



Assessing citizen adoption of e-Government initiatives in Gambia: A validation of the technology acceptance model in information systems success

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ABSTRACT

The technology acceptance model (TAM) has been used extensively to explain and predict users' acceptance of corporate information technology (IT). With the advancement in IT and the expanding popularity of internet applications in Gambia, e-Government has been a priority factor in rendering government services and in making information more accessible to citizens. This study shows how the TAM and e-Government initiatives would positively impact the Gambian government, despite the cultural differences within the country. This study developed a successful model of the Gambian e-Government system to assist Gambians with more efficient and cost-effective government operations. The study results reveal that the core constructs of the TAM have strong influences on user-intention towards e-Government products. This implies that the Gambian government can potentially utilize this study's TAM findings in other contextual settings to design and promote further implementation of e-Government systems.

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1. Introduction

Electronic government (e-Government) uses information technology (IT), such as wide area network, the internet, and mobile computing to transform government operations and to provide citizens and organizations with more convenient access to government information and services (Campeau & Higgins, 1995). From a technical perspective, e-Government is a government of new technology to help simplify and automate transactions between itself and its constituents, businesses, or other governments (Jaeger, 2003); unfortunately, the process of diffusion in developing countries remains slow. The gap of IT diffusion between developed and developing nations may be due to socio-economic differences that inhibit access to IT. Alternately, this gap may be due to differences in literacy rates or an inability to effectively use IT.

e-Government is a fundamental element in the modernization of any government, serving as a means towards enhancing transparency, accountability, and good governance; making the government more result-oriented, efficient and citizen-centered; and enabling citizens and businesses to access government services and information as efficiently and as effectively as possible through the use of internet and other channels of communication (Aggelidid & Chatzoglou, 2008).

The use of IT in the government sector offers great opportunities for enhancing service quality and efficiency and trimming down

governmental expenses. Effective and operational e-Government facilitates better and more efficient delivery of information and services to citizens, promotes productivity among public servants, encourages participation of citizens in government, and empowers all citizens (Kim et al., 2009a, 2009b). However, the widespread failure of e-Government projects suggests that e-Government often produces naïve optimism (Dishaw & Strong, 1999). Developed countries such as the U.S., Canada, and Finland are still leading the world in the field of e-Government. The information age holds the promise of new and powerful weapons in the arsenals of developing countries wrestling against economic, social, and political challenges. On the African continent, 40% of the adult population is illiterate and the PC penetration is the lowest in the world. In this context, e-Government platforms that provide an avenue for more direct governance to citizen and business participation in government would have much less cultural impact than they would in Western countries. Therefore, it is thus important to examine both the impact and implications of e-Government in developing countries (Bwalya, 2009).

The technology acceptance model (TAM) explains and predicts users' acceptance of new technology. Despite the large volume of research in this area, which focuses almost exclusively on corporate settings, few studies have applied the TAM to e-Government implementation in African countries. It is necessary to develop and establish empirical support for the TAM in explaining citizens' acceptance of e-Government systems initiated by governments in this area.

The purposes of this study are two-fold. First, while prior research on the TAM and e-Government focuses on developed countries, this study focuses on developing countries like Gambia, and how TAM

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impacts e-Government success and the country's developmental aspiration. We examine whether environment influences the impacts that the TAM model can have for e-Government initiatives, despite cultural differences. Second, this study examines the various factors affecting the intentions of Gambia's citizens to use e-Government facilities, and surveys a sample of citizens in Gambia. The results of this study can be replicated and extended to other countries in Africa to create a complete picture of critical factors affecting citizen acceptance of e-Government systems in these areas.

2. Theoretical background

In this section, we take a closer look of the Gambia e-Government progress and the development it registered in comparison with the developed nations.

