International Journal of Social Science Research and Review

http://ijssrr.com
editor@ijssrr.com
Volume 9, Issue 3
March, 2026
Pages: 420-449

Does Attitude Matter in Enhancing Use Behavior of the e-Procurement System in Developing Countries? Perceptions of Buyers and Suppliers from Tanzania

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http://dx.doi.org/10.47814/ijssrr.v9i3.3275

Abstract

Despite prevalent application of e-procurement systems in developing countries, their sustained and effective use remains limited, particularly due to behavioral resistance among procurement stakeholders and low user engagement. While prior studies have mainly emphasized organizational and technical factors, the attitudinal dimension influencing post-adoption use behavior is still under considered, especially in e-procurement contexts. This study addresses this gap by examining the determinants of use behavior of e-procurement systems in developing countries, focusing on Tanzania from the perspectives of both buyers and suppliers. Grounded in the modified Unified Theory of Acceptance and Use of Technology (UTAUT), the study emphasizes the mediating role of Attitude in shaping user behavior following e-procurement system adoption. The study collected data from 384 respondents comprising buyers and suppliers selected using stratified sampling and by adopting a deductive research approach and an explanatory cross-sectional survey design. Data were gathered through documentary review and a structured questionnaire, and analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of SmartPLS 4 software. The findings reveal that Performance Expectancy, Social Influence, and Attitude all exert statistically significant effects on Use Behavior ($p < 0.05$). Notably, Performance Expectancy influences Use Behavior both directly and indirectly through Attitude, while Social Influence affects Use Behavior only indirectly, mediated fully by Attitude. These findings highlight the role of user attitude as a cognitive-affective screen through which perceived usefulness and social influence translate into actual system usage. The study offers a novel theoretical contribution by validating Attitude as a central mediating construct in the extended UTAUT model, moving beyond traditional intention-based models to emphasize real-world use behavior. This insight provides a more complete and Behaviourally grounded understanding of digital technology adoption. Practically, the

results inform policymakers and system designers about the importance of nurturing positive user attitudes through ongoing change management and targeted capacity-building in e-procurement adoption contexts. Such efforts are vital to refining the long-term effectiveness and sustainability of e-procurement initiatives in developing countries, Tanzania in particular.

Keywords: *Attitude; e-Procurement System; Performance Expectancy; Social Influence; Use Behavior*

1.0 INTRODUCTION

The application and continuous use of technological innovations, particularly in developing countries, often depend on the perceptions and expectations of users (Dwivedi et al., 2017; Dwivedi et al., 2020). Globally, user behavior toward new technologies is shaped by their beliefs about the technology's performance benefits, social influence and the effort required to use it effectively (Dwivedi et al., 2017; Wang et al., 2021). The Unified Theory of Acceptance and Use of Technology (UTAUT) and its extended versions highlight several key factors influencing technology adoption, including performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2003; Venkatesh et al., 2012). Among these, user attitude has increasingly been recognized as a crucial mediator between these factors and actual usage behavior (Chen et al., 2011; Dwivedi et al., 2017; Al-Sayid & Kirkil, 2025). UTAUT is a leading framework for explaining why people accept and use new technologies and it integrates eight prior acceptance models (Venkatesh et al., 2003). In longitudinal studies, it was noted that validation across multiple organizations, UTAUT explained about 69–70% of the variance in intention to use Information Technology (IT), outperforming each source model (Venkatesh et al., 2003). However, UTAUT applications often explain less variance than the original due to context issues (Dwivedi et al., 2011; Dwivedi et al., 2017; Blut et al., 2022). On the other hand, the revised models emphasize attitude as a central mediator between beliefs and behavior (Dwivedi et al., 2017; Dwivedi et al., 2020). Furthermore, UTAUT2 extends UTAUT for consumers by adding constructs like price value, and habit, boosting explained variance in intention from 56% to 74% (Venkatesh et al., 2012; Tamilmani et al., 2021; Venkatesh et al., 2016; Taneja & Bharti, 2021).

Although existing studies have extensively examined the direct impact of performance and Social Influence on technology adoption (Almajali, 2023; Gambo et al., 2019; Singh & Chan, 2022), there is a lack of clarity on how attitude mediates the relationship between these expectations (performance and social influence) and actual usage behavior, particularly in e-procurement contexts. Few empirical studies have isolated and measured the indirect effects of performance and Social Influence on e-procurement use behavior through users' attitudes, especially in developing countries (Matano et al., 2020; Shahin et al., 2022).

Moreover, while the original and modified UTAUT models (Venkatesh et al., 2003; Dwivedi et al., 2017) incorporate behavioral intention and facilitating conditions as primary determinants of use behavior, they have largely ignored the direct role of attitude as a predictor of actual technology use. The modified UTAUT does acknowledge attitude as having an indirect influence**,** but its direct effect on use behavior remains underexplored and unconfirmed in procurement settings (Dwivedi et al., 2017; Dwivedi et al., 2020).

To fill this gap, the current study examines the direct influence of user attitude on the use behavior of e-procurement systems among buyers and suppliers from Tanzania. Grounded in the modified UTAUT model, this study contributes to both theory and practice by proposing that performance expectancy and Social Influence not only shape attitudes but also have an indirect effect on use behavior through these attitudes. In doing so, it challenges and extends the prevailing technology adoption models by

highlighting attitude as an important and quantifiable determinant of e-procurement system application. Figure 1 presents the modified UTAUT model adopted from Dwivedi et al. (2017), which serves as the theoretical foundation for this study.

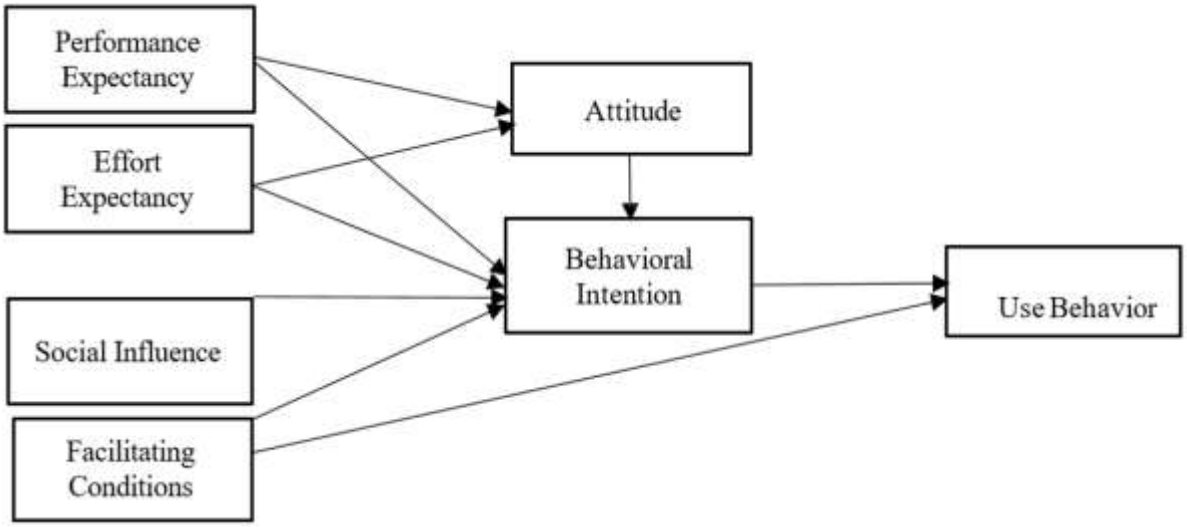


Figure 1: Modified UTAUT
Source: Adopted from Dwivedi et al. (2017)

1.1 Use Behavior

Use behavior refers to the actual actions, interactions, and usage patterns individuals exhibit when engaging with a specific technology, service, or system (Farzin et al., 2021; Wang & Qi, 2021; Harborth et al., 2020). It encompasses not only the frequency and consistency of system utilization but also the depth of engagement, such as the range of features used and the level of integration into routine tasks. In technology adoption research, use behavior serves as a critical outcome variable, reflecting whether users have successfully transitioned from initial acceptance to sustained usage often considered a key determinant of long-term implementation success.

On the other hand, use behavior is consistently explained by a combination of individual, social, organizational, and structural factors, often mediated by behavioral intention (LoParco et al., 2025; Wahyudi & Wardani, 2025; Da Graca Ambrosio et al., 2025; Lu, 2025; Raza et al., 2025; Nurbasari et al., 2025; Sadeghi-Bazargani et al., 2025; Lissah et al., 2025; Tang et al., 2025; De Jonge et al., 2025; Shrestha et al., 2025; Colburn et al., 2025; Ju & Wang, 2025; De Moraes Oliveira et al., 2025; Hristova et al., 2025). In the context of this study, use behavior refers to the actual and continued use of the e-procurement system by both suppliers and buyers. It reflects buyers' and suppliers' willingness and commitment to incorporate e-procurement systems into their daily operational practices, beyond mere mandated use or trial. Importantly, use behavior in this context is not only a function of technical capability or system availability but is also extremely influenced by the attitudinal nature of the users toward use of the new technology.

While traditional models like the Unified Theory of Acceptance and Use of Technology (UTAUT) primarily emphasize performance expectancy, effort expectancy, and facilitating conditions as predictors of technology use (Dwivedi et al., 2017; Dwivedi et al., 2020), they often understate the direct role of attitude as a behavioral driver. On the other hand, the modified UTAUT model by Dwivedi et al. (2017) acknowledges attitude as an indirect influencer but does not explicitly capture its direct influence on actual use behavior particularly in complex, institutional settings like e-procurement systems in developing countries.

This study addresses this critical gap by theorizing that the use behavior of suppliers and buyers is directly influenced by their attitudes toward the e-procurement system, the linkage which has inadequate considered in previous literature (Dwivedi et al., 2017; Dwivedi et al., 2020). A positive attitude characterized by a belief in the system's ease of use, usefulness, and value addition was expected to improve the possibility of consistent and voluntary usage. On the other hand, negative perceptions or skepticism may hinder full adoption or usage of e-procurement, regardless of system capabilities or institutional mandates.

Moreover, the study posits that performance expectancy and Social Influence also influence use behavior indirectly through their impact on attitude. That is, if suppliers and buyers believe the e-procurement system is beneficial and easy to use, they are more likely to develop a promising attitude, which in turn motivates usage behavior. This mediated linkage has less been considered in the existing e-procurement literature, particularly in the context of developing countries like Tanzania, where adoption is often hindered by contextual barriers such as resistance to change, inadequate infrastructure and limited digital literacy (Shatta, 2023; Shatta & Mabina, 2024)

Understanding use behavior through this study is vital not only for theoretical refinement but also for practical application. By recognizing attitude as a key mediating factor, policymakers and system designers can better modify interventions to stand-in positive user perceptions through awareness campaigns and targeted training of users thereby enhancing the system’s effectiveness and long-term sustainability.

1.2 The Effect of Performance Expectancy on Attitude and on Use Behavior

Performance expectancy refers to the degree to which users believe that employing a particular technology will lead to improvements in task execution, efficiency, or productivity (Dwivedi et al., 2017; Venkatesh et al., 2003). In the specific context of e-procurement systems, Shatta (2023) defines performance expectancy as the extent to which system usage provides tangible advantages such as streamlined workflows, cost reductions, improved transparency, and time savings particularly for suppliers operating within public procurement environments. Building on this, the current study adopts a broader view and defines performance expectancy as the perceived benefits that both buyers and suppliers derive from using e-procurement systems in their procurement activities. These benefits may include reduced paperwork, enhanced procurement speed, lower transaction costs, better traceability, and overall process efficiency factors that are important in resource-constrained environments like Tanzania. Previous studies assert that, performance expectancy consistently improves attitudes and Behavioural intentions, and often directly increases use behaviour (Ramadhina et al., 2025; Suyanto et al., 2024; Hendrajaya et al., 2024; Alfianti et al., 2025; Yuliantie, 2024; Refsi & Soma, 2025; Shatta & Mabina, 2024; Hamdi, 2025; Vaddhano, 2024; Saputri et al., 2024; Zhao et al., 2025; Permatasari et al., 2025; Khowaja et al., 2025; Faida et al., 2022).

A wide body of literature (Refsi & Soma, 2025; Shatta & Mabina, 2024; Hamdi, 2025; Vaddhano, 2024; Saputri et al., 2024; Zhao et al., 2025; Permatasari et al., 2025; Khowaja et al., 2025) highlights the strong, positive influence of performance expectancy on both user attitudes and technology adoption behavior across various technological domains, including enterprise systems, mobile services, and e-government platforms (Dwivedi et al., 2017; Shaikh et al., 2018). Within the modified Unified Theory of Acceptance and Use of Technology (UTAUT) by Dwivedi et al. (2017), performance expectancy is positioned as a key determinant of users’ cognitive evaluations and, consequently, their attitudes toward technology. Empirical findings from this model consistently reveal statistically significant path coefficients, confirming a strong and direct relationship between performance expectancy and user attitude. For instance, Shatta (2023) found that performance expectancy significantly influenced both the attitude and procurement performance using e-procurement platforms. These results were supported by

quantitative data revealing positive and significant path coefficients, suggesting that users who perceive the technology as advantageous are more likely to form favourable attitudes, which in turn enhance procurement performance. These findings converge that perceiving a system as easy to use usually improves attitudes, intentions, and ultimately use behaviour, often via mediating attitudes or intentions (Suyanto et al., 2024; Hendrajaya et al., 2024; Alfianti et al., 2025; Yuliantie, 2024; Refsi & Soma, 2025).

