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Digital Communication Technologies in Public Administration: A Study of Ministry of Basic and Secondary Education, Delta State

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Abstract

This study investigates the role of digital communication technologies in enhancing public administration using Ministry of Basic and Secondary Education as a case study. The objectives were on exploring the impact, finding out the opportunities and identifying the challenges of digital communication technologies. Through a comprehensive analysis of survey data from 146 respondents, the study explores various dimensions of digital communication technologies' influence on citizen engagement, consumer behaviour, and public service delivery. The findings reveal positive perceptions of digital technologies among respondents, highlighting their potential to improve citizen engagement, streamline public service delivery, and overcome traditional barriers to communication. Despite challenges such as limited infrastructure and connectivity issues and infringe of privacy, respondents recognize the transformative impact of digital technologies on public administration processes. Based on the findings, two key recommendations emerge: first, governments should prioritize investment in digital infrastructure to expand internet access and enhance digital literacy among citizens. Second, capacity building and training programs should be implemented to equip public administrators with the skills needed to effectively leverage digital tools for service delivery and citizen engagement. This study underscores the importance of embracing digital communication technologies in public administration and provides valuable insights for policymakers, administrators, and practitioners seeking to harness the full potential of digitalization in governance.

Keywords: *Digital Communication Technologies, Public Administration, Citizen Engagement, Streamline Public Service Delivery.*

Introduction

Governance practices are changing quickly in the field of public administration since technology is always growing to support digital communication (Corvalán 2018). Digital communication technologies present both opportunities and challenges for public administration, as this examination looks into many elements of them. The goal of this study is to raise awareness about the revolutionary potential of these technologies for government operations by performing an empirical analysis, analyzing recent literature, and case studies. People have several chances thanks to digital communication technology for the benefits it poses of increased transparency, improved service delivery, and increased public participation. By use of social media, online platforms, and mobile applications, public administrators may create direct engagement with citizens, potentially resulting in the development of a more inclusive government framework (Firmstone & Coleman 2015). The study also examines how the introduction of cutting-edge communication technologies might lead to chances for process and procedure improvement in administration.

The study explores the challenges of digital communication in public administration, including the digital gap, cybersecurity risks, and privacy issues (Karwatzki, Dytynko, Trenz & Veit 2017). It examines government agencies' strategies to address these issues and develop plans for the safe and equitable use of digital technology. The research also examines the impact of internet communication on organizational culture, public administrator skill sets, and bureaucratic structures. The study aims to help policymakers, practitioners, and researchers navigate the unpredictable seas of digital transformation, focusing on best

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practices, innovation, and optimizing digital communication potential for responsive and successful public administration.

Objectives

Assess the impact of digital communication technologies on citizen engagement.

Explore opportunities for digital communications for enhanced public administration and service delivery.

Identify challenges with the application of digital communication technologies in public administration.

Research Questions

Is there any impact of digital communication technologies on citizen engagement?

What specific opportunities exist for streamlining administrative processes and delivering services more responsively in Delta State Ministry of Basic and Secondary Education?

What are the main challenges with the use of digital communication technologies in public administration in Delta State Ministry of Basic and Secondary Education?

Literature Review

Impact of Digital Communication Technologies on Citizen Engagement

Digital Communication

In this contemporary era, the integration of digital communication technologies has become a defining feature of public administration, reshaping the dynamics of citizen engagement (Cristóvam, Saikali & Sousa 2020). The advent of technologies has ushered in a new era of governance, providing both government entities and citizens with innovative tools to interact, share information, and participate in decision-making processes. Digital communication refers to the exchange of information, messages, and content using digital technologies and electronic platforms (Liu & Yuan 2015). It encompasses a wide range of communication methods facilitated by digital devices, networks, and applications. Digital communication involves the transmission of data in the form of text, images, audio, or video through electronic channels (Hanisch, Goldsby, Nicolai & Oehmichen 2023; Panagiotopoulos, Barnett, Bigdeli & Sams 2016).