2.1. e-Government in Gambia

In his article titled, "The e-Government in Africa", [Yayehyirad Kitaw \(2006\)](#), the pioneer of e-Government, predicted that the development of e-Government in most African countries would be the world's largest and fastest-growing industry in the next decade. The government of Gambia has vigorously promoted an e-Government initiative since 2005. The goals of this initiative include better and more efficient delivery of government information and services to all citizens, increased productivity among public servants, the encouragement of citizens' participation in government, and the empowerment of all Gambians in line with the development priorities outlined in Gambia's Vision 2020 development plan ([Islam & Okuda, 2005](#)). Gambia's e-Government stores government information and transactions, and includes the integrated Financial Management Information System (IFMIS), the Public Service Commission Website and the Official Government Web Portal (OGWP). These online services benefit citizens and government, as well as increase government accountability, by making its operations more transparent and reducing opportunities for corruption. Online services provide development opportunities, such as livelihood, employment, and entrepreneurship training ([Jobe, 2009](#); [Agarwal & Prasad, 1999](#)). Gambia's e-Government initiative creates a paperless environment, encourages efficient processes, and increases the public's convenience in contacting government agencies. This system enables citizens to purchase goods and services, obtain and distribute information, print forms, and submit bids and proposals on the internet ([Carter & Bélanger, 2005](#); [Bertot, 2003](#)). As mentioned in the introduction, 40% of the adult population is illiterate and PC penetration is the lowest in the world with 2.2 computers per 100 inhabitants. Africa has the highest internet tariffs, and only 2.7 telephones per 100 inhabitants. Millions of citizens are not empowered in the decision-making processes of their government. Based on these factors, it is reasonable to question the relevance of a discourse on the prospects of e-Government in Africa.

In more advanced countries such as the United Kingdom, the United States, Canada, Germany, and Sweden, e-Government services have enabled citizens to perform many functions over the web, such as obtaining relevant and up-to-date information, downloading forms, scheduling appointments, and paying taxes. Compared to most developed Western countries, the developing country of Gambia is experiencing substantial obstacles to establishing and perfecting its internet infrastructure ([Jobe, 2009](#)). Thus, it is important to investigate factors that affect the citizens' acceptance of e-Government to help the Gambian government design and implement better systems.

2.2. Technology acceptance model (TAM)

Many researches use TAM as a framework to predict and explain a variety of human behaviors in the IT adoption context ([Ajzen &](#)

[Fishbein, 1980](#); [Gupta & Jana, 2003](#); [Hu et al., 1999](#)). TAM theorizes that causal linkages flow in a sequence of beliefs, attitudes, intentions, and behaviors. To examine an individual's actual system use, most studies focus on factors affecting the individual's intentions of system acceptance ([Chen et al., 2002](#); [Gefen et al., 2003](#); [Karahanna et al., 1999](#)).

A general model of TAM is shown in [Fig. 1](#). Prior research suggests that perceived usefulness (PU) and perceived ease of use (PEOU) are two major influential emotional beliefs that determine a user's IT acceptance. [Davis \(1989, p. 320\)](#) defined perceived usefulness as "the degree to which a person believes that using a particular system would enhance his or her job performance" and perceived ease of use as "the degree to which a person believes that using a particular system would be free of effort" ([Davis is also cited in Venkatesh, 2000; Torres et al., 2005](#)).

This study examines the validity of TAM in the e-Government setting in Gambia and focuses on how Gambians behave differently, and exhibit different levels of acceptance, than other e-Government users. Information and communications technologies (ICTs) are playing an increasingly vital role in the daily lives of people in Africa, revolutionizing work and leisure and changing the rules of doing business ([Taylor & Todd, 1995](#); [ECA/Government of the Gambia, 2004](#)). With the emergence of an information technology economy, the country of Gambia could leap to higher levels of social, economic, and political development.

[Larsen and Rainie \(2002\)](#) suggested that e-Government services include information for research, government forms and services, public policy information, employment and business opportunities, voting information, tax filing, license registration, or renewal, payment of fines, and submission of comments to government officials. However, the successful operation of e-Government does not depend on the technology, but rather on the people ([Akman et al., 2005](#); [Wang & Liao, 2008](#)). [Bwalya \(2009\)](#) pointed out,

"The Gambia e-government has been implemented by the Gambia government in collaboration with the immigration authority as part of its agenda to provide services efficiently and therefore contribute a substantial amount of tax returns to Gambia. The need for the authority to introduce this computer-based application was specifically to improve immigration service delivery; reduce the time it takes for the department to issue Permits and Visas and Clearing of persons at the ports of entry by about 50% ultimately reducing the cost of doing business for the applicants in the country" (p. 7–11).

The e-participation component of e-Government adoption was intended to encourage and emphasize the proposed adoption model of TAM suggested by [Davis in 1989](#). It was desired that there would be a flow of information between the Gambian government and different stakeholders involved in the development process of its e-Government initiative. Thus, this study focuses on the influential factors of e-Government success from the perspective of Gambia's citizens.

