Assessing the Antecedents of E-Government Adoption: A Case of the Ghanaian Public Sector

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Abstract
For decades, E-government has been integrated into the governance aspect of developed and developing economies. Its adoption enabled public officials and agencies to discharge their functions and make data-driven decisions in an equitable and timely manner. Literature however is limited in terms of explaining the cognitive and attitudinal factors that contribute to the adoption and utilization of e-government systems and platforms. This study contributes to the ongoing discussions by means of exploring behavioral factors that could influence individuals’ attitudes and behavior toward e-government adoption. The study utilized the theory of planned behavior to assess the psychological and cognitive influencers that elicit the attitude and behavior of employees toward the use of the new technology. The case study was conducted among the public sector institutions in Ghana. The structural model connecting the variables in the study was examined using Partial Least Squares (PLS) Structural Equation Model (SEM) techniques. Findings from the study indicate that subjective norms and attitudes have a significant effect on individuals’ behavioral intentions. However, perceived behavioral control was found not to have a significant effect on the behavioral intentions of employees as suggested by previous studies. Although the findings contribute to theory by elucidating which components of the theory of planned behavior truly impact individuals’ attitudes and mental models, it pays limited attention to the role of cultural dynamics and how it can influence the behavioral intentions of individuals. This can be addressed in future studies.

Keywords
E-government, theory of planned behavior, Ghana, PLS-SEM, public sector institutions

Introduction
For decades e-governance has been integrated into the governance aspect of developed and developing economies. However, nations in developed countries have enjoyed much success as compared to developing ones. The success of e-government in developed economies compared with developing ones is dependent on the degree of trust in the governance system (Nam, 2014), digital divide in the utilization of e-government services (Dimitrova & Chen, 2006), and the income and educational inequalities of individuals in these locations (Zheng & Schachter, 2017). As much as e-government has chalked some success, its implementation and adoption are riddled with challenges such as resistance to change, governance, and organizational structures, to mention a few, which have affected the low rate of e-government adoption and performance (Amegavi et al., 2018; Awowi, 2010; Gershon et al., 2018). In addition, the low degree of individual technology literacy plays a key role in the failure of e-government systems and services (Nam, 2014) and this is especially so in developing economies.

Success stories of e-government can be seen in the case of Estonia. Estonia has developed and deployed mechanisms that enable citizens to access critical public services over the internet for almost a decade. It has further extended the provision of digital citizenship to interested parties after an application process. The adoption of e-government systems has seen the nation gain dozens of foreign investments over the years (Layne & Lee, 2001; Ndou, 2004). In Africa, e-government is an evolving process with few governments initiating measures to implement new technologies that aim
at enhancing public service delivery. For instance, the governments of Ethiopia, Rwanda, and Ghana have adopted deliberate strategies to utilize e-government platforms to deliver public goods and services. More so, e-government is considered as a tool to combat endemic corruption in the public sector (Kitaw, 2006; Mistry & Jalal, 2012; Setor et al., 2021) of these countries. E-government has the potential to provide efficient and effective services to prevent nepotism and favoritism in accessing and distributing national resources. When citizens enjoy an equitable treatment in accessing government services, it serves as an underlying factor to enrich trust between public institutions and citizens.

In the context of Ghana, the demand for accountability and transparency by the citizen in the acquisition and utilization of public services has influenced the implementation of e-government systems. The success of e-government systems is evident by the high score obtained in the e-government readiness score in the United Nations (2017, 2018) triannual e-government development index. The successful feat achieved by the e-government paradigm is attributed to the significant investment made in areas of digitalization of government services, e-government policies formulation, and deliberate implementation (Abusamhadana et al., 2021). However, the low degree of public officer technology self-efficacy and digital divide hinders the extent of e-government success (Mensah & Mi, 2018).

The success of e-government has attracted the attention of scholars and practitioners alike. The discourse on e-government over the period has focused on diverse perspectives such as the conceptualization and the documentation of the evolution of e-government (Adam, 2020), management of information resources in public institutions (Sarker et al., 2018), e-government utilization at national and regional levels (Agozie & Kaya, 2021), and e-government and smart cities (Paskaleva, 2009). In addition, there is a growing number of studies that attempt to investigate the underlying factors that influence the adoption of e-government. These clusters of studies have unearthed factors such as trust in government (Nam, 2014), income, and educational level of citizens (Zheng & Schachter, 2017). The technology efficacy and customer demand-side factors coupled with regulatory requirements have also been considered to serve as antecedents of e-government in Ghana (Amegavi et al., 2018; Mensah & Mi, 2018).

