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How Do TAM and UTAUT Affect User Trust in the Saudi E-Government Services Through User Satisfaction?

Najoud Alhuwaishel[1], Dr. Mahmoud Saleh [2]

[1] Department of Marketing/College of Business Administration

King Saud University/Saudi Arabia

[2] Department of Marketing/College of Business Administration

King Saud University/Saudi Arabia

Abstract:

This study investigates the factors influencing users' satisfaction and trust in digital government services, focusing on the Technology Acceptance Model (TAM) (perceived usefulness, and ease of use) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (effort expectancy, social influence, and performance expectancy). The study employs a quantitative research approach, utilizing snowball sampling to collect data from users of e-government services in Saudi Arabia. The data is analyzed using statistical techniques, including Structural Equation Modeling (SEM), to test the research hypotheses. Effort expectancy, usefulness, ease of use, and social influence drive user satisfaction, with effort expectancy being the key factor. Satisfaction boosts trust in digital platforms. Performance expectancy, however, does not appear to affect satisfaction, likely due to cultural or contextual factors specific to Saudi Arabia. Although this study is valuable, it has limitations, including potential sampling bias. Future research should consider additional contextual factors, diverse cultures, and moderators such as cultural influences and individual differences. Longitudinal and qualitative studies could enhance understanding of the user's satisfaction and trust in digital government services in Saudi Arabia. This study integrates the Theory of Acceptance and Use of Technology (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) to examine factors influencing user satisfaction and trust in digital government services in Saudi Arabia. The findings that shape user satisfaction and trust contribute to the academic discourse on digital government services and provide practical implications for policymakers, IT developers, and government entities who are concerned with developing e-government services.

Keywords: Perceived Usefulness, Ease of Use, Effort Expectancy, Social Influence, Performance Expectancy, Trust, Satisfaction, Digital Government Services, Saudi Arabia, TAM, UTAUT.

1. Introduction

The rapid digital transformation of government services has revolutionized the public sector, enhancing efficiency, accessibility, and transparency. In alignment with its Vision 2030 initiative, Saudi Arabia has made significant investments in e-government services to strengthen citizen engagement, streamline administrative processes, and foster trust in public institutions. Despite these advancements, the continued use and adoption of e-government services remain dependent upon user satisfaction, which plays a critical role in shaping user behavior and trust (Sachan et al., 2018; Danila & Abdullah, 2014; Kala et al., 2024). Understanding the determinants of satisfaction and their subsequent impact on trust is essential for policymakers and system designers aiming to enhance the effectiveness of digital governance.

This study examines how user satisfaction influences the trust in Saudi e-government services through the theoretical lenses of the Technology Acceptance Model (TAM) (Davis, 1989) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). TAM posits that perceived usefulness and perceived ease of use drive user adoption, suggesting that a positive experience with e-government services enhances satisfaction and fosters long-term engagement. UTAUT extends this perspective by incorporating factors such as performance expectancy, effort expectancy, social influence, and facilitating conditions, providing a more comprehensive framework for analyzing technology acceptance and sustained usage.

By integrating TAM and UTAUT, this research examines the interplay between user satisfaction and trust, particularly in the context of Saudi Arabian usage. Given the unique socio-cultural and regulatory environment, factors may further mediate these relationships. Moreover, trust in e-government services is not merely a byproduct of satisfaction but a crucial determinant of sustained digital engagement, influencing users' willingness to rely on online platforms for essential services.

Numerous studies have examined the quality and adoption of electronic government (e-government) and mobile government (m-government) services in Saudi Arabia. Alshehri (2012) identifies technological, cultural, and organizational barriers to e-government adoption and suggests recommendations for overcoming these challenges in the Saudi community. Alotaibi (2016) focused on m-government services, identifying trustworthiness, usage experience, awareness, and security as critical factors influencing the adoption of m-government services in Saudi Arabia. Trust in digital services is influenced by the transparency and quality of

government initiatives (Morgan & Hunt, 1994; Mayer et al., 1995; Carter & Bélanger, 2005; Susanto & Aljoza, 2015; Mensah, 2019), and factors such as perceived usefulness, ease of use, and self-efficacy also play critical roles in user acceptance of mobile e-government services (Hung et al., 2013). While barriers faced by specific demographics impact the acceptability and usability of systems, highlighting the need for improvements in accessibility and user satisfaction (Bhat et al., 2000; Maguire, 2000; Nurmela et al., 2013; Weichbroth, 2020; Choudrie et al., 2017).

This study contributes to the growing body of literature on e-government adoption by providing empirical insights into the factors that drive user satisfaction and trust in Saudi Arabia's digital governance landscape. The findings offer valuable implications for policymakers, IT developers, and government entities seeking to optimize user experiences, promote digital inclusion, and enhance public trust in e-government services.

