

Trust in E-government Practices: A Platform Perspective of a Postal Service Organisation

Kofi A Boateng^{1*}, Rosemary Boateng-Coffie² and Peter Darko¹

¹Dept. of Supply Chain and Information Systems, KNUST School of Business, Kumasi, Ghana

²Dept. of Human Resource and Organisational Development, KNUST School of Business Kumasi, Ghana

Abstract. *E-government continues to gather research momentum from academics of diverse theoretical and practical orientations to signify the enduring significance of the concept, especially from the standpoint of digital service delivery in much of the developing world. A platformisation perspective driven by digital service delivery is teased out to make a case for this study. Dwelling on the fundamental assumptions of a positivistic research philosophy with the UTAUT epistemological model as the guiding frame to solicit responses of students in an online environment, the study employs quantitative techniques to analyse eight hypothetical scenarios. Findings suggest trust in e-government, Internet trust, social influence and performance expectancy are some of the strong predictors of intention to use e-government services. The study discusses the revelation that citizens are particularly influenced by peer pressure in their intention to use public digital services. Theoretical implications and empirical lessons of the factors that should be of significant consideration to system designers and policy makers in e-government practice have been accounted for. Future research can take the direction of qualitative efforts to bring out the underlying rationale and tensions connected with digital service acceptance in e-government practice.*

Keywords: *Digital Service, E-government, Emerging Economies, Platformisation, Trust*

1. Introduction

The increasing significance of digital service delivery (Ubaidillah et al., 2013; Boudreau, 2012a; D’Emidio et al., 2015; Omar et al., 2017) could be traceable to Porter and Miller’s (Porter & Millar, 1985) revelation – in their inspirational study of the relationship between information and competitive advantage – of a move from product-led economy to a service-driven one. The move envisages the crucial role trust and platforms (Alaimo & Kallinikos, 2017a) play in electronic government (e-government) practices (Mojumder et al., 2019; Van Alstyne et al., 2016). These practices, regarded as transformational, are conditioned by ‘creative solutions’ that provide the avenue for inspiring technology mediated interactions (Boateng, 2013) between the citizenry and the government. Aspects of the technology-mediated interactions manifest in the application of platforms for the delivery of

digitally-enabled services (Chesbrough, 2011). It is no longer gainsaying the incontrovertible truth that digital service delivery, due to its far-reaching significance for meaningful e-government practice, constitutes the primary avenue of job generation in much of the Organisation for Economic Co-operation and Development (OECD) world (Berry et al., 2006).

Indeed, the service-driven economy offers ‘core infrastructures’ by whose instrumentality organisations ‘.... expand, domestically and globally’ (Orlikowski & Scott, 2015). As technology takes the centre stage for widening the scope and scale of service offerings and broadening the appeal of contemporary organisations (Ye & Kankanhalli, 2018), platforms become key in how they deliver digital services (Yoo et al., 2012). We feel

*Corresponding author. Email: kaboateng.ksb@knust.edu.gh
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School of Business and Management-Institut Teknologi Bandung

motivated by (Alaimo & Kallinikos, 2017) to consider platformisation as typifying the 'infrastructural operations' for inducing user participation in many contextualized IT-driven socio-economic engagements. By platformization, we appeal to Helmond's (2015 p.5) understanding of it as "the rise of the platform as the dominant infrastructural and economic model of the social web and the consequences of the expansion of social media platforms into other spaces online". The foregoing understanding of platformisation is reinforced by a more recent explanation as "the penetration of the infrastructures, economic processes, and governmental frameworks of platforms in different economic sectors and spheres of life" (Helmond 2019, p. 5-6).

The 2030 Agenda for Sustainable Development reveals the intentions of governments of much of the emerging economies to build technology infrastructure for the delivery of quality services through various e-government projects (UNCTAD, 2018). At the heart of emerging economies' e-government strategy, is the determination and commitment to encouraging their citizens to embrace digitally-enabled government services. However, till yet, scholarly account of the application of platforms in facilitating digitally-driven delivery of government services within the context of trust appears to be desperately missing from the mainstream information systems and management literature (Helmond, 2015-Poell et al., 2019; van der Graaf & Ballon, 2019).

It is crucial to address this knowledge and understanding shortfall on a couple of counts. In the first place, we need to gain an understanding of how, especially within the postal services industry, government generates more value in the manner it serves its citizenry via digital service delivery. Secondly, it is important to appreciate the underlying forces considered as *sine qua non* for meaningful e-government practice. Meaningful in the sense that it is critical to take account of both sides of the equation in any

e-government endeavours: the government or its agency on the one hand and the citizenry on the other. Taking this two-sided view is sensible because of the opportunity to become familiar with the complex interactions involved in both sides of the platform use.

Researchers have drawn on the UTAUT model to explain the factors that influence citizens' adoption of e-government (Tewari et al., 2023; Mustaf et al., 2020). However, to ensure a better fit to the context of emerging economies, a modification of the UTAUT model is proposed to achieve the objectives of this research. The decided change is based on insights derived from reviewing the recent scholarly literature on citizen-focused e-government approaches (Nurfatiasari & Aprianingsih, 2017). Two variables have been added to the original UTAUT model, namely, e-government trust, and Internet trust to accommodate its relevance to the study at hand. The overarching aim is to find out the role of trust in bringing about digital service delivery in e-government projects.

This study seeks to anticipate the factors that influence citizens' adoption of e-Government services in emerging economies, as well as adapting a conceptual model of UTAUT that embraces the identified relevant constructs. Although every nation, even in a small geographical area, varies from others in many ways, the study may help to explain the key determinants of citizen adoption of an e-government project (Alawadhi & Morris, 2008a) from the standpoint of platforms.