As much as these studies contribute to the understanding of e-government adoption and processes, most were conducted from a technology acceptance perspective except a study conducted by Zhao et al. (2019). They examined the determinants of e-government adoption from a social cognitive perspective. The extent literature on e-government places limited emphasis on the role of cognitive and behavioral factors in the adoption of new technologies despite individual resistance to change is acknowledged to affect new technology adoption and diffusion. Examining behavioral and cognitive factors would enable researchers to gain insight into how to shape the mental model of individuals toward the adoption of new technologies, especially in analog institutions such as public sector institutions. To address this gap in the literature, the study seeks to examine the behavioral and cognitive factors that influence the adoption of e-government. The study also seeks to answer the research question, what cognitive and behavioral factors influence the adoption of e-government? The study is to provide a nuanced understanding of the cognitive and attitudinal factors that influence the adoption of e-government from the perspective of the theory of planned behavior. Identifying the cognitive and behavioral factors that inform the adoption of e-government would contribute to the development of deliberate strategies that are geared toward resolving the culture of resistance to new technologies mostly found in the public sector. The findings are expected to contribute to theory by elucidating which components of the theory of planned behavior truly impact individuals’ attitudes and mental models. The underlying effect of peer influence and perception plays a major part in molding employee behavior, which aids in coping with the resistant culture at most legacy institutions. The rest of the paper is arranged as follows; Section 2 focuses on the literature review and theory employed for the study. It further elaborates on the hypothesis development, Section 3 focuses on the research method used, Section 4 presents the empirical analysis, and Section 5 presents implications and conclusions of the study.

Theoretical Background

E-Government

For the past decades, governments across the globe have instituted measures to integrate technology, public policy, and government. This gave birth to the term “e-government.” E-government is defined by the United Nations (2005) as the employment of the internet and the world-wide-web for delivering of government information and services to its citizens. The rapid pace of technological innovation and infrastructure serves as a backbone for this process. Integrating technology and governance allows public or government officials and agencies to provide information and services to citizens without geographical restrictions. For this reason, several countries have adopted this concept. A case for the adoption of e-government can be seen from the success story of e-government implementation in Estonia (Kalvet, 2012; Kitsing, 2011) as mentioned earlier.

The deployment and conceptualization of e-government are rooted in the demand for transparency in public services. Public service is characterized by several allegations of corruption, especially in developing countries. And this defeats the purpose of democracy; where every aspect of governance is expected to provide a certain degree of transparency. Transparency is critical to the success of governments because, it serves as the fundamental building block for trust (Agozie & Kaya, 2021; Benbasat & Barki, 2007). Trust is
critical to the success of government and government policies. However, there is low trust between governments and citizens. The abuse of political power, and nepotism coupled with increasing corruption has contributed significantly to the low trust of citizens in public officers. E-government is therefore introduced as a medium to provide an equal opportunity for every citizen to gain access to public goods without discrimination. Studies have indicated that e-governance promotes good governance and eliminates issues of corruption, especially in public procurement. The government’s sourcing is conducted through e-portals in recent times. And using electronic channels eliminates issues such as favoritism among others within the process (Adjei-Bamfo et al., 2020).

To curb the reoccurrences of these situations, governments have adopted electronic mediums to conduct government business. Utilizing technological platforms and portals, the government has moved its day-to-day activities to websites and e-portals. These portals are classified under the e-governance concept. Electronic governance is considered as the usage of information communication technology in the public sector and is targeted at enhancing information and service delivery. The implementation of these systems is to ensure good governance, transparency, and decentralization (Warkentin et al., 2002).

Although studies have acknowledged the potential success of e-government in the governance space, they have equally alluded to the failure of e-government to achieve its expected outcome over the period especially in developing economies. The reasons for such a failure are attributed to several factors such as organization and individual resistance to change and a low degree of trust among others. In addition, inadequate technological infrastructure has affected the process of this phenomenon as well (Mohammed et al., 2016; Tummers & Rocco, 2015). Another major challenge is the lack of the required technological infrastructure. E-governance relies mostly on technological platforms, equipment, and software. Therefore, to ensure the smooth performance of such a system, it requires the proper functioning of each technological system. In most developing economies, access to advanced technological systems is restricted and this is attributable to several factors. These include the lack of research and development in the field of ICT that has affected the production of appropriate systems by local enterprises; most of the systems, knowledge, and resources utilized in the development and deployments of e-government portals are imported; the cost of deploying these systems impedes the expansion of such programs to cover every facet of governance; and the transaction cost places a significant burden on attaining e-government goals and objectives (Bhuiyan, 2009; Braa et al., 2004; Kitaw, 2006).

