Journal of Libyan Academy Bani Walid 2025
مجلة الأكاديمية الليبية بني وليد
e-ISSN: 3104-3860
المجلد الأول، العدد الثاني، 2025

Determinants of e-Government Adoption in Libya: Examining the Mediating Effect of Trust

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محددات تبني الحكومة الإلكترونية في ليبيا: دراسة الأثر الوسيط للثقة

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Received: 28-02-2025; Accepted: 26-04-2025; Published: 31-05-2025

Abstract
Governments are continuously striving to improve the services they offer to their citizens. The advent of e-Government (electronic government) has provided numerous advantages; however, citizens still have yet to engage with services that are offered. Most of the existing literature in this area appears to focus on developed countries, with few studies articulating the situation of e-government in developing countries. This research aims to outline the factors influencing the use of e-Government services in Libya. Using the existing literature, the research is developed around the Unified Theory of Acceptance and Use of Technology (UTAUT) and adds the factors of security and trust. The research adopts three main constructs; individual factors which consist of performance expectancy, effort expectancy, social influence and IT knowledge; technological factors which consist of facilitating conditions, security, and privacy; and trust which comprises trust in the government and trust in the Internet, with trust also analyzed as a mediating factor. This is a quantitative research study that uses a questionnaire as the main method of data collection. The questionnaire was administered to 320 respondents using stratified vector sampling from the population of the students and staff of the University of Tripoli (academic and administrative staff). The results suggested that both personal and technical factors are significant predictors of the intention to use e-Government services. The main predictors include performance expectancy, social influence, IT knowledge, trust in the Internet, facilitating conditions, privacy and security. Trust was shown to partially mediate between technical factors and behavioural intention. Increasing citizen participation in e-Government services could have a huge impact on improving public spending efficiency and public satisfaction.

Keywords: e-Government Adoption, Libya, Mediating Effect, Trust.

الملخص
تسعى الحكومات باستمرار إلى تحسين الخدمات التي تقدمها لمواطنيها. وقد وفّر ظهور الحكومة الإلكترونية العديد من المزايا؛ ومع ذلك، لا يزال المواطنون غير منخرطين في استخدام الخدمات المقدمة. يركّز معظم الأدبيات الحالية في هذا المجال على الدول المتقدمة، مع وجود عدد قليل من الدراسات التي تتناول وضع

الحكومة الإلكترونية في الدول النامية. يهدف هذا البحث إلى تحديد العوامل التي تؤثر في استخدام خدمات الحكومة الإلكترونية في ليبيا.
وبالاعتماد على الأدبيات السابقة، تم بناء هذا البحث استنادًا إلى نظرية التوحيد لتقبل واستخدام التكنولوجيا (UTAUT)، مع إضافة عنصري الأمن والثقة. يتبنى البحث ثلاثة محاور رئيسية:

- العوامل الفردية التي تشمل: توقعات الأداء، توقعات الجهد، التأثير الاجتماعي، ومعرفة تكنولوجيا المعلومات؛
- العوامل التقنية التي تشمل: الظروف الميسّرة، والأمن، والخصوصية؛
- الثقة، التي تتضمن الثقة في الحكومة والثقة في الإنترنت، وتم أيضًا تحليلها كعامل وسيط.

هذا البحث هو دراسة كمية استخدمت الاستبيان كأداة رئيسية لجمع البيانات. تم توزيع الاستبيان على 320 مشاركًا باستخدام أسلوب العينة الطبقية الموجهة من مجتمع طلاب وموظفي جامعة طرابلس (من الكادر الأكاديمي والإداري).
أظهرت النتائج أن كلاً من العوامل الشخصية والتقنية تُعد من العوامل المهمة التي تتنبأ بنيّة استخدام خدمات الحكومة الإلكترونية. وشملت أبرز المحددات: توقعات الأداء، التأثير الاجتماعي، معرفة تكنولوجيا المعلومات، الثقة في الإنترنت، الظروف الميسّرة، الخصوصية، والأمن. كما أظهرت النتائج أن الثقة تتوسط جزئيًا العلاقة بين العوامل التقنية والنية السلوكية.
إن زيادة مشاركة المواطنين في خدمات الحكومة الإلكترونية قد يكون لها تأثير كبير على تحسين كفاءة الإنفاق العام ورضا الجمهور.

الكلمات المفتاحية: تبني الحكومة الإلكترونية، ليبيا، الأثر الوسيط، الثقة.

Introduction

Electronic Government (e-Government) dramatically changes the traditional thinking about public administration and its practice by engaging information technology to best optimize communication with government actors both internal and external to government institutions. E-Government employs digital media in the processes, transparency improvement, and better services in the future. Four interaction models underlie its operation: Government-to-Government (G2G) for inter-agency collaboration; Government-to-Employee (G2E) for modernizing internal administrative functions; and Government-to-Citizen (G2C) for a direct relationship between governments and citizens. However, e-Government is losing traction across the world, especially in developing countries where factors like digital infrastructure, socio-economic hurdles, and political instability negatively affect the implementation of e-Government. Though e-Government is potentially an avenue through which governance could be made inclusive, there has been too little research on the nuanced factors motivating citizens in such regions to embrace e-Govenment services, making it a critical gap in understanding how to bridge the divide.

Those factors upon which the theories of adopting e-Government should be grounded have not yet been developed into theoretical studies, especially so in places outside Western and Asian nations (Bannister & Connolly, 2015). Most of the dominant theoretical perspectives, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), have enjoyed much application in predicting user behavior. However, these models have been criticized for a narrow focus on the organizational and technical dimensions while neglecting crucial socio-cultural and psychological factors such as trust, security, as well as privacy. Perceived usefulness and ease of use as espoused under TAM often tend to ignore the kind of institutional trust that helps shape citizens' willingness towards engagement with digital platforms, particularly so in areas afflicted by either poor perceived

levels of corruption or political instability. Likewise, most of the clear focus that UTAUT espouses by stressing performance expectancy and effort expectancy ignores system-based issues such as inadequate infrastructure or a digital literacy gap, which primarily apply to developing countries. This theoretical gap increases due to a lack of empirical studies on how trust-both in government and technology-would mediate the relationship between systemic factors and behavioral intentions.

