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A Sixteenth-Year Journey of Technology Acceptance Model Research: Bibliometric Analysis

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RESEARCH ARTICLE

Abstract
The Technology Acceptance Model (TAM) is a crucial theoretical model for understanding and analyzing the adoption and usage of technology and information systems. In the ever-changing dynamic landscape of the technological environment, there is a widespread demand for a comprehensive analysis of the applications of TAM in scientific research. Despite a few bibliometric analyses earlier, the model requires a thorough analysis to explore the recent trends, advancements, and future research directions to offer insights into its versatile acceptance, adoption, and application in various technological settings. Therefore, this paper aims to explore a sixteen-year journey of TAM research, including the trends, evolution, and impact by executing a bibliometric methodology. The study has collected a portfolio of 2,014 papers from the Scopus database and analysed the data using advanced bibliometric techniques, for instance, content, keyword, and network analyses, with the help of R, R Studio, Biblioshiny, and VOSViewer. The study analysis reveals a complete and robust overview of TAM on the adoption and usage of technology and information systems, including the top contributing authors, journals, fields, affiliations, sources, and emerging research domains in the previous literature. Therefore, the study serves as a critical resource for researchers, scholars, practitioners, and policymakers to comprehend the trajectory of TAM in shaping technology acceptance and adoption studies while guiding future research pathways.

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1 INTRODUCTION

The Technology Acceptance Model (TAM) has undergone significant momentum over the last couple of years in the discourses of modifications, expansions, and advancements by academics and practitioners to adapt it to the ever-changing dynamic technological environment to utilize the model as a fundamental theoretical framework aimed to investigate, explore, and improve

technology adoption processes in the numerous settings, i.e., education, tourism & hospitality, pharmacy, ready-made garments, leather engineering, Small & Medium Enterprises (SMEs), banking, Machine Learning (ML) and Artificial Intelligence (Gemini, Chatbots, ChatGPT) [1]–[8]. It elucidates the process through which individuals perceive, accept, and integrate information systems or technology into their everyday activities [9]. The TAM has been recognized as a robust and concise framework for understanding the factors influencing technology adoption [10], [11]. Over time, TAM has developed into a prominent model for comprehending the factors that influence human behavior when it comes to accepting or rejecting technology. TAM was proposed by Fred Davis over twenty-five years ago and has emerged as a prominent model to explore the components that influence users' embrace of technology [11], [12]. However, areas of implementation of the TAM model, including the health sector, telemedicine, machine learning (M-learning) in higher education (university levels), social media entertainment technology, social learning systems in higher education, banking technology adoption, and mobile data services, are widely expanding the field's width for the acceptance of technologies [9], [10] [13]–[20]. Several literature reviews on the TAM model have been undertaken in the past few decades, focusing on the educational, M-learning, and financial sectors [9], [17], [19]. Several evaluations have incorporated the fundamental elements of the TAM and not extensively examined the new specific domains on to impact of the adoption of technology systems [13], [18], while other technology adoption models like the Unified Theory of Acceptance and Use of Technology (UTAUT) have focused on the extensive analysis of main external factors (effort expectancy, performance expectancy, and so on), and moderating factors (such as age, gender, size) affects the behavioral intention, and it ultimately influences the dependent variable [actual adoption of a Human Resources Information System (HRIS)] [21]–[23]. Although the existing reviews have contributed valuable information, we contend that completing a systematic evaluation utilizing rigorous quantitative bibliometric methodologies can yield further insights. However, literature research, especially bibliometric methodologies, shows ongoing progress in uncovering new factors that affect model core variables. The validity of the prediction of the TAM model could be enhanced by exploring the latest application of the model. However, there remain areas of research unexplored or unaddressed, like individual variables' moderating effect, adding perceived enjoyment to the TAM model, investigating actual usage and its ties to objective outcome measures, and targeting older adults [2], [15], [17].

Previous studies focus on the extensive applications and contributions of the TAM model in different domains such as education, health, medicine, marketing, business, and tourism. These studies showed that unleashing the influence of key components (perceived ease of use and perceived usefulness) of the TAM model will help in adopting technology acceptance [5]–[8]. However, less attention has been given to the bibliometric studies integrating the applications of the TAM model in contemporary digital AI technology areas such as ChatGPT, Bard, and chatbots. To fill the gap, we investigate the primary issues by reviewing the extensive literature published regarding the TAM model during the preceding sixteen years. The research questions are as follows:

a. What are the recent trends and practices of TAM?

b. What are the most prominent and influential sources and contributors?

c. What are the factors of the TAM model that specifically influence the behavioral intention to accept new technology?

The study utilized R Studio, Biblioshiny, and visualization software like VOSviewer on the TAM model to fulfill the objectives. Thus, TAM can be highlighted from the perspective of the adoption of technologies. From the previous literature reviews, the authors have reflected through their studies in the scholarly fields, mentioning the contributions of the TAM model in several spheres to discover the actual usage of technologies in their field.

The subsequent sections of the study are organized in the following manner. The methodology is presented in section three, following the background in section two. The results and discussion are structured consecutively in sections four and five. Then, section six uncovers the conclusion

and recommendations.

2 THE RATIONALE OF THE STUDY

Fred Davis introduced the conceptual model for technology acceptance in 1985, which is known as TAM. From its inception 30 years ago to the present, the TAM [12] has been widely studied in technology acceptance research. The TAM model was developed by adding two discrete assumptions, perceived ease of use and perceived usefulness, that could predict the user's attitude towards using technology [24]. Afterwards, TAM is standardized to facilitate the creation of a solid model capable of accurately predicting how to use a particular technology. However, many variations of TAM provide a reliable paradigm for assessing diverse learning tools. Previous literature reviews explained the TAM model as elucidating the fundamental mechanisms governing the acceptance of technology and forecasting user behavior. So, it conceptualizes users' acceptance and use of information technology [25].

