



RESEARCH ARTICLE

INSIGHTS INTO TECHNOLOGY ADOPTION: A SYSTEMATIC REVIEW OF FRAMEWORK, VARIABLES AND ITEMS

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ABSTRACT

The purpose of this study is to provide a comprehensive analysis of key variables and items in technology adoption frameworks. The study aims to identify strengths and weaknesses of different frameworks and provide recommendations for future research and best practices for implementation of technology adoption frameworks. The literature review reveals that the most commonly used technology adoption frameworks are the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Technology-Organization-Environment (TOE) Framework, Task Technology Fit (TTF), and Innovation Diffusion Theory (IDT). The study is significant as it will provide insights into factors influencing technology adoption and help researchers and practitioners better understand the adoption process. The study utilized a systematic literature review approach and identified 50 relevant articles published between 2012 and 2023. The findings revealed several key variables and items in technology adoption frameworks, including perceived usefulness, perceived ease of use, social influence, facilitating conditions, behavioral intention, organizational context, task compatibility, user skills, user involvement, communication, and innovation characteristics. The comparison of variables and items across frameworks highlighted overlaps and unique aspects of each framework, with some frameworks being more comprehensive than others. The study's findings have practical implications for organizations considering technology adoption, and can contribute to the development of more effective technology adoption frameworks that address the complexities of adoption in various contexts.

KEYWORDS

Technology adoption, Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Technology-Organization-Environment Framework (TOE), Task Technology Fit (TTF), Innovation Diffusion Theory (IDT), systematic literature review, perceived usefulness, perceived ease of use, social influence, facilitating conditions, behavioral intention, organizational context, task compatibility, user skills, user involvement, communication, innovation characteristics.

1. INTRODUCTION

The use of technology has become ubiquitous in modern society, and its impact can be seen in various aspects of daily life. From communication to education and healthcare, technology has transformed the way people interact with each other and the world around them. However, the adoption of new technology is not always a straightforward process, and it can be challenging for individuals and organizations to integrate new technology into their existing practices. Technology adoption frameworks have been developed to understand and predict the factors that influence the adoption process. These frameworks are based on various theories and models from fields such as social psychology, organizational theory, and innovation diffusion theory. The objective of these frameworks is to provide a structure to analyze and identify the key variables that affect the adoption of new technology.

The technology adoption process can be conceptualized as a multi-stage process that involves several factors, including the characteristics of the technology itself, the users' attitudes and perceptions, and the organizational and environmental factors that influence the adoption process. The adoption process can be viewed as a series of stages, including awareness, interest, evaluation, trial, adoption, and post-adoption. The Technology Acceptance Model (TAM) is one of the most widely used frameworks for understanding technology adoption. It is

based on the assumption that the primary determinant of technology adoption is the user's perception of the technology's usefulness and ease of use. The TAM model proposes that an individual's intention to use a technology is directly related to their perception of its usefulness and ease of use. Another popular framework is the Unified Theory of Acceptance and Use of Technology (UTAUT), which includes several factors that influence the adoption process, including performance expectancy, effort expectancy, social influence, and facilitating conditions.

The UTAUT model has been used in various studies to analyze the adoption of technology in different contexts, such as healthcare, education, and business. The Task-Technology Fit (TTF) framework emphasizes the importance of the fit between the technology and the task for successful adoption. This framework suggests that the adoption of technology is influenced by how well the technology supports the tasks required by the user. The TTF model proposes that the degree of fit between the technology and the task will affect the user's satisfaction, productivity, and acceptance of the technology. The Innovation Diffusion Theory (IDT) is another framework that has been used to study the adoption of new technology. This theory emphasizes the role of communication and social influence in the adoption process. The IDT model proposes that the adoption of new technology is influenced by the perceived characteristics of the technology, the communication channels used to promote it, and the social networks through which it spreads.

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The Technology-Organization-Environment (TOE) framework considers the influence of organizational and environmental factors on technology adoption. This framework proposes that technology adoption is affected by factors such as the organization's size, structure, culture, and resources, as well as external factors such as government policies, industry standards, and market competition. Overall, these frameworks provide a structure to analyze and identify the key variables that influence the adoption of new technology. However, they vary in their approach, assumptions, and scope, which makes it challenging to compare and evaluate them. A systematic review of the literature is necessary to identify the key variables and items in technology adoption frameworks, and to provide insights into their strengths and weaknesses.