2. Literature review

2.1 Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is a widely used framework for understanding how users adopt and accept new technologies (Davis, 1989; Silva, 2015). Developed from the theory of reasoned action, TAM identifies perceived usefulness (PU) and perceived ease of use (PEOU) as key factors influencing user acceptance (Alomary & Woollard, 2015). It has been extensively applied to e-government adoption, with research demonstrating that its core constructs significantly impact user intentions toward e-government services (Lin et al., 2011; Al-Hujran, 2009). To enhance its explanatory power, TAM has been extended to incorporate additional factors such as trust, perceived behavioral control, and attitudes (Özkan & Kanat, 2011).

PU and PEOU are central to shaping users' adoption and continued engagement with e-government services. PU refers to the extent to which individuals believe technology will enhance their efficiency and performance (Venkatesh & Davis, 2000), while PEOU reflects the perceived effort required to use the system (Davis, 1989). Studies have shown that PU and PEOU significantly influence behavioral intentions, as users are more likely to adopt a system that is both useful and easy to use (Alomary & Woollard, 2015; Hamid et al., 2016). Additionally, these relationships are shaped by demographic and contextual factors, such as age, gender, and prior experience, which moderate their effects on e-government adoption (Camilleri, 2020).

2.1.1 Perceived Usefulness (PU)

Empirical research consistently supports the strong predictive power of PU in determining user intention to adopt e-government services. Mensah and Mi (2017) found that while perceived service quality influences adoption intention, it does not significantly moderate the relationship between PU and behavioral intention, reinforcing that usefulness remains a primary driver of adoption. Furthermore, Arfat et al. (2018) emphasize the role of computer self-efficacy and user satisfaction in strengthening the relationship between perceived usefulness (PU) and e-government adoption. Beyond initial adoption, PU also affects the continued use of e-government platforms. Li and Shang (2020) emphasize that perceived service value mediates the relationship between service quality and long-term engagement, aligning with the findings of Horst et al. (2007), who establish trust as a crucial factor influencing perceived value. Similarly, Li and Xue (2021) investigate how post-use trust and satisfaction influence continuous-use intention, highlighting the interconnected nature of post-use experience (PU), trust, and sustained user engagement. Thus, H1 describes the relationship between perceived usefulness and user satisfaction, which could be hypothesized as:

H1: Perceived Usefulness has a statistically significant positive impact on user satisfaction with e-government services.

2.1.2 Perceived Ease Of Use (PEOU)

Similarly, PEOU plays a crucial role in shaping behavioral intentions toward e-government adoption, as usability and accessibility significantly influence user perceptions (Alomary & Woollard, 2015). The International Organization for Standardization (ISO) defines usability as "the extent to which specified users can use a product to achieve specified goals with effectiveness, efficiency, and satisfaction in a specified context of use" (Weichbroth, 2020). This definition aligns with PEOU, emphasizing the design of user-friendly systems and ease of interaction. Research has consistently demonstrated that systems that are easier to navigate require less cognitive effort, increasing the likelihood of sustained usage (Hamid et al., 2016; Li & Xue, 2021).

Beyond system design, external factors such as demographic characteristics and social influence shape perceptions of ease of use. Choudrie et al. (2017) highlight that digital divides related to age, gender, and education affect e-government adoption, with older adults and less technologically experienced individuals perceiving these systems as more challenging to use. Similarly, Camilleri (2020) emphasizes that demographic factors moderate the relationship between perceived ease of use (PEOU) and behavioral intention, highlighting the importance of providing inclusive and user-friendly digital government services. Facilitating conditions and social influences also have a substantial impact on PEOU. Chen and Aklikokou (2019) note that social pressure can

shape users' perceptions of ease of use. Zubir and Abdul Latip (2023) suggest that governments can leverage targeted marketing and community collaboration to encourage adoption. Additionally, Teerling and Pieterson (2011) recommend employing multichannel marketing strategies to guide citizens toward digital service platforms. Thus, H2 describes the relationship between perceived ease of use and user satisfaction, which could be hypothesized as:

H2: Perceived Ease of Use has a statistically significant positive impact on user satisfaction with e-government services.

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

The Unified Theory of Acceptance and Use of Technology (UTAUT) is a comprehensive model that integrates eight key technology acceptance theories to explain IT adoption (Venkatesh et al., 2003). Taiwo and Downe (2013) suggest that performance expectancy, effort expectancy, and social influence are important predictors of the behavioral intention to use technology. Furthermore, their research suggests that facilitating conditions, in conjunction with behavioral intention, directly influence the actual use of technology. This framework underscores the interplay of these factors in shaping user adoption and the ongoing use of technological innovations. The UTAUT model has been widely applied to investigate e-government adoption across various countries, consistently identifying these factors as essential determinants (Nasri, 2014; Bhuasiri et al., 2016; AlAwadhi & Morris, 2008). Additionally, it has been validated and adapted for use in various cultural contexts, including Kuwait, Qatar, Thailand, and Malaysia. These insights underscore the importance of aligning e-government services with user expectations, enabling policymakers and practitioners to enhance adoption rates (Nasri, 2014; Shafi & Weerakkody, 2009; Bhuasiri et al., 2016; Sivaji et al., 2019).

