

THE INFLUENCE OF DIGITAL TECHNOLOGIES ON QUALITY SERVICE DELIVERY IN GHANA'S PUBLIC SECTOR: THE MEDIATING ROLE OF SERVICE EXPECTATION

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Abstract

It has been crucial to solve the service delivery problem since civil society emerged. Although the challenges and barriers to quality service may vary, there is little empirical evidence on how digital technologies affect quality service in Ghana's public sector. Public quality service remains poor for people in Ghana who use government ministries, departments, and agencies on a daily basis. As a result, the study assessed the impact of digital technologies on service delivery and quality in Ghana's public sector. The study used a causal research design with a quantitative approach. The study sample size was 384 respondents who mostly patronized the public institutions considered for the study. By using SPSS (version 22) for the analysis, the study found that for almost all the public sector institutions chosen for this study, the level and state of adoption of digital technology was satisfactory. In addition, a positive correlation was found between digital technology adoption, service delivery and quality in public sector institutions in Ghana. Furthermore, a positive effect of service expectation on service delivery and quality in public sector institutions in Ghana was found. Moreover, the mediating effects of service expectations were positive and significant on the relationship between digital technology adoption and service delivery and quality. Customers who patronize most public sector institutions should be provided with sustainable, high-quality digital experiences through the maintenance of digital infrastructure, including dependable internet connectivity and accessible digital platforms, should be given top priority by the management.

Keywords: Digital technologies, Service quality, Public sector, Service expectation, Ghana

Introduction

Studies have shown that a country's economy is highly reliant on the service sector (e.g. Apte et al., 2008; Marks et al., 2009; Subramaniam & Reed, 2009). Both the private and public sectors play a significant role in the growth of the service industry. The responsibility of the public sector in delivering high-standard goods and services is even more vital (Wartningsih et al., 2020) in emerging nations like Ghana. In essence, organizations in the public sector are under growing pressure to enhance their efficiency and provide high-quality services (Curristine et al., 2007),

whilst in-service processes are slow to evolve. This has been exacerbated by difficulties in assessing outcomes, increased public and press scrutiny, lack of discretion to account arbitrarily, and the need that decisions be based on law.

Public service serves as a channel for the government to respond to the needs of the larger the citizenry (Shareef et al., 2016). In other words, the public sector is in charge of establishing and executing policies and programs with the ultimate goal of providing crucial social services capable of enhancing the general population's quality of life. Specifically, the term "public," as explained by Gumah et al. (2020) refers to the population of a certain area at a given time. The phrase "public service" connotes government involvement in non-profit service delivery. According to Hudson & Day (2019), the desire to satisfy the public via the implementation of public policies, the enforcement of laws, and the promotion of public welfare results in effective public service delivery.

Public service delivery is significant because it represents the fundamental structure of nation-building, serves as a physical link between government and the people, teaches individuals about national principles, and finally, serves as a link between the state and citizens (Van de Walle & Scott, 2009). Given that the main purpose of public service is effective service delivery, monitoring their performance to assure compliance is vital. The degree to which public services meet up to people's expectations of effective service delivery varies by country (Katelo et al., 2021). As a result, practically every nation in the world is constantly revamping its public services to guarantee the effective and efficient provision of goods and social services. According to Alford & Greve (2017), service delivery in the public sector is more difficult since it entails assessing silent requirements, determining priorities, allocating resources, and publicly explaining and accounting for actions taken.

Quality service is one trait that has piqued the interest of academics in the field of services marketing (Furrer & Sollberger, 2007). It has been acknowledged as a critical factor in guaranteeing the organization's long-term survival and success (Suvidha, 2013). Parasuraman et al. (1985: p.45) defined quality service as “the degree and direction of divergence between the consumer's expectations and reality”. Accordingly, this suggest that quality service is established by the disparity between client expectations of a service provider's performance and the actual service obtained (Parasuraman et al., 1988).

According to Carlsson & Md Hussain (2010), "quality service is a targeted assessment that encompasses the client's impressions of essential quality dimensions: dependability, responsiveness, assurance, empathy, and tangible." Chingang et al. (2010) describes quality service as the extent to which a service satisfies the requirements and expectations of the client. Quality service is also defined as “a targeted assessment that represents the client's impression of particular service qualities” (Hinson et al., 2011, p.268). Quality service is the outcome of a client's evaluation of how a service was delivered in accordance to their expectations for the service (Hinson et al., 2011). Eby et al. (2019) described quality service as a client's assessment of a firms’

total perfection or excellence. Ma et al. (2021) defines quality service as an organization's capacity to meet or exceed client expectations. According to Ramseook-Munhurrin et al. (2010), institutions of the public sector are inherently constrained in their capacity to offer high-quality services, which is exacerbated by systems, structures, and procedures designed to assure transparency, accountability, and efficiency.