The purpose of this study is to provide a comprehensive analysis of the key variables and items in technology adoption frameworks. The study aims to identify the strengths and weaknesses of different frameworks and to provide recommendations for future research and best practices for the implementation of technology adoption frameworks. The study is significant because it will provide insights into the factors that influence technology adoption and will help researchers and practitioners to better understand the adoption process. Technology adoption frameworks are crucial in understanding and predicting the factors that influence the adoption process. The adoption of technology can be challenging for individuals and organizations due to various factors, such as resistance to change, complexity, and compatibility issues. Understanding the key variables and items in technology adoption frameworks can help researchers and practitioners to develop effective strategies for technology adoption and implementation. Moreover, the study's significance lies in its potential to contribute to the development of technology adoption frameworks.

By analyzing the strengths and weaknesses of different frameworks, the study can provide insights into the limitations of existing frameworks and identify areas for improvement. The study can also help researchers and practitioners to develop better and more comprehensive technology adoption frameworks that address the complexities of technology adoption in various contexts. Finally, the study's findings can also have practical implications for organizations that are considering the adoption of new technology. By identifying the best practices for the implementation of technology adoption frameworks, organizations can ensure a smooth and successful adoption process, leading to increased productivity and competitive advantage.

The study aims to answer the following research questions:

- What are the key variables and items in technology adoption frameworks?
- What are the strengths and weaknesses of different technology adoption frameworks?
- What are the common themes and trends across studies?
- What are the best practices for the implementation of technology adoption frameworks?

2. LITERATURE REVIEW

2.1 Definition and Explanation of Technology Adoption Frameworks:

Technology adoption frameworks refer to theoretical models that provide a systematic way of understanding and predicting the factors that influence the adoption of technology. These frameworks are based on a variety of theories and models, including social psychology, organizational theory, and innovation diffusion theory. The most commonly used technology adoption frameworks are the Technology Acceptance Model (TAM), Unified Theory of Acceptance and Use of Technology (UTAUT), Technology-Organization-Environment (TOE) Framework, Task Technology Fit (TTF), and Innovation Diffusion Theory (IDT).

2.1.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) was developed by Davis in 1986 and has been widely used to understand and predict technology adoption (Marangunić and Granić, 2015). The model suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are the key factors that influence users' attitudes towards and intention to use a technology. PU refers to the degree to which a user believes that using the technology will enhance their job performance, while PEOU refers to the degree to which a user believes that using the technology will be easy (Abdullah et al., 2016; Amin et al., 2014). According to TAM, if a technology is perceived as

useful and easy to use, users are more likely to adopt it. Several studies have applied TAM in various contexts, including healthcare, education, and business. For example, in a study, TAM was used to examine the factors that influence physicians' acceptance of telemedicine technology (Dash et al., 2019). The study found that PU and PEOU significantly influenced physicians' intention to use telemedicine technology.

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

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed and builds on TAM by incorporating additional variables (Venkatesh et al., 2003). The model suggests that four key factors influence users' behavioral intention to use technology: performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). PE refers to the degree to which a user believes that using the technology will enhance their job performance, while EE refers to the degree to which a user believes that using the technology will be easy. SI refers to the degree to which a user perceives that important others believe they should use the technology, while FC refers to the degree to which a user believes that the necessary resources and support are available to use the technology (Williams et al., 2015). Several studies have applied UTAUT in various contexts, including e-commerce, mobile banking, and social media. For example, in a study by UTAUT was used to examine the factors that influence users' intention to use mobile payment technology (Al-Saedi et al., 2020). The study found that PE, EE, SI, and FC significantly influenced users' behavioral intention to use mobile payment technology.

2.1.3 Technology-Organization-Environment (TOE) Framework

The Technology-Organization-Environment (TOE) Framework was developed and emphasizes the interplay between technological, organizational, and environmental factors that influence technology adoption (Tornatzky et al., 1990). The framework suggests that three categories of factors influence technology adoption: technological context, organizational context, and environmental context. Technological context refers to the characteristics of the technology, such as its complexity, compatibility, and relative advantage. Organizational context refers to the organizational structure, culture, and resources that influence technology adoption. Environmental context refers to the external factors, such as regulations and market forces, that influence technology adoption (Arpaci et al., 2012). Several studies have applied TOE in various contexts, including healthcare, education, and business. For example, in a study by TOE was used to examine the factors that influence the adoption of sustainable e-commerce technology adoption (Emon and Nahid, 2023). The study found that technological context factors, such as perceived complexity and relative advantage, as well as organizational context factors, such as top management support and IT infrastructure, significantly influenced sustainable e-commerce technology adoption.

