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**E-GOVERNANCE IN SOUTH AFRICA: BARRIERS AND ENABLERS OF VIRTUAL EVALUATION
IN THE PUBLIC SECTOR****Lesedi Senamele Matlala***School of Public Management, Governance and Public Policy, University of Johannesburg, South Africa**E-mail: lmatlala@uj.ac.za**Received 15 March 2025; accepted 12 May 2025; published 30 June 2025*

Abstract. Virtual Evaluation (VE) has emerged as a valuable tool in public sector monitoring and evaluation (M&E), offering opportunities to enhance efficiency, accessibility, and cost-effectiveness. The increasing emphasis on digital transformation in South Africa has led to growing interest in integrating VE into public sector evaluation processes. Despite this interest, there is limited empirical research on the factors that influence its adoption, particularly in government institutions responsible for M&E. Existing studies primarily focus on the benefits of VE, with little attention given to the challenges public officials face in implementing it effectively. This study aims to investigate the barriers and enablers affecting the adoption of VE in South Africa's public sector. Using a mixed-methods approach, the study draws insights from workshops hosted by the South African Monitoring and Evaluation Association (SAMEA), a survey with public sector officials, and key informant interviews with senior government evaluators. The Technology Acceptance Model (TAM) and Institutional Theory guide the research, which helps explain the technological and organizational dynamics influencing VE adoption. Preliminary analysis suggests that successful VE implementation depends on technological readiness, institutional support, and regulatory alignment. The study explores challenges related to digital skills, infrastructure, policy clarity, and stakeholder engagement, highlighting areas that require targeted interventions. Based on the findings, the study recommends capacity-building programs to improve digital proficiency among public officials, investment in infrastructure to support VE platforms, and policy frameworks to standardize and institutionalize VE across government departments. By addressing these challenges, public institutions can enhance the effectiveness of M&E practices and leverage digital innovations for improved governance. This study contributes to the evolving discourse on digital transformation in M&E, offering practical insights for policymakers, evaluators, and researchers working to advance evidence-based decision-making in South Africa's public sector.

Keywords: Virtual Evaluation; Public Sector Evaluation; Digital Transformation; Monitoring and Evaluation (M&E); South Africa; Technology Acceptance Model; Institutional Theory; Evaluation Capacity-Building; Policy Innovation; E-Governance.

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1. Introduction

Monitoring and Evaluation (M&E) continue to serve as essential tools in the public sector, offering a foundation for accountability, transparency, and evidence-based policymaking. With the increasing complexity of service delivery and heightened demands for efficiency, digital innovations—particularly Virtual Evaluation (VE)—have emerged as promising alternatives to traditional, face-to-face approaches (Funnell & Rogers, 2011; Bamberger & Mabry, 2020; Dossou et al., 2023). VE leverages digital platforms such as cloud-based dashboards, mobile data collection, and real-time analytics to streamline evaluation processes and broaden participation. These capabilities are especially relevant in contexts like South Africa, where logistical and resource constraints often limit large-scale evaluation exercises. By overcoming geographic barriers and reducing costs, VE offers a potentially transformative shift for public sector M&E (UNICEF, 2023).

The integration of VE across Africa has gained momentum in the wake of broader e-governance reforms and the impact of the COVID-19 pandemic (Wirajing & Nchofoung, 2023). Digital tools are increasingly being deployed to collect and process data in sectors such as education, health, and agriculture, albeit unevenly (Letouzé, 2013; United Nations Global Pulse, 2016). In South Africa, however, progress has been patchy (Olumekor et al., 2025). While departments such as Health and Basic Education have experimented with digital platforms, the lack of comprehensive policy frameworks and coordinated infrastructure investments has hindered widespread adoption (OECD, 2022). Global experiences emphasize that the successful institutionalization of VE requires more than just technology—it depends on political will, cross-sector collaboration, and targeted capacity-building (UNDP, 2023). These preconditions are often weak or inconsistently applied within the South African public service, where digital literacy gaps and fragmented IT systems persist (Paul & Adams, 2024).

Despite the increasing use of digital tools in public administration, the adoption of VE in South Africa remains underdeveloped. Studies show that while some public institutions have adapted to virtual M&E environments, many still revert to conventional methods due to a combination of bureaucratic inertia, regulatory ambiguity, and technological under-preparedness (Raftree, 2013; Waxa & Gwaka, 2021). While the Technology Acceptance Model (TAM) explains part of this phenomenon—citing perceived usefulness and ease of use as key factors (Moodley, 2024)—Institutional Theory helps illuminate the broader organizational and systemic forces that discourage innovation in the public sector (Gregory & Wilson, 2018). These include rigid administrative norms, limited interdepartmental coordination, and political resistance to transparency-enhancing tools like VE (African Evaluation Association, 2022). Together, these factors create a constrained environment that limits the uptake of digital evaluation methodologies.

This study critically assesses the key enablers and barriers to VE implementation within South Africa's public sector, drawing from empirical data collected through national surveys, interviews with M&E practitioners, and secondary sources. As global literature suggests, digital transformation in public governance is not solely a matter of technological readiness—it also hinges on institutional culture, regulatory frameworks, and policy coherence (World Bank, 2023). The South African case highlights the disconnect between digital innovation rhetoric and on-the-ground capacity realities, with VE often introduced without sufficient training, funding, or systems integration. By applying both TAM and Institutional Theory, this research explores the micro-level perceptions of evaluators and macro-level dynamics shaping VE adoption. The findings aim to inform strategic interventions that can help reposition VE from a peripheral innovation to a standard practice within public sector M&E frameworks.

The remainder of the paper is as follows. The next sections review existing literature on Virtual Evaluation, focusing on global trends, theoretical frameworks, and empirical studies relevant to the South African context. This is followed by an outline of the research design and methodology, detailing data collection strategies and analytical approaches. The subsequent section presents the findings from the survey, interviews, and SAMEA workshops, identifying key barriers and opportunities for VE adoption. The following discussion explores the implications of the findings, linking them to existing literature and theoretical perspectives. The final section provides policy recommendations and conclusions, highlighting the need for institutional reforms, technological investments, and targeted capacity-building initiatives to facilitate the successful integration of VE into the public sector.

2. Conceptual Framework

Virtual Evaluation (VE) refers to using digital technologies and virtual methodologies to conduct M&E processes remotely, reducing reliance on traditional, in-person data collection and analysis. VE encompasses a range of digital tools, including mobile surveys, cloud-based data management systems, real-time analytics, and video conferencing platforms, all designed to enhance the efficiency, accessibility, and scalability of evaluation

practices (Bamberger & Mabry, 2020). Unlike conventional evaluation methods that require physical presence and extensive logistical arrangements, VE leverages technology to facilitate data collection, stakeholder engagement, and evidence-based decision-making across different geographical locations (Funnell & Rogers, 2011). This approach has gained relevance in contexts where in-person evaluations are constrained by cost, time, or mobility restrictions, making it particularly beneficial for large-scale and cross-sectoral evaluations.

VE operates at the intersection of digital transformation and evaluation science, drawing on innovations in data collection, storage, and analysis to improve the quality and efficiency of assessments. The methodological flexibility of VE allows for integrating quantitative and qualitative evaluation techniques, enabling evaluators to conduct structured surveys, real-time interviews, and participatory assessments remotely. Furthermore, VE is closely linked to broader trends in e-governance and digital public administration, where governments and organizations increasingly adopt technology-driven solutions to enhance accountability and decision-making (United Nations Global Pulse, 2016). While the definition of VE continues to evolve with advancements in digital technology, at its core, it represents a paradigm shift in evaluation methodology, emphasizing efficiency, inclusivity, and adaptability in response to the changing demands of public sector evaluation.

3. Analytical Framework

The analytical framework guiding this study is rooted in two complementary theories: TAM and Institutional Theory. These frameworks help explain the individual-level adoption of VE technologies and the broader organizational and systemic factors influencing their implementation in the public sector. TAM, developed by Davis, posits that the adoption of new technologies is driven by two key factors: perceived usefulness (PU) and perceived ease of use (PEOU) (Kowalska-Pyzalska, 2024).

In the context of VE, PU refers to how effective public officials perceive virtual methodologies to be in enhancing evaluation processes. At the same time, PEOU reflects how they find VE platforms easy to use and integrate into their existing workflows. Several studies have found that public officials are more likely to embrace VE if they believe it improves evaluation efficiency and decision-making without requiring excessive effort or technical expertise (Anadon et al., 2016; McKinsey Digital, 2017). However, TAM alone does not fully account for the organizational, regulatory, and infrastructural barriers that influence VE adoption, necessitating an additional institutional perspective.

Institutional Theory provides a broader organizational lens to understand why public sector institutions either facilitate or resist adopting VE technologies. This theory posits that organizational behaviour is shaped by formal structures (laws, policies, and regulations) and informal pressures (norms, culture, and political dynamics) (Cheng et al., 2017; Gregory & Wilson, 2018). Many public institutions are characterized by rigid bureaucratic structures and risk-averse cultures, which can slow the adoption of digital innovations such as VE. Institutional Theory highlights the role of regulatory frameworks, leadership support, and interdepartmental coordination in determining whether VE is institutionalized as a standard evaluation practice or remains a peripheral tool used only in specific contexts (Gupta, Dasgupta & Gupta, 2008; United Nations Global Pulse, 2016). In this regard, government commitment to ICT infrastructure investment, digital literacy programs, and clear VE policies is crucial in enabling sustainable adoption.