The problem of service delivery has been crucial since the emergence of civil society, in which men entered into an agreement with the government based on a social contract (Akinboade et al., 2012). Since state agencies were established to carry out specific tasks like regulatory aspects, enhance the execution of governmental mandates, reduce government bureaucracy in service provision, increase efficiency in service delivery, and concentrate on particular areas of governmental interest, the provision of services is crucial to these organizations (Adaku et al. 2018). However, there are still a number of issues with how state agencies perform services, including their inability to access a range of services offered by the government and their failure to respond to citizens' needs. Lack of accountability and transparency in service delivery, the caliber of services provided, and the pace of service delivery are additional factors that have been cited by state agencies as challenges in service delivery (Bel et al., 2014; Mansoor & Williams, 2018). According to Ajibade et al. (2017), among other things, organizational culture, government service culture, and service providers' negative attitudes are all contributing factors to the difficulty of providing services by government agencies. Poor training in service delivery, insufficient resources, and low levels of accountability are other issues linked to poor service delivery (Ali, 2017).

After the implementation of several digitalization transformation projects in Ghana, it was anticipated that Ghana's public services would be of higher quality. However, poor quality service is still a daily experience for people in Ghana who access various services from government ministries, departments, and agencies, according to anecdotal and empirical evidence on the state of public quality service (Ohemeng & Ayee, 2016). Also, efforts to implement a public-private partnership method for the delivery of various public services have been greeted with resistance from individuals who worry about the effects of profit-driven private-sector firms manufacturing or distributing these necessary public goods (Armah-Attoh, 2015). Due to lack of service facilities, insufficient service quantity, or insufficient quality service, residents continue to struggle to access essential public services, leaving the government to fill the major provider role (Armah-Attoh, 2015). The challenges and barriers militating against expectations of quality service may be versatile, and yet there is dearth empirical evidence on the effect of digital technologies on service delivery and quality in Ghana's public sector. To this end, this study sought to assess the effect of digital technologies on service delivery and quality in public sectors institutions in Ghana as mediated by service expectation. Specifically, this study puts forward two specific objectives; to examine the current level of adoption of digital technology in Ghana's public sector; assess how digital technologies have improved quality service delivery in public sector institutions in Ghana.

An Overview of Digital Technologies

According to Rice (2003), digital technologies refer to a broad range of methodologies, instruments, services, and software and hardware-dependent applications (Jafri et al. 2022). By using electronic tools, they make it easier to create, store, process, send, and display information. The use of personal computers, digital television, radio, mobile phones, robotics, and other devices are all examples of digital technologies (Vuorikari et al., 2016). For Straker et al. (2022), digital technologies include hardware like laptops and tablets, software and apps, augmented and virtual reality, and less tangible kinds of technology like the Internet. They also include tools like cameras, calculators, and digital toys as well as systems like personal computers, tablets, and tools like these. Although they are clearly positioned as cultural tools, digital technologies are frequently conceptualized in general and inconsistently (Straker et al., 2022). Data generation, creation, storage, and processing tools, systems, and equipment are all examples of digital technology. Microprocesses that are programmed to carry out a variety of tasks enable the data processing and logic capabilities of digital technologies (Straker et al., 2022).

Today's civilization is heavily reliant on digital technologies, particularly in the form of IT system architectures, business impact analyses, and innovation-driving concepts like the Internet of Things (IoT), big data, and virtual reality/augmented reality (Brehm & Günzel, 2018). According to the literature, IoT, Big Data and Analytics have made it possible for business models based on product-service systems to evolve (Rymaszewska et al., 2017).

According to Rymaszewska et al. (2017), the Internet of Things (IoT) technology equips objects with sensors that enable communication and make them active members of an information network. Porter & Heppelmann (2014) demonstrated how the implementation of IoT technology transforms standalone items into smart and connected ones, highlighting the features of monitoring product status and condition. Organizations now have the opportunity to learn about how customers use items owing to the Internet of Things. Organizations may now acquire real-time remote monitoring of product usage, status, and location (Baines et al., 2009). The Internet of Things (IoT) technology enables businesses to gather a sizable amount of data, or "Big Data" (Nobre & Tavares, 2017). Big Data cannot be analyzed using conventional software or database techniques because of their volume, variety, velocity, and veracity (Jabbour et al., 2019). Instead, special analytics that make use of software and data mining processes are needed to find patterns in the data and make predictions (Pagoropoulos et al., 2017).