Despite such evidence, much of the prior literature (Ramadhina et al., 2025; Suyanto et al., 2024; Hendrajaya et al., 2024; Alfianti et al., 2025; Yuliantie, 2024; Refsi & Soma, 2025; Shatta & Mabina, 2024; Hamdi, 2025; Vaddhano, 2024; Saputri et al., 2024; Zhao et al., 2025; Permatasari et al., 2025; Khowaja et al., 2025; Faida et al., 2022) has predominantly explored direct effects from performance expectancy to intention or adoption without thoroughly examining indirect or mediated relationships. This study addresses that gap by suggesting that performance expectancy not only directly shapes user attitudes but also indirectly affects actual use behavior through those attitudes. In other words, this study theorized that when users (both buyers and suppliers) perceive that e-procurement system will improve their procurement-related tasks, they are more likely to develop a positive attitude toward the system, which subsequently translates into voluntary and sustained usage. This mediated relationship was particularly appropriate in developing countries, where skepticism about technological interventions is often high due to resistance to change, poor infrastructure or previous failed implementations. By better understanding how performance expectancy shape attitudes and, in turn, use behavior, implementing agencies like Public Procurement Regulatory Authority and the government of Tanzania can refine their deployment strategies by clearly communicating about the system and its benefits to the current users. In addition, demonstrating successful outcomes to potential users particularly buyers and suppliers.

Based on the arguments of the previous literature (Dwivedi et al., 2017; Yuliawati & Kurniawan, 2021;Ramadhina et al., 2025; Suyanto et al., 2024; Hendrajaya et al., 2024; Alfianti et al., 2025; Yuliantie, 2024; Refsi & Soma, 2025; Shatta & Mabina, 2024; Hamdi, 2025; Vaddhano, 2024; Saputri et al., 2024; Zhao et al., 2025; Permatasari et al., 2025; Khowaja et al., 2025; Faida et al., 2022) on the influence of performance expectancy on attitude and use behavior, the following hypotheses were formulated to guide empirical testing in this study:

H1a: Performance Expectancy (PE) positively and directly effects attitude (AT) of buyers and suppliers towards Use Behavior of e-Procurement System
H1b: Performance Expectancy (PE) positively and indirectly effects Use Behavior (UB) of e-Procurement System through the attitude (AT) of buyers and suppliers

1.3 The Effect of Social Influence on Attitude and on Use Behavior

Social Influence refers to the degree of ease associated with the use of a particular system or technology (Dwivedi et al., 2017). It captures users' perceptions concerning the simplicity or complexity of learning or operating a given technological solution (Dwivedi et al., 2017; Venkatesh et al., 2003). According to Venkatesh et al. (2003), Social Influence reflects an individual's sense of how easy it is to use a technology. Similarly, Dwivedi et al. (2017) emphasize that when users perceive a system as easy to understand and operate, they are more inclined to accept and adopt it. In this study, Social Influence is defined as the perceived ease of use of the e-procurement system by both buyers and suppliers, on all sides of aspects such as clarity of functions, user interface design, system navigation, and overall user-friendliness.

Across the information systems and technology adoption literature (Islam et al., 2024; Wang et al., 2024; Vaddhano, 2024; Suyanto et al., 2024; Rizkalla et al., 2024; Kim et al., 2024; Hendrajaya et al., 2024; Piekema et al., 2024; Alfianti et al., 2025; Permatasari et al., 2025; Polyportis & Pahos, 2024; Saputra et al., 2025; Nuswantoro et al., 2024; Zaman et al., 2025; Yanti et al., 2025; Obenza et al., 2024;

Rasid et al., 2024; Yuliawati & Kurniawan, 2021), Social Influence has consistently emerged as a key determinant of behavioral intentions (Dwivedi et al., 2017; Venkatesh et al., 2003; Shatta, 2023). Technologies that are perceived to be intuitive and require minimal learning effort are more likely to foster positive user perceptions and facilitate faster adoption. This is particularly relevant in developing countries like Tanzania, where users may face additional challenges such as lack of prior exposure to ICT-based systems, limited digital literacy and inadequate technical training.

Social influence, therefore, plays a double role as a cognitive evaluation that directly shapes users' intention to use the system; and as an indirect enabler of sustained usage through its influence on users' intention to use the technology (Dwivedi et al., 2017). As demonstrated in prior empirical studies (Alfianti et al., 2025; Permatasari et al., 2025; Polyportis & Pahos, 2024; Saputra et al., 2025; Nuswantoro et al., 2024; Zaman et al., 2025; Yanti et al., 2025; Obenza et al., 2024; Rasid et al., 2024), the easier a system is to use, the more positively users tend to evaluate it, leading to increased willingness to adopt and integrate it into daily operations (Shaikh et al., 2018). This bring into line with the modified Unified Theory of Acceptance and Use of Technology (UTAUT) model which recognizes Social Influence as a significant antecedent of users' intention and, indirectly, of use behavior (Dwivedi et al., 2017). However, in contexts where ease of use is taken for granted, Social Influence can become less influential relative to performance, policy factors, social, or trust (Islam et al., 2024; Wang et al., 2024; Vaddhano, 2024; Suyanto et al., 2024; Rizkalla et al., 2024; Kim et al., 2024; Hendrajaya et al., 2024; Piekema et al., 2024; Alfianti et al., 2025; Permatasari et al., 2025; Polyportis & Pahos, 2024; Saputra et al., 2025; Nuswantoro et al., 2024; Zaman et al., 2025; Yanti et al., 2025; Obenza et al., 2024; Rasid et al., 2024).

While these relations are well-established in mobile service and consumer technology adoption (Alfianti et al., 2025; Permatasari et al., 2025; Polyportis & Pahos, 2024; Saputra et al., 2025; Nuswantoro et al., 2024; Zaman et al., 2025; Yanti et al., 2025), their implications for institutional systems such as e-procurement especially in the public sector remain underexplored (Shatta, 2023; Shatta &Mabina, 2024). In procurement contexts, where both compliance with regulatory and technical accuracy are essential, system complexity can be a critical barrier to adoption (Shatta, 2023). If buyers and suppliers perceive the e-procurement system as overly technical, poorly designed, or requiring substantial effort to learn, their attitude may become negative, regardless of the system's functional benefits. This, in turn, can hinder system utilization and reduce overall efficiency.

To address this issue, the current study suggests that Social Influence influences use behavior indirectly through its effect on user attitude. That means that, when the system is perceived as easy to use by the society, it creates a more positive attitude among buyers and suppliers, which then increases the probability of continued engagement with the e-procurement system. This understanding is important for system designers and policymakers aiming to improve adoption rates and ensure the sustainability of procurement digitization initiatives in developing countries, Tanzania in particular. The following hypotheses were proposed to guide empirical testing in this study:

H_{2a}: Social Influence (SI) positively and directly effects attitude (AT) of buyers and suppliers
H_{2b}: Social Influence (SI) positively and indirectly effects Use Behavior (UB) of e- Procurement System through the attitude (AT) of buyers and suppliers

1.4 The Effect of Attitude on Use Behavior

Attitude is widely recognized in prior literature (Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024; Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025; Egner et al., 2024; Ayvazyan, 2025; Peterková & Il'ko, 2024; SathishJ & Thiruchelvi, 2024) as a fundamental psychological construct that reflects an individual's evaluative orientation either favorable or unfavorable towards a particular object, concept, or behavior. According to Dwivedi et al. (2017) attitude is defined as a

psychological tendency expressed by evaluating a particular entity with some degree of favor or disfavor. It serves as a lens through which individuals interpret and respond to their environment, shaping both their perceptions and behavioral intentions (Shatta &Mabina, 2024). Attitudes are not only evaluative in nature expressing likes or dislikes but also inherently motivational, influencing the direction, intensity, and persistence of individual actions (Shatta, 2023).

In the context of technology adoption, particularly within organizational and institutional frameworks, attitude represents a user's predisposition to respond positively or negatively to the idea of using a technological system (Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024; Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025; Egner et al., 2024; Ayvazyan, 2025; Peterková & Iľko, 2024; SathishJ & Thiruchelvi, 2024). It bridges the gap between cognitive evaluations (e.g., perceived usefulness and ease of use) and behavioral responses (e.g., system utilization or resistance). Positive attitudes typically arise when users perceive a technology as beneficial, user-friendly, and aligned with their goals or values; negative attitudes, on the other hand, often emerge in response to perceived complexity, unreliability, or lack of relevance (Shatta, 2023). Attitude consistently emerges as a driver of use behaviour and intentions in many domains such as in higher education (Obenza et al., 2024; Paudel & Acharya, 2024) to predict intention to use artificial intelligence, online food delivery (Ramba & Pratomo, 2024) and sustainable behaviour (Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025). In the context of this study, attitude is defined as the cognitive and emotional disposition of buyers and suppliers toward the use of the e-procurement system, surrounding their beliefs about its value, trustworthiness, usability, and relevance to their roles. A promising attitude implies openness to learning and using the system, while an unfavorable one may result in minimal engagement or even avoidance despite institutional mandates (Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025).

While much of the traditional technology acceptance literature such as the original UTAUT model (Venkatesh et al., 2003) emphasized constructs like performance expectancy, effort expectancy, and social influence, attitude was not explicitly included as a core determinant of use behavior. However, in later extensions of the model such as the modified UTAUT by Dwivedi et al. (2017) and prior empirical studies (Paudel & Acharya, 2024; Pradana & Marsasi, 2024; Ramba & Pratomo, 2024; Deshpande, 2024; Arafa et al., 2024; Shaliha & Marsasi, 2024; Obenza et al., 2024; Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024; Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025;Egner et al., 2024; Ayvazyan, 2025; Peterková & Iľko, 2024; SathishJ & Thiruchelvi, 2024), attitude has been recognized as a crucial mediating variable. Currently its direct influence on actual use behavior remains underexplored, especially in areas like e-procurement where adoption often involves resistance to technological change, institutional mandates and compliance pressures. This study seeks to fill this theoretical and empirical gap by locating attitude as a direct predictor of use behavior within the context of e-procurement system adoption in Tanzania.

A growing body of empirical research (Paudel & Acharya, 2024; Pradana & Marsasi, 2024; Ramba & Pratomo, 2024; Deshpande, 2024; Arafa et al., 2024; Shaliha & Marsasi, 2024; Obenza et al., 2024; Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024; Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025;Egner et al., 2024; Ayvazyan, 2025; Peterková & Iľko, 2024; SathishJ & Thiruchelvi, 2024) supports the significant role of attitude in shaping both behavioral intentions and actual usage patterns. For example, Dwivedi et al. (2017) revealed a statistically significant and positive relationship between attitude and behavioral intention in various technological contexts. Similar results have been reported by Shatta and Mabina (2024) who demonstrated that users with positive attitudes are not only more likely to accept new technologies but are also more inclined to use them regularly and efficiently.

Despite these findings, few studies have examined this relationship within the specific setting contexts (Paudel & Acharya, 2024; Pradana & Marsasi, 2024; Ramba & Pratomo, 2024; Deshpande, 2024; Arafa et al., 2024; Shaliha & Marsasi, 2024; Obenza et al., 2024; Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024) where often marked by resistance from digital infrastructure limitations, rooted manual systems and low levels of user trust in technology. In such environments,

attitude may play an even more noticeable role, serving as a psychological buffer and amplifier of other adoption-related factors such as perceived usefulness (Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024; Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025; Egner et al., 2024; Ayvazyan, 2025; Peterková & Il'ko, 2024; SathishJ & Thiruchelvi, 2024).

Therefore, this study proposes that the attitude of buyers and suppliers has a direct and positive influence on their use behavior of the e-procurement system, a substance that has not been adequate considered in prior studies (Paudel & Acharya, 2024; Pradana & Marsasi, 2024; Ramba & Pratomo, 2024; Deshpande, 2024; Arafa et al., 2024; Shaliha & Marsasi, 2024; Obenza et al., 2024; Nazirova & Borbala, 2024; Iranmanesh et al., 2024; Zhang et al., 2024; Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025;Egner et al., 2024; Ayvazyan, 2025; Peterková & Il'ko, 2024; SathishJ & Thiruchelvi, 2024). By establishing this linkage empirically, the study not only contributes to the theoretical improvement of the UTAUT context but also offers practical insights for system developers and policymakers aiming to increase system acceptance and user satisfaction. The following hypothesis was theorized to guide empirical testing in this study:

H3: Attitude (AT) positively and directly influences Use Behavior (UB)

1.5 Conceptual Model of the Study

The conceptual model was developed to evaluate the assumptions about the effect of performance expectancy, social influence, and attitude on the use behavior of e-procurement system of buyers and suppliers. Figure 2 shows the conceptual model of the study based on both theoretical and empirical perspectives from the existing literature.