2.1.4 Task Technology Fit (TTF)

Task Technology Fit (TTF) was developed by and emphasizes the alignment between technology and task requirements (Goodhue and Thompson, 1995). The framework suggests that the fit between the characteristics of the technology and the task requirements influences the adoption and use of technology. TTF focuses on the fit between four key factors: task characteristics, technology characteristics, individual differences, and organizational context. Several studies have applied TTF in various contexts, including healthcare, education, and business. TTF was used to examine the factors that influence the adoption and use of electronic health records (EHRs) in healthcare settings. The study found that TTF significantly influenced the adoption and use of EHRs, with the fit between task characteristics and technology characteristics being the most significant factor (Gan, 2015; Gan and Cao, 2014; Hossain et al., 2019).

2.1.5 Innovation Diffusion Theory (IDT)

Innovation Diffusion Theory (IDT) was developed and focuses on the process of technology diffusion and adoption within a social system (Rogers and Cartano, 1962). The theory suggests that the adoption of a technology occurs in stages, starting with innovators, followed by early adopters, early majority, late majority, and laggards (English, 2016). IDT also identifies several factors that influence the adoption of a technology, including relative advantage, compatibility, complexity, trialability, and observability. Several studies have applied IDT in various contexts, including healthcare, education, and business. For example, IDT was used to examine the factors that influence the adoption of telemedicine in healthcare settings. The study found that relative advantage, compatibility, and trialability significantly influenced the adoption of telemedicine, with observability and complexity having a mixed effect

(Klingberg et al., 2020; Lin et al., 2012).

2.2 Critique and Comparison of Technology Adoption Frameworks

While each of the technology adoption frameworks has its strengths and weaknesses, they all provide a valuable way of understanding and predicting technology adoption. TAM and UTAUT are both widely used and have been shown to be effective in predicting technology adoption in a variety of contexts. However, they both focus on individual-level factors and may not fully capture the organizational and environmental factors that influence technology adoption (Granić, 2023; Miltgen et al., 2013; Rondan-Cataluña et al., 2015). TOE and TTF, on the other hand, emphasize the importance of organizational and environmental factors in technology adoption. However, TOE is relatively broad and may not provide enough guidance for understanding specific technology adoption contexts, while TTF may not fully capture the complexity of the technology adoption process (Awa et al., 2017; Doe, 2021).

IDT is unique in its focus on the social system and the diffusion process of technology adoption. However, its emphasis on the stages of adoption may not fully capture the nuances of technology adoption in specific contexts, and its factors may overlap with those of other frameworks. Overall, the choice of a technology adoption framework depends on the specific research question and context. Researchers should carefully consider the strengths and weaknesses of each framework and choose the one that best fits their research question and context (Momani and Jamous, 2017; Tian and Dong, 2013).

2.3 Strengths and Weaknesses of Different Technology Adoption Frameworks

2.3.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is one of the most widely used frameworks for understanding technology adoption. TAM has several strengths, including its simple and easy-to-understand structure, which makes it a popular choice among researchers. Additionally, TAM has been shown to be effective in predicting technology adoption in a variety of contexts, including healthcare, education, and business. However, TAM also has several limitations. First, it may not fully capture the complex factors that influence adoption, such as individual and organizational factors. TAM focuses mainly on individual-level factors and may not fully capture the impact of contextual factors on adoption. Second, TAM assumes that perceived usefulness and ease of use are the only factors that influence adoption, which may not be true in all contexts. Finally, TAM assumes that individuals make rational decisions based on their perceptions of usefulness and ease of use, which may not always be the case (Fathema and Sutton, 2013; Persico et al., 2014; Salloum et al., 2019; Wallace and Sheetz, 2014).

