

**USE OF VIRTUAL PLATFORMS FOR CONSTRUCTION SITE MEETINGS IN
BENIN CITY**

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**BEING A PROJECT SUBMITTED TO THE DEPARTMENT OF QUANTITY
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**IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF
THE DEGREE OF BACHELOR OF SCIENCE (B.SC.) IN QUANTITY SURVEYING**

APRIL, 2026

DECLARATION

I declare that this project is an original work carried out by me, **WINNING OSHOMOMOH DAVID**, with Matriculation Number **ENV2009674** in the Department of Quantity Surveying, Faculty of Environmental Sciences, University of Benin, Benin City.

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CERTIFICATION

We certify that this project with the title: **USE OF VIRTUAL PLATFORMS FOR CONSTRUCTION SITE MEETINGS IN BENIN CITY**, submitted by **WINNING OSHOMOMOH DAVID**, with Matriculation Number **ENV2009674**, has satisfied the regulations governing the award of a Bachelor's Degree in Quantity Surveying from the University of Benin, Benin City, Edo State.

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DEDICATION

This project is dedicated to God Almighty, the owner of intellect, time, talent, resources, and possessions, who inspires me and for seeing me through these years of my studies in this Great Citadel of Learning.

ACKNOWLEDGMENTS

I sincerely express my profound gratitude to God Almighty, the giver of life and wisdom, who sustained me physically and financially throughout this project.

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ABSTRACT

The increasing digitalization of the construction industry has highlighted the growing relevance of virtual platforms as alternatives to traditional face-to-face site meetings. This study examines the use, benefits, and challenges of virtual platforms for construction site meetings in Benin City, Nigeria, where infrastructural limitations and cultural preferences influence technology adoption. A quantitative research design was employed, with data collected from 140 construction professionals—including architects, engineers, quantity surveyors, and contractors—selected from a target population of 842. Using Mean Item Scores (MIS), the findings show that Google Meet, Zoom, and WhatsApp are the most commonly used virtual platforms due to their accessibility and low data requirements. Key benefits identified include enhanced stakeholder participation regardless of location, reduced meeting costs, time savings, and improved documentation. However, major barriers to effective adoption remain, such as poor internet connectivity, unstable power supply, limited technical skills, and low acceptance among older professionals. The study concludes that while virtual platforms significantly improve communication efficiency and stakeholder engagement, their full potential is hindered by infrastructural and cultural constraints. It recommends targeted digital training, improved technological infrastructure, and hybrid meeting models to support sustainable digital transformation in Benin City's construction sector.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

The construction industry worldwide has historically depended on face-to-face meetings for project coordination, progress monitoring, and issue resolution (Ameyaw et al., 2021). These conventional meetings are gradually being augmented or replaced by virtual platforms due to advancements in Information and Communication Technology (Cheng et al., 2020). Virtual platforms present substantial opportunities to enhance efficiency, reduce operational costs, and foster improved collaboration among stakeholders, especially in complex construction projects (Adwan and Al-Soufi, 2019). The incorporation of technologies such as Building Information Modeling (BIM) and interactive virtual environments has further accelerated the digital transformation of construction processes, facilitating real-time decision-making and streamlining workflows (Nasrazadani et al., 2021).

In developing areas, the uptake of virtual platforms in construction has been slower, primarily due to infrastructural limitations, insufficient technical expertise, and resistance to change (Ebekoziem and Aigbavboa, 2021). Despite these challenges, the advantages of virtual collaboration tools—such as enhanced communication, reduced travel time, and better documentation—are increasingly acknowledged (Zuofa and Ochieng, 2021). Virtual platforms address critical pain points in traditional meetings, particularly regarding stakeholder accessibility and documentation quality (Olaniyan et al., 2020). However, the degree to which these tools are adopted differs considerably across regions, with urban centers typically leading the way compared to smaller cities (Shehu et al, 2022).

Rapid urbanization and infrastructural expansion in many developing regions have intensified the demand for efficient project management practices (Onwuanyi and Ojo, 2021). Virtual platforms offer a practical solution to address these needs, particularly in settings where

physical meetings are hindered by traffic congestion, geographically dispersed project sites, or other logistical challenges (Oluwamayowa et al., 2020). This study aims to bridge this gap by investigating the role of virtual platforms in improving construction site meetings, with a focus on their suitability for specific regional contexts.

1.2 Statement of the Research Problem

Despite global advancements in digital communication, the construction sector in various developing contexts continues to struggle with inefficient coordination practices. Traditional site meetings are often characterized by delayed stakeholder participation, poor record-keeping, and fragmented communication flows, which directly affect project timelines and budgets (Adeyemi et al., 2020). Several studies have indicated that up to 40% of construction failures can be traced to miscommunication, underscoring the critical role of effective interaction in project success (Olaniyan et al., 2021). Virtual meeting platforms present a promising solution to these issues, but remain underutilized in many construction environments due to systemic and infrastructural challenges.

The limited integration of virtual platforms is linked to digital infrastructure deficits, particularly inconsistent internet service, restricted access to supporting technologies, and resistance to change among professionals accustomed to traditional practices (Aduwo et al., 2022). Without sufficient digital literacy or institutional incentives, stakeholders may view these platforms as burdensome rather than enabling tools. Consequently, even where exposure to such tools occurred during periods of forced remote work, such as the COVID-19 pandemic, sustained adoption remains low (Agyekum et al., 2021). The disconnection between awareness and implementation represents a significant barrier to optimizing construction workflows.

Moreover, the absence of region-specific implementation frameworks limits the ability to promote and regulate digital adoption in local construction practice. Most existing literature emphasizes larger metropolitan areas, often overlooking smaller or differently structured urban environments where unique cultural, technological, and organizational variables may influence adoption (Ebekozi et al., 2023). As a result, there is a notable gap in research examining the intersection of stakeholder readiness, platform suitability, and implementation challenges in diverse construction settings. This study addresses that gap by critically evaluating how virtual platforms are engaged in site meetings and how stakeholder-specific barriers might be overcome.

1.3 Research Questions

1. What virtual meeting platforms are used for construction site meetings?
2. How do virtual meeting platforms benefit construction site meetings?
3. What barriers hinder the use of virtual platforms in construction site meetings?

1.4 Aim and Objectives of the Study

Aim: The aim of the study is to assess the use of virtual platforms for conducting construction meetings with a view to enhancing the participation of stakeholders during meetings.

Objectives: The objectives of the study are to:

1. Identify virtual meeting platforms used for construction site meetings.
2. Evaluate the benefits of virtual platforms for construction site meetings.
3. Assess barriers to the use of virtual platforms for construction site meetings

1.5 Scope of the Study

This study investigates the use of virtual platforms in construction site meetings within mid-sized urban settings experiencing significant construction activity. It includes professionals

such as architects, quantity surveyors, project managers, contractors, and engineers engaged in projects between 2020 and 2023. Both public and private construction projects are considered, reflecting the industry's increasing shift towards digital collaboration tools to enhance communication and efficiency (Azizi et al., 2023).

The research focuses on platforms used for real-time collaboration and communication. It excludes technologies not directly related to site meeting functions, such as autonomous construction equipment or advanced analytics tools. It also does not extend to sectors outside the construction industry or cities with vastly different technological infrastructure profiles, acknowledging that digital adoption varies significantly across different regions and sectors (Badamasi et al., 2022).

The study allows an evaluation of virtual platform engagement before, during, and after widespread remote work transitions associated with global events. The study excludes retired professionals, students, and those not directly involved in construction coordination roles. By focusing on this defined population, the study ensures its findings are reflective of active professional experiences and implementation realities. This delimitation helps establish the extent to which virtual meeting platforms are embraced and the contextual factors shaping their use. The exclusion of financial cost analysis and long-term economic impact assessment allows the study to maintain a narrowed scope centered on communication and operational variables (Shojaei et al., 2023).

1.6 Significance of the Study

This study holds significant value for construction professionals, policymakers, and researchers. It provides actionable insights into the adoption of virtual platforms, aiming to enhance project coordination, reduce delays, and improve decision-making. The findings will contribute to the broader discourse on technology adoption in urban centers and inform

strategies aligned with national digital economy policies. By bridging global advancements with local realities, the research supports sustainable urban development and offers replicable strategies for similar regions.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction to Virtual Platforms in Construction

The construction sector in Nigeria, like numerous developing nations, grapples with unique challenges that frequently hinder the adoption of innovative technologies and practices (Toriola-Coker et al.2021).

These challenges include but are not limited to: inadequate infrastructure, encompassing unreliable power supply and limited internet connectivity; a dearth of skilled professionals proficient in utilizing virtual platforms and other advanced technological tools; resistance to change among established construction firms and professionals who may be accustomed to traditional methods; and financial constraints that limit investments in technology and training (Ozumba and Shakantu.2014). The poor sustainability of construction projects in developing countries, including Nigeria, highlights the need for sustainable construction practices that serve present and future generations (Okoye et al., 2023).

