

Assessing the Role of Mobile Applications in Enhancing Project Efficiency and Time Management among NGO Field Workers

Gibrilla Amara Tucker

School of Technology, Department of Physics and Computer Science,
Njala University, Sierra Leone
Mobile: +243819987074
Email: tuckergibrilla@gmail.com
ORCID number: 0009-0000-1278-5667

Abstract

Non-governmental organisations (NGOs) often rely on field workers to manage and execute projects in complex environments where time efficiency and effective task coordination are critical. This study systematically reviews existing literature to explore how mobile applications have been utilised to enhance project efficiency and time management among NGO field staff, particularly in Sub-Saharan Africa. Drawing on peer-reviewed studies, technical reports, and documented NGO case studies published between 2010 and 2024, the review identified common patterns in mobile application use for reporting, task scheduling, communication, and data tracking. Guided by the Technology Acceptance Model (TAM) and Activity Theory (AT), the study synthesised findings across diverse contexts to uncover both the benefits and constraints of mobile technology adoption. The results showed that mobile apps have contributed to improved reporting speed, reduced administrative delays, and better coordination among teams. However, challenges such as low digital literacy, poor network infrastructure, and limited organisational support continue to hinder optimal use. The review highlighted key themes around usability, institutional readiness, and the need for context-aware deployment of mobile tools. It also identified significant gaps in the literature, particularly in long-term evaluations and locally-driven implementation strategies. The study concluded by recommending improved staff training, stronger digital infrastructure, and better integration of mobile technologies into NGO operational frameworks.

Keywords: Mobile Technology, NGO Workers, Field Management, Time Efficiency, Project Delivery, Communication Tools

Introduction

In many parts of sub-Saharan Africa, development interventions often depend on the work of non-governmental organisation (NGO) field staff, who operate in difficult terrains with limited resources. These field workers serve as the human infrastructure through which projects on healthcare, education, agriculture, and human rights are executed in local communities. However, their work is frequently hindered by issues of coordination, time mismanagement, and delayed reporting. The need for more efficient systems of communication, tracking, and project implementation has led many NGOs to experiment with mobile applications as operational tools in field environments. These digital tools offer opportunities for real-time data collection, communication between headquarters and field teams, and more structured scheduling of activities. Yet, the actual impact of mobile applications on improving time management and project efficiency in these settings remains under explored, particularly within African NGO operations.

The dependence of NGOs on physical paper-based systems has often led to delays in data transmission, duplication of tasks, and poor monitoring of field activities. With the advancement of mobile technologies, there is increasing hope that digital tools can resolve these bottlenecks. Scholars have argued that mobile applications have transformed not only communication patterns but also how data is collected and processed in low-resource environments. For example, Asi and Williams (2018) found that mobile apps used in humanitarian crises improved the speed of reporting and enhanced team coordination. This suggests that when used effectively, mobile technologies can contribute to more organised, time-efficient project delivery. Still, such outcomes are not automatic and often depend on the design of the app, the training of the users, and the conditions of the field.

NGOs working in remote areas face several logistical constraints that complicate daily operations. These include poor road networks, erratic power supply, and weak internet signals. In such conditions, even well-developed mobile applications can fail to deliver impact if they are not properly adapted to the realities of the field. Aker *et al.* (2016) observed that in several West African field interventions, mobile app usage declined over time, not because of software limitations but due to field staff lacking the technical knowledge or resources to operate them. This finding reflects a deeper tension in development work where digital solutions are promoted without adequate investments in human capacity and local infrastructure. Therefore, while mobile apps promise operational improvement, they may also risk being another layer of inefficiency if poorly implemented.

A significant portion of NGO activities involves time-bound deliverables that require strict compliance with reporting and project time lines. For example, vaccination campaigns, food distribution, and health awareness projects often operate on narrow time schedules. In this context, field workers must manage multiple tasks, communicate constantly with different teams, and provide regular updates to headquarters. Without structured digital systems, this process becomes cumbersome and inefficient. Nwaodu and Ilo (2015) noted that Nigerian NGOs still struggle with documentation delays, lost field records, and fragmented communication, all of which undermine their ability to deliver projects on time. These inefficiencies not only reduce the effectiveness of development interventions but can also erode donor confidence.

Recent efforts to digitalise NGO fieldwork have focused on using mobile applications to automate several of these routine functions. Reporting templates, GPS-tagged images, voice notes, and progress tracking features embedded in mobile apps now allow field workers to deliver updates in real-time. These functions reduce the time spent on redundant communication and enable programme officers to have constant visibility over ongoing activities. Bosch *et al.* (2020) argued that, mobile tools can restructure the workflows of field staff, reduce the mental burden of multitasking, and allow better resource allocation. However, these outcomes are not guaranteed as implementation success requires context-specific app design, training tailored to varying levels of digital literacy, and strong institutional frameworks that can support the use of these tools long-term.

