The uneven road to digital transformation: Information systems use in civil society project management

Simon Augustine Kilasara[1]
Robert Makorere[2]

[1]simkil08@gmail.com, simon.kilasara@ticd.ac.tz (+255784241455)
[2]rfmakorere@mzumbe.ac.tz (+255 693 025 994)

[1]Tengeru Institute of Community Development, [2]Mzumbe University, [1,2]Tanzania

https://doi.org/10.51867/ajernet.6.4.83

ABSTRACT

This study investigated how Civil Society Organisations (CSOs) in Tanzania adopt Information Systems (IS), with a focus on their shift from paper-based methods to digital tools in project management. Based on the Technology-Organization-Environment (TOE) framework and institutional theory, the research examines how technological capabilities, organisational conditions, and external pressures influence patterns of IS use across key functional areas. Data were gathered through a cross-sectional survey of 272 CSOs across five Tanzanian regions, representing a variety of geographic and operational contexts. Using descriptive statistics and analysis of variance (ANOVA), the study assessed IS adoption levels in both internal and external project functions. The findings reveal a fragmented and selective landscape of adoption. Offline systems still dominate in internal areas such as planning and budgeting, while manual methods remain common in resource and cost management. Conversely, internet-based tools, especially social media, are widely adopted, mainly driven by donor visibility and reporting needs. However, specialised project management systems are seldom used due to financial limitations, technical complexity, and a mismatch with existing workflows. Although device allocation tends to favour externally focused functions, most organisations configure and adapt digital tools across different departments. The study concludes that IS adoption among Tanzanian CSOs is flexible but mainly influenced by external factors, with digital tools often fulfilling compliance and communication rather than boosting internal efficiency. These findings highlight the importance of a more balanced and strategic digital transformation, backed by targeted capacity-building, donor alignment, and fair infrastructure investment. The study recommends that Tanzanian CSOs pursue strategic digital transformation by strengthening internal systems, enhancing staff digital skills, and adopting suitable IS technologies to bridge the internal and external digital gap, improve operational efficiency, and support sustainable, organisation-wide digital integration.

Keywords: Civil Society Organisations, Digital Transformation, Information Systems, IS Technology Adoption, Project Management

I. INTRODUCTION

The growing integration of Information Systems (IS) across sectors in Tanzania demonstrates both notable progress and ongoing hurdles in the country's digital transformation journey. Over the past twenty years, various national projects such as the Human Resource for Health Information System (HRHIS), Training Institutions Information System (TIIS), and the electronic Logistics Management Information System (eLMIS) have shown how digital tools can improve data accuracy, coordination, and decision-making in public sector management (Ishengoma et al., 2019; Ishijima et al., 2015; Ngulugulu et al., 2023). These successes highlight the increasing recognition of IS as a vital component for transparency, efficiency, and evidence-based governance. However, the continued presence of fragmented systems, limited user capacity, and infrastructural gaps, especially outside urban areas, has hindered the development of a fully integrated digital ecosystem across sectors.

Within Tanzania's civil society sector, the adoption of information systems (IS) technologies has primarily been pragmatic and donor-driven rather than strategically institutionalised (Mboera et al., 2021; Namayala et al., 2024). Civil Society Organisations (CSOs) tend to focus on systems that improve visibility, support donor accountability, and enhance stakeholder communication, such as social media, email platforms, and online collaborative tools. In contrast, more complex systems such as Project Management Information Systems (PMIS), data integration platforms, or cost-control applications are less common due to financial and technical limitations, as well as a preference for immediate, tangible results (Pitao et al., 2022; Rahman et al., 2018). The disparities in digital infrastructure between urban and rural CSOs further exacerbate this challenge, as gaps in infrastructure and connectivity limit system functionality and ongoing use.

Globally, Information Systems have transformed how organisations manage projects, coordinate teams, and interact with stakeholders. For CSOs, digital tools are essential enablers of transparency, accountability, and operational

efficiency (Benbya et al., 2020; Varajão et al., 2022). They support project design, budgeting, procurement, and monitoring functions while enabling real-time reporting to donors and beneficiaries (Sandra & Alexander, 2025). In Tanzania, where CSOs operate with limited resources, IS adoption is not just a technical upgrade but a strategic response to external pressures and internal capacity challenges (Kalolo et al., 2021; Wijatmoko et al., 2025). Therefore, understanding how Tanzanian CSOs transition from paper-based to digital systems is crucial to fostering sustainable digital transformation that enhances governance, performance, and societal impact.