Integrating Information and Communication Technology is seen as a way to enhance construction output, but obstacles to ICT implementation exist (Odubiyi et al., 2019; VASISTA and Abone, 2018). The current state of the construction industry in Nigeria reflects a reliance on traditional methods and a slow adoption of information communication technology, which contrasts with the capabilities of Building Information Modeling in enhancing performance and productivity (Babatunde et al, 2021). Effective material management is critical in the construction industry, where traditional methods often lead to theft, delays, and cost overruns (Odubiyi et al., 2019).

2.2 Virtual Meeting Platforms Used in Construction Site Meetings

The construction industry, traditionally reliant on face-to-face interactions, has increasingly adopted virtual platforms for meetings, driven by factors such as globalization, the need for remote collaboration, and advancements in technology (Elmualim & Gilder, 2014). Several virtual meeting platforms have become prominent in this sector.

2.2.1 General-Purpose Video Conferencing Platforms:

Platforms like Zoom and Microsoft Teams, initially designed for general business communication, have found widespread application in construction. Zoom, known for its user-friendly interface and robust video capabilities, facilitates real-time interaction among geographically dispersed teams (Encinas, Sattineni, & Simons, 2021). Microsoft Teams, integrated with the Microsoft 365 suite, offers a comprehensive collaboration environment with features like file sharing, chat, and video conferencing (Ahuja et al, 2020).

Zoom: Known for its user-friendly interface and features like breakout rooms and screen sharing, Zoom has become a staple in virtual meetings.

Microsoft Teams: Integrated with Office 365, it facilitates real-time document collaboration (e.g., editing construction plans), video conferencing, file sharing, and offers enterprise-grade security, critical for sensitive projects

Google Meet: Offers real-time video conferencing with features like screen sharing and live captions, integrated with Google Workspace. Browser-based and integrated with Google Workspace, it supports multilingual teams with real-time captions in 69 languages.

Cisco Webex: Provides robust security features and is favored for its reliability in corporate settings. Prioritizes security with end-to-end encryption and advanced AI tools (e.g., noise cancellation), suitable for government and large-scale projects.

Zoho Meeting: A comprehensive suite offering webinars and online meetings with features like screen sharing and recording. Offers department-specific meetings and secure hosting, catering to small contractors with budget constraints

Jitsi Meet: An open-source platform that allows unlimited participants without the need for an account.

Konet: Nigeria's indigenous virtual meeting platform, designed to cater to local businesses with features like voice, video, and file sharing.

Skype: It is particularly useful for formal, scheduled meetings with features like screen sharing and file sharing.

WhatsApp Video Call: It is more accessible for informal, quick updates due to its widespread use and compatibility with mobile devices.

2.2.2 Construction-Specific Collaboration Platforms:

In addition to general-purpose tools, several platforms are tailored to the unique needs of the construction industry. These platforms often integrate project management functionalities with communication tools. Examples include:

Procore: A construction management software that includes features for virtual meetings, document sharing, and project tracking (Chowdhury, 2021).

Autodesk BIM 360: A cloud-based platform that supports Building Information Modeling (BIM) workflows and facilitates virtual collaboration among project stakeholders (Kassem et al., 2017).

PlanGrid: A mobile-first platform that allows for real-time collaboration on construction documents and can be used for virtual meetings and site walkthroughs (Chowdhury, 2021).

While these tools are globally recognized, their adoption in Benin City remains understudied, highlighting a gap in localized research.

Table 2.1: Virtual Meeting Platforms for Construction Site Meetings

Virtual Platforms	Sources
Zoom	Adenegan, K. E., & Abiodun, O. A. (2018). Usage of Zoom Cloud Meeting for virtual meetings and e-learning. <i>Sustainable development goals paradigm shift: An educational approach</i> , 1-13.
Microsoft Teams	Nyktrakis, G. (2022). Technology enabling collaboration of agile development teams in hybrid working: the case of Microsoft Teams.
Google Meet	Tochukwu, I. C., & Nonyelum, O. F. (2024). Effectiveness of Electronic Meeting and Video Conferencing Tools and Techniques. <i>IUP Journal of Computer Sciences</i> , 18(4), 29-55.
Cisco Webex	Hurst, E. J. (2020). Web conferencing and collaboration tools and trends. <i>Journal of Hospital Librarianship</i> , 20(3), 266-279.
Zoho Meeting	Katari, P., Thota, S., Chitta, S., Venkata, A. K. P., & Ahmad, T. (2021). Remote project management: Best practices for distributed teams in the post-pandemic era. <i>Australian Journal of Machine Learning Research & Applications</i> , 1(2), 145-167
Jitsi Meet	Asfar, A. M. I. T., & Asfar, A. M. I. A. (2020). How To Using Online Meetings on Jitsi Meet Application. <i>Researchgate</i> . DOI, 10.
Konet	Luo, X. (2010). A knowledge-based electronic meeting system for implementing value management in construction briefing.
Skype	Orozco, N. G. (2021). Hybrid: The Future of Construction Meetings in the Digital Age.
WhatsApp video call	Taib, M. H. (2020). <i>Improving client-consultant-contractor communication in construction industry through whatsapp application</i> (Master's thesis, University of Malaya (Malaysia)).
Procore	Gajera, R. (2019). Leveraging Procore for Improved Collaboration and Communication in Multi-Stakeholder Construction Projects. <i>International Journal of Scientific Research in Civil Engineering (IJSRCE)</i> , ISSN, 2456-6667.
Autodesk BIM 360	Goulding, J. S., Rahimian, F. P., & Wang, X. (2014). Virtual reality-based cloud BIM platform for integrated AEC projects. <i>Journal of Information Technology in Construction</i> , 19, 308-325.
PlanGrid	Oladigbolu, E. A., Benyah, B. L., Sultan, H. A., Chukwuemezue, O. V., Christopher, B. O., & Onaopemipo, O. Construction Projects: A Study of Digital Tools Adoption In Lagos State.

2.3 Benefits of Virtual Platforms

Virtual platforms offer several benefits for construction site meetings:

2.3.3 Enhanced Communication and Coordination

Virtual platforms have emerged as a transformative solution for improving communication and coordination in Benin City's construction industry, addressing long-standing challenges

associated with traditional site meetings. These digital tools facilitate seamless interaction among project stakeholders by enabling real-time collaboration regardless of geographical location (Aghimien et al., 2022). The implementation of platforms such as Zoom, Microsoft Teams, and specialized construction software like BIM 360 has demonstrated particular effectiveness in overcoming the limitations of physical meetings, which often suffer from attendance inconsistencies and information delays (Oluwamayowa et al., 2021).

The adoption of virtual meeting platforms offers substantial benefits for project coordination in Benin City's construction sector. These technologies provide immediate access to project information, allowing for quicker decision-making processes that can reduce project delays by approximately 30% (Ebekoziem & Aigbavboa, 2023). Cloud-based document management systems integrated within these platforms ensure all stakeholders work with current project data, significantly minimizing errors caused by version control issues (Olatunji et al., 2020). Furthermore, the ability to record and archive meetings creates valuable reference materials that enhance accountability and reduce disputes among project participants.

Advanced features of virtual platforms contribute substantially to design coordination and conflict resolution. Building Information Modeling (BIM) tools enable real-time visualization of project elements, allowing teams to identify and address potential design conflicts before they result in costly on-site rework (Aghimien et al., 2022). Studies in comparable markets have shown that such digital coordination can reduce rework expenses by up to 22%, representing significant cost savings for construction projects (Oyewobi et al., 2021). The transparency afforded by these systems also improves stakeholder alignment throughout the project lifecycle.

Despite these advantages, Benin City faces specific challenges in adopting virtual communication tools. Infrastructure limitations, particularly unreliable internet connectivity, can hinder the consistent use of bandwidth-intensive platforms (Onwuanyi & Ojo, 2021). Additionally, some industry professionals maintain a preference for traditional face-to-face meetings due to familiarity and perceived effectiveness (Ebekozi et al., 2023). These barriers can be addressed through targeted strategies such as implementing low-bandwidth alternatives for basic communication needs and conducting comprehensive training programs to demonstrate the operational benefits of digital tools.

The successful integration of virtual platforms in Benin City's construction sector requires a balanced approach that considers local conditions. A hybrid model combining virtual and physical meetings may offer the most practical solution, allowing professionals to gradually adapt to digital workflows while maintaining some traditional practices (Oluwamayowa et al., 2021). Future research should focus on developing customized implementation frameworks that account for Benin City's unique technological infrastructure and professional culture, ensuring the sustainable adoption of these communication tools in the local construction industry.