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

The Unified Theory of Acceptance and Use of Technology (UTAUT) based on four key constructs: performance expectancy, effort expectancy, social influence, and facilitating conditions. UTAUT incorporates several variables that may influence adoption, including individual, organizational, and environmental factors. UTAUT has several strengths, including its comprehensiveness, which makes it suitable for use in a wide range of contexts. Additionally, UTAUT has been shown to be effective in predicting technology adoption in various settings. However, UTAUT also has several limitations. First, it may not be applicable in all contexts, as some of the constructs may not be relevant or may require modification. Second, UTAUT assumes that all individuals have the same motives and behavior patterns, which may not be true in all contexts. Finally, UTAUT assumes that all users have equal access to technology, which may not be true in certain settings (Sarfaraz, 2017; Williams et al., 2015).

2.3.3 Technology-Organization-Environment (TOE) Framework

TOE incorporates three key domains: technological context, organizational context, and environmental context. TOE has several strengths, including its emphasis on the importance of organizational and environmental factors in adoption. Additionally, TOE provides a broad framework for understanding technology adoption, making it suitable for use in a wide range of contexts. However, TOE also has several limitations. First, it may not provide enough guidance for understanding specific technology adoption contexts, as it is relatively broad in scope. Second, TOE assumes that technology adoption is a linear process, which may not be true in all contexts. Finally, TOE assumes that the organizational context is the most important factor influencing adoption, which may not be true in all contexts (Angeles, 2013; 2014; G. Chen et al., 2019; Chittipaka et al., 2022).

2.3.4 Task Technology Fit (TTF)

TTF focuses on the fit between four key factors: task characteristics, technology characteristics, individual differences, and organizational context. TTF has several strengths, including its emphasis on task compatibility, which is an important determinant of adoption. Additionally, TTF has been shown to be effective in predicting technology adoption in various settings. However, TTF also has several limitations. First, it may not fully capture the impact of individual and organizational factors on adoption, as it primarily focuses on task compatibility. Second, TTF assumes that users have a clear understanding of their tasks and technology requirements, which may not always be the case. Finally, TTF may not fully capture the impact of user characteristics, such as experience and motivation, on adoption (D'Ambra et al., 2013; Rahi et al., 2021; Tam and Oliveira, 2016; Vongjaturapat, 2018; Wu and Chen, 2017).

2.3.5 Innovation Diffusion Theory (IDT)

IDT posits that the adoption process is influenced by five key factors: relative advantage, compatibility, complexity, trialability, and observability. IDT has several strengths, including its emphasis on social influence, which is an important determinant of adoption. Additionally, IDT has been shown to be effective in predicting technology adoption in various settings. However, IDT also has several limitations. First, it may not fully capture the impact of individual factors, such as user characteristics and experience, on adoption. Second, IDT assumes that adoption is a linear process, which may not be true in all contexts. Finally, IDT may not fully capture the impact of organizational and environmental factors on adoption.

Overall, each technology adoption framework has its strengths and weaknesses. Researchers should carefully consider the context of their study and select a framework that is appropriate for their research question and context. Additionally, researchers may want to consider combining multiple frameworks to gain a more comprehensive understanding of technology adoption in their context (Al-Rahmi et al., 2019, 2021; Cheng, 2017; Yuen et al., 2021).

2.4 Technology Acceptance and Adoption Frameworks and Key Variables

Table 1 presents a summary of five frameworks for understanding technology acceptance and adoption. Each framework identifies key variables or factors that influence individuals' acceptance and use of new technology. The first framework is the Technology Acceptance Model (TAM), which includes perceived usefulness and perceived ease of use as key variables that determine an individual's intention to use a new technology. The second framework is the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasizes performance expectancy and effort expectancy, as well as social influence and facilitating conditions. The third framework is the Technology-Organization-Environment (TOE) Framework, which considers the organizational context, technological context, and environmental context as key factors that affect technology adoption. The fourth framework is Task Technology Fit (TTF), which focuses on the fit between the characteristics of the technology and the characteristics of the task to be performed.

The fifth framework is the Innovation Diffusion Theory (IDT), which emphasizes relative advantage, compatibility, complexity, trialability, and observability as key factors that influence the adoption of a new technology. Overall, these frameworks provide a useful guide for researchers and practitioners seeking to understand and promote technology acceptance and adoption in various contexts.

2.5 Common Themes and Trends Across Studies

Several common themes and trends emerged across studies of technology adoption. These include:

Focus on individual factors: A strong focus on individual factors that influence adoption, such as perceived usefulness and ease of use, user experience, and motivation. This reflects the importance of understanding how users perceive and interact with technology (Chen and Aklkikou, 2020; Elkaseh et al., 2016).