By integrating TAM and Institutional Theory, this analytical framework allows for a multi-level examination of VE adoption in South Africa's public sector. It enables an assessment of public officials' perceptions (micro-level analysis) and the broader institutional environment shaping VE implementation (macro-level analysis). This dual approach is essential given that technological adoption in government is not solely an individual decision but is embedded within complex institutional structures (Shapiro, 2016). The analytical framework will guide the study in exploring how digital evaluation tools are perceived, how public institutions shape adoption decisions, and

what systemic changes are required to support VE integration into South Africa's public sector evaluation ecosystem.

4. Literature Review

The integration of ICT into public administration has revolutionized how governments deliver services, engage with citizens, and evaluate policy performance. VE—a digitally enabled method of conducting M&E remotely—has gained traction for its ability to facilitate real-time data collection, reduce costs, and improve accessibility (Bonfiglio et al., 2023; UNICEF, 2023). As governments shift toward digital governance frameworks, VE stands out as a mechanism that can address logistical challenges and support more inclusive evaluation practices (Garcia & Kotturi, 2020; Fröhlich et al., 2024). Yet, despite its potential, VE remains underutilized in many public sectors, particularly in the Global South. This underutilization stems from challenges such as data security, ethical concerns, digital exclusion, and weak regulatory frameworks (Facca et al., 2020; Petersson & Breul, 2020).

Countries such as Canada, South Korea, and Brazil have advanced digital M&E by leveraging tools like artificial intelligence, blockchain, and big data analytics to enhance real-time performance assessments and ensure transparency in public governance (Jasper et al., 2023). For example, Canada's blockchain-backed evaluation systems enable secure, tamper-proof data management, while South Korea uses AI-based platforms to assess health and urban planning policies (Leeuw, 2020; Gregory & Wilson, 2018). Brazil and Mexico have also made strides with open-data and geospatial monitoring systems in Latin America in social and environmental programs, respectively (Cintron & Montrosse-Moorhead, 2022). These examples demonstrate that VE is scalable and adaptable to various governance settings, providing institutional buy-in and technological readiness (Reid, 2023).

In contrast, VE implementation across much of sub-Saharan Africa remains fragmented due to infrastructure gaps, digital illiteracy, and limited policy support (Hejnowicz & Chaplowe, 2021). While mobile-based evaluations have been piloted in countries like Kenya and Ghana, the lack of sustainable investment in VE systems limits their scalability (Mobenzi, 2020). Despite national digital strategies and growing interest in e-governance in South Africa, VE uptake has been sporadic and mainly driven by donor-funded pilot initiatives. Institutional inertia, rigid procurement systems, and outdated regulatory frameworks hinder full-scale adoption. Moreover, many departments operate with legacy systems incompatible with cloud-based tools, posing a technical and financial barrier to digitizing evaluation practices.

Emerging research suggests that one of the critical enablers of VE adoption is the ability to align digital tools with existing policy mandates and operational needs. Studies by Bamberger and Mabry (2020) and Davies et al. (2018) emphasize the importance of developing flexible evaluation frameworks integrating ethical data management, participatory design, and adaptive learning. In VE, real-time analytics and AI-enhanced platforms can offer deeper insights into program effectiveness. Still, their implementation must be guided by strong legal and ethical standards—particularly concerning data privacy, equity, and consent (Facca et al., 2020). This is particularly relevant when working with marginalized populations or politically sensitive contexts where digital exclusion and trust deficits may compromise data integrity.

The evolving landscape of digital evaluation calls for a paradigm shift in how public institutions conceptualize and execute M&E. As the COVID-19 pandemic illustrated, digital platforms are not just alternatives but necessary instruments for continuity in evaluation under conditions of uncertainty (UNICEF, 2023). However, transitioning to VE demands more than adopting new technologies—it requires institutional transformation, sustained capacity-building, and a rethinking of accountability mechanisms in the digital era (Garcia & Kotturi, 2020; McKinsey Digital, 2017). While international models provide valuable lessons, localized approaches tailored to governance contexts like South Africa are essential for meaningful VE implementation. Bridging the

gap between potential and practice in VE requires multisectoral collaboration, adequate funding, and a commitment to continuous learning and policy coherence.

5. Context and Scope of Virtual Evaluation in the Public Sector

In this study, the assessed VE refer specifically to government-led evaluations of public programmes and policies across various sectors, including health, education, social development, economic development, and environmental governance. These evaluations were conducted virtually using online surveys, remote interviews, digital data dashboards, and video conferencing platforms like MS Teams and Zoom. Government officials reported using VE primarily to monitor program performance, assess service delivery outcomes, evaluate policy implementation progress, and conduct stakeholder consultations. For instance, in the education sector, VE was used to assess school readiness interventions and teacher development programmes, while in health, it was applied to assess the rollout of community-based care strategies. These examples demonstrate that VE is not limited to administrative functions but is increasingly used to monitor complex, field-based interventions and policy reforms. Logistical constraints, cost-efficiency considerations, and a broader push for digital transformation in public service delivery largely drove the shift to virtual modes.

6. Methodological Framework

6.1 Research Design and Rationale

This study adopts a qualitative-dominant mixed-methods design to investigate the barriers and enablers influencing the adoption of VE in South Africa's public sector. This methodological approach was selected to capture both individual experiences and systemic challenges shaping VE implementation across varying levels of government. Mixed-methods research is particularly suited for studying digital innovation within public administration, where adoption decisions are informed by personal perceptions, organizational cultures, and regulatory dynamics (Fetterman et al, 2015; Creswell, 2017). The design integrates three core components: a structured online survey, one-on-one semi-structured interviews, and analysis of workshop discussions with M&E professionals. These instruments allow for triangulated insights into how VE is understood, utilized, and contested within public institutions.

6.2 Data Collection Methods

Primary data was collected between July and October 2024. Ethical clearance for the study was obtained from the University of Johannesburg's Faculty of Humanities Research Ethics Committee (Protocol No: 24PMGPP157). All data collection activities were conducted virtually using digital platforms such as Google Forms for surveys and Microsoft Teams or Zoom for interviews and workshops. The survey served a dual purpose: it captured quantitative perceptions of VE from M&E professionals and functioned as a recruitment tool for the qualitative phase. Out of the full dataset, responses from 98 public-sector officials were isolated for this study to ensure sector-specific relevance. These respondents were drawn from national, provincial, and municipal departments.

Four semi-structured interviews were conducted with eight government officials representing different tiers and departments within the public sector. These interviews enabled a deep dive into leadership perspectives on VE policy alignment, budgetary priorities, institutional resistance, and digital readiness. In addition, transcripts from three multi-stakeholder virtual workshops were analyzed, focusing specifically on contributions from public officials. Although the workshops were attended by representatives from academia, NGOs, and the private sector, the current analysis maintains a narrow lens on government insights to preserve thematic consistency. Both the interviews and workshops offered rich, dialogic spaces for capturing the lived experience and strategic reflections of officials tasked with implementing or overseeing VE initiatives.

6.3 Data Analysis Techniques

Qualitative data from interviews and workshops were thematically analyzed using NVivo 12, applying Braun and Clarke's (2006) six-phase framework. This approach enabled systematic coding and the identification of recurrent themes such as infrastructure limitations, digital literacy gaps, policy fragmentation, and stakeholder resistance. Patterns were cross-validated across sources to enhance analytical rigour. Survey data was processed in SPSS, where descriptive statistics were used to highlight trends in attitudes toward VE's feasibility, perceived effectiveness, and institutional constraints. While inferential statistical methods were not prioritized due to the sample size, the descriptive results complemented and contextualized the qualitative findings.

6.4 Validity, Reliability and Ethical Considerations

Multiple strategies were employed to ensure the credibility and trustworthiness of the study. Data triangulation across three distinct sources (surveys, interviews, and workshops) allowed for cross-verification of emerging insights. Researcher reflexivity was also maintained throughout the process to minimize bias in interpretation. Participation in the study was entirely voluntary, and all respondents provided informed consent before engagement. Confidentiality was upheld through anonymized coding (e.g., GOV012, GOV021) and secure data storage on password-protected devices. No personal identifiers were retained in the analysis or reporting processes, and participants were informed of their right to withdraw at any point without penalty. The University of Johannesburg's ethical approval process ensured that all procedures adhered to standard academic protocols, affirming the study's ethical integrity and compliance.

7. Findings and discussions

7.1 Demographic profiles of the participants

The demographic profile of the 22 government officials who participated in the interviews and 40 respondents from the survey provides key insights into the composition, experience, and expertise of public sector evaluators engaging with VE. Most interview participants were Program/Project Managers (10 respondents) and Professional Evaluators (8 respondents), indicating that most individuals involved in VE discussions occupy operational and managerial roles within government-led evaluations. Researchers (4 respondents) were comparatively fewer, highlighting a limited engagement of research-driven evaluation specialists in policy implementation processes. The survey respondents showed a similar distribution, with 14 Program/Project Managers and 12 Professional Evaluators comprising the largest segments. Experience levels varied, with most senior officials (more than 10 years of experience) occupying managerial positions, which could influence attitudes toward VE adoption given their reliance on traditional evaluation methodologies. Conversely, early-career professionals (1-5 years of experience) were primarily found in Researcher and Public Service Evaluator roles, indicating that younger professionals may be more receptive to technology-driven evaluation processes.