2.3.4 Operational Efficiency Gains

Adopting virtual platforms in Benin City's construction industry has demonstrated significant potential for enhancing operational efficiency across multiple project phases. These digital solutions address critical inefficiencies that have long plagued traditional construction management approaches, particularly in the areas of time management, cost control, and resource allocation (Aghimien et al., 2022). By transitioning from physical to virtual site meetings, construction firms in Benin City can achieve measurable improvements in project execution and overall productivity.

Virtual platforms contribute substantially to time savings throughout the construction lifecycle. The elimination of travel requirements for meetings allows project teams to reallocate what was previously lost time to more productive activities (Oluwamayowa et al., 2021). Research indicates that Nigerian construction firms using virtual meeting solutions reduced time spent on coordination activities by an average of 18%, with some reporting reductions as high as 25% for projects with geographically dispersed teams (Ebekoziem & Aigbavboa, 2023). This time compression effect is particularly valuable in Benin City's fast-growing construction market, where project delays have been a persistent challenge (Onwuanyi & Ojo, 2021).

Cost reduction represents another significant efficiency gain enabled by virtual platforms. The digital nature of these solutions eliminates numerous expenses associated with traditional site meetings, including transportation costs, venue rentals, and printed materials (Olatunji et al., 2020). A 2023 study of Edo State construction firms revealed that organizations implementing virtual meeting platforms reduced their meeting-related expenses by approximately 15-20% annually (Ebekoziem et al., 2023). These savings can be particularly impactful for small and medium-sized contractors operating with limited budgets in Benin City's competitive construction market.

The operational efficiency benefits extend to improved resource management and workforce productivity. Virtual platforms enable more effective scheduling and participation in meetings, as stakeholders can join from active work sites or other locations without disrupting ongoing operations (Aghimien et al., 2022). This flexibility has been shown to increase meeting attendance rates by up to 40% compared to traditional site meetings, while simultaneously reducing the downtime associated with traveling to meeting locations

(Oyewobi et al., 2021). The ability to record and digitally archive meetings also creates efficiency gains in information retrieval and knowledge transfer across project teams.

Quality control processes benefit substantially from virtual platform implementations. The digital documentation capabilities of these systems provide more accurate and accessible records of decisions, action items, and design approvals (Olatunji et al., 2020). This reduces the likelihood of errors caused by miscommunication or lost paperwork, which have been identified as contributing factors in approximately 35% of construction defects in Nigerian projects (Oluwamayowa et al., 2021). The searchable nature of digital records also significantly reduces the time required to locate specific project information when needed.

Despite these efficiency advantages, Benin City's construction sector faces implementation challenges that must be addressed to fully realize the potential benefits. Internet reliability issues can sometimes offset the time savings potential of virtual platforms, particularly when connectivity problems disrupt meetings or delay information sharing (Ebekoziem & Aigbavboa, 2023). Additionally, the initial learning curve associated with adopting new technologies may temporarily reduce productivity as staff become familiar with the platforms (Onwuanyi & Ojo, 2021). These challenges can be mitigated through targeted training programs and the use of hybrid meeting models that combine virtual and in-person elements.

The efficiency gains achievable through virtual platforms position Benin City's construction sector for improved competitiveness and project outcomes. As the local industry continues to embrace digital transformation, these tools will likely play an increasingly important role in optimizing construction operations (Aghimien et al., 2022). Future research should focus on developing implementation strategies that maximize efficiency benefits while addressing Benin City's specific infrastructure and cultural context, ensuring that virtual platforms deliver their full potential value to the local construction industry.

2.4 Barriers to Adoption of Virtual Platforms

2.4.1 Technological and Infrastructural Constraints

The implementation of virtual meeting platforms in Benin City's construction industry faces significant technological and infrastructural barriers that hinder widespread adoption and effective utilization. These constraints present substantial challenges to digital transformation efforts in the local construction sector, despite the demonstrated benefits of virtual collaboration tools in other markets (Aghimien et al., 2022). The current technological landscape in Benin City creates a complex environment for implementing advanced digital solutions in construction project management.

Internet connectivity issues represent perhaps the most fundamental constraint affecting virtual platform adoption. Benin City's digital infrastructure suffers from inconsistent broadband coverage and unreliable internet speeds, with only 42% of construction firms reporting access to stable, high-speed internet connections capable of supporting video conferencing platforms (Ebekoziem & Aigbavboa, 2023). This connectivity gap is particularly acute in peri-urban and outlying project sites, where construction activities frequently take place, but telecommunications infrastructure remains underdeveloped (Onwuanyi & Ojo, 2021). The resulting technical limitations force many firms to rely on basic communication tools like WhatsApp, which offer limited functionality compared to comprehensive virtual meeting platforms.

Hardware limitations further compound the technological challenges facing Benin City's construction sector. Many small and medium-sized contractors lack access to adequate computing devices, with a significant portion of site personnel depending primarily on smartphones for digital communication (Oluwamayowa et al., 2021). This device constraint restricts the ability to utilize feature-rich platforms that require larger screens or specialized

hardware for optimal performance, such as BIM collaboration tools that enable 3D model viewing and manipulation (Olatunji et al., 2020). The cost of upgrading hardware presents a substantial barrier for many firms operating with limited capital reserves in Benin City's competitive construction market.

Software-related challenges also hinder the effective implementation of virtual platforms. Many construction professionals in Benin City lack familiarity with advanced digital tools, resulting in low adoption rates even when the technology is theoretically available (Ebekoziem et al., 2023). The learning curve associated with new software platforms creates resistance among experienced professionals accustomed to traditional methods, particularly among older workforce demographics (Aghimien et al., 2022). Additionally, subscription costs for premium features in platforms like Procore or BIM 360 often exceed the budgetary constraints of local firms, limiting access to full functionality (Oyewobi et al., 2021).

Power supply instability represents another critical infrastructural constraint affecting virtual platform usage. Benin City experiences frequent electricity outages, with many construction firms relying on generators or alternative power sources that may not provide the consistent energy supply required for extended virtual meetings (Onwuanyi & Ojo, 2021). These power challenges are particularly acute for smaller firms without the resources to invest in robust backup power systems, creating disparities in digital capabilities across different tiers of the construction industry (Ebekoziem & Aigbavboa, 2023).

The integration of virtual platforms with existing workflows presents additional technical hurdles. Many Benin City construction firms maintain paper-based or rudimentary digital systems that are incompatible with advanced collaboration platforms, requiring substantial process changes to achieve effective implementation (Oluwamayowa et al., 2021). This integration challenge is compounded by the lack of local technical support for specialized

construction software, forcing firms to depend on remote assistance that may not always be timely or effective (Olatunji et al., 2020).

Data security and privacy concerns also influence technology adoption patterns. Many construction professionals in Benin City express apprehension about storing sensitive project information on cloud-based platforms, particularly given the limited local regulatory frameworks governing digital data protection (Aghimien et al., 2022). These concerns are amplified by instances of cyber threats targeting Nigerian businesses, making some firms reluctant to fully embrace virtual collaboration tools (Ebekozi et al., 2023).

Despite these significant constraints, potential pathways exist to gradually overcome Benin City's technological and infrastructural limitations. The development of localized solutions tailored to the city's specific conditions, combined with targeted investments in digital infrastructure, could help bridge the current adoption gap (Oyewobi et al., 2021). Future research should focus on identifying cost-effective strategies to address these constraints while maximizing the benefits of virtual platforms within Benin City's unique operational environment.

2.4.2 Organizational and Cultural Resistance

The adoption of virtual meeting platforms in Benin City's construction industry faces significant organizational and cultural barriers that extend beyond technological limitations. These deeply rooted resistance factors present unique challenges to digital transformation efforts in the local construction sector (Aghimien et al., 2022). The resistance stems from long-established work practices, hierarchical organizational structures, and cultural preferences that shape professional interactions in Benin City's construction environment.

2.4.2.6 Hierarchical Decision-Making Culture

Benin City's construction sector operates within a strongly hierarchical professional culture that influences technology adoption patterns. Decision-making processes typically follow top-down approaches, with senior professionals maintaining a preference for traditional face-to-face meetings that reinforce established power dynamics (Ebekozen & Aigbavboa, 2023). This cultural norm creates resistance to the more egalitarian communication styles enabled by virtual platforms, where participation dynamics often flatten traditional hierarchies (Oluwamayowa et al., 2021). Many senior professionals perceive virtual meetings as less authoritative and potentially disruptive to established chains of command in construction projects.

2.4.2.7 Preference for Physical Interactions

The construction industry in Benin City places high cultural value on in-person interactions, which are seen as more trustworthy and effective for building professional relationships (Onwuanyi & Ojo, 2021). Many local contractors and clients express skepticism about the ability to properly assess project progress, material quality, or workmanship through digital means. This cultural preference manifests in resistance to virtual alternatives, even when they offer logistical advantages (Olatunji et al., 2020). The tactile nature of construction work further reinforces this bias, as many professionals believe physical site presence provides irreplaceable contextual understanding.

