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THE UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT) USED ON MOBILE APPLICATION: LITERATURE REVIEW

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ABSTRACT

This paper aims to perform a systematic review of articles that have used the unified theory of acceptance and use of technology (UTAUT) from 2019 to 2023. The results in this research are based on the literature analysis of 10 existing articles on the UTAUT model. This has been performed by collecting data including demographic details, methodological details, limitations, and significance of relationships between constructs from the available articles based on the UTAUT. The findings indicated that general-purpose systems and specialized business systems were examined in the majority of the articles using the UTAUT. The analysis also indicated that the cross-sectional approach, survey methods, and structural equation modeling analysis techniques were the most explored research methodologies whereas Smart PLS was found to be the largely used analysis tool. This is the continued research that examined the literature on the UTAUT for the past five years and provided the researchers with accumulative knowledge about the model.

KEYWORDS *UTAUT, Literature Review, Mobile Application*

INTRODUCTION

With the recent rapid advancement in mobile telecommunication technologies, mobile phone applications have changed not only how we use mobile phones but also our lives. People now through new methods by using mobile gadgets and technologies (Chao, 2019). Thus, mobile devices are a crucial tool for mobile health, banking, and mobile learning (m-learning) (Alalwan et al., 2017).

Effective implementation of any information technology (IT) of information system (IS) depends on user acceptance (Davis, 1989). In recent decades in the domains of psychology, ISs, and sociology, numerous theoretical models have been

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developed to predict and explain user acceptance of IT or ISs (Chao, 2019). (Venkatesh et al., 2003) developed a unified model that brings together alternative views on user and innovation acceptance – The Unified Theory of Acceptance and Use of Technology (UTAUT). The UTAUT suggests that four core constructs (performance expectancy, effort expectancy, social influence, and facilitating conditions) are direct determinants of behavioral intention and ultimately behavior and that these constructs are in turn moderated by gender, age, experience, and voluntariness of use. This model provides a framework that not only explains the acceptance of IT and ISs but also elucidates the actual use of such technologies and systems. Because of its capability to integrate, the UTAUT model contributes substantially to the exploration of technology acceptance and usage (Chao, 2019).

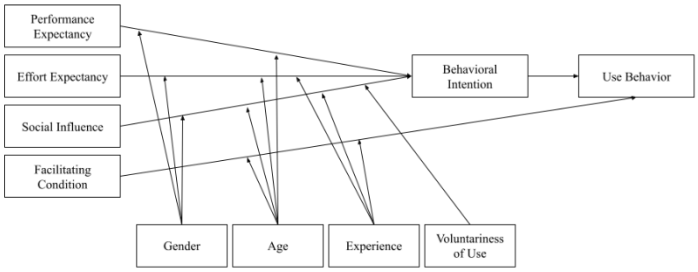


Figure I. (Venkatesh et al., 2003)

In keeping with other review work such as that of (Williams et al., 2015) such a study is likely to be of value in that it can assist researchers in accepting and using understanding prior UTAUT-related findings, recognize possible future research topics, and guide future research endeavors. The aim of this study therefore is to provide such a review.

The remainder of this paper is structured as follows. In the following section, we describe the methodology employed and follow this with a section presenting our findings based upon an analysis of the material along a series of dimensions, including demographic aspects, types of technology, examined, methodological considerations, and an analysis of UTAUT and external constructs employed in various studies. We present a summary of the limitations of extant UTAUT studies, and finally, we present our concluding remarks and suggestions for future research directions.

Literature Review

Mobile Application

A mobile application, commonly known as an app, is a term to categorize software programs that run on a handheld computing device such as a smartphone, tablet, e-reader, or wearable accessory (Moon et al., 2022).

Unified Theory of Acceptance and Use of Technology

Research on the acceptance and usage of information technology (IT) and information system (IS) has been conducted and advanced by accumulating several empirical models and theories over the last decades (Moon et al., 2020). (Venkatesh et al., 2003) formulated and validated a comprehensive model entitled the Unified Theory of Acceptance and Use of Technology (UTAUT), which integrated different

construct by synthesizing the eight leading models; (a) theory of reasoned action (TRA) (Ajzen, 1991), (b) technology acceptance model (TAM) (Davis, 1989), (c) theory of planned behavior (TPB) (Ajzen, 1991), (d) motivational model (MM) (Davis et al., 1992), (e) combined TAM and TPB (C-TAM-TPB) (Taylor & Todd, 1995), (f) model of PC utilization (MPCU) (Thompson et al., 1991), (g) Innovation diffusion theory (IDT) (Everett, 1995), and (h) social cognitive theory (SCT) (Compeau & Higgins, 1995).