The rest of the paper proceeds as follows. A call out of the contemporary literature is presented to update our understanding of e-government while at the same time demonstrating the shortfall in our knowledge in particular reference to digital service delivery. The philosophical assumptions underscoring the study is discussed with justification of a survey method as an appropriate means of data collection. The quantitative mode of data analysis is also submitted as well to signpost the means of

arriving at the discussions that follow the presentation of the research findings. Concluding account is provided to signal the implications of the study in both theoretical and practical terms.

2. Literature, Model / Hypotheses Development

The key thrust of this paper is to tease out the preparedness of the citizenry to accept the provision of e-government services delivered by digital means. In this portion of the work the literature on e-government and digital service delivery is presented to develop the working hypotheses.

2.1. E-government Practices in Emerging Economies

The adoption of various e-government practices by the governments of emerging economies has attracted many scholarly studies such as (Aneke et al., 2019; Ashaye & Irani, 2019; Bwalya, 2017; Gupta et al., 2016; Lallmahomed et al., 2017; Twizeyimana & Andersson, 2019). E-government is perceived to be "the use of the ICTs (Internet, the web, mobile devices, network tools, social media, etc.) to enable the governmental agencies [to communicate] virtually with customers, businesses, and other government partners, as well as delivering its service bundles by electronic means" (El-Haddadeh, 2020). The United States of America E-government Act of 2002 defines e-government as "the use by the Government of web-based Internet applications and other information technologies, combined with processes that implement these technologies to improve both access to, and the delivery of government information and services to users in and outside the government, in terms of effectiveness, efficiency, service quality, and transformation" (Bucher & Helmond, 2017). Drawing on these explanations, Loukis & Charalabidis, (2011), delineate the characteristics of good e-government as: comprehensive; integrated; ubiquitous; transparent; accessible; safe; re-engineered; intraoperative and developed towards the

provision of electronic services. Diverse perspectives on e-government have helped in shedding new insights on the conceptualization and the dynamics its implementation and application (Opara & Rouse, 2019). However, the object of delivering efficient and effective services to its citizens depends on the proper allocation and use of available resources. Available and proper resource allocation in e-government aims to minimise cost and maximise gains, as well as meaningful identification of the various stakeholders and their requirements for digital service delivery.

Lessons from researchers interested e-government in emerging economies suggest each country implements a specific component of the e-government system that is favourable to its own socio-economic and administrative context (Priandi et al., 2019). The socio-economic and administrative dynamics illustrate the notion that the experiences in developed countries which sometimes account for successful implementation and use may be absent or different in emerging economies. The reverse is also true. Emerging economies, have seen a low level of acceptance of e-government services, mostly because of the project failures that have been witnessed elsewhere. Such negative experiences have the potential to influence the extent of trust in e-government efforts. Hence, the introduction of e-government initiatives become problematic, and has frequently been seen as the principal cause of their failure (European Union, 2015; Khan & Majeed, 2020).

A disappointing outcome of the implementation of e-government systems could also be regarded as evidence of citizens mistrust or lack of sufficient awareness of the new processes or projects (in this case, digital service delivery). In other scenarios, the issue of digital divide explains the lack of skills and funds necessary to access implemented e-government projects. Similarly, citizens may resist change or simply be impervious to the convictions that favour e-government

acceptance (Ashaye & Irani, 2019; Lallmahomed et al., 2017; Leuprecht et al., 2016; Cahlikova, 2019). The inevitability of change may dawn on people even though they nonetheless resist it (Aneke et al., 2019; Munyoka & Maharaj, 2019). The resistance to change could be linked to a lack of public confidence in the ability of the government to offer the expected digital service delivery.

The foregoing situation is challenge to e-government acceptance in spite of the fact that government efforts may try to incentivise the use of digital service initiatives (Twizeyimana & Andersson, 2019b). Other difficulties may take such forms as privacy and security concerns. Rodrigues et al., (2016) and Cahlikova, (2019) advance thoughts on the need for a data protection law and emphasise the urgency of raising people's awareness by promoting educational campaigns that encourage data privacy and discourage online identity theft behaviour.

2.2. Platformisation of Digital Service Delivery

The advent of digital service has given considerable traction to the ideals supported by platformisation. And by platformisation, we project our thoughts to coincide with the notion considered by Helmond, (2015) to the effect that platformisation identifies "the rise of the platform as the dominant infrastructural and economic model of the social web and the consequences of the expansion of social media platforms into other spaces online". Inherent in this explanation of platformisation is its data exchange functions and management possibilities that find some form of relationship with that espoused by Poell et al., (2019), that platformisation evokes the integration of three institutional perspectives of markets, governance and the supporting data infrastructure. The infrastructure aspect of platformisation has a near-synonymous connotation with 'construction'. This idea of construction connects quite well with the functional infrastructure or what we describe as 'base support' for occasioning and spearheading the interoperable processes that

take place on platforms for meaningful digital service delivery (Bonchek & Choudary, 2013).

For these general service practices, emphasis shifts from manufacturing to service operations, otherwise known as 'service-dominant logic' (Barrett et al., 2015) that involves the simultaneous exchange between the two or more parties to service delivery experience. First, platformisation as a form of market arrangement concerns itself with the enrolment of 'multi-sided parties' Boudreau, (2012b) for aggregating transactions. The multi-sided parties, and the relationships that characterise their activities, can be as complex as the kind of transactions that bring them together to participate on the platform for diverse digital service need fulfilment.