2.4.2.8 Change Aversion and Risk Perception

Construction firms in Benin City demonstrate notable risk aversion when considering new technologies, particularly among small and medium-sized enterprises (Aghimien et al., 2022). Many organizations perceive the transition to virtual platforms as unnecessarily disruptive to proven workflows, with concerns about potential productivity losses during the learning

period (Ebekozién et al., 2023). This risk aversion is compounded by limited exposure to successful case studies within the local market, creating a cycle of skepticism that inhibits adoption.

2.4.2.9 Generational Digital Divide

The construction workforce in Benin City exhibits a pronounced generational divide in technology acceptance (Oyewobi et al., 2021). Older professionals who have built careers using traditional methods often show reluctance to adopt digital tools, while younger professionals tend to be more receptive. This generational tension creates organizational friction when implementing virtual platforms, as firms must balance the preferences and capabilities of diverse age groups within their teams (Oluwamayowa et al., 2021). The lack of targeted digital training programs exacerbates this divide, leaving many experienced professionals without adequate support for transitioning to new technologies.

2.4.2.10 Perceived Cost-Benefit Imbalance

Many construction firms in Benin City, particularly smaller operations, question the economic justification for investing in virtual meeting platforms (Ebekozién & Aigbavboa, 2023). The subscription costs for premium features are often viewed as prohibitive relative to perceived benefits, especially when traditional meeting methods appear to function adequately (Aghimien et al., 2022). This perception persists despite evidence of long-term cost savings, as the upfront investment and transition costs dominate decision-making considerations.

2.4.2.6 Limited Digital Literacy

Beyond basic technological constraints, Benin City's construction sector faces significant skills gaps in digital literacy that fuel resistance to virtual platforms (Onwuanyi & Ojo, 2021). Many professionals lack confidence in their ability to effectively use advanced digital tools,

creating apprehension about adopting new systems (Olatunji et al., 2020). This skills gap is particularly acute among site supervisors and tradespeople, who often have less formal technology training than office-based staff.

2.5 Overcoming Resistance Strategies

Addressing these organizational and cultural barriers requires targeted interventions:

Leadership Engagement: Involving senior professionals in pilot programs to demonstrate virtual platform effectiveness (Oyewobi et al., 2021).

Hybrid Implementation: Gradually introducing virtual elements while maintaining some physical meetings.

Localized Training: Developing context-appropriate digital skills programs for construction professionals.

Success Showcasing: Highlighting Benin City-based case studies of successful implementations.

The persistence of these organizational and cultural resistance factors suggests that technological solutions alone cannot drive widespread adoption of virtual platforms in Benin City's construction sector (Ebekozi et al., 2023). A comprehensive change management approach that addresses human factors and cultural norms will be essential for successful digital transformation in the local industry.

2.6 Comparative Analysis and Best Practices

2.6.1 Lessons from Other Nigerian Cities

The adoption of virtual platforms in Benin City's construction sector can benefit significantly from examining implementation experiences across Nigeria's major urban centers. These comparative insights reveal both successful strategies and persistent challenges that can inform Benin City's digital transformation efforts.

Lagos, as Nigeria's economic hub, provides valuable lessons about rapid technology adoption under crisis conditions. During the COVID-19 pandemic, over 65% of large construction firms in Lagos adopted virtual meeting platforms as emergency solutions (Aghimien et al., 2022). However, post-pandemic data shows only about 30% maintained consistent usage, with most reverting to traditional methods due to cultural preferences and intermittent connectivity (Ebekoziem & Aigbavboa, 2023). This "temporary adoption" phenomenon suggests that Benin City must develop more sustainable implementation strategies that address both technological infrastructure and human factors to achieve lasting transformation. Abuja's experience demonstrates the potential of policy-driven adoption, particularly for public sector projects. The Federal Capital Development Authority's mandate for digital documentation on major infrastructure projects has driven 45% higher virtual platform adoption rates compared to private sector projects in the same city (Oluwamayowa et al., 2021). However, the high costs of advanced BIM systems used in Abuja's showcase projects remain prohibitive for most Benin City firms, indicating the need for more affordable, scalable solutions tailored to mid-sized city contexts.

Kano's construction sector offers an alternative model emphasizing pragmatic, low-tech solutions that may be particularly relevant for Benin City. Research shows 72% of small and medium construction firms in Kano rely primarily on WhatsApp for project coordination, supplemented by occasional in-person meetings (Onwuanyi & Ojo, 2021). This hybrid approach achieves basic digital coordination while accommodating local infrastructure limitations and cultural preferences, suggesting that Benin City might benefit from similar transitional solutions.

Cross-cutting lessons from these cities highlight three critical success factors: First, the importance of leadership commitment - firms with strong digital champions showed 50%

higher retention of virtual platforms post-pandemic (Aghimien et al., 2022). Second, a need for context-appropriate training programs that address varying digital literacy levels across organizational hierarchies. Third, the value of starting with simple, widely accessible tools before introducing more complex systems.

For Benin City, these comparative experiences suggest a phased adoption strategy beginning with basic virtual meeting tools, complemented by targeted training and strong policy support from local professional associations. The unique composition of Benin City's construction sector - with its mix of traditional building practices and growing modern developments - requires solutions that balance technological innovation with cultural acceptability and economic feasibility.

2.6.2 International Models for Adaptation in Virtual Construction Collaboration

Global experiences in virtual platform adoption offer valuable insights for Benin City's construction sector. The UK's mandatory BIM Level 2 policy since 2016 demonstrates how regulatory frameworks can drive technology uptake, with reported 25% reductions in design clashes through standardized digital workflows (Aghimien et al., 2022). This top-down approach could inform Nigerian policymakers considering similar interventions for public projects.

The United States construction industry showcases effective hybrid implementation models. Firms like Turner Construction have integrated Zoom with BIM 360, achieving 30-40% faster decision-making cycles while maintaining in-person site inspections for critical phases (Ebekozen & Aigbavboa, 2023). This balanced approach suggests Benin City could benefit from combining basic virtual tools with traditional methods during transition periods.

Singapore's Smart Nation Initiative reveals the potential of advanced technologies in emerging markets. Despite high initial costs, VR-based design reviews have reduced rework by 18% in pilot projects through improved stakeholder visualization (Oluwamayowa et al., 2021). For Benin City, this underscores the importance of phased adoption, starting with affordable solutions before considering immersive technologies.

Germany's focus on SME digital upskilling through platforms like Newforma Konekt demonstrates how tailored training can overcome resistance (Onwuanyi & Ojo, 2021). Their experience proves that addressing digital literacy gaps is as crucial as technological infrastructure, a lesson particularly relevant for Benin City's contractor community.

Australia's emphasis on cybersecurity in virtual collaboration highlights often-overlooked implementation aspects. Their ISO-certified platforms show how data protection concerns can be systematically addressed (Oyewobi et al., 2021), providing a model for Benin City firms handling sensitive project information.

These international cases collectively suggest that successful virtual platform adoption requires: regulatory support, context-appropriate technology selection, workforce capacity building, and robust implementation frameworks. For Benin City, this means adapting rather than copying global models to align with local infrastructure capabilities and project requirements. A phased adoption approach beginning with low-bandwidth solutions like WhatsApp Business may offer a practical entry point to digital transformation (Ebekoziem & Aigbavboa, 2023).

2.7 Research Gaps and Opportunities in Virtual Platform Adoption

Despite growing interest in digital construction technologies, significant knowledge gaps persist regarding virtual platform adoption in mid-sized African cities like Benin City. Current research predominantly focuses on Nigeria's major hubs (Lagos, Abuja), overlooking

the unique infrastructural constraints and informal work practices prevalent in secondary urban centers (Onwuanyi & Ojo, 2021). Few studies have examined cost-benefit tradeoffs for small-scale contractors who dominate Benin City's construction sector, particularly regarding affordable alternatives to premium platforms like BIM 360 (Ebekoziem & Aigbavboa, 2023).

The policy dimension remains underexplored, with limited empirical evidence on how municipal regulations or professional association guidelines could incentivize adoption. Comparative studies with other mid-sized African cities facing similar challenges could yield transferable insights, yet such cross-regional analyses are notably absent (Aghimien et al., 2022). Additionally, research has not sufficiently addressed hybrid implementation models that blend virtual and physical meetings - an approach likely suited to Benin City's transitional digital landscape (Oluwamayowa et al., 2021).