Some develop countries have, besides these shortcomings in e-Government, challenges in context like a low penetration of an internet connection, poor technology literacy, and lack of institutional frameworks. For Libya, political instability and an underdeveloped base in digital infrastructure have slowed down the stages of applying e-Government, making it impossible for citizens to adopt the e-Government mode of administration since it is meant and usually inefficient. Additionally, technology perceptions in culture and governance play important roles in determining adoption. In societies where public institutions are most often mistrusted, e-Government would be seen as some form of surveillance or misuse of a citizen's information. Such concerns are heightened in the aftermath of frequent attacks on cybersecurity and the absence of solid legal mechanisms that assure users of effective protection of their privacy. While previous studies have indicated the importance of trust in fostering technology adoption, insufficient research sought to investigate its dual role as both a direct predictor and mediator in the context of e-Government. From this, it is quite clear that a comprehensive model incorporating trust into current frameworks like UTAUT needs to be developed around the very specific socio-technical challenges of developing countries .

To bridge such gaps, this study finally comes to investigate the outcome of factors determining people's intention to use e-Government in Libya, among the still-developing countries in North Africa, where e-Governance is at its early stages. The UTAUT model is extended with trust, security, and privacy in examining the interaction of individual, technological, and institutional factors to shape citizens' behavioral intentions. There is considerable interest regarding the mediation role of trust, especially since Libya's long-running political crises have undermined public trust in government institutions as well as digital platforms. Readings should guide policymakers in developing approaches that will enhance citizen interest in e-Government, strengthening transparency, cutting bureaucratic inefficiencies, and inclusive growth. Contextualizing e-Government adoption within Libya's socio-political landscape, this research thus adds to an increasingly rich knowledge base regarding digital governance in fragile states and generates actionable inputs for governments in their quest to rebuild public trust through technology.

Problem statement

The acceptance of e-Government services by citizens has remained unremarkable. There is limited research in Libya for many reasons, especially due to the lack of an official e-Government site of their own in Libya as of 2023. The studies that exist do not account for the reasons behind discrepancies in citizen acceptance of e-Government in general. Earlier studies have either focused on the cultural or organizational factors that contribute to adoption. Technical views of the topic have been extensively studied, however, social studies that examine citizens' acceptance of technology have hardly been studied. Frameworks like the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) have been criticized for not allowing considerations for privacy and security. It is clear from the literature that the factors that cause citizens to adopt e-Government services are not well understood.

Research Questions

This research attempts to answer these questions:

1. How do individual factors influence the behavior intention to use e-Government services in Libya? In particular:

a) to what extent does performance expectancy affect the behavior intention to use e-Government services in Libya?

b) How does effort expectancy influence the behavior intention to use e-Government services in Libya?

c) To what extent does social influence affect the behavior intention to use e-Government services in Libya?

d) What is the effect of IT knowledge on the behavior intention to use e-Government services in Libya?

2. What is the relationship between trust factors and the intention to use e-Government services in Libya? In particular:

a) To what extent does trust in government influence the behavior intention to use e-Government services in Libya?

b) What is the effect of trust in the Internet on the behavior intention to use e-Government services in Libya?

3. What is the impact of technological factors on the behavioral intention to use e-Government services in Libya? Specifically:

a) How do facilitating conditions influence the behavioral intention to use e-Government services in Libya?

b) What effect does security have on the behavioral intention to use e-Government services in Libya?

c) What effect does privacy have on the behavioral intention to use e-Government services in Libya?

4. Does trust mediate between the individual links and technological factors, and the behavioral intention to use e-Government services in Libya?

5. How do behavioral intention influence actual use of e-Government services in Libya?

Research Objectives

This study will pursue the following objectives :

1. Identify the influence of individual factors on the behavioral intention to use e-Government services in Libya .
2. Identify the relationship of trust factors to behavioral intention to use e-Government services in Libya .
3. Identify the impact of technological factors on the behavioral intention to use e-Government services in Libya .
4. Determine the potential mediating role of trust on the relationship of individual and technological factors and the behavioral intention to use e-Government services in Libya .
5. Identify the impact of behavioral intention on usage of e-Government services in Libya.

Research Hypotheses

Based on the literature review and the conceptual framework of this study, the following are the hypotheses of this study:

First main hypothesis is related to the effect of behavioral intention on the use behavior of e-Government services by citizens.

H1: Behavioral Intention has positive effect on use behavior of e-Government services in Libya.

Second main hypothesis is related to the effect of individual factors on the behavioral intention to use e-Government services. The hypothesis has three sub hypotheses related to the dimensions of the construct individual factors.

H2: Individual factors has positive effect on behavioral intention to use e-Government services

H2a: Performance expectancy has positive effect on behavioral intention to use e-Government services.

H2b: Effort expectancy has positive effect on behavioral intention to use e-Government services.

H2c: Social influence has positive effect on behavioral intention to use e-Government services.

H2d: IT knowledge of citizens has positive effect on behavioral intention to use e-Government services

Third main hypothesis is related to the effect of the construct trust on behavioral intention. This hypothesis has two sub hypotheses.

H3: Trust has positive effect on behavioral intention to use e-Government services

H3a: Trust in government has positive effect on behavioral intention to use e-Government services

H3b: Trust in Internet has positive effect on behavioral intention to use e-Government services

Fourth main hypothesis is related to the effect of technological factors on behavioral intention to use e-Government. This hypothesis has three sub hypotheses.

H4: Technological factors has positive effect on behavioral intention to use e-Government services

H4a: Facilitating condition has positive effect on behavioral intention to use e-Government services

H4b: High security has positive effect on behavioral intention to use e-Government services.

H4c: High privacy has positive effect on behavioral intention to use e-Government services.

Fifth hypothesis is related to the role of trust as a mediator between individual factors and technological factors, and the behavioral intention to use e-Government services.

H5: Trust plays a mediator role between technological factors and individual factors, and the behavioral intention to use e-Government services.

H5a: Trust mediates the relationship between individual factors and the behavioral intention to use e-Government services.

H5b: Trust mediates the relationship between technological factors and the behavioral intention to use e-Government services.

Significance of the Study

This research is very important because there are a number of potential benefits for the Libyan government, its people, and the economy. Using e-Government is a powerful way of reducing corruption via the telecommunications infrastructure, while reaching and improving online

public services. Additionally, this research is also important since adoption of e-Government by citizens may promote increases in participation with government operations leading to more public participation in decision-making. Knowledge about these important factors will be beneficial to the government and policy-makers providing necessary information to better understand these factors so they can prioritize them and improve the adoption rate. If there is greater citizen uptake of e-services, life would it load off their lives, and help the government provide services more effective, and reduce citizens time and costs of a transaction. Ultimately, the Libyan economy would benefit from reduced operational costs, which could potentially, reduce public expenditure overall.