Mobile applications in development contexts are typically adopted for specific purposes: data collection, monitoring and evaluation, communication, and reporting. Each of these functions addresses a particular weakness in traditional field operations. For instance, mobile forms with validation checks reduce errors in data entry, while push notifications help coordinate team actions across distances. Despite this, scholars such as Orlikowski and Scott (2015) have warned against over-reliance on digital tools, noting that technologies do not automatically resolve organisational inefficiencies but rather amplify existing dynamics, whether good or bad. This argument is particularly relevant in NGO settings where organisational culture, leadership styles, and accountability mechanisms all shape how technologies are adopted and used. An app may exist, but without leadership endorsement or integration into standard operating procedures, its use may remain optional,

Although the use of mobile apps for NGO work is gaining recognition, there is a lack of empirical studies focused on the relationship between these tools and time efficiency. Much of the existing literature emphasises data accuracy, cost-effectiveness, or general ICT use in development. What remains underexamined is how these tools alter the day-to-day time use of field workers, especially in settings where every hour counts toward achieving project deliverables. This gap is particularly important to address because time wastage in field operations often leads to cascading delays across entire project cycles. This study focuses on synthesising existing research and documented field experiences to understand how mobile applications shape the day-to-day operations of NGO field staff. Rather than generating new data through interviews or surveys, the study reviews published literature, peer-reviewed journal articles, NGO technical reports, and digital development case studies. The goal is to explore how mobile tools have been implemented across different field contexts, what outcomes they have produced in terms of time management and project efficiency, and what institutional or technical factors affect their successful use. This approach draws on the Technology Acceptance Model (TAM), which highlights perceived usefulness and ease of use as central to digital adoption, and Activity Theory, which situates technology within the broader operational environments where people work and interact.

Objectives of the Study

The objectives of this research are to:

- i. Assess the role of mobile applications in enhancing project efficiency and time management among field workers
- ii. Examine how mobile applications are used by NGO field workers for scheduling, task management, and reporting.
- iii. Evaluate the impact of mobile applications on project efficiency, particularly in relation to meeting deadlines and reducing redundant tasks.
- iv. Explore the role of mobile apps in improving time management practices among field staff.
- v. Identify challenges faced by NGO field workers in adopting and effectively using mobile applications.
- vi. Make recommendations for improving the design, training, and infrastructure support for mobile application use in field-based NGO work.

Statement of the Problem

Non-governmental organisations play a central role in development anywhere, often filling critical gaps in education, health, human rights, and livelihood projects. These interventions are largely implemented through field workers who operate in dispersed, and sometimes difficult, locations. Their responsibilities range from conducting surveys to mobilising communities, coordinating local partners, and providing regular updates to programme offices. While their role is indispensable, it is also complicated by recurring issues of poor coordination, reporting delays, time mismanagement, and duplicated efforts. These operational inefficiencies have a direct impact on project outcomes, making it difficult for NGOs to deliver interventions on time or within budget.

Despite numerous capacity-building efforts, many NGOs still rely on manual processes and fragmented communication systems. Reporting is often paper-based or spread across multiple channels such as text messages, emails, and informal calls. This fragmentation not only wastes time but also reduces accountability and data integrity. According to Aina and Olatunji (2020 p.215), field reports from Nigerian NGOs are frequently inconsistent and delayed due to weak communication systems and the absence of centralised reporting platforms. The consequence is that decision-makers at head offices are unable to respond quickly to emerging issues on the ground, leading to missed targets or rushed activities near project deadlines.

In response to these issues, mobile applications have emerged as a possible solution for improving the flow of information, reducing delays, and helping field workers manage their time more effectively. These apps are increasingly used for real-time data collection, scheduling, and progress tracking. However, the assumption that mobile applications automatically lead to efficiency improvements is problematic. Adoption varies significantly depending on the capacity of the organisation, the digital literacy of staff, and the level of infrastructure support. For instance, many rural field staff operate in areas with limited network coverage, making real-time communication and uploads difficult. Even where devices are available, the lack of technical support or training can discourage meaningful use. demanding a critical look at the implications.

Literature Review

The increasing reliance on mobile technology by NGOs is largely driven by the need to enhance real-time communication, streamline data collection, and improve the accountability of field operations. NGOs operating in low-resource settings have adopted mobile apps for a variety of operational needs, including field reporting, beneficiary registration, needs assessments, and coordination. Aker and Blumenstock (2015 p.356) notes that, mobile applications represent a transformative solution in Sub-Saharan Africa, helping organisations “overcome geographic and infrastructural constraints to service delivery”.

The practical uses of mobile applications in field operations often revolve around three core areas namely, communication, task scheduling, and real-time data submission. Tools like Kobo Toolbox and ODK have become especially popular among humanitarian and development NGOs for their offline data capture features. According to Tomlinson *et al.* (2009), these tools reduced paper-based inefficiencies and improved response time in maternal health interventions across Southern Africa). However, these successes are not automatic and depend on several contextual factors such as connectivity, device availability, and user readiness. A study by Dada *et al.* (2022) on mobile app use among community-based organisations in Nigeria found that while applications improved coordination and reduced duplication of tasks, inconsistent adoption across teams and digital illiteracy remained significant barriers. These findings reflect broader concerns in the literature that mobile apps offer great promise, but their full potential remains untapped due to technical, infrastructural, and institutional limitations.

