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E-government Implementation In Ghana: prospects And Challenges

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ABSTRACT

Electronic government has become a popular focus of government efforts in many countries around the world. E-government and internet has made an essential change in the whole society structure, values, culture and the ways of conducting business by utilizing the potential of information communication technology as a tool in the daily work. E-government helps in achieving greater efficiency in government performance by raising service performance, and service delivery, by eliminating inefficient processes and reducing bottlenecks and red tape in the service delivery process as much as possible. The purpose of the study was to examine the prospects and challenges of e-government implementation in Ghana. Specifically, the study sought to analyze the e-government implementation practices in the public sector of Ghana as well evaluate the impact of e-government implementation on the governance system in Ghana. The study adopted a positivism paradigm as a research philosophy, due to its appropriate formulation of hypothesis, exploration of the relationship and causality between variables in a specific industry, the independence of the researcher in the study. Also, a descriptive research design was applied due to its high degree of objectivity and neutrality. A cross-sectional study design was used for the collection of primary data through a structured questionnaire. A purposive sampling was used in the selection of public service institutions. The Yamane (1967) sample size technique was used in determining the sample size. The Statistical Package for Social Science (SPSS) 20 was applied in analyzing the conceptual properties of the scales and proposed model. The hypothesis developed for the study was tested using correlation analysis, whereas the studies proposed objectives tested using multiple regression analysis. The findings of the study indicate that all the four-hypothesis developed for the study were accepted in the data set. Moreover, three out of the four objectives of the study were supported in the data set. The findings of the study indicated that, E-government implementation impact governance system through availability of infrastructure, availability of uninterrupted power supply and financial and resource supply.It is recommended for policy makers, stakeholders and management of public sector institution to encourage the implementation of efficient E-government implementation in public sector institutions.

1. Introduction

Electronic government appears to be the major focus of various governments around the world as the way forward in the governance system. If not all, almost governments have either implemented or in the process of implementing as the sole way of fighting corruption, making governance transparent and accountable to the people and enhancing efficiency and effectiveness in the administration and operations of the government.

Electronic governance since its inception has brought drastic change in the way of doing business, the society's values and culture has also been affected positively or negatively by the use of information and communication technology. The main purpose of e-government is not only converting or changing the old books and files into internet use but also calls for different and making government operations done in a manner that will ultimately improve the processes of doing things.

It also calls for reconsidering ways the government functions are carried out today in order to improve processes and integration. The World Bank (2001) explained e-government as the as ways of utilizing ICT for developing and improving the relationship between government, citizens, businesses and other government entities (p.1). Deloitte Research (2010) posited that, e-government is the usage of ICT, particularly the internet, as a tool for carrying better government schemes to the citizens, businesses, and employees.

Misra (2009) opined that, arrival of internet, digital connectivity and widely use of innovative technologies have open a new chance to allow citizens through the access of information and knowledge. As a result, e-government is a global phenomenon springing from both developed and developing countries

OECD (2003) contend that, the cause for the speedy rise in e-government practices in the modern-day world is due to the fact that e-government systems have the ability of giving the world an acceptable better governance system.

This view appears to be supported by Mutula (2008) who assert that, e-government helps in achieving greater efficiency in government performance by raising service performance, and service delivery, by eliminating inefficient processes and reducing bottlenecks and red tape in the service delivery process as much as possible. Therefore this study attempted to (1)to analyze the e-government implementation policy and practices in the public sector of Ghana.(2) to evaluate the impact of e-government implementation on the governance system in Ghana. (3)To study the various legislation of e-governance in Ghana. (4)To suggest solutions to problems of e-governance in Ghana.