In recent years, digital technology has been extensively used across all industrial sectors (Magomedov et al., 2020). The production, delivery, sale, and consumption of goods have all undergone significant change as a result of growing digital technology (DT), such as the internet of things (IoT), big data analytics (BDA), artificial intelligence (AI), and 3D printing (Lasi et al., 2014). The so-called "Industry 4.0" stage of the economy alters both organizational structure and how things are produced (Vaidya et al., 2018; Whitmore et al., 2015). The cloud technology,

distributed computing technology, big data technology, Internet of Things technology according to Magomedov et al. (2020) are the main technologies that characterize the digital economy today.

Relationship between Digital Technology and Quality Service and Delivery

Todua & Gogitidze (2022) identified the key features of digital marketing that make companies successful in the banking sector. They revealed that in the 21st century, business has become a digital technology-driven system that can hugely impact consumer behaviour and labour productivity. Todua & Gogitidze (2022) highlighted the role of social media in shaping individual messaging in the banking industry and creating a product tailored to the target audience. This means that mobile marketing simplifies the implementation of banking operations for customers. It can also be suggested that digital technology in the banking sector has positively impacted on quality service and delivery (Yusheng & Ibrahim, 2019). This study shows that the adoption of digital platforms in the banking sector led to reduced waiting times, faster transactions, and improved overall quality service. According to Li et al. (2021), the banking industry is rapidly developing to utilize e-banking as an efficient and suitable tool to satisfy customers. Online banking service is the general service suggested by customary banks to provide faster and more reliable services for customers. Son et al. (2020) investigated the impact of customers' digital banking adoption on hidden defection. The implementation of digital channels as an avenue for economic transactions, for example, online and mobile banking/Fin-Tech has shifted the paradigm of customer–bank interactions, providing unprecedented opportunities for both parties. The prevailing belief is that digital banking has several advantages, such as lower costs and higher information transferability for customers (Son et al. 2020). These benefits can also promote competition between banks, giving customers' preference for “multi-homing,” or engagement with multiple banks.

Son et al. (2020) developed an analytical model to provide insights into the effects of digital banking adoption while taking customers' multi-homing behaviours into consideration and aid in the delivery of service and providing quality of service. The study provides that there is a significant correlation between digital technology and quality service and delivery in the banking sector. Carbó-Valverde et al. (2018) examined the sequence of decisions that bank customers follow to adopt digital services and diversify the use of those services. The sequential approach relies on machine learning applied to an in-depth survey on consumer preferences for financial services. The results showed that the adoption of digital banking services starts with information-based services (e.g., checking account balance) followed by transactional services (e.g. online or mobile money transfer). The study showed that digital technology has positive impact on service delivery and quality. However, the diversification of the use of online channels is mainly explained by the consciousness about the range of services available and the perception that they are safe. Also, the findings revealed that bank customers adopt non-bank payment services only once they are frequent and diversified digital bank customers.

In the health sector, Shen et al. (2021) examined digital technology-based telemedicine for the COVID-19 pandemic. Digital technology-based telemedicine platform has currently been established in many countries to help in service delivery, incorporated into clinical workflow with four modes, including “many to one” mode, “one to many” mode, “consultation” mode, and “practical operation” mode, and has shown to be feasible, effective, and efficient in sharing epidemiological data, enabling direct interactions among healthcare providers or patients across distance, minimizing the risk of disease infection, improving the quality of patient care, and preserving healthcare resources and improving health quality service care(Cheshmehzangi, et al. 2022). According to Smith et al. (2020), coronavirus disease 2019 (COVID-19) pandemic reminded us of the importance of using telehealth to deliver care, especially as a means of reducing the risk of cross-contamination caused by close contact. They found out from their study that telehealth and digital health platforms have led to improved patient-provider communication, resulting in better healthcare quality service. Downes et al. (2019) investigated the transformation of health care for patients in this era of information and communication technology (ICT), digiceuticals, and digitally enabled systems. These studies highlight the view that the way patients access care and interact with health care systems is rapidly changing through the use of information and communication technology (ICT). In essence, a view is projected about how health care is being transformed through digital innovations, such as wearable technology, remote monitoring, patient portals, mobile applications (apps), and new service models such as telemedicine and virtual visits. In view of this, it can be posited that digital technology has positive impact on quality service and delivery in the health sector. Thus, resonating with the idea that, over the last couple of decades, developments in the information and communication technology (ICT) have made the most palpable impact on health care management all over the world (Saba, Ngepah & Odhiambo, 2023).

Sarku et al. (2021) investigated digital platforms in Climate Information Service (CIS) delivery for farming in Ghana. Phone-based applications, Internet connectivity, and big data are enabling climate change adaptations. The delivery of CIS with information and communication technology’s (ICTs) was used mostly by men and during the farming season. A variety of ICT tools are used to deliver CIS due to the level of demand for information. For instance, old technologies like radio remain one of the most relevant and cost-efficient ICT platforms for the delivery of CIS. The vast majority of these platforms both private and public are for delivering climate information services and for data collection. In view of this, climate information service as a digital tool has aided the delivery of quality information related to climate in the agricultural sector in Ghana (Sarku et al. 2021).