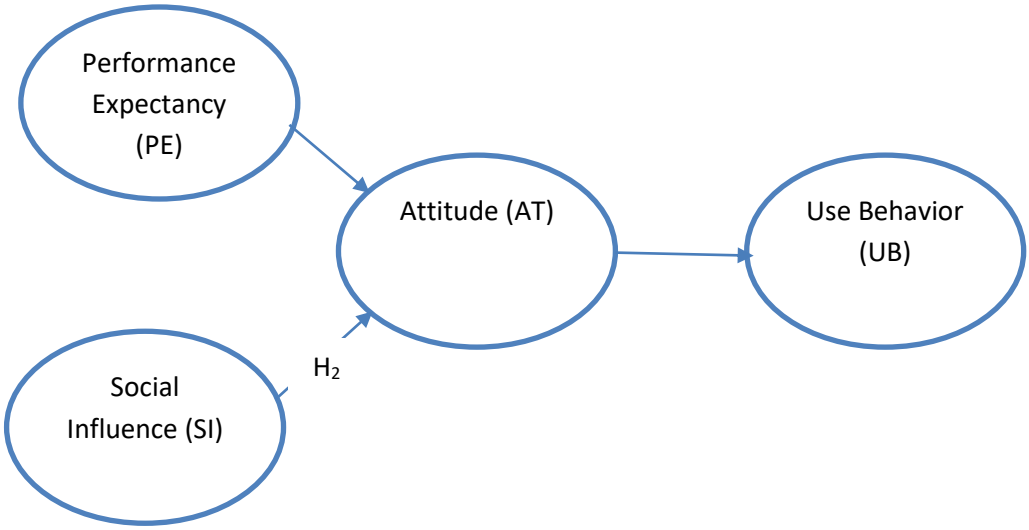


Figure 2: Conceptual Model
Source: Adapted from Dwivedi et al. (2017)

1.6 Mathematical Model for Operationalization of the Conceptual Model

To operationalize the conceptual model and empirically test the hypothesized relationships among constructs, the study employed a partial least squares structural equation modeling (PLS-SEM), applying the mathematical formula: $x = \lambda Y + \varepsilon$. This model is widely used in behavioral and social science research to represent the relationship between unobserved variables and their corresponding observed indicators (Sarstedt et al., 2022; Shatta, 2023; Shatta & Mabina, 2024). In this mathematical formula: x

denotes the vector of observed indicators, which are directly measurable variables derived from survey items or empirical data collection tools. Y represents the latent variable, an underlying construct that is not directly observable such as "Attitude", "Performance Expectancy", "Social Influence", or "Use Behavior" but is inferred through its effect on the observed indicators. λ signifies the factor loading matrix, which quantifies the strength and direction of the relationship between each observed variable and the corresponding latent construct. Higher loadings suggest that the observed indicator is a strong reflection of the latent construct. ε captures the random measurement error, accounting for variability in the observed indicators that cannot be explained by the latent variable.

By modeling latent variables in this way, the study addresses issues of measurement validity and reliability, which are particularly important in studies involving psychological constructs such as user attitude, perceptions, and behavioral intent. This approach enables the differentiation between true construct variance and measurement error, leading to more accurate and interpretable results. In the context of this study, constructs such as Social Influence, Performance Expectancy, Attitude, and Use Behavior are treated as latent variables. Each is measured through a set of validated observed indicators derived from prior studies and adapted to the e-procurement context in Tanzania. For instance, "Attitude" was measured through items assessing users' feelings of satisfaction, trust, and favorability toward the usage of e-procurement system. The application of this model not only provides statistical rigor but also allows for the testing of mediated relationships, such as the indirect effect of performance expectancy on use behavior through attitude. By capturing both direct and indirect effects within a unified statistical model, the study contributes to a more understanding of the behavioral mechanisms that drive or hinder e-procurement system adoption in a developing-country context.

2.0 METHODOLOGY

The adoption of a positivist research philosophy supported the methodological design of this study, aligning with the causal relationships hypothesized within the proposed conceptual framework. Positivism emphasizes quantifiable observations and the use of scientific methods to test theories, making it particularly suitable for studies involving structured models and hypothesis testing, such as the current study into the use behavior of e-procurement systems.

To test the formulated hypotheses, the study employed a cross-sectional and explanatory survey research design. This approach enabled the collection of data from a targeted population of buyers and suppliers involved in using e-procurement system in Tanzania at a single point in time. A cross-sectional design was deemed appropriate due to its efficiency in capturing attitudes, perceptions, and behavioral intentions across a defined sample, without the need for longitudinal tracking (Shatta, 2023).

Data collection was conducted through a structured survey methodology, utilizing closed-ended questionnaires to ensure consistency and facilitate statistical analysis. This method is widely recognized for its effectiveness in obtaining large volumes of quantifiable data, allowing for the application of both descriptive and inferential statistics. The questionnaire was developed based on validated constructs from prior studies and tailored to the e-procurement context.

To determine an appropriate sample size for robust analysis using Partial Least Squares Structural Equation Modeling (PLS-SEM)**,** the study adopted the "10-times rule" as proposed by Hair et al. (2019). According to this rule, the minimum sample size should be ten times the the highest number of indicators for any exogenous construct, whichever is greater. In this study, the exogenous variables “Performance Expectancy and Social Influence” were each measured by four indicators, resulting in a minimum required sample size of 40 respondents. However, to enhance statistical power and generalizability, the final sample comprised 384 respondents, far exceeding the threshold and meeting the recommended criteria for model estimation accuracy and path coefficient stability.

Survey items were coded numerically, and the collected data were subjected to initial screening and cleaning. Descriptive statistics including frequency distributions, means, and standard deviations were used to analyze respondents' demographic profiles and basic response patterns. This preliminary analysis was conducted using IBM SPSS Statistics Version 26.

For hypothesis testing and model evaluation, the study employed PLS-SEM using SmartPLS 4 software, which is especially suitable for predictive research**,** complex models, and non-normal data distributions. PLS-SEM allows for simultaneous estimation of measurement and structural models and is widely used in information systems and technology adoption research for its flexibility and robustness.

To address issues related to missing data, the extra response method within SmartPLS 4 was utilized. Specifically, a value of 99 was assigned as a placeholder for 20 missing data points across the collected questionnaires. This method facilitates the clear distinction between observed and unobserved data, ensuring that missing values do not distort estimation results. The decision to use this placeholder aligns with the recommendations of Hair et al. (2019), who note that proper coding of missing data supports model reliability and internal validity.

2.1 Measurement and Structural Model Evaluation Using PLS-SEM

This study employed Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess both the measurement and structural models, using SmartPLS 4 software**.** The decision to use PLS-SEM was informed by the nature of the research model**,** the exploratory nature of the study**,** and the presence of latent variables measured through reflective indicators**.** Reflective measurement models are characterized by the assumption that observed indicators are manifestations of their underlying latent constructs. In this study, all constructs namely Performance Expectancy, Social Influence, Attitude, and Use Behavior were operationalized using reflective indicators**,** making PLS-SEM an appropriate analytical approach. The evaluation of the measurement model (outer model) and structural model (inner model) was conducted following the guidelines and criteria proposed by Hair et al. (2019). The assessment of the reflective measurement model was carried out in four major stages:

2.1.1 Indicator Reliability

Each indicator's outer loading on its respective construct was examined to ensure that it reliably reflected the latent variable. A threshold value of 0.708 was adopted, as loadings above this value indicate that the indicator explains at least 50% of the variance in the latent construct (Hair et al., 2019). Indicators with loadings below this threshold were reviewed for potential removal, provided that their exclusion did not compromise construct validity.

2.1.2 Internal Consistency Reliability

To assess the consistency of responses across items measuring the same construct, Composite Reliability (CR) was used as it offers a more accurate estimate for PLS-SEM. A composite reliability score above 0.70 was considered acceptable, indicating that the set of indicators adequately captures the construct (Hair et al., 2019).

2.1.3 Convergent Validity

The Average Variance Extracted (AVE) was calculated for each construct to measure the extent to which the indicators collectively capture the variance of their associated latent construct. An AVE value

of 0.50 or higher was considered evidence of adequate convergent validity, as it indicates that at least 50% of the variance in the indicators is attributable to the construct (Hair et al., 2019).

2.1.4 Discriminant Validity

To confirm that constructs were empirically distinct from one another, discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) of correlations. An HTMT value below 0.90 was used as the cut-off criterion, indicating that each construct shares more variance with its indicators than with other constructs (Hair et al., 2019).

Upon establishing the reliability and validity of the measurement model, the structural model was evaluated to test the hypothesized relationships between the latent variables. The following criteria were used to assess the model:

2.1.5 Collinearity Assessment

To ensure that multicollinearity did not distort the structural relationships, Variance Inflation Factor (VIF) values were examined for all predictor constructs. According to Hair et al. (2019), VIF values below 3 are considered ideal, indicating acceptable levels of multicollinearity. In this study, all VIF values met the recommended threshold, affirming the robustness of the structural estimates.

2.1.6 Path Coefficients and Significance Testing

The significance of the path relationships was tested using bootstrapping with 5,000 resamples, a standard method in PLS-SEM. Path coefficients (β) were examined alongside their t-statistics and p-values. A t-value greater than 1.96 and a p-value ≤ 0.05 were considered statistically significant, providing empirical support for the hypothesized relationships between constructs.

2.1.7 Coefficient of Determination (R^2)

The R^2 values of the endogenous constructs were used to evaluate the model's explanatory power. As per Hair et al. (2019), R^2 values can be interpreted as follows: 0.75 or higher: substantial, 0.50 to 0.74: moderate, 0.25 to 0.49: weak and below 0.25: very weak. In this study, the R^2 values indicated a moderate to substantial level of variance explained, particularly for the construct "Use Behavior."

2.1.8 Effect Size (f^2)

To assess the impact of exogenous constructs on endogenous variables, effect sizes (f^2) were computed. Effect size values were interpreted using Hair et al. (2019) guidelines: $f^2 \geq 0.02$: small effect, $f^2 \geq 0.15$: medium effect and $f^2 \geq 0.35$: large effect. These values provided insight into the practical significance of each predictor, beyond mere statistical significance.

2.1.9 Predictive Relevance (Q^2)

The Stone-Geisser Q^2 value was used to assess the predictive relevance of the model via blindfolding procedures. A Q^2 value greater than zero for a specific endogenous construct suggests that the model has predictive relevance for that construct (Hair et al., 2019). All endogenous variables in this study demonstrated positive Q^2 values, confirming the model's predictive accuracy.

3.0 *RESULTS*

3.1 Demographic Characteristics of the Respondents

A total of 384 participants were included in the final analysis of this study. Among these, approximately 56% of the respondents identified themselves as buyers, while the remaining 44% identified as suppliers. This distribution mirrors the findings of previous studies which similarly reported a lower response rate among suppliers compared to buyers (Shatta & Mabina, 2024). This trend may be attributed to suppliers' relatively limited engagement with institutional research processes or lower exposure to formal e-procurement frameworks, particularly in developing country contexts such as Tanzania.

Regarding educational qualifications, a significant portion of the respondents approximately 68% held a bachelor's or Master's degree, making it the most common level of academic attainment among participants. This finding is consistent with the study by Shatta and Mabina (2024), which also observed that a majority of e-procurement users possessed undergraduate and postgraduate level of education. The prominence of bachelor's degree and master's holders suggests that the participant pool had a sufficient level of academic literacy and professional experience to engage meaningfully with e-procurement systems and to provide valid, informed responses to the research instrument.

The combination of educational diversity and stakeholder representation (buyers and suppliers) contributes to the credibility, comprehensiveness, and authenticity of the dataset. The demographic composition is reflective of real-world procurement stakeholder groups and thereby enhances the external validity and generalizability of the findings. Moreover, the balanced distribution of responses across buyer and supplier categories provides an equitable basis for analyzing attitudinal and behavioral differences, a central focus of this study.

Table 1 summarizes the key demographic characteristics of the participants, including gender, role (buyer or supplier), education level, and years of experience in public procurement.