Furthermore, due to the limitations of the Theory of Reasoned Action (TRA) and the Theory of Planned Behavior (TPB), the subsequent development of the TAM incorporated behavioral intention as an innovative component, which directly influenced the perceived usefulness of the technology [2]. Withal, the efficacy of the model has been validated by multiple studies that underscore its wide-ranging suitability for various technologies and user demographics. Acceptance of the TAM model in different areas of communication technologies is affected by the ready accessibility, convenience, and low cost, and the components of the TAM model evaluate it. In addition, the comparative analysis of previous literature found that the TAM model is extensively used to predict the acceptance of behavior in the telemedicine arena, especially for healthcare practitioners' utilization of remote care technologies [13]. Factors affecting college entrance among physicians in the telemedicine field are observed, examined, and controlled based on various theories of behavioral models. As a scholarly field, TAM is one of the most widely used in adopting technology. It is noteworthy in the telemedicine field that more than half of the studies from previous research were conducted through the applications of TAM and the extended TAM model [18]. From the previous literature, enhancing comprehension of acceptance studies based on TAM within the educational setting establishes a strong basis for expanding knowledge, as well as a better understanding and advancement of knowledge in the usage of technology-based and e-learning [26] in educational institutions. Acceptance studies have examined TAM's adaptability for various learning technologies, including mobile educational technology [27], Personal Learning Environments, open-source Learning Management Systems (LMSs), and commercial LMS Blackboard [2]. TAM Model has yet to extend its applications to adopt technology banking, mobile banking, and online banking technologies in the banking industry [11], [14]. For example, E-commerce topped the TAM application list, with further research on upcoming applications like augmented reality. The study will be conducted to display the contributions of TAM through the bibliometric analysis of past studies. Therefore, this research aims to review the literature on TAM to enrich the body of knowledge by compiling the present literature and bibliometrics on this model for providing further research directions by bridging the gaps about the applications of TAM in the era of advanced and global technology.

3 METHODOLOGY

This study uses a two-step review method: firstly, used the PRISMA model for selecting desired articles, and then conduct a bibliometrics analysis to explore the trend and implications of TAM. We follow the guidelines and procedure of the PRISMA model for identifying articles. We follow four steps, including identification, screening, analysis, and reporting of our desired articles, and this model ensures transparency and removes bias in selecting publications [28], [29].

We collect research articles from SCOPUS, a source of scholarly articles in business, social sciences, and humanities databases. Scopus database is more famous than others, including the Web of Science(WoS), because of its large number of articles and its large portions of WoS-indexed articles [30]–[32]. To successfully retrieve articles from a database search query, design is most important as it maintains a balance between precision and comprehensiveness, and saves time

and research effort [33], [34]. For a successful query design, we first select appropriate keywords and search for these keywords in the database. We analysed previous literature before selecting our research keyword and talked with three research experts. After maintaining this procedure, our search query is "TAM", "Technology Acceptance Model", "TAM in IT System", and "Extended Model of TAM". We refined our search query according to the PRISMA model's inclusion and exclusion criteria [35]. We refined our results by considering our subject area and setting the language criteria to be English. Then, we limit our search by excluding conference papers, book chapters, and notes, only focusing on final journal-published articles. Initially, we got 10,806 articles from the Scopus database by following the PRISMA technique, and after refinement, we analyzed the total 2014 articles from 2007 to June 2023, as represented in Figure 1.

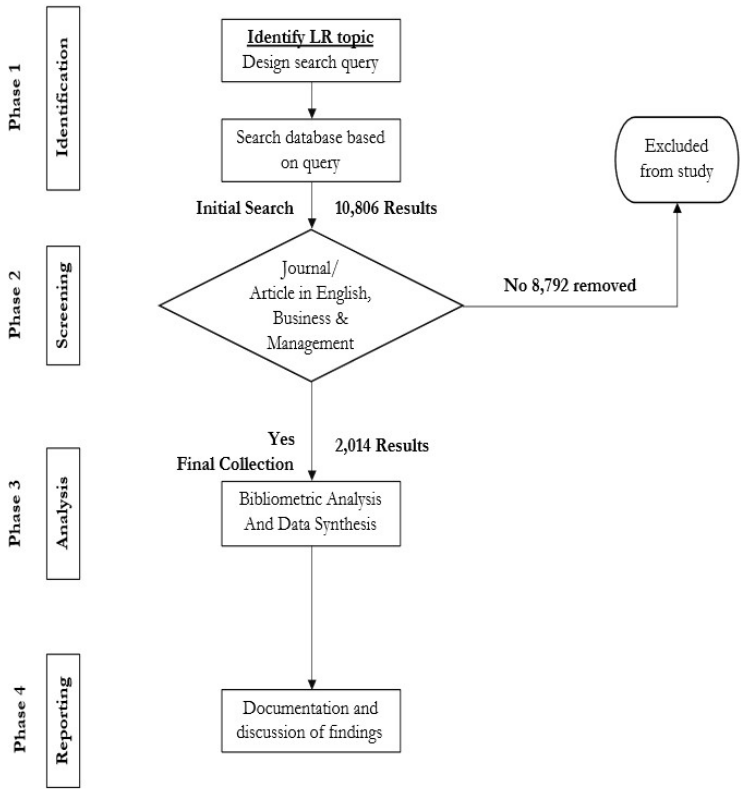


Figure 1. PRISMA Model of TAM Research, [36]

Business and management researchers use bibliometric methodologies to assess authors, publications, journals, and countries [37]. Bibliometrics quantify publication volume, citation counts, social media co-authorship, and topic trends [38]. This study analyzed bibliometrics data using R Studio, biblioshiny, and VOSViewer for textual and bibliometric data [39], [40]. Our study used R Studio for bibliometrics analysis and Vosviewer for network visualization in TAM [41], [42]. This bibliometrics study evaluates performance evaluation and scientific mapping. Performance evaluation uses publication output and citation count analysis to assess a domain's efficiency and effect, while scientific mapping reveals its organization and evolution [43], [44].