The gender and education composition of participants further reflects key structural patterns within the public sector evaluation space. Female officials (11 interviewees and 19 survey respondents) were likelier to occupy mid-level evaluation roles, while male officials dominated senior leadership positions. Educational backgrounds suggest high expertise among government evaluators, with most participants holding Master's (15) or Honours (12) qualifications. Notably, PhD holders (6 respondents) were concentrated in the education and social development sectors, reinforcing the idea that policy-oriented evaluation roles attract higher academic qualifications. The geographic distribution of participants showed a strong concentration in Gauteng, Western Cape, Free State, and KwaZulu-Natal, highlighting the centralization of government evaluation functions in administrative hubs. These findings suggest that while VE adoption is influenced by institutional positioning, experience, and digital literacy, younger and mid-career professionals may be key drivers of technological transformation in public sector evaluation.

Table 1. Government Officials – Comprehensive Demographic Overview

Category	Interviews (n=22)	Survey (n=40)
Role in Evaluation		
Program/Project Manager	10	14
Professional Evaluator	8	12
Researcher	4	6
Public Service Evaluator	0	4
Traditional Civil Servant	0	4
Years of Experience		
1-5 years	5	8
6-10 years	7	12
More than 10 years	10	20
Gender		
Male	11	21
Female	11	19
Highest Education Level		
PhD/NQF 10	4	6
Masters/NQF 9	9	15
Honours/NQF 8	7	12
Diploma/NQF 6	2	7
Sector of Evaluation		
Education	7	12
Health	6	10
Social Development	5	8
Environment	4	6
Economic Development	3	7
Geographic Distribution		
Gauteng	8	14
Western Cape	5	9
Free State	4	6
KwaZulu-Natal	3	6
Limpopo	2	5

7.2 Understanding and Adoption of Virtual Evaluation

The understanding and adoption of VE within the public sector remain uneven, with significant gaps between theoretical awareness and practical implementation. As illustrated in Figure 1, a large portion of survey respondents demonstrated some level of familiarity with VE, with 44% rating their understanding as *Good* and 32.6% as *Fair*. However, only 16% rated their understanding as *Excellent*, while a small but notable group (9%) reported *Poor* or *Very Poor* comprehension. This discrepancy suggests that while many government officials

acknowledge the principles of VE, fewer have hands-on experience applying these methods in their evaluation processes. This finding is reinforced by data on VE adoption, where only 30% of respondents reported incorporating VE methodologies into their government evaluation projects.

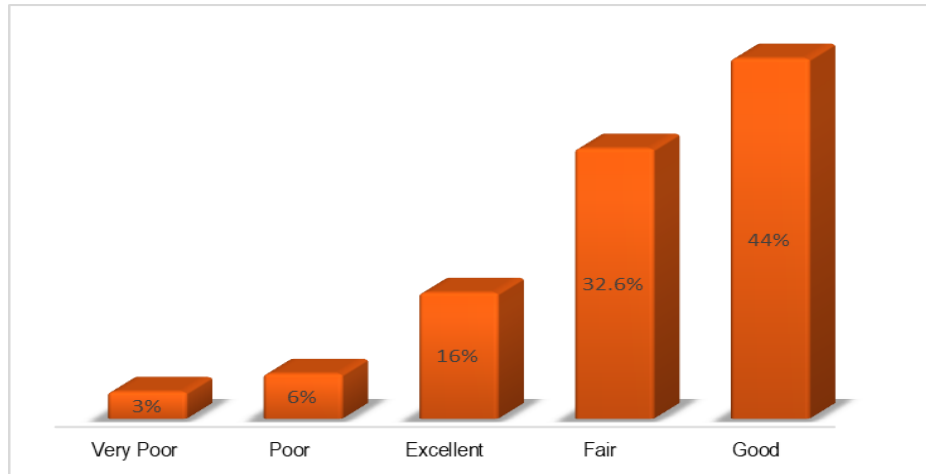


Figure 1. Understanding of Virtual Evaluation

Source: own production

When asked about their previous use of VE, 48% of the respondents indicated that they had integrated VE methodologies into government evaluation projects at least once (see Figure 2). In comparison, 13% of respondents had never fully conducted a VE but had participated in discussions about its potential implementation. Interviews revealed that officials who had conducted VE processes tended to work in the education, health, and social development sectors, where digital monitoring tools are more commonly piloted. However, many participants cited inconsistent internet connectivity, lack of digital literacy, and resistance to technology adoption as key barriers to fully transitioning to VE models.

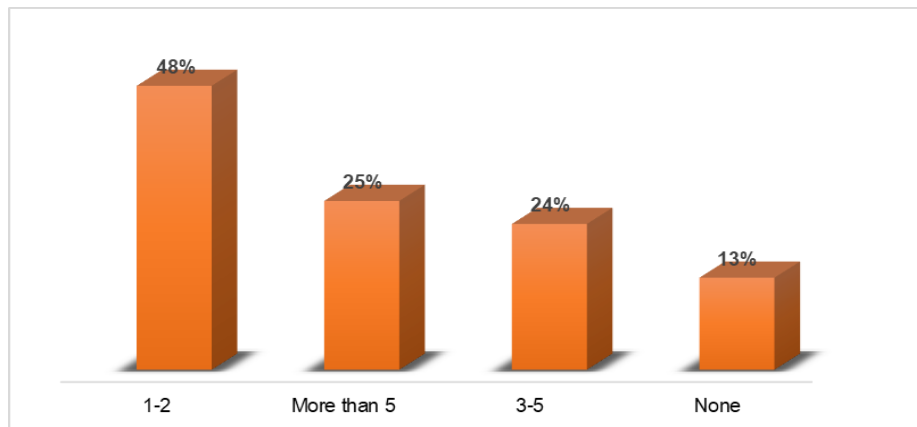


Figure 2. Incorporation of Virtual Evaluation in Projects

Source: own production

Before presenting the detailed findings, it is useful to summarize the main barriers and enablers influencing the adoption of VE in South Africa's public sector. These factors were derived from survey results, interviews, and workshop discussions with public officials. The barriers include institutional resistance to change, technological and infrastructure constraints, limited digital capacity, data security concerns, and cultural resistance to virtual

engagement. Conversely, enablers include increasing recognition of VE's effectiveness, supportive policy frameworks, growing technological investments, and the willingness of some departments to integrate VE into future evaluation initiatives. Table 2 below provides a consolidated overview of these key factors.

Table 2. Overview of Barriers and Enablers to VE Adoption in the Public Sector

Barriers to VE Adoption	Enablers to VE Adoption
Institutional and bureaucratic resistance to change	Perceived effectiveness and feasibility of VE
Technological limitations and infrastructure gaps	Institutional and policy support for VE adoption
Digital literacy and public sector capacity deficits	Technological advancements and infrastructure investments
Methodological and data security concerns	Future intent to use VE in public sector evaluations
Cultural and stakeholder resistance to VE	

7.3 Barriers to the Effective Virtual Evaluation Adoption

Adopting VE in the public sector is hindered by several challenges that impact its effectiveness and implementation. As depicted in Figure 3, most respondents (89.1%) acknowledged experiencing barriers in implementing VE, reinforcing concerns about the feasibility of digitizing evaluation in government settings. Table 3 further breaks down these barriers, with technological limitations such as unstable internet connectivity and compatibility issues emerging as the most prominent challenge, cited by 20 respondents. This is followed by a lack of digital literacy (10), underscoring the reality that many public officials and stakeholders are inadequately trained to utilize VE tools effectively. Concerns about data privacy and regulatory compliance (5) point to risks associated with handling sensitive evaluation data on virtual platforms. Cultural barriers (3), such as discomfort with digital interactions in traditionally interpersonal contexts, further reveal that VE adoption is not only a technical issue but also a socio-cultural one.

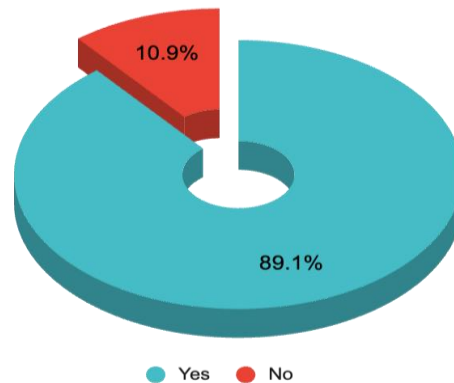


Figure 3. Annual Challenges Experienced in Virtual Evaluation
Source: own production

The qualitative responses reinforced the survey data by exposing less quantifiable yet significant barriers such as the erosion of interpersonal connection in digital spaces, limited participant engagement, and distrust of remote methodologies. For instance, issues like low response rates, bias due to digital exclusion, power cuts, and difficulties in rapport-building during virtual interviews were all cited, each by one or two respondents. These may appear statistically marginal, but when triangulated with qualitative insights, they underscore the cumulative weight of seemingly minor yet persistent operational disruptions. Of note is the lack of stakeholder willingness to engage in VE—reported by at least one participant—which speaks to a broader scepticism about the legitimacy of virtual tools in high-stakes public evaluations. These findings reveal a landscape where technological readiness, institutional culture, and social trust intersect to shape the trajectory of VE implementation. The following

sections delve deeper into technological, institutional, methodological, and cultural barriers to unpack the nuanced and often systemic issues obstructing VE institutionalization in South Africa's public sector.

