

The Public Service Digitalization in the Philippines Towards a National Program to Capacitate Digital Frontliners

Reyner Aaron M. Villaseñor

Public Administration Program, University of Perpetual Help - Graduate School

Abstract

The rapid advancement of technology has driven a global transformation in public service delivery. In the Philippines, efforts to digitalize public services are crucial for inclusive development and efficient governance. This study, titled "The Public Service Digitalization in the Philippines Towards a National Program to Capacitate Digital Frontliners," examines this transformation through the experiences of government employees, known as digital frontliners. These individuals are key to implementing and managing digital technologies across public sectors.

Using a mixed-method research design, the study integrates descriptive, correlative-comparative, and phenomenological approaches to gather quantitative and qualitative data. A total of 400 digital frontliners participated in a survey, while 10 key informants were interviewed. This approach provides a comprehensive analysis of the digitalization process, focusing on demographic profiles, challenges, job satisfaction, and service effectiveness.

The theoretical framework includes the Theory of Digital Government Transformation, the Unified Theory of Acceptance and Use of Technology (UTAUT), and Capacity Building and Development Theory. These frameworks help understand the dynamics of public service digitalization, technology acceptance, and the importance of capacity building.

Key findings reveal a diverse workforce among digital frontliners, significant challenges such as infrastructure limitations and digital literacy disparities, and varying levels of job satisfaction. The research underscores the need for robust digital infrastructure, tailored training programs, and streamlined administrative processes. It also highlights the importance of public-private collaboration.

The study proposes a national program to enhance the capabilities of digital frontliners through continuous professional development and innovation support. This program aims to improve digital public services, making them more efficient, transparent, and accessible. The findings provide a foundation for evidence-based policymaking and strategic planning, contributing to the Philippines' digital transformation and inclusive growth.

Introduction

Public service delivery in the Philippines was undergoing a significant transformation driven by rapid digital changes reshaping society. With the nation addressing various socioeconomic challenges and a growing population, leveraging technology to enhance public service delivery had become essential. This study focused on the Philippines' efforts to digitalize public services, aiming to balance the potential of digital innovation with the ongoing obstacles to inclusive progress.

The main contribution of this study was to analyze the complexities involved in digitalizing public services in the Philippines. By exploring the country's digital landscape, the study aimed to reveal the intricate linkages between technological advancements, governance practices, and societal requirements. This research sought to provide insights into how these factors interacted to influence public service delivery in the digital era.

The Philippine government's digital transformation strategy was built on an extensive legal framework designed to facilitate this change. Key legislative pieces included the Data Privacy Act of 2012, the Ease of Doing Business and Efficient Government Service Delivery Act of 2018, and Republic Act No. 10844, which established the Department of Information and Communications Technology. These laws, along with the Philippine Digital Strategy and the eGovernment Interoperability Framework, formed a strong foundation supporting the nation's goal of digitizing public service delivery. They underscored the government's commitment to fostering an environment conducive to digital innovation, ensuring privacy and security, and optimizing services.

Current research highlighted the dual nature of digital transformation in the Philippines: the immense opportunities it presented and the significant challenges it faced. Studies by Moreno and Zabala (2022) highlighted the obstacles faced by municipal governments in the Zamboanga Peninsula, such as inadequate infrastructure and knowledge, alongside the opportunities for enhancing service provision and citizen engagement through digitization. Similarly, research by Sedighi et al. (2022) and Magcope et al. (2023) confirmed improvements in service effectiveness and user satisfaction from digital governance, but also pointed out issues like low digital literacy, data privacy concerns, and internet accessibility in rural areas, necessitating a nuanced approach to digitalization.

Building on these observations, the current study aimed to navigate the complexities of public service digitalization in the Philippines. Through a review of literature, interviews with key stakeholders, and an analysis of empirical data, this research sought to provide valuable insights into the potential and challenges of delivering digital public services. It aimed to advance scholarly debate and evidence-based policymaking, fostering a better understanding of how digital transformation could address the diverse needs of the Filipino people.

