

## Role of Perceived Ease of Use and Perceived Usefulness in Adoption of Mobile Computing Technology

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**ABSTRACT:** The adoption of mobile computing technology is examined in this theoretical research article in relation to perceived usefulness and ease of use. It investigates how these constructs affect user behaviour and decision-making processes with regard to mobile computing, drawing on the Technology Acceptance Model (TAM). The paper offers a conceptual understanding of technology adoption in the mobile era by synthesizing research data with current theoretical frameworks. In addition to providing implications for developers, educators, and politicians, the discussion highlights how important these perceptions are in determining user intents.

**KEYWORDS:** Mobile Computing, Perceived usefulness, Perceived ease of use, Technology Acceptance Model, Adoption of mobile computing.

### INTRODUCTION

Mobile computing technologies have become essential tools in the digital age, impacting almost every aspect of both personal and professional life. The reach and influence of mobile computing are extensive and constantly growing, including wearable technology, cloud-based apps, smartphones, and tablets. These technologies redefine the conventional boundaries of work, education, and social contact by enabling users to access information, communicate, and complete tasks at any time and from any location. Jung, Y. (2014). The quick spread of mobile devices has raised a lot of interest in learning what motivates people to embrace and incorporate these tools into their daily lives. Adoption is determined by how people view the technology's usefulness and usability rather than only by the presence of cutting-edge features or creative designs. In this regard, Davis's (1989) Technology Acceptance Model (TAM) offers a solid theoretical framework for investigating these dynamics. Venkatesh, V., & Davis, F. D. (2000)

TAM suggests that two primary theories—Perceived Ease of Use (PEOU) and Perceived Usefulness (PU)—influence an individual's attitude toward using a technology, which subsequently affects their behavioral intention to adopt it. Wang, Y. S., (2006). PEOU measures how much a person thinks utilising a technology will be effortless, whereas PU measures how much they think the technology will improve their performance or quality of life. Users' acceptance and continuous use of mobile computing technologies are greatly influenced by these two constructs. Davis, F. D. (1989). The purpose of this paper is to investigate the theoretical foundations of PEOU and PU in the context of mobile computing. The study aims to give a thorough knowledge of how these perceptions influence adoption behaviours by combining insights from conceptual models and previous research. This underlines important factors for developers, educators, and policymakers who want to encourage the efficient and broad adoption of mobile computing technologies. Park, E., & Kim, H. (2014).

The discussion begins with an overview of the Technology Acceptance Model, followed by an analysis of mobile computing trends. The functions of PEOU and PU are then explored, along with their respective and combined impacts on the adoption of technology. The study concludes with recommendations for further study and practical consequences, highlighting the continued significance of TAM in the dynamic field of mobile computing. Venkatesh, V.(2003).

### OBJECTIVES

1. To examine the role of perceived ease of use and perceived usefulness in the adoption of mobile computing technology.
2. To understand the interrelationship between perceived ease of use and perceived usefulness in the adoption of mobile computing technology.

### THEORETICAL FRAMEWORK

**Technology Acceptance Model (TAM)** The Technology Acceptance Model (TAM) is a theory that explains how individuals accept and use technology. Davis (1989) developed the Technology Acceptance Model (TAM), which has been crucial in figuring out how people utilise information technology. It suggests that two key factors, perceived usefulness and perceived ease of use, influence a user's attitude towards using a technology, which in turn, impacts their intention to use it and ultimately their actual use of the technology. The Technology Acceptance Model is based on the Theory of Reasoned Action (TRA) and assumes that the acceptance of a technology is influenced by user attitudes formed by their perceptions. Perceived Usefulness (PU) refers the degree to which a user thinks that utilising a specific technology will enable them to accomplish their objectives or enhance their work. Whereas Perceived Ease of Use (PEOU) is the extent to which a user believes that using a particular technology will be easy and effortless. Davis, F. D. (1989). These factors have a direct impact on users' willingness to accept innovation, making them the most important predictors of technology adoption behaviour. With the introduction of new concepts like social impact, enabling circumstances, and hedonic motivation, TAM has developed throughout time through a number of expansions, including TAM2, TAM3, and the Unified Theory of Acceptance and Use of Technology (UTAUT) Zhou, T. (2011). Venkatesh, V., & Davis, F. D. (2000).