The second institutional viewpoint of platformisation is governance. Governance in platformisation subscribes to the idea of the supply of the relevant infrastructures and favourable conditions for creating value in addition to striking a balance between transparency and control in regulating the behaviour of the various stakeholders (Constantinides et al., 2018). The competitive spirit that accompanies market transactions is sustained the last viewpoint of data infrastructure that provides incentives for, especially, continuous participation and financial benefits (Nieborg, 2017).

Maintaining a careful balance between transparency and control then reveals a fundamental essence of governance in platformisation; for it provides the 'mechanisms that appropriately bound participant behaviour without excessively constraining the desired level of generativity' (Holden & Karsh, 2010). When participant behaviour is bound as a means of governance, the understanding is the extent to which platformisation both, and simultaneously, enable and restrain the performance of certain functions (Bucher & Helmond, 2017).

2.3. Theoretical Model and Hypotheses Formulation

There are a number of theories and models that are relevant to the analysis of technology acceptance. The Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2003a; Diaz Satriavi & Sushandoyo, 2018) is one such theory that provides the opportunities for more variables to be added in line with the ideals of this study. The UTAUT model consists of four predictors (Performance Expectancy; Effort Expectancy; Social Influence, and Facilitating Conditions), two outcomes (Behavioral Intention; and Use behavior) and four moderator variables (Gender; Age; Experience; and Voluntariness of use). The model also maintains that three constructs have a direct influence on usage intentions, namely, effort expectancy (complexity), performance expectancy (relative advantage), and social influence (Holsapple & Sasidharan, 2005a)

The UTAUT integrates at least four behavioral models of technology adoption: the theory of reasoned action (Ajzen & Fishbein, 1980); the technology acceptance model (Bagozzi, 2007); the motivational model (Compeau & Higgins, 1995) and the theory of planned behavior (Ajzen, 1991). In addition to this, the UTAUT includes determinants that moderate the four direct factors: gender, age, experience, and usage voluntariness. Following (Walsh et al., 2008) a moderator is considered to be a factor that progressively shifts the form of the power of the relationship existing amongst a criterion factor and a predictor. UTAUT is useful and seems like a more appropriate model since it covers the other major adoption models. Furthermore, its explanatory power in technology acceptance related matters is superior to other technology acceptance theories (Venkatesh & Zhang, 2010).

We are encouraged by the point that recent scholarship on e-government has a favourable disposition towards the UTAUT model. The point also underscores most of the variables and sufficiently explains the factors in e-government adoption, especially in matters of

trust and technology-mediated exchanges, such as the use platforms. This scholarly encouragement motivates our decision to apply the model. The number of e-government users coupled with the varied personal characteristics that usually affect implementation (for example age of user, IT skills, and confidence level and prior knowledge with internet) and interconnected difficulties motivated the researchers to apply the UTAUT model. Applying the UTAUT serves as the propositional foundation because of its ability to map the constructs from different standpoints. The adopted model focuses on the factors that might encourage the citizens of emerging economies to use e-government services such as digital service delivery opportunities.

Holsapple & Sasidharan, (2005a) reiterated the need to test the model in different contexts. However, the purpose of using the UTAUT model is to test a set of variables that can predict e-government acceptance and use (Beenkens, 2011; Holden & Karsh, 2010). This modified UTAUT model is designed to address the research hypothesis related to the adoption of e-government in emerging economies.

2.3.1. Performance Expectancy

Performance expectancy is defined as “the degree to which an individual believes that using the system will help him or her to attain gains in job performance”. Performance expectancy in the UTAUT model was developed from five original models’ constructs which had been used in certain technology adoption models, namely, perceived usefulness from the TAM and the combined TAM-TPB model, extrinsic motivation from the MM model, job-fit from the MPCU model, relative advantage from the IDT (DOI) model, and outcome expectancy from the SCT mode (Holsapple & Sasidharan, 2005a). In the context of this study, we put forward the following hypothesis:

H1: Performance expectancy has a positive influence on the behavioral intention to use e-government services.

2.3.2. Effort Expectancy

Effort expectancy is defined as “the degree of ease associated with the use of a system”. Effort Expectancy in the UTAUT model has been developed from three constructs used in certain technology adoption models, namely, perceived ease of use from the TAM/TAM2 Models, complexity from the Model of Personal Computer Utilization, and ease of use from the Innovation Diffusion Theory (IDT) or Diffusion of Innovation (DOI) model (Holsapple & Sasidharan, 2005a). The authors have shown that effort expectancy plays a key role in facilitating the acceptance of technology. In view of this, the following hypothesis becomes appropriate:

H2: *Effort expectancy has a positive influence on the behavioral intention to use e-government services.*

2.3.3. Social Influence

Social influence is defined as “the degree to which an individual perceives that others believe he or she should use the new system” (Holsapple & Sasidharan, 2005a). In the present research, social influence is defined as the importance of family or colleagues or a friend’s opinion/belief in affecting the intention to use an e-government service. Social influence in the UTAUT model has been developed from three constructs used in some technology adoption models, namely, the subjective norm from the TRA, TAM2, TPB/Decomposed Theory of Planned Behaviour (DTPB), and C-TAM-TPB Models, social factors from the MPCU Model, and image from the IDT (DOI) model (ibid). In the context of this study, the hypothesis is stated thus:

H3: *Social influence has a positive influence on the behavioral intention to use e- Government services.*