Research on e-government services has examined various factors influencing their adoption and sustained use across diverse populations and contexts. Razak et al. (2017) found that effort expectancy and social influence significantly impact continuance intention in Malaysia. In contrast, Mensah et al. (2020) found that while these factors did not directly predict attitudes toward e-government use, trust in government and perceived service quality positively influenced adoption intention. Moreover, in Nigeria, Ogunsola and Olojo (2021) revealed that performance expectancy, effort expectancy, social influence, and trust collectively influenced citizens' continued use of Web 2.0 for e-government services, a technology that enables dynamic interaction, user-generated content creation, sharing, collaboration, and communication. Additionally, Kurfali et al. (2017) found that performance expectancy, social influence, facilitating conditions, and trust in the Internet positively impacted citizens' intention to use e-government services in Turkey. Moreover, trust factors strengthened performance expectancy, whereas effort expectancy and trust in the government did not significantly affect behavioral intention. These findings provide policymakers with valuable insights to enhance the adoption and utilization of e-government services.

2.2.1 Performance Expectancy

Performance expectancy refers to an individual's belief that using a specific technology will improve their job performance (Venkatesh et al., 2003). Research on citizen satisfaction with government services has applied the expectancy-disconfirmation model, which posits that satisfaction is determined by comparing prior expectations with actual performance. The study by James (2011) highlights that past performance significantly influences citizens' expectations of future performance. This finding highlights the significance of performance expectancy, which influences how citizens perceive and interact with public services. The study also suggests that managing these expectations through transparent communication and reliable performance data can enhance overall satisfaction and foster greater public engagement. While performance information can shape positive expectations, normative expectations are generally more resistant to change (James, 2011; Favero & Kim, 2021). This model has been tested across various government levels, demonstrating that political ideology, party identification, and trust in government influence expectations at the federal level (Morgeson, 2012). Recent research distinguishes between normative and predictive expectations, indicating that normative expectations have a stronger negative relationship with satisfaction, whereas predictive expectations have a minimal impact (Favero & Kim, 2021). Thus, H3 describes the relationship between performance expectancy and user satisfaction, which could be hypothesized as:

H3: Performance Expectancy has a statistically significant positive impact on user satisfaction with e-government services.

2.2.2 Effort Expectancy

Effort expectancy refers to the ease of using a specific technology (Venkatesh et al., 2003). Studies on e-government adoption show that effort expectancy and social influence significantly impact continuance intention among Malaysian government employees (Razak et al., 2017). However, Mensah et al. (2020) found that performance expectancy, effort expectancy, and social influence did not predict attitudes toward e-government use, while facilitating conditions influenced behavioral intention and effort expectancy. Trust in government and perceived service quality were also identified as important factors. Nasri (2014) confirmed that facilitating

conditions, social influence, attitude, effort expectancy, and performance expectancy determine citizens' intention to use e-government services in Tunisia. Thus, H4 describes the relationship between effort expectancy and user satisfaction, which could be hypothesized as:

H4: Effort Expectancy has a statistically significant negative impact on user satisfaction with e-government services.

2.2.3 Social Influence

Social influence refers to the degree to which important individuals believe a person should adopt a new system (Venkatesh et al., 2003). Social influence plays a significant role in shaping adoption intentions for e-government services, with factors such as familiarity and ubiquitous connection contributing to this influence (Liu, 2022; Tung & Rieck, 2005). Liu (2022) demonstrated that adopting digital government services is closely tied to the level of trust and social influence. Additionally, performance expectancy, effort expectancy, and facilitating conditions are crucial determinants in the adoption process (Qiyamullaily & Subriadi, 2024). External pressures from the business environment also impact these adoption decisions (Tung & Rieck, 2005).

Qiyamullaily and Subriadi's (2024) systematic literature review highlights that trust, performance expectancy, effort expectancy, social influence, and facilitating conditions significantly influence the adoption of e-government services across different countries, with trust in information security and government transparency being particularly crucial. Thus, H5 describes the relationship between social influence and user satisfaction, which could be hypothesized as:

H5: Social Influence has a statistically significant positive impact on user satisfaction with e-government services.

2.3 User Trust

In marketing research, trust has been defined in various ways; for instance, Morgan & Hunt (1994) characterized it as "when one party has confidence in an exchange partner's reliability and integrity," Mayer et al. (1995) defined it as "the willingness of a party to believe the actions of another party based on the expectation that the other will perform a particular action properly, irrespective of the ability to monitor or control the other party."; consequently, brand trust fosters brand loyalty by establishing valuable exchange associations (Morgan & Hunt, 1994). Numerous studies have underscored the substantial impact of service features on public trust. Fire (2016) and Liu (2022) both emphasize the role of trust in shaping citizens' perceptions and intentions regarding using these services. Fire (2016) further emphasizes the importance of transparency, citizen participation, and high-quality interaction in building trust. Chiang (2013) and Lee (2020) contribute to this understanding by identifying trust as a crucial factor influencing the intention to adopt digital government services, specifically highlighting the role of social media competence in this process. These findings underscore the need for government agencies to prioritize building trust to enhance the usability of digital government services.