The fundamental components of TAM are still very applicable in the context of mobile computing, where portability, flexibility, and on-the-go access are critical. In addition to user trust, mobile technology requires instant usefulness and intuitive design. As a result, TAM remains a crucial perspective that researchers use to analyse the behavioural foundations of digital adoption. Recent research has also indicated that PEOU may have an indirect effect on PU. This link emphasises how user-friendliness improves the way users engage with different features, which in turn makes the technology seem more beneficial. Kim, B. (2010). These concepts influence the user's attitude towards the technology, which in turn influences their behavioural intention to utilise the system. Wang, Y. S.(2006). TAM has been extended and used to a range of technologies, including mobile computing, in order to predict customer acceptability. Recent iterations of the TAM have included elements like as perceived enjoyment, trust, and self-efficacy, which increase the model's explanatory power in contemporary mobile contexts. Chong, A. Y. L. (2013).

### MOBILE COMPUTING TECHNOLOGY

Mobile computing refers to the ability to use computing devices wirelessly and remotely. Mobile apps, cloud computing, Internet of Things (IoT) devices, and wireless networks are just a few of the many technologies it includes. These technologies enable users to access information and services anytime and anywhere, creating a seamless digital experience. Lu, J., et al(2003); Wang, Y. S.(2009). The widespread adoption of mobile devices has transformed sectors such as education, healthcare, retail, banking, and government services. COVID-19 pandemic further accelerated this trend, encouraging more businesses and people to use mobile-first solution. The study of PEOU and PU is becoming more and more relevant, nevertheless, because user adoption is still dependent on opinions about usability and utility despite technological developments. The mobile revolution has reshaped the landscape of communication, commerce, education, and governance, enabling users to interact with digital services ubiquitously. Mobile computing can now handle sophisticated applications like real-time video streaming, e-commerce transactions, AI-based personal assistants, and cloud-based productivity tools thanks to advancements in wireless connection technologies like 4G, 5G, and Wi-Fi 6 Lu, J., et al(2003); Chong, A. Y. L. (2013). These aspects underline the revolutionary importance of mobile technology in contemporary society by enabling healthcare, digital banking, personalised learning, and work-from-anywhere environments. The COVID-19 pandemic and other worldwide events have further accelerated the rise in mobile use. Mandates for remote work and lockdowns forced people and companies to rely more on mobile platforms. Global digital studies state that the use of mobile devices has overtaken that of desktop computers and is increasing annually, especially in emerging economies.

Although access is widely available, user adoption varies. Perceived usefulness and usability have a big impact. For instance, younger users can accept mobile platforms if they believe they might be useful for entertainment or productivity, whereas adults may avoid them because they are unfamiliar with them. Therefore, creating inclusive, user-friendly mobile technologies that close digital gaps and promote broad acceptance requires an understanding of the behavioural and psychological aspects of adoption, especially PEOU and PU. Venkatesh, V.(2003)

### ROLE OF PERCEIVED EASE OF USE IN MOBILE COMPUTING ADOPTION

Users' willingness to adopt mobile computing is largely determined by perceived ease of use, or PEOU. Simplicity in design increases the likelihood that users will engage with, investigate, and incorporate mobile technology into their regular routines. PEOU affects first impressions and is especially important when adoption is just getting started. The design elements contributing to PEOU include natural navigation, consistent layout, minimal learning curves, and responsive performance. Iqbal, S., & Qureshi, I. A. (2012). Features like guided onboarding, voice assistance, and context-aware help systems further alleviate cognitive load, making technologies feel less intimidating and more accessible. For users with limited technical backgrounds, a simplified interface can be the difference between adoption and rejection. Davis, F. D. (1989)