Variables Definitions

Table I present all the internal and external variables definition as given in their originating studies.

Table I. Variables Definition

Variables	Definition	Origin	Referred Articles
Attitude	The degree to which an individual likes or dislikes the use of a particular technology	(Taylor & Todd, 1995)	(Moon et al., 2020)
Behavioral Intention	The degree to which an individual will engage in the acceptance and use of a particular technology	(Ajzen, 1991)	(Moon et al., 2020; Venkatesh et al., 2003)
Device Compatibility	Compatibility standards assure the user that a component or sub-system can be successfully incorporated and be "inter-operable" with other constituents of a more extensive system of closely specified inputs and outputs	(Al Amri & Almaiah, 2020)	(Alghazi et al., 2021)
Device Memory	The mobile's ability to absorb, store, and transfer media of various sizes	(Alghazali et al., 2021)	(Alghazali et al., 2021)
Device Performance	The accomplishment of a given task measured against presently known standards of accuracy, completeness, cost, and speed	(Alghazali et al., 2021)	(Alghazali et al., 2021)
Device Processing Power	A mobile processor can accomplish calculation tasks that make learning through mobile technology easy and flexible	(Alghazali et al., 2021)	(Alghazali et al., 2021)
Device Security and Reliability	The measures taken to protect sensitive data stored on portable devices	(Alghazali et al., 2021)	(Alghazali et al., 2021)
Effort Expectancy	The degree of ease associated with the adoption and usage of the new technology	(Davis, 1989)	(Moon et al., 2020; Venkatesh et al., 2003)
Facilitating Condition	The degree to which an individual believes that sufficient infrastructure and resources exist to support the adoption and usage of the new technology	(Davis, 1989)	((Ivanova & Kim, 2022); Moon et al., 2020; Thompson et al., 1991)

Variables	Definition	Origin	Referred Articles
Habit	Habit refers to how people tend to do behave automatically because they learn from previous experiences	(Venkatesh et al., 2012)	(Ivanova & Kim, 2022)
Hedonic Motivation	The pleasure gained when using certain technologies	(Venkatesh et al., 2012)	(Rahmiati et al., 2022)
Loyalty	Repeat visit behavior and future repurchase of products or reuse of services	(Arianita et al., 2023)	(Arianita & Anggarawati, 2023)
Mobile Self-Efficacy	An individual's perceptions of his or her ability to use mobile devices to accomplish particular tasks (e.g., browsing the internet)	(Ajzen, 1991)	(Chao, 2019; Moon et al., 2020; (Nikou & Economides, 2017)
Network Coverage	The ability to use mobile devices to access the network from various places	(Alghazali et al., 2021)	(Alghazali et al., 2021)
Network Speed	The speed of communication via a mobile device (i.e., a smartphone) and the length of time required to complete the learning process, which involves browsing, downloading, and sending materials	(Alghazali et al., 2021)	(Alghazali et al., 2021)
Perceived Enjoyment	The extent to which the activity of using a specific system perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use	(Park et al., 2012)	(Chao, 2019)
Perceived Innovativeness	A personal trait, which is usually associated with consumers who dare to take risks when they try new technological innovations and services	(Karjaluoto et al., 2019)	(Arianita et al., 2023)
Perceived Risk	Potential for loss in the pursuit of a desired outcome of using an e-service	(Featherman & Pavlou, 2003)	(Chao, 2019)
Performance Expectancy	The degree of ease associated with the adoption and usage of the new technology	(Davis, 1989)	(Alghazali et al., 2021; Ivanova & Kim, 2022; Moon et al., 2020; Venkatesh et al., 2003)
Price Value	A cognitive consumer consideration regarding the trade-off between the benefits and costs incurred when using an innovation	(Venkatesh et al., 2012)	(Rahmiati et al., 2022)