Research consistently shows that public trust in government services is closely linked to the perceived ease of use and trustworthiness of e-government initiatives (Carter & Bélanger, 2005; Susanto & Aljoza, 2015). This is particularly important in developing countries, where building trust and utilizing social influence is vital to promoting new e-government services (Susanto & Aljoza, 2015). Recent studies have highlighted the crucial role of trust, perceived security, and privacy in influencing users' intentions to engage with e-government services (Almansoori et al., 2024; Liu, 2022).

Research indicates that trust is crucial in adopting e-government services and user satisfaction. Trust directly influences behavioral intention and system use, with system effectiveness measures and operational effectiveness mediating its effects on user satisfaction (Santa et al., 2019; Hooda et al., 2022). In e-government contexts, trust is impacted by performance expectancy, effort expectancy, social influence, and facilitating conditions (Hooda et al., 2022). Studies have found that perceived ease of use, compatibility, and trustworthiness are significant predictors of citizens' intention to use e-government services (Carter & Bélanger, 2005).

Trust has been integrated into technology acceptance models, including the Unified Theory of Acceptance and Use of Technology (UTAUT), to improve the understanding of e-government adoption (Hooda et al., 2022). In this context, user trust mediates the relationship between technology acceptance factors and user satisfaction with e-government services (Alshehri et al., 2012). Nevertheless, trust is established through the effectiveness of the operations that e-government systems provide to organizations, and it plays a critical role in the success of these systems (Tegethoff, 2020). Overall, these findings emphasize the vital role of trust in mediating technology acceptance factors and user satisfaction with e-government services.

Belanger and Carter's (2008) study concludes that citizens' trust in the government and the technology used for e-government initiatives significantly influence their willingness to engage in e-government transactions. These findings underscore the importance of establishing trust and mitigating perceived risks to promote widespread adoption and satisfaction with e-government services. Therefore, building and maintaining trust is crucial for

fostering positive perceptions, ensuring user satisfaction, and promoting the sustained use of e-government services.

2.4 User Satisfaction

Satisfaction is an experience's effect that compares expectations with actual experiences (Bhattacherjee, 2001). In the context of e-government services, it reflects citizens' emotions and perceptions based on their interactions with digital platforms (Hujran et al., 2023). Several studies have highlighted key factors that influence user satisfaction in this domain. AlAwadhi and Morris (2008) found that strong facilitating conditions enable users to access and utilize e-government services effectively, resulting in higher satisfaction. Sachan et al. (2018) emphasize that technological capabilities embedded in government websites significantly impact service quality and user satisfaction, suggesting that improving these features can encourage continued use. Similarly, Danila and Abdullah (2014) identify personal innovativeness, perceived usefulness, ease of use, attitude, subjective norms, perceived behavioral control, and system quality as predictors of sustained e-government adoption, underscoring the role of satisfaction in shaping trust and user behavior. Additionally, Kala et al. (2024) highlight that satisfaction directly influences the intention to continue using e-government services, reinforcing its significance in long-term adoption.

Studies suggest that when users perceive e-government services as beneficial for efficiently completing tasks, their satisfaction increases. Carter and Bélanger's (2005) study integrates constructs from the Technology Acceptance Model, Diffusion of Innovations theory, and web trust models to reveal that perceived ease of use, compatibility, and trustworthiness significantly predict citizens' intention to use e-government services. Saleh et al.'s (2024) study findings indicate that perceived trust, perceived quality, performance expectancy, effort expectancy, social influence, self-efficacy, and facilitating conditions are the most significant factors influencing behavioral intention to use e-government services. These factors operate through the mediation effects of attitude and perceived satisfaction. Additionally, demographic characteristics such as age, gender, education, and experience with e-government services moderate the relationship between these mediators and behavioral intention.