2.3.4. Facilitating Conditions

Facilitating conditions are defined as “the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system” (Holsapple & Sasidharan, 2005a). In the e-government context, facilitating conditions refer to the degree to which citizens expect that the e-government system is supported

with a functioning helpdesk and a technical team with good infrastructure. The facilitating conditions in the UTAUT model have been developed from three constructs used in some aspects of technology adoption models. These are, perceived behavioral control from the TPB/DTPB and C-TAM-TPB models. Facilitating conditions from the MPCU model, and compatibility from the IDT (DOI) model (Holsapple & Sasidharan, 2005a). Insights from the authors, suggest that the availability of technical support to help citizens with any difficulty or problem that might affect them could lead to increased satisfaction on the part of citizens (Gupta et al., 2016). Therefore, this study advances the following hypothesis:

H4: *Facilitating conditions have a positive influence on the behavioral intention to use e-government services.*

2.3.5. Trust Constructs

Trust is a variable that is incorporated in the model for the purposes of this study; it is not used in the original UTAUT model. Research about digital services behavior shows the importance of adding the trust factor in adoption models because it provides for a means of understanding users’ behavior when they accept and use digital services (Munyoka & Maharaj, 2019b). Trust is defined as an expectancy that the words in the spoken or written statements given to people can be relied on (Rotter, 1967a). Nieborg, (2020) also argues that, trust has great value for research in the area of social psychology and personality. The literature related to digital trust has focused on two types of trust. First, trust in the entity providing the service in our context, the government of an emerging economy (e-government trust) and secondly, trust in the media through which the service is provided in our context, the Internet (Williams et al., 2016a).

2.3.6. Trust in E-Government

Trust has been shown to be an integral part of e-government adoption (Williams et al., 2016b). Due to the impersonal nature of the Internet, citizens must believe that the agency providing the service is reliable. Lack of trust

is one of the most formidable barriers to e-government service adoption, especially when financial or personal information is involved. For example, a citizen wants to be sure in making transactions via e-government services that her/his personal information is secured. In view of this the following hypothesis becomes appropriate:

H6: Trust in the e-government has a positive influence on behavioral intention.

2.3.7. Internet Trust

"Trust in the Internet is a salient predictor of e-government adoption" (Munyoka & Maharaj, 2019b). Trust in digital service is critical when the information that is shared with others is sensitive (Munyoka & Maharaj, 2019b). This construct in the e-government context is exemplified when a citizen wants to use certain services. The question that arises is whether they should trust the Internet and provide their personal or credit card information. Hence, the study considers the following hypothesis:

H7: Trust in the Internet has a positive influence on behavioral intention.

2.3.8. Behavioural Intention

Behavioral Intention is defined as "[a] person's subjective probability that he or she will perform the behavior in question" (Khan & Majeed, 2020). Another definition by Nurfatiasari & Aprianingsih, (2017) is the readiness of an individual to act, use, or adopt a behavior towards a specific thing. Intentions refer to people's willingness to try or plan to do something but not to the effort to get the thing or perform the behavior (Lips & Koops, 2005). In the e-government services context, behavioral intention is considered to be the resolve of citizens to use e-government services such as digital service delivery given the opportunity. Researchers have found that behavioral intention has a positive effect on the actual use of a technology system (Holsapple & Sasidharan, 2005a; Lips & Koops, 2005). In the present study, it is expected that the independent variables of *Performance Expectancy*, *Effort Expectancy*, *Social Influence*, *Facilitating Conditions*, *Trust in e-*

government and *trust in Internet* have a marked effect on behavioral intention, which in turn affects acceptance and use of e-government services. An example of this construct in the e-government is when a citizen intends to use an e-government system to obtain digital services in the future. In the context of this study, the following hypothesis is stated:

H8: Behavioral intention to use e-government services has a positive influence on the perceived use of e-Government system

3. Methodology

This study is contextualised around the Ghana Postal Service system. Sensitised by positivist research philosophical assumptions, informed by quantitative epistemological orientation, the paper seeks to apply survey methodological techniques to solicit views as part of the data collection efforts.

In 2017, GhanaPost GPS introduced a digital address system with a code name: Jack Where Are You? meant to provide every place in Ghana a unique digital identification. The unique digital identifier is in the form of a nine alpha-numeric structure such as AK-338-6714 which comes in three different languages of English, French and Spanish. The Jack Where Are You? App is supposed to give impression about the primary functionality of the App: The provision of locational or geographical identity. GP GPS operates as a downloadable application on Google Play Store.

Upon download and installation on mobile devices, especially smart phones, GP GPS is able to work in both online and offline modes. The App has different functionalities for digital service delivery options and modules. Some of the service options include the generation of one's digital address, making distress calls in emergency for ambulance, fire and police, among a host of allied services. The GP GPS App is required to generate a person's digital address for the application and processing of national identification cards such as Ghana Card, passport, driver's license,

among others. Financial institutions such as banks and insurance companies also require the use of digital address to process applications for bank account and insurance registration. It has to be said that the generation and use of the GP GPS allows individuals and organisations the opportunity to interface with GP in the form interorganizational and interoperable relationships.

3.1. Data Collection and Analysis Technique

The quantitative approach is selected and justified on three counts: the study involves creating a set of testable hypotheses for deductive interpretation.

An optimal number of 600 participants are considered for this study. This is based on the Slovin's formula as it calculates the sample size (n) given the population size (N) and a margin of error (e). It is computed as $n = N / (1 + N * e^2)$. By using the Slovin's formula, the sample size is 600 participants with a margin of error of 4%. The questionnaires were pilot tested with a very limited population to ensure any traces of ambiguity have been cleared to ensure clarity. The population size (N) = 29,614,337, while the calculation of the sample size is as derived as: $n = 29,614,337 / (1 + 29,614,337 * (4 \%)^2) = 600$.