Table 1: Type of Respondent * Education Level

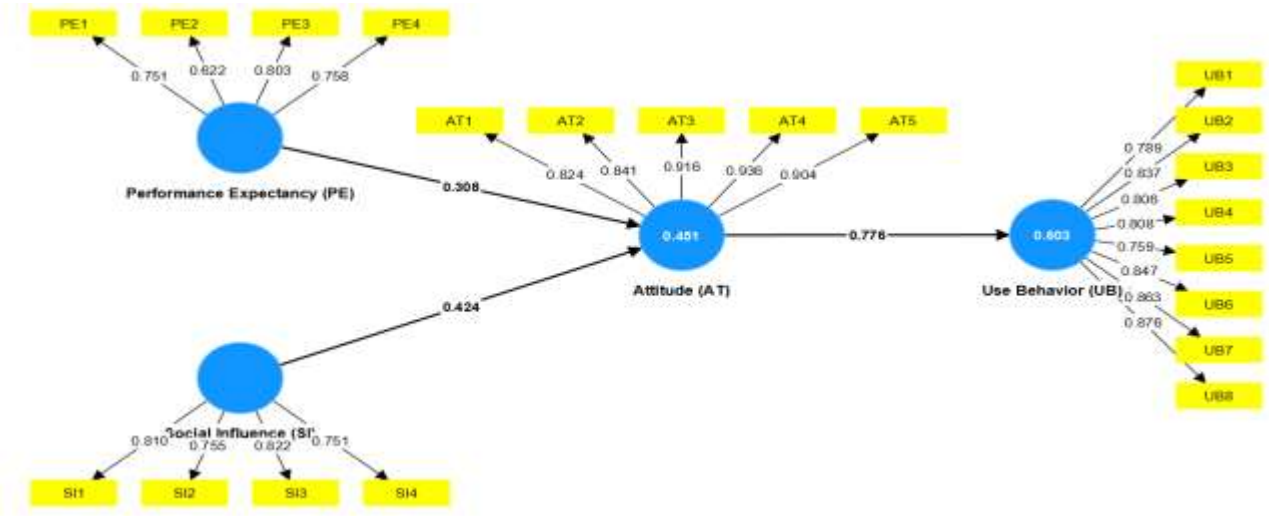
Education Level	Primary Education	Secondary Education	Certificate Level	Diploma Level	Bachelor Degree	Masters	PhD	Total
Buyers	0	0	5	20	108	86	1	215
Suppliers	2	24	5	65	47	21	0	169
Total	**2**	**24**	**10**	**85**	**155**	**107**	**1**	**384**

3.2 Measurement and Structural Model Assessment Results

Following the application of the Partial Least Squares Structural Equation Modeling (PLS-SEM) algorithm using SmartPLS 4, the measurement model and structural model were assessed to validate the hypothesized relationships within the conceptual framework. As depicted in Figure 3, all indicator loadings for the reflective constructs exceeded the minimum acceptable threshold of 0.708, in accordance with the guidelines set by Hair et al. (2019). This result confirms that the indicators demonstrate satisfactory levels of indicator reliability, with each observed item explaining more than 50% of its respective latent construct's variance. This high reliability emphasizes the strength of the measurement model and affirms the internal consistency of the measurement scales. Furthermore, the Composite Reliability (CR) values for all constructs also exceeded the recommended threshold of 0.70, confirming internal consistency reliability across the indicators within each construct. The Average Variance Extracted (AVE) values were all above 0.50, providing evidence of convergent validity, indicating that a

substantial proportion of variance in the observed variables is captured by their respective latent constructs rather than by measurement error. In evaluating the structural model, the coefficient of determination (R^2) values for the two endogenous constructs Attitude (AT) and Use Behavior (UB) were found to be 0.451 and 0.603, respectively, as illustrated in Figure 3. These values indicate that: 45.1% of the variance in Attitude (AT) is explained by the exogenous constructs Performance Expectancy (PE) and Social Influence (SI). This level of explained variance suggests a moderate predictive accuracy of the model in explaining user attitudes (Hair et al., 2019), 60.3% of the variance in Use Behavior (UB) is explained by the combined influence of Performance Expectancy (PE), Social Influence (SI), and the mediator Attitude (AT). This value falls within the range indicating a substantial level of explanatory power, supporting the strength of the theoretical model. All hypothesized path relationships in the model showed positive and statistically significant path coefficients, indicating that changes in the exogenous constructs were associated with corresponding changes in the dependent variables. Which means that a one standard deviation increases in either Performance Expectancy (PE) or Social Influence (SI) was associated with a positive change in Attitude (AT).

Similarly, a positive change in Attitude (AT) translated into a higher likelihood of Use Behavior (UB), i.e., the continued and active use of the e-procurement system by both buyers and suppliers. These findings offer empirical support to the mediating role of Attitude (AT) and support the theoretical proposition that user perceptions of system usefulness and social influence indirectly influence actual technology usage behavior through attitudinal shifts. The positive directionality of all path coefficients also indicates that enhancing users' expectations of performance benefits and reducing perceived complexity of the users are both effective pathways to increasing the adoption and use of e-procurement systems. Therefore, the PLS-SEM results confirm that the measurement model met all reliability and validity requirements, while the structural model demonstrated meaningful and statistically strong relationships, providing solid support for the proposed research hypotheses.



Independent Variables Mediator Variable Dependent Variable

Figure 3: Indicator's Reliabilities, R^2 Values and Relevance of the Path Coefficients

3.2.1 Reliability and Convergent Validity Assessment

The reliability and convergent validity of the reflective measurement model were evaluated in accordance with the established guidelines proposed by Hair et al. (2019)**.** These assessments are critical to ensure that the constructs used in the structural model are both internally consistent and capable of accurately representing the latent variables they are intended to measure. To assess internal consistency reliability**,** the study utilized Composite Reliability (CR) rather than Cronbach's Alpha, as CR is

considered a more accurate indicator in structural equation modeling, particularly when using PLS-SEM. According to Hair et al. (2019), a CR value above 0.708 indicates an acceptable level of reliability, suggesting that the construct indicators consistently measure the intended latent concept. In this study, all constructs Performance Expectancy (PE), Social Influence (SI), Attitude (AT), and Use Behavior (UB) achieved CR values above the 0.708 threshold, thereby confirming strong internal consistency across all measurement items.

In evaluating convergent validity, the study applied the Average Variance Extracted (AVE) metric for each construct. AVE measures the extent to which a construct explains the variance of its indicators. As per the criterion outlined by Hair et al. (2019), an AVE value greater than 0.50 is considered adequate, indicating that more than 50% of the variance in the observed indicators is captured by the latent variable. The results showed that each construct exceeded this benchmark, further validating that the indicators are well-correlated and meaningfully contribute to their respective constructs.

The consistently high CR and AVE values suggest that favourable and coherent response patterns were observed across the dataset, indicating a high degree of measurement reliability and convergent validity**.** This demonstrates that the constructs were appropriately designed and that respondents interpreted and answered the survey items in a reliable and consistent manner. These findings also strengthen the accuracy of the theoretical model, suggesting that the latent constructs effectively capture the intended dimensions of e-procurement adoption behavior. The measurement model demonstrates strong psychometric properties, providing a solid foundation for the structural model assessment that follows. Table 2 presents the detailed results of the composite reliability and average variance extracted for each construct used in the study.

Table 2: Reliability and Convergent Validity Analysis Results

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Attitude (AT)	0.934	0.948	0.784
Performance Expectancy (PE)	0.737	0.825	0.543
Social Influence (SI)	0.799	0.865	0.617
Use Behavior (UB)	0.935	0.944	0.679

3.2.2 Discriminant Validity Assessment

To assess the discriminant validity of the constructs in the measurement model, this study employed the Heterotrait-Monotrait Ratio of Correlations (HTMT), as recommended by Hair et al. (2019). Discriminant validity refers to the degree to which a construct is truly distinct from other constructs in the model, both conceptually and empirically. Establishing discriminant validity is essential to ensure that each latent variable capture phenomenon not represented by other variables in the structural model.

The HTMT criterion is widely recognized as a more robust and conservative method for assessing discriminant validity compared to traditional approaches such as the Fornell-Larcker criterion. It involves the computation of the ratio of between-construct correlations (heterotrait) to within-construct correlations (monotrait). According to Hair et al. (2019), an HTMT value below 0.90 suggests that constructs are empirically distinct and do not exhibit multicollinearity.

In this study, the HTMT values for all pairs of constructs Performance Expectancy (PE), Social Influence (SI), Attitude (AT), and Use Behavior (UB) were found to be less than 0.90. These findings confirm that each construct demonstrates adequate discriminant validity, indicating that participants were able to distinguish between the underlying concepts measured by each set of indicators. This further

supports the conceptual clarity of the measurement model and affirms that the latent constructs do not overlap in terms of their empirical meaning.

The establishment of discriminant validity strengthens the overall measurement model, ensuring that the causal relationships tested in the structural model are not confounded by measurement redundancy or conceptual ambiguity. These results validate the theoretical distinctiveness of the constructs used to explain e-procurement system adoption behavior in the Tanzanian context. Table 3 provides the HTMT values for all construct pairs, demonstrating compliance with the threshold and confirming the empirical separability of each construct.

Table 3: Discriminant Validity Analysis (HTMT Results)

	Attitude (AT)	Performance Expectancy (PE)	Social Influence (SI)
Performance Expectancy (PE)	0.718		
Social Influence (SI)	0.732	0.882	
Use Behavior (UB)	0.830	0.662	0.662

3.2.3 Q^2 Predict Results

In addition to evaluating the explanatory power of the structural model using R^2 values, the study further assessed its predictive relevance through the Q^2 statistic, derived using the blindfolding procedure. Predictive relevance reflects the model's ability to accurately predict the endogenous (dependent) constructs based on the exogenous (independent) variables. According to Hair et al. (2019), a Q^2 value greater than zero indicates that the model has predictive relevance, whereas a value of zero or below suggests that the model lacks predictive capability for the respective construct.

In the context of this study, the Q^2 values for both Attitude (AT) and Use Behavior (UB) were found to be greater than zero. These results confirm that the exogenous constructs Performance Expectancy (PE) and Social Influence (SI) possess meaningful predictive power in explaining the variance in both endogenous variables. Specifically: The positive Q^2 value for Attitude (AT) indicates that Performance Expectancy (PE) and Social Influence (SI) are capable of predicting shifts in users' attitudinal dispositions toward the e-procurement system.

Likewise, the positive Q^2 value for Use Behavior (UB) suggests that the combination of Performance Expectancy (PE), Social Influence (SI), and the mediating variable Attitude (AT) can predict users' actual behavioral engagement with the system. This predictive capability is particularly significant in applied research settings such as public e-procurement in developing countries, where accurate forecasting of adoption behaviors is critical for designing effective policy interventions, training programs, and system refinements.

The Q^2 values thus reinforce the external validity and applicability of the proposed model, supporting its utility not only for theoretical advancement but also for practical decision-making in procurement modernization initiatives. Table 4 summarizes the Q^2 statistics for the key endogenous variables, further substantiating the robustness and predictive quality of the model.

Table 4: Q^2 Predict Results

	Q^2predict	RMSE	MAE
Attitude (AT)	0.441	0.757	0.519
Use Behavior (UB)	0.404	0.778	0.557

3.2.4 Collinearity Statistics by VIF Metric for Inner Model

To ensure the robustness and interpretability of the structural model, the study assessed multicollinearity among the predictor constructs using the Variance Inflation Factor (VIF)**.** Multicollinearity occurs when two or more predictor variables in a model are highly correlated, which can inflate standard errors and distort the estimated path coefficients, ultimately reducing the statistical power and validity of the model (Hair et al., 2019).

In PLS-SEM, collinearity is particularly critical during the evaluation of the inner model**,** where it is necessary to confirm that the exogenous (predictor) constructs do not exhibit excessive linear relationships that could bias the interpretation of structural paths. According to Hair et al. (2019), VIF values below 3.0 are considered acceptable, suggesting that multicollinearity is not a concern and that the variance of the estimated regression coefficients is not adversely inflated.

The VIF values for all predictor constructs in this study were found to be well below the threshold of 3**,** thereby confirming that the inner model does not suffer from collinearity issues**.** This finding affirms the independence of the exogenous variables Performance Expectancy (PE) and Social Influence (SI) and validates their unique contributions to explaining variance in the endogenous constructs Attitude (AT) and Use Behavior (UB)**.**

The absence of multicollinearity enhances the reliability of the path coefficient estimates, ensuring that the causal inferences drawn from the model are statistically sound and not compromised by overlapping predictive power. This strengthens the overall credibility of the study's findings, especially in the context of complex behavioral models such as those involving technology adoption. Table 5 presents the detailed VIF statistics for the inner model constructs, providing evidence of acceptable collinearity levels across all predictor variables.

Table 5: Collinearity Statistics (VIF) for Inner Model Results

	Attitude (AT)	Use Behavior (UB)
Attitude (AT)		1.000
Performance Expectancy (PE)	1.855	
Social Influence (SI)	1.855	

3.3 F^2 Values Results

In addition to assessing the strength and significance of path coefficients, the study examined the effect size (f^2) of each exogenous construct on the endogenous variables to evaluate the magnitude of their individual contributions within the structural model. The f^2 metric reflects the extent to which the removal of a specific exogenous construct from the model would reduce the explained variance (R^2) in the corresponding endogenous variable, thereby offering insights into the practical importance of each predictor. According to Hair et al. (2019), f^2 values are interpreted using the following benchmarks: 0.02 indicates small effect, 0.15 indicates medium effect, 0.35 and above indicates large effect. The findings of the present study revealed f^2 values of 0.093, 0.176, and 1.518 across the hypothesized associations in the structural model: The f^2 value of 0.093 represents a small but meaningful effect size, suggesting that the corresponding exogenous construct has a modest influence on its associated dependent variable. The f^2 value of 0.176 falls within the medium effect size range, indicating a more substantial contribution to the explained variance in the outcome construct.

The f^2 value of 1.518 is well beyond the large effect threshold, signifying a very strong effect size and highlighting the critical role of that specific predictor in driving user attitudes or behaviors toward the

e-procurement system. These results demonstrate that while all constructs contribute positively to the model, they do so to varying degrees of intensity. The presence of both moderate and very large effect sizes underscores the theoretical and practical significance of the selected predictors particularly Performance Expectancy (PE), Social Influence (SI), and Attitude (AT) in influencing Use Behavior. Moreover, the exceptionally high f^2 value (1.518) may point to a dominant predictive role of one construct, likely the Attitude (AT) variable in mediating the effects of the other predictors on usage behavior. This finding reinforces the conceptual framework proposed in this study, which emphasizes the central mediating role of user attitude in technology adoption decisions within public procurement contexts. Overall, the f^2 results provide further empirical support for the robustness and explanatory power of the research model. The detailed findings of the effect size assessment are presented in Table 6, confirming that the hypothesized paths contribute significantly and practically to the overall understanding of e-procurement system adoption behavior.

Table 6: F^2 Values Results

	Attitude (AT)	Use Behavior (UB)
Attitude (AT)		1.518
Performance Expectancy (PE)	0.093	
Social Influence (SI)	0.176	

3.4 Statistical Significance of the Tested Hypothesized Relationships

The results of the structural model assessment, as illustrated in Figure 4, revealed that all proposed hypotheses were statistically supported, with p-values below the conventional threshold of 0.05. This indicates that the relationships hypothesized in the conceptual framework are not only theoretically grounded but also empirically valid. The significance of these paths confirms the predictive and explanatory power of the model in understanding the behavioral dynamics associated with e-procurement system adoption among buyers and suppliers in a developing country context.