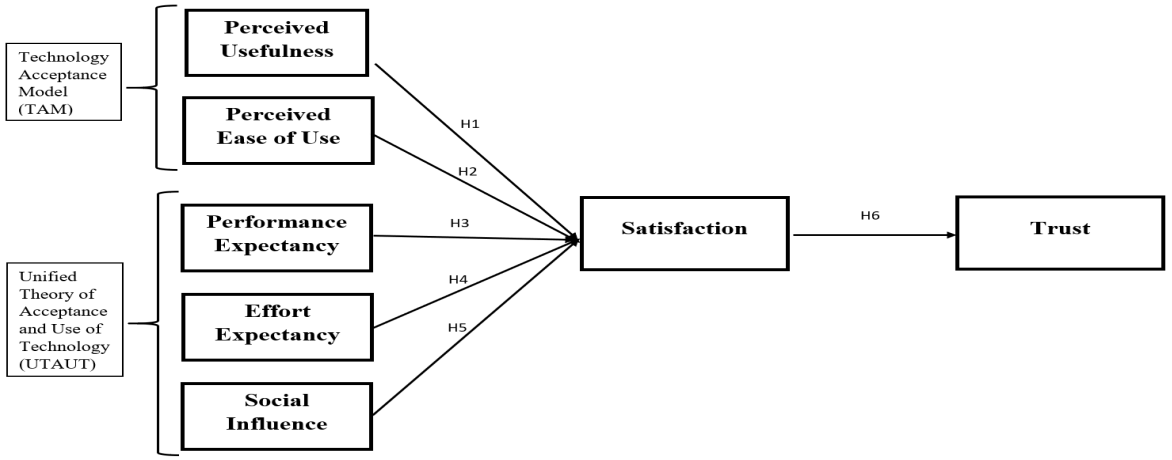
Research by Dwivedi et al. (2019) integrates insights from the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), demonstrating that both models collectively explain user satisfaction with e-government services. The study found that perceived usefulness, ease of use, performance expectancy, effort expectancy, social influence, and facilitating conditions are significant predictors of user satisfaction. The study emphasizes the multifaceted nature of satisfaction in the context of e-government adoption.

User satisfaction is critical for the success and sustainability of e-government platforms, with key determinants varying across countries. In Jordan, security, privacy, trust, and awareness significantly shaped public service satisfaction (Alawneh et al., 2013). The key determinants of citizen e-satisfaction with e-government services in Pakistan include trust, accessibility, awareness, service quality, computer anxiety, expectations, and security or privacy (Malik et al., 2016). In Korea, User satisfaction and perceived efficiency are key determinants of the continuous use of platform-based e-government services (Nam et al., 2024). These studies highlight the importance of understanding and addressing specific factors within each country that influence user satisfaction, which is vital for the successful implementation and adoption of e-government services. Despite contextual differences, common factors such as trust, accessibility, and service quality consistently emerge as key determinants of satisfaction with e-government services. Alkraiji and Ameen (2021) revealed that e-government enhances trust in government transactions by improving users' perceptions of the system's responsiveness, which reflects the role of user satisfaction. Thus, H6 describes the relationship between user satisfaction and user trust, which could be hypothesized as:

H6: User satisfaction has a statistically significant positive impact on user trust in e-government services.

3. Theoretical Framework

Figure 1: The Conceptual Model



4. Research Methodology

4.1 Data Collection Instrument

This research used a survey to collect quantitative data to statistically test the hypotheses. The constructs examined in this study were measured using well-established scales adapted from prior research and tailored to the specific context of the investigation. The factors from the Technology Acceptance Model (TAM) included Perceived Usefulness, which was measured using scales from Davis (1989), Mensah (2020), and Xie et al. (2017), and Perceived Ease of Use, which was measured using scales from Davis (1989) and Xie et al. (2017). Additionally, factors from the Unified Theory of Acceptance and Use of Technology (UTAUT) were incorporated, including Performance Expectancy, Effort Expectancy, and Social Influence, all measured using Venkatesh et al. (2003) scales. Other constructs measured were Satisfaction, assessed using scales from Li & Shang (2020) and Mandari & Koloseni (2023), and Trust, evaluated using scales from Kurfalı et al. (2017) and Venkatesh et al. (2016). All constructs were assessed on a 5-point Likert scale, ranging from "Strongly Disagree" to "Strongly Agree." Finally, the questionnaire concluded with prompts for respondents to provide demographic information. The questionnaire was initially developed in English and subsequently translated into Arabic. Following this, it was back-translated into English to ensure translation equivalence.

4.2 Population and Sample

The sample for this study was drawn from residents in Saudi Arabia who had previously used a Saudi government platform. The study employed the snowball sampling technique, a non-probability method where participants refer the questionnaire to others with similar characteristics (Parker et al., 2019). Responses were collected using online survey forms distributed through Google Forms. After completing the questionnaire, respondents were encouraged to forward the survey link to other users of electronic platforms. No participants were hired; all responses were provided voluntarily. A total of 457 responses were collected and filtered, and 104 did not complete the questionnaire. 353 responses were left to analyze.

4.3 Statistical Analysis Techniques

This study utilizes both SPSS and Smart PLS software for its comprehensive statistical analysis. Primarily, the statistical examination of this study begins with the presentation of the sample and descriptive statistics using SPSS statistical software. The validity and reliability of the constructs will be thoroughly examined. Ensuring construct validity involves confirming both convergent and discriminant validity.

Item reliability is assessed by computing Cronbach's alpha for each construct. Constructs with a Cronbach's alpha exceeding 0.7 are considered acceptable, in line with the recommended threshold by DeVillis (2016) and Kline (2023). Convergent validity is evaluated by ensuring that the average variance extracted (AVE) (CR) exceeds .5, following the recommendations of Fornell and Larcker (1981). As for the discriminant validity, the Heterotrait-Monotrait (HTMT) Ratio of Correlations was utilized. All HTMT values were below the conservative threshold of 0.85 (Henseler et al., 2015), demonstrating that the constructs are distinct. This outcome further validates the discriminant validity of the measurement model, ensuring that each construct measures a unique aspect of the phenomenon under investigation.