Table 3. Challenges Faced in Conducting Virtual Evaluations (VE)

Challenge	Count
Technological limitations (e.g., unstable internet connection, compatibility issues with digital platforms)	20
Lack of digital literacy among stakeholders (e.g., difficulty navigating online tools, limited access to technology)	10
Concerns about data privacy and security (e.g., protecting sensitive information shared online, ensuring compliance with data protection regulations)	5
Cultural sensitivities (e.g., challenges in adapting virtual evaluation methods to diverse cultural contexts)	3
Elements of interpersonal connection lost using online methods	2
Elements of interpersonal connection lost using online methods	2
Low response rates from participants	2
Bias in online samples due to digital accessibility differences	1
Inconsistent responses and participant hesitation due to privacy concerns	1
Difficulty in building rapport with focus groups and interviewees	1
Loadshedding and power cuts affecting digital meetings	1
Lack of willingness from stakeholders to engage in VE	1
Limitations in conducting direct observations in VE	1

7.3.1 Institutional and Bureaucratic Resistance to Change

One of the primary barriers to adopting VE in the public sector is institutional inertia and resistance to change, which are deeply rooted in government bureaucracies. Findings indicate that senior officials, particularly those with over ten years of experience, are hesitant to shift from traditional evaluation methodologies, prioritizing direct engagement and structured oversight. The reliance on long-standing bureaucratic procedures makes integrating VE challenging, as officials perceive it disrupts conventional oversight mechanisms. Survey data supports this notion, with 35 out of 40 respondents identifying limited face-to-face interaction as a key disadvantage of VE (Table 3). The preference for in-person evaluations aligns with the structured nature of public sector accountability mechanisms, where interpersonal interactions, contextual observations, and relationship-building are considered vital components of the evaluation process. According to participant GOV012, a senior official from Gauteng, *"Virtual evaluations challenge the traditional way we assess programs. Without direct engagement, verifying the validity of findings and building trust with stakeholders is harder."* This sentiment illustrates a broader concern that digital methods may weaken the rigour of public sector evaluations by reducing direct oversight and engagement with beneficiaries.

Table 4. Perceived Disadvantages of Virtual Evaluation (VE)

Disadvantage	Count (n=40)
Limited face-to-face interaction	35
Technical challenges	32
Concerns about data privacy and security	28
Potential biases in online data collection	30

Beyond institutional resistance, the bureaucratic structure of government evaluations reinforces hierarchical control over data collection and reporting. Traditional evaluations allow for centralized authority over fieldwork, data validation, and decision-making, while VE introduces decentralized participation that some officials perceive as a threat to institutional control. This is evident in the reluctance of senior officials to embrace digital

transformation due to concerns over data security, inconsistencies in virtual engagement, and the inability to physically monitor project sites. As participant GOV027, a department head from the Western Cape, noted, *"Virtual evaluations decentralize authority. Instead of our teams overseeing every aspect of data collection, evaluators work remotely, and we don't always have control over what's being reported."* This resistance is not unfounded, as public sector evaluations involve politically sensitive programs where data manipulation or misrepresentation can have significant policy implications. Studies on public sector digital transformation indicate that government agencies are slower to adopt technology-driven processes due to risk aversion and concerns about accountability mechanisms (Heeks, 2018; Dammak et al., 2023). In this context, VE is perceived as an approach that shifts power away from central agencies, reducing their ability to oversee and validate findings in real time.

Another major institutional barrier to VE adoption is scepticism surrounding the credibility and reliability of digital data collection methods. Traditional evaluations in the public sector emphasize on-the-ground observations, direct beneficiary interactions, and comprehensive site visits, all of which VE methods struggle to replicate. Survey findings reveal that 30 out of 40 respondents cited potential biases in online data collection as a critical disadvantage of VE, further reinforcing concerns about data integrity. The perception that digital methodologies may exclude marginalized communities, particularly those with limited digital access, raises concerns about selection bias and the representativeness of evaluation findings. As Participant GOV019, an evaluation manager in Free State, explained, *"With virtual evaluations, you don't always get the full picture. Remote data collection doesn't capture the contextual realities of different locations, making it harder to assess real program impact."* This perspective is consistent with previous research on digital governance, which suggests that public sector evaluations require mixed-method approaches to ensure comprehensive data collection (Bonfiglio, 2023). While VE offers efficiency and scalability, its perceived lack of contextual depth makes it less attractive for policymakers who rely on evaluations to inform budgetary and policy decisions.

Slow digital adaptation and institutional culture further exacerbate public sector resistance to VE. Many government agencies continue to rely on paper-based reporting, in-person site visits, and bureaucratic procedures that are fundamentally incompatible with the flexibility required for VE. Even when new digital tools are introduced, their integration into government systems is often delayed due to administrative bottlenecks and senior officials' lack of digital skills. As Participant GOV034, a mid-career evaluator from KwaZulu-Natal, explained, *"Government institutions don't change overnight. Even when introducing new evaluation tools, it takes years before they become standard practice."* This slow adaptation is widely recognized in public sector digital transformation research, emphasizing the need for strong policy incentives, training programs, and leadership buy-in before technological innovations are widely adopted (OECD, 2020). Findings from this study suggest that institutional inertia, resistance to decentralized evaluation models, concerns about digital data integrity, and the slow pace of bureaucratic reform are the most significant barriers to VE adoption in the public sector.

7.3.2 Technological Limitations and Infrastructure Gaps

Public sector institutions, particularly in developing contexts, continue to face severe technological limitations that hinder the effective adoption of VE. The findings of this study reveal that technological barriers are among the most significant constraints preventing the institutionalization of VE in government evaluation processes. Table 3 highlights that 20 respondents cited unstable internet connectivity and software compatibility issues as key challenges, reflecting broader infrastructure deficiencies in government offices. Many public institutions rely on outdated ICT infrastructure, with slow internet speeds, weak cybersecurity measures, and fragmented digital systems making it difficult to conduct VE efficiently. This aligns with broader discussions in the literature that emphasize the digital divide as a key determinant of technology adoption (Shevlane et al., 2023; United Nations Global Pulse, 2016). While developed countries have successfully integrated cloud-based platforms, AI-driven evaluation tools, and real-time data analytics in public sector monitoring, many developing nations struggle with even the most basic ICT capabilities, limiting their ability to transition to virtual methodologies (Reid, 2023).

In South Africa, infrastructure disparities between urban and rural government institutions exacerbate these challenges. Interviews with public officials revealed that while metropolitan-based departments have relatively stable internet access, municipal and provincial offices—particularly in Free State, Limpopo, and Eastern Cape—continue to experience frequent disruptions in connectivity. Participant GOV021, a government evaluator from Free State, explained: *“Our internet is unreliable, especially in remote government offices. If we can’t maintain a stable connection, how do we expect people to engage meaningfully in virtual evaluations?”* This issue is particularly relevant given the increasing reliance on cloud-based VE tools that require continuous internet access for data collection, analysis, and reporting. The TAM suggests that perceived ease of use plays a significant role in determining technology adoption; however, when infrastructure limitations create technological inefficiencies, public officials are less likely to perceive VE as a viable alternative to traditional evaluation methods (Anadon et al., 2016). This further supports the notion that while digital tools offer clear advantages in enhancing evaluation efficiency, their adoption remains contingent on institutional capacity and ICT readiness (McKinsey Digital, 2017).

Beyond internet instability, software incompatibility and digital literacy gaps were also identified as critical barriers to VE implementation. Public sector evaluation systems often operate on legacy software that lacks integration with modern VE platforms, resulting in frequent technical failures. As Participant GOV033, an IT specialist supporting government evaluation systems, noted: *“Government departments rely on outdated internal systems that don’t integrate well with modern virtual evaluation tools. This means that even when there’s an attempt to go digital, we still face technical failures.”* This underscores the challenge of transitioning from paper-based or manually conducted evaluations to digital frameworks, particularly in bureaucratic institutions that are slow to modernize their operational systems. Findings from the survey further reinforce this, with 10 respondents identifying a lack of digital literacy among stakeholders as a major barrier to VE adoption (Table 3). This challenge is consistent with existing research, highlighting that public officials, especially senior personnel who have spent decades working with traditional evaluation methods, often resist technological change due to inadequate training and exposure (Hejnowicz & Chaplowe, 2021). While TAM emphasizes perceived usefulness as a key driver of adoption, the absence of structured digital capacity-building programs in government institutions means that many officials lack the technical proficiency required to engage with VE tools effectively, leading to continued reliance on traditional, in-person evaluation approaches.