2. Literature review

E-government definitions abound (Curtin et al., 2003; Ngulube, 2007; Oliver and Sanders, 2004; Yong and Hiap-Koon, 2005). Jeong (2007) defines E-government as the use of ICT applications and other web-based applications to improve and/or enhance the efficiency and effectiveness of public sector institutions. Ayee (2008) succinctly intimated that E-government is regarded as the pursuit of a 'paperless' public service. Similarly, several other authors have expressed E-government as the use of only the internet (as a tool for information and communications technology (ICT) to achieve better government (Alateyah et al., 2013; Alghamdi et al., 2011; OECD, 2003). Along the same lines, the United Nations (2001) succinctly defined E-government as "utilizing the internet and the World Wide Web for delivering government information and services." (p.1). According to Okot-Uma (2004) E-government, includes two basic components: e-services;delivery of services to the public, and e-administration- which involves the administrative processes of government with the aid of ICT applications. Moon (2002) together with Jeong (2007) also saw E-government as embracing three dimension/ aspects: (1) government to citizen (G2C), whereby the citizens access government information and services online or are served by the use of ICT application (2) government to business (G2B), which allows online interaction between government and businesses in the private sector; and (3) government to government (G2G), involves various levels of government agencies. Whiles some scholars have explained E-government to encapsulate the use of ICTs in the provision of efficient governmental services (Holzer et al., 2004; United Nations, 2001). Other scholars have viewed E-government as a catalyst for public reforms (Helbiget al., 2009; Kraemer and King, 2006; Heeks, 1999). For instance, Saxena (2005) posited that E-government does not only mean the use of all sorts of ICTs by public institutions to improve both their relations with their users and their internal functioning (p.501). Many studies have recounted that E-government solution enhance delivery of public services (Kenny, 2001; Mpinganjira, 2013; Njuru, 2011; Rose, 2002). They also contend that the introduction of E-government applications in public service has radically shrink bureaucratic processes and needless paper work, and eliminate the risk of clerical errors thereby increasing the time hitherto used in delivering public services. One of the identified benefits of E-government is that it could lead to greater transparency and accountability in the public sector itself (Bertot et al., 2010; Heeks, 2002b; Holzer, 2004; Welch et al., 2005). Mpinganjira (2013) again argues that E-government ensures increased internal efficiencies in delivery of government services and this substantially reduces transaction and other clerical costs associated with delivering public services. E-government has been touted as a measure that could reverse or at least limit the corrupt practices in the public sector (Cho and Choi, 2004; Hopper et al., 2009; Pathak et al. 2009, Singh et al., 2010). One major challenge of E-government implementation in developing countries that dominated the literature reviewed was the lack of ICT infrastructure (Ndou, 2004; Ebrahim and Irani, 2005; Bourn, 2002). Another challenge of E-government relates to issues of finance. A study by Alam (2012), in Banglades reveals that financial limitation is the main barrier for implementing the E-government project in that country. A major challenge confronting E-government and world technology at large relates to cyber-attacks and digital espionage (Chabrowe, 2009; Layton, 2007).

3. Research methodology

Research Philosophy Adopted

Owing to the aims and objectives, this research selected the positivism paradigm as a research philosophy and approach.Saunders et al. (2000) posited that, positivism paradigm hypothesizes objectivity in the analyses and interpretation of gathered data. Along the same lines, this philosophy presumes that, the results procured by the approach are law-like generalizations comparable with outcomes secured by a usual scientist. Remenyi et al. (2005) postulate that, this philosophy desires quantifiable observations, highly structured methodology and statistical analysis. Positivism was espoused due to the following reasons: the appropriate formulation of hypotheses, exploration of relationships and causality between variables in a specific industry, independence of researcher in the study and the desired generalization for public institutions.

Research Design Selected

This current study applied descriptive research design in examining the prospects and challenges of e-government implementation in Ghana. Descriptive research designis more expansive than other quantitative methods and gives a wider scopeof an event or phenomenon. Using descriptive design helps to explore the relationship between variables included the conceptual framework. This is consistent with the arguments of Lans and Van der Voordt (2002) who emphasized that, descriptive research design has a high degree of objectivity and neutrality

Sampling Procedures

Sampling is "the selection of a fraction of the total number of units of interest to decision makers for the ultimate purpose of being able to draw general conclusions about the entire body of units (Parasuramanet al.,2004, p. 356). The two Public service institutions, Ghana Education Service and Ghana Immigration Service were selected using a purposive sampling technique. In purposive sampling, items for the sample are selected deliberately by the researcher; however, this design is adopted because of the relative advantage of time and money inherent in this method of sampling.