4 RESULTS

4.1 Overview

In this study, we analyzed scientific articles on TAM from 2007 to 2023, and we got 2014 documents from 558 sources. In Table 1, the annual growth rate of TAM production is 4.02, with an average age of 5.97. The average citation per document is 35.91, which is influential for researchers. The total number of authors we got from this analysis is 4613, and the number of

authors of single documents is 244. The total keywords are 4736, and the total articles analysed are 1970; others are conference papers, book chapters, and others.

Table 1. Overview of TAM Research

Description	Results
Timespan	2007:2023
Sources (Journals, Books, etc)	558
Documents	2014
Annual Growth Rate %	4.02
Document Average Age	5.97
Average citations per document	35.91
Keywords Plus (ID)	2734
Author's Keywords (DE)	4736
Authors	4613
Authors of single-authored docs	244
Single-authored docs	287
Co-Authors per Documents	2.79
International co-authorships %	24.03
Article	1970

4.2 Annual Scientific Production

Figure 2 represents the annual scientific production of TAM research publications from 2007 to 2023. Interest in the TAM model mainly started in 2007, and interest in this area gradually increased. We noticed that article production grew on a large scale from 2017 to 2022, and the total scientific production was 1,122, with the highest number of articles in 2022, which was 263. In this sixteenth-year journey, especially from 2017 to 2022, researchers may be increasingly interested in the TAM model due to rapid technological advancement, especially in information technology fields, as it explains and predicts how users use and predict new technologies or information systems [45].

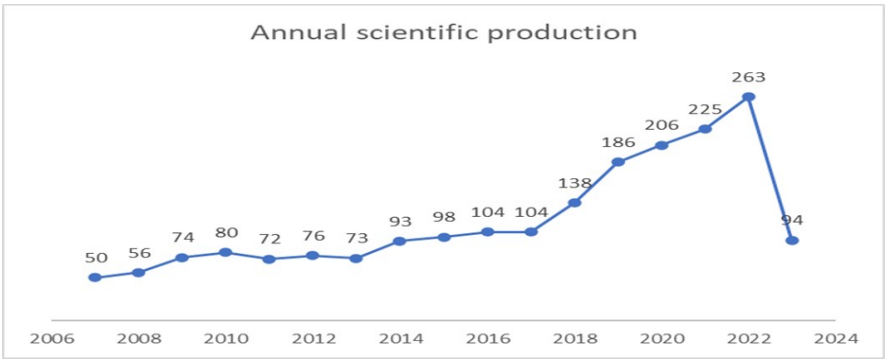
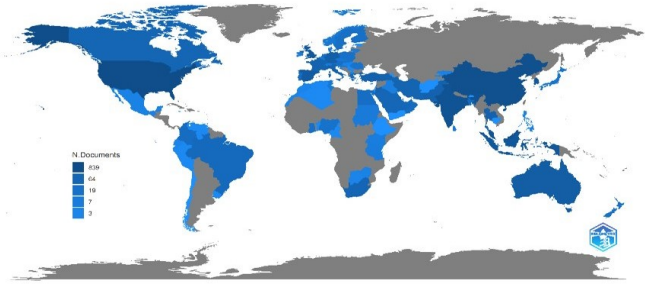


Figure 2. Annual Scientific Production

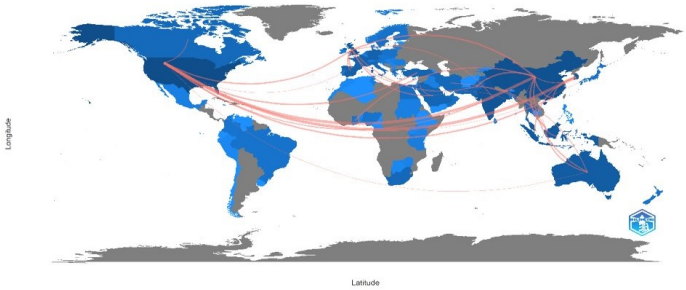
4.3 Countries' Scientific Production and Collaboration

Figure 3 (a) represents the country's annual scientific article production in TAM. Figure 3 (a) and Table 2 show that the topmost interested countries in TAM model research are the USA (839), China (617), Malaysia (473), India (451), Indonesia (300), South Korea (262), UK (262), Spain (183), Australia (160), and Germany (133). The top ten contributing countries, Italy, Turkey, Thailand, Pakistan, and France, also produce many scientific articles in TAM. The USA and China are the top contributors of scientific articles as they are the home of giant technology companies, including Google and Apple. Facebook, Alibaba, and these companies are interested in understanding

technology acceptance and usability, as these directly impact their products [46]. Figure 3(b) and Table 3 show the top collaborative article producers' countries and their collaborative production. We see the USA again holding the top position in collaborative output in TAM as it is home to technological innovation. The total number of collaborative productions in the USA is 163, and their top collaborative partners are China (25), Korea (25), Turkey (10), Hong Kong (10), and Thailand (4). China is 2nd to collaborative article producer country with 94 collaborative productions, including the top collaboration with the UK (12), Pakistan (11), Malaysia (10), Hong Kong (9), and Ghana (8). Besides these two top collaborative article-producer countries, there are large numbers of collaborative productions, including the UK (93), Malaysia (75), Australia (32), India (30), and Korea (28). From this analysis, we conclude that the USA and China hold top positions in individual and collaborative production in TAM, and apart from these, Malaysia, India, and Indonesia are emerging countries that are interested in producing articles in the field of TAM.