Scope of the Study

This research evaluates the factors influencing citizens' adoption of e-Government services in Libya. Since this investigation is focused predominantly on citizens' behaviour, it will not include other factors such as organizational and cultural. The research focuses in a specific location - Tripoli, the capital of Libya. Tripoli is a salient spot for this research, as it contains a large portion of the Libyan population (approximately 25 per cent - or 1.4 million out of 5.5 million). The study's target population is students, academic staff, and professional services staff working at the University of Tripoli. Therefore, employees, businesses and government organizations are excluded from this research.

Literature Review

Research on e-Government adoption in North Africa has so far been sparse. In their recent study, Dombeu & Rannyai (2014) reported that, of 50 academic articles analyzing e-Government acceptance and adoption, only three originated from Libya. Overall, previous studies failed to take a holistic/situational viewpoint when analyzing e-Government Adoption. Most relied on a specific model of technology acceptance (either the Technology Acceptance Model (TAM) or Unified Theory of Acceptance and Use of Technology (UTAUT)), and missed contextual factors altogether .

The vast majority of existing studies have based their conclusions on countries from the Western and Asian worlds, and African countries (specifically Libya) have not received their share of academic critique. It is worth highlighting that the factors influencing citizens` adoption of e-Government services vastly differ between countries, based on factors like demographics, education standards, and experience with technology (Weerakkody et al., 2013). Therefore, it is essential to examine the factors that promote and prevent Libyan citizens to adopt e-Government services.

Furthermore, not only is there a lack of research on e-Government adoption in North Africa, but studies have also shown how infrastructure and economic challenges have negatively impacted the implementation and success of e-Government projects in the region (Jain & Akakandelwa, 2014). Some of the most prominent barriers delaying the progression of e-Government projects in some African countries include shortages in the number of experienced human resources, technological infrastructures, and financial resources (Nesrine, 2016). The infrastructure and economic challenges are exacerbated by political instability and poor governance, which can impede the establishment of strong e-Government systems as well as make it harder for the governments in North African countries to undertake such systemic change. Systemic change in the context of e-Government relies not only on technological investment but also - on an even greater level - on capacity building in terms of a fundamental

shift in organization as well as policies that are sometimes required to address country or regional specific socio-economic and political regimes.

In addition, because of the nature of e-Government adoption itself, cultural and social factors are influential in shaping citizens' perceptions and readiness regarding the uptake of e-Government services. Research shows that trust in government and familiarity with digital technology are among the key factors that influence the attitude of users toward e-Government portals (Mpinganjira, 2013). In Libya, where trust in public institutions is particularly low due to a prolonged period of conflict and dysfunctionality, generating confidence in e-Government systems is even more pertinent (Nokele & Mukonza, 2021). Likewise, social norms and established ways of working may also play a role in determining how citizens perceive and engage with e-Government services. Therefore, understanding socio-cultural aspects is necessary for developing e-Government offerings that are people-centered and resonate with local communities by meeting their identified needs and interest. This importance on a socio-cultural focus in the analysis of the e-Government adoption situation in Libya and similar contexts cannot be overemphasized.

Conceptual Framework of the Study

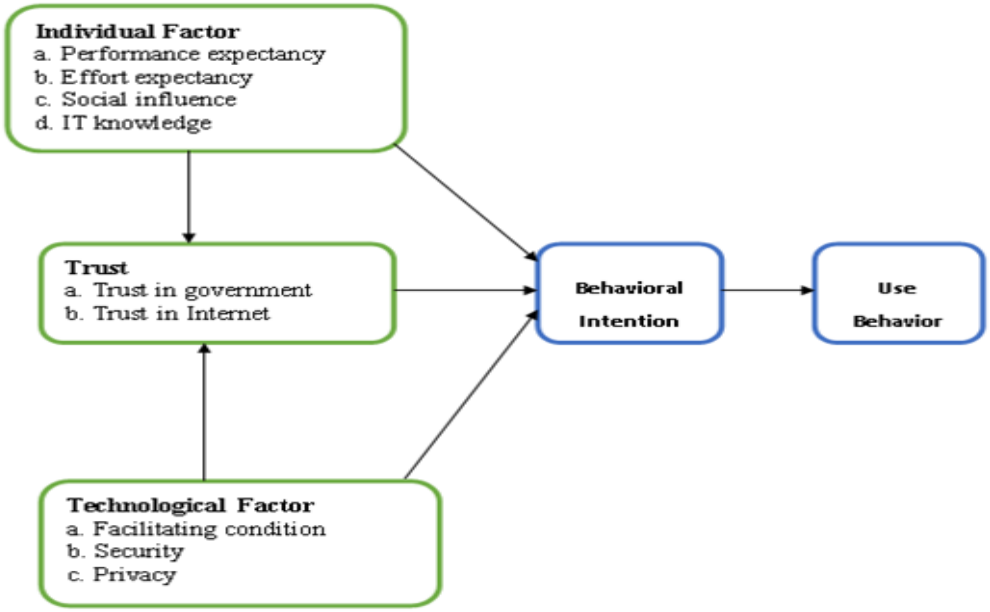

Figure 1. Conceptual Framework of the Study**.**

Research Methodology

This study used a quantitative research design to investigate the factors influencing citizens' adoption of e-Government services in Libya, focusing on the mediating role of trust. A structured research methodology was realized to test the hypothesized relationships between individual factors, technological factors, trust, and behavioral intention to use e-Government services.

An extended Unified Theory of Acceptance and Use of Technology (UTAUT)-based questionnaire was the research instrument for data collection. The questionnaire measured multiple constructs mainly organized under three categories: individual factors (performance expectancy, effort expectancy, social influence, IT knowledge), technological factors (facilitating conditions, security, privacy), and trust factors (trust in government, trust in the

Internet), along with behavioral intent and actual use of e-Gusiness services. Each construct was measured using multiple items adapted from validated scales in previous literature, ensuring content validity. The questionnaire was pretested with a small sample to verify clarity and comprehensibility before the main data collection phase.

The population for this study includes students, academic staff, and administrative staff at the University of Tripoli, which is the capital city of Libya. This site was purposely chosen because approximately 25% of Libya's population (around 1.4 million out of 5.5 million citizens) resides in Tripoli. The University of Tripoli also gave a heterogeneous sample that could potentially use e-Government systems to study different levels of education, technological proficiency, and interaction with government services. The stratified sampling technique was adopted so as to ensure proportional representation of samples from different university constituencies (students and staff-both at academic and administrative levels), giving a total sample size of 320 respondents.