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From a psychological perspective, users are more at ease and confident when they perceive a system to require less work. In industries where accuracy and trust are crucial, such as healthcare, finance, and education, this effect becomes much more significant. For instance, even if a mobile banking software is fast or secure, customers may be stopped from making transactions if it is hard to use. Baptista, G., & Oliveira, T. (2015). On the other hand, a well-designed software increases user pleasure and promotes recurring use. Alalwan, A. A., Dwivedi, Y. K., & Rana, N. P. (2017). Additionally, studies show that PEOU is strongly associated with lower levels of anxiety and higher levels of self-efficacy, particularly in elderly users. Furthermore, regular upgrades that streamline features, fix usability issues, and incorporate user input can maintain and even enhance PEOU over time. High perceived ease of use is therefore not only a design principle but also a strategic necessity for promoting the adoption of mobile computing across a range of demographic groups Al Amin, M., Muzareba, A. M., Chowdhury, I. U., & Khondkar, M. (2023).

Users' acceptance of mobile computing is significantly influenced by perceived ease of use. A mobile application or gadget is more likely to be adopted and used by users if they find it easy to use. The perception of ease of use is influenced by a number of factors, including system stability, compatibility with other devices, user interface design, and usefulness. Studies have shown that interfaces that require minimal effort to learn and operate significantly reduce the load on users. This impression increases confidence and improves the user experience, which raises the possibility of adoption. Moreover, when users encounter fewer barriers in accessing the technology, their satisfaction and trust in the system grow. Users are more satisfied and have greater faith in the system when they face fewer obstacles when utilising the technology. Over time, perceived ease of use is further strengthened by regular upgrades that streamline functions and take user input into account. Venkatesh, V. (2003).

### ROLE OF PERCEIVED USEFULNESS IN MOBILE COMPUTING ADOPTION

Perceived usefulness is another vital determinant of adoption. Users are more motivated to adopt technologies that they believe will improve their productivity, efficiency, or overall quality of life. In mobile computing, perceived usefulness often establishes in the form of faster communication, real-time information access, and convenience in executing tasks. For instance, professionals may find mobile devices useful for managing work-related activities on the go, while students may use them for learning purposes. Apps that provide scheduling, collaboration, note-taking, and file sharing capabilities enable users to remain productive regardless of location. Mobile platforms are useful in the healthcare industry since they assist with vital sign monitoring, prescription reminders, and telehealth service connections. PU is strongly linked to both personal objectives and situational demands. A student might find value in language learning applications that improve academic achievement, while a small business owner might view mobile accounting apps as helpful for on-the-go financial management. Both situations make utility the main driver of frequent and ingrained use. Iqbal, S., & Qureshi, I. A. (2012)

Additionally, people are more inclined to suggest mobile technology to others when they believe it is essential to reaching goals like time savings, increased convenience, or improved accuracy. The adoption rates can be greatly increased by this word-of-mouth effect. Therefore, whether through marketing, trial versions, or user case studies, developers and organisations must properly explain and illustrate the advantages of their technology. PU is a key component in the diffusion of mobile computing since it serves as both an emotional and logical rationale for technological adoption.

### INTERRELATIONSHIP BETWEEN PEOU AND PU

PEOU and PU have a high correlation, according to research. People are more likely to find a system useful if they believe it to be simple to use. The argument is that simplicity of use increases a product's usefulness by lowering the amount of work needed to accomplish a desired result. According to this relationship, system design advancements that increase usability may also have a favourable effect on perceived utility, which could result in increased adoption rates. Furthermore, this link is especially important in high-stakes or frequently used applications like digital banking and healthcare monitoring. If a mobile system is difficult to use, consumers may never find its full capabilities or benefits, even if the technology is intrinsically powerful. In this approach, PEOU serves as a doorway to PU. This association is further supported by empirical research. It has been discovered that PEOU significantly predicts PU, which in turn influences behavioural intention to use, in a variety of mobile adoption settings. Product designers and developers must therefore see these components as interrelated levers rather than as separate entities. Improving one frequently enhances the other, increasing the possibility of long-term customer pleasure and adoption. Therefore, ease of use makes it easier to interact with the technology more deeply and uncovers its true potential. Davis, F. D. (1989).