Theory of Planned Behavior

The increasing rate of technological innovation has contributed significantly to the surge in research across diverse fields. This is because technological innovation spans several industries. Imperatively, it is necessary to understand the nuances of factors that influence the adoption and utilizing of technology. To understand the antecedents of technology adoption, different theoretical lenses are adopted. For instance, the technology acceptance model, innovation diffusion theory, and the theory of planned behavior, to mention but a few (Agag & El-Masry, 2016; Lee et al., 2011; Yap & Chen, 2017) are among the widely used theoretical lenses.

To investigate the behavioral intentions of public sector employees regarding the adoption of e-government systems and platforms, the Theory of Planned Behavior (TPB) is employed as the theoretical lens of this study. The theory of planned behavior like its predecessor, the Theory of Reasoned Action (TRA), is formulated as a social psychological framework used in analyzing the behavioral intentions of individuals (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). Ajzen (1985) proposed the theory of planned behavior as an improvement of the earlier model, the Theory of Reasoned Action (TRA). Although the Theory of Reasoned Action (TRA) was considered to have some strength, it had shortcomings that are addressed by Ajzen (1985) in the new theory. The Theory of Planned Behavior is a social psychology model. Specifically, the social psychology model is used to explain the behavior and actual intentions of individuals. The theory argues that the behavioral intentions and attitudes of individuals are the most relevant predictors of decision-making behavior.

According to the Theory of Planned Behavior, the prediction of the actual behavior of an individual rests on three fundamental building blocks. Namely, subjective norms, perceived behavioral control, and attitude toward behavior. These factors are argued to influence the behavioral intentions of an individual, which further explains an individual’s actual intentions (Ajzen & Fishbein, 1977; Bhattacherjee, 2000). The theory of planned behavior is depicted in Figure 1 below.

Hypotheses Development

Public Officers’ Attitude and Behavioral Intentions

The psychology literature defines attitude as a set of emotions, beliefs, and feelings that an individual has toward a specific object or event. These attitudes of individuals are argued to influence how different people react to similar situations or events. Attitude is rooted in three basic underlying forces such as cognitive aspect, emotion aspect, and action aspect (Sheeran et al., 2016; Sherif, 2015). Studies conducted by Bhaskar and Garimella (2017) and Fayolle and Gaillly (2015) indicate that the attitude of individuals influences their behavioral intentions to adopt and utilize new knowledge or innovation. However, the intentions of an individual to utilize a particular technology rest significantly on the belief system of the individual (Ajzen, 1985).
As argued by Ajzen (1985) in his seminal work, an individual’s beliefs about a behavioral result are the basic influencing factors in behavioral formation. These sets of beliefs and normative factors turn to affect the decision-making process of an individual. In the case of technology adoption where resistance to change is a common phenomenon especially in the public sector, the attitude of individuals can be shaped by stakeholders need to implement strategies that deliberately seek to enrich individual officers’ beliefs, emotions, and actions about the relevance of utilizing a particular technology.

Generally, the behavior of an officer can enhance the competitiveness and reputation of an agency. Thus, when an individual within the public sector adopts a positive attitude toward the usage of e-government platforms and portals, this attitude will contribute to a fair and equitable society. Hence, the acquisition of essential public services will not be characterized by several bottlenecks and corruption (Gil-Garcia et al., 2013; Isaac et al., 2017). When public officers have a positive attitude toward behavior, it has a high propensity to influence the behavioral intention of the said individuals. Hypothesis 1 is formulated based on this assumption.

H 1: the attitude of public officers has a positive impact on their behavioral intentions

Subjective Norms and Behavioral Intentions

Individual decision-making and attitudes are influenced to a certain degree by external factors and this is referred to as subjective norms. These forces can be classified as the two-factor structure and three-factor structure. According to the two-factor structure, pressure from higher authorities or higher hierarchies in an organization affects the behavioral intentions of individuals. The direction, opinions, and comments from external agents play a critical role in the formation of behavior (Fan et al., 2014; Kaushik & Rahman, 2015; Park, 2000). In the case of the public service sector, individuals in higher authority, regulatory, and government departments can institute stringent measures to ensure officers adopt and utilize a particular technology for its intended purpose.