This study aimed to broaden awareness of the digitalization landscape in Philippine public services and provide inclusive and efficient methods that could be implemented across the nation's diverse regions. By examining the relationships between technology, governance, and societal demands, the study intended to offer a comprehensive analysis to guide the development of digital transformation strategies. The ultimate goal was to enable a more equitable and efficient digitization of public services, ensuring that all Filipinos could benefit from technological advancements, thereby promoting better governance, social equity, and economic growth.

To achieve this goal, the research was conducted across the Philippines' varied geographic regions, examining the unique opportunities and challenges each area presented in the context of digital public service delivery. This study aimed to capture the range of experiences and perspectives that characterized the digitalization landscape nationwide, from the bustling metropolis of Metro Manila to the remote barangays in mountainous regions.

The expected outcome of this research was the development of a national program to empower digital frontliners. This program would address the need for improved digital literacy and technical skills, identified as a critical gap by the study. By emphasizing the importance of human capital in driving technological innovation and ensuring that the benefits of digital transformation were equitably

distributed, this program offered a strategic approach to promoting sustainable and inclusive digitalization throughout the Philippines.

Methodology

This study employed a mixed-method research design that combined descriptive, correlative-comparative, and phenomenological approaches to analyze the digitalization of public services in the Philippines from the perspective of government employees, termed digital frontliners. The descriptive aspect focused on profiling digital frontliners based on age, gender, education, and other demographic factors. It also identified key challenges such as infrastructure limitations, digital literacy disparities, and bureaucratic obstacles. Additionally, the study explored the experiences and job satisfaction of these employees. The correlative-comparative analysis examined the relationships between the profiles of digital frontliners, the challenges they faced, and their perceptions of digitalization. The phenomenological inquiry provided in-depth insights from selected digital frontliners, offering a nuanced understanding of their experiences.

The population for this study consisted of 1,810,428 government employees, with a sample size of 400 randomly selected to ensure diverse representation for the quantitative part. Purposive sampling was employed for the qualitative component to select participants with relevant experiences. This approach allowed the study to cover a wide range of government offices and demographic backgrounds. The respondents included government employees involved in public service digitalization, particularly IT officers and key informants from various sectors. Out of the total, 400 employees participated in the quantitative survey, while 10 key informants provided qualitative insights.

A self-made survey questionnaire was used as the research instrument, comprising five parts: profiling, challenges, experiences, perceptions, and job satisfaction. The survey included both quantitative ratings and qualitative open-ended questions. A pilot test and expert validation ensured the reliability and clarity of the instrument. Data collection was conducted via Google Forms, with initial and follow-up email invitations sent to targeted government agencies. Organic Intelligence, Inc. assisted in the data collection process. In-depth interviews were conducted to gather qualitative data, enriching the findings from the survey.

For data analysis, quantitative data were coded, tallied, and classified using descriptive statistics such as mean, percentage, and standard deviation. Inferential statistics, including Pearson correlation, Spearman correlation, and ANOVA, were applied using SPSS software to examine relationships and differences among variables. Thematic analysis was used for qualitative data, identifying patterns and themes to provide a comprehensive understanding of the digitalization of public services. This combination of methods offered a holistic view of the challenges and experiences of digital frontliners in the Philippines.

Result and Discussion

The Profile of the Respondents: The profile of digital frontliners in the Philippines' public service digitalization efforts reveals a predominantly middle-aged and female workforce with a high level of educational attainment. The majority of respondents fall within the age range of 40 to 49 years old, representing 44.3% of the participants. This group is followed by those aged 50-59 years (17.5%) and those under 30 years (17.0%). Females make up 59.8% of the workforce, while males account for 39.3%. In terms of educational background, a significant portion of the digital frontliners are highly educated, with 67.0% being college graduates. Furthermore, 25.0% hold master's degrees, and 1.0% have doctoral degrees, indicating a strong presence of advanced expertise within the workforce. The years of service

among respondents are diverse, with the largest group (44.5%) having 7 to 10 years of experience, followed by those with 4 to 6 years (17.8%) and less than 1 year (13.5%).