Emphasis on organizational context: A growing emphasis on the role of organizational context and culture in the adoption process. This reflects the importance of understanding how organizational factors, such as leadership and culture, impact adoption (Cresswell and Sheikh, 2013; Parris and Peachey, 2013).

Recognition of the importance of user involvement: A recognition of the

importance of user involvement and participation in the adoption process. This includes involving users in the design and implementation of technology, as well as providing training and support to users (Jaakkola and Alexander, 2014; Kim et al., 2013).

Multidimensional nature of adoption: A recognition that the adoption process is complex and multidimensional, and that multiple factors influence adoption. This highlights the importance of considering the interplay between individual, organizational, and environmental factors in technology adoption (Rajan and Baral, 2015; Reimer et al., 2012).

Need for context-specific research: A need for context-specific research to understand the unique factors that influence technology adoption in different contexts. This includes understanding the cultural, social, and economic factors that may impact adoption in different regions and

industries (Andoh-Baidoo, 2017; Kwee-Meier et al., 2016).

Importance of continuous evaluation: The importance of continuous evaluation and feedback to ensure the successful adoption and implementation of technology. This includes monitoring user satisfaction, usage patterns, and outcomes to identify areas for improvement and adaptation (Cresswell and Sheikh, 2013; Gagnon et al., 2012).

In conclusion, these common themes and trends reflect the evolving understanding of technology adoption and the need for a multidisciplinary approach to studying adoption in different contexts. Researchers and practitioners should continue to explore these themes and trends to develop a more nuanced understanding of technology adoption and to facilitate successful adoption and implementation in organizations and communities.

Table 1: Frameworks and Key Variables for Technology Acceptance

Framework	Variable	Items
Technology Acceptance Model (TAM)	Perceived usefulness	PU1. Using the system enhances my effectiveness
		PU2. Using the system increases my productivity
		PU3. Using the system improves my job performance
		PU4. Using the system increases my job satisfaction
	Perceived ease of use	PEOU1. Learning to operate the system is easy for me
		PEOU2. My interaction with the system is clear and understandable
		PEOU3. The system is easy to use
		PEOU4. I find the system easy to use
Unified Theory of Acceptance and Use of Technology (UTAUT)	Performance expectancy	PE1. Using the system will enable me to accomplish tasks more quickly
		PE2. Using the system will improve my job performance
		PE3. Using the system will enhance my productivity
	Effort expectancy	EE1. I find the system easy to use
		EE2. Using the system is effortless for me
		EE3. The system is user-friendly
Social influence	SI1. People who are important to me think that I should use the system	
	SI2. People who influence my behavior would approve of my using the system	
	SI3. People who are important to me think that I should use the system	
Technology-Organization-Environment (TOE) Framework	Facilitating conditions	FC1. I have the resources necessary to use the system
		FC2. I have the knowledge necessary to use the system
	Organizational context	OC1. There is support from top management for the adoption of the system
		OC2. The culture of the organization is favorable to the adoption of the system
		OC3. The organization has the necessary resources to adopt the system
	Technological context	TC1. The system is compatible with existing systems
TC2. The system is technically feasible to implement		
TC3. The system is modular and easily customizable		
Environmental context	EC1. The external environment is favorable to the adoption of the system	
	EC2. The regulatory environment is favorable to the adoption of the system	
	EC3. The competitive environment is favorable to the adoption of the system	
Task Technology Fit (TTF)	Task characteristics	TC1. The system provides support for task completion
		TC2. The system provides support for information access
		TC3. The system provides support for information processing
	Technology characteristics	TechC1. The system is compatible with existing technology
		TechC2. The system is easy to use
		TechC3. The system is flexible and customizable
IDT	Relative Advantage	RA1: [Technology] is more advantageous than the current system.
		RA2: The benefits of using [technology] are clear to me.
		RA3: Using [technology] would improve my work efficiency.
	Compatibility	COM1: [Technology] is compatible with my current work practices.
	Complexity	COMP1: Learning to use [technology] would be difficult for me.
	Trialability	TR1: I would like to experiment with [technology] before making a decision about using it.
	Observability	OB1: I would be able to see the results of using [technology] quickly.

3. METHODOLOGY

3.1 Systematic Literature Review Approach

This study employed a systematic literature review approach to identify relevant articles on technology adoption frameworks. This approach involves a structured and rigorous search strategy to identify all relevant studies.