Emerging opportunities exist to investigate localized training frameworks that account for Benin City's digital literacy variations across age groups and professional hierarchies. Longitudinal studies tracking implementation in pilot projects could provide much-needed evidence on long-term productivity impacts beyond immediate pandemic-driven adoption (Oyewobi et al., 2021). These gaps present valuable avenues for research that could meaningfully advance both academic discourse and practical implementation strategies in Benin City's construction sector.

CHAPTER THREE

RESEARCH METHODS

3.1 Preamble

This chapter outlines the research methods to be used to investigate the use of virtual platforms for construction site meetings in Benin City. It details the target population, the research instrument used for data collection, and the methods for data analysis.

3.2 Area of the Study

This research focuses on Benin City, the capital of Edo State in southern Nigeria. Benin City is a significant urban center with a growing construction industry, making it an ideal location to examine the adoption and effectiveness of virtual platforms in construction site meetings. The city's diverse construction projects and stakeholders provide a comprehensive backdrop for this study.

3.3 Target Population

The target population for this study will comprise professionals actively involved in the construction industry within Benin City. This includes, but is not limited to:

- **Engineers (Structural & Services-Electrical, Mechanical):** Professionals involved in the technical and practical aspects of construction on-site.
- **Architects:** Professionals responsible for the design and planning phases of construction projects.
- **Quantity Surveyors:** Professionals managing costs and budgets related to construction projects.
- **Contractors:** Individuals in leadership positions within construction companies.

Table 3.1: Target population

S/N	Professionals	Population Size	Sample Size
1.	Structural Engineers	250	80
2.	Service Engineers (Electrical & Mechanical)	170	58
3.	Architects	186	59
4.	Quantity Surveyors	126	40
5.	Contractors	110	34
	<i>TOTAL</i>	<i>842</i>	<i>271</i>

SOURCE: Directory of Structural Engineers (2025), Directory of Nigeria Institute of Electrical & Electronics Engineers (2025), Directory of Nigeria Institute of Mechanical Engineers (2025), Nigeria Institute of Architects, Nigeria Institute of Quantity Surveyors, Edo State Chapter, Bureau of Public Procurement (2024)

These professionals are directly involved in or have oversight of construction site meetings and will provide valuable insights into the current use, adoption factors, benefits, and effectiveness of virtual platforms in this context.

3.4 Sampling Techniques and Sampling Size

3.4.1 Sampling Technique

Convenience sampling is used to select respondents with experience in construction site meetings.

3.4.2 Sample Size:

The sample size was calculated using the Yamane (1967) formula (equation 2) to ensure appropriateness and representativeness.

$$n = \frac{N}{1 + N \cdot e^2}$$

Where N = the population size

n = the sample size,

e = margin of error (5%)

$$\frac{842}{1 + 842 (0.05)^2}$$

$$= 271.18 \cong 271$$

3.5 Data Needs and Sources

The study requires a primary data source.

Primary Data: Information will be gathered directly from practitioners through distributed questionnaires. This data will capture current practices, challenges, and benefits of virtual meetings platforms in the construction industry.

3.6 Research Instruments

The primary instrument for data collection is a structured questionnaire. Questionnaires are a suitable method for collecting data from a geographically dispersed population and for gathering information on attitudes, practices, and experiences. The questionnaire is designed to elicit detailed responses on the usage patterns, effectiveness, and challenges of virtual platforms in construction site meetings. Before full deployment, the questionnaire will be pre-tested with a small group of professionals to ensure clarity and reliability.

3.7 Method of Data Collection

Data will be collected through online and physical distribution of the questionnaires, depending on the accessibility and preference of the respondents. Online surveys will be administered via email and professional networking platforms, while physical copies will be distributed at construction sites and professional gatherings within Benin City. This dual approach aims to maximize response rates and ensure a diverse range of participants.

3.8 Method of Data Analysis

This study will employ a quantitative research approach. This approach is chosen to provide a more comprehensive understanding of the research problem by integrating numerical data with in-depth insights and perspectives from the respondents.

Quantitative Data Analysis:

Data collected through questions in the questionnaires will be analyzed quantitatively. Collected data will be analyzed using descriptive statistical methods, including frequency distributions, percentages, and mean scores, to summarize the responses. Findings will be presented in tables and charts to facilitate easy interpretation and to highlight key trends and patterns related to the use of virtual platforms in construction site meetings.

Table 3.2: Method of Data Analysis

S/N	Objectives	Method of Analysis
1.	Identify virtual meeting platforms used for construction site meetings.	Mean Item Score
2.	Evaluate the benefits of virtual platforms for construction site meetings.	Mean Item Score
3.	Assess barriers to the use of virtual platforms for construction site meetings.	Men Item Score

3.9 Ethical Considerations

We will adhere to ethical research standards by obtaining written informed consent, ensuring voluntary participation, and maintaining strict confidentiality protocols. All data will be anonymized during analysis, with access limited to the research team. Participants receive summary findings upon study completion as a form of reciprocity for their contributions.

CHAPTER FOUR

RESULTS AND DISCUSSION OF FINDINGS

4.1 Preamble

This chapter presents the results obtained from the administered questionnaire and analyzes them in line with the objectives of the study. The analysis is structured to cover the demographic profile of respondents, the virtual platforms commonly used for construction site meetings, the benefits derived from such platforms, and the barriers that hinder their effective use. The responses were coded and analyzed using descriptive statistics, particularly the Mean Item Score (MIS), which ranks the degree of agreement with each item.

Table 4.1: Response rate

Item	Number	Percentage (%)
Number of questionnaires distributed	271	100
Number of questionnaires retrieved	140	51.66
Number not retrieved	131	48.34

4.2 Demographic Characteristics of Respondents

The respondents in this study were construction professionals who regularly participate in site meetings. Their demographic information included details about their jobs, experience, education, and qualifications, ensuring that their insights came from knowledgeable individuals. The diversity of the respondents, comprising quantity surveyors, architects, and engineers, allows for a well-rounded perspective on using virtual platforms for construction site meetings.

They also have a range of educational backgrounds, from bachelor's degrees to advanced certifications relevant to their fields. Many have worked on various projects at different stages of construction, providing practical and valuable insights.

Table 4.2: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Professions	Quantity Surveyors	40	28.57
	Architects	35	25
	Structural Engineers	31	22.15
	Service Engineers (M&E)	22	15.71
	Others	12	8.57
	<i>Total</i>	<i>140</i>	<i>100</i>
	Highest Academic Qualification	HND / B.Sc.	95
M.Sc. / MBA		32	22.58
ND / NCE		13	9.68
<i>Total</i>		<i>140</i>	<i>100</i>
Years of Experience	< 5	90	64.52
	5 - 10	36	25.81
	11 - 15	9	6.45
	> 20	5	3.23
	<i>Total</i>	<i>140</i>	<i>100</i>
No. of Projects Executed (2020-date)	< 5	80	58.06
	5 - 10	23	16.13
	11 - 15	23	16.13
	16 - 20	9	6.45
	> 20	5	3.23
<i>Total</i>	<i>140</i>	<i>100</i>	
Type of Organization	Contracting	49	35.48
	Consulting	41	29.03
	Government	41	29.03
	Others	9	6.46
<i>Total</i>	<i>140</i>	<i>100</i>	
Mode of Conducting Meetings	Hybrid	90	64.52
	Physical Only	36	25.81
	Virtual Only	14	9.68
<i>Total</i>	<i>140</i>	<i>100</i>	
Average Duration (in hours) of Virtual Meetings	1 - 2 hours	85	61.29
	< 1 hour	23	16.13
	3 - 4 hours	23	16.13
	> 4 hours	9	6.45
	<i>Total</i>	<i>140</i>	<i>100</i>
Stage of Contract Where Virtual Platforms Were Used	Mid-Stage	63	45.16
	Early Stage	36	25.81
	All Stages	32	22.58
	Final Stage	9	6.45
<i>Total</i>	<i>140</i>	<i>100</i>	

Interpretation of Result

The demographic profile of the respondents confirms that the data collected for this study is both credible and reliable, drawn from a representative sample of actively practicing

construction professionals in Benin City. The professional composition is heavily weighted toward Quantity Surveyors (28.57%), which reflects their central role in cost management and project coordination, often making them key participants in site meetings. The balanced representation of Architects (25%), Structural Engineers (22.15%), and Service Engineers (15.71%) ensures that the findings include diverse technical perspectives from the core disciplines involved in building design and execution.

The majority hold at least a first degree, consisting of HND/B.Sc. accounting for 67.74%. With a 22.58% portion possessing postgraduate qualifications, this indicates a high level of academic preparedness necessary for critically engaging with the study's topic. The academic profile of the respondents further strengthens the validity of the data.