The three-factor structure consists of individual norms, exemplary norms, and instructive norms. A high degree of individual norms is argued to impact positively on the behavior of individuals, especially in moral-oriented situations. Per the theory of planned behavior, an individual’s perception of subjective norms about an event can impact his/her behavior. So, scholars have argued that, the framework guiding the digitization of public services should have a moral component that is geared toward refining the intentions of individuals (Wan et al., 2017).
Since government and regulatory pressure influence the behavior of public officers, pressures from civil societies and society should be considered as significant forces. Against the backdrop of continuous policy and regulatory reforms coupled with the demands from relevant stakeholders and society, the behavior of public officers toward the adoption of e-government technology needs much attention. Public opinion in most cases has the power to enforce decisions at low transaction costs (Ho et al., 2015; Minton et al., 2018). Civil societies should endeavor to make strong demands whiles using appropriate mediums to ensure public officers adopt and utilize special technologies for the benefit of society. Hypothesis 2 is based on this assumption:

H 2: the external pressures exerted on public officers by civil societies and regulatory agencies have a positive impact on the behavioral intentions of officers.

**Perceived Behavioral Control and Behavior intentions**

The concept of perceived behavioral control evolved from the fact that individuals make decisions based on the degree of difficulty and other resource constraint issues. Decision-making is influenced by economic resources, time, and cost individuals perceive to gain or lose. The concept of perceptual control was first introduced to address the shortcomings identified by critics of the theory of reasoned action. Thus, the self-consciousness of individuals is critical to the discovery of one’s abilities and plays a major role in the self-regulation system of someone’s behavior (Conner & Sparks, 2005; Kraft et al., 2005). Being aware of oneself provides the leverage needed to develop self-efficacy and a strong sense of an individual’s abilities.

Following the theory of planned behavior, when individuals have the incentive to develop their abilities and the desire to perform their functional duties, this affects their behavior (Han et al., 2010; H. Li et al., 2002; Tarkiainen & Sundqvist, 2005). Public institutions must therefore develop measures that will provide fertile grounds for employees to nurture and develop their abilities to higher degrees. Studies have confirmed the relationship between an individual’s confidence in their abilities and their availability to perform certain tasks. There is a consensus that, the ability of individuals to control their behavior has an impact on a person’s intentions and behavior (Motowildo et al., 1997; Rydval & Ortmann, 2004). Public officers should attempt to enrich their knowledge that consequently affects self-consciousness and self-control. Highly skilled individuals stand the chance of performing well at assigned tasks and further comply with regulations and demands from civil societies. Based on this assumption, Hypothesis 3 is proposed:

H 3: the perceived behavioral control of public officers has a positive impact on the behavioral intentions of officers.

**Behavioral Intentions and Actual Behavior**

The theory of planned behavior postulates that, individual’s actual behavior is influenced by their behavioral intentions. As acknowledged in the social psychology literature, people with positive behavioral intentions, to a high degree, translate these intentions to actual behavior and attitude, and vice versa (Conner & Norman, 2005; Johnstone & Lindh, 2017; Pearce & Argyle, 2013; Strong et al., 2017). That is, the positive behavioral intentions have a positive effect and determine the behavior of individuals (Ajzen, 1985; Lu et al., 2009). The willingness for people to act consciously and positively in the face of increasing digitization is critical to the success of this governance paradigm. Public sector institutions according to research have a low propensity for achieving digitalization goals, and if an employee does not have the willpower to aid in the program execution (Kaba, 2018; Norman et al., 2017; Zhang et al., 2018) digitalization goals will suffer a bigger blow.

The study conceptualizes that, for government digitalization agenda to achieve its intended success it is crucial to formulate policies and incentives that are geared toward shaping employees’ behavior. Shaping the behavior of public sector employees will serve as a fulcrum for proper adoption and continuous utilization of such technologies. It is therefore hypothesized that positive behavioral intentions of public sector employees will have a positive effect on individuals’ behavior to adopt an e-government system and technologies. Based on this assumption, Hypothesis 4 is proposed:

H 4: the behavioral intentions of public sector employees have a positive impact on individuals’ behavior to adopt e-government technologies.