The statistical confirmation of all hypothesized relationships suggests that the key constructs Performance Expectancy (PE), Social Influence (SI), and Attitude (AT) are strongly associated with Use Behavior (UB). Furthermore, the mediating role of Attitude (AT) in the indirect pathways between Performance Expectancy (PE)/Social Influence (SI), and Use Behavior (UB) was also statistically significant, reinforcing the centrality of attitude in influencing technology adoption decisions.

These results offer strong support to the applicability of the research model for practical and managerial decision-making. The confirmation of all theoretical pathways implies that the relationships postulated in the conceptual framework reflect actual behavioral patterns observed among procurement stakeholders. This has important implications for public sector managers, system designers, and policymakers aiming to increase the acceptance and sustained use of e-procurement platforms. By focusing on enhancing users' expectations of system performance and minimizing the perceived effort required to interact with the system, organizations can positively shape user attitudes and, in turn, encourage consistent system use.

In addition, the statistically significant results highlight the model's predictive relevance and reliability, positioning it as a strong tool for diagnosing and addressing behavioral barriers to e-procurement adoption. The validated relationships underscore the importance of user-centric implementation strategies, emphasizing training, communication, and system usability as key levers for improving adoption outcomes. Figure 4 presents the standardized path coefficients, t-statistics, and p-values for all tested hypotheses, clearly demonstrating the statistical significance and directionality of the relationships within the model.

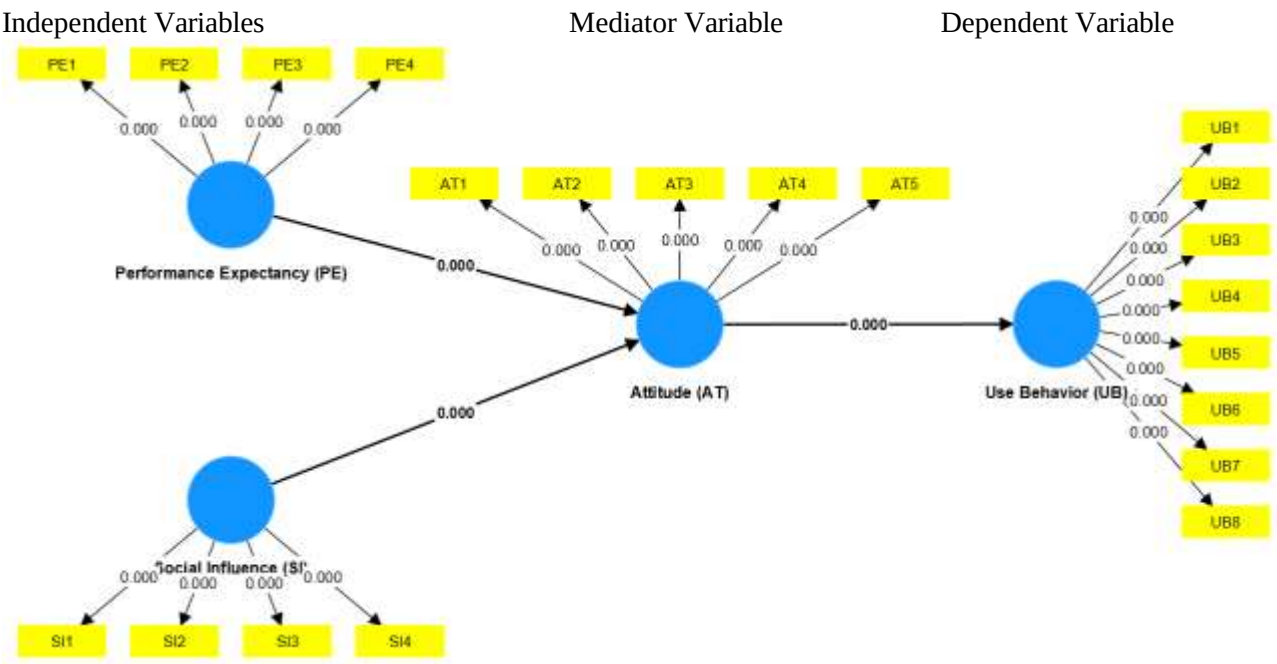


Figure 4: Statistical Significance Results of the Tested Hypotheses

3.5 Importance-Performance Map Analysis Results

The Importance-Performance Map Analysis (IPMA) presented in Figure 5 offers valuable strategic insights into how various latent constructs contribute to the target construct Use Behavior (UB) in terms of both relative importance (total effects) and performance (average latent variable scores). This double perspective is particularly useful for practitioners and policymakers seeking to prioritize resource allocation during the implementation or reform of e-procurement systems.

Among the constructs evaluated, Attitude (AT) is positioned above the average in both importance and performance dimensions relative to Use Behavior. This indicates that Attitude not only has a strong influence on users' engagement with the system, but also performs well in terms of user evaluations. Its high importance score suggests that Attitude is a critical driver of system usage, and therefore should be a strategic focus area for interventions aimed at increasing adoption and continued use. The elevated position of Attitude on the IPMA map highlights the necessity of shaping favorable user perceptions, through training, change management initiatives, and communication strategies that build trust, motivation, and a sense of value in using the e-procurement platform.

In contrast, the constructs Performance Expectancy (PE) and Social Influence (SI) are situated below the average in terms of importance, suggesting that their direct contribution to Use Behavior is relatively modest compared to Attitude. However, both constructs are positioned above the average in terms of performance, indicating that while users perceive the system as functionally adequate performance expectancy and social influence, these attributes alone are not the primary drivers of usage behavior in this context. This discrepancy suggests a potential saturation effect: once a basic threshold of system usefulness and social influence is met, additional improvements in these areas may not yield proportionally higher gains in behavior, unless they are accompanied by changes in user attitudes. Thus, although performance expectancy and social influence should not be ignored since they contribute indirectly through Attitude they should be complemented by efforts to influence user mindset and emotional engagement with the technology. From a managerial perspective, the IPMA findings provide clear guidance for prioritization: Attitude (AT) should receive the highest strategic focus, as it is both important and highly impactful. Interventions should aim to foster trust, reduce resistance to change, and

communicate long-term benefits to encourage positive user sentiment. Performance Expectancy (PE) and Social Influence (SI) should continue to be monitored and maintained at high-performance levels to ensure that negative perceptions do not emerge, especially as system complexity evolves or as new features are introduced.

Therefore, the IPMA results strengthen the study's theoretical claim that attitude is a central mediating and driving factor in e-procurement system usage, and that behavioral change strategies should be as much about influencing perception as they are about improving system features.

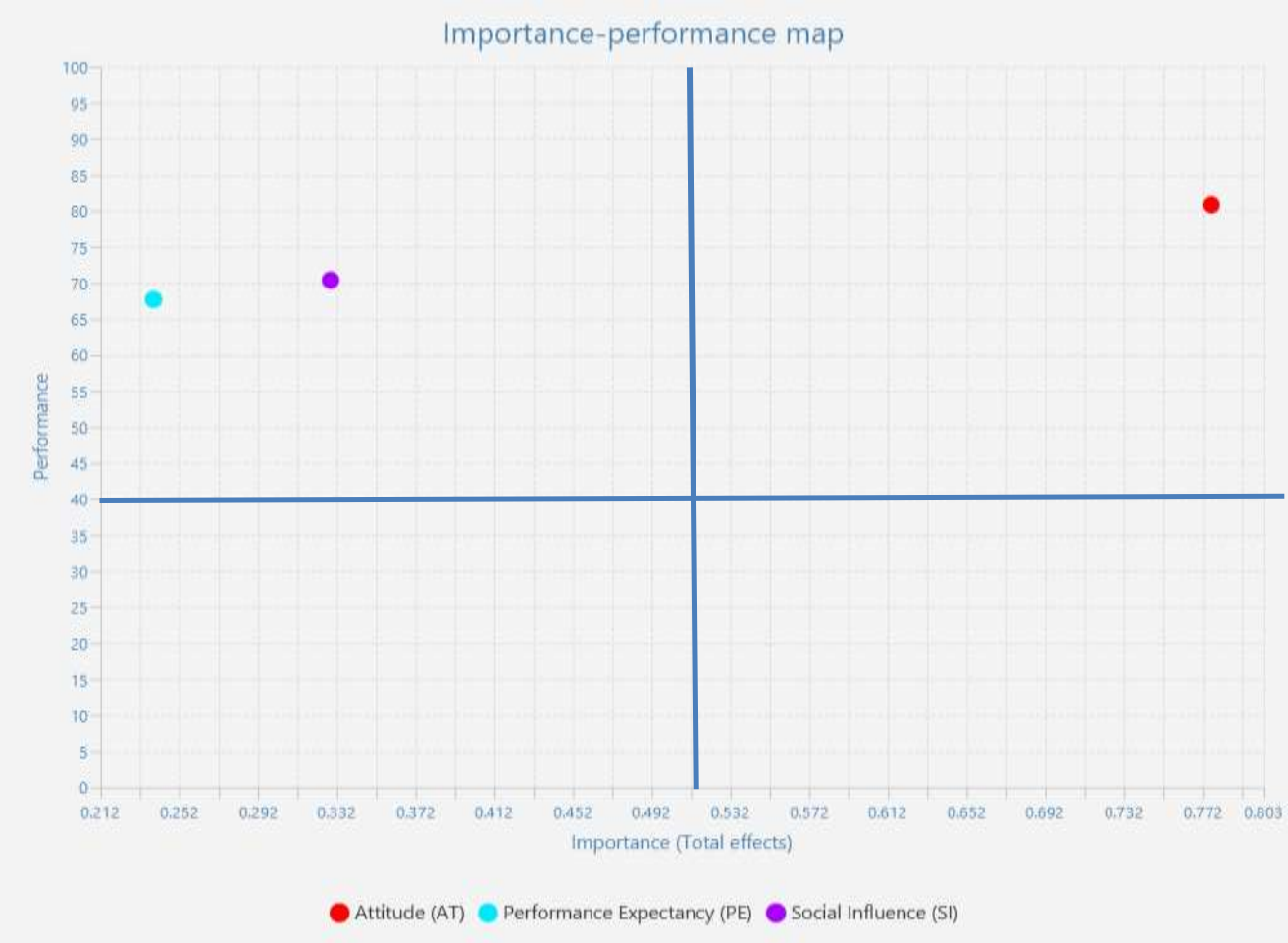


Figure 5: Importance-Performance Map Analysis Results

3.6 Additional Analysis for Testing the Types of Mediation

To understand further the mechanisms through which exogenous constructs influence use behavior, the study conducted a mediation analysis within the framework of Partial Least Squares Structural Equation Modeling (PLS-SEM). This analysis was aimed at recognizing the type and strength of indirect effects conveyed through the mediating variable, Attitude (AT). The approach followed the widely accepted guidelines proposed by Hair et al. (2019), which distinguish between full mediation and partial mediation based on the statistical significance of both direct and indirect effects. According to Hair et al. (2019): Full mediation is present when the direct effect of the independent variable on the dependent variable is not statistically significant ($p > 0.05$), while the indirect effect through the mediator is statistically significant ($p < 0.05$). Partial mediation occurs when both the direct and indirect effects are statistically significant ($p < 0.05$), indicating that the independent variable influences the dependent

variable both directly and through the mediator. Applying this framework, the study tested the mediating role of Attitude (AT) in the relationship between: Social Influence (SI) and Use Behavior (UB), Performance Expectancy (PE) and Use Behavior (UB). Following a bootstrapping procedure with 5,000 resamples, the results revealed the following: The direct effect of Social Influence (SI) on Use Behavior (UB) was not statistically significant ($p > 0.05$). The indirect effect of Social Influence (SI) on Use Behavior (UB) through Attitude was statistically significant ($p < 0.05$). This supports the existence of full mediation, indicating that users' perception of social influence affects their use behavior exclusively through their attitudes toward the system. In practical terms, unless Social Influence (SI) influences Attitude positively, it does not have a direct impact on system usage. On the other hand, both the direct effect and indirect effect of Performance Expectancy on Use Behavior through Attitude were statistically significant ($p < 0.05$). This demonstrates the presence of partial mediation, suggesting that Performance Expectancy not only has a direct influence on Use Behavior but also exerts an additional effect through shaping user attitudes. This result supports the existence of partial mediation, thus, users who believe the system will enhance their job performance are more likely to use it both because of that belief directly, and because it fosters a positive attitude. These findings provide important theoretical insights, affirming that Attitude acts as a central mediating mechanism in the adoption of e-procurement systems. However, its role is not uniform across all predictors.

These distinctions enhance the explanatory power of the model and provide actionable guidance for system implementers. For instance, initiatives aimed at improving social influence must focus on enhancing user attitudes (e.g., through training and user support), whereas efforts to improve perceived usefulness can generate behavioral outcomes both directly and via attitudinal reinforcement. Figure 6 presents the results of testing the types of mediation which exist in the modified conceptual framework.