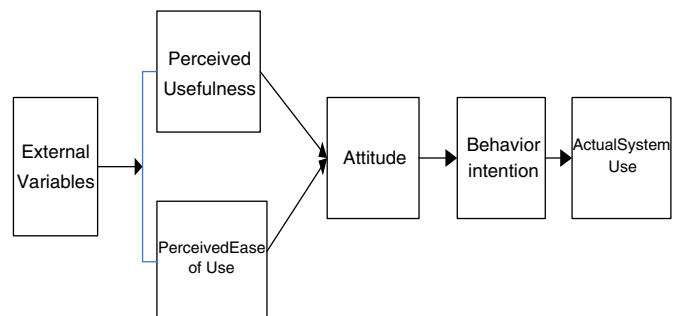


Fig. 1. The technology acceptance model (TAM).

3. Research hypotheses and model

TAM asserts that intentions to perform behavior determine actual behavior. Intention itself represents an individual's attitude toward the behavior. The TAM indicates that both perceived usefulness (PU) and perceived ease of use (PEOU) are key, independent variables that can determine or influence potential user' attitudes (ATT) toward behavioral intention (BI).

Davis (1989) called for further research to consider the role of additional external variables that influence PU and PEOU. Two important external variables – information systems quality (ISQ) and information quality (IQ) – have been consistently found to be influential factors that affect the perceived usefulness and ease of use of IT. Table 1 summarizes the related prior study on the variables that are used in the empirical analysis of TAM.

A review of relevant literature on the Gambia e-Government systems reveals a broad spectrum of information technology applications in most government departments and private sectors. When citizens use Gambian e-Government websites to look for information or to start a particular administrative procedure, they tend to expect more efficiency and effectiveness when compared to their expectations of the traditional service counter approach. Citizens will perceive the Gambian e-Government to be a useful resource if it can help them gather information or complete administrative procedures quickly, easily, and effectively (Rabaiah et al., 2006; Lucas & Spitler, 1999).

According to Ajzen and Fishbein (1972), attitude and the subjective norms are important factors on the behavioral intention formation, a proposition that is supported by TAM. Users with a more positive attitude toward IT are likely to be more satisfied with system and view it as more useful (Ajzen & Fishbein, 1980; Heeks, 2006; Shin, 2007). Therefore, user attitude is hypothesized to positively affect perceived usefulness and behavioral intention.

DeLone and McLean (1992, 2003) defined information system quality as quality manifested in a system's overall performance and measured by individuals' perceptions. Because citizens are faceless in e-Government interactions, the information system's quality becomes the "online storefront" upon which first impressions are formed. If a citizen perceives an e-Government system to be of high quality, that citizen will be more likely to use internet systems to submit applications or access other e-Government services online (Wang, 2003).

Information quality (IQ), as assessed by citizens, usually influences their satisfaction and perceived usefulness (Moon & Kim, 2001; Aggelidid & Chatzoglou, 2008). Gallagher (1974) used customer perceptions of an information system's value to determine information quality.

The applications of e-Government in Gambia promises to enhance the delivery of public goods and services to citizens not only by improving the process and management of government, but also by redefining the traditional concepts of citizenship and democracy. With the emergence of an information technology economy, the

country of Gambia could leap to higher levels of social, economic, and political development. Based on the technology acceptance model (TAM) theory (Lederer et al., 2000; Lin & Lu, 2000), this study presents the following hypotheses:

- H1.** User attitude on using the e-Government system positively affects behavior intentions.
- H2.** The perceived usefulness of the e-Government services has a positive effect on user behavior intentions.
- H3.** The perceived usefulness of using e-Government has a positive effect on user attitudes regarding use of the internet.
- H4.** The perceived ease of use of e-Government has a positive effect on user attitudes toward the use of e-Government systems.
- H5.** The perceived ease of use of e-Government systems positively affects the perceived usefulness of using the internet to fill out applications.
- H6.** The information systems quality of e-Government systems positively affects the perceived usefulness of using the internet in submitting application forms online.
- H7.** The information quality of e-Government filing systems positively affects the perceived usefulness of using the internet.

Fig. 2 presents the research model with the hypotheses shown in their respective links.

4. Research methodology

After developing the research framework, we conducted a series of personal interviews with three Gambian e-Government officials from the Department of Information, Communication, and Technology and two professors from the University of Gambia to assess the validity of the proposed research model. Based on our review of related literature and the comments gathered from our interviews, we created an initial version of a survey questionnaire. Then, we refined the questionnaire with extensive pre-testing by fifteen academics and government officials with significant expertise in e-Government operations. Pre-testing results revealed that the questionnaire items were comprehensive, except for three questionnaire items related to "perceived ease of use." We deleted these three items from our questionnaire.

4.1. Sampling

This study focuses on citizens who use e-Government systems to file applications or using e-Government in their work. The final questionnaire was e-mailed to e-Government officials working at the Department of Information, Communication, and Technology, who helped us distribute 1000 questionnaires to e-Government users through Gambia's e-Government system from March 14, 2008 to May 26, 2008.