**Research Methods**

The study explored the cognitive and behavioral factors that influence individuals’ attitudes and behavior to adopt new technologies in public sector institutions of Ghana, in the wake of digitalization. To investigate the research question, an empirical approach was employed. Data were collected from key informants in public institutions. The data collection covered areas such as perceived behavioral control, individual attitude toward behavior, subjective norms, behavioral intentions, and the actual behavior of employees.

To investigate the research questions and hypotheses stated for the study, a survey approach was utilized in the data collection. Acquired data were analyzed using the quantitative technique—Partial Least Squares Structural Equation Modeling. The choice of quantitative techniques enables researchers to ascertain the empirical relationships between theoretical variables understudied. The targeted sample for the study is made up of employees of public institutions in Ghana. Data were collected from identified respondents in the public sector of Ghana using a random sampling approach. These respondents are public officials.
in-charge of the government digitalization and e-government programs and initiatives in various state enterprises.

Respondents were selected based on their knowledge and expertise in the area of government digitization and e-government activities. The study targets informants in public sector institutions. However, data were collected from individuals working in public institutions located in Accra, Tema, and Kumasi. The rationale for selecting these three cities is that, most of the largest government institutions in terms of the number of employees and the size of the population to be served are located here. These cities, according to both the 2010 and 2021 Population and Housing Census are the most populated. In addition, most digitalization projects are carried out in government institutions located mostly in urban centers like Accra, Tema, and Kumasi. The identification and selection of respondents were done following the recommendation made in a study conducted by Campbell (2002). In his paper, he argues that to arrive at a meaningful conclusion and outcome, information and data for a particular study should be collected from individuals with high degrees of knowledge and expertise about the subject matter. Doing so provides the leverage to deal with inaccurate data and any form of biases (Kothari, 2008; Yin, 2009).

To analyze the acquired data, Partial Least Squares-Structural Equation Modeling (PLS-SEM) was conducted using the SmartPLS statistical software version 3. Partial Least Squares Structural Equation Modeling provides the appropriate platform to test the relationship between latent variables and observed variables in a robust manner. In addition, the data acquired satisfy the data requirement and suitability for PLS-SEM as elaborated in the literature (Hair et al., 2014). This statistical tool was used to evaluate the conceptual model understudied. It further provided the means to explore the distinctive relationship between individuals’ perceived attitudes toward behavior, subjective norms, perceived behavioral control, and behavioral intentions. It also helped to examine the relationship between behavioral intentions and the actual behavior of public sector employees.

Data Collection

Data were collected using field survey techniques. A questionnaire measuring items on a 7-point Likert scale was utilized to solicit information from respondents. Respondents were key informants who are employees of public institutions that have been enrolled in government digitalization programs such as the automation of government business processes.

The questionnaire items covered scales established for perceived behavioral control, subjective norms, and attitude toward behavior by Ajzen (1991), Yang et al. (2019), and Zhu and Sarkis (2007). Questionnaire items for behavioral intentions and actual behavior were adopted from studies conducted by Kaba (2018), H. Li et al. (2002), Norman et al. (2017), and Tarkiainen and Sundqvist (2005). The questionnaires were designed to be concise and as accurate as possible to avoid issues of biases and non-responses. To deal with any form of ambiguities, the questionnaires were pretested to refine the survey instrument using top public service officials such as officials from the Human Resource Department or the Corporate Affairs Office in the selected institutions for the study. This was done based on recommendations from previous studies (Eisenhardt & Graebner, 2007; Zhu & Sarkis, 2007). The initial contact made with the top officials was also utilized to solicit permission and ask for help to explain the purpose of the study to the larger part of public service employees working within their organizations, and happened to be part of the target respondents for the study. Once permission was granted purposive sampling approach was used to identify and collect the data used in the analysis. The survey was conducted from August 2019 to December 2019 and a total of 258 questionnaires were administered. The questionnaires were administered in person with the aid of either an official from the Human Resource Department or Corporate Affairs Officer where necessary. After the survey period, a non-response rate of 16% was attained.

Empirical Analysis

Profile of Respondents

Table 1 below presents the demographic characteristics of respondents surveyed for the study. It further includes the job position and work experience of respondents. It can be seen from the table that, on average, most respondents have worked for their respective agencies and institutions for over 5 years.