Similarly, a study by Büyüközkan et al. (2020) examined a new digital quality service model and its strategic analysis in aviation industry, using interval-valued intuitionistic fuzzy AHP. They sought to propose a new and genuine Digital Quality service (DSQ model). Airlines companies according to these researchers have to provide digital products and services to ensure customer satisfaction (Büyüközkan et al. 2020). The proposed model consists of digital tangibles, reliability, digital interaction, digital trust, and customer-centricity dimensions; and 35 criteria related to them.

The results showed that the most significant dimension is digital trust, and the three most important criteria are proactive customer service, cybersecurity, and customer insight helping to deliver service.

According to Wilson et al. (2019) in the e-commerce sector, data analytics led to more accurate service recommendations and improved quality service. The purpose of the study was to examine the effect of website design quality and quality service on consumers repurchase intention in the Asian, European, North and South American, and Australian e-commerce industry. The results showed that in Asia, Australia, and Europe, quality service played a more significant role in affecting repurchase intention, while website design quality played a more important role in affecting repurchase intention in the North and South American e-commerce industry. Furthermore, satisfaction positively mediated the relationships between website design quality, quality service and repurchase intention (Wilson et al., 2019). In particular, the above reviews demonstrate a strong positive relationship between digital technology and quality service and delivery. It highlights the potential of digital technology to enhance efficiency, personalization, communication, issue resolution, and data-driven improvements in service industries.

Mediating Effect of Service Expectation in the Relationship between Digital Technology and Quality service and Delivery

Chen and Yang (2021) investigated the mediating effect of network structural embeddedness between customer experience and consumer purchase intention in the context of cross-border e-commerce. Network density and Network centrality were found to separately play mediating role between website ease of use, website relationship service and consumer purchase intention. In contrast, both of them play a mediating role between customer cost and consumer purchase intention. The study demonstrates a strong positive association between digital technology and quality service, with consumers' service expectations acting as a direct mediating factor in this relationship.

Chen et al. (2020) investigated the use of digital technology in the context of e-commerce platforms. Their study presented the first large-scale analysis on the emerging role of intermediaries in social e-commerce platforms, which provides potential insights for the design and management of social computing marketing platforms. The study found a significant positive effect of digital technology on quality service, and this relationship was partially mediated by customers' service expectations. As customers interact with digital interfaces and experience technological enhancements, their expectations about quality service are influenced, which, in turn, affects their perception of the service delivered.

Ghazali et al. (2018) investigated the impact of mobile applications on service delivery in shops with a closer look at M-shopping and technology adoption in Malaysia. The purpose of their study was to integrate the Technology Acceptance Model (TAM) and the Theory of Planned Behaviour (TPB), and includes additional variables such as personal innovativeness (PI) and trust. Their findings suggest that customers' expectations of quality service were influenced by the

functionality and features offered through the app, thereby mediating the relationship between digital technology and quality service and delivery.

Medina et al. (2015) aimed at researching the satisfaction of professional users of online technology services. Their study analyzed the influence of mediating relationships between variables on these types of processes. Three variables, in addition to the expectations of the service's perceived usefulness, were included in the analysis: effort expectancy, social influence and facilitating conditions. The results showed that disconfirmation of expectations that is, expectations carried by the user prior to entering into contact with the service, plays a major role in the model. However, expectations 'remembered' after entering into contact with the service do not influence disconfirmation. They observe that digital technology adoption directly impacts perceived quality service, with service expectation acting as a mediator, ultimately influencing customer satisfaction.

In summary, the empirical research on the mediation effect of service expectation in the relationship between digital technology and service delivery indicates that digital technology can significantly impact quality service mediated by service expectation.

Methodology

The design of this study is non-experimental (i.e., causal research design) because it allows the comparison of relationships between variables. A causal research design was employed in this study because of its unique ability to help researchers establish causal relationships between two or more variables in a bid to reveal how one variable impacts or influences other(s) (Cresswell, 2014).