Variables	Definition	Origin	Referred Articles
Satisfaction	Users' level of satisfaction with reports, web sites, and support services	(DeLone & McLean, 2016)	(Chao, 2019)
Social Influence	The degree to which an individual perceives that other people believe he or she should adopt and use the new technology	(Davis, 1989)	(Ajzen, 1991; Ivanova & Kim, 2022; Moon et al., 2020; Venkatesh et al., 2003)
Stress	COVID-19 related stress is defined as the individual's perception of adopting protective measures when perceiving a health risk	(Venkatesh et al., 2003)	(Araujo et al., 2023; Westcott et al., 2017)
Trust	Accumulation of trust beliefs: integrity, benevolence, and ability that relate with the bank and mobile-banking channel	(Alalwan et al., 2017)	(Chao, 2019)
Word of Mouth	The process by which information or ideas about a product, service, or company are spread from person to person	(Arianita et al., 2023)	(Arianita et al., 2023)
Openness	People who possessed the openness personality trait were eager to try new things and experiences	(Zhang & Yu, 2022)	(Zhang & Yu, 2022)
Emotional Stability	Individual's proclivity to be emotionally adaptable	(Zhang & Yu, 2022)	(Zhang & Yu, 2022)
Positive Competition	A type of competition that brought people constant intrinsic motivation, rendering them focus on their own goals and performance rather than generating too many negative feelings which may lead to unsatisfying outcomes	(Nunes et al., 2018)	(Zhang & Yu, 2022)
Perseverance of Effort	A beneficial personality for an individual. It was defined as one's inclination to work hard even in the face of adversity	(Zhang & Yu, 2022)	(Zhang & Yu, 2022)

RESEARCH METHOD

This study examines UTAUT research conducted from 2019 to 2023. A comprehensive electronic search using Google Scholar resulted in 10 usable papers. We used the "UTAUT Model Mobile Application" as the keyword. The studies of 10 usable papers appeared more in journals such as Sustainability, Frontiers in

Psychology, Healthcare, Journal of Asian Finance Economics and Business, Journal of Information System, Management and Business Review, The Manager Review, and Universal Access in the Information Society. The articles were analyzed in terms of a series of characteristics including types of relationships found between model constructs, external variables, limitations of studies, and methodological details.

RESULT AND DISCUSSION

Many different researchers with different research intentions and subjects of focus have conducted UTAUT studies by applying a variety of research methodologies in different environments. This diverse body of work has seen numerous new constructs being incorporated into the original theory, with UTAUT being blended with other theoretical models, and on occasion, a re-specification of the underlying relationships between UTAUT variables (Williams et al., 2015). This section presents an analysis of these UTAUT studies by examining a number of variables including most productive universities/institutions, most productive departments, keyword analysis, types of systems examined, research subjects, relationship between major UTAUT variables, weight analysis, relationship of external variables with UTAUT constructs, and most frequently used external variables.

Demographic Characteristics

Table II illustrates 18 universities/institutions associated with the highest combinations of number of paper published and associated counts of contributing authors/co-authors. Texas Tech University appears at the top of this list of most productive authors.

Table II. Publications by University/Institution

University/Institution	Author count
Beijing Language and Culture University	2
Hail University	1
Intituto Politecnico de Lisboa	2
King Faisal University	1
Kingdom University	1
Missouri State University	1
Mongolia International University	1
National Taichung University of Science and Technology	1
Sahyadri College of Engineering and Management	2
Telkom University	1
Texas Tech University	5
Universidade de Lisboa	2
Universitas Andalas	3
Universitas Bengkulu	3
Universitas Negeri Padang	1
University of Craiova	3

University/Institution	Author count
University of Malaya	3
Woosong University	1
Total	34

Table III illustrates the home departments of the authors or co-authors who have contributed to publishing papers on UTAUT. By far the majority of authors belonged to departments related to the information system, technology, and computer science fields, whereas a far smaller group belonged to psychology and finance.

Table III. Most Productive Departments

Department/School	Count
Accounting and Finance	1
Business Administration	3
Centre for Internship Training and Academic Enrichment	1
Computer Networks and Communication	1
Computer Science	1
Computer System and Technology	1
Counseling, Leadership, and Special Education	1
Doctoral School of Economic Science	2
Edicott College of International Studies	1
Educational Psychology and Leadership	5
Escola Superior de Tecnologia da Saude	2
Finance, Banking, and Economic Analysis	1
Foreign Studies	2
Information System	2
International Relations	1
Management	7
Psicologia	2
Total	34

Table IV presents the 12 countries whose universities contributed the most UTAUT research publications. Indonesia and Romania appears at the top of the list as the highest proportion of work was produced.