Descriptive Statistics

Table 2 shows the descriptive statistics of constructs examined in the study. Descriptive statistics include means, standard deviations, and the minimum and maximum data points. The descriptive statistics cover variables such as Perceived Behavioral Control (PBC), Attitude Toward Behavior (AIT), Behavioral Intentions (BI), Subjective Norms (SN), and Actual Behavior (AB).

Measurement Model Evaluation

The construct reliability and validity were measured to ascertain the credibility of data acquired through the field survey. The reliability of scales was measured using Cronbach’s alpha and composite reliability metrics. These approaches are consistent with the Partial Least Squares Structural Equation-Modeling approach developed by (Hair et al., 2014). A Cronbach’s alpha with a value of .7 and more is considered to be acceptable for a construct (Hair et al., 2011; Henseler et al., 2015). All our constructs satisfy this
condition as depicted by Table 3. The Average Variance Extracted (AVE) metric was assessed to establish the validity of constructs. “The minimum acceptable AVE is .50—an AVE of .50 or higher indicates the construct explains 50% or more of the indicators’ variance that makes up the construct” (Hair et al., 2022). All our constructs meet this criterion (see Table 3).

Factor analysis was conducted to validate the predictors used to examine the constructs understudied. This was done in accordance with Partial Least Squares Structural Equation Modeling procedures proposed by Hair et al. (2014). An item needs to have a numeric value greater than 0.5 to be included in the final analysis. From Table 3, it can be seen that the entire measurement indicators obtained high factor scores. This indicates that the variables understudied can predict the outcome of unobserved constructs. The valid data set was used to examine the relationships between variables in the conceptual model.

### Correlation Test

Pearson’s Correlation test was conducted to examine the statistical relationship between an individual’s attitude toward behavior, subjective norms, perceived behavioral control, and behavioral intention of employees of public institutions. It was further used to examine the relationship between intentions and individuals’ behavior to adopt and continuously utilize e-government technologies. The outcome of the correlation test indicates that, there is a relationship between the independent variables and employees’ behavior toward the adoption of e-government. Though, the relationship between some variables is stronger than others. Table 4 presents the outcome of the correlation test for the latent variables in the study.

Although correlation does not equal causality, it offers insights into the relationship between examined constructs (Anwar & Abdullah, 2021; Pereira et al., 2018). In the face of this, our results show that, pressures from employees’ external environment and professional groups serve as underlying factors that influence the formation of new and enhanced behavior. An individual would adopt new skills and knowledge to ensure conformity to industry certification requirements and further be acknowledged as a specialist or an expert in a specific field (Jain et al., 2020; J. Li et al., 2018). When individuals are surrounded by individuals with high proficiency and attitude toward learning new skills, it serves as a form of incentive to regulate the behaviors of others.

According to the correlation test, perceived behavioral control has a strong positive association with individual behavior to embrace various public service technologies. Individuals’ adoption behavior reveals a reasonably substantial association with attitude and subjective norms of persons (Ulker-Demirel & Ciftci, 2020). This indicates that, the perceived behavioral control, attitude, and subjective norms of persons have a relationship with employee behavior to some extent. Furthermore, a considerable association appears to exist between subjective norms and the behavioral intention of public sector personnel.

Individual perception, attitude, and efficacy are documented to influence the behavior of employees in the

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**Table 1. Demographic Characteristics of Respondents.**

| Gender   | Frequency |
|----------|-----------|
| Male     | 138       |
| Female   | 78        |

| Respondents’ age (in years) | Frequency |
|----------------------------|-----------|
| 18–25                      | 24        |
| 26–30                      | 58        |
| 31–35                      | 64        |
| 36–40                      | 19        |
| 41–45                      | 9         |
| 46–50                      | 27        |
| >50                        | 15        |

| Educational background | Frequency |
|-----------------------|-----------|
| Doctorate degree      | 3         |
| Master’s degree       | 54        |
| Bachelor’s degree     | 144       |
| High school           | 15        |

| Job position                                      | Frequency |
|---------------------------------------------------|-----------|
| Senior management (e.g., Director)                | 48        |
| Middle-level management (e.g., Head of Department) | 74        |
| Line manager                                      | 94        |

| Work experience (in years) | Frequency |
|---------------------------|-----------|
| <5                        | 56        |
| 6–10                      | 38        |
| 11–15                     | 75        |
| 16–20                     | 32        |
| >20                       | 15        |