1.1 Statement of the Problem

Despite the progress made by Tanzania in advancing the use of digital technology, many Civil Society Organisations (CSOs) still depend on paper-based and semi-digital tools for project management, data analysis, and reporting. While practical, the paper-based approach limits scalability, reduces data accuracy, and slows decision-making, especially in an organisational environment where development programs are becoming more data-driven and complex (Mboera et al., 2021; Nyandongo et al., 2019). In contrast, specialised Information Systems (IS) have been established to significantly enhance operational efficiency, stakeholder coordination, and evidence-based accountability (Ishengoma et al., 2019; van Besouw & Bond-Barnard, 2021). Experiences from Tanzania's public sector relating to the adoption and use of eLMIS and HRHIS have demonstrated the transformative power of digital platforms in strengthening planning, monitoring, and service delivery (Ishijima et al., 2015; Ngulugulu et al., 2023).

On the other hand, when observing the private sector under the civil society lens, the adoption of IS reflected as remaining inconsistent and fragmented, with selective use across organisational functions. Existing studies (Kock et al., 2020; Namayala et al., 2024) show that most CSOs adopt tools that improve external visibility and donor reporting, such as social media and communication platforms, while internal project management systems are rarely used. As a result, a dual landscape of limited digital engagement, where front-end functions are digitized while leaving the core operational processes to still rely on manual or offline methods (Pitao et al., 2022; Wijatmoko et al., 2025). Such uneven IS-technology uptake on one end implicates adaptive experiences, yet inconsistent adoption patterns on the other. Such experiences have led to limited system integration within organizational processes and, in turn, led to inefficiencies in the implementation of development projects.

Despite the growing concerns about the importance of digital tools in civil society practices, Tanzania is experiencing a shortage of empirical evidence on how its CSOs are adopting the IS in the management of social projects. Little is known of the CSOs' utilization of IS technologies across project functions or how these patterns vary across organisations and regions. This study aims to map and analyse the patterns of IS adoption within Tanzanian CSOs, focusing on the extent, types, and functional use of digital tools in project management as the sector transitions from paper-based to digital systems.

1.2 Research Objective

To examine how digital tools are used across key project management functions.

II. LITERATURE REVIEW

2.1 Theoretical Review

To better understand the dynamics of IS adoption in CSOs, this study uses the Technology–Organisation–Environment (TOE) framework along with Institutional Theory as complementary perspectives. The TOE framework describes adoption across three connected dimensions: the technological context, including factors such as ease of use, perceived usefulness, and the compatibility of IS tools with current practices; the organisational context, which covers leadership commitment, financial and human resources, and internal policies; and the environmental context, involving donor expectations, regulatory frameworks, and sectoral competition. This framework has been widely applied to evaluate adoption readiness in low-resource settings, such as sub-Saharan Africa, where infrastructural challenges and institutional fragility hinder digital transitions. For CSOs, the TOE framework is especially relevant, as resource limitations, donor dependence, and unreliable digital infrastructure greatly influence their ability to transition from paper-based to digital project management systems. (Díaz-Arancibia et al., 2024).

Institutional theory deepens this understanding by highlighting the social, political, and normative forces that shape organisational decisions. CSOs often adopt technologies not only for operational gains but also to satisfy coercive pressures from donors and regulators, to meet normative standards based on professional accountability, or to conform to mimetic pressures driven by peer imitation and the desire for social acceptance and legitimacy. (Arshad et al., 2020; Zeng et al., 2021). This is especially clear in prioritising external-facing digital tools, such as social media and reporting dashboards, that fulfil visibility and transparency demands from donors and the public.

This is especially evident in the focus on digital external tools like social media and reporting dashboards, which meet the visibility and transparency demands of donors and the public.

Furthermore, recent research on status quo bias in technology adoption indicates that even when digital tools are accessible, organisations may choose traditional systems because of familiarity, risk aversion, or internal resistance to change. (Nugawela & Sedera, 2022). This tendency is more pronounced in small and mid-sized CSOs, where staff capacity and digital leadership might be limited. Such resistance can hinder deeper integration of IS tools, especially in back-office functions like budgeting or procurement.