Components of Digital Communication

Digital technologies involve electronic devices, platforms, data transmission, multimedia elements, interactivity, synchronous and asynchronous communication, and accessibility (Panagiotopoulos, Barnett, Bigdeli & Sams 2016). They enable communication through social media, email, instant messaging, video conferencing, and collaborative tools (Udovenko 2022). Data transmission involves binary code transfer across networks, while multimedia elements integrate various media forms. Interactivity allows two-way interaction, while synchronous communication occurs in real-time (Wukich 2020). Digital communication transcends geographical boundaries (Barranha, Ribeiro & Pereira 2016).

Citizen Engagement

Citizen engagement is a multifaceted concept that encapsulates the active involvement, participation, and interaction of individuals with government entities and public institutions. It represents a fundamental aspect of democratic governance, emphasizing the collaboration between citizens and the state in decision-making processes, policy development, and the overall improvement of the public sphere (Tonelli, Bermejo, Santos, Zuppo & Zambalde 2017). This concept extends beyond mere information dissemination, aiming

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to empower citizens by providing them with opportunities to contribute to the shaping of public policies and services. It encompasses various dimensions, including participation, collaboration, and interaction between citizens and government entities. Scholars such as Liu and Yuan (2015) and Firmstone and Coleman (2015) have highlighted the importance of meaningful engagement, emphasizing a shift from mere information dissemination to active involvement in decision-making processes.

Dimensions of Citizen Engagement

Citizen engagement is a process that aims to involve individuals from diverse backgrounds, socioeconomic backgrounds, and demographic groups in civic processes (Pyrma 2019). It promotes a more representative and equitable form of governance by ensuring that citizens have the opportunity to participate. Transparent communication is crucial for effective citizen engagement, as it fosters trust and enables citizens to make informed contributions. Collaborative decision-making is encouraged, with platforms for consultation, public forums, and participatory mechanisms facilitating this process (Cristóvam, Saikali & Sousa, 2020). Access to public services and resources is ensured through digital technologies, making government interactions more convenient and responsive to citizen needs. Citizen engagement also includes advocacy and activism, where citizens actively voice their concerns, push for policy changes, and participate in civic movements. Effective feedback mechanisms are essential for continuous improvement, and citizen engagement empowers individuals by providing them with the knowledge, skills, and confidence to actively participate in civic life. Digital citizen engagement has expanded, with online platforms, social media, and mobile applications providing new avenues for citizens to connect with government and express their opinions (Firmstone & Coleman 2015).

Digital Communication in Citizen Engagement

Social Media Platforms: The use of Twitter by government agencies for real-time communication. Agencies often share updates, and emergency information, and engage in direct conversations with citizens (Liu, Lai & Xu 2018). For instance, during natural disasters, local authorities use Twitter to provide timely updates and address citizen concerns.

Government Websites and Portals: Interactive websites that allow citizens to access government services and information. For instance, a city's official website might have an online portal for residents to pay taxes, register for services, and submit feedback, streamlining administrative processes (Hanisch, Goldsby, Nicolai Oehmichen 2023).

Mobile Applications: The development of mobile apps to enhance citizen-government interactions (311 App, Year). For instance, 311 apps enable residents to report non-emergency issues, such as potholes or streetlight outages, directly to local authorities. These apps provide a user-friendly interface for citizens to engage with government services on their smartphones (Ochara & Mawela 2015).

Email Campaigns: Political campaigns and government initiatives often utilize email communication to reach a broad audience. Candidates may send newsletters, updates, and policy briefs directly to constituents' email inboxes, fostering ongoing communication and information dissemination (Liu, Lai & Xu 2018).

Online Forums and Discussion Platforms: Government-sponsored online forums that facilitate citizen discussions on policy matters. These platforms provide a space for citizens to express opinions, ask questions, and engage in constructive dialogues. For instance, a municipal government might host a forum where residents can discuss proposed urban development projects (Panagiotopoulos, Barnett, Bigdeli & Sams 2016).