The study population consisted of clients who patronize the services of public sector institutions who have adopted digital technologies in their services. This is because not all public sector institutions have adopted digital platforms for their service delivery (Osei-Kojo, 2017). The study's participants were adults (above 18 years); thus, they should have in-depth knowledge to assure accurate data. To ensure that every member of the population had an equal chance of being chosen, the respondents were chosen using a straightforward random probability sampling technique (Patten & Newhart, 2017). In the opinion of Ofori & Dampson (2011) probability sampling justifies selecting a representative sample from the target population and deriving conclusions about the data using statistics. This method was chosen because it ensures objectivity in the choice of any study unit. Choosing a sample that would be representative of the entire population was equally important. The study sample size was estimated by using the Krejcie and Morgan (1970) table. From the sample Table, using 100000 as the benchmark for the total customers who patronize the services of such institutions, sample size of 384 was anticipated. Since all the units within the sample answered the questionnaire, a response rate of 100% was achieved.

The data collection tool used was a semi-structured questionnaire. Questionnaires were administered to the staff of public sector firms to answer, after which the questionnaires were

collected and compiled for data cleaning and analysis. The selected institutions were public sector institutions that have used some level of digital platforms for their service for more than a year. Five institutions namely; Electricity Company of Ghana (ECG), National Identification Authority (NIA), Driver and Vehicle Licensing Authority (DVLA), Ghana Revenue Authority (GRA) and Ghana Ports and Harbours Authority (GPHA) were used as the sampling frame from which the data was collected.

By implementing multiple techniques to evaluate and improve the instrument, the study ensured the validity and reliability of the research tool (questionnaire). A reliability test was conducted to ensure the validity of the study's research instrument, and the results, including the Cronbach alpha, are presented in the next results section. The Statistical Package for Social Science (SPSS) version 26 was used to process the data gathered. Moreover, the processed data was then analyzed using descriptive and inferential statistics such as percentage, frequencies, means, standard deviations, correlation and regression analysis.

Results and Discussion

Table 1. Sociodemographic- Demographic characteristics of respondents

Description	Frequency	Percentage
Age:		
18 -24 years	75	19.5%
25 –31 years	85	22.1%
32 -38 years	117	30.5%
39 -45 years	49	12.8%
46 -52 years	29	7.6%
53 –59 years	16	4.2%
60 years and Above	13	3.4%
Gender:		
Female	198	51.6%
Male	186	48.4%
Marital Status:		
Single	146	38%
Married	207	53.9%
Divorced	16	4.2%

Widowed	15	3.9%
Educational Level:		
No Formal Education	9	2.3%
Basic Level	13	3.4%
SHS Level	51	13.3%
HND	62	16.1%
Bachelors	142	37.0%
Masters`	69	18.0%
PhD	38	9.9%

The study sample consisted of 384 respondents sampled from various governmental service in Ghana. A breakdown of the respondent's sociodemographic may be seen in Table 1. Employees between the age group of 18 - 24 and 25 – 31 numbered 75 and 85 respectively, representing 19.5% and 22.1% of the workforce respectively. 117 respondents representing 30.5% were between the ages of 32 and 38. This was followed by 49 respondents who fell between 39- and 45-years range, representing 12.8%. Next respondents aged 46 to 52 were 29 representing 7.6% of the total. The next two age groups, 53 to 59 (16 respondents) and 60 years and older (13 respondents) came in at 4.2% and 3.4%, respectively. This suggests that the bulk of public sector workers between 32-38-years were males representing 48.4% of the total, while females representing 51.6%. This suggests that there are more female employees in Ghana's public sector than there are male employees. However, the respondent's marital status was either single or married, divorced or widowed, being 146 and 207, 16 and 15 respectively, representing 38%, 53.9%, 4.2% and 3.9% of the population respectively. Table 1 further shows the level of education of the employees in the public sector. It can be seen that out of the respondents sampled, 9 respondents were with no formal education representing 2.3%, followed by 13 (3.4%) who had Basic Level certificate, followed by 51 respondents with Senior High School Level certificate representing 13.3%. 62 (16.1%) respondents were with Higher National Diploma (HND) certificate. 142 (37%) respondents had bachelor certificate. Also, 69 respondents were with masters' certificate representing 18%, followed by respondents with PhD degree certificate who were 38 representing 9.9%. Hence, the majority of the employees in the public sector had gone through formal education.

Table 2. Reliability Test

Variable	Cronbach Alpha	No. of Items
Digital Technology (DT)	.725	5
Quality Service and Delivery (QSD)	.920	18
Service Expectation (SE)	.824	6

Source: Field Data (2023)

The degree of a scale's dependability reflects its resistance to random error (Pallant, 2013) or the consistency with which it produces results after repeated measurements (Middleton, 2019). The internal consistency metric was used to evaluate how well each item on a scale represents an underlying dimension (Pallant, 2013). For the individual consistency reliability, it must be at least 0.7. In table 2, the Cronbach Alpha values for the variables "Digital Technology," "Quality service and Delivery," and "Service Expectation" ranged from 0.725 to 0.920. This shows that each construct and scale used to assess the study's variables was valid.