Corroborating research supports these findings. A study by Alam et al. (2022) highlights significant gender differences in digital transformation efforts among SMEs, with women being more active in digital initiatives. Similarly, Grebnyak and Novozhenina (2022) found that women are more likely to use digital platforms for various services, emphasizing their critical role in digital transformation. Additionally, Li et al. (2022) document a positive association between workforce education levels and innovation outputs, underscoring the importance of a well-educated workforce for successful digital transformation. Shen et al. (2022) emphasize the need for diverse experience levels to enhance resilience and adaptability in public service delivery, aligning with the varied years of service among the respondents. Overall, these studies reinforce the significance of the demographic and professional profiles observed among the digital frontliners in the Philippines' public service.

Description of Digital Frontliners Towards Primary Challenges Hindering the Success of Public Service Digitalization in the Philippines: The study identifies infrastructure limitations as a major challenge hindering public service digitalization in the Philippines. Respondents agree that poor internet connectivity, frequent power outages, and inadequate digital infrastructure in remote areas severely restrict the effective delivery and expansion of digital public services. These issues are underscored by mean scores ranging from 4.06 to 4.53, with outdated hardware and software being the highest concern. Additionally, insufficient funding and support for infrastructure upgrades further exacerbate these challenges. The overall consensus highlights the need for substantial investment in upgrading internet connectivity, power reliability, and technological infrastructure to ensure sustainable digital public services.

Digital literacy disparities are perceived as the most critical challenge, with a strong agreement among respondents. The lack of digital literacy leads to unequal access and utilization of digital public services, compounded by limited awareness and understanding of digital platforms and inadequate training programs. Socioeconomic factors, such as income and education levels, also contribute to these gaps, impacting the effectiveness of digital service delivery. Addressing digital literacy gaps is crucial for ensuring equitable access to digital public services for all citizens.

Bureaucratic obstacles also pose significant challenges. Respondents agree that bureaucratic red tape and lengthy approval processes delay the implementation of digital initiatives, and resistance to change within government agencies impedes the adoption of digital technologies. Inefficient procurement processes and budget allocation further hinder the timely acquisition and deployment of digital infrastructure. Complex regulatory frameworks and compliance requirements create barriers to innovation, and a lack of interdepartmental coordination limits the scalability and effectiveness of digital initiatives. Addressing these bureaucratic challenges requires streamlining processes, enhancing interdepartmental collaboration, and fostering a culture of agility and flexibility within government agencies.

The primary challenges hindering public service digitalization in the Philippines include infrastructure limitations, digital literacy disparities, and bureaucratic obstacles. Digital literacy disparities are seen as the most critical issue, followed by infrastructure limitations and bureaucratic obstacles. Addressing these challenges involves substantial investment in improving digital infrastructure, targeted digital literacy programs, and streamlining bureaucratic processes to foster a more agile and responsive public service environment. Studies by Hjort and Tian (2021), Kumar et al. (2022), Shaw (2023), Miller et al. (2023),

and Suardana (2023) support these findings, highlighting the importance of robust digital infrastructure, digital literacy, and efficient bureaucratic processes for successful digitalization efforts.

Description of Digital Frontliners on Their Perception, Experiences, and Job Satisfaction in Delivering Digitalized Public Service to Their Clientele: Digital frontliners generally have a positive perception of delivering digitalized public services. They moderately agree that digitalization enhances overall service efficiency (mean = 3.27). They feel confident in utilizing digital tools and platforms (mean = 3.83) and perceive digitalized public services as providing greater accessibility and convenience (mean = 4.28). Additionally, respondents agree that digitalization has improved the quality of interactions with clientele (mean = 3.88). The overall composite mean of 3.82 indicates a general agreement that digitalized public services positively impact service delivery. These findings suggest a need for continuous evaluation and refinement of digital systems to consistently meet efficiency goals.

The experiences of digital frontliners in delivering digitalized public services are mixed yet generally positive. Respondents moderately agree that they frequently encounter technical challenges (mean = 3.40), but they find it rewarding to witness the positive impact of digital services on clientele (mean = 3.87). They agree that they receive adequate support and training (mean = 3.68) but also experience frustration due to the complexity of digital systems (mean = 3.93). The composite mean score of 3.72 suggests that, despite challenges, frontliners generally have a positive experience and feel supported in their roles. Continuous technical support, training, and system enhancements are crucial for improving the delivery of digital public services.