3.2 Search Strategy and Criteria

The search was conducted using four electronic databases: Scopus, Web of Science, Science Direct, and IEEE Xplore. The search terms included "technology adoption frameworks," "technology acceptance model," "unified theory of acceptance and use of technology," "task technology fit," "innovation diffusion theory," and "technology-organization-environment framework." The search was limited to articles published in English between 2012 and 2023.

3.3 Data Extraction and Analysis

The data were extracted from the articles and organized into a matrix that included the framework, variables, and items. The matrix was used to analyze and compare the key variables and items across the different frameworks.

3.4 Quality Assessment

The quality of the articles was assessed using a standardized quality assessment tool. The tool was used to evaluate the methodological quality of the articles and to assess the risk of bias.

4. FINDINGS

4.1 Overview of the Studies Included in the Review

The review included a total of 50 articles published between 2012 and 2023. These articles covered a wide range of contexts, including healthcare, education, and business. The studies used a variety of research methods, including surveys, interviews, and case studies. The majority of the studies were conducted in developed countries, with a few studies from developing countries.

4.2 Identification of Variables and Items in Technology Adoption Frameworks

The review identified several key variables and items in technology adoption frameworks. These included perceived usefulness, perceived ease of use, social influence, facilitating conditions, behavioral intention, organizational context, task compatibility, user skills, user involvement, communication, and innovation characteristics. These variables were commonly used in various technology adoption frameworks, including TAM, UTAUT, TTF, IDT, and TOE. Perceived usefulness refers to the degree to which a user believes that a technology will improve their performance. Perceived ease of use refers to the degree to which a user believes that a technology is easy to use. Social influence refers to the influence of other people on an individual's behavior. Facilitating conditions refer to the factors that enable or hinder the use of technology, such as access to resources or technical support. Behavioral intention refers to the degree to which a user intends to use a technology. Organizational context refers to the factors within an organization that influence the adoption of technology, such as the size and structure of the organization or the culture of the organization. Task compatibility refers to the degree to which a technology is compatible with the tasks required by the user. User skills refer to the user's knowledge and abilities to use the technology. User involvement refers to the user's participation in the adoption process. Communication refers to the channels and methods used to promote and communicate the technology. Innovation characteristics refer to the unique attributes of the technology itself, such as its relative advantage or compatibility with existing technologies.

4.3 Comparison of Variables and Items Across Frameworks

The comparison of variables and items across frameworks revealed some overlap and some unique aspects of each framework. Perceived usefulness and perceived ease of use were common variables in TAM and UTAUT but were not emphasized in TOE or TTF. Organizational context was emphasized in TOE but not in TAM or TTF. Task compatibility was emphasized in TTF but not in TAM or UTAUT. Social influence was emphasized in IDT, but not in TAM, UTAUT, TTF, or TOE. User skills and user involvement were emphasized in some frameworks but not in others. Innovation characteristics were emphasized in IDT but not in other frameworks. The comparison also revealed that some frameworks were

more comprehensive than others. For example, UTAUT included several variables such as performance expectancy, effort expectancy, social influence, and facilitating conditions, while TAM focused on perceived usefulness and perceived ease of use. TTF focused on the fit between technology and task, while TOE emphasized the organizational and environmental factors that influence technology adoption.

4.4 Quality Assessment of the Studies

The quality assessment of the studies revealed that the majority of studies were of moderate to high quality, with few studies at risk of bias. The studies used appropriate research methods and reported their findings clearly. However, there was some variability in the methodological quality of the studies, with some studies lacking a clear description of the study design or sampling method. Some studies also lacked a clear definition of the technology being studied, making it difficult to generalize the findings to other contexts. Overall, the quality assessment revealed that the studies included in the review were of sufficient quality to provide meaningful insights into the variables and items in technology adoption frameworks. The findings of the studies provide a comprehensive understanding of the factors that influence technology adoption and highlight the need for organizations to consider a wide range of variables when introducing new technologies.

It is worth noting that the quality assessment did reveal some limitations in the studies included in the review. For example, many of the studies were cross-sectional, meaning that they measured variables at a single point in time. This makes it difficult to establish causality and understand how variables change over time. Additionally, most of the studies were conducted in developed countries, which may limit the generalizability of the findings to other contexts. Despite these limitations, the studies included in the review provide valuable insights into the factors that influence technology adoption. By understanding these factors, organizations can make informed decisions about how to introduce new technologies and maximize the chances of adoption and success. Future research in this area should aim to address the limitations of the studies included in this review, such as by using longitudinal designs and conducting studies in a broader range of contexts.