The researchers find probability sampling technique in the form of simple random to be quite appealing to the aims of this study. The questionnaire requires respondents to indicate their views of the modified UTAUT model, using a seven-point Likert scale that ranges from 1 “strongly Disagree” through to 7 “strongly Agree”. In contrast to simple regression, Structural Equation Modeling (SEM) is a preferred choice among analytic methods where research designs include complex models similar to the one in this study. SEM is a family of statistical procedures

that depicts multiple relationships among latent constructs through the use of equations fairly similar to multiple regression equations (Hair et al., 2014). The study employs the use of the PLS SEM. The reason for the selection is informed by our research purpose, models and data characteristics. The measurement model assessment specifies the rule of correspondence between the measured and the latent variables. According to Hair et al., (2019) and Porter, (1985) there are two criteria for assessing the measurement model, namely, reliability and validity assessments.

4. Results And Analysis

4.1. Measurement, Model Analysis and Construct Validity

Specification of rules of correspondence between the measured and the latent variable is the initial step to set the measurement model (Hassan et al., 2015). According to Hair, (2019), the two criteria for assessing the measurement model are reliability and validity test. Reliability measures the extent to which an assessment tool produces stable and consistent results (Hair, 2019). The reliability test measures the extent to which a variable or group of variables are consistent with what they intend to measure. This study presents findings on both the internal and external consistency of its variables. The researchers tested to ensure that item loadings were sufficiently high (0.7 or higher indicating that the construct explains more than 50% of the indicator's variance) and that all items loaded higher against their own constructs than against other constructs (Hair et al., 2013). The loading and cross loading of the remaining items are adequate as can be seen in table 4.1 below:

Table 4.1
Item Loadings and Cross Loadings

Items	Actual Usage	Behavioral Intention to Use	Effort Expectancy	Facilitating Conditions	Performance Expectancy	Social Influence	Trust In Government	Trust in Internet
BI1	0.622	0.788	0.481	0.49	0.534	0.463	0.539	0.611
BI2	0.698	0.836	0.43	0.423	0.543	0.439	0.507	0.661
BI3	0.718	0.838	0.361	0.427	0.517	0.407	0.555	0.637
EE1	0.385	0.383	0.745	0.428	0.62	0.334	0.263	0.312
EE2	0.324	0.367	0.714	0.464	0.574	0.33	0.28	0.31
EE3	0.309	0.287	0.557	0.362	0.511	0.358	0.257	0.346
EE4	0.366	0.326	0.634	0.574	0.504	0.418	0.309	0.365
FC1	0.372	0.309	0.486	0.627	0.495	0.481	0.301	0.358
FC2	0.373	0.349	0.459	0.668	0.423	0.236	0.322	0.383
FC3	0.338	0.4	0.353	0.691	0.324	0.35	0.427	0.368
FC4	0.266	0.316	0.456	0.545	0.355	0.392	0.342	0.308
PE1	0.597	0.487	0.515	0.46	0.753	0.367	0.335	0.473
PE2	0.524	0.445	0.537	0.421	0.688	0.345	0.271	0.454
PE3	0.489	0.46	0.628	0.401	0.711	0.356	0.323	0.457
PE4	0.464	0.497	0.671	0.471	0.768	0.409	0.367	0.428
PE5	0.43	0.418	0.621	0.488	0.646	0.423	0.349	0.458
SI1	0.449	0.414	0.497	0.492	0.461	0.78	0.318	0.377
SI2	0.45	0.419	0.419	0.406	0.409	0.789	0.316	0.395
SI3	0.436	0.457	0.389	0.481	0.422	0.862	0.391	0.426
TG1	0.399	0.423	0.225	0.365	0.289	0.325	0.651	0.546
TG2	0.492	0.514	0.36	0.457	0.391	0.342	0.791	0.639
TG3	0.499	0.545	0.364	0.424	0.353	0.29	0.838	0.633
TG4	0.324	0.414	0.244	0.359	0.314	0.294	0.636	0.524
TI1	0.562	0.509	0.352	0.305	0.425	0.335	0.512	0.656
TI2	0.573	0.542	0.338	0.333	0.383	0.361	0.541	0.699
TI3	0.678	0.584	0.393	0.484	0.507	0.323	0.583	0.753
TI4	0.603	0.487	0.263	0.404	0.42	0.337	0.558	0.629
USE 1	0.72	0.6	0.371	0.366	0.48	0.401	0.434	0.636
USE 2	0.702	0.577	0.367	0.398	0.519	0.355	0.392	0.604
USE 3	0.602	0.5	0.313	0.316	0.422	0.356	0.371	0.547

Further attributes of the constructs are tested by measuring their psychometric properties. The researchers assessed the AVE, the composite reliability and Cronbach Alpha for acceptable quality. The AVE of all the constructs were higher than 0.5 as required. Composite Reliabilities values were very high

(least value was 0.883), and thus comfortably exceeding the suggested 0.7 threshold (Chin, 1998). Finally, Cronbach Alpha values also comfortably exceeded the 0.7 threshold (Hair et al., n.d.), with the least Cronbach Alpha value being 0.883 seen in table 4.2 below.