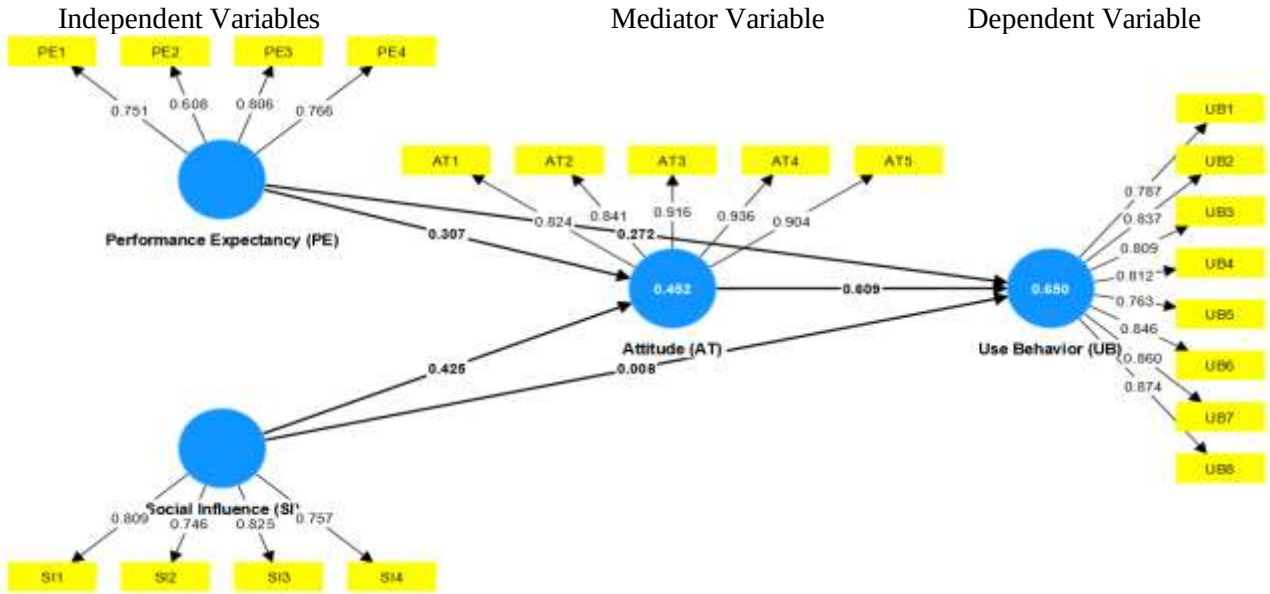


Figure 6: Results for Testing the Types of Mediation

4.0 DISCUSSION

This study sought to examine the relationships among Performance Expectancy (PE), Social Influence (SI), Attitude (AT), and Use Behavior (UB) within the context of e-procurement adoption in Tanzania, using the modified Unified Theory of Acceptance and Use of Technology (UTAUT) as a theoretical foundation. The results revealed several statistically significant paths and mediation effects that offer both theoretical and practical insights into technology adoption behavior.

4.1 Performance Expectancy influences Attitude and Use Behavior

The study hypothesized that Performance Expectancy would have a direct effect on Attitude and an indirect effect on Use Behavior, mediated through Attitude. The empirical findings support this hypothesis. Specifically, the results showed a strong, statistically significant direct relationship between Performance Expectancy and Attitude ($p < 0.05$), as well as a significant indirect effect on Use Behavior through Attitude.

These results imply that an increase of one standard deviation in Performance Expectancy leads to a corresponding increase in positive user mindset (Attitude) toward the e-procurement system, which in turn enhances actual usage behavior. This finding aligns with the updated UTAUT framework by Dwivedi et al. (2017), which highlights the importance of user perceptions about system utility. However, while prior models emphasized direct behavioral intention, this study extends the theoretical model by empirically confirming the indirect pathway through Attitude, specifically within an e-procurement and developing country context a perspective that has received limited attention in the literature.

Thus, this study makes a valuable theoretical contribution by providing evidence that Attitude mediates the effect of Performance Expectancy on actual system usage, rather than just behavioral intention. This mediating role has not been adequately explored in earlier technology adoption models (Venkatesh et al., 2003; Venkatesh et al., 2012; Dwivedi et al., 2017; Chen et al., 2011), and fills a notable gap by shifting the analytical focus from intention to behavior, which is crucial for successful system implementation.

4.2 Social Influence influences Attitude and Use Behavior

In a similar disposition, the study hypothesized that Social Influence would have a direct influence on Attitude and an indirect influence on Use Behavior through Attitude. The analysis confirmed this path, with a positive and statistically significant effect of Social Influence on Attitude, and a significant indirect effect on Use Behavior mediated by Attitude. Notably, the direct effect of Social Influence on Use Behavior was not significant, confirming a full mediation effect.

This finding is particularly important because it reveals that users' perceptions influence their behavior only through changes in attitude an insight not emphasized in earlier iterations of UTAUT. While previous research (e.g., Dwivedi et al., 2017) highlighted the importance of Social Influence in shaping behavioral intention, this study shifts the lens to actual use behavior, reinforcing the mediating role of attitude as an essential behavioral driver. Moreover, the results contradict the implication in the original and modified UTAUT models that Social Influence exerts only an indirect influence through intention (Venkatesh et al., 2003; Venkatesh et al., 2012), as this study shows that attitude not intention is the dominant mediating variable in this context. These findings represent a novel theoretical contribution, extending existing models by suggesting a more psychologically grounded pathway, where Social Influence shapes technology use through cognitive-emotional evaluations (attitude), rather than purely rational intention.

4.3 Attitude influences Use Behavior

The final hypothesized relationship was the direct effect of Attitude on Use Behavior, which was found to be positive and statistically significant. This indicates that a one standard deviation increase in Attitude leads to a measurable increase in the actual use of the e-procurement system among buyers and suppliers. This finding provides healthy empirical support for positioning Attitude as a key determinant of use behavior, beyond mere intention.

Interestingly, this result diverges from prior studies that have predominantly linked Attitude to behavioral intention, not actual use (e.g., Dwivedi et al., 2017; Venkatesh et al., 2003). While the importance of Attitude has been acknowledged in earlier models, its direct role in driving observable user behavior especially in institutional systems like e-procurement has not been adequately empirically verified to the same extent. This research therefore adds new theoretical depth by illustrating that a favorable user attitude can directly translate into measurable behavioral outcomes, especially when supported by social influence and perceived usefulness.

5.0 CONCLUSION

5.1 Theoretical Implications

This study makes a notable theoretical contribution by extending the modified Unified Theory of Acceptance and Use of Technology (UTAUT) framework proposed by Dwivedi et al. (2017), particularly through the introduction and empirical validation of attitude as a mediating variable between core constructs and actual use behavior. As illustrated in Figure 6, the relationships among Performance Expectancy (PE), Social Influence (SI), Attitude (AT), and Use Behavior (UB) were empirically validated, confirming both direct and indirect pathways within the structural model. Specifically, the study contributes to the existing body of knowledge by clarifying the role of Attitude as a psychological bridge between users' perceptions (Performance Expectancy (PE) and Social Influence (SI)) and their actual behavior, rather than merely influencing behavioral intention as was the focus of earlier UTAUT models (Venkatesh et al., 2003; Chen et al., 2011; Venkatesh et al., 2012; Venkatesh et al., 2016; Dwivedi et al., 2017).

In addition, identifying a full mediation effect between Social Influence and Use Behavior, and a partial mediation effect between Performance Expectancy and Use Behavior, offering a more understanding of technology adoption mechanisms in institutional settings. Demonstrating that Attitude exerts a direct and significant effect on Use Behavior, which enhances the predictive power of the UTAUT model when applied to real-world public-sector technology implementations particularly in the context of developing economies like Tanzania.

This enriched understanding of the mediated pathways through which perceptions of usefulness and social influence always influence actual behavior addresses a critical theoretical gap that has been acknowledged but not fully explored in earlier studies (Chen et al., 2011; Dwivedi et al., 2017; Venkatesh et al., 2016). Previous frameworks have often assumed that positive expectancy beliefs naturally lead to system usage through intention, yet this study empirically demonstrates that attitude plays an active and necessary mediating role, especially in systems that require not just adoption but sustained behavioral engagement, such as e-procurement platforms.

Moreover, the findings contribute to broader technology diffusion literature by validating cognitive-affective mechanisms in explaining behavioral outcomes, extending the innovation adoption thinking of UTAUT into a more contemporary and digitally driven context. The theoretical insights gained also align with and extend findings from recent empirical studies (Gugenishvili & Laine-Kronberg, 2025; Müller et al., 2025; Ayvazyan, 2025), which emphasize the evolving nature of user acceptance frameworks in complex, organizational environments. The final validated research model, presented in Figure 7, reflects this integrated understanding and offers a revised version of the modified UTAUT that includes attitude as both a direct and mediating predictor of use behavior. This model may serve as a reference framework for future studies seeking to assess user adoption dynamics in digital transformation initiatives within the public sector, especially in low- and middle-income countries.

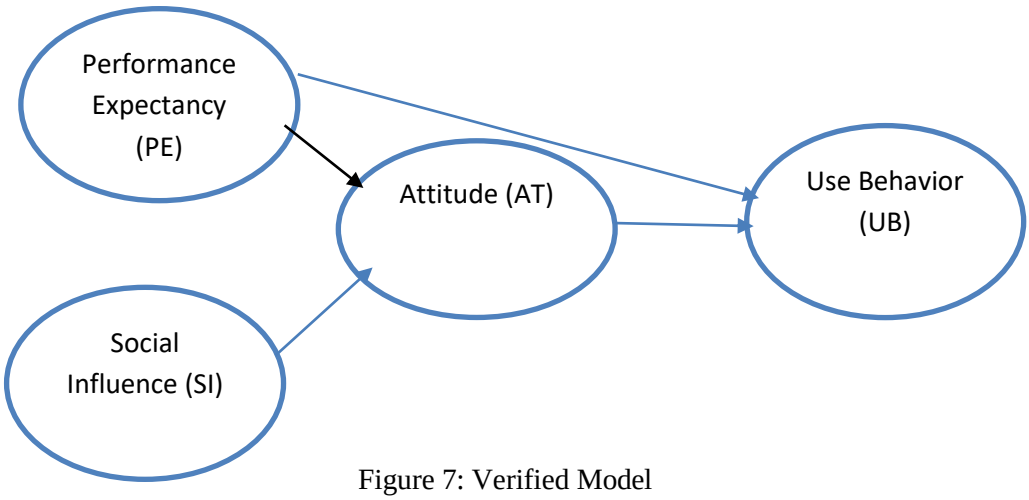


Figure 7: Verified Model
Source: Authors

5.3 Practical Implications

The findings of this study provide important insights into the behavioral mechanisms underlying the adoption of e-procurement systems by buyers and suppliers, with significant social and organizational implications. As demonstrated by the results, particularly in Figure 5, the direct and indirect significance of Performance Expectancy (PE) suggests that buyers and suppliers place substantial emphasis on the perceived benefits and performance improvements associated with e-procurement when deciding whether or not to adopt such systems. This indicates a pragmatic orientation among procurement stakeholders where decisions are strongly influenced by the potential for increased efficiency, transparency, and task effectiveness.

In contrast, while Social Influence (SI) was shown to have a statistically significant indirect effect, its direct effect on use behavior was not significant. This distinction implies that users do not consider social influence as a standalone factor when deciding to adopt the e-procurement system. Instead, Social Influence influences behavior only through its effect on users' attitudes. That is, social influence help to foster more favorable attitudes, which in turn drive actual usage. This finding reinforces the importance of psychological readiness and highlights that cognitive and emotional engagement must precede behavioral engagement.

From a social systems perspective, this reinforces the idea that technology adoption in public procurement is not merely a technical or operational issue, but a human-centered process requiring attention to user perception, motivation, and change management. Organizational efforts aimed solely at upgrading system functionality or reducing complexity may fall short if they fail to simultaneously cultivate positive user attitudes and address behavioral resistance. However, the social influence can directly influence change of mindset of users and lead them to implement the system.

5.4 Social Implications

The validated research model offers clear guidance for public procurement managers, policymakers, and digital transformation leaders, particularly in the prioritization of investment and implementation strategies. Specifically: Performance Expectancy (PE) should be prioritized in communications, training, and system development. Emphasizing tangible benefits such as faster procurement cycles, greater compliance, cost savings, and auditability can build a strong rational case for adoption, as users are clearly motivated by performance outcomes. Social Influence (SI), while not

directly influencing behavior, should not be overlooked. It plays a crucial role in shaping attitudes, and thus contributes indirectly to usage.

Investment in user-centered design, interface simplicity, intuitive workflows, and support services is essential to foster positive attitudes, particularly among less digitally literate users. Attitude (AT) emerges as a key leverage point, mediating both effort and performance perceptions. Change management strategies should focus on attitude formation and reinforcement, using storytelling, peer advocacy, and leadership messaging to align e-procurement with user values and institutional goals.

For policy development, these findings suggest that mandating adoption alone is insufficient. Instead, policies must be coupled with attitude-oriented interventions and evidence-based demonstrations of system performance to ensure buy-in from key procurement actors. Ultimately, these insights reinforce the social reality of digital transformation that system success depends not only on what technology does, but also on how users perceive, value, and internalize its role in their day-to-day activities. The findings thus have broader relevance for e-governance, public-sector innovation, and ICT-for-development initiatives.