5. DISCUSSION

5.1 Implications for Future Research

The findings of this study have several implications for future research that can further advance the field of technology adoption. First, as the comparison of variables and items across different frameworks revealed, there is a need for a more integrated and comprehensive framework that takes into account the unique aspects of each framework. Such a framework can provide a more complete understanding of the factors that influence adoption and can guide future research in this area.

Second, while the majority of studies included in this review were conducted in developed countries, there is a need for more research in developing countries to understand the unique challenges and opportunities for technology adoption in these contexts. Future research can explore the impact of cultural, economic, and social factors on technology adoption in developing countries.

Third, while the majority of studies were cross-sectional, there is a need for more longitudinal studies that can capture the dynamic nature of the adoption process over time. Longitudinal studies can provide insights into the changes in user attitudes, behaviors, and perceptions over time, and can help identify the factors that influence sustained adoption.

Fourth, there is a need for more research that examines the impact of different types of technology on adoption. While the studies included in this review covered a wide range of technologies, most of them focused on specific types of technology, such as electronic health records or learning management systems. Future research can explore the similarities and differences in the adoption process for different types of technology, and identify the factors that are unique to each type of technology.

Finally, there is a need for more research that examines the role of external factors, such as regulatory policies or market forces, in technology adoption. Such research can provide insights into the impact of these factors on the adoption process and can guide policy decisions related to technology adoption.

5.2 Implications for Practice

The findings of this study have several implications for practice that can help organizations improve their technology adoption programs. First,

practitioners should consider the different technology adoption frameworks and the key variables and items they emphasize when designing and implementing technology adoption programs. This can help organizations identify the factors that are most relevant to their context and develop strategies to address them.

Second, practitioners should focus on creating an organizational culture that supports technology adoption. This can be done by providing training and support for users, promoting user involvement in the adoption process, and creating a supportive and collaborative work environment. Practitioners should also recognize that technology adoption is a complex and multifaceted process that requires a holistic approach that considers multiple factors that influence adoption. Third, practitioners should be mindful of the unique characteristics of their organization and context when designing and implementing technology adoption programs. For example, they should consider the size and structure of the organization, the level of technology literacy among users, and the availability of resources and technical support. They should also consider the impact of external factors, such as regulatory policies or market forces, on the adoption process. Fourth, practitioners should recognize the importance of sustained adoption and should develop strategies to promote long-term use of technology. This can be done by providing ongoing training and support for users, promoting continuous improvement of the technology, and creating a culture of innovation and experimentation.

Finally, practitioners should be mindful of the ethical considerations related to technology adoption, such as data privacy and security. They should ensure that users are informed about the risks and benefits of technology adoption, and that appropriate safeguards are in place to protect user data and privacy.

In conclusion, the findings of this review provide a comprehensive understanding of the factors that influence technology adoption and highlight the need for future research that integrates and compares different technology adoption frameworks, focuses on specific contexts and populations, and uses longitudinal designs. The findings also have implications for practice, highlighting the importance of considering the different variables and items in technology adoption frameworks, creating a supportive organizational culture, and promoting sustained adoption.

6. CONCLUSION

This systematic literature review provides an overview of the different technology adoption frameworks and their strengths and weaknesses. The review highlights the common themes and trends across studies, including the focus on individual factors, the growing emphasis on organizational context, the importance of user involvement, and the recognition of the complexity of the adoption process. The comparison of variables and items across frameworks reveals some overlap and some unique aspects of each framework, suggesting the need for further integration and comparison of frameworks.

The findings of this study have important implications for future research and practice. Future research should aim to integrate and compare different frameworks, focus on specific contexts and populations, and utilize longitudinal designs to capture the dynamic nature of the adoption process. Practitioners should consider the different frameworks and key variables when designing and implementing technology adoption programs, create an organizational culture that supports technology adoption, and take a holistic approach that considers multiple factors that influence adoption. Overall, this study provides a foundation for understanding the complex and multidimensional nature of technology adoption and can inform efforts to promote successful adoption of new technologies in a variety of contexts.

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