Field reporting is one of the areas where mobile applications have made measurable impact. Real-time uploads of activity reports, photos, and GPS-tagged evidence have allowed NGOs to maintain better oversight of field operations. According to Chibet *al.* (2015), mobile platforms significantly improved the efficiency of frontline workers in low-resource environments by allowing decentralised data sharing between field staff and headquarters. In a study conducted by Tusiime and Gasper (2021), frontline workers in Ugandan NGOs reported improved reporting consistency through mobile apps, but they also identified frustrations tied to app crashes, battery failures, and network constraints. These realities indicate that mobile reporting tools may improve reporting speed in theory, but in practice, their success depends on adequate infrastructure and capacity support.

Despite the growing body of literature on mobile technologies in NGO work, few studies focus explicitly on their impact on time management, a key variable in project efficiency. Time management in NGO fieldwork involves the organisation of daily schedules, prioritisation of tasks, and meeting of deadlines under resource constraints. While reporting speed is often tracked, less attention is paid to whether mobile apps help field workers structure their activities or reduce time wastage. One of the few regionally relevant studies is by Nyaguthii and Oyugi (2020), who examined the role of task management apps in community health initiatives in Kenya. They found that digital scheduling improved field officers' punctuality and reduced delays in monthly reporting cycles. However, they also observed that only staff who received consistent mentoring continued to use the tools beyond the pilot phase.

Similarly, Kyem and Asiedu (2021) observed that in Ghana, mobile reminders and project management dashboards helped NGOs avoid missed deadlines in field-based agricultural projects. However, staff without smartphone literacy or access often relied on informal systems, such as notebooks or peer reminders. These findings suggest that mobile apps can enhance time discipline but are effective only when embedded in a supportive digital culture. Sustained use of mobile apps is shaped not only by individual preferences but by institutional capacity and leadership support. Venkatesh and Davis (2000) explain in the Technology Acceptance Model (TAM), perceptions of a system's usefulness and ease of use strongly influence user behaviour. However, in low-resource organisations, staff perceptions are also affected by external factors such as peer influence, access to training, and technical support. In the Nigerian context, Bello and Odukoya (2022) investigated the role of organisational policies in mobile app adoption by Lagos-based NGOs. They found that clear reporting structures, digital on boarding training, and dedicated ICT support units were crucial to app usage. Conversely, organisations without these structures showed a drop-off in app adoption after initial deployment.

This aligns with findings by Asongu and Nwachukwu (2018), who observed that African NGOs that involved staff in the app selection process had higher adoption rates and better feedback loops, compared to organisations that imposed tools from above. These studies collectively underscore that adoption is not merely a technical process, but also an organisational one.

Beyond data collection and scheduling, mobile applications facilitate day-to-day communication between field workers and supervisors. Informal tools such as WhatsApp have become the de facto channels for quick updates, queries, and coordination. These platforms offer real-time messaging, document sharing, and group communication features that are often faster than emails or in-person meetings. However, a study by Egbulefu (2020) on the use of WhatsApp in humanitarian coordination in Nigeria found that while the platform accelerated communication, it also led to information overload, message fatigue, and a lack of documentation protocols. To this end, sensitive project information shared over unsecured channels raised data protection concerns.

Integrating these informal channels with formal workflows remains a challenge which is the reason why Ciburra and Andoh-Baidoo (2017) recommend using structured platforms like mobile dashboards that track messages, generate automated reports, and allow secure archiving. Their study in Sierra Leone found that organisations that structured mobile communications into existing project cycles saw a 32% reduction in duplicated tasks and late submissions. The implication here is that mobile communication tools are effective only when systematically managed and aligned with organisational workflows.

A consistent finding across the literature is the constraint posed by poor infrastructure and digital literacy. Nigeria, like many Sub-Saharan countries, experiences frequent network interruptions, limited broadband coverage in rural areas, and unreliable power supply. According to GSMA (2021), nearly 40% of NGO field workers in northern Nigeria report difficulty using mobile apps due to poor connectivity. Even when mobile signal is available, inconsistent electricity hampers device charging, particularly in areas without solar solutions. Digital literacy further compounds the issue. In a survey by Edewor (2019), over 45% of NGO

field staff in South-eastern Nigeria admitted to needing regular help to fill digital forms, use mobile reporting tools, or troubleshoot app errors. While training is often provided at the onboarding stage, long-term support is rare. This affects confidence as it reduces tool usage and contributes to a cycle where mobile apps are underused or abandoned.

Theoretical Framework

Understanding how mobile applications enhance project efficiency and time management among NGO field workers requires a framework that accounts for both individual decision-making and broader organisational structures. This study draws on two theoretical models which are the Technology Acceptance Model (TAM) and Activity Theory (AT). Together, they offer a robust lens for analysing how mobile apps are adopted, used, and integrated into fieldwork operations in resource-constrained NGO settings.