Direct administration of the questionnaire to the selected participants was the method of data collection. Researchers ensured ethical norms were addressed by obtaining informed consent from all participants and guaranteeing confidentiality of responses. The questionnaire administration process was strictly monitored to achieve a high response rate and few missing questionnaires, thus increasing the quality of the collected data.

The manner and order of data analysis were as follows: preliminary descriptive statistics to profile the demographic characteristics of the respondents. Data screening procedures for normality testing and multicollinearity will then follow for the various levels of data screening to ensure the data's suitability for advanced statistical analysis. Exploratory Factor Analysis (EFA) was used to measure the construct validity for this kind of research, after which Kaiser-Meyer-Olkin (KMO) tests were conducted to ensure sampling adequacy for each construct category. Results showed satisfactory KMO values supporting factor analysis.

Thereafter, a two-stage structural equation modeling (SEM) approach was followed. First, a measurement model was established to validate the constructs via Confirmatory Factor Analysis (CFA) so as to ensure reliability and validity of the measurement items. The second stage was structural model testing that examined the hypothesized relationships among the research variables. This included direct effects between predictor variables (individual factors and technological factors) and behavioral intention, and the mediating effect of trust on these factors to behavioral intention. The structural model proceeded by looking at behavioral intention and actual use of e-Government services.

Mediation analysis was executed through bootstrapping procedure aiming at testing the significance of indirect effects, in line with the recommended contemporary methodological literature for the analysis of mediation. This rigorous analytical approach allowed a more comprehensive understanding of direct and even indirect relations among study variables and a nuanced impression on the reality of e-Government adoption in Libya.

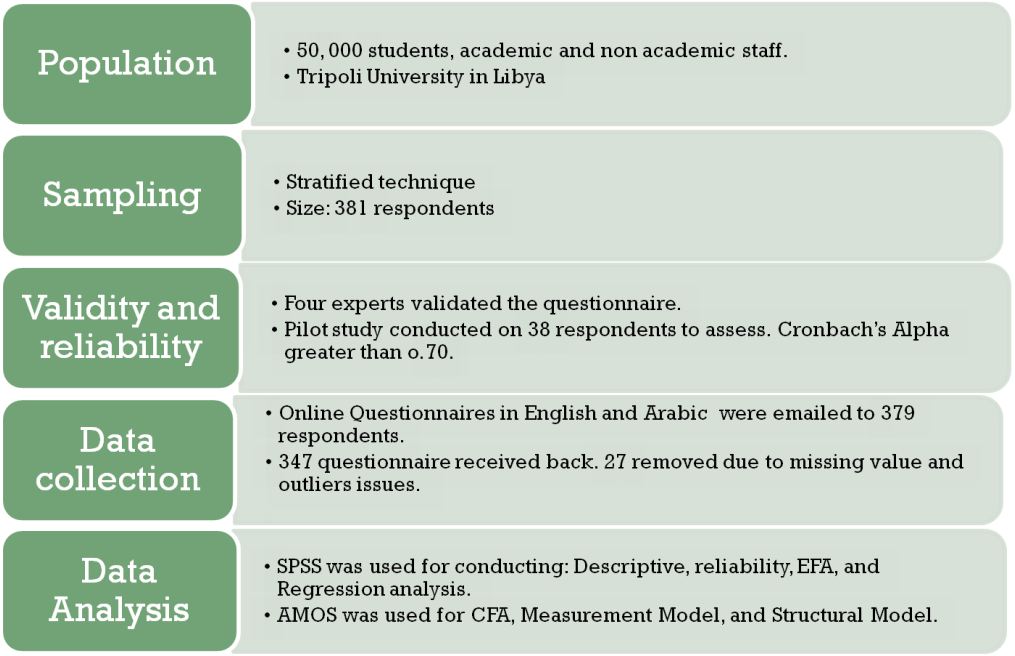

Figure 2. Measurement Model

Results

The demographic analysis of 320 respondents indicated a balanced representation among different demographic categories. The sample allowed participants to be drawn from various educational profiles, age groups, and occupations from the University of Tripoli. According to the demographic information table, male and female participants appeared to be evenly represented, with representation in a variety of age categories as well. Most of the respondents were those with higher education qualifications, corresponding to the university population being studied. Students and staff (both academic and administrative) were included in the sample, and hence, views from different stakeholders in the university community were captured.

Data Screening and Preliminary Analysis

Preceding hypothesis testing, the data were rigorously screened. Tests for normality revealed that the distribution of data showed that skewness and kurtosis were well within acceptable limits. For statistical purpose, the rule of thumb is that skewness not exceed ±2 and kurtosis not exceed ±7. This proved to us that the normality of data distribution is suited for parametric analysis .

Multicollinearity checks were performed to ensure that the predictor variables were independent. VIF values for all variables ranged from 1.01 to 4.67, far below the critical value of 10, which indicates that multicollinearity is not a serious problem. Tolerance values are all above 0.2, confirming that multicollinearity is not a major concern among predictor variables.

Exploratory Factor Analysis

KMO was applied to measure sampling adequacy for each construct category. The KMO value for individual constructs was 0.878, which indicates, according to Kaiser's criteria, "meritorious" sampling adequacy. For technological constructs, the KMO value was 0.826, again showing "meritorious" adequacy. For trust constructs, KMO was 0.782, indicating "mediocre" adequacy. All KMO values exceeded the 0.6 least value required, signifying that the conduct of factor analysis was justified .

Bartlett's test of sphericity was significant for all construct categories ($p < 0.001$), confirming that the correlation matrices were not identity matrices and, therefore, suitable for factor analysis. The EFA results substantiate the proposed factor structure with items loading predominantly on the intended factors, with factor loadings surpassing the minimum threshold of 0.4 and most exceeding 0.7, indicating strong construct validity .

Measurement Model Assessment

The measurement model was then subjected to Confirmatory Factor Analysis (CFA), which examined the issues of reliability and validity. The model fit the data well with the following acceptable fit indices: Chi-square/df ratio = 2.37 (below the prescribed maximum of 3), CFI = 0.92, TLI = 0.91 (both well above the proposed minimum of 0.9), RMSEA = 0.068 (well below the recommended maximum value of 0.08) .

Reliability of the constructs was evaluated by Cronbach's alpha and composite reliability (CR). All constructs had good internal consistency as evidenced by Cronbach's alpha values above the 0.7 mark, with the range from 0.76 to 0.89. Composite reliability values also support the reliability of those constructs in that their values ranged from 0.77 to 0.91 .