(a) country scientific production



(b) country collaboration map

Figure 3. Countries' Scientific Production and Collaboration

Table 2. Top Countries Total Production of TAM

Region	Frequency
USA	839
China	617
Malaysia	473
India	451
Indonesia	300
South Korea	262
UK	262
Spain	183
Australia	160
Germany	133
Italy	96
Turkey	95
Thailand	92
Pakistan	89
France	86

Table 3. Top Country Collaboration of TAM

From	Frequency	To
USA	163	China(25), Korea(25), Turkey(10), Thailand(4), Hong Kong(10), Australia(5), Austria(1), Brazil(1), Canada(6), Colombia(3), Croatia(1), Denmark(1), Egypt(2), Finland(2), France(5) Germany(2), India(7), Iran(3), Iraq(1), Ireland(1), Italy(1), Japan(5), Jordan(2), Kuwait(2), Malaysia(3), Morocco(1), Netherlands(3), New Zealand(1), Nigeria(2), Pakistan(2), Poland(1), Quatar(1), Saudia Arabia(4), Singapore(1), South Africa(1), Spain(2), Sweden(2), Switzerland(1), UAE(3), UK(9), Venezuela(1)
China	94	Australia(8), Canada(2), Croatia(1), Czech Republic(1), Denmark(1), France(3), Ghana(8), Hong Kong(9), India(4), Iraq(1), Italy(1), Japan(2), Korea(6), Lithonia(1), Malaysia(10), Netherlands(1), New Zeeland(1), Oman(1), Pakistan(11), Poland(1), Singapore(5), South Africa(1), Sweden(1), Tanzania(2), UK(12)
UK	93	Australia(3), Austria(1), Belgium(2), Brazil(1), Canada(3), Croatia(1), Denmark(2), Egypt(4), Estonia(1), Finland (2), France(12), Germany(3), Greece(3), Hong Kong(3), Iran(1), Italy(3), Jamaica(1)
Malaysia	75	Australia(8), Austria(1), Bahrain(2), Bangladesh (5), Benin(1), Croatia(2), Czech Republic(1), Denmark(1), Egypt(1), France(2), Germany(1), Hong Kong(1), India(2), Indonesia(8), Iran(2), Iraq(2), Jordan (3), Korea(1), Mexico(1), New Zealand(3), Nigeria(2), Oman(2), Pakistan(6), Peru(2), Saudi Arabia(5), Singapore(2), South Africa(1), Spain(2), United Arab Emirates94), United Kingdom(1)
Australia	32	Bangladesh(3), Brazil(1), Canada(1), Denmark(1), Finland(1), France(4), Germany(3), Hong Kong(2), Iran(6), Italy(1), Kuwait(2), Mexico(1), New Zealand(2), Pakistan(1), Saudi Arabia(1), South Africa(1), Thailand(1), Denmark(2), Ireland(1)
India	30	Australia(2), Bhutan(1), Denmark(1), France(1), Indonesia(1), Italy(1), Jordan(1), Korea(1), Netherlands(1), New Zealand(1), Oman(2), Qatar(2), Saudi Arabia(2), Serbia(1), Slovenia(1), Spain(2) Switzerland(1), United Arab Emirates(1), United Kingdom(60), Yemen(1)
Korea	28	Australia (2), Canada (1), Croatia (1), Hong Kong(8), Japan (3), New Zealand (2), Pakistan(1), Singapore(7), South Africa(1), Spain(1), United Kingdom(1)

Germany	21	Austria(3), Benin(1), Denmark(3), Finland(1), France(2), Ireland(2), Kenya(1), Kyrgyzstan(1), Netherlands(3), New Zealand(1), South Africa(1), Tanzania(1), Thailand(1)
France	19	Norway(1), Cameroon(1), Canada(1), Czech Republic(1), Denmark(1), Finland(1), Hong Kong(3), Luxembourg(2), Mexico(3), Morocco(1), Portugal(1), South Africa(1), Sweden(2), Tunisia(1)
Italy	14	Cyprus(1), Egypt(1), France(3), Ireland(1), Morocco(1), Netherlands(4), Oman(1), Turkey(2)

4.4 Most Cited Country

The importance of citation impact metrics in assessing research impact is gradually increasing, and researchers are showing a growing interest in scientometric literature [47]. In this study, we analyze countries' citation impact metrics of TAM based on total citations and Average Annual Citation. Figure 4 presents the countries most cited in TAM research based on a single country's total citations and AAC. The USA holds the top position with 19,485 citations in TAM. China is in 2nd place with 8,046 citations, the UK is in 3rd place with 5,872 citations, Korea is in 4th place with 4,882 citations, and India is in 5th place. Besides these countries, Spain, Malaysia, Australia, Hong Kong, and France are in the top ten positions. The top-cited countries produce more meaningful and impactful research in TAM.