Technology Acceptance Model (TAM) originally developed by Davis (1989), the Technology Acceptance Model has been widely applied to studies of user behavior and information system adoption. It identifies two critical factors that influence technology usage which are, Perceived Usefulness (PU) and Perceived Ease of Use (PEOU). PU refers to the extent to which an individual believes that using a system will improve their job performance, while PEOU relates to the effort required to use the system. In NGO fieldwork, these perceptions influence whether field workers adopt mobile applications for reporting, task scheduling, or data collection.

TAM has seen substantial adaptation in development contexts. Venkatesh and Davis (2000) extended the model by integrating additional variables such as social influence and experience, demonstrating that users may still adopt systems perceived as difficult if peer influence or organisational expectations are strong. This is especially relevant for NGO staff who may feel obligated to use mobile reporting tools despite limited training or support. A credible regional application of TAM comes from Alhassan and Adam (2021), who studied the adoption of mobile-based data systems by health workers in northern Ghana. Their findings indicate that PU significantly influenced initial adoption, while sustained use depended more on PEOU and continuous institutional support. This underscores that simply deploying mobile tools is insufficient unless organisations also invest in usability improvements and user training.

In the Nigerian context, Bello and Odukoya (2022) found that while mobile tools offered transparency and reporting gains in NGOs, inconsistent perceptions of ease of use limited their widespread adoption. This supports the application of TAM in this study, helping to examine how both personal and organisational variables affect mobile app usage for time and project management.

While TAM focuses on individual technology adoption, Activity Theory (AT) offers a systemic perspective that captures how tools are embedded in organisational routines and influenced by institutional norms, rules, and divisions of labour. Originally developed by Vygotsky and extended by Engeström (1987), AT conceptualises human activity as an interaction between the user (subject), the goal (object), and the mediating tools (e.g., mobile apps), all within a broader context of community, rules, and role divisions. In fieldwork environments, where tasks are complex and involve multiple actors, AT allows researchers to explore not only how mobile apps are used, but also how they reshape workflows and create

new patterns of coordination. Ciborra and Andoh-Baidoo (2017) used AT in their study of mobile communication systems in Sierra Leone and found that mobile tools improved efficiency only when aligned with pre-existing community norms and institutional structures. Tools imposed without contextual adaptation led to limited engagement.

Similarly, Kyem and Asiedu (2021) examined agricultural extension projects in Ghana and concluded that mobile task applications only became effective when local work divisions and accountability structures supported their use. Their findings capture how mobile apps are not standalone solutions but must fit into existing organisational environment to achieve the intended impact on time management and project execution. For this study, AT is useful in analysing the contradictions that arise when NGO field workers are expected to adopt mobile applications in environments with limited infrastructure, unclear reporting channels, or poor training. It enables a distinct understanding of how tools mediate tasks and how institutional dynamics affect their success or failure.

Methodology

This study adopts a Systematic Literature Review (SLR) approach to examine how mobile applications support project efficiency and time management among NGO field workers. Rather than collecting new data through field surveys or interviews, this study relies entirely on existing peer-reviewed literature, NGO reports, and documented case studies to address the research objectives. A systematic review is appropriate here because it provides a structured way to explore and synthesise existing evidence across diverse sources. Petticrew and Roberts (2006 p.16) note that, this method is particularly effective when the aim is to “gather and interpret what is already known about a policy or practice area”. Given that mobile applications are already being used across various NGO settings, this approach allows for a comprehensive understanding of their effectiveness, challenges, and practical outcomes without the need for primary data collection.

1. Research Design and Strategy

The review was guided by the central research question: How are mobile applications used to enhance project efficiency and time management among NGO field workers, and what factors influence their successful implementation? To answer this, the study conducted a structured search of existing literature using specific inclusion and exclusion criteria. The selected works were then analysed to identify recurring themes, challenges, and insights relevant to the objectives of this research.

2. Data Sources and Search Process

The review drew from multiple academic and grey literature sources. Databases searched included:

- **Google Scholar**
- **Science Direct**
- **Scopus**
- **JUSTOR**

- **PubMed**
- **African Journals Online (AJOL)**

Additional sources were drawn from reports and digital development publications by:

- **GSMA Mobile for Development**
- **WHO and ITU digital health documents**
- **NGO case repositories** (e.g., Mercy Corps, Pathfinder International, World Vision)

Search terms used included combinations such as:

- Mobile applications and NGO field workers
- Time management and digital tools in NGOs
- Project efficiency and mobile apps and Sub-Saharan Africa
- Technology adoption in humanitarian and development contexts

Boolean operators were applied to refine results, and filters were used to limit the search to materials published between 2010 and 2024, with a focus on Sub-Saharan Africa.

3. Inclusion and Exclusion Criteria

To maintain relevance and quality, sources were included if they met the following criteria:

- Peer-reviewed academic articles or credible institutional/NGO report
- Focused on mobile application use in NGO, development, or humanitarian contexts
- Addressed themes related to time management, reporting, task efficiency, or digital adoption
- Located in Sub-Saharan African settings, with priority given to studies involving Nigerian NGOs
- Studies were excluded if they:
 - focused on corporate or government use of mobile tools with no NGO relevance
 - Lacked empirical findings or clear outcomes
 - Were opinion-based without data or theoretical engagement

A shortlist of approximately 40 studies was initially reviewed. After applying inclusion criteria and quality checks, 21 relevant and high-quality sources were selected for synthesis.