5. Results

5.1 Sample Characteristics

The study sample comprises 353 respondents. Table 1 reports the complete sample characteristics of this study. Females comprised the majority of the sample (63.2%), compared to males (36.8%). Table 1 reports that more than 50% of the respondents were from two age groups, 20-29 (26.1%) and 50-59 (24.1%). The age group under 20 only constituted 1.7% of the sample, while the 60 and above age group comprised 13.6%. As for the education level, most respondents were college graduates (67.1%), 11.3% were Master's graduates, and 12.2% were high school graduates. The majority of the sample were Saudi citizens, representing 98.3% of the sample.

Table 1: Sample Characteristics

	Frequency	Percent	Cumulative Percent
Gender			
Male	130	36.8	36.8
Female	223	63.2	100.0
Age			
less than 20	6	1.7	1.7
20-29	92	26.1	27.8
30-39	59	16.7	44.5
40-49	63	17.8	62.3
50-59	85	24.1	86.4
and above 60	48	13.6	100.0
Nationality			
Saudi	347	98.3	98.3
Non Saudi	6	1.7	100.0
Education			
Highschool	43	12.2	12.2
College Graduate	237	67.1	79.3

Diploma	15	4.2	83.6
Master's degree	40	11.3	94.9
Doctoral Degree	18	5.1	100.0

5.2 Reliability and Validity

The study evaluated variable reliability using Composite Reliability (CR) and Cronbach's Alpha. Table 2 presents the reliability and validity of the included items across the sample. All Alpha values exceeded the recommended threshold of 0.700. The Average Variance Extracted (AVE) generally surpassed 0.500, indicating convergent validity. According to Hair et al. (2021), items with an AVE above the threshold can be accepted. This reaffirms the convergent validity observed in the study. Perceived Usefulness was not auto-generated in the SmartPLS reliability table. However, based on its outer loadings and consistent item strength, we manually computed its Composite Reliability (0.89 and 0.921) and AVE (0.796), exceeding the recommended thresholds. This confirms its strong internal consistency and convergent validity.

Table 2: Construct Reliability and Validity

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
Perceived Usefulness	0.807	0.89	0.921	0.796
Perceived Ease of Use	0.884	0.884	0.928	0.811
Performance Expectancy	0.814	0.818	0.878	0.645
Effort Expectancy	0.840	0.842	0.893	0.676
Social Influence	0.867	0.879	0.909	0.713
Satisfaction	0.931	0.931	0.948	0.784
Trust	0.885	0.890	0.921	0.743

The Heterotrait-Monotrait (HTMT) Ratio of Correlations was used to establish discriminant validity. All HTMT values were below the conservative threshold of 0.85, indicating that the constructs are distinct from one another and further confirming discriminant validity.

(Table 3: HTMT Ratio (Heterotrait-Monotrait Ratio

	Heterotrait-monotrait ratio (HTMT)
Perceived Ease of Use <-> Effort Expectancy	0.812
Performance Expectancy <-> Perceived Ease of Use	0.661
Performance Expectancy <-> Effort Expectancy	0.876
Social Influence <-> Perceived Ease of Use	0.475
Social Influence <-> Performance Expectancy	0.699
Social Influence <-> Effort Expectancy	0.679
Social Influence <-> Satisfaction	0.613
Satisfaction <-> Perceived Ease of Use	0.711
Satisfaction <-> Performance Expectancy	0.733
Satisfaction <-> Effort Expectancy	0.824
Trust <-> Perceived Ease of Use	0.500

Trust <-> Performance Expectancy	0.577
Trust <-> Effort Expectancy	0.609
Trust <-> Social Influence	0.510
Trust <-> Satisfaction	0.630

5.3 Hypothesis Testing

The hypothesized relationships among constructs were tested using Partial Least Squares Structural Equation Modeling (PLS-SEM), which enables simultaneous testing of multiple structural paths. The results in Table 4 and the structural model (Figure 2) show the standardized path coefficients, t-statistics, and p-values for each relationship. All hypotheses were supported except for the relationship between Performance Expectancy and Satisfaction, which was not statistically significant (p = 0.291).