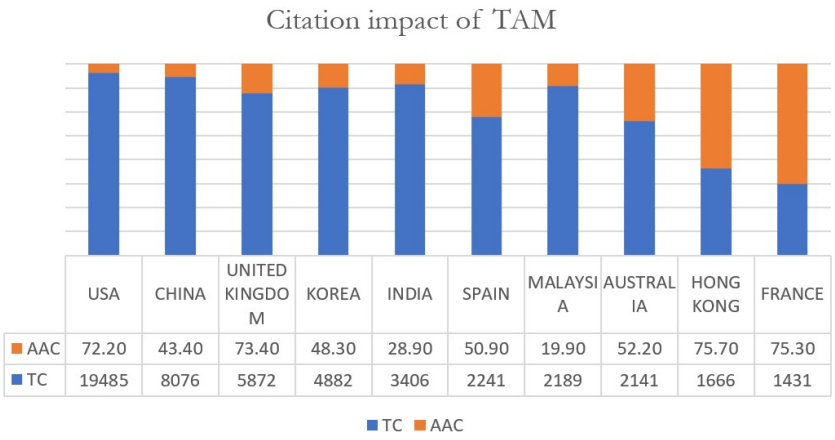


Figure 4. Countries' Total Number of Citations in the Area of TAM

4.5 Most Relevant Source

The most relevant source analysis is vital for evaluating which journals are more focused on publishing in TAM [48]. And this information helps researchers submit papers to these journals. Table 4 presents the top ten sources that published the most articles in TAM. Technological Forecasting and Social Change published the highest number of articles in TAM, 52, and the 2nd position is held by the International Journal of Business Information Systems with a total of 47 articles. The Journal of Retailing and Consumer Service published 37 articles, Technology in Society published 37 articles, and the International Journal of Bank Marketing published 34 articles in TAM. The Journal of Hospitality and Tourism Technology, Journal of Internet Banking and Commerce, Journal of Asian Finance, Economics and Business, Information and Management, and Industrial Management and Data Systems have also published 31, 26, 25, 24, 23 articles in TAM. This list of relevant sources will help researchers read and summarize their TAM-related articles.

Table 4. Most Relevant Sources of Journals Concerning TAM

Sources	Articles
Technological Forecasting and Social Change	52
International Journal of Business Information Systems	47
Journal Of Retailing and Consumer Services	37
Technology In Society	37
International Journal of Bank Marketing	34
Journal Of Hospitality and Tourism Technology	31
Journal Of Internet Banking and Commerce	26
Journal Of Asian Finance, Economics and Business	25
Information And Management	24
Industrial Management and Data Systems	23

4.6 Globally Cited Documents

This study also analyzes top globally cited documents by considering total citations, total citations per year, and normalized total citations. Table 5 represents the top ten most globally cited documents, where we see that Venkatesh V, 2008, documents have the highest citations, total citations per year, and normalized total citations, respectively, 3,834, 239.63, and 26.49. Lee M-c, 2009 articles have the 2nd highest total citations (1102), total citations per year (73.47), and normalized total citations (73.47). Ha S, 2009 articles have total citations (785), TCPY (52.3), NTC (7.24), Schierz PG, 2010 have total citations (748), TCPY (53.43), NTC (10.95). Besides these documents, Ahn T, 2007, Hausman Av, 2009; Loiacono Et, 2007; Rauniar R, 2014; Slade El, 2015; Ha I, 2007 are also the most cited documents. A total analysis of globally cited documents will help the scholar by providing information on which documents have the highest citations and which documents they should read and follow.

Table 5. Most Globally Cited Documents

Authors, Year	DOI	TC	TCPY	NTC
VENKATESH V, 2008	10.1111/j.1540-5915.2008.00192.x	3834	239.63	26.49
LEE M-C, 2009	10.1016/j.elerap.2008.11.006	1102	73.47	10.17
HA S, 2009	10.1016/j.jbusres.2008.06.016	785	52.33	7.24
SCHIERZ PG, 2010	10.1016/j.elerap.2009.07.005	748	53.43	10.95
AHN T, 2007	10.1016/j.im.2006.12.008	659	38.76	5.32
HAUSMAN AV, 2009	10.1016/j.jbusres.2008.01.018	601	40.07	5.54
LOIACONO ET, 2007	10.2753/JEC1086-4415110302	541	31.82	4.37
RAUNIAR R, 2014	10.1108/JEIM-04-2012-0011	511	51.10	10.40
SLADE EL, 2015	10.1002/mar.20823	455	50.56	9.79
HA I, 2007	10.1016/j.im.2007.01.001	445	26.18	3.60

4.7 Most Relevant Word with Tree Maps

Figure 5 presents the most relevant tree maps from abstracts from previous literature on TAM. In this research, we evaluate and analyze abstracts on essential topics: technology acceptance model, technology acceptance, perceived usefulness, electronic commerce, surveys, internet, perceived ease of use, innovation, structural equational modeling, technology acceptance, consumption behavior, behavioral research, decision making, information systems, sales, electronic and social effects, modeling, technology, technology development, perceived risk, and other aspects. This figure shows that the technology acceptance model holds the largest branch of this tree map created from previous studies. Followed by perceived usefulness, perceived ease of use, and technology adaptations are three TAM model constructs analysed from abstracts of articles published in the Scopus database. This tree map provides significant keywords that are more

focused on the TAM model, which will help researchers get trends on the TAM model.