Data Analysis and Thematic Synthesis

Each selected study was carefully reviewed to extract key findings. The analysis process involved:

- Summarising main points from each study in plain language
- Taking notes on benefits, challenges, and usage patterns related to mobile apps in field operations
- Grouping similar ideas and outcomes under major themes (e.g., improved reporting, time savings, digital literacy challenges)

This thematic approach helps to identify recurrent patterns across studies without requiring statistical tools. No software or line-by-line coding was used instead, a practical method of reviewing and comparing study findings was adopted. The focus remained on interpreting what the research collectively reveals about mobile applications in NGO practice.

Ethical Considerations

As the study relies solely on published material, no human participants were involved. Therefore, ethical clearance was not required. Nonetheless, all sources are acknowledged appropriately, and data use is in line with academic standards of transparency and integrity.

Limitations

This method is subject to several limitations. First, it depends entirely on what has already been published. Valuable insights from NGOs that have not documented their experiences publicly may be missed. Second, most sources are from English-language journals, which could limit the geographic scope. Lastly, while thematic synthesis offers strong interpretive power, it does not provide statistical generalisation. Despite these limitations, this method offers a comprehensive and academically sound basis for assessing mobile technology use in NGO fieldwork.

Findings

1. Improved Reporting Speed and Real-Time Updates

A consistent theme across several studies is that mobile applications significantly reduce the time required for reporting by field staff. Digital tools such as CommCare, KoboToolbox, and custom NGO apps are replacing handwritten reports and Excel spreadsheets, enabling real-time submission of data from remote locations. For instance, Bosch, J. *et al.* (2020) reported that a health-focused NGO operating in Northern Nigeria saw average reporting times drop from 5 days to under 24 hours after switching to mobile-based reporting templates. Similarly, Asi and Williams (2018) documented how mobile tools improved coordination and speed during emergency relief operations in Syria and Iraq, allowing “real-time visual updates” via mobile forms. These gains are attributed not only to faster transmission but also to better standardisation and error reduction, as forms often include validation features that prevent incomplete submissions. By eliminating the need for manual consolidation, project managers can respond more quickly to field challenges.

2. Enhanced Task Scheduling and Time Tracking

Another major benefit noted in the literature is the role mobile apps play in structuring the daily workflow of NGO field workers. Apps with built-in task lists, reminders, and progress-tracking modules help workers stay on schedule, prioritise tasks, and complete time-bound deliverables more efficiently. Ouma and Mudege (2021), in their study on digital agricultural extension tools in Uganda, observed that mobile tools reduced administrative overload and helped officers better allocate their time between farm visits, data entry, and feedback sessions. Similarly, GSMA (2020) reported on a digital monitoring platform used by field nutrition

officers in Senegal, which enabled real-time task status updates and better supervision by central coordinators. This function is particularly helpful in multi-component programmes like vaccination campaigns or school outreach, where different tasks need to be completed across various locations in a fixed timeframe.

3. *Reduction of Redundant Communication and Delays*

Several studies revealed that mobile tools help streamline communication between field teams and headquarters, cutting down on redundant messages, physical returns to base, or unclear reporting lines. Rather than waiting for in-person updates or email reports, field staff now upload images, geo-tagged forms, or voice notes directly to project dashboards. Aker and Blumenstock (2015), observed that in Sierra Leone's Ebola response programme, the adoption of mobile tools eliminated up to 30% of repeat calls and unnecessary field movements (. This not only saved time but also cut operational costs and fatigue among overstretched workers. However, the studies also warned that these benefits depend on network reliability. For example, Alhassan and Adam (2021) noted that in Ghana's Northern region, data syncing failures due to poor connectivity undermined the full benefit of mobile platforms, delaying end-of-day reporting.

4. *Challenges with Digital Literacy and Technical Skills*

Despite the positive outcomes, digital illiteracy among field workers remains a barrier to efficient usage. Many field officers lack the confidence or skill to use advanced mobile apps especially those with multi-step forms, dashboards, or synchronisation features. Edewor (2019) found that over 60% of local NGO staff surveyed in Southeastern Nigeria had no prior training on mobile data tools and relied on informal peer guidance. Likewise, Nwaodu and Ilo (2015) observed that fragmented ICT policies and lack of dedicated technical support slowed down app adoption and limited its use to younger, tech-savvy workers. Where training was provided, such as in the Pathfinder International's mHealth pilot, uptake improved significantly. Field staff involved in the pilot were able to deliver antenatal care reminders, schedule follow-ups, and transmit data with fewer delays (GSMA, 2017).