Table 4.2
Attributes of Constructs

Construct	<i>Cronbach's Alpha</i>	Composite Reliability	Average Variance Extracted (AVE)
Actual Usage	0.718	0.841	0.639
Behavioral Intention to Use	0.861	0.915	0.782
Effort Expectancy	0.754	0.845	0.579
Facilitating Conditions	0.729	0.831	0.551
Performance Expectancy	0.837	0.885	0.609
Social influence	0.851	0.91	0.771
Trust in Government	0.825	0.883	0.653
Trust in internet	0.777	0.857	0.601

The items were next tested for sufficient discriminant validity. Discriminant validity examines the extent to which a measure correlates with measures of constructs that are different from the construct they intended to assess (Barclay et al., 1995). The factor loading and cross loadings table indicates good discriminant validity because the loading of each measurement item on its latent variable is larger than its loading on any other construct. Further, discriminant validity is assessed by comparing the AVE for each

factor against the squared correlation of each construct, with the former required to be higher than the latter (Fornell & Larcker, 1981). In table 4.3 (see below), the bold diagonal numbers represent squared AVEs whilst the off-diagonal numbers represent correlation among constructs. It can be seen that the bold diagonal numbers are all greater than the off-diagonal ones, representing adequate discriminant validity.

Table 4.3
Inter correlation for First-Order Constructs

Actual Usage	0.799							
Behavioral Intention to Use	0.653	0.884						
Effort Expectancy	0.386	0.419	0.761					
Facilitating Conditions	0.388	0.431	0.514	0.742				
Performance Expectancy	0.546	0.551	0.668	0.492	0.78			
Social Influence	0.43	0.455	0.433	0.449	0.45	0.878		
Trust In Government	0.458	0.551	0.331	0.429	0.386	0.357	0.808	
Trust in internet	0.663	0.637	0.383	0.424	0.515	0.403	0.646	0.775

Finally, the researchers tested for multicollinearity to ensure the constructs did not overly correlate with other constructs. It is recommended that correlation among constructs should be more than 0.3 but less than 0.7 (Pallant & Tennant, 2007).

Analysis and empirical validation of the structural model and hypotheses are done using partial least square (PLS) analysis. SmartPLS (Ringle, 2005) was used for the analysis. PLS provides the magnitude and significance of the hypothesized causal relationships as standardized path coefficients. The parameter estimate of the hypothesized structural path should be statistically significant with the hypothesized

Correlation values greater than this threshold suggest presence of multicollinearity. From table 4.3, there is adequate correlation between the constructs. All correlations are between 0.3 and 0.7 as recommended.

4.2. Structural Model Results

direction of the effect. Bootstrapping analysis is a non-parametric approach for estimating the precision of the PLS estimates. A path is considered to be statistically significant if its p value is less than the 0.05 significance level. The results of the PLS analysis with bootstrapping reveals that all hypothesized direct effects of the research model were statistically significant (see Figure 1 below).

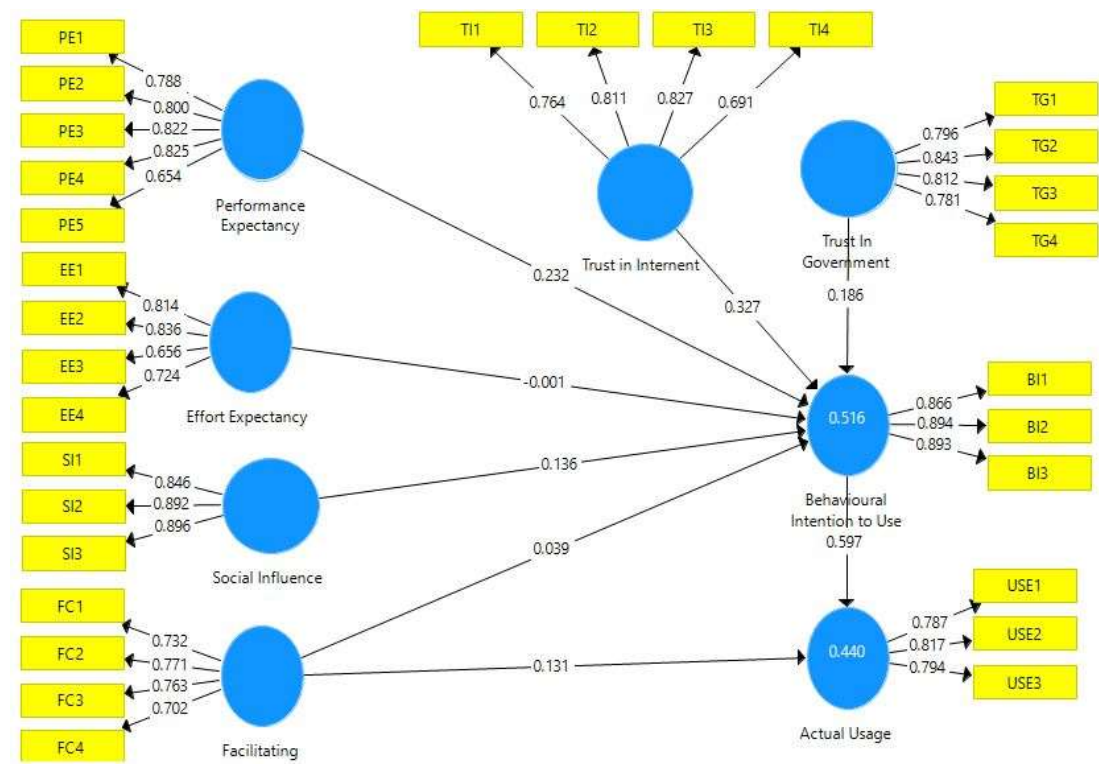


Figure 1.
Results of Test of PLS analysis

The R² values, shown inside the circles, represent the variance explained by the latent variables.