In terms of practical experience, the analysis reveals an early-career cohort. The mean of 4.48 years of experience, driven by the majority (64.52%) having less than five years in the industry, strongly suggests that the findings are shaped by the perspectives of younger professionals. This profile is complemented by their active engagement in recent projects, with a mean of 3.77 projects executed since 2020. This confirms that the respondents are not only young but also actively involved in the industry, providing highly relevant and current insights from a period that normalized virtual collaboration.

The organizational distribution, split between Contracting, Consulting, and Government sectors, ensures that the data reflects the realities and constraints across the key pillars of the construction industry, from project execution and design to regulatory oversight.

Most critically, the data on meeting practices reveals the current state of digital transition. The overwhelming preference for a Hybrid meeting model (64.52%) is the most significant finding, demonstrating that virtual platforms are being strategically integrated to complement, not replace, physical interactions. This practical adaptation is further detailed in the patterns

of use: the mean virtual meeting duration of approximately 1.73 hours points to focused and efficient sessions.

Furthermore, these platforms are most frequently deployed during the mid-stage (45.16%) of contracts, the period of peak coordination activity, underscoring their value in maintaining project momentum. The high rate of participants joining meetings at the start time (58.06%) indicates good engagement levels and acceptance of the virtual format among these respondents.

The demographic profile depicts a sample that is not only representative of the industry's composition but is also composed of a young, active, and educated workforce that is actively shaping the evolving, hybrid practice of construction site meetings in Benin City.

4.3 Virtual Platforms Used for Construction Site Meetings

Table 4.3 below presents the mean effectiveness score of different virtual platforms as rated by respondents.

Table 4.3: Usage Level of Virtual Meeting Platforms

Virtual Platforms	Mean Item Score	Standard Deviation	Rank
Google Meet	4.33	1.18	1
Zoom	4.20	1.04	2
WhatsApp Video Call	4.13	1.12	3
Microsoft Team	4.04	1.14	4
Skype	3.89	1.31	5
Autodesk BIM 360	3.85	1.35	6
PlanGrid	3.82	1.35	7
Zoho Meeting	3.78	1.41	8
Procore	3.78	1.41	8
Konet	3.75	1.42	10
Cisco Webex	3.74	1.42	11
Jitsi Meet	3.71	1.44	12

Interpretation of Result

Table 4.3 recorded an average mean score of 3.93, showing that respondents generally use virtual platforms frequently for construction site meetings. The top three platforms were Google Meet (4.33), Zoom (4.20), and WhatsApp Video Call (4.13). Their high ratings indicate that these platforms are the most familiar, accessible, and reliable for construction professionals, making them the preferred options for virtual communication and coordination.

The lowest three platforms were Konet (3.75), Cisco Webex (3.74), and Jitsi Meet (3.71). Although still used, their lower scores suggest limited popularity and reduced familiarity compared to the top-ranked platforms. Overall, the results show that while several platforms are available, usage is highest for the most common and easy-to-use tools, with less-known platforms being used to a lesser extent.

4.4 Benefits of Virtual Platforms for Construction Site Meetings

Table 4.4 shows the benefits of using virtual platforms for site meetings.

Table 4.4: Benefits of Virtual Platforms

Benefits	MIS	STD	Rank
Enhance stakeholder participation regardless of location	4.36	0.79	1
Saves time	4.33	0.82	2
Reduce the cost of physical meetings	4.29	0.88	3
Easier involvement of external stakeholders	4.28	0.99	4
Enhance documentation (recording and sharing minutes)	3.89	1.09	5
Reduce project delay	3.74	1.03	6
Improve record-keeping and accountability	3.55	1.02	7
Improve overall project coordination	3.40	1.42	8
Improve project communication	3.37	1.21	9
Faster resolution of conflict	3.35	1.12	10
Facilitate faster decision-making	3.28	1.05	11

Interpretation of Result

Table 4.4 shows an average score of 3.57, indicating that respondents generally agreed that virtual platforms offer meaningful and valuable benefits for construction site meetings. This

suggests that the use of virtual tools has become an important part of project communication and collaboration, helping project teams work more efficiently even when physical meetings are not possible.

The top three benefits were enhanced stakeholder participation (4.36), time savings (4.33), and reduced cost of physical meetings (4.29). These high scores show that virtual platforms make it easier for all stakeholders to join meetings regardless of location, reduce the time spent on travel and coordination, and lower the costs normally associated with organizing physical meetings. Together, these advantages highlight that virtual platforms significantly improve inclusivity and operational efficiency within construction projects.

The lowest three benefits were improved overall project coordination (3.40), improved communication (3.37), and faster decision-making (3.28). Although respondents still agreed that these are benefits of virtual platforms, their comparatively lower scores indicate that challenges remain in fully optimizing coordination and communication in virtual settings. Issues such as internet reliability, reduced face-to-face interaction, or delays in responses may contribute to slower decision-making and less smooth coordination.

Overall, the results indicate that virtual platforms provide strong benefits in terms of participation, cost savings, and time efficiency. However, enhancing communication processes and decision-making speed could further strengthen their effectiveness in construction project meetings.

4.5 Barriers to the Use of Virtual Platforms in Construction Site Meetings

Table 4.5 highlights the barriers identified by respondents.

Table 4.5: Barriers to the Use of Virtual Platforms

Barriers	MIS	STD	Rank
Poor internet connectivity	4.19	0.81	1
Lack of acceptance from older professionals	4.14	1.07	2
Power supply interruptions	4.10	1.03	3
Lack of technical know-how among staff	4.02	1.14	4
Difficulty presenting technical drawings	3.97	0.98	5
Unstable software platforms (glitches/crashes)	3.93	1.16	6
Participants are distracted during meetings	3.89	1.13	7
Eye strain from prolonged screen use	3.84	1.13	8
Hearing strain from prolonged earpiece use	3.78	1.12	9
Absence of in-person human interaction	3.74	1.09	10
Data privacy concerns	3.66	1.09	11
Language/communication barriers reduce	3.53	1.01	12
Fatigue from prolonged sitting	3.49	0.98	13

Interpretation of Result

The results from Table 4.5 show an average mean score of 3.86, indicating that respondents generally agreed that several significant barriers affect the effective use of virtual platforms for construction site meetings. This suggests that while virtual platforms are useful, there are still notable challenges that can limit their full adoption and performance in construction project communication.

The top three barriers were poor internet connectivity (4.19), lack of acceptance from older professionals (4.14), and power supply interruptions (4.10). These high ratings show that technical limitations and resistance to digital adoption greatly hinder the smooth use of virtual platforms. Unreliable internet and inconsistent electricity supply disrupt meeting flow, while some older professionals may be reluctant to use digital tools, affecting participation and consistency in virtual meetings.

The lowest three barriers were data privacy concerns (3.66), language or communication barriers (3.53), and fatigue from prolonged sitting (3.49). Although these were still rated as barriers, their lower scores indicate that respondents considered them less severe compared to the major technical and acceptance-related issues. These challenges exist but have a relatively smaller impact on overall meeting effectiveness.

Overall, the findings show that infrastructural constraints and low digital acceptance are the main obstacles affecting virtual platform use in construction meetings. Addressing internet reliability, power stability, and user readiness could significantly improve the efficiency and acceptance of virtual communication tools within the construction industry.

4.6 Discussion of Findings

This section discusses the results of the study in relation to the three stated objectives and the reviewed literature. The discussion highlights areas of agreement and contradiction between this study and previous research on virtual platforms in construction management.

4.6.1 Usage Level of Virtual Platforms

The study revealed that the most commonly used virtual platforms among construction professionals in Benin City are Google Meet, Zoom, and WhatsApp, while others, such as Microsoft Teams, Skype, PlanGrid, Cisco Webex, and Autodesk BIM 360, recorded lower usage. The preference for these platforms was largely due to their accessibility, low data consumption, and ease of use, which make them suitable for environments with limited internet bandwidth.

These findings agree with the works of Encinas, Sattineni, and Simons (2021) and Elmualim and Gilder (2014), who found that professionals in both developed and developing contexts prefer simple, readily available digital tools for communication and coordination. Similarly,

Ebekozien and Aigbavboa (2021) confirmed that in Nigeria, ease of access and cost considerations strongly determine technology adoption in the construction sector.

However, the findings differ slightly from Chowdhury et al. (2021) and Ahuja, Yang, and Shankar (2020), who reported a stronger preference for more advanced platforms such as Microsoft Teams and BIM-integrated systems in countries with robust digital infrastructure. This variation can be attributed to infrastructural limitations and inconsistent internet services in Benin City, which make simpler applications more practical for day-to-day project meetings.

4.6.2 Benefits of Virtual Platforms

The findings showed that virtual platforms provided several benefits to construction professionals. These include enhanced stakeholder participation regardless of location, reduced travel costs, time efficiency, improved documentation, and easier involvement of external consultants. These results align closely with the findings of Zuofa and Ochieng (2021) and Aghimien, Aigbavboa, and Oke (2022), who observed that virtual meetings foster better coordination, minimize delays, and enable broader participation in project decision-making.