Sample Size

Moher et al. (1991) posited that, sample size is recognized as a key parameter for the planning of studies. The conditions required in ascertaining the appropriateness of a sample size were adhered. A purposive sampling was used in the selection of public institutions. Using purposive sampling, a researcher is allowed to choose a study based on specific features and process which justified on the study to be made (Silverman, 2004,). Consequently, the selection of a sample population is more warranted based on specific set of criteria than can be critically analyzed.

$$n=\frac{N}{1+N(e)^2}$$

The rationale for the above formula is explained below, where the sample size, level of precision and sample population respectively is denoted by (n, e and N). A 50% degree of variability were assumed whereas, the confidence level was set at 95% and level of precision estimated at 5%. Personnel were picked as core respondents for the study. The population of the study was composed of 1000 employees with a target population of 850 employees of the selected public service institutions. A total of (850) respondents were recognized and reached, (600) respondents returned back with full expected information corresponding to a response rate of (71.0%). Five questionnaires were left out due to inconsistent responses and omitted answers.

Table 1. Profile of Respondents

Variables	Frequency (s)	Percentage of totals(%)	Variables	Frequency (s)	Percentage of totals(%)
Gender			Education		
Male	315	52.5	Junior High	73	12.2
Female	285	47.5	Senior High	196	32.7
			Diploma	130	21.7
Age			HND	84	14.0
18-25	199	33.2	Bachelor's degree	104	17.3
26-35	310	51.7	Master's degree	13	2.2
36-45	69	11.5			
46-55	22	3.7	Experience		
			Less than one year	166	27.7
Institutions			1-5 years	219	36.5
Ghana Education Service	350	58.3	6-10years	103	17.2
Ghana Immigration Service	250	41.6	11-15years	61	10.2
			16-20years	28	4.7
			20years and above	23	3.8

From Table 1 most of the respondents were males (52.5%) and in the age bracket of 26 - 35 years (51.7%) with 1 to 5 years working experience in the hotels (36.5%). The importance of getting staff of an organization or institution to beengaged in a research process are that theworkforces are theauthentic people who execute the changes introduced by the authoritiesin an organization

4. Data analysis

The Statistical Package for Social Science (SPSS) 20 was applied in analyzing the conceptual properties of the scales and proposed model. The researcher mainly employed the use of descriptive statistics to analyze the responses to the questionnaire. To measure the degree and direction of the relationship among variables a correlation analysis was conducted (Krzanowsk,1998; Rodriguez,1982). Proposed and suggested correlation coefficient values were observed (Galton, 1988). To test the impact of the relationship between e-government multiple regression analysis was applied (Fisher, 1992). This study used variance inflation factors (VIFs) to examine the effect of multicollinearity (Hair et al., 2006).

5. Results and discussions:

Correlation Analysis

The degree and direction of the relationship among variables were measured using correlation analysis (Krzanowsk, 1988; Rodriguez, 1982). Proposed and suggested correlation coefficient values were observed (Galton, 1988). The correlation coefficient (r) measures the strength of the association between each pair of variable. Table 2 reports the correlation matrix computed.

Table 2. Correlation Matrix

Items	**Mean**	**SD**	**1**	**2**	**3**	**4**	**5**
1. Infrastructure	21.83	8.98	1				
2.Uninterrupted power supply	16.98	6.65	0.231**	1			
3.Financial and resource supply	16.66	6.67	0.264**	0.842**	1		
4. Cyber security	7.96	3.32	0.744**	0.398**	0.556**	1	
5.Governance system	39.06	10.05	0.847**	0.413**	0.420**	0.710**	1

**p<0.01; * p<0.05.

Table2 shows a positive and significant relationship between Infrastructure and governance system (r=0.847, p <.05). Furthermore, the correlation matrix indicates a positive and significant correlation between uninterrupted power supply and governance system (r=0.413, p <.05). Additionally, there remain a strongly positive and significant relationship between Financial and resource supply and governance system (r=0.420, p <.05). Also, there existed a very strong but positively significant correlation between cyber security and governance system (r=0.710, p <.05).

Hypotheses Testing

The research hypotheses developed will be tested using correlation analysis (Churchill and Brown, 2004).