Together, the TOE framework and Institutional Theory, reinforced by behavioural insights from bias theory, provide a solid theoretical foundation for analysing the uneven, selective, and externally focused nature of IS adoption in CSOs. They demonstrate that the shift from paper to digital is not merely a technical upgrade but a complex process shaped by contextual factors, institutional logics, organisational capacity, and psychological attitudes toward change.

2.2 Empirical Review

Empirical studies including that of Ardito et al. (2025) and (Kostalova et al., 2015) are consistent with the fact that, the adoption process of Information Systems technology across organisations is empirically gradual, uneven, and context-dependent. The basic definition of IS technology adoption refers to the decision to acquire, install, and implement digital systems to enhance operational functions; however, the speed and scope of adoption vary widely based on factors such as organisational size, leadership commitment, financial resources, and technological readiness (Lambiase et al., 2025; TechSoup, 2021).

In Tanzanian, public institutions have reported achieving key milestones in IS technology adoption across sectors through initiatives like the Human Resource for Health Information System (HRHIS), the Training Institutions Information System (TIIS), and the electronic Logistics Management Information System (eLMIS). Specific studies (Ishengoma et al., 2019; Ishijima et al., 2015; Ngulugulu et al., 2023) bear witness to how the public sector experiences the IS adoption benefits through enhanced data quality, planning, and service delivery. On the contrary, when looking at the private sector Mboera et al. (2021) and Namayala et al. (2024) observed that, observed that, similar progress has not been seen within Civil Society Organisations (CSOs). The use if IS technology remains selective, uneven, and donor-driven mainly across organizations. The studies further indicated that the motives behind the use of IS technology by most organizations in Tanzania are primarily compliance with financial reporting procedures, donor requirements, and public visibility. At the same time, internal systems for project management, resource allocation, and data analytics remain underdeveloped.

The uneven patterns of IS technology adoption are not unique to Tanzania; on a global scale, studies have also shown limitations on the use of IS technology across complex or strategic project tasks. According to Kolisch et al. (2005) in Germany, only 20% of organisations were observed to use IS technology for managing multi-project portfolio. Similarly, in Brazili Duarte et al. (2012) had reported that just 24% of organizations had employed IS technology in designing their projects. Mboera et al. (2021) further observed that only 38.5% of organisations were committed to using IS technology regularly, with specific functions for data management. Such experiences highlight a persistent gap between IS technology availability and actual implementation. In the Tanzanian private sector experience, external actors are primed with considerable influence on the patterns of IS technology adoption across organizations. As observed by Al-Adwan et al. (2021) and Twi-Brempong et al. (2020), donor requirements and accountability expectations are often featured to influence organisational decisions to adopt IS technology, mainly for compliance, resulting in superficial changes rather than full integration of IS at both operational and strategic levels. This has created a model of IS technology adoption that emphasizes visibility over organisational learning or process efficiency (Wijatmoko et al., 2025).

Organizations are experiencing practical challenges in the process of adopting IS technologies. This hinders the effectiveness and sustainability of use of respective digital tools. According to (Kalolo et al., 2021; Lashayo et al., 2018; Rahman et al., 2018), in the process of adoption of IS technologies, Organizations are facing issues such as staff turnover, limited technical skills, and inadequate access to reliable internet and power infrastructure. Pitao et al. (2022) further established the uneven IS technology adoption experiences by asserting that hybrid digital-paper workflows are common in rural organisations, where digital systems often coexist with manual methods due to infrastructural instability and limited vendor support.

The literature, therefore, highlights a dual challenge in Tanzania's civil society sector. While the adoption of IS technology is seen as a crucial means towards enhanced project efficiency, transparency, and scalability of social projects, its adoption varies across functions and regions. The study builds on these findings by analysing patterns of IS adoption among Tanzanian CSOs, focusing on which project functions are digitised, how adoption differs among organisations, and the transformation pathways that emerge in a context influenced by both opportunities and limitations.

Although the digital transformation of Civil Society Organisations (CSOs) has attracted increasing academic interest, most current research focuses on broad adoption factors, sector-wide digital readiness, or access to technology. These studies provide limited insights into how information systems (IS) are adopted at the operational level within

project management, especially regarding how specific tools are used internally and externally (Al-Adwan et al., 2021; TechSoup, 2021). Furthermore, few empirical studies examine the distribution and intensity of IS use across planning, budgeting, donor reporting, and resource tracking, despite these areas being vital to CSO performance.