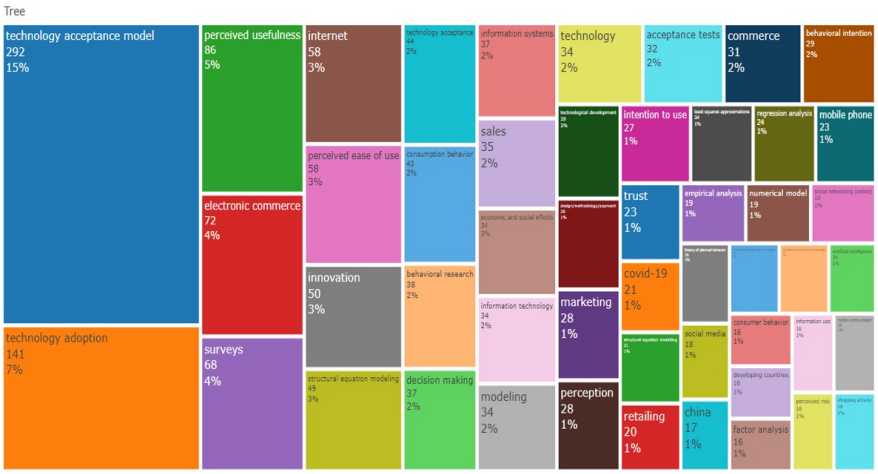


Figure 5. The Focus of the Most Significant Words and the Tree Map from the Abstract

4.8 Co-occurrence Evaluation

Figure 6 represents co-occurrence networks and connections of TAM with other issues created from keywords plus and authors' keywords. Figure 6 shows that the technology acceptance model strongly connects with perceived usefulness, value, adoption, technology readiness, innovations, diffusion theory, consumer behavior, structure equation modeling, mobile communication systems, e-commerce, etc. From this, the co-occurrence network technology acceptance model is the central keyword, indicating that this is a more frequently discussed topic in TAM literature.

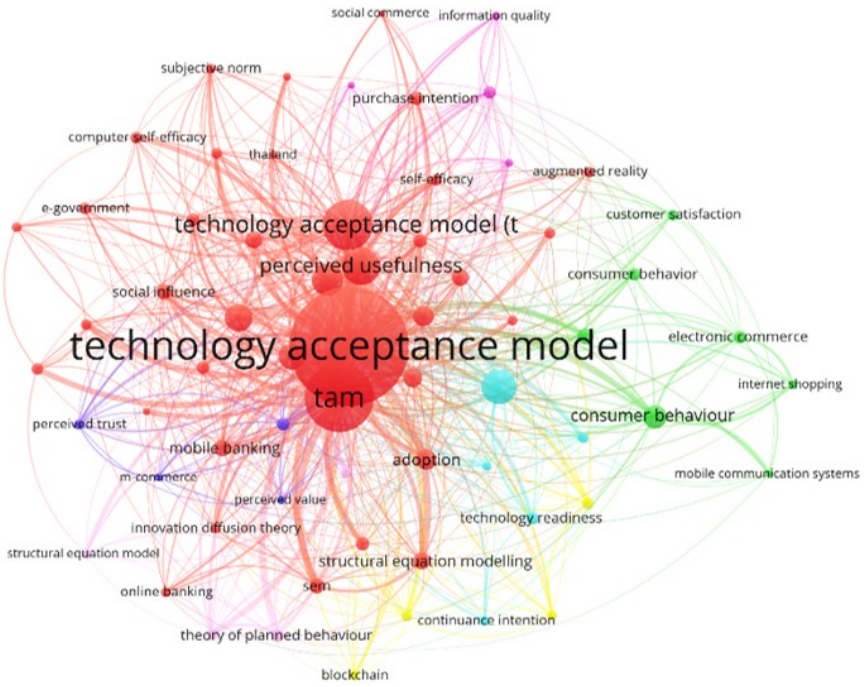


Figure 6. Co-occurrence Author Keywords

4.9 Thematic Map of TAM

Figure 7 represents the thematic mapping of the technology acceptance model by analyzing the author's keywords. This analysis shows nine related circles of the TAM model, including i) technology acceptance model, tam, perceived risk, ii) technology acceptance model, trust, technology acceptance, iii) perceived usefulness, perceived ease of use, technology adoption, iv) consumer behaviour, consumer behaviour, electronic commerce, v) purchase intention, virtuality, augmented reality, vi) ease of use, usefulness, Jordan, vii) artificial intelligence, fintech, viii) technology, ix) e-government, culture, structural equation modeling. From these thematic evaluations, we can conclude that the technology acceptance model significantly connects with technology adoption.

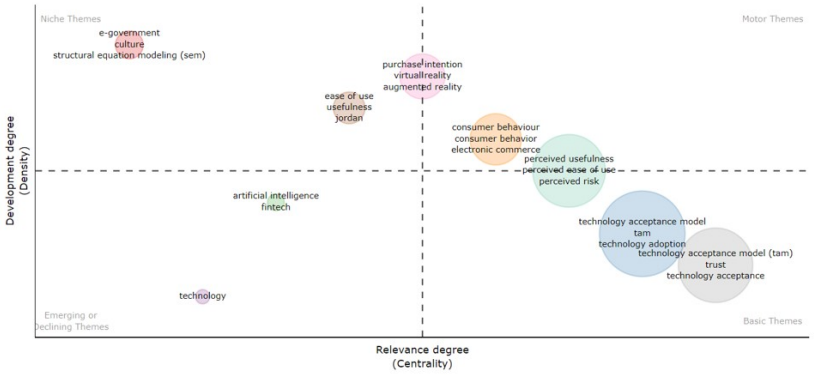


Figure 7. Thematic Mapping of TAM

4.10 Thematic Evaluation

In Figure 8, we present the thematic evaluation of TAM over time. The sixty-year journey of TAM is divided into two phases: from 2007 to 2018, and from 2019 to June 2023. In the early phase, TAM research was focused on acceptance, consumer behavior, the technology acceptance model, perceived usefulness, Web 2.0, internet shopping, and technology. Researchers and policymakers are highly focused on the last phase of TAM, as many technological innovations occur. The technology acceptance model, extended technology acceptance model, technology, theory of reasoned action, ease of use, perceived trust, consumer behaviour, diffusion of innovation, and adoption intention attracted researchers in the 2nd phase of TAM used from 2019 to 2023.