Hypothesis 1

This proposition aims to investigate whether infrastructure has a significant relationship with governance system.

H_0: Infrastructure is not significantly related to with governance system.

H_1: Infrastructure is significantly related to with governance system.

Table 3 summarizes the finding of the correlation matrix.

Table 3: Correlation Matrix: Hypothesis 1

	1	2	p value
1. Infrastructure	1		
2. Governance system	0.847**	1	0.000

**p<0.01; * p<0.05.

Infrastructure was positively and significantly related governance system (r=0.847, p <.05). Therefore, the findings reject the null hypothesis. This result is compatible with the arguments and findings of Njuru (2011) who contend that, the provision of infrastructure is a prerequisite for the effective development of e-government in the public sector.

Hypothesis 2

This proposition seeks to examine whether uninterrupted power supply has a significant relationship with governance system.

H_0:Uninterrupted power supply is not significantly related to governance system.

H_1: Uninterrupted power supply is significantly related to governance system.

Table 4 displays results of the relationship

Table 4: Correlation Matrix: Hypothesis 2

	1	2	p value
1Uninterrupted power supply	1		
2. Governance system	0.413**	1	0.000

**p<0.01; * p<0.05.

Uninterrupted power supply correlated with governance system significantly (r=0.413, p <0.05). Hence, the findings reject the null hypothesis. This result is compatible with the study by Achampong (2012) who contend that the availability of uninterrupted power supply, ensure the efficient use of e-government application.

Hypothesis 3

The purpose of this proposition was to investigate whether there exists a significant relationship between financial and resource supply and governance system.

H_0:Financial and resource supply is not significantly related to governance system.

H_1: Financial and resource supply is significantly related to governance system.

Table 5 summarizes the finding of the correlation matrix.

Table5: Correlation Matrix: Hypothesis 3

	1	2	p value
1. Financial and resource supply	1		
2. Governance system	0.420**	1	0.000

**p<0.01; * p<0.05.

Financial and resource supply is significantly and positively correlated with governance system (r=0.420, p <0.05). This result provides credence to the empirical evidence adduced by Alam (2012) that, financial resources are a prerequisite for the implementation of-government in any country. Managing and controlling the performance of human resource constitutes vitalsection of a firm and evident how their human capital is being managed.

Hypothesis 4

This proposition aims to examine whether the relationship between cyber security and governance system was significant.

H_0:Cyber security is not significantly related governance system.

H_1: Cyber security is significantly related governance system.

Table 6 displays results of the relationship.

Table 6: Correlation Matrix: Hypothesis 4

	1	2	p value
1. Cyber security	1		
2. Governance system	0.710**	1	0.000

**p<0.01; * p<0.05.

Cyber security was positively and significantly related to governance system (r=0.710, p <0.05). Therefore, the findings reject the null hypothesis. This results parallels finding of other studies which found that when they postulated that, cyber-attacks and digital espionage are major challenges confronting e-government implementation and world technology (Chabrowe, 2009; Layton, 2007)

6. Objective of the study

The research objectives developed was tested using multiple regression analysis.

Objective 1

To analyze the e-government implementation practices in the public sector. The e-government implementation attributes examined in this study were, infrastructure, uninterrupted power supply, financial and resource supply and cyber security. The standardized estimates values of the human resource development practices are encapsulated in Table 7 below.

Table 7: E-government Implementation Attributes

	Unstandardized Coefficients	Std. error	p value
Infrastructure	0.897	0.071	0.000
Uninterrupted power supply	0.218	0.116	0.052
Financial and resource supply	0.419	0.103	0.000
Cyber security	0.144	0.132	0.278

From the above table, it can be observed that the unstandardized estimates and standard error values of e-government implementation attributes ranged between 0.144 and 0.897 with standard error of 0.071 and 0.132. Infrastructure had the highest unstandardized estimate of 0.897 (SE=0.071), while cyber securityhad the lowest unstandardized estimate of 0.144 (SE=0.132). The results support objective 1 since, the selected attributes were significant (p < 0.05) with the exception of cyber security which was not significant. This result is compatible with the arguments and findings of Mutula (2008) who assert that, e-government helps in achieving greater efficiency in government performance by raising service performance, and service delivery, by eliminating inefficient processes and reducing bottlenecks and red tape in the service delivery process as much as possible. Furthermore, this result is consistent with other studies which recognized e-government as a measure that could reverse or at least limit the corrupt practices in the public sector (Cho and Choi, 2004; Hopper et al., 2009; Pathak et al. 2009, Singh et al., 2010).