Social Media Campaigns: Government-led social media campaigns to raise awareness and gather public input through agencies maintaining active social media. For instance, a health department's Facebook page may share health tips, updates on disease outbreaks, launch a social media campaign to promote vaccination during flu season, utilizing engaging content, hashtags, user-generated content to reach a wider audience and answer citizen queries, creating a direct channel for communication ((Ochara & Mawela 2015).

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Text Messaging Services: Government-initiated text messaging services for critical alerts and notifications. For example, emergency services can send text alerts to citizens in specific geographic areas about impending natural disasters, ensuring timely and direct communication (Ivwighren, Igben & Ogwezi 2023). These examples illustrate the diverse ways in which digital communication technologies are employed to facilitate citizen engagement, ranging from real-time interactions on social media to the convenience of mobile applications and the inclusivity of online forums according to the study of Ranzatti, Rosini, Silva, Palmisano and Guevara (2019).

Opportunities of Digital Communications for Enhanced Public Administration and Service Delivery

Digital communication technologies offer numerous opportunities for improved public administration and service delivery (Reysen & Hackett 2017). Social media platforms like Twitter, Facebook, and Instagram enable real-time communication with citizens, enhancing the overall citizen experience. Government websites and portals, like CityName.gov, provide a centralized hub for citizens to access government services and information. Mobile applications like the 311 app enable residents to report non-emergency issues directly to local authorities, enhancing accessibility and citizen engagement as postulated by Siyam, Alqaryouti and Abdallah (2020). Electronic government services, such as online tax filing and license renewals, further enhance efficiency. Government-initiated email campaigns automate routine tasks, reduce paperwork, and optimize resource allocation, promoting time management, faster delivery, and continuous engagement (Udovenko 2022; Nam & Park 2017). These technologies enable governments to create more responsive, transparent, and citizen-centric systems that adapt to the evolving needs of the digital age (Zheng 2017).

Challenges with the Application of Digital Communication Technologies in Public Administration

Digital communications technologies are increasingly being used in government interactions, raising concerns about privacy in the opinion of Kshetri and Defranco (2020). Governments collect vast amounts of data, including personal details and behavioral patterns, to improve service delivery and policy effectiveness. However, this data collection raises ethical questions about the scope, purpose, and ethical use of citizens' private information (Karwatzki, Dytynko, Trenz & Veit 2017). The deployment of digital communication technologies also exposes sensitive citizen information to potential security vulnerabilities, such as data breaches and ransomware attacks. Transparency and accountability are crucial for maintaining public trust. Cross-border data flows and jurisdictional issues complicate efforts to ensure consistent privacy protections (Buck & Ralston 2021). Emerging technologies, such as facial recognition, biometrics, and artificial intelligence, introduce new privacy concerns (Corvalán 2018). Balancing security and privacy are an ongoing challenge, requiring careful consideration of legal, ethical, and societal implications. To navigate these challenges, governments must adopt a proactive approach, including robust data protection laws, transparent communication about privacy practices, user-friendly consent mechanisms, continuous cybersecurity measures, and ongoing efforts to educate citizens about their rights and privacy implications (Buck & Ralston 2021; Boulianne 2018). A holistic approach that combines technological innovation with a focus on equity, privacy, security, and user-centric design may also be helpful.

Theory

Digital Governance Model

The term "Digital Governance Model" refers to the idea of a strategic approach to public administration or government that is used to manage, regulate, and leverage digital technologies in a responsible manner for their work, service delivery, and interactions with the general public (Almeida, Filgueiras & Gaetani 2019). Public policy norms, methods, institutions, and instruments are in place that mandate the effective use of digital resources and the creation of an environment that is transparent, creative, and supportive. According to Ravšelj, Umek, Todorovski and Aristovnik (2022), the adoption of a holistic strategy, encompassing policy, organizational, technical, and cultural aspects, is crucial in assisting governments in managing the intricacies of digital transformation and realizing the potential of digital governance. The "Opportunities and Complexities of Digital Communication Technologies in Public Administration" are

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greatly aided by the Digital Governance Model because it is a framework that provides structure for understanding how governments can effectively handle and make use of digital technologies in the administration field is necessary. Digital communication technologies have the power to transform government operations, service delivery, and citizen interaction (Zwitter & Hazenberg 2020).