5.5 Limitation and Recommendation for Future Research

It is important to acknowledge several limitations that offer opportunities for future research and theoretical improvement while this study provides valuable insights into the behavioral mechanisms underlying the adoption of e-procurement systems. Firstly, the study focused on a limited set of constructs namely Attitude (AT), Performance Expectancy (PE), and Social Influence (SI) derived from the modified Unified Theory of Acceptance and Use of Technology (UTAUT) developed by Dwivedi et al. (2017). These three constructs collectively explained 65% of the variance ($R^2 = 0.65$) in the Use Behavior (UB), as shown in Figure 6. The variance ($R^2 = 0.65$) suggests that a significant proportion (35%) of the variance in use behavior remains unexplained and is less than the explanatory power of the original UTAUT which explained about 69–70% of the variance in intention to use Information Technology (IT) (Venkatesh et al., 2003). In addition, this R^2 value falls within the "moderate" range according to the thresholds proposed by Hair et al. (2019) where 0.75, 0.50, and 0.25 represent substantial, moderate, and weak explanatory power, respectively. To enhance the explanatory power and comprehensiveness of future models, it is recommended that future research incorporates additional constructs from the modified UTAUT framework, such as: Facilitating Conditions (e.g., infrastructure availability) and effort expectancy (e.g., ease to use the system). Including these dimensions could help capture a broader range of behavioral determinants, moving beyond rational perceptions of usefulness to also include environmental and emotional influences on system usage**.**

Secondly, the geographic scope of the study was limited to buyers and suppliers within Tanzania. While this national focus allowed for in-depth exploration of a specific public procurement environment, it inherently restricts the generalizability of the findings. Cultural, institutional, and infrastructural differences can significantly affect how e-procurement systems are perceived and used across different countries and regions. As such, future studies should seek to validate the proposed model in other developing and developed countries, conduct multi-country comparative analyses, and explore regional variations in user attitudes, technology readiness, and institutional support for e-procurement. By doing so, researchers can establish a more globally generalizable framework for e-procurement adoption and identify context-specific enablers and barriers that influence system usage across diverse settings. Moreover, future studies could also adopt mixed-methods approaches, combining quantitative structural modeling with qualitative insights from interviews. This would allow for a more understanding of user motivations, resistance factors, and contextual challenges that quantitative models alone may not fully capture. Such efforts would further enhance the theoretical toughness, practical relevance, and global applicability of technology adoption models in the context of public-sector digital transformation.

REFERENCES

Alfianti, N., Sadat, A., & Kusumaningtyas, D. (2025). Pengaruh Performance Expectancy dan Social Influence Terhadap Continuance Intention to Use Melalui Mediasi Attitude Towards Use pada Aplikasi Netflix. *PENG: Jurnal Ekonomi dan Manajemen*. https://doi.org/10.62710/cvb9wr37

Alfianti, N., Sadat, A., & Kusumaningtyas, D. (2025). Pengaruh Performance Expectancy dan Social Influence Terhadap Continuance Intention to Use Melalui Mediasi Attitude Towards Use pada Aplikasi Netflix. *PENG: Jurnal Ekonomi dan Manajemen*. https://doi.org/10.62710/cvb9wr37

Almajali, D. A., Majali, T., Masa'deh, R., Al-Bashayreh, M. G., & Altamimi, A. M. (2023). Antecedents of acceptance model for e-procurement in Jordanian public shareholding firms. *Journal of Consumer Marketing*. https://doi.org/10.1108/JCM-12-2021-5075

Al-Sayid, F., & Kirkil, G. (2025). Integrating Technology Acceptance Model with UTAUT to Increase the Explanatory Power of the Effect of HCI on Students' Intention to Use E-Learning System and Perceive Success. *IEEE Access*, 13, 20720-20739. https://doi.org/10.1109/access.2025.3534740

Arafa, A., Lestari, S., Sofiani, F., & Sugiarto, D. (2024). Determinants of Employee Attitudes and Behavior to Use Employee Self-Service App. *Business and Entrepreneurial Review*. https://doi.org/10.25105/v24i1.19875

Ayvazyan, M. (2025). The psychological foundations of attitudes and their impact on the work environment. *SUSh Scientific Proceedings*. https://doi.org/10.54151/27382559-25.2pb-208

Blut, M., Chong, A., Tsigna, Z., & Venkatesh, V. (2022). Meta-Analysis of the Unified Theory of Acceptance and Use of Technology (UTAUT): Challenging its Validity and Charting a Research Agenda in the Red Ocean. *J. Assoc. Inf. Syst.*, 23, 10. https://doi.org/10.17705/1jais.00719

Colburn, D., Mitchell, K., & Gewitz-Meydan, A. (2025). Cumulative determinants of adolescent health indicators: the effects of social and structural determinants of health and child sexual abuse on overdose and suicide attempt. *Frontiers in Public Health*, 13. https://doi.org/10.3389/fpubh.2025.1595115

Da Graca Ambrosio, M., Vyas, S., Stromin, J., Lusinga, S., Zinzer, P., Brukwe, K., Makhanya, Z., Gwebu, H., Schley, A., Markle, L., Stern, D., Facciolà, C., Melendez-Torres, G., Gardner, F., & Lachman, J. (2025). Exploring the Association Between Behavioral Determinants and Intention to Use a Chatbot-Led Parenting Intervention by Caregivers of Adolescent Girls in South Africa: Cross-Sectional Study. *JMIR Pediatrics and Parenting*, 8. https://doi.org/10.2196/76992

De Jonge, M., Bukman, A., Blankers, M., Onrust, S., Spronk, D., Van Laar, M., & Kleinjan, M. (2025). Determinants of the willingness to reduce or quit cocaine use among nightlife attendees. *Archives of Public Health*, 83. https://doi.org/10.1186/s13690-025-01693-2

De Moraes Oliveira, M., De Oliveira Kaizer, U., Jannuzzi, F., Oliveira, H., Alexandre, N., Gallani, M., São-João, T., Cornélio, M., & Rodrigues, R. (2025). Predictors of adherence to insulin therapy in type 2 diabetes mellitus: an application of the theory of planned behavior. *Health Psychology and Behavioral Medicine*, 13. https://doi.org/10.1080/21642850.2025.2525181

Deshpande, P. (2024). Impact of Attitude on Human Lifestyle: A Comprehensive Analysis. *International Journal of Advanced Multidisciplinary Research and Studies*. https://doi.org/10.62225/2583049x.2024.4.3.2903

Dwivedi, Y., Rana, N., Chen, H., & Williams, M. (2011). A Meta-analysis of the Unified Theory of Acceptance and Use of Technology (UTAUT).155-170.https://doi.org/10.1007/978-3-642-24148-2_10

Dwivedi, Y., Rana, N., Jeyaraj, A., Clement, M., & Williams, M. (2017). Re-examining the Unified Theory of Acceptance and Use of Technology (UTAUT): Towards a Revised Theoretical Model. *Information Systems Frontiers*, 21, 719 - 734. https://doi.org/10.1007/s10796-017-9774-y

Dwivedi, Y., Rana, N., Tamilmani, K., & Raman, R. (2020). A meta-analysis based modified unified theory of acceptance and use of technology (meta-UTAUT): a review of emerging literature.. *Current opinion in psychology*, 36, 13-18. https://doi.org/10.1016/j.copsyc.2020.03.008

Egner, L., Sundfør, H., & Fyhri, A. (2024). Bike Attitudes Predict Behaviour Change, more than Vice Versa: A Norwegian Quasi-replication of Kroesen and Colleagues (2017). *Findings*. https://doi.org/10.32866/001c.126757

Faida, E., Supriyanto, S., Haksama, S., Suryaningtyas, W., Astuti, W., Nudji, B., & Hasina, S. (2022). The effect of performance expectancy and behavioral intention on the use of electronic medical record (EMR) in tertier hospital in Indonesia. *International journal of health sciences*. https://doi.org/10.53730/ijhs.v6ns9.12729

Farzin, M., Sadeghi, M., Kharkeshi, F. Y., Ruholahpur, H., & Fattahi, M. (2021). Extending UTAUT2 in M-banking adoption and actual use behavior: Does WOM communication matter? *Asian Journal of Economics and Banking*. (DOI already in the journal; use as given in your source)

Gambo, M. M., Dodo, M., & Yusuf, H. (2019). Assessment of stakeholders' perception of risk determinants associated with the adoption of e-procurement in the Nigerian construction industry. *WABER Conference Proceedings*. https://doi.org/10.33796/waberconference2019.13

Giri, G., & Manohar, H. L. (2023). Factors influencing the acceptance of private and public blockchain-based collaboration among supply chain practitioners: a parallel mediation model. *Supply Chain Management*, 28(1), 1–24. https://doi.org/10.1108/SCM-02-2021-0057

Gugenishvili, I., & Laine-Kronberg, A. (2025). The Influence of Prior Knowledge and Perceived Impact on the Connection Between Attitudes and Sustainable Behavior. *Sustainable Development*. https://doi.org/10.1002/sd.3335

Hamdi, E. (2025). Study of behavioral intention: A mediator for behavioral use in the hospital industry. *Jurnal Ekonomi dan Bisnis*. https://doi.org/10.24914/jeb.v28i1.10906

Hendrajaya, C., Brahmasari, I., & Ratih, I. (2024). The influence of effort expectancy, performance expectancy, and social influence on perceived risk, behavioral intention, and actual use moderated by user trust in social commerce in Indonesia. *Edelweiss Applied Science and Technology*. https://doi.org/10.55214/25768484.v8i6.3017

Hendrajaya, C., Brahmasari, I., & Ratih, I. (2024). The influence of effort expectancy, performance expectancy, and social influence on perceived risk, behavioral intention, and actual use moderated by user trust in social commerce in Indonesia. *Edelweiss Applied Science and Technology*. https://doi.org/10.55214/25768484.v8i6.3017

Hristova, V., Haralampiev, K., Vlaev, I., & Karabeliova, S. (2025). Predicting Pro-Environmental Behavior: The Leading Influence of Environmental Attitudes. *Behavioral Sciences*, 15. https://doi.org/10.3390/bs15030291

Iranmanesh, M., Senali, M., Foroughi, B., Ghobakhloo, M., Asadi, S., & Tirkolaee, E. (2024). Effect of augmented reality applications on attitude and behaviours of customers: cognitive and affective perspectives. *Asia-Pacific Journal of Business Administration* https://doi.org/10.1108/apjba-07-2023

Islam, M., Tamanna, A., & Islam, S. (2024). The path to cashless transaction: A study of user intention and attitudes towards quick response mobile payments. *Heliyon*, 10. https://doi.org/10.1016/j.heliyon.2024.e35302

Ju, C., & Wang, S. (2025). Determinants of consumer intention to use autonomous delivery vehicles: based on the planned behavior theory and normative activation model. *Humanities and Social Sciences Communications*, 12. https://doi.org/10.1057/s41599-025-04662-w

Khowaja, S., Shah, N., & Zaidi, Z. (2025). Performance Expectancy and Attitude as Key Predictors of Telemedicine Adoption: Evidence from Healthcare Professionals in Pakistan. *The Critical Review of Social Sciences Studies*. https://doi.org/10.59075/p1fjn843

Kim, S., Zhong, Y., Wang, J., & Kim, H. (2024). Exploring Technology Acceptance of Healthcare Devices: The Moderating Role of Device Type and Generation. *Sensors (Basel, Switzerland)*, 24. https://doi.org/10.3390/s24247921

Lissah, S., Ayanore, M., Krugu, J., Aberese-Ako, M., & Ruiter, R. (2025). Assessing the socio-cognitive determinants of personal protective equipment uses among domestic waste collectors in the Ho municipality, Ghana: A cross-sectional study. *PLOS One*, 20. https://doi.org/10.1371/journal.pone.0334542

LoParco, C., Rossheim, M., Wang, Y., Yang, Y., Paichadze, N., Cavazos-Rehg, P., & Berg, C. (2025). A longitudinal mediated examination of legal, commercial, and individual determinants of cannabis and derived cannabis use behaviors and consequences among US young adults.. *Addictive behaviors*, 172, 108526. https://doi.org/10.1016/j.addbeh.2025.108526

Lu, Z. (2025). Mapping adolescent problematic social media use patterns across 41 countries/regions: A multilevel latent class analysis with social determinants.. *Addictive behaviors*, 172, 108523. https://doi.org/10.1016/j.addbeh.2025.108523

Masudin, I., Aprilia, G. D., Nugraha, A., & Restuputri, D. P. (2021). Impact of e-procurement adoption on company performance: Evidence from Indonesian manufacturing industry. *Logistics*, 5(1), 16. https://doi.org/10.3390/logistics5010016

Müller, A., Bács, Z., Fenyves, V., Kovács, S., Lengyel, A., & Bacsne, E. (2025). Demographic Influences on Environmental Attitudes and Actions: An Analysis of The Attitude-Behavior Gap. *Geojournal of Tourism and Geosites*. https://doi.org/10.30892/gtg.602spl01-1477

Nazirova, Z., & Borbala, S. (2024). Values, Attitudes and the Behaviour Paradigm: A Systematic Literature Review. *Journal of Human Values*, 30, 214 - 239. https://doi.org/10.1177/09716858241236902

Ndei, F. M., & Mutuku, M. (2021). E-Procurement and Performance of Non-Governmental Organizations in Kenya. *Journal of Business and Management Sciences*, 9(2), 71–80. https://doi.org/10.12691/jbms-9-2-3