Table IV. University Affiliation According to Country

Researchers Originating Country	Count	Researchers Originating Country	Count
Bahrain	1	Mongolia	1
China	2	Portugal	1
India	2	Romania	3
Indonesia	3	Saudi Arabia	2
Korea	1	Taiwan	1
Malaysia	3	United States of America	1

Our findings at Table V reveal that published UTAUT research has been based on primary data captured in 14 places/countries. By far the most popular source of primary data has been the Indonesia, followed some way behind by India.

Table V. Most Used Counties for Primary Data Collection

Country/Place	Count	Country/Place	Count
Africa	1	Mongolia	1
Australia	1	Portugal	1
China	1	Saudi Arabia	1
Europe	1	Taiwan	1
India	2	United States of America	1
Indonesia	3	Total	14

Table VI illustrates 10 outlets that have each published one or more UTAUT research papers. Numerous journal have published UTAUT-research, including the Sustainability as the top paper with the most publication in this analysis.

Table VI. Publishers of UTAUT Research Articles

Journal/Conference Name	Count
Frontiers in Psychology	1
Healthcare	1
Journal of Asian Finance, Economics and Business	1
Journal of Information System	1
Management and Business Review	1
Sustainability	3
The Manager Review	1
Universal Access in the Information Society	1
Total	10

This analysis displays the number of publications of UTAUT work appearing between 2019 and 2023. The findings indicate that the number of publication tend to stagnate but slightly increased year upon year, as we know that at 2019 and 2020 there is one papers each year, for 2021 and 2023 there are two paper each, and four for year 2022. We suggest that this upward trend will continue and future years will see a further increase in the number of UTAUT-related papers published.

3 different types of system were examined in the articles under analysis, being classified into three categories that we suggest. Specialized business systems were most frequently examined, while education and general purpose systems were equal.

Tabel VII. Systems Used in UTAUT Studies

Type	ISs for Each Category	Publications
Education Systems	Mobile Learning Application (3)	(Alghazali et al., 2021; Chao, 2019; Zhang & Yu, 2022)
General Purpose Systems	General Mobile Application (3)	(Araújo et al., 2023; Moon et al., 2022; Saputra et al., 2021)

Type	ISs for Each Category	Publications
Specialized Business Systems	Mobile Banking (4)	(Arianita & Anggarawati, 2023; Ivanova & Kim, 2022; Rahmiati et al., 2022; Samartha et al., 2022)

Our findings revealed that 8 out of 10 were using cross-sectional research approach. As far as research methodologies were concern, survey instrument were commonly used, followed some way behind by interviews. Survey instruments were commonly used in different form such as questionnaire survey and online or web-based survey. Much data analysis involved structural equation modelling using software such as PLS and AMOS. Partial least squares (PLS) regression is one of the most commonly adopted structural equation modelling (SEM) techniques used to validate structured data. PLS regression is especially effective for data analysis during the early stages of theory development when the theoretical model and its measures are not yet complete (Yuan et al., 2020).

Table VIII. Research Methodologies

Methodology	Details	References
Research Approach	Cross-sectional (8)	(Alghazali et al., 2021; Araujo et al., 2023; Arianita et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Moon et al., 2020; Samartha et al., 2022; Zhang & Yu, 2022)
	Confirmatory (1)	(Saputra et al., 2021)
Methodology	Survey	(Alghazali et al., 2021; Araujo et al., 2023; Arianita et al., 2023; Chao, 2019; Moon et al., 2020; Rahmiati et al., 2022; Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
	Interview	(Araujo et al., 2023; Chao, 2019; Moon et al., 2020; Saputra et al., 2021)
Analysis Method	Average Variance Extracted Analysis (7)	(Alghazali et al., 2021; Arianita et al., 2023; Ivanova & Kim, 2022; Rahmiati et al., 2022; Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
	Composite Reliability (5)	(Alghazali et al., 2021; Arianita et al., 2023; Rahmiati et al., 2022; Samartha et al., 2022; Zhang & Yu, 2022)
	Confirmatory Factor Analysis (4)	(Araujo et al., 2023; Ivanova & Kim, 2022; Moon et al., 2020; Zhang & Yu, 2022)
	Cronbach's Alpha (8)	(Alghazali et al., 2021; Araujo et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Moon et al., 2020; Rahmiati et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)