5. *Infrastructure and Connectivity Constraints*

Many studies stress poor digital infrastructure as a recurring constraint. These include weak internet signals, low smartphone penetration, and lack of electricity to charge devices. These challenges disproportionately affect rural and remote locations where many NGOs operate. Chibet *et al.* (2015), studying digital health applications in rural Kenya, noted that "battery failure and network unavailability were common causes of missed data uploads," resulting in gaps in programme records. Similarly, Aker *et al.* (2016) found that in Mali, despite a strong app design, over 40% of field staff could not use the tool effectively due to SIM card incompatibilities or lack of device ownership. These infrastructural gaps reduce the time-saving and coordination benefits that mobile apps are expected to provide, often requiring hybrid systems that still depend partly on paper reporting.

6. *Unequal Access and Organisational Readiness*

The organisational context also influences how well mobile apps improve efficiency. Larger NGOs with stable funding and partnerships are often better equipped to deploy tailored mobile solutions and provide staff support. Smaller or local NGOs may lack such capacity and instead rely on generic tools that are not fully integrated into their workflow. Edewor's (2019) study shows that, smaller NGOs in Nigeria were found to rely on WhatsApp or Google Forms due to lack of funding for specialised software or devices. This reinforces a digital divide in the sector, where only a few organisations benefit fully from technological innovations. MacGregor and Fernback (2022) also argue that, these disparities reflect deeper inequalities in access to technical expertise, institutional culture, and decision-making power, often sidelining community-based organisations in the digital transformation process.

7. *Sustainability and Long-Term Use*

Several sources noted that initial enthusiasm for mobile applications often fades if the implementation is not supported by long-term planning and institutional stability. Apps introduced for pilot projects sometimes become obsolete when donor funding ends or project priorities shift. Aker *et al.* (2016) documented this pattern in West African health campaigns, where mobile apps were widely adopted during the intervention phase but abandoned later due to lack of ongoing support, software updates, or device maintenance. For sustainable use, Bosch *et al.* (2020) recommend that mobile apps be integrated into standard operating procedures, accompanied by recurrent training, monitoring, and feedback loops.

Discussion

The reviewed literature presents strong evidence that mobile applications have positively influenced project efficiency and time management among NGO field workers. However, the benefits of these tools are mediated by complex social, infrastructural, and organisational conditions. This discussion critically explores those dynamics by connecting the findings to the theoretical frameworks and broader development discourse.

1. *Mobile Tools as Enablers of Workflow Efficiency*

A central theme that emerged across the literature is that mobile applications offer concrete solutions to long-standing problems in NGO fieldwork such as delayed reporting, redundant communication, and fragmented scheduling. These digital tools have reduced administrative burdens, enabling quicker data submission and better alignment of field activities with central timelines (Asi & Williams, 2018; Bosch *et al.*, 2020). This aligns well with the Technology Acceptance Model (TAM), particularly the concept of perceived usefulness. Many of the studies reviewed show that when field workers see mobile tools as making their job faster and easier, they are more likely to adopt them consistently (Alhassan & Adam, 2021). However, this usefulness is not universal or automatic. In contexts where reporting is not directly linked to app use for instance, where paper-based alternatives remain accepted the perceived value of digital tools often diminishes.

2. *Efficiency Gains Are Unevenly Distributed*

While the literature documents improved time management outcomes in multiple settings, the benefits are unevenly distributed across the NGO sector. Larger organisations with better digital capacity, funding, and external partnerships are better positioned to adopt mobile platforms at scale. Smaller, community-based NGOs often lack access to training, reliable devices, or adaptable app systems (Edewor, 2019). This disparity reflects what MacGregor and Fernback (2022) describe as digital institutional inequality, where access to tools does not translate equally into effective use. Some organisations may possess digital devices but lack ICT personnel, leadership support, or a cohesive digital policy. These conditions dilute the intended benefits of mobile technologies and, in some cases, lead to abandonment after initial implementation. Therefore, digital transformation is not merely a technical upgrade but also a question of organisational maturity and readiness.

3. *The Role of Organisational Structures and Support*

Field efficiency does not depend solely on individual adoption. Organisational structures including supervision, internal communication, and operational policy also shape how well mobile apps perform. This is where Activity Theory becomes a useful analytical tool helping to shift the focus from the app itself to the full activity system: the tools, rules, division of labour, and community that enable or constrain usage. For instance, studies reporting positive outcomes often describe contexts where mobile app use is embedded in organisational routines with supportive leadership, regular training, and feedback loops (GSMA, 2020; Ouma & Mudege, 2021). In contrast, NGOs that introduced apps as short-term fixes or donor-driven experiments frequently experienced low adoption and poor integration into workflow (Aker *et al.*, 2016).

4. *Infrastructure: The Persistent Limitation*

Despite technological advances, digital infrastructure remains a major limitation. Weak network signals, erratic electricity, and unreliable hardware all contribute to app under performance. Many NGOs operate in rural environments where phones cannot be charged daily, or where data costs are prohibitive for workers earning modest stipends (Chibet *et al.*, 2015). The implication is that app effectiveness depends on much more than design requiring infrastructure alignment. A highly functional app will still fail if it relies on always-on connectivity in offline environments. Therefore, mobile app developers and NGOs must prioritise offline feature, local storage features, and power-efficient interfaces.