Table 3 Correlation among variables

Variables	1	2	3	4	5
Age (1)	1				
Gender (2)	.115	1			
Digital Technology Adoption (3)	.824	.024	1		
Service Expectations (4)	.537	.024	.651	1	
Service Quality and Delivery (5)	.084	.205	.143	.824	1

Source: Field Survey (2023)

To estimate the normality of the data set in the distribution, this current study adopted correlation co-efficient as a way to examined the data set. The results of the correlation coefficient among the variables under this current study were also presented in table 3.

Table 4. ANOVA Output

	Model	Sum of Squares	df	Mean	F	Sig
1	Regression	25.837	1	25.837	171.100	.000 ^b
	Residual	57.683	382	.151		
	Total	83.520	383			
2	Regression	42.157	1	42.157	389.331	.000 ^b
	Residual	41.363	382	.108		
	Total	83.520	383			
<i>1: a. Dependent Variable QSD b. Predictor Variable :(Constant), DT</i> <i>2: a. Dependent Variable QSD b. Predictor Variable :(Constant), SE</i>						

The ANOVA table (Table 4) shows the test significance for R and R² using the F-statistics. The independent variable effectively explains the variation in the dependent variable if the F-statistics significance value is less than 0.05. In model 1, the p-value for this analysis is less than .05 (p .000). Given that $F(1,382) = 171.100$, $p = .000$, digital technology has a statistically significant effect on quality service delivery in the public sector of Ghana.

Also, the p-value for model 2 analysis is less than 0.05 (p .000). Given that $F(1,382) = 389.331$, $p = .000$, service expectation has a statistically significant effect on quality service delivery in the public sector of Ghana.

Table 5. Model Summary of Regression Output

Model	R	R square	Adjusted Square	Std. Error of the Estimate
1	.556 ^a	.309	.308	.38859
2	.710 ^a	.505	.503	.32906

1: a. Predictor Variable :(Constant), DT

b. Dependable Variable QSD

2. a. Predictor Variable :(Constant), SE

b. Dependable Variable QSD

The model summary of the regression output is shown in Table 5 with digital technology acting as the independent variable and quality service and delivery as the dependent variable. The R, R square, Adjusted R square, and Standard Error statistics are included in this table. In model 1, digital technology, and quality service and delivery have a linear relationship, which is indicated by the Pearson product moment correlation coefficient, R. Since the R value is .556, it is shown that there is a significant positive relationship between digital technology, and quality service and delivery. The adoption of digital technology and the quality and delivery of services are positively correlated, as indicated by the R value of 0.556^a. An R value of 0.556^a, which is close to 1, denotes a considerable positive connection. This suggests that as digital technology is adopted, quality service and delivery tend to advance as well. Thus, the positive correlation coefficient indicates that quality service and delivery tend to increase as adoption of digital technologies increases. This is consistent with the logical notion that since technology adoption enhances quality service and delivery, employees are more willing to accept it.

Regarding the relationship between digital technology and quality service and delivery; the correlation reveals a strong positive and significant relationship between the two variables. This association may be influenced by regional or local circumstances. The R square quantifies the amount of variation in the dependent variable brought on by the independent variable, showing a variation of 30.8% in Ghana's public sector service delivery and quality. This suggests that the public sector has improved in terms of quality service and delivery as a result of the implementation of digital technology.

In *model 2*, service expectation was acting as the independent variable and quality service and delivery as the dependent variable. Service expectation, and quality service and delivery of services have a linear relationship, which is indicated by the Pearson product moment correlation coefficient. Since the R value is 0.710^a, it can be said that there is a significant positive relationship between service expectation and quality service and delivery. Service expectation and the quality service and delivery are positively correlated, as indicated by the R value of 0.710^a. R value of 0.710^a, which is close to 1, denotes a considerable positive connection. This suggests that as

customer expectation of service is high, quality service and delivery tend to increase as well. This is consistent with the logical notion that since service expectation has aid in providing quality of service and delivery, employees are more willing to accept it. In this relationship, there is a high positive and significant association between service expectations and quality service and delivery, according to the correlation. Conditions in the region or locality may have an impact on this connection. The R square, which measures the degree of variation in the dependent variable caused by the independent variable, indicates that Ghana's public sector service delivery and quality varied by 50.3%. This shows that as a result of increased customer expectations for service, the public sector has improved in terms of quality service and delivery.