Table 4.4.
Attributes of Constructs

Construct	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Actual Usage	0.718	0.841	0.639
Behavioral Intention to Use	0.861	0.915	0.782
Effort Expectancy	0.754	0.845	0.579
Facilitating Conditions	0.729	0.831	0.551
Performance Expectancy	0.837	0.885	0.609
Social Influence	0.851	0.91	0.771
Trust In Government	0.825	0.883	0.653
Trust in internet	0.777	0.857	0.601

4.3. Hypothesis Testing

The hypotheses that were developed in chapter two were evaluated and examined based on the bootstrapping result. Out of the

8 proposed hypotheses discussed, six 6 were confirmed to be significant, with two deemed insignificant.

Table 4.5.
Hypothesis Results

Hypothesis	Relationship	Path Co-efficient	T Statistics (O/STDEV)	P Values	Result of Hypothesis
H1	Performance Expectancy -> Behavioral Intention to Use	0.232	5.268	0.000	Supported
H2	Effort Expectancy -> Behavioral Intention to Use	-0.001	0.029	0.977	Not Supported
H3	Social Influence -> Behavioral Intention to Use	0.136	3.364	0.001	Supported
H4	Facilitating Conditions -> Behavioral Intention to Use	0.039	0.921	0.357	Not Supported
H5	Facilitating Conditions -> Actual Usage	0.131	3.281	0.001	Supported
H6	Trust In Government -> Behavioral Intention to Use	0.186	4.141	0.000	Supported
H7	Trust in Internet -> Behavioral Intention to Use	0.327	6.522	0.000	Supported
H8	Behavioral Intention to Use -> Actual Usage	0.597	17.213	0.000	Supported

The study seeks to examine forces that influence the adoption of e-government in emerging economies. In order to achieve this objective, the study advanced eight hypotheses. From the table above, all the hypotheses in the study are confirmed with

only two relationships deemed insignificant. The table above outlines the path relationship, the path coefficient, and their associated t-values and p-value.

4.3.1 *Performance Expectancy has a positive influence on behavioral intention to use e-government services*

From table 4.5 above, the result supports hypothesis 1. H1 depicts ($\beta = 0.232$, $t = 5.268$, $p = 0.000$) which also states that Performance Expectancy has a positive influence on behavioral intention to use e-government services. The result also revealed that the said relationship is statistically significant with P value indicating less than 0.05. Effort Expectancy has a positive influence on behavioral intention to use e-government services. From table 4.5 above, the result does not support hypothesis 2. H2 depicts ($\beta = -0.001$, $t = 0.029$, $p = 0.977$) which also states that Effort expectancy will have a positive influence on behavioral intention to use e-government services. The result also reveals that the said relationship is statistically insignificant with P value indicating more than 0.05.

4.3.2 *Social Influence has a positive influence on behavioral intention to use e-government services*

From table 4.6 above, the result supports hypothesis 3. H3 depicts ($\beta = 0.136$, $t = 3.364$, $p = 0.001$) which also states that Social Influence has a positive influence on behavioral intention to use e-government services. The result also demonstrates that the said relationship is statistically significant with P value indicating less than 0.05.

4.3.3 *Facilitating conditions has a positive influence on behavioral intention to use e-government services*

From table 4.5 above, the result does not support hypothesis 4. H4 depicts ($\beta = 0.039$, $t = 0.921$, $p = 0.357$) which also states that Facilitating conditions have a positive influence on behavioral intention to use e-government services. The result also shows that the said relationship is statistically insignificant with P value indicating more than 0.05.

4.3.4 *Facilitating conditions have a positive influence on actual use of e-government services*

From table 4.5 above, the result supports hypothesis 5. H5 depicts ($\beta = 0.131$, $t = 3.281$,

$p = 0.001$) which also states that Facilitating conditions have a positive influence on Actual Use of e-government services. The result also indicates that the said relationship is statistically significant with P value indicating less than 0.05.

4.3.5 *Trust in e-government has a positive influence on behavioral intention*

From table 4.5 above, the result supports hypothesis 6. H6 depicts ($\beta = 0.186$, $t = 4.141$, $p = 0.000$) which also states that Trust in the government will have a positive influence on behavioral intention. The result also revealed that the said relationship is statistically significant with P value indicating less than 0.05.

4.3.6 *Trust in the Internet has a positive influence on behavioral intention*

From table 4.5 above, the result supports hypothesis 7. H7 depicts ($\beta = 0.327$, $t = 6.522$, $p = 0.000$) which also states that Trust in the Internet has a positive influence on behavioral intention. The result also reveals that the said relationship is statistically significant with P value indicating less than 0.05.

4.3.7 *Behavioral intention to use e-government services has a positive influence on the perceived use of e-Government*

From table 4.5 above, the result supports hypothesis 8. H8 depicts ($\beta = 0.597$, $t = 17.213$, $p = 0.000$) which also states that Behavioral intention to use e-government services will have a positive influence on the perceived use of e-Government facilities. The result also suggests that the said relationship is statistically significant with P value indicating less than 0.05. Hence supported.

4.3 Discussion of Results

The fundamental objective of this section is to determine the variable factors that influence adoption. The hypotheses defined and discussed below are grouped according to the relevant variables.

4.4.1 *Performance expectancy*

The validity of the hypothesis 1 (Performance expectancy has a positive influence on

behavioral intention to use e-government services). The positive influence reflects its degree of agreement to the definition of performance expectancy, which informs how individuals believe that the use of a system will help them to improve the performance of their task. This indicates that on average, respondents had positive attitudes to e-government's usefulness, speed, accessibility and impact on productivity. This result indicates that the available bundle of e-government services makes citizens confident that their productivity, in terms of the benefits gained, will be higher if they use those services. Thus, users with a favorable performance expectancy are more likely to be interested in the adoption of various e-government services and benefits. Other researchers uncovered similar results albeit in different national settings.