Table 4: Hypothesis Testing (Path Coefficient)

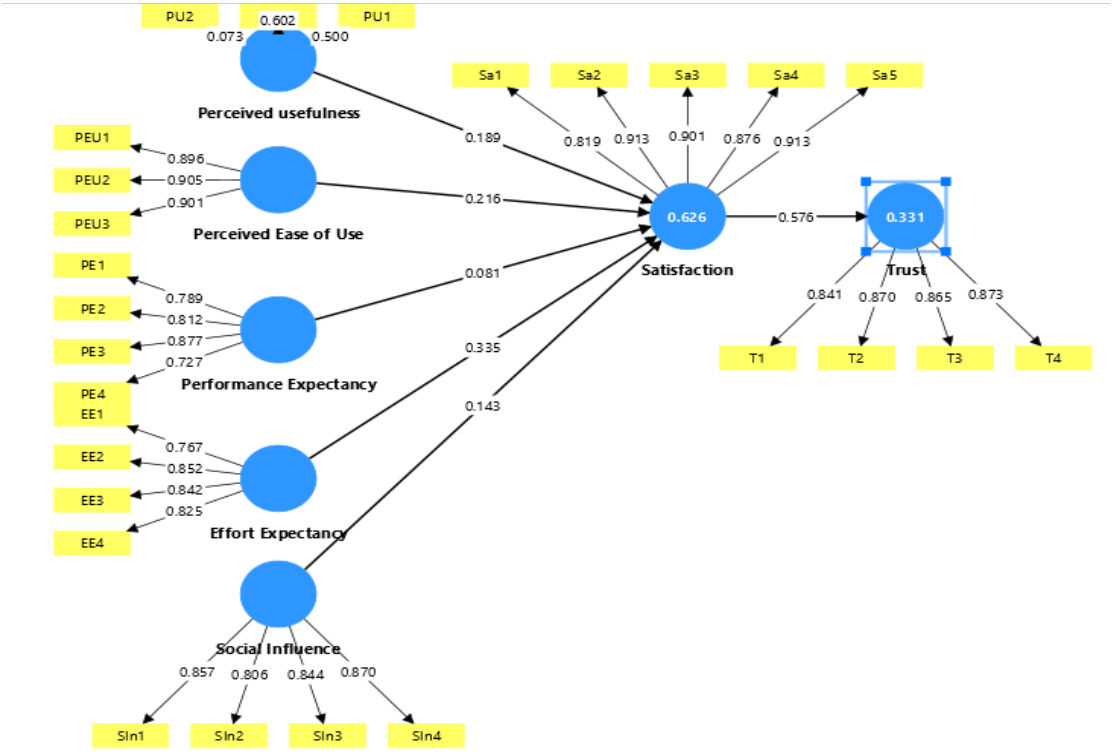
	Original sample (O)	**Sample mean (M)**	**Standard deviation (STDEV)**	**T statistics (|O/STDEV|)**	**P values**	**Results**
Perceived usefulness -> Satisfaction	0.189	0.190	0.051	3.670	0.000	Supported
Perceived Ease of Use -> Satisfaction	0.216	0.216	0.051	4.235	0.000	Supported
Performance Expectancy -> Satisfaction	0.081	0.085	0.077	1.056	0.291	Not Supported
Effort Expectancy -> Satisfaction	0.335	0.331	0.064	5.198	0.000	Supported
Social Influence -> Satisfaction	0.143	0.144	0.045	3.164	0.002	Supported
Satisfaction -> Trust	0.576	0.584	0.058	9.879	0.000	Supported

The findings also analyzed the R-squared value. As shown in Table 5, the R^2 value for Satisfaction was 0.626, indicating that approximately 62.6% of the variance in Satisfaction is explained by the independent variables (Perceived Usefulness, Perceived Ease of Use, Performance Expectancy, Effort Expectancy, and Social Influence). This reflects moderate to substantial explanatory power, according to the thresholds suggested by Hair et al. (2021). Similarly, the R^2 value for Trust was 0.331, meaning that 33.1% of the variance in Trust is explained by Satisfaction. This is considered weak to moderate explanatory power, which is understandable given the model structure and the single predictor variable.

Table 5: Coefficient of Determination (R Square)

	R-square	**R-square adjusted**	**Interpretation**
Satisfaction	0.626	0.620	Moderate to substantial
Trust	0.331	0.330	Weak to moderate

Figure 2: The Model



6. Discussion

This study investigated the factors influencing users' satisfaction and trust in digital government services, focusing on perceived usefulness, ease of use, effort expectancy, social influence, and performance expectancy. The findings demonstrate that perceived usefulness, perceived ease of use, effort expectancy, and social influence all significantly affect user satisfaction.

Among these, effort expectancy showed the most potent effect, suggesting that users are more satisfied when digital government services are perceived as easy to use and require minimal effort. This aligns with prior research in technology acceptance, which highlights ease of use and social norms as key drivers of satisfaction (Davis, 1989; Venkatesh et al., 2003). Additionally, satisfaction has a significant influence on trust, supporting the notion that positive user experiences foster greater confidence in digital platforms (Carter & Bélanger, 2005; Hooda et al., 2022).

Interestingly, the relationship between performance expectancy and satisfaction was not statistically significant. This may indicate that users of digital government platforms do not necessarily equate expected performance outcomes with satisfaction, possibly because their primary concerns are ease of use and usability rather than long-term benefits, or because of the routine services that are usually provided by e-government. This finding contrasts with several studies but may reflect cultural or contextual influences specific to the Saudi digital government setting (Alshehri et al., 2012; AlAwadhi & Morris, 2008). Further research is needed to understand these influences and their implications for designing and implementing digital government services in Saudi Arabia.