5. *Participation and Design Adaptability*

One striking insight from the literature is that user-centred design significantly improves adoption and outcomes. Field workers are more likely to engage with apps that match their work rhythms, task language, and comfort level. Ouma and Mudege (2021) assert, co-designing tools with field workers led to higher usage and fewer errors compared to top-down deployments. This supports the arguments by Orlikowski and Scott (2015), who warn against assuming that technology alone will resolve organisational inefficiencies. In practice, technologies often reflect and amplify existing practices. Thus, participatory design involving

users in app testing, training feedback, and feature iteration is not merely an add-on but a critical strategy for achieving sustained use and actual gains in time efficiency.

6. *Sustainability and Long-Term Integration*

A recurring theme in the review is the fragility of mobile technology initiatives in NGO settings. Many apps are introduced during donor-funded projects but are not sustained afterward due to funding gaps, absence of ownership, or failure to update and maintain the platform. These short-term implementations often result in tool fatigue, where staff abandon multiple apps introduced without coordination (Aker *et al.*, 2016). For mobile apps to truly contribute to long-term efficiency, they must be treated not just as temporary interventions, but as institutional systems. This includes budgeting for app maintenance, planning for scale, with structuring tools into operational procedures. The value of an app is cumulative as it increases when used consistently over time, enabling NGOs to develop digital records, dashboards, and performance analytics.

Conclusion

This study set out to examine the role of mobile applications in enhancing project efficiency and time management among NGO field workers through a systematic review of existing literature. Drawing on sources from health, education, agriculture, and development interventions, the study finds that mobile applications, when appropriately implemented, can significantly improve the speed and accuracy of reporting, reduce delays in communication, and help field workers structure and track their activities more effectively. The application of the Technology Acceptance Model (TAM) and Activity Theory provided a conceptual framework for understanding how mobile tools are used, not just as technical solutions, but as part of broader systems of human activity. The findings confirm that when field staff perceive mobile apps as easy to use and useful in real-time field conditions, their adoption increases. However, this perception is shaped not just by the app interface but also by training, infrastructure, and organisational support.

Equally important is the recognition that the impact of mobile applications is not uniform. While some NGOs have successfully integrated mobile tools into daily operations, others struggle due to infrastructural constraints, digital skill gaps, lack of funding, and unsupportive organisational environments. This variability points to the fact that mobile tools do not automatically improve project outcomes; their effectiveness depends on being properly embedded in local contexts and operational cultures. Another key insight is the challenge of sustainability with many digital tools introduced during short-term projects failed to gain long-term traction due to inadequate funding, poor follow-up, or the absence of institutional ownership. Without clear strategies for sustainability and continuous improvement, mobile apps may become yet another underutilised innovation in development work.

Recommendations

Based on the findings and discussion, the following actionable recommendations are made for NGOs, technology providers, donors, and development actors aiming to maximise the benefits of mobile applications in field-based project delivery:

1. *Invest in Structured and Continuous Training*

NGOs must ensure that field workers receive hands-on, context-specific training not just at on boarding but regularly throughout the project cycle. Training should cover not only how to operate the app but also how to troubleshoot basic problems, manage data costs, and protect digital security. As observed by Edewor (2019), the absence of in-house ICT support and formal training limits even basic app use in local NGOs. Regular refresher sessions and peer-to-peer support systems can significantly improve adoption and reduce app abandonment.

2. *Design for Low-Infrastructure Environments*

Apps must be optimised for offline functionality, low bandwidth use, and minimal battery drain. Tools that rely heavily on continuous connectivity are often ineffective in rural areas with erratic networks and power supply. Studies like Chibet *et al.* (2015) stresses the need for locally adaptive design – including multi-language options, simple dashboards, and compatibility with low-cost devices (p. 195). App developers and NGOs should prioritise features that enhance reliability, not just aesthetics or complexity.

3. *Adopt User-Centred, Participatory Development Processes*

Digital tools for fieldwork must reflect the everyday realities of the users. NGOs are encouraged to adopt co-design approaches where field staff are actively involved in testing, giving feedback, and refining app features. Ouma and Mudege (2021) shows that, such approaches increase user engagement, reduce abandonment, and improve accuracy in data reporting. Participatory design helps avoid creating solutions that are technically sound but practically irrelevant.

4. *Integrate Mobile Tools into Organisational Workflows*

Mobile apps should not be seen as standalone innovations but as part of a broader operations strategy. NGOs must embed app use into Standard Operating Procedures (SOPs), staff performance expectations, and reporting frameworks. This institutionalisation creates accountability and ensures sustained use beyond the life span of a project. Bosch *et al.* (2020) noted, mobile tool success increases when app use becomes routine rather than optional.

5. *Conduct More Sector-Specific and Comparative Research*

Current research is heavily concentrated on mobile apps in health and emergency response sectors. There is a need for more peer-reviewed studies on the role of mobile tools in agriculture, education, human rights, and governance-focused NGO work. Additionally, comparative research across regions and NGO types would help identify best practices and adaptable models. Cross-sector learning can also improve implementation quality and scalability.