The Study Area

The Delta State Ministry of Basic and Secondary Education, based in Asaba, Nigeria, oversees the entire education system, from elementary to secondary levels. Its goals include improving facilities, curriculum, and human resources, digitalization, and creative teaching techniques. The ministry also addresses teacher shortages and professional development, aiming to improve education quality. Its strategy includes creating an information-friendly learning and schooling zone, promoting inclusivity, and integrating digital communication technology (Delta State Ministry of Basic and Secondary Education Office, 2024).

Research Method

This cross-sessional research used a structured survey questionnaire to gather data from 152 participants, with 146 analyzed. The survey focused on access to digital communication technologies, government engagement, transparency, accountability, data security concerns, and digital literacy. The sample was stratified randomly to ensure representation across demographic groups. The survey was administered electronically, with clear instructions and informed consent. Statistical analysis used descriptive statistics and Stata15.0 software app to get the mean output. Decision is where X= calc $\leq$ 3.00, outcome is negative but where X= $\geq$ 3.00, outcome is positive.

Data Presentation

Demographic Data

Table 1: Respondent Gender, Age and Education Level

GENDER	Male	Female			
	76 (52%)	70 (48%)			
AGE	18-24	25-34	35-44	45-54	55+
	14 (9.5%)	43(29.4%)	52 (32.4%)	24 (16.4%)	13 (8.9%)
EDUCATION LEVEL	High School or Below	College/University	Postgraduate		
	34 (23.2%)	74 (51%)	38 (26%)		

Table 1: The data provides demographic information on the sample, including gender, age, education level, and gender. The majority of respondents are male (52%), with a slightly preponderance of males. The majority of respondents are aged 35-44, with a mature demographic profile. The majority of respondents have completed high school (23.2%), with 51% attending college or university and 26% having a postgraduate degree. This data helps in understanding the demographic makeup of the population and potential influencing factors in relation to the study's goals or research questions.

Research Questions 1: Is there any impact of digital communication technologies on citizen engagement?

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Table 2: Respondent Value on Impact of Digital Communication Technologies

1	Questionnaire Items	RESPONDENT VALUES					MEAN OUTPUT		OUT-COME
		Strongly Disagree	Dis-agree X=2	Un-decided X=3	Agree X=4	Strongly Agree X=5	∑	_ X	
		F/FX	F/FX	F/FX	F/FX	F/FX	F/FX		
A	*Digital communication technologies have increased citizens' engagement with government initiatives and policies*	12	19	23	39	56	146	3.80	POSITIVE
		12	38	69	156	280	555		
B	*Citizens feel more empowered to participate in public decision-making processes due to digital communication platforms*	11	14	26	48	47	146	3.72	POSITIVE
		11	28	78	192	235	544		
C	*Digital communication technologies have improved the transparency and accountability of government actions and decisions*	5	14	31	57	39	146	3.76	POSITIVE
		5	28	93	228	195	549		
D	*Government responsiveness to citizen feedback and concerns has increased with the adoption of digital communication technologies*	8	18	27	42	51	146	3.54	POSITIVE
		8	36	81	168	225	518		
E	*Digital communication technologies have facilitated better communication and dialogue between citizens and government officials*	12	18	26	37	53	146	3.69	POSITIVE
		12	36	78	148	265	539		

Table 2 above data reveals that digital communication technologies have a strong positive impact on citizen participation, with a mean score of 3.80 3.70, 3.72, 3.76, and 3.69. Most respondents agree that digital platforms encourage citizen collaboration and engagement in government processes. However, there is a slight discrepancy in perceptions with the mean score of 3.54, possibly due to differences in backgrounds or perceptions. Information and communication technologies are crucial for public sector institutions, offering effective communication channels, enhancing decision-making, soliciting input, and monitoring public affairs.