Table 6. Coefficients of the Regression Output

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
1. Constant	2.061	.194		10.621	.000
DT	.552	.042	.556	13.081	.000
2. Constant	1.722	.146		11.790	.000
SE	.622	.032	.710	19.731	.000

1: a. Dependent Variable: QSD

2: a. Dependent Variable: QSD

The slope b of the regression equation is represented by the numerical value on the second rows, marked in this example as DT (representing the independent variable) in model 1. Based on these findings, the researchers can present the regression equation below, which forecasts how digital technology will affect service delivery and quality in model 1 (see Table 6).

$$Y (\text{Quality service and Delivery}) = 2.061 + .552DT.$$

Taking the values for the slope and the intercept in the resulting regression equation, the researchers can make the following accessions, in the absence of any influence from the predictor variable (DT), the intercept (2.061) indicates the anticipated or base level of quality service and delivery. In other words, certain level of quality service and delivery would still be anticipated, which in this study is 2.061, even if all the predictor factors were zero.

In the second model, the numerical number on the second rows, denoted in this case as SE (representing the independent variable), is the slope b of the regression equation. The regression equation that makes predictions about how service expectation (SE) will impact service delivery and quality, is based on these observations.

$$Y (\text{Quality service and Delivery}) = 1.722 + .622SE.$$

The researchers can make the following adjustments by taking the values for the slope and intercept in the resulting regression equation: The intercept (1.722), implies that, where there is no influence from the predictor variable (SE), basic level of quality service and delivery would still be expected. In other words, even if all the predictor elements were zero, you would still expect employees to perform at a specific level of quality service and delivery, which in this case is 1.722.

Table 7. Regression Analysis Showing the Paths for Mediating Variable

Effect	Path	β	SE	z	95% CI		P
					Lower	Upper	
Total (c)	DT → SQD	.552	.042	1.314	.468	.635	.000
Path 1 (a)	DT → SE	.466	.053	8.792	.363	.570	.000
Path 2 (b)	SE → SQD	.508	.032	15.87	.446	.570	.000
Direct (c')	DT → SQD	.315	.036	8.75	.244	.385	.000

Source: Field Data (2023)

The study aims to test if service expectation level mediates the relationship between digital technology and quality service and delivery. Multiple regression was used to test the mediation model. From Table 7, digital technology adoption has a positive and significant effect on service expectation, $\beta = .552$ (95% CI: .468, .635), $z = 1.314$, $p > .000$. The indirect effect; path 1 and 2, however, revealed a significant positive association, $\beta = .466$ (95% CI: .363, .570), $z = 8.792$, $p > .000$ and $\beta = .508$ (95% CI: .446, .570), $z = 15.87$, $p > .000$, respectively (see Figure 1). Thus, the level of service expectation significantly mediates the relationship between digital technology adoption and quality service and delivery in the public sector institution in Ghana as shown by the p values in Table 8. Notwithstanding, digital technology has a direct significant positive relationship with quality service and delivery as shown in Table 7. The finding suggests that the level of service expectation affect the quality of service and the delivery of service in public sector institution of Ghana.

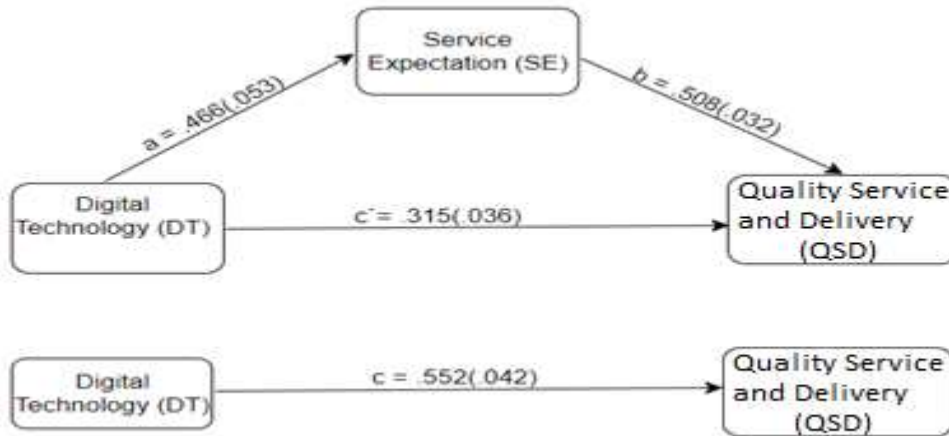


Figure 1. The direct and indirect relationship among the variables (Source: Field Data, 2023)

Table 8. Sobel Test for the Mediating Variable's Effect

	Test Statistics	Std. Error	<i>p</i> -value
Sobel test	7.69143193	0.03077774	0
Aroian test	7.67988066	0.03082444	0
Goodman test	7.70323639	0.03073098	0

Discussion

The primary objective of this study was to investigate the relationship between the adoption of digital technology and its impact on quality service delivery within the context of public sector institutions in Ghana. The study confirms that e-government has the potential to enhance the delivery of public services through increased effectiveness, decreased operational costs, increased service accessibility, and improved customer satisfaction which aligns with the findings of Osei-Kojo (2017); Abubakari & Namooog (2023). Abubakari and Namooog (2023) investigated the impact of technology adoption on the accounting systems of public institutions in Ghana. The study established that the level of technology adoption in the public institutions is high. The study also revealed that the use of technology in the accounting system of public institutions has positive and significant impact on the accounting systems of public institutions, hence improving quality service and delivery.