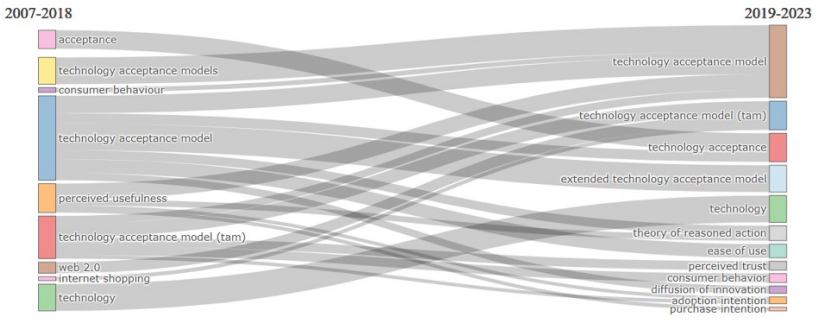
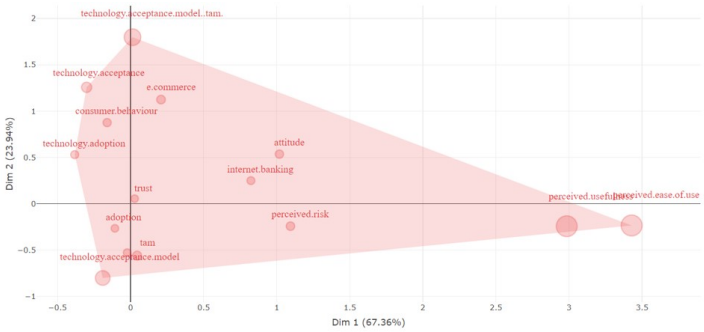


Figure 8. Thematic Evaluation of TAM

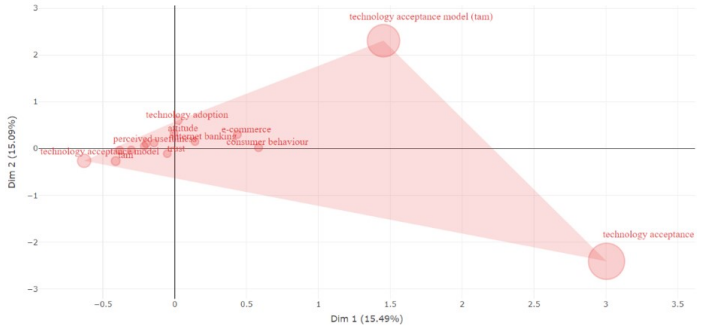
4.11 Conceptual Structure Map

This study also analyzed conceptual mapping using MCA and CA methods, presented in Figures 9(a) and 9(b). In Figure 9(a), we present the relationship structure of TAM by MCA methods with 15 keywords, including technology acceptance model, technology acceptance, perceived ease of use, perceived usefulness, technology adoption, consumer behaviour, trust, e-commerce, internet banking, attitude, perceived risk, adoption, and TAM. According to MCA methods, these are the most prominent technology adoption factors connected with the technology acceptance model.

According to CA methods, technology adoption, e-commerce, e-commerce, trust, consumer behaviour, and perceived usefulness are the most prominent factors connected with TAM.



(a) MCA methods



(b) CA methods

Figure 9. Conceptual Structure Map

4.12 Most Relevant Authors' Analysis

Table 6 presents the most relevant authors highly focused on the TAM area. This table shows that KIM J has the highest number of article producers in TAM, with 14 articles and 7.58 articles fractionalized (AF). DWIVEDI YK is the 2nd most contributor with 10 articles, 2.63 AF, and MENSAH IK is in 3rd position with 9 articles, 6.17 AF. Except them, PARK J with 9 articles and AF 3.00, LAW R with 8 articles and 2.58 AF, OOI K-B with 8 articles and 1.78 AF, RAMAYAH T with 8 articles and 1.82 AF, LEE J with 7 articles and 3.00 AF, LI Y with 7 articles and 1.79 AF and, RATEN V with 7 articles and 7.00 AF are top ten contributors in the area of TAM. From this analysis, researchers can understand who the most influential experts in TAM fields are. This information will help the researcher collaborate and guide their research.

Table 6. Most Relevant Authors in the Area of TAM

Authors	Articles	Articles Fractionalized
KIM J	14	7.58
DWIVEDI YK	10	2.63
MENSAH IK	9	6.17
PARK J	9	3.00
LAW R	8	2.58
OOI K-B	8	1.78
RAMAYAH T	8	1.82
LEE J	7	3.00
LI Y	7	1.79
RATTEN V	7	7.00

5 DISCUSSION

A sixteen-year journey from 2007 to June 2023 of the technology acceptance model as a bibliometric analysis paper provides valuable insight into the development and progress of TAM. This study provides a comprehensive overview of the TAM research landscape. Overall findings suggest that the TAM model has grown significantly over the past few years, with various studies conducted in this area and several technologies adopted. The two most prominent factors in predicting technology acceptance are perceived usefulness and ease of use. The reviews also identified other influencing factors, including social influence, perceived value, adoption, technology readiness, innovation and diffusion theory, consumer behavior, structural equation modeling, mobile communication systems, e-commerce, trust, and self-efficacy for influencing technology acceptance.

This study also highlights some emerging trends in TAM research, including increasing interest in studying technology adoption of new technologies such as mobile applications, and this finding supports previous literature [49]. The technology acceptance model remains the most relevant and influential model predicting technology acceptance, as evidenced by a large number of research studies conducted using the TAM model. Researchers are more focused on how other factors, like culture, social norms, and organizational policies, can influence technology acceptance.