Research Question 2: What specific opportunities exist for streamlining administrative processes and delivering services more responsively in Delta State Ministry of Basic and Secondary Education?

Table 3: Respondent Value on Opportunities of Digital Communications Technologies

1	***Questionnaire Items***	***RESPONDENT VALUES***					***MEAN OUTPUT***		***OUT-COME***
		Strongly Disagree	Dis-agree X=2	Un-decided X=3	Agree X=4	Strongly Agree X=5	∑	_ X	
		F/FX	F/FX	F/FX	F/FX	F/FX	F/FX		

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A	Digital communication technologies can enhance administrative efficiency within the Ministry by automating routine tasks and reducing paperwork	9 9	12 24	33 99	49 196	43 215	146 543	3.71	POSITIVE
B	Digital platforms enable faster communication and information dissemination, facilitating more responsive service delivery to stakeholders	11 11	16 32	29 87	53 212	37 185	146 527	3.60	POSITIVE
C	Online learning platforms and digital resources offer opportunities for innovative teaching methods and personalized learning experiences for students	8 8	16 32	22 66	52 208	48 240	146 554	3.79	POSITIVE
D	Digital communication technologies provide avenues for enhanced collaboration and coordination among different departments within the Ministry	13 13	21 42	26 78	42 168	44 220	146 521	3.56	POSITIVE
E	The integration of digital communication technologies can improve transparency and accountability in educational governance practices	6 6	12 24	31 93	57 228	40 200	146 551	3.77	POSITIVE

Table 3 data shows that digital communication is a promising method for improving public administration and service delivery. The mean score of 3.71 indicates many opportunities for leveraging digital technology. However, some respondents between the mean scores of 3.60 and 3.56, disagree with providers on the number of opportunities provided by digital communication which is likely as a result of the research participants' divergent opinions or life experiences. Addressing these issues is crucial to realize the potential for improved governance and the use of public services.

Research Question 3: What are the main challenges with the use of digital communication technologies in public administration in Delta State Ministry of Basic and Secondary Education?

Table 4: Respondents Rating on Challenges with The Application Of Digital Communication.

1	***Questionnaire Items***	***RESPONDENT VALUES***					***MEAN OUTPUT***		***OUT-COME***
		Strongly Disagree	Dis-agree X=2	Un-decided X=3	Agree X=4	Strongly Agree X=5	∑	_ X	
		F/FX	F/FX	F/FX	F/FX	F/FX	F/FX		
A	Limited access to digital infrastructure and internet connectivity in rural areas poses challenges for	10 10	10 20	41 123	45 180	40 200	146 533	3.65	POSITIVE

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	implementing digital communication initiatives								
B	Data privacy and security concerns surrounding the collection and storage of sensitive information on digital platforms need to be addressed	8 8	13 26	29 87	49 196	47 235	146 552	3.78	POSITIVE
C	Uneven levels of digital literacy among stakeholders, including students, teachers, and administrators, hinder the effective utilization of digital communication technologies	8 8	18 36	25 75	44 176	51 255	146 550	3.76	POSITIVE
D	Insufficient training and capacity-building programs for staff to effectively utilize digital tools and platforms for administrative tasks and service delivery	7 7	15 30	30 90	47 188	47 235	146 550	3.76	POSITIVE
E	Resistance to change and traditional bureaucratic practices may impede the adoption and integration of digital communication technologies within the Ministry	12 12	19 38	26 78	39 156	50 250	146 534	3.65	POSITIVE

Table 4 ratings show that respondents face challenges in using digital communication in public administration, with moderate recognition of these barriers with the mean outcome of 3.71, 3.60, 3.79, 3.56 and 3.77. They view social media as a medium-sized problem, and their responses fluctuate. The study suggests that these challenges should be considered and reduced to make digital channels more accessible in public administration, rather than a major barrier.