In addition, digital technology adoption has aided in the quality and delivery of service in public sector institutions. This finding underscores the pivotal role that embracing digital advancements

plays in elevating the efficiency, effectiveness, and overall performance of public sector entities in Ghana. Consequently, it underscores the importance for further investment and integration of digital solutions to continually improve public service delivery standards to meet the evolving needs of the populace. The findings yielded illuminating insights, showing the pivotal role that service expectations play in this varied relationship. Indeed, it becomes clear that service expectations have a significant impact and serve as the relationship between the adoption of digital technologies and the ultimate results in service delivery and quality.

Further, this study investigated the mediating function of service expectations as important contribution to the relationship between digital technology and service expectation and delivery. It emphasizes how service expectations play a key role in determining how digital technologies affect quality service and delivery. Besides improving operational efficiency, public sector organizations that embrace digital transformation also help to define and raise the expectations of the citizens they serve. In essence, the research reveals the importance of prioritizing digital technology adoption in the public sector in Ghana. By doing so, these institutions can not only bridge the gap between service expectations and actual service delivery, but also create a virtuous cycle where improved technology leads to higher expectations, which, in turn, drive further enhancements in quality service and delivery.

Laurenza, Quintano, Schiavone and Vrontis (2018) revealed the purpose of exploitation of Digital Furthermore, technologies by illustrating how such IT can influence the business process improvements in healthcare industry. The results show the adoption of Digital technologies could improve performance of all the main healthcare business processes, in particular those processes that can be simplified with the adoption of Information Technology. More specifically, Digital technologies are able to make services and processes more efficient and, at the same time, allow the delivery of better quality and reduction in response times, with many benefits for several actors such as National Health Systems, clinicians and patient.

Conclusion and Implications

The findings have significant implications for organizational processes and policy makers in Ghana's public sector. It is obvious that strategies to manage and satisfy the public's rising service expectations should go hand-in-hand with investments in digital technologies. The study also emphasizes the significance of ongoing initiatives to narrow the digital gap and guarantee equitable access to technology for all societal groups. In conclusion, the study sheds light on the relationships at play in the adoption of digital technologies and how they affect the quality and delivery of services in Ghana's public sector.

Recommendation

It is essential for Ghana's public sector organizations to fund employee training and digital literacy initiatives. Organizations may make sure that their personnel are better prepared to utilize digital technology by providing them with the appropriate digital skills and knowledge. Secondly, the

creation and maintenance of digital infrastructure, including dependable internet connectivity and accessibility of digital platforms, should be given top priority by the government and pertinent agencies. Again, institutions in the public sector should pay particular attention to monitoring and coordinating service expectations with their capacity for providing digital services. They can prevent service users' disappointment and unhappiness by outlining the services that can be offered through digital media and establishing reasonable expectations. In order to keep up with technology improvements and evolving customer expectations, public sector organizations should commit to a culture of continuous improvement and review and update their digital strategy on a regular basis. Finally, organisations should encourage more study in this area with an emphasis on the mediating function of service expectations to continuously analyze the influence of digital technologies on service delivery and quality.

Suggestions for Further Studies

The study was conducted among employees in the public sector institutions in Ghana on the effect of digital technology on the public sector as mediated by service expectation. The research proposes that future researchers keen on this topic should:

1. Conduct a comparative study between Ghana and other countries with varying levels of digital technology adoption in the public sector.
2. Investigate the relationship between digital literacy levels among both service providers and service recipients and their ability to utilize digital technologies effectively in the public sector.
3. Investigate the impact of digital technologies on service delivery and quality in specific sectors of the public sector in Ghana, such as healthcare, education, or transportation.

List of abbreviations

ECG – Electricity Company of Ghana

NIA – National Identification Authority

DVLA – Driver and Vehicle Licensing Authority

GRA – Ghana Revenue Authority

GPHA – Ghana Ports and Harbours Authority

DT - Digital technology

IoT - Internet of things

BDA - Big data analytics

AI - Artificial Intelligence

TAM - Technology Acceptance Model

TPB - Theory of Planned Behaviour

PI - Personal innovativeness

SPSS - Statistical Package for Social Science

Digital Technology (DT)

QSD - Quality Service and Delivery

SE - Service Expectation

ICT - Information and Communication Technology

CIS - Climate Information Service

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