From this study, we find that the USA and China are the leading contributors in the fields of TAM, both individual and collaborative production of scientific productions, as they are the houses of technological innovation. Besides the USA and China, various countries from all geopolitical locations, including Malaysia, India, Indonesia, South Korea, the UK, Spain, Australia, and Germany, also contributed to these fields, which indicates that TAM is now a global research concern. Most cited journals in this field are Technology Forecasting and Social Change, and the most cited document is Venkatesh V (2008) with 3834 citations. The study indicates that TAM is a rapidly growing research area, and in recent years, scientific research production in the field of TAM has been significant, and these findings support previous literature findings [11]. Over the last eight years, from 2017 to 2024, the total number of research publications amounts to 1324. Citation analysis, including total citations and average citations, indicates that TAM is the most cited research area.

This study suggests that there is a need for more research on the adoption of new technologies because new technologies are being developed and released at an unprecedented rate. Researchers need to better understand how new technologies are being developed and adopted, and how these technologies can be designed to be more acceptable to users.

6 IMPLICATIONS

6.1 Theoretical Implications

This research shows that TAM is highly used as a reliable and authentic model because of its widespread usability, adaptability, and relevance. As a fundamental model in technology information systems, TAM's application has been extended in various technological contexts like psychology, e-commerce, healthcare, education systems, business, marketing, and engineering [50]–[52]. Our study has reflected that the primary constructs of the TAM model (Perceived ease of use and perceived usefulness) have a common connection to understanding the adoption of technology, and behavioral intention (use behavior) is entirely described and maintained by the relevance and simplicity of the TAM model. The emerging trends and integration of new technologies, such as blockchain and artificial intelligence, have been aligned with implementing components of the TAM model for enhancing technology adoption in different domains [53], [54]. The study has explored how the theoretical implications of the TAM model can be remodified for further understanding and compatibility through integrating other established theories, including the Unified Theory of Acceptance and Use of Technology (UTAUT), the Innovation Diffusion Theory (IDT), and the Theory of Planned Behavior (TPB) theoretical frameworks. In addition, the analysis of citation structures presents valuable insights into the prominent researchers,

publications, and references within the field of technology adoption. So, the Technology Acceptance Model (TAM) implications highlight the necessity for a fundamental shift in our comprehension of technology adoption. By incorporating the viewpoints above, individuals can effectively traverse the ever-changing domain of technology and leverage its capacity for profound influence in diverse fields.

6.2 Practical Implications

The study's practical consequences offer practitioners, scholars, and policymakers a vital way to comprehend how the TAM model is shaped in several domains, including marketing, e-commerce platforms, education, healthcare, and medicine [50]–[55]. Valuable insights can be drawn from this bibliometric analysis, which focuses on the key drivers of the TAM model, such as perceived ease of use and perceived usefulness instigating successful integration and application of innovative technologies across a variety of technological and informational settings and contexts, including supply chain management software, library information system, cybersecurity solutions, machine learning, AI adoption, and healthcare and educational information systems [56]–[58]. Furthermore, the identification of the recognizable journals, authors, countries, and areas in TAM model research can assist academicians in understanding technology acceptance logically, help practitioners generate user-centric solutions, encourage the tactical application of scarce assets, and minimize adoption risks by decision-makers, which contributes to an atmosphere that is conducive to advancements in technology. From this bibliometric study, the powerful tools such as co-occurrence analysis, bibliographic coupling, and cluster analysis on the TAM model help the stakeholders in academia, industry, and policymakers to grasp the prevailing trends and ultimately contribute to informed decisions and strategies related to technology acceptance and adoption. Finally, this paper suggests that academicians should accommodate new technologies and user behaviors by updating the TAM model by considering the influence of the mediating and moderating variables while fostering technology adoption in a changing digital ecosystem; practitioners should actively incorporate TAM principles into user-centered development and change management.

7 CONCLUSIONS AND RECOMMENDATIONS

The Technology Acceptance Model (TAM) is a widely used theoretical framework for evaluating technology and information system acceptance and adoption. In the rapidly developing technological landscape, there is a growing demand for a comprehensive evaluation of TAM applications in scientific research. Previous Bibliometrics reviews of TAM have contributed to various areas of TAM. Still, some areas, including thorough assessment for all fields, recent trends, and practice of TAM to offer insights into widespread application and adoption of new technology, require further analysis. The purpose of this study is to explore the last sixteen years of research in the domain of TAM, including recent trends and practices of TAM, and to evaluate prominent contributors and contributions in the area of TAM. The study analysed 2014 articles from the Scopus database using advanced Bibliometrics analysis tools, including R Studio, Vosviewer, and biblioshiny. In this study, we extracted data from only the Scopus database. Though the Scopus database is more comprehensive, future researchers should expand the scope of the analysis, including other databases such as Web of Science and PubMed. The accuracy of bibliometrics analysis depends on the relevance of chosen keywords; in our study, we use some of the most prominent keywords. By excluding these, researchers can use more keywords for analysis. Technology is rapidly developing, and new technology is regularly adopted, so there is a regular analysis of recent trends in TAM. In our study, we used only those articles that use the English language, and we ignored articles not written in English. So, in the future, researchers can analyze articles that are not written in English, which will give a more comprehensive research overview of TAM. Our study analyses articles from 2007 to June 2023, where we ignored articles before 2007. Researchers can analyze data from the beginning use of TAM until they are given more accurate and appropriate guidelines for practitioners to recognize the most relevant articles based on the impact of citations. In the future, researchers may recognize relevant articles considering quality and other impactful issues.

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