Convergent validity was checked based on Average Variance Extracted (AVE), where all constructs showed AVE values greater than the recommended value of 0.5. To prove discriminant validity, the square root of AVE of each construct was compared to the correlation between the constructs, proving that the former was greater than the latter in all cases.

Structural Model and Hypothesis Testing

In the structural model, significant results were obtained concerning the factors influencing the behavioral intention to use e-Government services in Libya. The fit of the model was deemed adequate, with similar fit indices to the measurement model. The structural model explains 67% of the variance in behavioral intention ($R^2 = 0.67$), and 51% of the variance in actual use behavior ($R^2 = 0.51$), which is fairly decent .

Direct Effects

The hypotheses testing results for direct effects were summarized in the analysis below. Behavioral intention apparently affects use behavior or acceptance of e-Government services, which was supported by this study ($\beta = 0.71$, $p < 0.001$). This supports the theory espoused in technology acceptance models, such as UTAUT .

As for individual constructs (H2), the aggregate construct had a significant positive effect on behavioral intention ($\beta = 0.42$, $p < 0.001$), thus supporting hypothesis H2. Seven constructs were found to significantly influence behavioral intention to use e-Government services at the sub-construct level with performance expectancy ($\beta = 0.38$, $p < 0.001$), social influence ($\beta = 0.27$, $p < 0.01$), and IT knowledge ($\beta = 0.32$, $p < 0.001$) supporting hypotheses H2a, H2c, and H2d respectively. Effort expectancy ($\beta = 0.09$, $p > 0.05$), however, exerted no significant influence on behavioral intention, hence hypothesis H2b was rejected.

In the context of trust factors (H3), it is evident that the large trust construct (which is one of the factors related to trust) had a significant effect on behavioral intention (beta = 0.29, $p < 0.001$), lending support to hypothesis H3. When looking at the sub-constructs, that trust in the Internet (beta = 0.34, $p < 0.001$) was found to significantly effect behavioral intention. This sub-construct supports hypothesis H3b. The result in relation to this was contrary to expectation by which trust in government (beta = 0.11, $p > 0.05$) does not significantly influence behavioral intention. Hence, hypothesis H3a is rejected .

For technological factors (H4), the overall construct had a significant positive effect on behavioral intention (beta = 0.31, $p<0.001$), supporting hypothesis H4. At the sub-construct level, facilitating conditions (beta = 0.29, $p<0.01$), security (beta = 0.33, $p<0.001$), and privacy

(beta = 0.30, p<0.001) all showed significant positive effects on behavioral intention, supporting hypotheses H4a, H4b, and H4c.

Mediating Effects of Trust

The mediation analysis examined the mediating role of trust between predictor variables and behavioral intention. Results indicate that trust partially mediated the relationship between technological factors and behavioral intention to use e-Government services, with a significant indirect effect under the statistic of beta = 0.18, p<0.01, thereby supporting hypothesis H5b. Thus, although the effect between technological factors and the behavioral intention remained significant (beta = 0.31, p<0.001) when trust's mediating effect was included in the model, with the total effect being 0.49 (p<0.001), it affirms the idea of a partial mediation .

Indirect Effect of Trust: Individual Factors and Behavioral Intention

CONCLUSION The indirect effect was not significant (beta=0.06,p<0.05) leading to a complete rejection of the hypothesis. The individual factors still had a direct effect on behavior intention significantly (beta=0.42,p<0.001), showing that trust did not mediate the relationship .

Summarily, results indicate that individual factors (more specifically, performance expectancy, social influence, and IT knowledge) and technological factors (namely, facilitating conditions, security, and privacy) each influenced citizens' intention to use e-Government services directly in Libya. Internet trust was most significant of the factors, with partial mediation also found between the technological aspect and behavioral intention. Such results provide promising new insight into factors influencing E-Government adoption in the Libyan context.

Table 1. Demographic Characteristics of Respondents (N = 320)**.**

Variable	Label	Frequency	Percent (%)
Age	Less than 25	195	60.9
	25–35 years	46	14.4
	36–45 years	47	14.7
	More than 45	32	10.0
Gender	Male	275	85.9
	Female	45	14.1
Education	Bachelor	175	54.7
	Master	108	33.8
	PhD	26	8.1
	Diploma	11	3.4
Occupation	Student	286	89.4
	Lecturer	27	8.4
	Non-academic staff	7	2.2
Internet Access	Yes	320	100.0
Length of Using the Internet	2–5 years	43	13.4
	6–9 years	146	45.6
	More than 9 years	131	40.9
Frequency of Using E-Government	Rare	220	68.8
	Sometimes	60	18.8
	Never	30	9.4
	Often	10	3.1

Normality & Multicollinearity

Table 2. Normality Test: Skewness and Kurtosis Values.

Variable	Skewness	Kurtosis
Performance Expectancy	-0.067	-0.206
Effort Expectancy	-0.022	-0.235
Social Influence	-0.096	-0.248
IT Knowledge	0.087	0.050
Facilitating Condition	-0.148	-0.282
Security	-0.045	-0.378
Privacy	-0.025	-0.212
Trust in Government	0.027	-0.072
Trust in Internet	-0.023	0.071
Behavioral Intention	-0.013	-0.329
Use Behavior	-0.204	-0.004

Table 3. Multicollinearity Statistics: Tolerance and VIF Values.

Variable	Tolerance	VIF
Performance Expectancy	0.591	1.693
Effort Expectancy	0.520	1.925
Social Influence	0.540	1.852
IT Knowledge	0.525	1.904
Facilitating Condition	0.438	2.283
Security	0.553	1.810
Privacy	0.461	2.168
Trust in Government	0.415	2.408
Trust in Internet	0.451	2.219
Behavioral Intention	0.414	2.414

Exploratory Factor Analysis (EFA)
KMO of Individual Factors

Table 4. KMO and Bartlett's Test for Individual Factors.