Methodology	Details	References
	Path Analysis (3)	(Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
	PLS Analysis (1)	(Chao, 2019)
	Structural Equation Modeling (7)	(Alghazali et al., 2021; Chao, 2019; Ivanova & Kim, 2022; Moon et al., 2020; Rahmiati et al., 2022; Samartha et al., 2022; Saputra et al., 2021)
	Structural Model (1)	(Zhang & Yu, 2022)
Analysis Tool	AMOS (1)	(Zhang & Yu, 2022)
	Smart PLS (7)	(Alghazali et al., 2021; Arianita et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Rahmiati et al., 2022; Samartha et al., 2022; Saputra et al., 2021)
	SPSS (2)	(Saputra et al., 2021; Zhang & Yu, 2022)

UTAUT's six main variables are performance expectancy (PE), effort expectancy (EE), social influence (SI), behavioral intention (BI), facilitating condition (FC), and usage behavior (UB). BI being both an independent and dependent variable (Williams et al., 2015). In order to better understand the predictive power of each individual independent variable, a weight analysis was performed for each independent/dependent pairing. We adopted an approach in line with the work of (Williams et al., 2015) in order to identify the most/least frequently used predictors, and among these, the best, worst, and promising predictors. It is important to note how many times a particular relationship was examined, as consistent evidence across studies is required in order that a best predictor be identified (Jeyaraj & Eze, 2006).

Table IX. Results of Examining Relationships

Study	PE-BI	EE-BI	SI-BI	FC-BI	FC-UB	BI-UB
(Chao, 2019)	Yes	Yes	X	X	X	X
(Moon et al., 2020)	Yes	No	No	No	X	X
(Alghazali et al., 2021)	Yes	Yes	No	X	X	X
(Arianita et al., 2023)	Yes	No	No	Yes	X	X
(Samartha et al., 2022)	No	Yes	Yes	X	X	X
(Rahmiati et al., 2022)	X	X	X	X	X	Yes
(Araujo et al., 2023)	No	Yes	No	No	X	X
(Ivanova & Kim, 2022)	Yes	Yes	Yes	Yes	X	Yes
(Zhang & Yu, 2022)	Yes	Rev	Rev	Yes	No	Yes
(Saputra et al., 2021)	No	No	No	No	Yes	No

Note:
PE – Performance Expectancy, EE – Effort Expectancy, SI – Social Influence, FC – Facilitating Condition, BI – Behavioral Intention, UB – Use Behavior

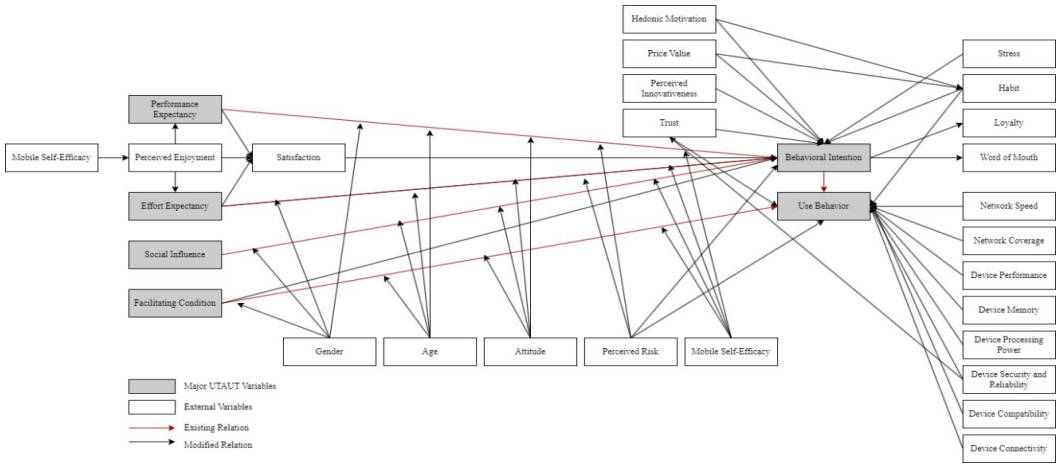
Yes – Significant Relation, No – Non-Significant Relation, X – Not Tested, Rev – Reversed (Negative Relation)