Table 1
Definitions and supported researches of the individual characteristics constructs.

Constructs	Definition	Supported literature
Attitude toward behavior	Person's general feeling of favourableness or unfavourableness as far as the use or not of an information system is concern	Ajzen and Fishbein (1972)
Perceived usefulness	The degree to which a person believes that using a specific application system will increase his or her job performance within an organization context	Chen et al. (2002)
Ease of use	The degree to which a person believes that using computer technology would be achieved with minimum possible effort	Ajzen and Fishbein (1972)
Information system quality	An individual's apprehension about the information system quality, when she/he wants to look for the update information in the computer or internet	Kettinger and Lee (1994) and Heo and Han (2003)
Information quality	The information quality of the e-government service will enable the people to research for the information and look the news through online TVs and radios online	Carter and Bélanger (2005) and Igbaria et al. (1997)

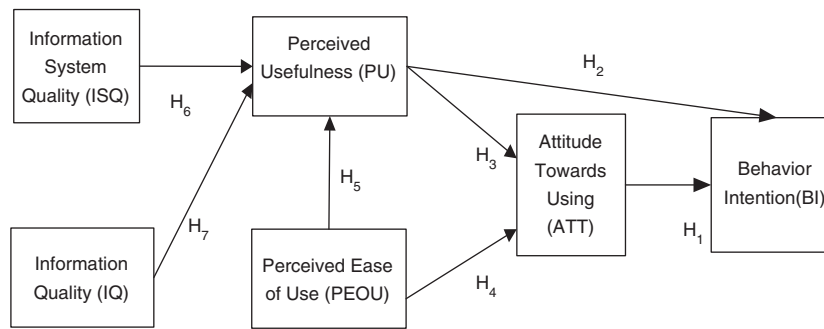


Fig. 2. TAM model in e-Government.

Subjects were employed people who, because of their career, were identified as having greater than average access to the internet or e-Government facilities. This means that our respondent pool reflects the population of interest in e-Government usages in Gambia.

Two weeks after the initial email, a follow-up email was sent to all recipients who had not responded, requesting their participation and cooperation. A reminder and thank-you email was sent to all subjects who responded positively.

4.2. Descriptive analysis

This section analyzes the demographic data acquired. Of the 1000 questionnaires, 167 surveys were returned; of the 167 questionnaires, 21 were excluded due to missing information, being incomplete, or being unreadable. The response rate was 16.7% including 14.6% valid questionnaires. To avoid misconceptions, the orientation of the 5-point Likert scale was applied uniformly; low scores represented negative settings, while high scores represented for favorable situations.

According to the questionnaire results, 56.5% of the respondents were male, and 43.5% were female. Most of the subjects (or about 77.9% of the respondents) were from 20 to 40 years old. The respondents were engaged in various occupations: 42.8% of them were employed by the government and 37.3% of them were from business sectors. 15.6% of the respondents were students. The majority of the e-Government users in Gambia were younger people who use e-Government systems more often than the older people did. With a total population of 1.8 million people, the age structures of the Gambian population based on 2009 government estimation were as follows: 0–14 years: 23.6%; 15–30 years old: 36.2%; 30–45 years old: 19.5% 45–60 years old: 12.6%. The demographic characteristics in this study have a similar age distribution as the total population of Gambia. Therefore, our sample represents the e-Government usage population.

46.7% of the subjects' monthly incomes were below 1000 Gambian Dalasis and 39.1% were between 1000 and 3000 Gambian Dalasis. The average time spent on computer usage for these people were between 12 and 24 h per week. Detailed descriptive statistics related to the respondent's characteristics are shown in Table 2.

This study reviewed seven more journal articles discussing TAM and presented their empirical survey results in Table 3. Prior research sample sizes ranged from 140 to 165, and the response rates were below 20%, similar to our Gambian case. This proves that our sample size is comparable to prior research and our response rates (16.7%) are similar to other studies using the TAM.

5. Empirical results

To ensure the content validity of the scales used in the study, the items selected for the constructs should represent the concepts of our measurement model in the empirical results as we described the details below.

5.1. Validation of the measurement scales

To validate our measurement model, we undertook validity assessments of content, discriminate, and convergent validity. Content validity of this survey was established from the existing literature, and our measures were constructed by adopting constructs validated by other researchers. Pre-tests were conducted with experts in the field of e-Government in Gambia. The final set of 22 questionnaire items (as shown in Table 4) exhibit mean, standard deviation, Cronbach's alpha, and average variance extracted (AVE) exceed recommended standards for reliability and uni-dimensionality (Cronbach, 1970). According to Fornell and Larcker (1981), if AVE is greater than 0.5 of the total variance, convergent validity is established and the convergent validities of all six e-Government factors we used were confirmed. As shown in Table 4, our average variance extracted values ranged from 0.550 to 0.684, exceeding the recommended threshold.