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	1178.768
	Df	78
	Sig.	.000

KMO of Technological Factors

Table 5. KMO and Bartlett's Test for Technological Factors

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.784
Bartlett's Test of Sphericity	Approx. Chi-Square	1989.221
	Df	78
	Sig.	.000

KMO of Trust

Table 6. KMO and Bartlett's Test for Trust

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.786
Bartlett's Test of Sphericity	Approx. Chi-Square	1301.217
	Df	28
	Sig.	.000

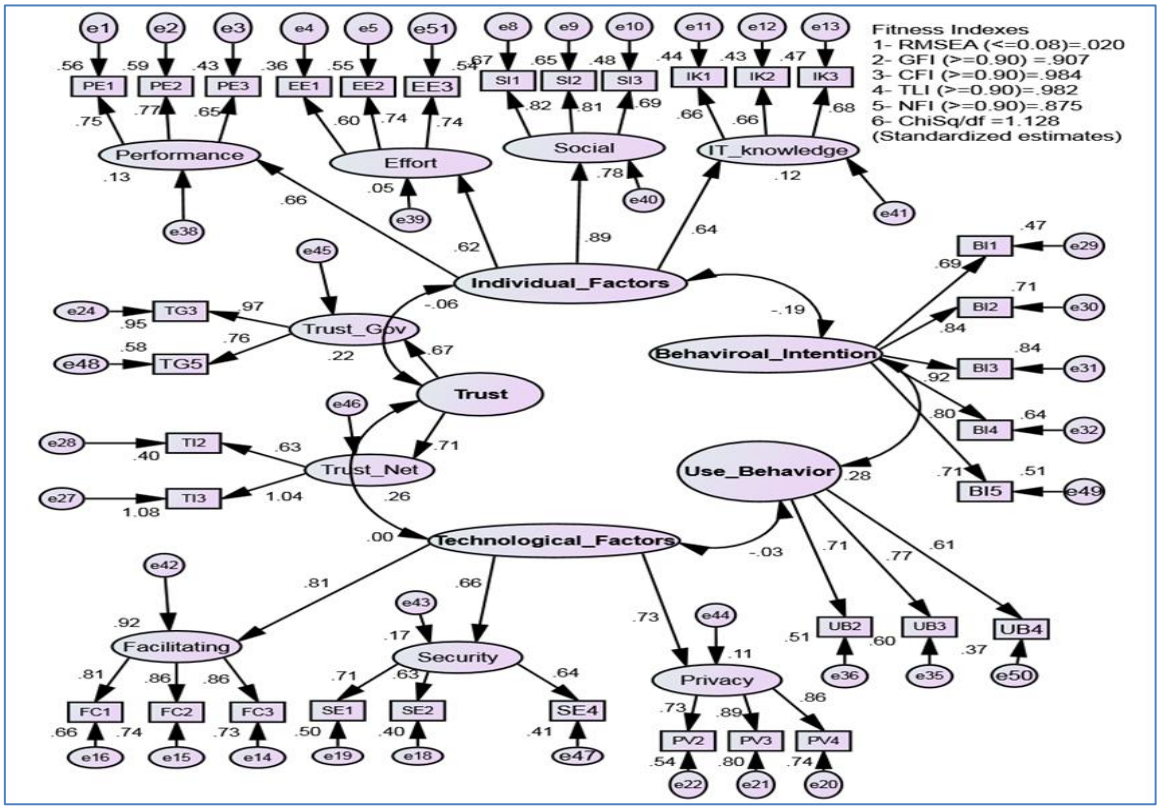

Figure 3. Measurement Model (Construts).

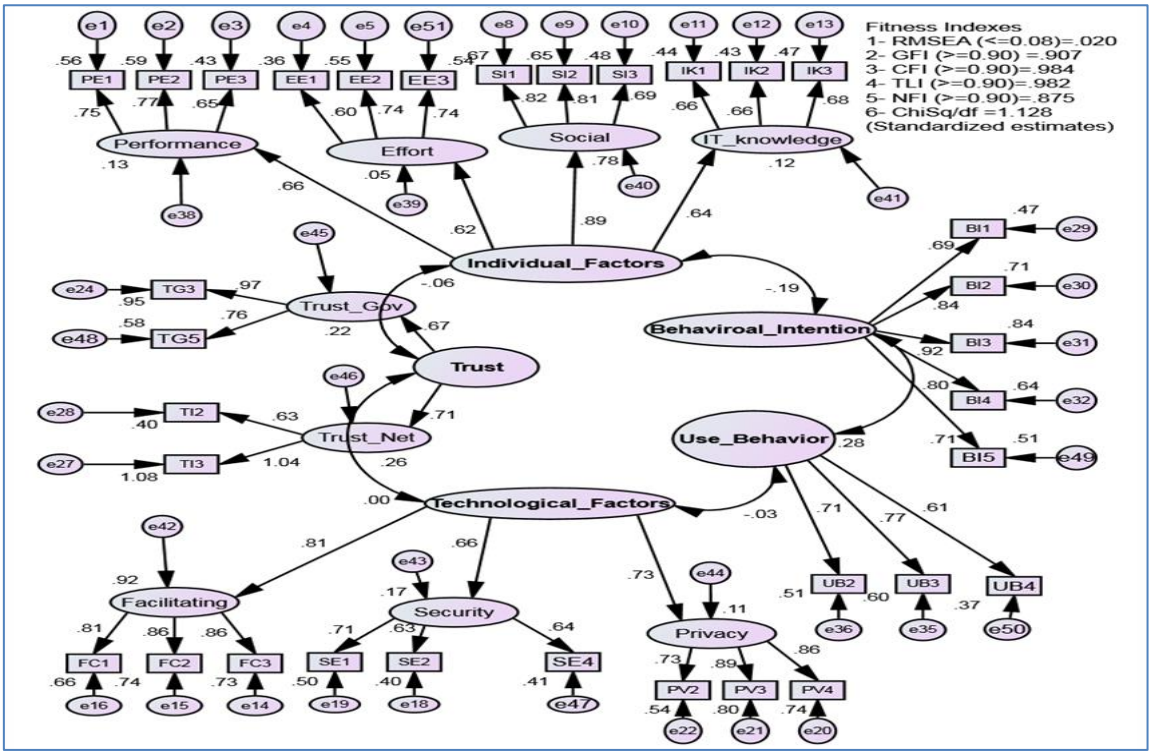

Figure 4. Measurement Model (Variables).