In addition to infrastructure deficiencies and software challenges, load shedding and power outages present another systemic barrier to VE adoption in South Africa’s public sector. Participant GOV026, a government evaluator from Limpopo, noted: *“We’ve lost virtual evaluation data multiple times due to unexpected power cuts. Government systems are not designed to safeguard digital data effectively.”* Unlike private-sector organizations that invest in backup power solutions and secure data storage mechanisms, government institutions often lack contingency plans to ensure the resilience of VE systems. This is a critical limitation, as VE relies on uninterrupted digital access for evaluation sessions, stakeholder engagement, and real-time data processing. Institutional Theory (Cheng et al., 2017) suggests that both formal policies and informal norms shape organizations. In the case of VE, the absence of institutional mechanisms to prioritize digital security and reliability has resulted in persistent technological inefficiencies. Government procurement and budgeting processes have not sufficiently prioritized ICT investment, further delaying the digital transformation of public sector evaluations (McKinsey Digital, 2017). Participant GOV018, a government procurement officer, described the challenge as follows: *“We can’t just buy software when we need it. It takes months of approvals, tender processes, and compliance checks before anything gets implemented. By the time we get the tools, they are already outdated.”* This highlights the bureaucratic inefficiencies in public sector procurement, where slow administrative processes make it difficult for government institutions to keep pace with technological advancements. Compared to private sector organizations, which adopt digital tools based on competitive needs and efficiency gains, the public sector remains constrained by procedural delays and regulatory hurdles that prevent the timely adoption of VE.

The combination of technological constraints, digital literacy gaps, and bureaucratic inefficiencies suggests that VE adoption in the public sector is not merely a technical challenge but a deeply embedded structural issue. While ICT-driven evaluation models have been successfully integrated into governance frameworks in countries such as Estonia, Canada, and South Korea (Gregory & Wilson, 2018), South Africa's experience reflects the broader struggles of developing nations attempting to modernize public administration. The literature emphasizes that VE has the potential to enhance efficiency, reduce costs, and improve stakeholder participation in policy evaluations (United Nations Global Pulse, 2016), yet without addressing infrastructure limitations and institutional resistance, its implementation will remain inconsistent. The findings suggest that beyond investment in ICT, government institutions must also implement structured training programs, digital security protocols, and procurement reforms to support the long-term viability of VE. As public-sector evaluations increasingly demand real-time data and adaptive decision-making, overcoming these barriers will be critical in ensuring that VE can be effectively institutionalized within South Africa's evaluation landscape.

7.3.3 Digital Literacy and Public Sector Capacity Deficits

The widespread lack of digital literacy among government officials and key stakeholders is a significant barrier to adopting VE in the public sector. The ability to navigate digital platforms, interpret data from virtual sources, and effectively conduct remote evaluations is not evenly distributed across public institutions. The study findings indicate that 10 respondents specifically cited digital literacy issues, with many government officials reporting difficulty using digital evaluation tools. The TAM underscores that the perceived ease of use of technology is a critical determinant of its adoption. When government officials struggle with digital literacy, their PEOU decreases, negatively impacting their willingness to engage with VE tools. This aligns with previous research by Anadon et al. (2016), highlighting that digital literacy remains a core challenge in developing countries, where training programs on technology adoption are often inadequate or inconsistently implemented.

Interviews further reinforced this issue, with multiple participants emphasizing that limited training on VE methodologies prevents meaningful engagement with digital platforms. One government evaluator from KwaZulu-Natal explained: *"Many officials struggle with even basic digital tools. Without serious capacity-building efforts, asking them to conduct a fully virtual evaluation is unrealistic."* This statement reflects the institutional challenges discussed by Cheng et al. (2017), who argue that public institutions are often slow to integrate new digital methods due to a lack of structured training and investment in human capital. Without targeted interventions, digital literacy deficits will continue to hinder the effective deployment of VE methodologies, creating reliance on traditional, in-person evaluations despite their logistical inefficiencies.

Beyond individual competency gaps, the study found that government training programs have not sufficiently incorporated VE techniques, leaving public officials ill-equipped to transition to digital methodologies. Institutional Theory (Scott, 2008) provides insight into why this occurs, suggesting that deeply ingrained bureaucratic norms and rigid administrative structures discourage the rapid adoption of new methods. Many government training modules still prioritize traditional M&E approaches, with limited efforts to integrate emerging virtual techniques. A respondent from Limpopo expressed frustration at the absence of structured capacity-building programs, stating: *"There is no formalized training on VE within most government departments. We are expected to learn on our own, but without structured guidance, adoption remains slow."* This lack of structured training exacerbates the digital divide within the public sector, as younger professionals who may have some familiarity with digital tools are often overshadowed by senior officials resistant to technology-driven change. As McKinsey Digital (2020) highlighted, governments that fail to invest in digital skills development often experience slow and fragmented technology adoption, leading to inefficient evaluation processes and increased reliance on outdated assessment methods.

The public sector's slow response to digital literacy training also affects its ability to institutionalize VE as a standard practice. Gregory & Wilson (2018) argue that public institutions require a sustained commitment to

professional development to ensure that digital innovations are effectively integrated into governance processes. The study findings reinforce this argument, as participants noted that government agencies rarely offer ongoing digital training tailored to VE methodologies. As a result, evaluators are left to rely on their initiative to acquire the necessary digital skills, which significantly slows the uptake of VE. Furthermore, the absence of peer learning structures—such as mentorship programs or cross-departmental knowledge-sharing initiatives—further isolates officials who lack confidence in using VE platforms. Without structured efforts to enhance digital literacy, the government will struggle to overcome the institutional resistance that currently limits the adoption of virtual evaluation methods.

7.3.4 Methodological and Data Security Concerns

Beyond operational and technological barriers, methodological and data security concerns are critical factors limiting the widespread adoption of VE in the public sector. As seen in Table 3, 28 respondents identified data privacy and security concerns, emphasizing the heightened risks associated with digital platforms in government evaluations. Public sector evaluations involve handling sensitive information related to policy performance, financial accountability, and service delivery outcomes. The transition to virtual methodologies introduces potential cybersecurity threats, unauthorized data access, and regulatory non-compliance risks. As Participant GOV014, a senior M&E officer from Gauteng, explained: *"Government evaluations handle highly sensitive data, from financial expenditure reports to impact assessments on vulnerable populations. Virtual platforms may lack the encryption standards required for regulatory compliance, exposing this data to cyber risks."* This statement reflects growing concerns about digital governance, where cybersecurity and data protection remain significant challenges in adopting e-Governance tools. The institutional barriers identified align with Institutional Theory, which explains how formal rules and compliance requirements shape technological adoption in public administration. Many government agencies struggle to implement VE due to a lack of standardized guidelines on safeguarding sensitive information within digital evaluation environments.

Further compounding the issue, 30 respondents cited concerns about bias in online data collection, a methodological limitation affecting VE findings' representativeness. Unlike traditional in-person evaluations, where evaluators can ensure diverse participation across geographic and socio-economic groups, VE relies on digital accessibility. This dependence on online engagement inherently excludes individuals with limited internet connectivity, digital literacy, or access to necessary technological devices, leading to biased data collection. As participant GOV029, a researcher from the Department of Economic Development, stated: *"We noticed that our virtual evaluations overwhelmingly reflected the views of urban professionals who had the means to participate. Meanwhile, the voices of lower-income and rural respondents were completely underrepresented, distorting our findings."* In the public sector, where policy decisions must reflect diverse stakeholder perspectives, this limitation creates hesitancy around fully adopting VE methodologies. Ensuring inclusivity in evaluation processes is particularly critical in government settings where policy interventions directly impact marginalized communities.

Additionally, participant hesitation and inconsistent responses in VE were cited as challenges, particularly concerning stakeholder engagement in digital environments. Unlike in-person evaluations, where evaluators can build rapport and probe deeper into responses, virtual platforms often limit interaction quality. Participants may be reluctant to provide candid feedback due to fears of digital surveillance, misused recorded responses, or uncertainty about the confidentiality of virtual platforms. As Participant GOV011, a program manager from the Western Cape, highlighted: *"Stakeholders are hesitant to speak freely in virtual evaluation settings. They worry that their responses are being recorded, monitored, or could be accessed by unintended parties, which makes them more reserved in their feedback."* These findings align with the TAM, which suggests that perceived risks, including security concerns and lack of trust in digital tools, significantly affect technology adoption. The perceived lack of security and privacy in VE diminishes its credibility among public officials, reinforcing their preference for traditional face-to-face evaluations, which allow for confidential, controlled environments that ensure data integrity and trust.

These methodological and security concerns illustrate why VE adoption in the public sector remains slow despite the potential benefits of digital evaluation tools. The need for stringent data protection policies, investment in digital security infrastructure, and strategies to mitigate online sampling biases remain unresolved challenges that significantly hinder the institutionalization of VE within government evaluations.

