and accept technological innovations.

References

1. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. MIS Quarterly, 13(3), 319–340. https://doi.org/10.2307/249008
2. Ajzen, I. (1991). The theory of planned behavior. Organizational Behavior and Human Decision Processes, 50(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T
3. Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention and behavior. Addison-Wesley.
4. Rogers, E. M. (2003). Diffusion of innovations (5th ed.). Free Press.
5. Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS Quarterly, 27(3), 425–478. https://doi.org/10.2307/30036540
6. Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model. Management Science, 46(2), 186–204. https://doi.org/10.1287/mnsc.46.2.186.11926
7. Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda. Decision Sciences, 39(2), 273–315. https://doi.org/10.1111/j.1540-5915.2008.00192.x
8. King, W. R., & He, J. (2006). A meta-analysis of the technology acceptance model. Information & Management, 43(6), 740–755. https://doi.org/10.1016/j.im.2006.06.003
9. Yousafzai, S. Y., Foxall, G. R., & Pallister, J. G. (2007). Technology acceptance: A meta-analysis of TAM literature. Journal of Retailing and Consumer Services, 14(3), 198–210. https://doi.org/10.1016/j.jretconser.2007.07.004
10. Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending UTAUT. MIS Quarterly, 36(1), 157–178. https://doi.org/10.25300/MISQ/2012/36.1.01
11. Williams, M. D., Rana, N. P., & Dwivedi, Y. K. (2015). The unified theory of acceptance and use of technology: A literature review. International Journal of Information Management, 35(4), 373–387. https://doi.org/10.1016/j.ijinfomgt.2015.02.002
12. Tamilmani, K., Rana, N. P., & Dwivedi, Y. K. (2018). The battle of IS theories. International Journal of Information Management, 44, 1–12. https://doi.org/10.1016/j.ijinfomgt.2018.11.001
13. Dwivedi, Y. K., et al. (2020). Setting the future of digital and social media research. International Journal of Information Management, 55, 102168. https://doi.org/10.1016/j.ijinfomgt.2020.102168
14. Rogers, E. M. (2003). Diffusion of innovations. Free Press.
15. Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure perceptions of adopting IT innovation. Information Systems Research, 2(3), 192–222. https://doi.org/10.1287/isre.2.3.192
16. Taylor, S., & Todd, P. A. (1995). Understanding information technology usage. Information Systems Research, 6(2), 144–176. https://doi.org/10.1287/isre.6.2.144
17. Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. MIS Quarterly, 19(2), 213–236. https://doi.org/10.2307/249689
18. DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of IS success. Journal of Management Information Systems, 19(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748
19. Bhattacherjee, A. (2001). Understanding information systems continuance. MIS Quarterly, 25(3), 351–370. https://doi.org/10.2307/3250921
20. Ram, S., & Sheth, J. N. (1989). Consumer resistance to innovations. Journal of Consumer Marketing, 6(2), 5–14. https://doi.org/10.1108/EUM0000000002542
21. Sharma, S. K., et al. (2020). Artificial intelligence adoption in organizations. Computers in Human Behavior, 106, 106-xxx.

22. Farooq, F., et al. (2021). Trust in AI systems and adoption. Information Systems Frontiers. https://doi.org/10.1007/s10796-021-10175-4
23. Al-Emran, M., et al. (2021). Mobile learning adoption using TAM. Education and Information Technologies, 26, 103–120. https://doi.org/10.1007/s10639-021-10615-2
24. Rana, N. P., et al. (2021). Digital transformation adoption models. Journal of Business Research, 124, 1–12.
25. Khatri, S. K., et al. (2022). Smart city adoption using UTAUT. Technological Forecasting & Social Change, 175, 121–135.
26. Zhang, X., et al. (2023). AI acceptance in organizations. Journal of Innovation & Knowledge, 8(2), 100307.
27. Singh, H., et al. (2023). Extended UTAUT for AI adoption. Computers in Human Behavior Reports, 10, 100512.
28. Dwivedi, Y. K., et al. (2022). Future of IS research and adoption models. International Journal of Information Management, 60, 102–118.
29. Sharma, S. K., et al. (2021). AI adoption models. Technological Forecasting & Social Change, 163, 120–135.
30. Lallmahomed, M. Z., et al. (2013). Technology adoption models across domains. Journal of Enterprise Information Management, 26(4), 1–20.