Objective 2

To evaluate the impact of e-government implementation on governance system. As alluded to in objective one above, infrastructure, uninterrupted power supply, financial and resource supply and cyber security were chosen as e-government implementation attributes. Hence the following sub –objectives are indicated below.

2.1. The impact of infrastructure on governance system. Table 8 displays results for testing this objective.

Table 8. Regression Analysis: Predicting Governance System

Independent variable	Standardized Coefficient B	Std. Error	R^2	p value
Infrastructure	0.523	0.118	0.182	0.000

The above table indicates, infrastructure had a positive and significant impact on governance system(B=0.523, p < 0.05) which implies that for every unit increase in infrastructure, there is a 0.523 increase in governance system. The R^2(0.18) indicates that 18% of the variance of governance system are explained and attributed to infrastructure. The results therefore support objective 2.1. This results go side by side with findings by other researches which found that, the availability of infrastructure is a major stride in the effective implementation of e-government systems (Ndou, 2004; Ebrahim and Irani, 2005; Bonham et al., 2001; Bourn, 2002). Similarly, Bonham et al. (2001) postulate that, the availability of computers in public institutions together with good internet connectivity enhances e-government initiatives.

2.2. The impact of uninterrupted power supply on governance system**.** Table 9 below summarize the results of this objective.

Table 9. Regression Analysis: Predicting Governance System

Independent variable	Standardized Coefficient B	Std. Error	R^2	p value
Uninterrupted power supply	0.620	0.117	0.240	0.000

The above table shows that, uninterrupted power supply had a positive and significant impact on governance system *(B*=0.620; p < 0.05). Hence, for every unit increase in uninterrupted power supply, there is a 0.620governance system. The R^2 value of (0.240) indicates the prediction and explanation power of uninterrupted power supply on governance system. The results therefore support objective 2.2. This result affirms the empirical findings of previous research papers on uninterrupted power supply to ensure the efficient use of e-government application.

2.3. The impact of financial and resource supply on governance system. Table 10 presents the results of this objective.

Table 10. Regression Analysis: Predicting Governance System

Independent variable	Standardized Coefficient B	Std. Error	R^2	p value
Financial and resource supply	0.721	0.218	0.350	0.000

As displayed in Table 10, the beta value shows a positive and significant impact of financial and resource supply on governance system (*B*= 0.721). Hence every unit increase in of financial and resource supply will result to a 0.721 increase in governance system. Consequently, financial and resource supply did make a significant contribution in predicting governance system (p >.05). The R^2(0.350) indicates that 35% of the variance of governance system are explained and attributed to financial and resource supply. The results therefore support objective 2.3.. Furthermore, this result is consistent with earlier empirical studies which found that e-government implementation in public institutions is premised on the provision of the required funding

2.4. The impact of Cyber security on governance system. Table 11displays results for testing this objective.

Table 11. Regression Analysis: Predicting Governance System

Independent variable	Standardized Coefficient B	Std. Error	R^2	p value
Cyber security	-0.034	0.215	0.268	0.308

As displayed in Table 11, the beta value shows a negative and non-significant impact of cyber security on governance system (*B*= -0.034). Hence every unit increase in cyber security will result to a -0.034 decrease in governance system. Consequently, cyber security did not make a significant contribution in predicting governance system (p >.05). The results therefore do not support objective 2.4. Furthermore, this result supports the findings of previousresearchers who contended that, cyber-attacks and other security threats to the ICT assets and e-government are in different forms and come from either internal or external sources to the government.