7.3.5 Cultural and Stakeholder Resistance to VE

The cultural dimension of public sector evaluations presents another significant barrier to adopting VE. Findings indicate that stakeholder engagement remains a persistent challenge, with three respondents highlighting cultural sensitivities as a major obstacle. Public sector evaluations often involve communities where direct, in-person engagement is deeply ingrained in governance and participatory decision-making. In such contexts, virtual interactions may be perceived as impersonal, detached, and insufficient in fostering the trust needed for effective data collection. As Participant GOV017, a community engagement officer in a social development program, explained: *"In the communities we work with, evaluation is built on personal relationships and face-to-face dialogue. Virtual platforms feel disconnected from the realities of the people we serve, making participation more difficult."* This resistance is particularly pronounced in participatory evaluation models, emphasizing collaboration, inclusivity, and interpersonal rapport as essential elements for generating meaningful insights (Cousins & Whitmore, 1998). VE methods, by contrast, limit evaluators' ability to observe non-verbal cues, establish credibility, and engage communities in iterative discussions, which are fundamental to participatory evaluations. Public sector officials working in social development, public health, and rural governance have expressed concerns that the shift to VE undermines the core principles of inclusive evaluation, particularly in settings where oral communication and informal consultations are central to decision-making processes.

Beyond cultural sensitivities, low response rates (two respondents) and stakeholder unwillingness to engage in VE (one respondent) further illustrate the difficulty of securing participation in virtual evaluation processes. Public sector evaluations involve multiple stakeholders, including civil society organizations, community leaders, and program beneficiaries. However, reluctance to engage with digital platforms reduces the effectiveness of VE, as non-participation skews data representation and reduces the legitimacy of evaluation findings. As Participant GOV026, a government program manager from Limpopo, noted: *"We struggle to get community stakeholders to engage in virtual discussions. Many feel excluded because they are unfamiliar with the technology or don't see it as a legitimate way to be heard."* This aligns with broader research on e-Governance adoption, which suggests that digital exclusion—stemming from limited digital literacy, access constraints, and cultural norms—can create participation gaps in technology-driven public sector interventions. Moreover, these findings underscore the broader institutional challenges identified under Institutional Theory, which explains how long-standing practices and norms shape public sector responses to technological change (Cheng et al., 2017; Gregory & Wilson, 2018). Given that public sector evaluations require consensus-building and legitimacy among diverse stakeholders, resistance to VE ultimately slows its adoption and limits its application in participatory governance settings. Without strong stakeholder buy-in, VE remains an incomplete and underutilized evaluation tool within the public sector. Without addressing these cultural and participatory challenges, government institutions may struggle to institutionalize VE fully, further entrenching reliance on traditional evaluation methods despite the potential advantages of digital assessment tools.

7.4 Enablers to the effective adoption of VE

7.4.1 Perceived Effectiveness and Feasibility of VE

Government officials who have utilized VE in public sector evaluations report that it offers significant advantages in terms of efficiency, accessibility, and cost reduction. The ability to conduct evaluations remotely eliminates the logistical challenges of travel and venue arrangements, making the process more streamlined and financially sustainable. As illustrated in Figure 4, most respondents expressed satisfaction with VE's effectiveness, citing its ability to expedite data collection and decision-making. Participant GOV014, a senior evaluator in the Department

of Health, highlighted this advantage: *"Previously, evaluations would take months due to travel and scheduling constraints. We've completed assessments in half the time with virtual tools while maintaining rigour."* This aligns with broader trends in e-governance and digital evaluation, where technology is increasingly leveraged to enhance efficiency in policy assessment (McKinsey Digital, 2020; Anadon et al., 2016).

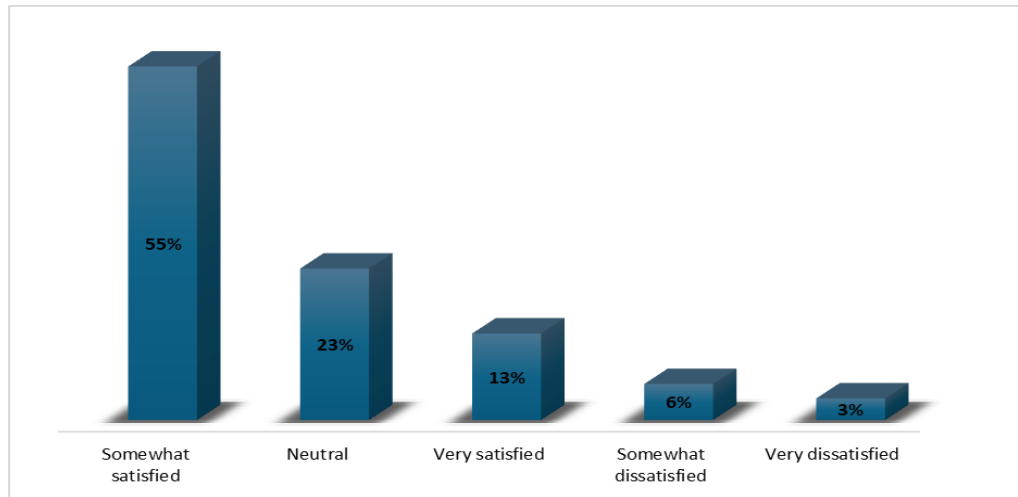


Figure 4. Satisfaction with VE Effectiveness

Source: own production

Beyond efficiency, the feasibility of integrating VE into public sector evaluation workflows has gained recognition. Figure 5 illustrates that many respondents found VE to be a practical alternative to traditional methods, particularly for evaluations requiring multi-stakeholder engagement. Remote tools have allowed for greater flexibility, enabling evaluators to conduct interviews, focus groups, and surveys without geographic limitations. Participant GOV027, an evaluator from the Department of Economic Development, explained: *"In many cases, we've found that VE is the only viable option. It allows us to reach key informants in different provinces without the usual logistical bottlenecks."* These findings suggest that VE is particularly well-suited for large-scale evaluations where in-person methods may be impractical. Cost-effectiveness is another major factor contributing to the perceived feasibility of VE adoption. Several government officials noted that virtual methods significantly reduce travel, accommodation, and venue hire expenses, allowing resources to be redirected toward more substantive evaluation activities. As Participant GOV035 from the Department of Social Development stated: *"Budget constraints are always a challenge. Virtual evaluations have allowed us to allocate funds toward more critical aspects of the evaluation process rather than logistics."* These cost-saving benefits align with findings from ICT-driven evaluation studies, emphasizing digital evaluation approaches' financial sustainability (United Nations Global Pulse, 2016).

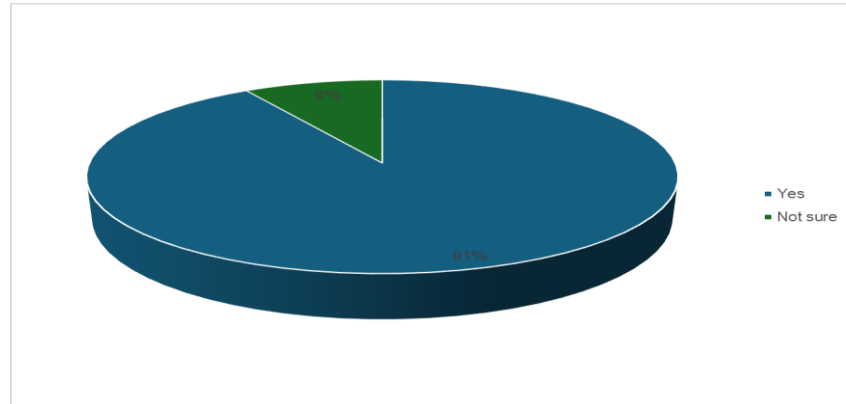


Figure 5. Feasibility of Integrating VE Methodologies
Source: own production

7.4.2 Institutional and Policy Support for VE Adoption

Successfully adopting VE in the public sector depends heavily on institutional commitment, leadership buy-in, and supportive regulatory frameworks. Government officials and evaluators widely recognize that VE adoption remains inconsistent and fragmented without a structured policy environment. Strong leadership commitment from government departments, particularly within M&E units, is critical in facilitating the integration of VE into standard public-sector evaluation practices. As previous digital governance initiatives demonstrated, leadership endorsement is crucial in influencing adoption rates and ensuring digital evaluation tools receive the necessary institutional backing (McKinsey Digital, 2020). Participant GOV011, a senior official in the DPME, emphasized this point: *"If VE is not championed at the highest levels, it remains a side project. We need leadership-driven policies that make it a mandatory evaluation approach rather than an optional alternative."* This statement underscores the importance of formalizing VE as part of national M&E policies to ensure sustained implementation across departments.

Regulatory frameworks also play a fundamental role in establishing clear guidelines for VE adoption. Several participants noted that one of the main barriers to VE implementation is the absence of standardized protocols governing virtual evaluation processes. Without clear policies on data security, evaluation ethics, and digital accountability, government departments remain hesitant to shift away from traditional evaluation methodologies. Figure 6 highlights that while there is an increasing intent to integrate VE into public sector evaluations, officials require stronger regulatory assurances to ensure that these methodologies meet compliance requirements. Participant GOV030, an evaluator from the Department of Public Works, stated: *"We don't have uniform policies that govern how VE should be conducted. Currently, each department is experimenting with its approach, making consistency challenging."* This reflects findings from public sector digital transformation research, which emphasize the need for cross-departmental alignment in policy frameworks to enhance the effectiveness of digital evaluation initiatives (United Nations Global Pulse, 2020).