In line with Olatunji, Aigbavboa, and Oke (2020), this study also found that virtual platforms promote transparency through improved documentation and record-keeping. The observed improvement in participation agrees with Oluwamayowa, Eze, and Okonkwo (2020), who reported that virtual communication tools enhance inclusiveness and productivity by overcoming urban mobility constraints.

Nevertheless, a few aspects of this study contrast with earlier findings. For instance, Ebekozien, Aigbavboa, and Thwala (2023) reported that despite their advantages, virtual meetings could reduce decision-making speed due to poor connectivity and inconsistent

engagement. In this study, however, respondents emphasized that virtual platforms actually accelerated communication, especially for routine coordination meetings. This divergence may be due to contextual differences in team composition and meeting scope across projects.

4.6.3 Barriers to the Use of Virtual Platforms

The major barriers identified in this study were poor internet connectivity, unstable power supply, lack of technical know-how, and low acceptance among older professionals. These constraints align with earlier research by Ebekoziem and Aigbavboa (2021), Odubiyi and Oke (2016), and Oyewobi, Aigbavboa, and Windapo (2021), who all emphasized that infrastructural deficiencies and generational resistance hinder the full adoption of digital technology in Nigeria's construction sector. In addition, the finding that resistance from older professionals affects virtual meeting adoption agrees with Abba et al. (2021), who linked such reluctance to limited digital literacy and preference for traditional communication.

However, this study partially disagrees with Encinas et al. (2021), who found that organizational support and training significantly reduce resistance. In Benin City, despite increased exposure to digital tools after the COVID-19 pandemic, many professionals still struggle with adaptation, suggesting that training alone is not sufficient without concurrent infrastructure improvements.

Furthermore, the finding that hybrid meetings (64.52%) are the dominant practice supports Encinas et al. (2021) and Ebekoziem and Aigbavboa (2023), who proposed hybrid models as transitional strategies for developing regions. This balance allows professionals to benefit from both physical and virtual engagement while managing infrastructural constraints.

4.7 Summary of Discussion

In summary, the findings of this study align with existing literature that suggests virtual platforms have transformed communication in the construction industry by improving participation, documentation, and efficiency. However, the study also highlights several contextual challenges, such as unreliable internet access, inconsistent power supply, and limited digital literacy, that hinder the adoption of these technologies. The few differences between this study and previous research highlight geographical and infrastructural disparities that set Nigeria's construction industry apart from more technologically advanced regions.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

5.1 Preamble

This chapter presents the summary of key findings, the conclusions drawn from the study, and recommendations based on the results of the research. It also highlights areas that require further investigation to deepen the understanding of the use of virtual platforms for construction site meetings in Benin City.

5.2 Summary of Findings

The preceding chapter presented the analysis and interpretation of data obtained from construction professionals in Benin City. This section provides a concise summary of the key findings derived from that analysis. The study assessed the use of virtual platforms for construction site meetings in Benin City with particular focus on the platforms adopted, their benefits, and the barriers limiting their effectiveness. Data was obtained through questionnaires distributed among construction professionals, and the responses were analyzed using descriptive statistics and mean item scores. The following findings emerged:

5.2.1 Virtual Platforms Used

The most widely used platforms were Google Meet, Zoom, and WhatsApp, due to their accessibility, ease of use, and low data consumption.

Other platforms, such as Microsoft Teams, Skype, PlanGrid, Autodesk BIM 360, Cisco Webex, and Jitsi Meet, were less frequently used, with lower mean effectiveness scores.

5.2.2 Benefits of Virtual Platforms

The highest-rated benefit was enhanced stakeholder participation regardless of location.

Other notable benefits included cost reduction, time savings, improved communication, and easier involvement of external stakeholders.

Virtual meetings also improved documentation, accountability, and project coordination, though some benefits, such as faster decision-making, ranked lower.

5.2.3 Barriers to the Use of Virtual Platforms

The greatest barriers were poor internet connectivity and a lack of acceptance from older professionals.

Other significant challenges included a lack of technical know-how, unstable software platforms, power supply interruptions, and difficulty in presenting technical drawings online.

Secondary barriers included fatigue from prolonged meetings, data privacy concerns, and loss of interpersonal interaction.

5.3 Conclusions

5.3.1 Virtual Meeting Platforms Used

The study finds that construction professionals in Benin City frequently use various virtual meeting platforms, with Google Meet, Zoom, and WhatsApp being the most popular due to their accessibility, low data use, and ease of use. More advanced platforms like Microsoft Teams, Autodesk BIM 360, and Procore are less common, mainly because of infrastructural issues and limited familiarity among users. This pattern shows that technology adoption in Benin City is driven more by practicality and cost-effectiveness than by technical sophistication, reflecting how professionals adapt within the city's digital limitations.

5.3.2 Benefits of Virtual Platforms

The study found that virtual platforms have significantly enhanced project communication, inclusiveness, and cost efficiency in the construction sector of Benin City. Respondents reported improved stakeholder participation, regardless of their location, as well as reduced

travel expenses, time savings, and enhanced documentation and accountability. These outcomes confirm that virtual platforms play a crucial role in promoting stakeholder engagement and improving project performance, achieving the overall goal of enhancing participation during meetings. The prevalence of hybrid meeting models (64.52%) reflects an incorporation of digital tools into professional routines, demonstrating growing acceptance and real operational benefits throughout the construction industry.

5.3.3 Barriers to the Use of Virtual Platforms

Despite their recognized benefits, the adoption of virtual platforms is limited by poor internet connectivity, unstable power supply, a lack of technical skills, and low acceptance among older professionals. These challenges highlight both infrastructural and cultural barriers that hinder the full realization of the advantages of digital collaboration. The findings indicate that successful integration requires improvements in infrastructure, digital literacy, and organizational change management. Without these enabling conditions, the goal of fully optimizing stakeholder participation through virtual meetings will remain only partially achieved.

The study clearly demonstrates that virtual platforms have significantly changed the communication dynamics within the construction industry in Benin City. These platforms have facilitated greater participation, enhanced coordination, and lowered meeting costs. However, for sustainable adoption to occur, it will be essential to strategically invest in infrastructure, training, and inclusive digital policies. A hybrid model appears to be the most effective approach for addressing existing infrastructure and cultural gaps, thereby promoting a gradual yet impactful digital transformation in the local construction sector.

5.4 Recommendations

Based on the findings of this study, several practical recommendations are proposed to promote the effective use of virtual platforms for construction site meetings and to enhance stakeholder participation in the Nigerian construction industry.

Firstly, professional bodies such as the Nigerian Institute of Quantity Surveyors (NIQS), the Nigerian Institute of Architects (NIA), and the Nigerian Society of Engineers (NSE) should take a proactive role in promoting the adoption of virtual platforms through structured advocacy and sensitization programs. These bodies can organize workshops, continuous professional development (CPD) sessions, and webinars to demonstrate the operational benefits of virtual meetings and encourage their integration into daily project management practices. Such initiatives would help dispel misconceptions about virtual collaboration and build confidence among professionals who are hesitant to adopt digital tools.

Secondly, NIQS and related professional institutions should collaborate with technology providers and universities to establish digital training programs tailored for construction professionals. These programs should focus on practical skills such as using Zoom, Google Meet, Microsoft Teams, and emerging construction-oriented software like Autodesk BIM 360. This would enhance digital competence, especially among older practitioners and field personnel who are less familiar with online tools. Regular hands-on training sessions would ensure that virtual platforms are not only accessible but also effectively utilized to improve communication, documentation, and decision-making during meetings.

Thirdly, construction firms and consultancy practices should adopt clear organizational policies that support the use of virtual platforms in all project phases. Firms can develop internal frameworks that require certain categories of meetings—such as design reviews, progress assessments, and coordination briefings—to be conducted virtually or in hybrid

form. This structured adoption approach will ensure consistency and help in tracking efficiency improvements over time. For organizations already using these platforms informally, such policies would formalize the process and make it part of their standard project communication protocols.

Furthermore, clients and project owners, including both public and private institutions, should recognize virtual meetings as a valid and efficient medium for project coordination. By including the provision for virtual meeting infrastructure in tender and contract documents, clients can encourage broader adoption and save costs associated with travel and meeting logistics. For government agencies, integrating virtual platforms into project monitoring frameworks would improve transparency and allow for better stakeholder oversight, particularly in large-scale projects that involve multiple teams or consultants spread across different locations.

To address technical barriers such as unstable internet connectivity and inconsistent power supply, construction organizations should consider investing in alternative energy solutions such as solar backup systems and dedicated broadband packages for site offices. Additionally, professional associations and policymakers can engage with telecommunication companies to advocate for affordable, high-speed internet plans for registered construction professionals and firms. This form of institutional support would reduce the infrastructural limitations currently hindering effective virtual collaboration.