This study adopted confirmatory factor analysis to examine whether the model used is appropriate in testing our hypotheses. The structural equation modeling was applied, using the robust maximum likelihood estimation method. The goodness of the fit was tested using various absolute, incremental, and parsimony fit indices, which exceeded the limits established by Hair et al. (1998) in almost all cases. Results shown in Table 5 suggest that the measurement model is adequate to test the hypotheses posed in this study.

The LISREL and SEM analysis of the path model developed in this study showed a reasonable fit for the structural model (see Table 5, $\chi^2/d.f. = 2.28$, GFI = 0.81, AGFI = 0.75, NFI = 0.91, NNFI = 0.93). Only AGFI value is a little bit below the recommended value. We were assured, therefore, that our research model is an adequate representation of the entire set of

Table 2
Demographic characteristics of respondents.

Measure	Items	Frequency	Percentage
Gender	Female	120	43.5%
	Male	156	56.5%
Education	Undergraduate	202	73.2%
	Graduate	74	26.8%
Age	20–30	128	46.4%
	31–40	87	31.5%
	41–50	46	16.7%
	51–60	15	5.4%
Monthly income	<1000 (GMD)	129	46.7%
	1000–3000	108	39.1%
	3000–5000	25	9.1%
	>5000	14	5.1%
Time of using computer per week	<12 h	138	50.0%
	12–24 h	114	41.3%
	>24 h	24	8.7%
Occupation	Government employees	118	42.8%
	Business sectors	103	37.3%
	Students	43	15.6%
	Others	12	4.3%

Table 3
Literature review for sampling data.

Studies	Research purposes	Sample	Factor/Constructs Developed/Tested
Agrifoglio et al. (2010). Twitter acceptance: The role of intrinsic motivation, information systems	Presents and tests acceptance and use of technology by users, focusing on role of intrinsic and extrinsic motivation in determining the usage behavior	385 returned questionnaires from twitter followers (response rate 12.63%).	1. Computer enjoyment 2. Perceived ease of use 3. Perceived usefulness 4. Playfulness
Venkatesh (2000). Management Science, 46(2)	Develops and tests TAM model to explain perceived usefulness and usage intentions in terms of social influence and cognitive instrumental processes	156 employees in four longitudinal field studies (response rate 0.60%)	1. Voluntariness 2. Experience 3. Subjective norm 4. Image 5. Job relevance 6. Output quality result 7. Demonstrability 8. Perceived usefulness
Chau and Hu (2001) Decision Sciences, 32(4), 699–719	Compare TAM, TPA, and decomposed TPB models	408 physicians in public tertiary hospital in Hong Kong (response rate 26.9%)	1. Behavioral intention 2. Attitude 3. Subjective norm 4. Perceived usefulness 5. Perceived ease of use 6. Compatibility
The UNDP report on the Gambia e-Governance study	The survey compares the TAM perceived usefulness and perceived ease of use of the Gambia e-Government Initiative and how citizen behaves in using computers	With all these approaches however, the survey was able to receive 165 responses out of 515 leaving a response rate of 17.5% as compared to that of our research as 16.7%	The sample frame revealed that about 41% of the institutions were located within Greater Banjul Area while a significant proportion of the rest were within other urban areas in other administrative divisions in the country
Park and Chen (2007)	TAM + DIT	71 doctors 23 nurses 17 other specialities in the U.S.	Smart phones
Wu et al., 2007	TAM + IDT	123 Physicians, nurses and medical technicians in Taiwan	Mobile Healthcare System (MHS)
Day et al., 2007	TAM	3 managers, 10 nurses, and 4 social workers in the U.S.	Videophones

causal relationships. The analysis suggests that the operationalization of overall e-Government factors was satisfactory.

5.2. Hypotheses testing

A primary purpose of this research is to test the TAM in the context of e-Government services adoption in Gambia. Several adoption factors, such as attitudes toward using e-Government systems, were

significant in predicting citizens' intention to use e-Government services. These adoption factors are presented in Fig. 3.