Table 12. Results of Multiple Regression Analysis

Model	Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
	B	Std. Error	Beta	T	Sig	Tolerance	VIF
(Constant)	8.689	1.808		4.805	0.000		
Infrastructure	0.897	0.071	0.802	12.556	0.000	0.382	2.620
Uninterrupted power supply	0.218	0.116	0.144	1.883	0.052	0.265	3.776
Cyber security	0.144	0.132	0.096	1.089	0.278	0.201	4.972
Financial and resource supply	0.419	0.103	0.165	4.053	0.000	0.943	1.061
*Adjusted R square=0.787***							
F Value=102.181							

** p< 0.01, * p< 0.05, *n*=138.

To test the impact of the relations between of e-government implementation and governance system, multiple linear regression analyses were performed (*Fisher, 1922).* This study uses variance inflation factors (VIFs) to examine the effect of multicollinearity. The values of the VIF associated with the predictors show a range from 1.061 to 4.972, which fall within acceptable limits (Hair et al., 1999). The results of the regression analysis are depicted in (**Table 12**).

The regression model is significant at (p<0.05), (adjusted R^2 =0.787) and explains an additional 79% of variance in governance system is attributed to infrastructure, uninterrupted power supply and financial and resource supply. The f value of 102.181 which is significant at (p < 0.05) shows the impact of the selected e-government implementation attributes on governance system. The results indicate a positive and significant impact of these e-government implementation on governance system. The results therefore support hypotheses 1,2 and 5. The Coefficient analysis shows that infrastructure *(B*=0.802) at (p<0.05), financial and resource supply *(B*=0.165) at (p<0.05) and uninterrupted power supply*(B*=0.144) at (p<0.05) are significant predictors of governance system.

7. Summary of findings

All the four hypothesis developed for the study were accepted in the data set. The findings support the contention of Mpinganjira (2013) who contend that, E-government ensures increased internal efficiencies in delivery of government services and this substantially reduces transaction and other clerical costs associated with delivering public services. Also the results support the supposition of Mutula (2008) who assert that, e-government helps in achieving greater efficiency in government performance by raising service performance, and service delivery, by eliminating inefficient processes and reducing bottlenecks and red tape in the service delivery process as much as possible. The study further revealed that three out of the four selected E-government implementation attributes had a positively significant impact on governance system. The regression model reports that, 79% of variance in governance system is attributed to infrastructure, uninterrupted power supply and financial and resource supply.

Theoretical Implications

The outcome of this study supports and confirms the debate in literature on the subject of effective E-government implementation about which further research in needed in the public sector institutions. The finding of this study gives recommendation to further look into the relationship that exist between E-government implementation and governance system based on the ground thatE-government lead to greater transparency and accountability in the public sector The findings of the study indicate that, E-government implementation impact governance system through the availability of infrastructure is a major stride in the effective implementation of e-government systems. Availabilityof uninterrupted power supply which ensure the efficient use of e-government application and financial and resource supply which is the bedrock for the efficient implementation of e-government initiatives in public sector institutions

Practical Implications

The outcome of this study lead to the reflection of a chain of consequences for public sector institutions. It is therefore fit to suggest and recommend for policy makers, government and all stakeholders to encourage the implementation of efficient E-government implementation in public sector institutions. E-government the study revealed,radically shrink bureaucratic processes and needless paper work, and eliminate the risk of clerical errors thereby increasing the time hitherto used in delivering public services. Along the same lines, several other authors contend that, E-government is a measure that could reverse or at least limit the corrupt practices in the public sector

The findings of the work shows that, E-government implementation impact governance system through availability of infrastructure, availability of uninterrupted power supply and financial and resource supply. In respect of availability of infrastructure, management of public sector institutions should ensure there is availability of infrastructure since it's a major stride in the effective implementation of e-government systems. Also management should ensure the availability of computers in public institutions together with good internet connectivity since they enhance e-government initiatives. On availability of uninterrupted power supply, management of the public sector institutions should ensure the availability of uninterrupted power supply since they ensure the efficient use of e-government application. Again, management should ensure that, there is adequate supply of electricity since they play a significant role in public libraries use of e-government. In line with financial and resource supply, management should ensure that, there is adequate financial and resource supply since it's the bedrock for the efficient implementation of e-government initiatives. Also, management should see to it that, public sector intuitions are provided with the necessary financial and resource supply since e-government implementation in public institutions is premised on the provision of the required funding.

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