Table X. Relationships Between Major UTAUT Variables

Relations	PE-BI	EE-BI	SI-BI	FC-BI	FC-UB	BI-UB
Significant Relation	6	5	2	3	1	3
Non-Significant Relation	3	3	5	3	1	1
Negative Relation	0	1	1	0	0	0
Not Tested	1	1	2	4	8	6
Total	10	10	10	10	10	10
Total Relations Examined	9	9	8	6	2	4
Total No. of Significant Relations	6	6	3	3	1	3
Weight Predictors	6/9=0.67	6/9=0.67	3/8=0.38	3/6=0.5	1/2=0.5	3/4=0.25

(Jeyaraj & Eze, 2006) suggest that a weight of 0.80 or more is required for an independent variable to quality as a best predictor, and we adopt this threshold in our work. Weight analysis of the independent variables indicates that there are none of the variables meet this requirement so none variables are qualify for the best predictor category.

Although the UTAUT model has been widely adopted, doubts exist over its capability to explain individuals' technology acceptance. Thus, the original UTAUT model has been extended in many researches (Chao, 2019). Many researcher (Kabra et al., 2017; Khalilzadeh et al., 2017) have suggested that increasing the number of external variables can enhance this model's ability to predict the acceptance of IT.



Picture II. Diagrammatic Representation of External Variables

A number of external variables being introduced onto the major constructs of UTAUT. Total of external combine with the internal variables is a total of 35 different variables only from the 10 research on this paper that we analyzed. Picture II shows how the variables connected to each other.

Table XI. Variables Used in UTAUT Research

External Variables	Count	Publications
Age	2	(Moon et al., 2020; Saputra et al., 2021)
Attitude	1	(Moon et al., 2020)
Attitude Towards Behavior	1	(Zhang & Yu, 2022)
Behavioral Intention	10	(Alghazali et al., 2021; Araujo et al., 2023; Arianita et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Moon et al., 2020; Rahmiati et al., 2022; Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
Device Compatibility	1	(Alghazali et al., 2021)
Device Connectivity	1	(Alghazali et al., 2021)
Device Memory	1	(Alghazali et al., 2021)
Device Performance	1	(Alghazali et al., 2021)
Device Processing Power	1	(Alghazali et al., 2021)
Device Security and Reliability	3	(Alghazali et al., 2021; Araujo et al., 2023; Ivanova & Kim, 2022)
Effort Expectancy	9	(Alghazali et al., 2021; Araujo et al., 2023; Arianita et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Moon et al., 2020; Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
Emotional Stability	1	(Zhang & Yu, 2022)
Experience	1	(Saputra et al., 2021)
Facilitating Condition	6	(Araujo et al., 2023; Arianita et al., 2023; Ivanova & Kim, 2022; Moon et al., 2020; Saputra et al., 2021; Zhang & Yu, 2022)
Gender	2	(Moon et al., 2020; Saputra et al., 2021)

External Variables	Count	Publications
Habit	2	(Rahmiati et al., 2022; Saputra et al., 2021)
Hedonic Motivation	2	(Rahmiati et al., 2022; Saputra et al., 2021)
Loyalty	1	(Arianita et al., 2023)
Mobile Self-Efficacy	2	(Chao, 2019; Moon et al., 2020)
Network Coverage	1	(Alghazali et al., 2021)
Network Speed	1	(Alghazali et al., 2021)
Openness	1	(Zhang & Yu, 2022)
Perceived Enjoyment	1	(Chao, 2019)
Perceived Innovativeness	2	(Araujo et al., 2023; Arianita et al., 2023)
Perceived Risk	3	(Chao, 2019; Ivanova & Kim, 2022; Samartha et al., 2022)
Performance Expectancy	9	(Alghazali et al., 2021; Araujo et al., 2023; Arianita et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Moon et al., 2020; Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
Perseverance of Effort	1	(Zhang & Yu, 2022)
Positive Competition	1	(Zhang & Yu, 2022)
Price Value	2	(Alghazali et al., 2021; Rahmiati et al., 2022)
Satisfaction	1	(Chao, 2019)
Social Influence	8	(Alghazali et al., 2021; Araujo et al., 2023; Arianita et al., 2023; Ivanova & Kim, 2022; Moon et al., 2020; Samartha et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
Stress	1	(Araujo et al., 2023)
Trust	4	(Arianita et al., 2023; Chao, 2019; Ivanova & Kim, 2022; Samartha et al., 2022)