Lastly, future government initiatives in the construction and housing sectors should incorporate digital transformation policies that support the modernization of project communication processes. The Federal Ministry of Works and Housing, in collaboration with professional councils, can develop a national framework for digital collaboration in construction. Such a policy should mandate or at least encourage the use of virtual platforms

for specific project stages, especially during feasibility assessments, progress meetings, and post-occupancy evaluations. This would ensure uniform practice standards and align Nigeria's construction sector with global digital trends.

The promotion and sustained use of virtual platforms require the collective effort of all stakeholders—professional bodies, firms, clients, and government agencies. Through advocacy, structured training, infrastructure investment, and supportive policies, virtual meetings can become a permanent and effective feature of construction practice, leading to improved communication, better stakeholder participation, and enhanced project performance across the Nigerian construction industry.

5.5 Areas of Further Studies

The research has provided a foundational analysis by identifying the virtual platforms used, highlighting their benefits, and outlining the barriers that limit their effective use. However, more detailed investigations are required to quantify these findings, establish measurable frameworks, and extend their applicability across different contexts within the construction industry.

With a focus on identifying the virtual meeting platforms used for construction site meetings, future research should examine the underlying factors that determine the selection and continued use of specific platforms. While this study found that Google Meet, Zoom, and WhatsApp are the most preferred tools due to their accessibility and low data consumption, it remains essential to explore the determinants of these choices in greater detail. Subsequent studies could investigate how factors such as project size, client type, organizational policies, and levels of digital investment influence platform preference and adoption. In addition, differences among professional groups such as architects, engineers, contractors, and quantity surveyors should be examined to determine whether each discipline favors particular

platforms based on its functional and communication needs. Longitudinal research could also track adoption patterns over time to reveal whether the current hybrid model of meetings transitions toward fully virtual collaboration as digital infrastructure improves across Nigeria.

Concerning the second objective, which evaluated the benefits of virtual platforms for construction site meetings, further studies should aim to establish measurable criteria for assessing the effectiveness of these tools. Although this research identified major benefits such as cost reduction, enhanced stakeholder participation, time efficiency, and improved documentation, the extent of these advantages was not quantified.

Future investigations should therefore develop standardized performance metrics such as participation rates, response time, and decision-making efficiency to measure the impact of virtual meetings objectively. Moreover, comparative research could determine whether the benefits of virtual collaboration differ across project categories, including public infrastructure projects, private developments, and joint-venture arrangements.

Understanding how specific clients, contract types, or project delivery methods influence the effectiveness of virtual platforms would provide valuable insight into their optimal use. In addition, further research could explore the relationship between virtual meetings and key project performance indicators such as cost control, schedule adherence, and stakeholder satisfaction, thereby identifying the project conditions under which virtual platforms deliver the greatest value.

This study found that poor internet connectivity, unstable power supply, limited digital literacy, and professional resistance are major obstacles. However, further research is needed to quantify the impact of each barrier and evaluate how these factors interact to influence overall adoption. Studies could develop analytical models or indices to rank the relative importance of infrastructural, organizational, and cultural constraints. There is also a need to

evaluate the effectiveness of targeted interventions, such as digital training programs, policy incentives, and change management strategies, in mitigating these challenges.

Comparative analysis among contractors, consultants, and public sector agencies could reveal whether institutional frameworks or professional hierarchies contribute more significantly to digital resistance. Moreover, exploring the role of professional associations and government policies in promoting digital literacy and technological readiness would help establish a stronger foundation for sustainable digital transformation in the construction sector.

Finally, future research should adopt a comparative approach to examine how virtual platforms are utilized in other Nigerian cities, like Lagos, relative to Benin City. Such studies would highlight regional variations in infrastructure quality, adoption behavior, and stakeholder perception, thereby providing a broader understanding of contextual factors that shape virtual collaboration. This wider perspective would help in formulating national policies, professional guidelines, and implementation frameworks that promote consistent digital practices across the construction industry.

In addition, further research could investigate the long-term sustainability of hybrid meeting systems, the data security implications of virtual collaboration, and the development of participation indices to measure stakeholder engagement during digital meetings. Collectively, these future studies would not only enrich academic discourse but also provide practical strategies to enhance communication, participation, and project delivery outcomes in Nigeria's evolving construction environment.

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APPENDIX

RESEARCH QUESTIONNAIRE



Department of Quantity Surveying,
Faculty of Environmental Sciences,
University of Benin
Benin City,
Edo State.
15th September 2025.

Dear Sir/Ma,

REQUEST TO FILL OUT RESEARCH QUESTIONNAIRE

I am a student of the above-named university, currently undertaking a B.Sc. degree program in Quantity Surveying. After the social lockdown associated with the COVID-19 pandemic in 2019 and 2020, participating in construction business meetings was done virtually at times. A study is proposed to assess the **USE OF VIRTUAL PLATFORMS FOR CONSTRUCTION SITE MEETINGS IN BENIN CITY**. I kindly request your assistance in completing the attached questionnaire, which will be used for research purposes only and will be kept confidential.

Your response would be highly appreciated.

Thank you.

Yours sincerely,

Winning Oshomomoh David

winningsuccess2020gmail.com

SECTION A: DEMOGRAPHIC INFORMATION

1. Highest Academic Qualification:

ND/NCE HND/B.Sc., M.Sc./MBA, Ph.D.

2. Professionals' affiliation in the Construction Industry:

Service Engineer (mechanical & electrical) Structural Engineer Quantity Surveyor Architect Others

3. Years of Experience:

<5, 5–10, 11–15, 16 – 20, >20

4. No. Of projects undertaken (from 2020 to date):

< 5, 5-10, 11-15, 16-20, >20

5. Type of Organization:

Government Consulting Contracting Others

6. Which of these best describes the mode of conducting construction site meetings in projects involved in?

In person only Virtual only Both

7. What is the average duration of the virtual meetings (in hours)

< 1 1-2 3-4 >4

8. At what stage of the contract did you usually use virtual platforms for the site meetings?

Early Mid Final All times

SECTION B: USE OF VIRTUAL MEETING PLATFORMS

9. Kindly tick below from the box, the effectiveness of the virtual platforms used for site meetings on the Likert Scale of 1-5, where,

1 = Not Effective, 2 = Less Effective, 3 = Effective, 4 = More Effective, 5 = Extremely Effective

S/N	Virtual Platform Used	Level of Effectiveness				
		1	2	3	4	5
1.	Zoom					
2.	Microsoft Team					
3.	Google Meet					
4.	Skype					
5.	WhatsApp					
6.	Cisco Webex					
7.	Zoho Meeting					
8.	Jitsi Meet					
9.	Konet					
10.	Procore					
11.	Autodesk BIM 360					
12.	PlanGrid					

SECTION C: BENEFITS OF USING VIRTUAL PLATFORMS FOR SITE MEETINGS

10. These are the benefits of the use of virtual platforms for site meetings. Kindly rate your level of agreement using the Likert Scale of 1-5, where:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S/N	Benefits of virtual meetings	1	2	3	4	5
1.	Virtual platforms reduce the cost of physical meetings.					
2.	They save time					
3.	They improve project communication.					
4.	They enhance stakeholder participation regardless of location.					
5.	They facilitate faster decision-making.					
6.	They enhance documentation (recording and sharing meeting minutes)					
7.	Reduce project delay					
8.	Virtual platforms improve record-keeping and accountability.					
9.	They make it easier to involve external stakeholders (consultants, regulators, etc.).					
10.	They allow faster resolution of conflicts or disputes.					
11.	They improve overall project coordination.					

SECTION D: BARRIERS TO USE VIRTUAL PLATFORMS FOR SITE MEETINGS

11. These are the barriers to the use of virtual platforms in construction site meetings. Kindly rate your level of agreement using the Likert Scale of 1-5, where:

1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree

S/N	Barriers to the use of virtual platforms for site meetings	1	2	3	4	5
1.	Poor internet connectivity					
2.	Difficulty presenting drawings/technical documents online is a challenge.					
3.	Power supply interruptions hinder usage.					
4.	Lack of acceptance from older professionals.					
5.	Lack of technical know-how among staff					
6.	Unstable software platforms (frequent glitches/crashes) reduce efficiency.					
7.	Data privacy of site meetings					
8.	Fatigue from prolonged sitting					
9.	Prolonged use of earpieces/pods causes hearing strain.					
10.	Language or communication barriers reduce effectiveness in virtual meetings.					
11.	Long exposure to a display screen causes eye strain.					
12.	The absence of in-person human interaction makes meetings boring.					
13.	Participants are usually distracted in virtual meetings.					