Training programs and structured digital literacy initiatives further enhance VE adoption by addressing previous resistance among government officials. Findings indicate that a major impediment to VE adoption is the lack of digital competence among evaluators, particularly senior officials accustomed to traditional, in-person methodologies. Institutional support in the form of targeted training programs is therefore essential in bridging this gap. Several participants emphasized the importance of integrating VE training into broader capacity-building programs for government evaluators. Participant GOV024, a National School of Government training coordinator, explained: *"Most officials struggle with VE simply because they haven't been trained to use it. Resistance would decrease significantly if digital evaluation tools were incorporated into formal training programs."* This aligns

with the principles of the Technology Acceptance Model, which suggests that perceived ease of use and user confidence directly impact technology adoption rates. By investing in structured digital literacy initiatives, the government can equip officials with the skills needed to navigate VE platforms effectively, ultimately fostering greater acceptance and institutionalization of these methodologies.

Digital transformation strategies also play a critical role in fostering an enabling environment for VE adoption. Public sector agencies that have successfully implemented VE have done so within broader digitalization efforts to modernize governance processes. Several participants highlighted the importance of integrating VE into government-wide digital strategies to ensure sustainability. Participant GOV039, an ICT director from the Department of Cooperative Governance and Traditional Affairs (COGTA), noted: *"VE should not exist in isolation—it should be part of a larger government digital transformation agenda. Integrating it into national e-governance frameworks will make its adoption more seamless."* This perspective is consistent with global best practices, where countries that have successfully institutionalized digital evaluations have done so within broader digital governance frameworks that promote interoperability, standardization, and cross-sector collaboration (Cheng et al., 2017).

7.4.3 Technological Advancements and Infrastructure Investments

The effectiveness and sustainability of VE in the public sector depend significantly on technological advancements and strategic infrastructure investments. Improvements in digital connectivity, the expansion of cloud-based platforms, and the development of secure data management systems play a crucial role in strengthening the adoption of VE methodologies. Public sector institutions, particularly those in developing contexts, have historically struggled with inadequate digital infrastructure, which has hindered the feasibility of virtual assessment processes. However, as governments prioritize digital transformation, significant progress has been made in expanding high-speed internet access, particularly in urban and administrative hubs, thereby enabling smoother integration of VE in policy evaluation. Participant GOV017, an IT director from the Department of Digital Transformation, emphasized this shift: *"We've seen noticeable improvements in digital connectivity in key government offices. The challenge is ensuring that these advancements extend to municipal and rural institutions where evaluation processes often occur."* This aligns with findings from ICT policy studies, which highlight the importance of equitable infrastructure expansion to ensure that digital evaluation methodologies do not exacerbate existing digital divides (United Nations Global Pulse, 2020; McKinsey Digital, 2020).

One of the key technological enablers of VE is the adoption of cloud-based platforms that facilitate real-time data collection, storage, and analysis. Traditional evaluation processes rely on cumbersome paper-based reporting systems, making data retrieval inefficient and limiting accessibility. On the other hand, Cloud-based VE platforms provide centralized repositories for evaluation data, allowing evaluators, policymakers, and stakeholders to access information remotely while ensuring data security and compliance with regulatory standards. Participant GOV031, a senior M&E specialist from the Department of Health, noted: *"Cloud-based platforms have significantly improved our ability to manage evaluation data. Previously, data silos made it difficult to coordinate evaluations across different departments, but now, with secure cloud solutions, we can ensure data integrity and accessibility across government entities."* These insights align with global trends in digital governance, where cloud computing is increasingly leveraged to enhance public sector evaluation processes, improve data transparency, and enable multi-agency collaboration (Gregory & Wilson, 2018). Emerging technologies such as artificial intelligence (AI), blockchain, and real-time analytics are further transforming the VE landscape by increasing the reliability and accuracy of virtual evaluation methodologies. AI-powered tools are being deployed to automate data analysis, identify trends, and detect anomalies in evaluation datasets, thereby improving decision-making efficiency. Participant GOV022, an AI specialist in government digital services, highlighted the potential of these technologies: *"AI is helping us process large volumes of evaluation data faster and more accurately. It minimizes human error and ensures we can detect patterns that might be overlooked in manual"*

analysis.” Similarly, blockchain technology has been proposed to secure evaluation data, ensure tamper-proof records, and enhance data integrity. Public sector evaluators increasingly recognize blockchain's potential to authenticate evaluation findings, particularly in sensitive assessments where data security is a primary concern.

VE is also integrated into broader e-governance strategies to enhance M&E processes across government institutions. As governments shift toward data-driven policymaking, digital evaluation tools are embedded within national e-governance frameworks to ensure seamless data interoperability and improve policy monitoring. Participant GOV039, a director of public sector innovation, explained: *“Virtual Evaluation shouldn’t be treated as a standalone tool—it should be embedded in the wider digital governance ecosystem. When linked with e-Governance frameworks, VE becomes essential to public administration, enabling real-time performance monitoring and evidence-based decision-making.”* This perspective aligns with international best practices, where countries such as Estonia, Canada, and South Korea have successfully incorporated VE into digital governance ecosystems to enhance policy evaluation and service delivery effectiveness (McKinsey Digital, 2020; Gregory & Wilson, 2018).

7.4.4 Future Intent to Use VE in Public Sector Evaluations

The study findings reveal a notable shift toward the willingness to integrate VE into future public sector evaluation frameworks. While early resistance to VE stemmed from concerns over methodological rigour, digital infrastructure limitations, and institutional reluctance, the findings indicate that many government officials recognize its long-term benefits. VE is increasingly perceived as essential for government programs’ cost-effective, scalable, and real-time evaluation processes. Figure 6 highlights that a significant proportion of participants expressed a positive outlook on the continued use of VE, particularly in social policy evaluations, performance audits, and remote monitoring of development projects. This aligns with global trends in digital governance, where governments in countries such as Estonia, South Korea, and Canada have successfully embedded ICT-based evaluation methodologies into policy monitoring systems (McKinsey Digital, 2020; York & Bamberger, 2020). Public sector officials, particularly those from urban-based government institutions with stronger digital infrastructure, noted that VE enhances accessibility and efficiency, reducing the time required to conduct evaluations while allowing for broader participation across multiple locations.

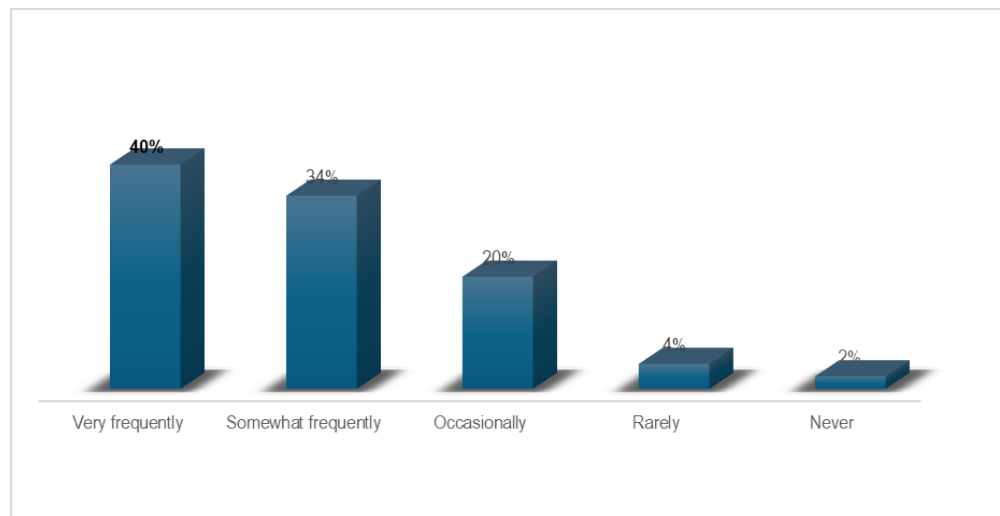


Figure 6. Future Intent to Use VE Methodologies

Source: own production

A key enabler of VE adoption is its ability to facilitate real-time policy tracking, particularly in crisis response scenarios. In recent years, governments worldwide have increasingly relied on virtual methodologies to conduct rapid assessments of emergency interventions, including pandemic response evaluations, disaster relief monitoring, and economic stimulus impact assessments (United Nations Global Pulse, 2021). This trend is also reflected in South Africa's public sector, where officials noted that VE provided an opportunity to collect and analyze data in real-time, thereby improving policy responsiveness. As Participant GOV025, a senior evaluator from the National Treasury, explained: *"When we need real-time data to track how public funds are being utilized, virtual evaluation provides an avenue to conduct oversight without delays. If integrated properly, VE could significantly strengthen accountability in public spending."* This statement supports arguments in digital governance literature that VE enhances transparency and accelerates evidence-based decision-making (Gregory & Wilson, 2018). However, some officials expressed scepticism, emphasizing that while VE enables rapid data collection, it does not automatically translate to improved accountability unless paired with robust verification mechanisms.