TAM explains an acceptable percentage of the variance in citizen's intention to use e-Government services in Gambia (the overall goodness of fit = 0.75). Since the overall model is satisfactory (Chi-square = 490.13, P>0.001), we tested the significance of each independent variable. Hypothesis 1 examines the link between “attitudes towards using” (ATTs) to “behavioral intention” (BIs). A citizen's actual use of e-Government system was influenced by their behavioral intentions to use. Attitude is significantly related to citizen's behavioral intention in using e-Government ($\beta = 0.28$; $P < 0.01$). This result supports the suggestion of the TAM. However, “perceived usefulness” (PU) has no significant effect on “behavioral intentions” (BIs). Hypothesis 2 is not supported.

Hypotheses 3 and 4 examined the impact of “perceived usefulness” (PU) and “perceived ease of use” (PEOU) on “attitude towards using” (ATTs). Perceived usefulness had no significant impact on attitude ($\beta = 0.02$) but “perceived ease of use” has a significant impact on attitude ($\beta = 0.34$; $P < 0.05$). As suggested by the original TAM, the positive impacts of PU on the attitude towards using the e-Government were confirmed.

Hypotheses 5, 6, and 7 examined the impact of “perceived ease of use”, (PEOU) “information system quality” (ISQ) and “information quality” (IQ) on “perceived usefulness” (PU) towards using the e-Government systems. It is observed that “perceived ease of use” (PEOU) and “information quality” (IQ) have strong impact on “perceived usefulness” (PU) toward using e-Government at the 0.01

Table 4
Descriptive statistics of the constructs.

Measure	Item	Mean	SD	Cronbach's α	Average variance extracted
Behavior intention (BI)	BI1	2.933	1.168	0.855	0.684
	BI2				
	BI3				
	BI4				
Attitude towards using (ATT)	ATT1	5.082	0.924	0.834	0.550
	ATT2				
	ATT3				
Perceived usefulness (PU)	PU1	5.142	1.078	0.842	0.620
	PU2				
	PU3				
Perceived ease of use (PEOU)	PEOU1	5.617	1.004	0.845	0.578
	PEOU2				
	PEOU3				
	PEOU4				
Information system quality (ISQ)	ISQ1	4.510	1.117	0.864	0.610
	ISQ2				
	ISQ3				
	ISQ4				
Information quality (IQ)	IQ1	4.573	1.140	0.858	0.628
	IQ2				
	IQ3				
	IQ4				
	IQ5				

Table 5
Goodness-of-fit indices: initial model vs. modified model.

Model	χ^2	d.f.	$\chi^2/d.f.$	GFI	AGFI	NFI	NNFI	RMR	RMSEA
Recommended value	N/A	N/A	<3	>0.80	>0.80	>0.90	>0.90	<0.10	<0.08
Initial model	490.13	215	2.28	0.81	0.75	0.91	0.93	0.06	0.09

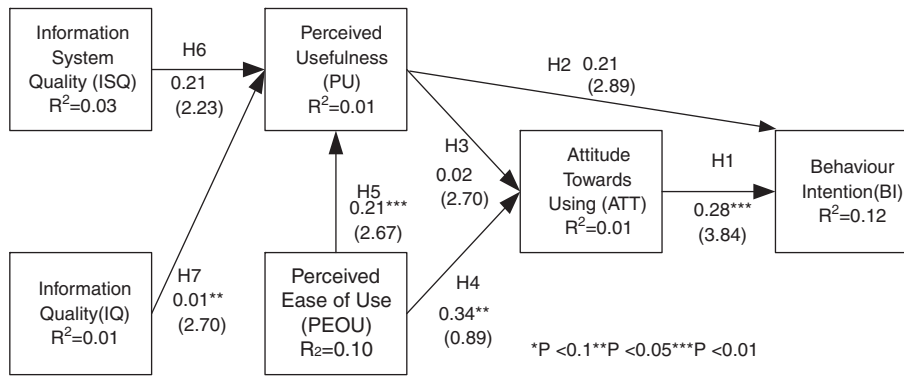


Fig. 3. Model of TAM in e-Government adoption.

and 0.05 significance levels, respectively. The greater the Gambia government willingness to emphasize on “information quality” (IQ) and “perceived ease of use” (PEOU), the greater will be influenced citizen's perceived usefulness on e-Government systems. Hypotheses 5 and 7 are supported.

Prior e-Government TAM research focuses on developed countries. This study highlights the impact and further developmental aspirations of e-Government on Gambia, a developing country. This study shows how the TAM and e-Government initiatives would positively impacts Gambian government, despite the cultural differences within the country. Table 6 summarizes the testing results for the hypotheses in this study.