Digital frontliners express general satisfaction with their jobs in delivering digitalized public services. They moderately agree on being satisfied with the level of autonomy and flexibility (mean = 3.41) and feeling valued and recognized (mean = 3.39). They find fulfillment in assisting clientele through digital channels (mean = 3.87) and are satisfied with the support and resources provided (mean = 3.57). Respondents are also motivated to improve their skills and knowledge (mean = 3.68). The composite mean of 3.58 indicates that while satisfaction is generally positive, there are areas for improvement to enhance overall job satisfaction. Ensuring consistent access to necessary resources and providing continuous learning opportunities can further foster job satisfaction and effectiveness.

Digital frontliners in the Philippines generally have positive perceptions, experiences, and job satisfaction in delivering digitalized public services. They recognize the benefits of digitalization in enhancing service efficiency, accessibility, and interaction quality. While their experiences indicate some technical and complexity-related challenges, the overall support and training provided help mitigate these issues. Job satisfaction is positive but slightly lower compared to perceptions and experiences, highlighting areas for improvement such as autonomy, recognition, and support. Addressing these factors will be crucial for maintaining and enhancing the effectiveness and engagement of digital frontliners. Studies by Whillans et al. (2023) and Konovalova (2021) support these findings, emphasizing the importance of autonomy, flexibility, and robust recognition programs in enhancing job satisfaction and overall well-being.

The Philippine Public Service Digitalization as Perceived by the Digital Front Liners: Digital frontliners generally agree on the positive impacts of digitalization on public services in the Philippines. Respondents believe that the digital services provided by the public sector are efficient (mean = 4.26), and they are satisfied with the speed and responsiveness of these digital platforms (mean = 3.57). The use of technology to streamline bureaucratic processes is also seen as efficient (mean = 3.68). Digitalization contributes positively to national development (mean = 3.97), and efforts have reduced bureaucratic red tape (mean = 3.84). The composite mean of 3.86 indicates a positive view of the digitalization of public

services in terms of efficiency, transparency, and accessibility. However, the variability in responses suggests a need for continuous improvements to ensure consistent service efficiency across all platforms and regions.

The findings indicate that digital frontliners generally agree that digitalization has positively impacted transparency and accountability in public service delivery. Respondents moderately agree that digitalization efforts are transparent (mean = 3.24), and they agree that digitalization has enhanced the transparency of government processes (mean = 3.77). The accountability of public officials due to digitalization efforts is perceived to have improved (mean = 4.37), and it is easier to monitor government spending and budgets through digital platforms (mean = 3.88). Digitalization has also facilitated greater citizen participation in public discussions and decision-making (mean = 4.38). The composite mean of 3.93 reflects a positive view of the impact of digitalization on transparency and accountability.

Digital frontliners agree on the positive aspects of accessibility and security in digitalized public services. They believe that digital services are accessible to all citizens (mean = 3.82) and that accessing important government information and services online is easy (mean = 3.84). Digitalization has made public services more accessible to marginalized communities (mean = 3.75), and the interfaces of digital platforms are user-friendly (mean = 3.81). The security and privacy protection offered by digital services are perceived as safe and secure (mean = 3.63). The composite mean of 3.77 indicates a positive view of the accessibility and security of digitalized public services. Continuous efforts are needed to ensure that accessibility is consistent across all regions and demographics.

Digital frontliners in the Philippines generally agree on the positive impacts of public service digitalization, particularly in terms of transparency, efficiency, and accessibility. Transparency is ranked highest (mean = 3.93), followed by efficiency (mean = 3.86) and accessibility (mean = 3.77). The overall composite mean of 3.85 reflects a consensus on the benefits of digitalization in enhancing public service delivery. These findings highlight the success of digitalization initiatives while also indicating the need for ongoing efforts to improve accessibility to ensure that all citizens benefit equally from digital public services.

Studies by Lin et al. (2023) and Ha (2022) support these findings. Lin et al. highlight that digitalization efforts have significantly improved the transparency and efficiency of public services, emphasizing the importance of customer-centric approaches and continuous enhancement of digital platforms. Ha discusses the socioeconomic and resource efficiency impacts of digital public services, finding that digitalization contributes to operational efficiency and resource optimization in public service delivery. These studies reinforce the positive impacts of digitalization on public service efficiency, transparency, and accessibility as perceived by digital frontliners in the Philippines.