Nurbasari, A., Aribowo, A., Hadianto, B., Karim, Z., & Raharjo, M. (2025). The determinants of micro, small, and medium entrepreneurial behavior to use social media: Technology-organization-environment framework. *International Journal of Management and Sustainability*. https://doi.org/10.18488/11.v14i3.4411

Nuswantoro, S., Ulfi, M., , M., & Rafli, M. (2024). Identification of Factors Influencing the Use of QRIS Using TAM and UTAUT 2 Methods. *Scientific Journal of Informatics*. https://doi.org/10.15294/sji.v11i2.3562

Obenza, B., Caballo, J., Caangay, R., Makigod, T., Almocera, S., Bayno, J., Camposano, J., Cena, S., Garcia, J., Labajo, B., & Tua, A. (2024). Analyzing University Students' Attitude and Behavior Toward AI Using the Extended Unified Theory of Acceptance and Use of Technology Model. *American Journal of Applied Statistics and Economics*. https://doi.org/10.54536/ajase.v3i1.2510

Paudel, S., & Acharya, N. (2024). Factors Affecting Behavioral Intention to Use ChatGPT: Mediating Role of Attitude. *Journal of Service, Innovation and Sustainable Development*. https://doi.org/10.33168/sisd.2024.0209

Permatasari, I., Madiawati, P., & Pradana, M. (2025). The Influence of Performance Expectations, Effort Expectations, Supportive Conditions, Social Influence, Risk, and Trust on Usage Behavior with Behavioral Intent as a Mediator (Case Study of MYBCA Adoption Among Generation Z). *East Asian Journal of Multidisciplinary Research*. https://doi.org/10.55927/eajmr.v4i8.334

Peterková, V., & Il'ko, I. (2024). Household pesticide use: attitudes, behaviors, and health risks. *International Journal of Agriculture, Environment and Food Sciences*. https://doi.org/10.31015/jaefs.2024.4.13

Piekema, L., Brug, A., Waninge, A., & Van Der Putten, A. (2024). Attitudes of support people: a key element when implementing technologies for people with intellectual and visual disabilities. *Disability and Rehabilitation. Assistive Technology*, 20, 432 - 443. https://doi.org/10.1080/17483107.2024.2387774

Polyportis, A., & Pahos, N. (2024). Understanding students' adoption of the ChatGPT chatbot in higher education: the role of anthropomorphism, trust, design novelty and institutional policy. *Behaviour & Information Technology*, 44, 315 - 336. https://doi.org/10.1080/0144929x.2024.2317364

Pradana, F., & Marsasi, E. (2024). Footwear Industry Investigation: The Impact of Attitude and Habits on Use Intention in Generation Z Based on Theory of Planned Behavior. *Jurnal Aplikasi Manajemen*. https://doi.org/10.21776/ub.jam.2024.022.04.13

Ramadhina, N., Rubiyanti, N., & Mangruwa, R. (2025). The Influence of Performance Expectancy, Effort Expectancy, And Social Influence on Use Behavior with Behavioral Intention as A Mediator (A Case Study of Cash on Delivery (COD) System Users in Marketplaces). *International Journal of Social Science and Human Research*. https://doi.org/10.47191/ijsshr/v8-i1-24

Ramba, Z., & Pratomo, L. (2024). The Influence of Attitude and Desire Towards Intention To Use Online Food Delivery. *Devotion: Journal of Research and Community Service*. https://doi.org/10.59188/devotion.v5i1.670

Rasid, N., Saad, S., & Johari, R. (2024). Investigating the Factors Influencing User Acceptance and Attitude towards Technology Usage in Online Learning. *International Journal of Academic Research in Business and Social Sciences*. https://doi.org/10.6007/ijarbss/v14-i3/20954

Ratnawati, N. T. T., & Suryawan, M. Y. (2021). E-procurement implementation as reflection of good governance in north Lombok regency. *HUSOCPUMENT*, 1(1), 8–14. https://doi.org/10.0121/husocpument.v1i1.3

Raza, M., Shakur, M., & Saqib, S. (2025). Determinants of Continuous Usage Behavior of Social Commerce: A Study of Small Online Vendors in Pakistan. *Journal of Lifestyle and SDGs Review*. https://doi.org/10.47172/2965-730x.sdgsreview.v5.n04.pe05537

Refsi, F., & Soma, A. (2025). The Influence Of Performance Expectancy, Effort Expectancy, Social Influence, Facilitating Conditions, And Financial Literacy On Use Behavior Of Buy Now Pay Later Services With Behavior Intention As A Mediating Variable Among Generation Z In The Bandung Raya Area. *International Journal of Educational Research & Social Sciences*. https://doi.org/10.51601/ijersc.v6i2.981

Rizkalla, N., Tannady, H., & Bernando, R. (2024). Analysis of the influence of performance expectancy, effort expectancy, social influence, and attitude toward behavior on intention to adopt live.on. *Multidisciplinary Reviews*. https://doi.org/10.31893/multirev.2023spe017

Sadeghi-Bazargani, H., Malekpour, F., Mohammadian, Y., Jafari-Koshki, T., Rezapur-Shahkolai, F., Khansari, M., Malekpour, A., & Marzroud, M. (2025). Examining the Determinants of Seatbelt Use Among Rural Drivers: An Application of the Theory of Planned Behavior. *Epidemiology and Health System Journal*. https://doi.org/10.34172/ehsj.26265

Saputra, A., Noraini, O., & Pertiwi, D. (2025). Analyzing the Impact of Social Influence and Cognitive Attitudes on The Willingness to Accept ChatGPT. *Journal of Information System Exploration and Research*. https://doi.org/10.52465/joiser.v3i2.599

Saputri, A., Listiana, E., Barkah, B., & Fitriana, A. (2024). The Influence of Performance Expectancy and Price Value on Favorable Behavioral Intentions Through Satisfaction With Viu Platform. *eCo-Buss*. https://doi.org/10.32877/eb.v7i2.1782

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2022). Partial Least Squares Structural Equation Modeling. In C. Homburg, M. Klarmann, & A. E. Vomberg (Eds.), *Handbook of Market Research* (pp. 587–632). Springer. https://doi.org/10.1007/978-3-319-05542-8_15-2

SathishJ, P. S., & Thiruchelvi, A. (2024). Exploring Environmental Influences on Responsible Tourism: The Role of Attitudes and Behaviour. *International Journal of Innovative Science and Research Technology (IJISRT)*. https://doi.org/10.38124/ijisrt/ijisrt24jun1060

Shahin, A., Jamkhaneh, H., & Shahin, R. (2022). The role of e-procurement in supply chains. In *Developments in Information & Knowledge Management for Business Applications* (pp. 599–616). (Springer/IGI Global; DOI as given by publisher)

Shaikh, A. A., Glavee-Geo, R., & Karjaluoto, H. (2018). How relevant are risk perceptions, effort, and performance expectancy in mobile banking adoption? *International Journal of E-Business Research*, 14(3), 39–60. (Add DOI from journal site, e.g. https://doi.org/…)

Shaliha, A., & Marsasi, E. (2024). The Influence of Attitude and Perceived Risk to Optimize Intention to Adopt Based on Theory of Planned Behavior in Generation Z. *EKOMBIS REVIEW: Jurnal Ilmiah Ekonomi dan Bisnis*. https://doi.org/10.37676/ekombis.v12i2.5427

Shatta, D. N. (2023). Determinants of behavioral intention to use e-procurement system in developing countries: Suppliers' perception from Tanzania. In *State of the Art in Partial Least Squares Structural Equation Modeling (PLS-SEM)*. Springer. https://doi.org/10.1007/978-3-031-34589-0

Shatta, D., & Mabina, B. (2024). The determinants of use behavior of e-procurement system in developing countries. *International Journal of Business Ecosystem & Strategy (2687-2293)*. https://doi.org/10.36096/ijbes.v6i2.498

Shrestha, G., Piya, R., Kakchapati, S., Sapkota, P., Joshi, D., & Baral, S. (2025). Assessing the drivers of sexual behavior among youth and its social determinants in Nepal. *PLOS ONE*, 20. https://doi.org/10.1371/journal.pone.0315495

Singh, P. K., & Chan, S. W. (2022). The impact of electronic procurement adoption on green procurement towards sustainable supply chain performance—Evidence from Malaysian ISO organizations. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(2), 61. https://doi.org/10.3390/joitmc8020061

Suyanto, M., Dewi, L., Dharmawan, D., Suhardi, D., & Ekasari, S. (2024). Analysis of The Influence of Behavior Intention, Technology Social Influence and Digitalization Performance Expectancy on Behavior To Use of QRIS Users in Small Medium Enterprises Sector. *Jurnal Informasi dan Teknologi*. https://doi.org/10.60083/jidt.v6i1.472

Tamilmani, K., Rana, N., Wamba, S., & Dwivedi, R. (2021). The extended Unified Theory of Acceptance and Use of Technology (UTAUT2): A systematic literature review and theory evaluation. *Int. J. Inf. Manag.*, 57, 102269. https://doi.org/10.1016/j.ijinfomgt.2020.102269

Taneja, B., & Bharti, K. (2021). Mapping unified theory of acceptance and use of technology (UTAUT) 2: a taxonomical study using bibliometric visualisation. *foresight*. https://doi.org/10.1108/fs-08-2020-0079

Tang, B., Ren, J., Li, Y., Dalal, K., Li, F., Yin, X., Chen, B., Zhao, W., & Wang, S. (2025). A study exploring predictors of cell phone use while walking among adolescents based on theory of planned behavior. *BMC Public Health*, 25. https://doi.org/10.1186/s12889-025-24047-7

Vaddhano, N. (2024). Impact of IT identity and data privacy on mobile telemedicine use: A UTAUT perspective. *Manajemen dan Bisnis*. https://doi.org/10.24123/mabis.v23i2.832

Vaddhano, N. (2024). Impact of IT identity and data privacy on mobile telemedicine use: A UTAUT perspective. *Manajemen dan Bisnis*. https://doi.org/10.24123/mabis.v23i2.832

Venkatesh, V., Morris, M., Davis, G., & Davis, F. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly*, 27(3), 425–478. https://doi.org/10.2307/30036540

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2012). Consumer acceptance and use of information technology: Extending the unified theory. *MIS Quarterly*, 36(1), 157–178. https://doi.org/10.2307/41410412

Venkatesh, V., Thong, J. Y. L., & Xu, X. (2016). Unified theory of acceptance and use of technology: A synthesis and the road ahead. *Journal of the Association for Information Systems*, 17(5), 328–376. https://doi.org/10.17705/1jais.00428

Venkatesh, V., Thong, J., & Xu, X. (2012). Consumer Acceptance and Use of Information Technology: Extending the Unified Theory of Acceptance and Use of Technology. *Behavioral Marketing eJournal*. https://doi.org/10.2307/41410412

Wahyudi, A., & Wardani, R. (2025). Analysis Determinant Factors of Use Behavior of the Hospital Management Information System (HIS) with Behavioral Intention as Mediation at General Hospital Dr. Iskak Tulungagung. *Journal Of Nursing Practice*. https://doi.org/10.30994/jnp.v8i3.548

Wang, C., & Qi, H. (2021). Influencing factors of acceptance and use behavior of mobile health application users: Systematic review. *Healthcare*, 9(3), 357. https://doi.org/10.3390/healthcare9030357

Wang, J., Li, X., Wang, P., Liu, Q., Deng, Z., & Wang, J. (2021). Research Trend of the Unified Theory of Acceptance and Use of Technology Theory: A Bibliometric Analysis. *Sustainability*. https://doi.org/10.3390/su14010010

Wang, L., Zhang, Y., Li, Z., Pang, X., Zhang, Y., & Zou, M. (2024). Analysis of willingness to use health management APP for female college students: application of UTAUT model based on Fogg theory. *Frontiers in Psychology*, 15. https://doi.org/10.3389/fpsyg.2024.1466566

Yanti, J., Sari, T., Lesmini, L., Robo, S., Saleh, S., & Nugraha, J. (2025). Analysis of the Influence of Effort Expectancy, Perceived Usefulness, and Digital Literacy on Intention to Use Retail Shopping Applications. *Journal of Information System, Technology and Engineering*. https://doi.org/10.61487/jiste.v3i2.153

Yuliantie, E. (2024). The effect of performance expectancy on behavioral intention: The mediating role of satisfaction. *Journal of Management and Business Insight*. https://doi.org/10.12928/jombi.v2i1.1123

Yuliawati, N.M., & Kurniawan, I. A. (2021). The Effect of E-Procurement System Implementation, Competence and Compensation on Employee Performance of Goods/Services Procurement, *Accounting Research Journal of Sutaatmadja, 5 (1)*, doi: (https://doi.org/10.35310/accruals.v5i01.698).

Zaman, S., Sabih, A., Alam, S., & Shahzad, K. (2025). User Acceptance of Social Media-Backed Digital Detox Apps: Exploring the Role of Personality Traits in Pakistan's Digital Landscape. *Annual Methodological Archive Research Review*. https://doi.org/10.63075/1nfx8d75

Zhang, S., Heinen, E., Yamamoto, T., Sato, H., & Gao, J. (2024). The influence of life events on the attitude-behavior relationship among household couples: A longitudinal study. *Cities*. https://doi.org/10.1016/j.cities.2023.104661

Zhao, J., Li, X., & Liao, H. (2025). Effect of L2 motivation on use behavior of translation technologies among English-related majors: Mediating effects of performance expectancy and L2 grit. *Language Teaching Research*. https://doi.org/10.1177/13621688251352261

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