Fig. 3 shows that hypotheses H2, H3, and H6 are not supported. Gambia's perceived usefulness (PU) exhibits weak linkage for behavior intentions (BIs) (H2) and attitudes (H3). Electricity availability in Gambia is not stable compared to Western world. The poor infrastructures in Gambia are a handicap to government efforts related to e-Government initiatives. This study shows that there is a direct relationship between power availability and a citizen's ability to make use of available government services. Relevant to this topic is how the government can enable its citizenry to access available e-Government resources. For instance, if someone in Brikama wants to download a government forms or application for a passport, driver's license, national ID card, or Treasury bills, that person will need specific computing and peripheral equipment (printers, scanners, and so forth). In Gambia, web portals are not user-friendly and Gambians may wait for long periods before navigating a browser due to slow internet connectivity. As a result, the majority of Gambians may prefer traditional government procedures rather than using e-Government services. Therefore, perceived usefulness does not have a strong impact on behavioral intentions or attitudes in a developing country with inadequate IT infrastructure. Empirical results do not support Hypothesis 6: The impact of information system quality (ISQ) on perceived usefulness (PU). The Gambia Information System available online does not offer the information that Gambians require, and some

government web portals are not properly in place. Information accessibility is problematic, and people hesitate to use e-Government systems available online.

Table 6 illustrates that human beings are rational and use a logical information-based thought process, despite findings from recent TAM and e-Government studies. Hypotheses 1, 4, 5, and 7 are supported. Several studies discuss various effects and emotional concepts of these same findings. Venkatesh et al. (2003) studied emotion via computer anxiety (an individual's apprehension, or fear, when this person may use a computer) as one of the determinants of perceived ease of use. This study examined the direct impact of general computer anxiety on PEOU, and found that computer anxiety's impact on PU is mediated by PEOU.

6. Discussion and conclusion

This study's results suggest that the core constructs of TAM have strong influences on citizen's intentions of using the e-Government systems. Our empirical results show that both IQ and PEOU positively influence on the PU in the Gambian e-Government system. Furthermore, PEOU significantly affects citizen's attitudes to use the e-Government systems. In the meantime, attitudes toward using the e-Government systems significantly affect Gambian citizen's behavioral intentions. Consistent with prior TAM literature, the core constructs of the TAMs (information quality, perceived usefulness, perceived ease of use, attitude towards using, and behavioral intention) have a significant and strong influence on Gambia's e-Government usage intention.

However, the results do not support hypotheses H2, H3, and H6. Gambia's perceived usefulness (PU) has a weak linkage with Behavior Intentions (BI) (H2) and Attitudes (H3). This may be due to Gambia's inconsistent and unstable electricity availability compared to Western world. Gambia's poor government infrastructure is a factor in unsuccessful e-Government initiatives. Accessing government documents via e-Government resources is quite difficult for Gambians. In some cases, Gambians must wait hours before browsers can navigate to

Table 6
The hypothesis testing result.

Hypotheses	Relationships	Results	Prior studies
H1	ATT→BI	Supported (p<0.01)	Davis (1989) and Karahanna et al. (1999)
H2	PU→BI	Not supported	Taylor and Todd (1995) and Hiller and Belanger (2001)
H3	PU→ATT	Not supported	Gefen et al. (2003)
H4	PEOU→ATT	Supported (p<0.05)	Lederer et al. (2000)
H5	PEOU→PU	Supported (p<0.01)	Davis (1989) and Venkatesh et al. (2003)
H6	ISQ→PU	Not supported	Lucas and Spitzer (1999), Lin and Lu (2000) and Dishaw and Strong (1999)
H7	IQ→PU	Supported (p<0.05)	Seddon and Kiew (1994) and Agarwal and Prasad (1999)

the specific website due to slow internet connection. Due to internet connection difficulties, the majority of Gambians prefer using traditional methods to process government documents rather than the e-Government services. Perceived usefulness (PU) does not have a strong impact on behavioral Intentions and attitudes in developing countries with inconvenient IT infrastructure. To improve Gambia's Information System understanding, the Gambian government should introduce control systems and web portals on their sites. Accessibility to Information is problematic and users sometimes hesitate to access online e-Government systems.

This study has several limitations which future research can address. The investigation of e-Government systems success models is relatively new to Gambia. Thus, generalizing findings in this discussion of e-Government categories or user groups is not concrete, but is a good basis for further research. The sample size in this study is another limitation. A cross-cultural validation using a large sample elsewhere is requires a greater generalization of the proposed model.

Citizens using the e-Government system put forth a great effort to meet successful results. This study's results show that the core constructs of the TAM have strong influences on user intention towards e-Government products. This implies that the Gambian government can potentially utilize this study's TAM findings in other contextual settings to design and promote e-Government systems.