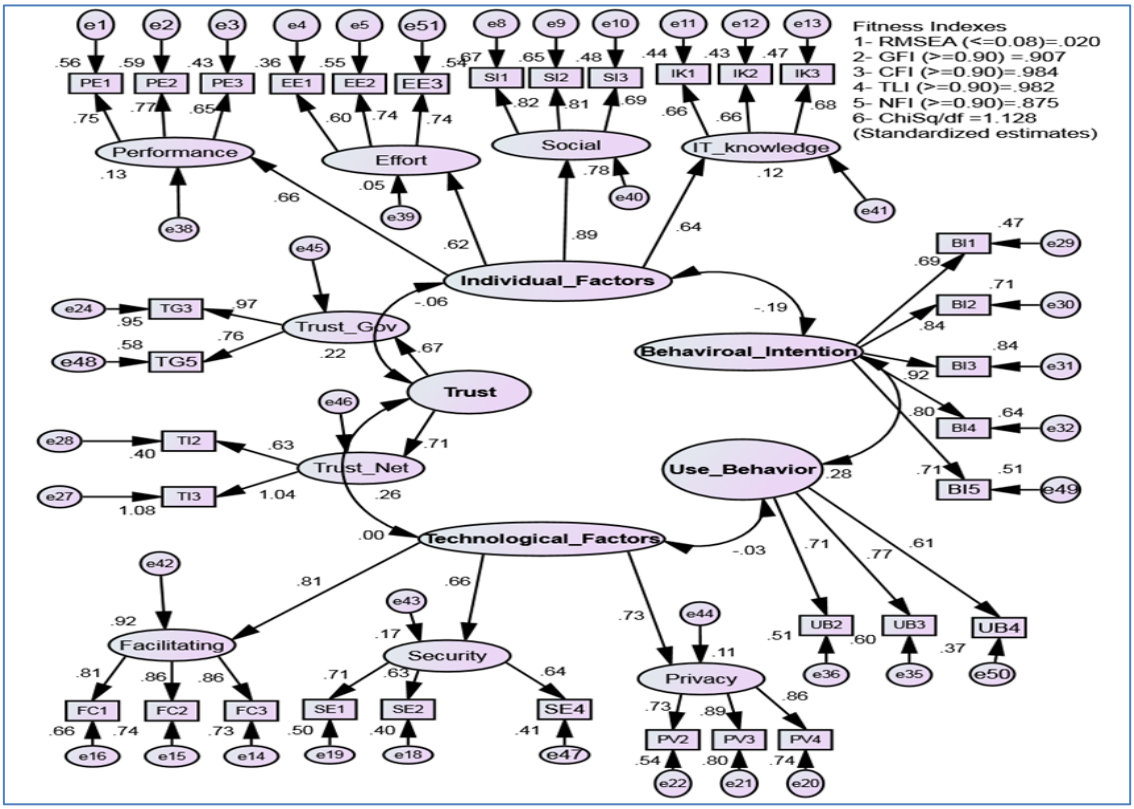

Figure 5. Structural Model (Direct Effect).

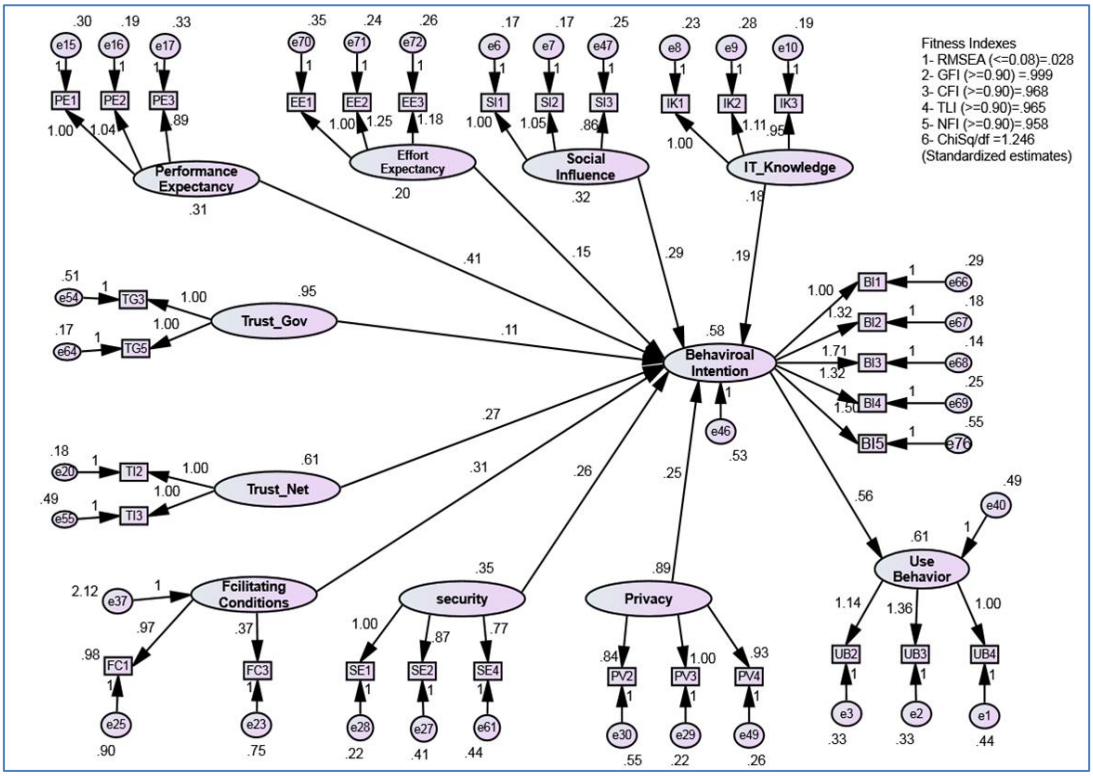

Figure 6. Structural Model (Sub-hypotheses).

Table 6. Structural Model: Hypotheses Testing Results.

Dependent Variable	Independent Variable	Estimate	S.E.	C.R.	P	Significance
Use Behavior	Behavioral Intention	0.56	0.11	5.04	0.00	Significant
Behavioral Intention	Individual Factors	0.47	0.14	3.35	0.00	Significant
Behavioral Intention	Performance Expectancy	0.41	0.06	6.90	0.00	Significant
Behavioral Intention	Effort Expectancy	0.15	0.08	1.75	0.08	Not Significant
Behavioral Intention	Social Influence	0.29	0.06	4.83	0.02	Significant
Behavioral Intention	IT Knowledge	0.19	0.08	2.37	0.02	Significant
Behavioral Intention	Trust	0.44	0.10	4.40	0.00	Significant
Behavioral Intention	Trust in Government	0.11	0.07	1.57	0.65	Not Significant
Behavioral Intention	Trust in Internet	0.27	0.04	6.58	0.00	Significant
Behavioral Intention	Technological Factor	0.27	0.09	3.00	0.00	Significant
Behavioral Intention	Facilitating Conditions	0.31	0.03	10.30	0.00	Significant
Behavioral Intention	Security	0.26	0.05	5.20	0.01	Significant
Behavioral Intention	Privacy	0.25	0.03	8.33	0.00	Significant