Works Cited

- Aker, J. C., & Blumenstock, J. (2015). The economic impacts of new technologies in Africa. In C. Monga & J. Y. Lin (Eds.), *The Oxford handbook of Africa and economics: Volume 2* (pp. 354–371). Oxford University Press.
- Aker, J. C., & Blumenstock, J. (2015). *The impacts of mobile technology on development programs: Evidence from Africa*. World Bank Policy Brief, 6(1), 1–10.
- Alhassan, M. D., & Adam, I. O. (2021). Understanding the adoption of mobile-based data systems among frontline health workers in Ghana. *Government Information Quarterly*, 38(2), 100572. <https://doi.org/10.1016/j.giq.2021.101572>
- Asi, Y. M., & Williams, C. (2018). The role of digital health in making progress toward Sustainable Development Goal (SDG) 3 in conflict-affected populations. *Journal of Public Health Policy*, 39(4), 387–394. <https://doi.org/10.1057/s41271-018-0142-0>
- Asongu, S. A., & Nwachukwu, J. C. (2018). The impact of mobile technologies on sustainable development in Africa. *Information Development*, 34(7), 580–593. <https://doi.org/10.1177/0266666917747082>
- Bello, R., & Odukoya, T. (2022). Digital tool adoption and skill gaps in non-profit operations in Nigeria. *African Journal of ICT Policy and Governance*, 10(1), 70–83.
- Bosch, T., Krüger, T., & Luyt, B. (2020). App-based social engagement in South African communities: Possibilities and challenges. *Information Technology for Development*, 26(1), 68–82. <https://doi.org/10.1080/02681102.2019.1573712>
- Chib, A., Van Velthoven, M. H., & Car, J. (2015). mHealth adoption in low-resource environments: A review of the use of mobile healthcare in developing countries. *Journal of Health Communication*, 20(1), 4–34. <https://doi.org/10.1080/10810730.2013.864735>
- Ciborra, C., & Andoh-Baidoo, F. (2017). Mobile technology integration in community development projects: Lessons from Sierra Leone. *Information Technology for Development*, 23(2), 180–195. <https://doi.org/10.1080/02681102.2016.1267021>
- Dada, D., Okoye, T., & Onwuzuruike, I. (2022). Digital inclusion in local NGOs: A Nigerian perspective. *Journal of African Development Studies*, 9(1), 20–31.
- Edewor, N. (2019). ICT usage among NGOs in the South-East of Nigeria. *Library Philosophy and Practice*, Article 2462, 140–150. <https://digitalcommons.unl.edu/libphilprac/2462>
- Egbulefu, C. (2020). Mobile communication in Nigeria's humanitarian sector: A case study. *Journal of African Development Communication*, 4(1), 40–52.
- GSMA. (2017). *mHealth and the Nigerian Health Sector: A Case Study*. London: GSMA Mobile for Development.
- GSMA. (2020). *Digital Tools in Field-Based Nutrition Programming*. London: GSMA.
- GSMA. (2021). *The Mobile Economy: Sub-Saharan Africa 2021*. <https://www.gsma.com/mobileeconomy/sub-saharan-africa/>
- Kyem, P. A., & Asiedu, A. B. (2021). The limits of digital coordination in rural development: A Ghanaian case. *Development Policy Review*, 39(3), 290–306. <https://doi.org/10.1111/dpr.12462>
- MacGregor, A., & Fernback, J. (2022). Digital inequality in humanitarian response. *Information Technology for Development*, 28(1), 1–20.
- Nwaodu, N., & Ilo, C. (2015). Challenges of NGO project management in Nigeria: A critical perspective. *Journal of Sustainable Development in Africa*, 17(3), 213–222.
- Nyaguthii, L., & Oyugi, L. N. (2020). Digital tools in community health delivery: Evidence from Kenya. *East African Journal of Health Sciences*, 2(1), 110–122.

- Orlikowski, W. J., & Scott, S. V. (2015). The algorithm and the crowd: Considering the materiality of service innovation. *MIS Quarterly*, 39(1), 201–216. <https://doi.org/10.25300/MISQ/2015/39.1.09>
- Ouma, E., & Mudege, N. (2021). Co-designing mobile tools with agricultural extension workers: A case from Uganda. *Development in Practice*, 31(1), 63–69.
- Ouma, M., & Mudege, N. (2021). Designing mobile applications for rural extension workers: Lessons from Uganda. *Information Development*, 37(1), 62–70. <https://doi.org/10.1177/02666666920951229>
- Petticrew, M., & Roberts, H. (2006). *Systematic reviews in the social sciences: A practical guide*. Blackwell Publishing.
- Tomlinson, M., Rotheram-Borus, M. J., Swartz, L., & Tsai, A. C. (2009). Scaling up mHealth: Where is the evidence? *PLoS Medicine*, 6(2), e1000192. <https://doi.org/10.1371/journal.pmed.1000192>
- Tusiime, G., & Gasper, M. (2021). Mobile health tools and NGO service delivery in Uganda: Promise and pitfalls. *Development Technology Review*, 3(2), 11–23.
- Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. *Management Science*, 46(2), 186–204.