Analysis: Descriptive Statistics

Table 5: Summarize Idctce Odcepasd Cadctpa

VARIABLE	OBS	MEAN	STD. DEV.	MIN	MAX
IDCTCE	146	3.989041	.5955147	2.2	5
ODCEPASD	146	3.751712	.5859391	2	5
CADCTPA	146	3.865753	.633375	2	5

Table 5 above provide the following encoded summaries of all the theme variables: Impact of Digital Communication Technologies on Citizen Engagement (IDCTCE), Opportunities of Digital Communications for Enhanced Public Administration and Service Delivery (ODCEPASD) and Challenges with the Application of Digital Communication Technologies in Public Administration (CADCTPA). From the data generated**,** OBS - Observed STD.DEV stands for "Standard Deviation," Minimum and Maximum scores 146 gathered data was analyzed as shown in the table above and the values of the mean, which displays the average value of the data utilized in the research, are 3.989041, 3.751712, and 3.865753 in this instance, demonstrating an appropriate response range in accordance with Mcleod, (2023), that ≥ 3 is an acceptable mean output.

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Discussion

This study examined how the digital communication technologies affect the citizen participation is found to be with an acceptable mean value of 3.989041, showing a generally positive perception of the impact of these technologies on citizen engagement. This implicitly reveals that the respondents realize the role played by digital platforms in enabling the citizen participation and interaction in the management processes. The consequence is in line with Pyrma (2019)'s study on digital communication which has brought many community engagements opportunities. The finding also corroborates Firmstone and Coleman (2015) study on public engagement in local government: the voices and the power of citizens in digital communication is pronounced in how communication technologies democratize the space.

The survey that confirms the mean value of 3.751712 in the context of discovering the digital communication applications for public administration and service provision indicates that implementers of the digital communication in public administration are acknowledged amongst the respondents. The opportunities include more effectiveness, ease of access, and better communication between the government agencies and the citizens. The result agreed with the standpoint of Siyam and others (2020) that Twitter can predict relation with the audience. Additionally, Reysen and Hackett (2017) found that digital communication technologies can also be a stepping stone towards global citizenship.

The study aimed at figuring out the huddles in using digital communication technologies in public administration. The mean output of 3.865753 served to consolidate the belief that the digital communication technologies could have negative effects, especially in the new formats of the information flow, and modes of engagement. These problems is consistent with the work of Buck and Ralston (2021); Kshetri and Defranco (2020) who are looking at issues of privacy and data security, jurisdiction or implementation hurdles.

Taking these findings into account, it can be concluded that the implementation of digital communication technologies in public administration has both pros and cons, but ultimately it is a critical aspect in terms of citizen engagement. The research underscores the necessity of looking into issues and exploiting the opportunities to realize the untapped power of digital technologies in the improvement of governance and service delivery. The results confirm that Lee, Kim, Park, Park and Oh (2018) theory that digital governance model can enable socio-technical transformation and civic engagement in government, while overcoming the current shortcoming of the finite state model. This also complies with the opinion of Ravšelj, Umek, Todorovski and Aristovnik (2022) that digital governance has got substantial development from the traditional public services to the citizen-oriented e-services and smart services, supporting evidence-based policymaking.

Conclusion

The study gives the essential arguments concerning the current state of digital communication technologies in the public administration of the Ministry of Basic and Secondary Education and calls for the adoption of strategies by policy makers and administrators which would help to capitalize on the opportunities and to provide solutions to the problems identified. This way, the ministry can increase their efficiency and ability to interact with the workforce, to improve the quality of services they provide and to promote transparency and accountability in administration.

Recommendations

- Given the positive perception towards digital communication technologies, broadening internet connectivity and improving digital communication systems in the ministry can ensure digital services availability and workforce participation.

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- Investing in capacity building and training programs for public administrators and staff is crucial to fully utilize digital communication technologies. These programs should enhance digital literacy, communication skills, and effective use of digital tools for public service delivery.

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