Hypotheses testing (Mediating effect of Trust)

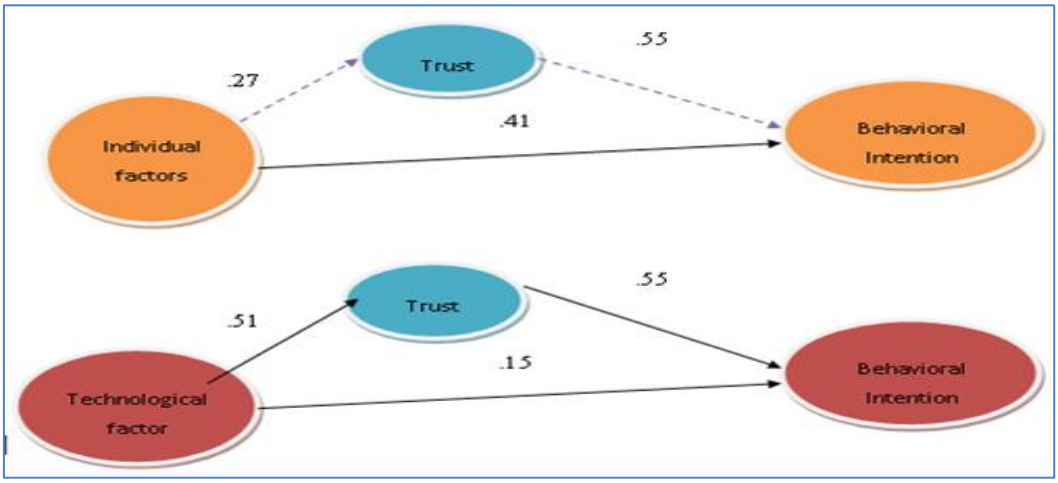

Figure 7. Structural Model (Direct Effects).

Table 5. Structural Model Results – Mediating Effects.

Dependent	Direction	Independent	Estimate	S.E.	C.R.	P	Result
Trust	<---	Technological Factor	.47	.15	3.11	.00	Significant
Behavioral Intention	<---	Technological Factor	.19	.17	1.11	.09	Significant
Behavioral Intention	<---	Trust	.54	.12	4.54	.00	Significant
Behavioral Intention	<---	Individual Factors	.42	.19	2.21	.03	Significant
Trust	<---	Individual Factors	.29	.16	.358	.02	Significant

Trust plays a partial mediating role between the variables

Contribution

This study theoretically contributes to knowledge by examining and utilizing the UTAUT model, as well as theoretically combining it with the TOE framework to develop a new model investigating UTAUT in conjunction with security and trust considerations.

This study contributes to the literature base on e-Government in developing nations overall, and more specifically Libya.

Additionally, this study considered trust as a mediating variable. There is limited research on trust as a mediating factor in e-Government adoption in the existing literature.

Similarly, there is limited research that considered trust either as an independent variable or a mediator with the UTAUT framework.

This study contributes to the literature base by including and testing trust as a mediator in the study of e-Government, and also examines the specific direct and mediating effects as part of the theoretical contributions.

In terms of practice, this research provides Libyan policymakers with a source of factors identified as the most salient drivers of citizen adoption of e-Government services. The results of this research could be used by the Libyan government to improve citizen engagement with governmental activities.

Increased use of the e-Government portal could save the government substantial operating costs, in both the requirement for staff and paper documents. There may be increased satisfaction with government by citizens from increased use of e-Government services.

Conclusion

This research analyzes the factors affecting e-Government adoption in Libya, extending the UTAUT paradigm by introducing trust, security, and privacy as vital determinants. Via a quantitative analysis involving a survey of 320 participants at the University of Tripoli, the authors unearth significant determinants of behavioral intention to adopt e-Government while emphasizing trust as a mediating factor in unpropitious scenarios of a developing country. The findings yield theoretical, practical, and contextual implications for the adoption of digital governance in fragile states .

Individual factors such as performance expectancy, social influence, and IT knowledge greatly affect behavioral intention to adopt e-Government services in Libya, while on the other hand, technological factors such as facilitating conditions, security, and privacy are strongly linked with the intention. Internet trust is very important as it partially mediates the relationship between technological factors and the behavioral intention, while trust in government

institutions does not significantly influence this intention, given the general institutional distrust that Libya has experienced over a long period because of political instability. The interesting finding is that effort expectancy, one of the main UTAUT constructs, has no significant effect, likely due to cultural and contextual specificities in how users perceive the ease of use of technology. The structural model explains 67% of the variance in behavioral intention and 51% in actual use behavior, highlighting the strength of the extended UTAUT framework .

The study closes some identified gaps in literature related to e-Government by contextualizing UTAUT within Libya's socio-political environment. Furthermore, it demonstrates the importance of integrating trust and security into technology adoption models, especially when dealing with environments characterized by institutional distrust and infrastructural inadequacies. The research also serves to demonstrate that various constructs of UTAUT cannot be generalized; thus, adaptations contextually relevant for developing nations should be engendered. Trust as a direct predictor and a mediator enriches the current frameworks, providing a feasible approach for analyzing digital governance in low-trust environments .

For Libyan policymakers, the results indicate actionable priorities. Strengthening cybersecurity measures, augmenting privacy protection, and building trust in digital platforms are of utmost importance to e-Government adoption. Investments in digital literacy can enhance IT knowledge and performance perception, while utilizing social influence from community leaders and educational campaigns can establish the norm for e-Government use. Other approaches that need to be taken to remedy the systemic scenarios involve political instability and transparency of institutions in order to rebuild citizen trust in government-administered initiatives. More e-Government adoption could help diminish levels of corruption, increase efficiency in the delivery system, and cut citizen transaction expenses.

Limitations nonetheless affect its generalizability for the rest of the population, including rural and non-academic residents of Libya. Future research should include a broader geographic and demographic area, longitudinal study designs to ascertain causative relationships, and use qualitative methods to decipher cultural and institutional barriers. An analysis between the Libyan context and other North African countries and the effect political instability has on e-Government adoption far outweighs the merit of a further analysis of the unchallenging role of effort expectancy on perceptions regarding technology ease in Libya.

This research stresses e-Government adoption complexity in developing nations, where technical infrastructure and socio-cultural factors intersect. Establishing trust and implementing context-specific policies could help Libya utilize e-Government as a tool for transparency, anti-corruption, and public service delivery. The study acts as a guide in examining digital governance in fragile states, stressing that holistic, localized approaches are necessary in bridging the digital gap toward inclusive growth.

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