These include studies in developed nations such as the United Kingdom (Hariri, 2014) Spain (Ramírez-Correa et al., 2015). This finding is consistent with those of (Venkatesh et al., 2003b) and (Pallant et al., 2007).

4.4.2 *Effort expectancy*

The non-validity of the hypothesis 2 (Effort expectancy has a positive influence on behavioral intention to use e-government services) reflects its degree of disagreement with the theoretical expectation. This indicates that on average, respondents had negative attitudes to efforts being put in place to use e-government services. This result can be explained by the decreased rate of citizens that are using variety of e-government services (Al-Gahtani et al., 2007).

4.4.3 *Social influence*

Social influence is defined in the literature as "The degree to which the use of a certain system (e-government services) is influenced by peers" (Venkatesh et al., 2003b). The addition of social influence construct and a number of related factors have been used in a number of prior studies (Lu et al., 2005). In the context of this study, it is hypothesized that social influence has a positive influence on the behavioral intention to use e-

government services. The validity of this hypothesis indicates that, citizens are particularly influenced by their peers to use public e-services (Awiagah et al., 2016; El-Haddadeh et al., 2019b; Gupta et al., 2016b; Twizeyimana & Andersson, 2019b).

4.4.4 *Facilitating conditions*

Facilitating conditions are defined as the degree to which an individual believes that they have the necessary technical knowledge and resources that are needed in order to support usage of e-government systems (Holsapple & Sasidharan, 2005a). In the present study, the hypothesis is that facilitating conditions have a positive effect on the intention and actual usage of e-government services. The statistical analysis of the questions relevant to hypothesis H4 reveals it as insignificant to the study, which indicates that respondents do not focus possession of relevant facilitating conditions that enable them make an intension to use an e-government system. However, the statistical analysis of the questions related to hypothesis H5 reveals it as significant, which is consistent with the work of (Hollenstein & Woerter, 2008).

4.4.5 *Trust*

A good number of research studies (see, for instance, Holsapple & Sasidharan, 2005b; Pavlou, 2003a) reveal that many citizens remain reluctant to adopt e-government services due to personal concerns about trust, privacy, and security. Therefore, trust and confidence play important role in successful adoption of e-government services (Al-Khouri, 2012). Carter & Weerakkody, (2008) define trust as "An expectancy that the promise of an individual or group can be relied upon". Trust in e-government requires having confidence in two separate components: trust in the delivery of government services, (Wang & Emurian, 2005) and trust in the Internet (Carter & Bélanger, 2005) With this study, the hypothesis is that both trust in e-government and trust in the Internet have corresponding positive influences on behavioural intention.

The statistical analysis of the questions relevant to hypothesis H6 shows a significant positive result which means that, on average, respondents have a positive attitude in trusting e-government services. Findings suggest, quite convincingly, that citizens' trust in the effective delivery of digital services by e-government systems will increase their interest in adopting such services. The statistical analysis of the questions relevant to hypothesis H7 reveals a positive and significant result where most of the respondents have a positive attitude towards their experience in trusting the Internet generally, as well as the legal and technological safeguards in Ghana in particular. The fact that Internet trust appears to be an important factor even for government related services (given that at a government level security can be assumed to be high), is quite interesting in itself. Although some groups (for example the younger population) tend to be exposed to those technologies and use them at a higher rate than others. There still appears to be a certain group of people (for example older) that believe that using the Internet is not as secure as carrying out transactions face to face.

4.4.6 Behavioral intention

Behavioral intention is the individual's readiness to perform a specific action or behavior (Davis, 1989). The statistical analysis related to the questions regarding hypothesis H8 reveals a significant and positive result. This result shows that, on average, respondents that intend to use e-government services are more likely to adopt them. The relationship between behavior intention and actual adoption is important to investigate empirically because intention is not always highly correlated with actual adoption and investigating only intention and not actual adoption can be a source of self-reporting bias (Ganotakis & Love, 2011).

Nevertheless, in this e-government study about adoption, we find that intention to use is likely to lead to actual usage of the technology. This is in line with (Flanders et al., 1975) who found that human attitudes and

intentions towards using a system influence actual usage, something that is also confirmed by TPB and TRA.

5. Conclusion

Finally, we make a case for the following arguments. First, the present study focuses on expanding the body of knowledge about e-government in developing countries. This research could guide the e-government planners of developing countries to consider the factors that help in achieving successful e-government adoption. This could maximize the e-government returns on ICT infrastructure investments and provide efficient services.

Second, the evidence resulting from the research should advance the understanding of e-government adoption among citizens of emerging economies. This is to enable policymakers in particular and academics in general, to better execute and replicate respectively a model of e-governance which is academically informed and based on public acceptance.

The constructs examined are but few factors that influence the adoption of e-government systems in developing countries. Further studies are needed to examine the other factors like control, privacy and security, etc. that will influence the adoption of e-government systems in developing countries. Furthermore, the study was conducted using an online survey instrument. As a result, it was difficult to gather diverse opinions from the digital divide. The population in this research was based on residents of Ghana only. It is important therefore to emphasize the point that results of this study cannot be generalized and any policy recommendations can be applied only to Ghanaian citizens. Finally, moderation or mediation testing has a realistic potential to provide insights that should be interesting in light of platform use in the provision of digital services in public-private partnership situations.

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