External Variables	Count	Publications
Use Behavior	5	(Arianita et al., 2023; Ivanova & Kim, 2022; Rahmiati et al., 2022; Saputra et al., 2021; Zhang & Yu, 2022)
Word of Mouth	1	(Arianita et al., 2023)

Referring to all the variables here are the questions that we gather from all the articles.

Table XII. Variables Questions

Variables	Questions	References
Attitude	I like using apps	(Moon et al., 2020)
	I am satisfied with apps for performing my daily living skills	
	I enjoy apps on my mobile device	
Attitude Towards Behavior	-	
Behavioral Intention	I think I will use mobile learning	(Alghazali et al., 2021)
	I plan to use mobile learning	
	I plan to use mobile learning	
Device Compatibility	Learning through mobile is a good thing if it can be used with any kinds of mobile devices	(Alghazali et al., 2021)
	I will involve in online education if it can be used through my mobile it	
	I will use media files of my course if my mobile can play	
	I think my smartphone can fit with online course materials	
	If my mobile run lectures and learning materials smoothly I will continue to learn	
Device Connectivity	I will spend more time on mobile learning if I could access anywhere, anytime	(Alghazali et al., 2021)

Variables	Questions	References
	Mobile learning would be useful if my device supports high-speed connectivity	
	I have no problem to connect to different generations of speed (3G, 4G, etc) from my device to interact with online courses	
	My phone has different ways to connect with other devices such as Wi-Fi and Bluetooth to share knowledge	
	It would be useful to have a phone that got variety of connectivity types to exchange course files with my classmates	
Device Memory	I will download learning materials (Lectures, Slides ... etc.) if I have enough space in my mobile	(Alghazali et al., 2021)
	Learning through mobile would be more sufficient if it comes with a large memory card	
	I have no problems with downloading a big size file of my course into my phone	
	It is useful to have a large memory capacity to store learning materials	
	I will download more educational contents If I am able to increase my phone memory capacity	
Device Performance	It would be easy for me to use my mobile devices for learning	(Alghazali et al., 2021)
	If I learn through my mobile device I will increase my chances of getting more knowledge	
	Using my mobile device to learn improves my performance in my courses	
	Using my mobile device to learn improves my productivity in my courses	

Variables	Questions	References
	Using my mobile device to learn improves my effectiveness in my courses	
Device Processing Power	I have a powerful device to start using mobile learning	(Alghazali et al., 2021)
	I will accomplish more learning tasks through my mobile if it is quicker than using a classic way	
	Nowadays, smartphones are strong enough to handle mobile learning	
	I believe my smart device offers a service that is superior in every way	
	I would use my phone to learn if it got high ability to deal with data	
Device Security and Reliability	I would feel secure using my credit/debit card information through a mobile banking application	(Khalilzadeh et al., 2017)
	Mobile banking applications are a secure means through which to send sensitive information	
	I would feel safe viewing my account balance on a mobile banking application	
	I would feel safe paying bills on a mobile banking application	
Effort Expectancy	I think it it easy to know how to use apps in my mobile device	(Moon et al., 2020)
	It is easy to use apps in my mobile device	
	I have no problem with using apps in my mobile device	
Emotional Stability	-	(Zhang & Yu, 2022)
Experience	*how long they used the app	(Saputra et al., 2021)