Correlation Result: The results of the correlation analysis provide significant insights into the primary challenges hindering the success of public service digitalization in the Philippines. Infrastructure limitations were found to negatively impact the perceived efficiency ($r = -0.153$, $p = 0.002$) and accessibility ($r = -0.187$, $p = 0.000$) of digital public services, highlighting a critical area for improvement. These findings suggest that the effectiveness of digital services is heavily reliant on robust and reliable infrastructure. This is consistent with global research, which underscores the importance of strong infrastructure in supporting digital transformation initiatives. Ensuring stable internet connectivity and a consistent power supply are foundational steps that can significantly enhance the delivery and reach of digital public services.

Digital literacy disparities exhibit significant positive correlations with the perceived efficiency ($r = 0.166$, $p = 0.001$), transparency ($r = 0.212$, $p = 0.000$), and accessibility ($r = 0.103$, $p = 0.039$) of public service digitalization. This underscores the importance of digital literacy in maximizing the benefits of digital services. Higher levels of digital literacy among the population lead to better user experiences and more effective utilization of digital platforms, thereby improving overall service outcomes. These results suggest that investments in digital literacy programs can play a pivotal role in enhancing public engagement and satisfaction with digital public services, facilitating more inclusive and equitable access. Bureaucratic obstacles present a substantial barrier to the effective implementation of digital public services, as evidenced by their significant negative correlations with efficiency ($r = -0.403$, $p = 0.000$), transparency ($r = -0.290$, $p = 0.000$), and accessibility ($r = -0.270$, $p = 0.000$). These findings highlight the detrimental impact of bureaucratic red tape and complex administrative processes on digital service delivery. Streamlining bureaucratic processes and reducing red tape are essential strategies to overcome these obstacles and improve the overall effectiveness of digital public services. This aligns with global experiences where simplifying administrative procedures has been critical in realizing the full potential of digitalization efforts. Addressing these challenges through policy reforms and process optimizations can lead to a more agile and responsive public service environment.

ANOVA Result: The study identified significant gender-based differences in perceptions of primary challenges in the digitalization of public services. Regarding infrastructure limitations, there was a notable positive difference between those who preferred not to disclose their gender compared to both females (Mean Difference = 0.98) and males (Mean Difference = 1.03). Conversely, females and males perceived fewer infrastructure limitations compared to those who preferred not to disclose their gender, with significant negative differences of -0.98 and -1.03, respectively. For digital literacy disparities, significant positive differences were found between females and those who preferred not to disclose their gender (Mean Difference = 1.29) and between males and those who preferred not to disclose their gender (Mean Difference = 1.41). This indicates that respondents who preferred not to disclose their gender perceived more digital literacy disparities compared to both females and males. In contrast, significant negative differences of -1.30 and -1.41 were observed for females and males, respectively, compared to those who preferred not to disclose their gender.

Age-based differences in perceptions also revealed significant insights. For infrastructure limitations, a significant positive difference was observed between respondents aged 50-59 years and those aged 60 years and above (Mean Difference = 0.49), indicating that older respondents perceived fewer infrastructure limitations. In terms of digital literacy disparities, younger respondents perceived fewer disparities compared to those aged 60 years and above. Specifically, significant negative differences were found between those less than 30 years old (Mean Difference = -0.18), those aged 30-39 years (Mean Difference = -0.22), those aged 40-49 years (Mean Difference = -0.31), and those aged 50-59 years (Mean Difference = -0.15) compared to those aged 60 years and above. Additionally, respondents aged 60 years and above perceived more digital literacy disparities compared to younger age groups, with significant positive differences ranging from 0.15 to 0.31. For bureaucratic obstacles, a significant positive difference was found between respondents less than 30 years old and those aged 30-39 years. These findings underscore the need for targeted interventions that address the unique challenges faced by different demographic groups in the digitalization of public services.