The results are consistent with prior research in technology acceptance frameworks such as TAM and UTAUT, which emphasize the importance of ease of use and social influence in shaping user satisfaction (Dwivedi et al., 2017; Alshehri et al., 2012). However, the non-significant result for performance expectancy suggests a potential need to consider contextual factors that might influence user perceptions and expectations in the Saudi context.

7. Conclusion

In conclusion, this study provides valuable insights into the factors influencing user satisfaction and trust in digital government services. The findings underscore the significance of perceived usefulness, ease of use, effort expectancy, and social influence in shaping user satisfaction. Notably, effort expectancy emerged as the strongest predictor, indicating that users prioritize services that are easy to use and require minimal effort. This finding aligns with established technology acceptance models, such as the Technology Acceptance Model (TAM)

and the Unified Theory of Acceptance and Use of Technology (UTAUT), which emphasize the role of ease of use and social norms in driving satisfaction.

The relationship between performance expectancy and satisfaction was not statistically significant, suggesting that users may not equate expected performance outcomes with their level of satisfaction. This finding highlights the importance of contextual factors, such as cultural or regional influences, in understanding user perceptions and expectations in the context of Saudi digital government. Overall, the study contributes to the existing literature on technology acceptance and provides practical implications for enhancing user satisfaction and trust in digital government services.

8. Theoretical and Managerial Implications

This study contributes to the existing literature on technology acceptance by providing empirical evidence on the factors influencing user satisfaction and trust in digital government services, particularly in Saudi Arabia. The findings reinforce the importance of perceived usefulness, ease of use, effort expectancy, and social influence in shaping user satisfaction, aligning with established frameworks such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis, 1989; Venkatesh et al., 2003). The significant impact of effort expectancy on satisfaction highlights the need for user-centric design in digital government platforms, emphasizing that users prioritize services that are easy to use and require minimal effort.

Moreover, the study contributes to understanding trust formation in digital contexts by linking satisfaction to trust, supporting previous research (Carter & Bélanger, 2005; Hooda et al., 2022). The non-significant relationship between performance expectancy and satisfaction offers a unique insight, suggesting that users may not always associate expected performance outcomes with satisfaction. This finding underscores the importance of considering contextual factors, such as cultural or regional influences, in understanding user perceptions and expectations, particularly in the Saudi digital government context (Alshehri et al., 2012; AlAwadhi & Morris, 2008).

The study provides a basis for comparing the adoption of digital government services across different cultural settings. It suggests that immediate usability concerns, rather than long-term performance expectations, may influence user perceptions of digital services more strongly. It highlights the need for context-specific models of technology acceptance that consider local cultural and institutional factors, thereby enriching the theoretical framework and offering practical implications for enhancing digital service delivery.

For practitioners and policymakers, this study underscores the importance of directing efforts towards minimizing user effort to enhance satisfaction with digital government services. Conducting user research and integrating citizen feedback are essential to ensure that platforms are intuitive and meet user needs. Implementing continuous user testing and feedback collection enables ongoing improvements, while establishing mechanisms for continuous assessment and enhancement of digital services ensures sustained quality. A focus on fostering positive user experiences is crucial for building trust in digital platforms. Developing training programs for government staff can enhance their understanding of user-centric design principles to support these efforts. Collaborating with technology partners enables leveraging innovative solutions to improve service delivery. Ensuring that accessibility features are integrated into digital platforms accommodates diverse user needs. Exploring partnerships with academic institutions can facilitate joint research on improving digital government services.

9. Limitations and Further Research

While this study provides valuable insights, it is not without limitations. The study exploited a non-probability sampling technique (snowball sampling), which may present sampling bias. The sample involved individuals willing to participate and may not fully represent the entire Saudi population. Also, the questionnaire used in the study was initially developed in English and then translated into Arabic. Although efforts were made to ensure translation equivalence, subtle differences in language and cultural nuances could have influenced participant responses. Future studies should consider using culturally adapted and validated instruments in the local language.

The non-significant result for performance expectancy suggests that there may be other contextual factors at play that were not captured in this study. Future research could explore these factors more deeply to provide a more comprehensive understanding of user satisfaction and trust in digital government services. Future research should consider expanding the scope to include diverse cultural and regional contexts to assess the broader applicability of the findings. Moreover, future studies should consider incorporating moderators such as cultural factors and individual differences to better understand how these variables influence the relationship between user satisfaction, trust, and the adoption of digital government services. This could provide deeper insights into the contextual nuances affecting user perceptions and behaviors, enriching the theoretical framework and offering practical implications for enhancing digital service delivery. Additionally, longitudinal studies could examine how user perceptions and satisfaction evolve as they interact more with digital government services.

Exploring the role of additional factors, such as perceived risk and privacy concerns, could provide a more nuanced understanding of user trust and satisfaction. Furthermore, qualitative research methods, such as interviews or focus groups, could offer deeper insights into the underlying reasons for user perceptions and behaviors.

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