Variables	Questions	References
Facilitating Condition	I have the resources necessary to use apps	(Moon et al., 2020)
	I have the knowledge necessary to use apps	
	I can get help from others when I have difculties using apps	
Habit	Using application x is my habit	(Saputra et al., 2021)
	I should use application x to finish my job	
Hedonic Motivation	Using application x is a pleasure for me	(Saputra et al., 2021)
	Using application x is entertaining me	
	Using application x makes me convenience	
Loyalty	I will consider digital payment as my first choice for future payments	(Yuan et al., 2020)
	It would be difficult to change my beliefs about digital payments	
	Even if a close friend recommends the provider other digital payment services, my preference for digital payments will not change	
Mobile Self-Efficacy	I am confident about using apps in my mobile device	(Moon et al., 2020)
	Using apps in my mobile device would not challenge me	
	I am comfortable to use apps in my mobile device	
Network Coverage	My usage of mobile learning will increase with good network coverage	(Alghazali et al., 2021)
	My university provides good Wi-Fi access to the Internet	

Variables	Questions	References
	Public Wi-Fi help me to use my phone to learn. Getting access to Internet everywhere would improve my knowledge	
Network Speed	Mobile Learning will enhance my knowledge as I get information quickly	(Alghazali et al., 2021)
	I intend to use mobile learning if my university provides fast Internet	
	Using my phone is relatively faster to learn than using the public network	
	My university provides fast access to the Internet	
	I would download more course materials on my phone if there is a fast coverage	
Openness	-	(Zhang & Yu, 2022)
Perceived Enjoyment	I find using application x enjoyable	(Chao, 2019)
	The actual process of using the application x is pleasant	
	I have fun using the application x	
Perceived Innovativeness	People seek my advice on new technology	(Araujo et al., 2023)
	Usually/In general, on my social circle I am the first to acquire new technology when it comes out	
	Usually, I can work out how to use new technology products without other's help	
Perceived Risk	When using mobile banking, my belief is that my information is kept private	(Rahmiati et al., 2022)
	When using mobile banking, my belief is that my transactions are safe	
	When using mobile banking, my belief is that my privacy would not be compromised	

Variables	Questions	References
	Using mobile banking applications is risky	
	I feel that using mobile banking applications would cause me a lot of trouble if something went wrong	
Performance Expectancy	I believe that apps in my mobile device are useful in my daily life	(Moon et al., 2020)
	I believe that apps in my mobile device allow me to get my tasks/chores done more quickly	
	I believe that apps in my mobile device increase my ability to do my tasks/chores well	
Positive Competition	-	(Zhang & Yu, 2022)
Price Value	Mobile devices with good specifications for the purposes of learning are reasonably priced	(Alghazali et al., 2021)
	Mobile learning is a good value for the money	
	Using my mobile devices to learn is reasonably priced compared with other learning channels like PC	
	Using the Internet for mobile learning is good value for the money	
Satisfaction	I was very content with application x	(Chao, 2019)
	I was very pleased with application x	
	I was satisfied with application x efficiency	
	I felt delighted with application x	
	Overall, I was satisfied with application x	
	My friends use the apps	

Variables	Questions	References
Social Influence	I usually download an app recommended by my friends	(Moon et al., 2020)
	I use certain apps because my friends and family members are using them	
Stress	Even when I am busy with other things, I worry with the COVID-19 situation	(Araujo et al., 2023)
	The current COVID-19 situation/issue is very stressful for me	
	I am worried with the consequences of the crises provoked by COVID-19 pandemic	
Trust	I believe banks will do everything they can to secure transactions through mobile banking applications for users	(Khalilzadeh et al., 2017)
	I believe that mobile banking applications are trustworthy	
	I believe that mobile banking applications are reliable	
Use Behavior	I often use internet banking to manage my account	(Venkatesh et al., 2003)
	I often use internet banking to transfer and remit money	
	I often use internet banking to make payments	
Word of Mouth	I would be willing to recommend this app to others	(Farzin et al., 2021)
	I am willing to tell the benefits of this application to others	
	I am willing to encourage others to use this application	
	I have positive things to say about this app to others	

CONCLUSION

Our intention in this paper is to present an overview of the current state of UTAUT-related research by presenting the results of a systematic and comprehensive review of 10 articles appearing since 2019. Results were presented in terms of six major aspects: demographic characteristics, research topics and types of technology examined, methodological analysis, internal and external variable analysis, analysis of major limitations, and theoretical and internal methodological details. Our intent in conducting the investigation was to provide a useful and usable resource for future researchers by providing information on the key areas previously addressed in UTAUT research, how UTAUT research tends to be carried out, and what is usually studied during the course of UTAUT research.

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