**Implications for Practice** Understanding the roles of PEOU and PU can guide stakeholders in promoting mobile computing adoption:

- **For Developers:** User experience (UX) must be given top priority in design, which means that accessible features, simple processes, and minimalistic design are crucial. To make sure that interfaces meet the varied needs of users, iterations should be guided by regular usability testing. Improving the application's usability not only lowers abandonment rates but also makes its full potential visible.

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- **For Educators and Trainers:** Both the "how" and the "why" of mobile computing should be addressed in training programs. Demonstrating the practical advantages of mobile technology must go hand in hand with teaching consumers how to use them. Both PEOU and PU are improved by this dual strategy, particularly for low-income groups or older persons.
- **For Policymakers:** Affordability and usability must be taken into account in government programs that promote digital inclusion. Policy frameworks have the potential to encourage the creation of citizen-centric mobile services, support local language interfaces, and encourage open standards. Through community training initiatives, public-private partnerships can also help decrease the digital literacy gap.
- **Business Leaders:** Companies need to show their value propositions and match their mobile strategy to consumer expectations. Cross-platform compatibility, real-time assistance, and customised notifications are examples of features that improve usability and perceived value. Users will be more engaged and loyal to businesses who view mobile computing as a strategic advantage rather than a passing fad.

## LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

A number of limitations should be noted, even if this theoretical article provides an in-depth investigation of the features of perceived usefulness (PU) and ease of use (PEOU) in the adoption of mobile computing technologies. First of all, the study is conceptual in nature and mostly draws from theoretical models and previously published works. The insights' applicability to particular user groups or industry contexts is limited in the absence of empirical data collection. Future research should examine both qualitative and quantitative approaches to verify the theoretical claims made here. Park, E., & Kim, H. (2014). Constructs including trust, social influence, habit, personal inventiveness, and technological anxiety are becoming more and more significant in mobile environments, where social trends and privacy concerns greatly affect user behavior. Al Amin, M., Muzareba, A. M., Chowdhury, I. U., & Khondkar, M. (2023). For a more comprehensive understanding, these constructions could be included in future models together with PEOU and PU. Examining how attitudes towards PEOU and PU change over time in response to emerging technologies requires longitudinal study. Mobile technology adoption patterns vary greatly between regions, age groups, and socioeconomic segments. Wang, Y. S. (2009). The expanded TAM framework could be useful for future study in areas including financial technology (fintech), smart cities, mobile healthcare, and mobile education. Venkatesh, V., & Davis, F. D. (2000).

## CONCLUSION

Perceived ease of use and perceived usefulness are foundational to understanding the adoption of mobile computing technologies. The Technology Acceptance Model remains a relevant and practical framework for examining user behavior in this domain. Stakeholders aiming to increase adoption must focus on designing technologies that are both easy to use and clearly beneficial to users. In summary, the concepts of perceived usefulness (PU) and perceived ease of use (PEOU) continue to be essential to understanding how users adopt mobile computing technology. These perspectives influence users' attitudes, intentions, and eventually their actions with relation to adopting technology, as the Technology Acceptance Model (TAM) illustrates. Wang, Y. S. (2006). Easy-to-use and clearly helpful technologies have greater acceptance rates and longer user engagement in the fiercely competitive and changing mobile market. Adoption may be limited if a mobile device is considered to be helpful yet challenging to use. Therefore, maintaining success in mobile marketplaces requires balancing both constructs.

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