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**Table 2. Results of Descriptive Statistics.**

| Constructs | M      | SD     | Minimum | Maximum |
|------------|--------|--------|---------|---------|
| PBC1       | 5.321  | 1.234  | 3       | 7       |
| PBC2       | 5.871  | 0.892  | 2       | 6       |
| PBC3       | 6.018  | 1.784  | 1       | 7       |
| AIT1       | 4.871  | 1.432  | 2       | 7       |
| AIT2       | 5.752  | 0.782  | 2       | 7       |
| AIT3       | 6.188  | 1.632  | 2       | 6       |
| BI1        | 5.891  | 1.348  | 1       | 7       |
| BI2        | 4.892  | 0.345  | 1       | 7       |
| BI3        | 4.213  | 1.912  | 2       | 7       |
| SN1        | 5.098  | 4.891  | 1       | 7       |
| SN2        | 3.456  | 1.360  | 1       | 7       |
| SN3        | 4.981  | 2.202  | 1       | 7       |
| SN4        | 6.121  | 1.089  | 1       | 7       |
| AB1        | 4.019  | 0.247  | 1       | 7       |
| AB2        | 3.564  | 0.566  | 2       | 7       |
| AB3        | 4.679  | 1.318  | 2       | 7       |
adoption of new technologies, and this is emphasized in studies in information studies. It is argued that an employee with a positive mental frame toward new technologies has a high propensity for adopting new technologies as compared to an employee that sees technology as a tool that might replace him/her on the job market. Such resistance behavior affects the adoption of technologies negatively. Negative behavior affects behavioral intentions to adopt and further diminishes the gains organizations stand to enjoy from digitalization (Tsai et al., 2019).

Hypotheses Testing

The hypotheses stated for the study were examined using the t-test approach. For a particular hypothesis to be considered significant, it needs to obtain a t-statistic value of 1.96 and above. The outcome of the t-test indicates all hypotheses can be considered to be significant except the hypothesis stated for the link between perceived behavioral control and behavioral intentions of individuals. Table 5 presents a summary of the hypotheses test.

Structural Model Evaluation

The structural model of the study was examined using the Partial Least Squares Structural Equation Modeling technique as proposed by Hair et al. (2014). The outcome of the path analysis indicates that, perceived behavioral control, subjective norms, and individuals’ attitude toward behavior have a positive impact on the behavioral intentions of public sector employees. Judging by the $r^2$ value for behavioral intention which is .645 indicates perceived behavioral control, attitude, and subjective norms have a significant influence on behavioral intentions of public officers. A high $r^2$
value indicates the set of variables has a significant impact on shaping the behavioral intentions of public sector employees. The intentions of individuals influence the actual behavior of individuals and this is confirmed by the obtained $r^2$ value of .748 as indicated in Figure 2. This means that behavioral intentions have a 74% influence on the actual behavior of public officers to adopt and utilize e-government. Figure 2 shows the outcome of the path analysis conducted.

Judging by the outcome of the Partial Least Squares—SEM it can be seen that employee attitude toward behavior and subjective norms have a significant effect on individual behavioral intention to adopt e-government technologies. These constructs have regression coefficients of .614 (3.872) and .823 (12.879) for individual attitude toward behavior and subjective norms respectively. Perceived behavioral control does not have a significant effect on the behavioral intentions of public sector employees judging by its regression coefficient and $t$-statistics value. This construct had a regression coefficient of .322 (1.879). Based on this, perceived behavioral control is removed from the model presented in the final results for the study (see Figure 2).

**Discussion**

The findings of the study indicate that the theory of planned behavior has implications on the behavioral intention and adoption of e-government by individuals, especially in the era of digitalization. The findings of the study also support the significant relationship between subjective norms, attitude toward behavior, and behavioral intentions. These factors have a significant relationship with intentions, judging by the regression coefficients, and the $r^2$ values produced by the structural model. The attitude of an individual toward a certain behavior shapes one’s mental perception of a particular event. As elaborated in the theoretical perspective and confirmed by the study, attitude toward a particular behavior is critical for shaping the behavioral intentions of individuals.