The generational divide in VE adoption was also evident in the study, with younger and mid-career public officials demonstrating greater openness to digital methodologies than senior officials. This aligns with findings in technology adoption research, which indicate that early-career professionals are more likely to experiment with digital tools due to their familiarity with technology in their daily work environments. Participant GOV031, a program manager in the health sector, noted: *"The more we use VE, the more we realize its efficiency. If the government invests in refining the systems and training officials properly, I don't see why VE wouldn't become a standard practice."* This statement underscores that while VE adoption is growing, sustained implementation will require structured training programs to enhance digital competency among government officials. This finding corresponds with the TAM, which posits that perceived usefulness and ease of use influence technology adoption. Officials who found VE to be intuitive and effective in streamlining evaluation workflows were more likely to express intent to continue using it in future projects. However, resistance remains among senior officials who view VE as requiring significant effort to integrate into established bureaucratic systems, reinforcing findings from Institutional Theory, which suggests that public sector organizations often resist digital transformation due to deeply embedded administrative norms and control mechanisms.

The future adoption of VE is also influenced by sectoral needs, with officials from the social development, education, and healthcare sectors expressing the strongest interest in using VE for ongoing program evaluations. This is largely attributed to the increased reliance on digital monitoring tools within these sectors, particularly for tracking service delivery outcomes in geographically dispersed communities. A senior education official (Participant GOV041) emphasized: *"Education sector evaluations require continuous tracking of interventions, and VE provides an opportunity to conduct follow-ups without requiring in-person visits to every school district. This is especially relevant for rural schools where physical access is limited."* This statement aligns with global trends in digital education monitoring, where governments have increasingly leveraged cloud-based platforms to track student performance, teacher training programs, and school infrastructure development (Letouzé, 2013). The healthcare sector has similarly recognized the value of VE in evaluating public health interventions, with some officials highlighting its use in monitoring vaccine rollout programs and telemedicine initiatives. These findings suggest that while VE adoption may be slower in sectors with high regulatory constraints, its potential for cost-effective and scalable evaluation is gaining recognition in policy-relevant fields.

Despite this increasing intent to use VE, concerns remain regarding data security, stakeholder engagement, and methodological reliability. Several officials cautioned that its future use may be sporadic rather than systemic without clear government policies on VE implementation. Participant GOV038, an evaluator in the economic development sector, warned: *"We've seen enthusiasm for digital tools before, but without institutional policies, they don't last. For VE to work long-term, it must be integrated into national evaluation frameworks with clear guidelines and accountability measures."* This reflects findings in institutional governance literature, which argue

that the sustainability of digital innovations in the public sector depends on regulatory support and long-term capacity-building efforts (United Nations Global Pulse, 2016). Thus, while officials recognize VE's potential, its success as a standard evaluation method will hinge on the government's ability to create enabling policies, invest in secure digital systems, and ensure that VE methodologies align with broader public sector governance objectives.

8. Lessons Learned, Implications, and Emerging Best Practices for Public Sector VE

The study's findings reveal critical lessons regarding adopting VE in the public sector, highlighting structural barriers and enabling conditions that shape its implementation. One key takeaway is the importance of balancing technological advancements with institutional capacity-building. While VE offers significant benefits regarding efficiency, accessibility, and cost reduction, its effectiveness depends on digital literacy, stakeholder buy-in, and robust ICT infrastructure. Public officials who have successfully integrated VE emphasize the need for structured training programs, regulatory clarity, and leadership support to mitigate resistance. This aligns with the TAM, which posits that technology adoption is influenced by perceived usefulness and ease of use. Institutional inertia remains a significant challenge, as government agencies operate within rigid bureaucratic frameworks that favour traditional evaluation methods. However, case studies from digital governance models in Estonia, South Korea, and Canada suggest that strategic policy interventions, such as formalizing VE guidelines and investment in digital security protocols, can accelerate adoption (McKinsey Digital, 2020).

The implications of these findings extend beyond technological constraints to the broader governance landscape. VE is not merely a technical shift but a systemic transformation that requires changes in institutional culture, evaluation methodologies, and stakeholder engagement practices. Public sector evaluations often operate within complex political environments where trust, transparency, and data credibility are paramount. The study highlights that resistance to VE is partly rooted in concerns over data validity and fears that virtual methods may fail to capture contextual nuances essential for policy evaluation. Institutional Theory supports this concern, as public organizations tend to resist change due to established norms, regulatory constraints, and hierarchical structures that make digital transitions difficult (Gregory & Wilson, 2018). Addressing these concerns requires a hybrid evaluation model that integrates digital tools while preserving elements of direct engagement where necessary. Furthermore, governments must develop legal and ethical frameworks to govern VE practices, ensuring compliance with data protection regulations and minimizing biases in online data collection (United Nations Global Pulse, 2021). These measures are crucial for positioning VE as a sustainable and effective approach to policy assessment.

Emerging best practices in VE highlight the importance of multi-stakeholder collaboration in strengthening its implementation. Successful VE initiatives globally demonstrate that partnerships between government agencies, technology providers, and academic institutions can drive digital innovation in public sector evaluations (Hejnowicz & Chaplowe, 2021; Cintron & Montrosse-Moorhead, 2022). For instance, governments that have incorporated artificial intelligence, blockchain, and real-time analytics into VE processes report higher levels of data security, improved stakeholder engagement, and enhanced decision-making capabilities. Evidence from digital governance initiatives suggests that mainstreaming VE into broader e-governance strategies—rather than treating it as a standalone tool—can lead to greater institutional acceptance. Ensuring VE aligns with national digital transformation agendas and public administration reforms increases its legitimacy and fosters long-term adoption.

The study's findings also indicate that a forward-looking approach is necessary for scaling up VE adoption in the public sector. Public institutions must move beyond pilot projects and embed VE within official evaluation policies and procedures. This requires sustained investment in digital infrastructure, professionalization of VE skills among public officials, and a shift toward open-data evaluation frameworks that enhance transparency.

Lessons from global best practices suggest that incentives such as performance-based funding mechanisms, digital literacy certification programs, and cross-sector learning platforms can further encourage VE adoption (Gregory & Wilson, 2018; McKinsey Digital, 2020). Ultimately, the success of VE in government evaluations will depend on a strategic combination of technological readiness, institutional reform, and stakeholder engagement, ensuring that virtual methodologies enhance rather than replace the fundamental principles of public sector evaluation.

Conclusion and Areas for Future Research

This study examined the barriers and enablers influencing the effective adoption of VE in the South African public sector. Drawing from empirical data—including survey responses, interviews with government officials, and a comprehensive literature review—the research set out to answer two core questions: (1) What factors hinder the institutionalization of VE in public sector evaluation systems? and (2) What conditions facilitate the integration of VE into public governance frameworks? The findings reveal that while VE holds promise as a scalable and efficient tool for public sector monitoring and evaluation, its implementation is constrained by institutional inertia, infrastructural gaps, digital literacy limitations, and weak regulatory and policy support. Conversely, enablers such as perceived cost-effectiveness, emerging digital infrastructure, leadership commitment, and stakeholder satisfaction with VE outcomes offer a path forward for its institutionalization.

The novelty of this study lies in its context-specific exploration of VE adoption within South African governance structures—an area often underrepresented in global M&E discourse. Unlike most evaluations focusing solely on technological capabilities, this research integrates the TAM and Institutional Theory to provide a dual-level analysis of individual and organizational dynamics that shape VE uptake. This theoretical contribution enhances our understanding of why digital evaluation tools are accepted in some institutional settings and resisted in others, offering a nuanced framework for policy intervention. In addition, the study presents empirical insights based on real-world challenges and perspectives from frontline evaluators, many of whom navigate complex bureaucracies that are slow to adopt innovation.

Despite these contributions, the study is not without limitations. First, it relies on self-reported data from a limited sample of government officials, which may introduce bias or restrict generalizability. Second, while it captures insights from diverse provinces and departments, it does not comprehensively account for the varying levels of digital maturity across all spheres of government. Third, the study focused primarily on the South African context due to time and resource constraints and may not fully reflect broader continental or global VE dynamics. Finally, the rapidly evolving nature of technology means that any static assessment of VE systems risks becoming outdated without longitudinal follow-up.

Future research should explore the long-term institutionalization of VE within the broader landscape of digital governance in the Global South. Key areas of inquiry include examining how governments can integrate advanced technologies—such as artificial intelligence, blockchain, and predictive analytics—into their evaluation ecosystems without compromising ethical standards or data protection. Additionally, comparative case studies between digitally advanced and under-resourced public institutions can provide valuable insights into best practices and scalable models of VE adoption. Investigating the role of political leadership, interdepartmental coordination, and civil society engagement in accelerating VE uptake would further enrich the field. As digital transformation continues to reshape public administration, ensuring the effective use of VE will be central to enhancing accountability, transparency, and evidence-informed policymaking.

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Lesedi Senamele MATLALA is a Lecturer at the University of Johannesburg and a Visiting Researcher at Michigan State University. He holds a PhD in Public Management, Governance, and Evaluation from the University of Johannesburg. His research focuses on digital governance, public policy, and Monitoring and Evaluation (M&E), specializing in Virtual Evaluation, Evidence-Informed Decision Making, and African youth-led evaluation innovation. Lesedi is also the Executive Director of Go-Getters Brand and actively contributes to M&E capacity-building initiatives through SAMEA and other continental networks.

ORCID ID: <https://orcid.org/0000-0002-6110-9902>

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