Appendix A. Questionnaires

Part I. Demographic information

1. In this part, the purpose of the study is to understand about your personal information. Please check out the appropriate corresponding questions.

Part I. Demographic information	
1. Gender <input type="checkbox"/> Male <input type="checkbox"/> Female	4. Education <input type="checkbox"/> Undergraduate <input type="checkbox"/> Graduate
2. Age (years) <input type="checkbox"/> 20–30 <input type="checkbox"/> 31–40 <input type="checkbox"/> 41–50 <input type="checkbox"/> 51–60	5. Occupation <input type="checkbox"/> Government Employees <input type="checkbox"/> Business Sectors <input type="checkbox"/> Students <input type="checkbox"/> Others
3. Monthly income (Dalasis) Less than 1000 (GMD) <input type="checkbox"/> 1000–3000 (GMD) <input type="checkbox"/> 3000–5000 (GMD) <input type="checkbox"/> Above 5000 (GMD)	6. How many times did you use computer per week <input type="checkbox"/> Less than 12 h <input type="checkbox"/> 12–24 h <input type="checkbox"/> More than 24 h

Users acceptance of internet in the Gambia

The following questions are about your acceptance of e-Government services and the use of telecommunication and internet in the Gambia. If you have used the computer before, please answer according to your prior experience. If you haven't used the computer before, please answer according to your understanding of the computer.

You need computer/internet because...

(1–Strongly disagree, 2–disagree, 3–neutral, 4–agree and 5–strongly agree)

	1	2	3	4	5
1. e-Government offers convenience	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. e-Government is not affordable	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. e-Government offers useful information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. e-Government adds variety to my lifestyle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part II: Behavior intention of the e-Government in the Gambia

In this part, the purpose of the study is to understand about your opinion. Please rate the following questions on a scale of 1 to 5 that best describe your life style preference. (1–Strongly disagree, 2–disagree, 3–neutral, 4–agree, and 5–strongly agree)

	1	2	3	4	5
1. I intend to use the e-Government system in the next two years to come.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. I intend to use the e-Government system on a regular basis in the future.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. I intend to use the e-Government information system in my next application of passport and national identity card.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. I will strongly recommend others to use e-Government and information technology services.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Attitude towards the e-Government use</i>					
5. Using e-Government and the internet is a good idea.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Using e-Government in the Gambia is a pleasant idea.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Using e-Government is a positive idea.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Perceived usefulness of e-Government</i>					
8. Using the e-Government would improve my performance in my workplace.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Using the e-Government services online enables me to accomplish my understanding of services and increase my productivity.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Using the e-Government would make it easier to do what I want to do and would be very useful in my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Perceived ease of use (PEOU)</i>					
11. Learning to operate the e-Government system would be easy for me.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. I would find it easy to get the e-Government to do what I want it to do.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. It would be easy for me to become skillful at using the e-Government service on the internet.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. I would find the e-Government easy to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Information system quality (ISQ)</i>					
15. I would find e-Government services very secure enough to conduct my transactions online.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16. The e-Government provides convenient access.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17. The e-Government services are easy to use.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18. I could use the e-Government services at anytime, anywhere I want.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Information quality (IQ)</i>					
18. The e-Government service will provide accurate information when I prepare to use it.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19. The e-Government will provide complete information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20. The e-Government will provide precise information.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21. The e-Government will provide the timely information about the transactions.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22. The e-Government will provide relevant information I need.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part III: Internet consuming behavior

For each question, please choose *only one answer* that best describes your preference.

1. How do you feel about e-Government use in general in Gambian society?

- Strongly dislike Dislike Neutral Like Strongly like

2. Your most favorite portal websites is...

- Unique Solution Google Quantum Associate

Quantum Net Gamtel Yegoo website

3. What kind of activities do you enjoy most from the use of e-Government services?

- Online movies
- Using ATM's and online banking
- Online e-journals

- Paying out my taxes
- Others (please specify _____)

Factors affecting your internet consuming behavior are...
 (1—Extremely not important, 2—not important, 3—neutral, 4—important and 5—extremely important)

	1	2	3	4	5
1. Lack of constant electricity in your house	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Poor networks in trying to connect from Gamtel ASDL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. High price charge on the internet every month	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Hackers for security reasons	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part IV: General comments

1. Why are we pursuing e-Government in the Gambia?

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2. What are the constraints and challenges of the Gambian e-Government services?

.....

3. Are online references on the Gambian government portable websites very convenient and easy to navigate by the citizens to get the necessary information?

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