Subjective norms as explained in the earlier sections focus primarily on the external factors that put pressure on individuals to adopt specific behaviors. The pressures from external stakeholders such as civil societies, regulatory agencies, and political actors are posited to shape the behavioral intentions of public sector employees (Verhoest et al., 2007). In line with this, the study found that, in order to influence the behavioral intentions of individuals, several external factors are involved. Thus, the adoption and the success of new technologies in public enterprises are mostly influenced by political actors involved, especially in a developing economy. Furthermore, the outcome of the study unearths the persuasive and coercive roles of peer-networks in the utilization of digital technologies. These findings conform to studies such as Wan et al. (2017) and Minton et al. (2018) that explored the dimensions of the theory of planned behavior that influence one’s behavioral intentions in the adoption of technologies. By adopting these technologies, public enterprises anticipate an improvement in performance while mitigating issues of corruption. In addition, the findings contribute to literature by re-emphasizing the power and role

**Table 5. Outcomes of Hypothesis.**

| Hypothesis                                      | Coefficient | t-statistic | p-Value | Decision  |
|------------------------------------------------|-------------|-------------|---------|-----------|
| Attitude $\rightarrow$ behavioral intention    | .614        | 12.879      | .000    | Supported |
| Subjective norm $\rightarrow$ behavioral intention | .823        | 3.872       | .000    | Supported |
| Perceived behavioral control $\rightarrow$ behavioral intention | .322        | 1.879       | .176    | Not supported |
| Behavioral intention $\rightarrow$ E-government adoption (actual behavior) | .542        | 9.872       | .000    | Supported |

![Figure 2. Results of structural model.](image-url)
of institutional stakeholders and peers in transforming the technological orientation of employees or public officers.

However, the perceived behavioral control of an individual did not have a significant influence on the behavioral intentions of individuals in this study as indicated earlier. This contradicts some findings in previous studies for instance, Pearce and Argyle (2013), Zhang et al. (2018), and (Kaba, 2018). The rationale for the non-significance of an individual’s perceived behavioral control in shaping the behavioral intentions of public officers is due to the analog nature of public institutions. Although an individual’s willpower is argued to influence the intentions and behavior of individuals, employees in the public sector are expected to follow a strict set of regulations and procedures. It becomes difficult for public sector employees to initiate self-directed projects and experimentation with digital channels.

The findings of the study make some interesting revelations that have some significant implications on how digitalization drive should be conducted to ensure maximum success. To ensure that e-government thrives and further mitigate the issue of resistance from stakeholders and agents, it is critical for policymakers to institute deliberate measures that shape the intentions of actors. Since subjective norms turn to have a significant influence on the behavioral intentions of public sector employees, it is essential to allow procedures and policies that will push individuals to abide by regulatory requirements and protocols. These strategies are geared toward enhancing individuals’ digital orientation and behavior.

The findings furthermore contribute to theory by teasing out which dimensions of the theory of planned behavior actually shape attitudes and mental models of individuals. The underlying effect of peer-network influence and perception play a key role in shaping the behavior of employees and this aids in dealing with the culture of resistance in most legacy institutions. Institutions should encourage individuals to enroll as members of professional bodies to derive the benefits of social capital presented by inter-personal networks. In addition, associations with such bodies allow enterprises to gain insights into changing trends in competitor and regulatory environments. Hence, institutions must encourage them. However, perceived behavioral control did not influence employee behavior, indicating employees have a difficulty in accepting new behavior. And this is true especially in institutions that possess high degrees of organizational resistance to change scale. This may arise from a lack of technical skills and proficiency to facilitate ease of adoption and diffusion.

Conclusion

The study concludes that the public officers and employees attitude, and subjective norms are essential antecedents for e-government adoption. In the context of Ghana, e-government adoption was actualized as a result of employee attitude toward e-government technologies and systems. Moreover, the subjective norms asserted by civil societies and regulatory agencies have become an important factor for the recent adoption of new technologies in the public sector.

The study implies that the success of e-government adoption lies in the cognitive, emotion, behavior, feeling, and willingness of officers to accept as well as in external pressures coming from hierarchical, regulatory pressures, and strong demands from civil societies. Therefore e-government adoption does not necessarily come from perceived behavioral controls such as the degree of difficulty on its use and other resource constraints.

Although the study makes some significant contributions to the area of information systems and social psychology, there are some shortcomings that need to be addressed in future studies. Future studies should endeavor to include the influence of cultural dynamics on individuals, since cultural influences might have an impact on the behavioral intentions of an individual.

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