Challenges encountered by selected digital front liners about the Philippines' public service digitalization: The qualitative portion of this study utilized in-depth interviews to understand the

experiences and perspectives of digital front-liners in the Philippines' public service digitalization. Key themes and findings from these interviews revealed significant insights into the digital transformation efforts, goals, perceived impacts, success stories, challenges, and needs for government support and policy. Digital transformation efforts were prominently highlighted by participants who detailed their roles in integrating digital systems, such as payment systems and AI for healthcare, into government operations. They emphasized the critical importance of ensuring successful integration to streamline processes and improve service delivery. Participants noted significant improvements in efficiency and service delivery due to digital transformation, making public services more accessible and reducing the need for physical visits. Success stories included implementing QR-payment systems in local markets and maintaining public service operations during the pandemic, demonstrating the transformative power of digital tools. The primary goals of digitalization, as expressed by participants, centered on improving efficiency, reducing physical movement, and enhancing service delivery. Setting clear, measurable objectives was deemed essential for ensuring successful digital initiatives. Digitalization has significantly impacted public services by streamlining operations, reducing paperwork, and enhancing service delivery, making them more efficient and convenient. It has also promoted financial inclusion and supported economic growth, as evidenced by the successful adoption of digital payment systems and other initiatives. Participants shared notable success stories, such as increased digital transactions, improved tax remittance processes, and the successful implementation of online learning platforms. These initiatives have led to tangible benefits for public services and streamlined operations, underscoring the positive impact of digital transformation. However, several challenges and difficulties were encountered during these efforts. Low digital literacy among government employees and the public emerged as a critical barrier, highlighting the need for comprehensive training programs and a change in mindset. Infrastructure challenges, including outdated technology, slow internet connectivity, and power source limitations, also hindered digital transformation efforts. Lengthy procurement processes often resulted in outdated technologies, emphasizing the need for streamlined procedures and clear policies supported by legislative backing. Collaboration and coordination challenges were evident in harmonizing ICT projects across various government agencies, necessitating cohesive policies and inter-agency collaboration. Continuous education and structured training programs were identified as essential for equipping stakeholders with the necessary skills and knowledge for digital transformation. Strategic partnerships with financial and mobile technology providers can enhance support for these initiatives. Participants also suggested recognition programs for digitized agencies to motivate stakeholders to embrace digital transformation. Government support and policy were deemed crucial for facilitating effective digital transformation. Participants emphasized the need for government-funded training, quality technology, improved infrastructure, and recognition programs. Clear policies, legislative backing, and strong political support were highlighted as essential for sustaining digital transformation efforts. Addressing these needs requires a multifaceted approach, including legislative support, adequate budget allocation, continuous education, and strategic partnerships. Overall, the study underscores the importance of improving digital literacy, investing in better technology and infrastructure, streamlining procurement processes, fostering inter-agency collaboration, and ensuring continuous education and training to drive and sustain digital transformation efforts in the Philippines' public services.

Policy recommendations that can be proposed to further enhance public service digitalization efforts in the Philippines, particularly in national program to capacitate digital front liners: To improve the digitalization of the public service in the Philippines, particularly through a national program to skill digi-

tal frontliners, several policy recommendations are proposed.

First, establish government-funded training programs that provide ongoing training in digital literacy, technology trends, AI, data applications, and automation. These programs should be developed in collaboration with financial institutions, technology providers and educational institutions to ensure quality education. Investments in digital infrastructure are critical, especially for improving internet connectivity in underserved areas and providing high-quality equipment and equipment to government offices and educational institutions. Structured change management and communication strategies are essential to guide stakeholders through the digital transformation process, address resistance to change and ensure stakeholder engagement.

Legislative support is needed to ensure proper budget allocation for IT infrastructure and mandate continuous improvement of digital literacy and infrastructure. Recognition and benchmarking initiatives should be implemented to incentivize digital adoption and publicize the successes of agencies that excel in digital transformation. Cross-agency collaboration should be encouraged to harmonize digital initiatives and develop a centralized digital transformation strategy. Comprehensive training programs for the public should be implemented to improve digital literacy and ensure accessibility, with additional support for vulnerable groups such as older people and people in rural areas. Finally, mechanisms should be established to regularly monitor and evaluate digital initiatives, as well as feedback loops to refine and improve digital transformation efforts.

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