A significant gap also exists in understanding how CSOs in resource-limited settings, such as Tanzania, manage digital adoption without integrated strategies or reliable infrastructure. While global research recognises that institutional pressures, donor mandates, and usability concerns influence adoption decisions (Chen et al., 2025; Zeng et al., 2021), it rarely clarifies how these factors lead to selective and fragmented digital adoption at the operational level. This study fills that gap by empirically analysing actual patterns of IS adoption across project functions in Tanzanian CSOs, providing a grounded view of how digital transformation often occurs unevenly, adaptively, and is shaped by external influences.

III. METHODOLOGY

This study employed a cross-sectional survey design, whereas data were gathered from a specific group at a single point in time. The methodology is known to be cost-effective and efficient, ideal for identifying trends in how CSOs across Tanzania utilise IS, and enables the generalisation of findings across the broader sector.

3.1 Study Area

The research was conducted in five regions: Dar es Salaam, Arusha, Kilimanjaro, Iringa, and Mwanza. Each area was chosen to represent different realities faced by CSOs when adopting IS technologies. Dar es Salaam is Tanzania's economic centre, and it embodies early adopters, while Arusha and Kilimanjaro represent donor-driven environments due to their mix of international and local NGOs. Equally, Iringa and Mwanza exemplify the challenges CSOs encounter in semi-urban and rural areas. Overall, this urban–rural balance provided a comprehensive view of the CSO landscape.

3.2 Study Population and Sampling

The study examined a list of CSOs officially registered with the Ministry of Community Development, Gender, Women, and Special Groups (MoCDGWS) for the financial year 2022/23, amounting to 11,703 organisations. To make the study manageable and statistically reliable, researchers focused on NGOs involved in project management and service delivery. Using Yamane's formula (with 95% confidence and a 5% margin of error), the target sample size was determined to be 387 CSOs.

Due to limited resources and some non-responses, 272 organisations ultimately participated about 70.3% of the target, which was still sufficient for meaningful analysis. A multistage probability sampling method was employed: CSOs were sorted by region, listed alphabetically, and then selected using systematic random sampling. Each CSO nominated one staff member involved in IS-related decisions to represent them in the survey based on the researcher-specified criteria.

3.3 Unit of Analysis and Unit of Inquiry

The organisation itself served as the unit of analysis, meaning the study examined CSOs as a whole. However, the data was collected from one key respondent per organisation, and the unit of inquiry was usually someone directly involved in using or managing IS tools.

3.4 Data Collection Methods

A structured questionnaire served as the primary data collection tool. It was designed to assess how far CSOs have progressed in adopting IS across four levels: Paper-based tools, Offline software applications, Internet-based platforms, and Specialised Project Management Information Systems (PMIS). The questionnaire was pre-tested to verify its relevance and reliability within the Tanzanian context. It included closed-ended and multiple-choice questions. CSOs could complete it either electronically or on paper. To encourage participation, follow-ups were carried out over three months.

3.5 Data Analysis

Data analysis combined both descriptive and inferential statistics. Descriptive stats like frequencies, percentages, averages, and standard deviations helped summarise IS adoption levels. Then, to explore further, the study used one-way ANOVA (Analysis of Variance) to test whether there were significant differences across different CSO functions. Results are presented in tables and charts to make them easy to compare and interpret. This mixed approach helped the study offer both a broad overview and detailed insights into what drives (or hinders) IS adoption in Tanzanian CSOs.

IV. FINDINGS & DISCUSSION

4.1 Findings

4.1.1 Demographic Characteristics of Respondents

Participants in this study came from a diverse range of Civil Society Organisations (CSOs) across Tanzania, offering a clearer view of the environment in which Information Systems (IS) are being adopted. Geographically, most CSOs were concentrated in Dar es Salaam, with about 40% both registered and actively operating there, which makes sense, as it is the country's main economic and administrative centre. However, they are not all based in the capital. Places like Mwanza (22.8%), Arusha (18.8%), and Kilimanjaro (16.5%) also had a significant CSO presence, while Iringa had far fewer. This distribution shows that while Dar es Salaam leads in access and infrastructure, CSOs in other regions still play a vital role, often working with fewer resources and facing more logistical challenges.

In terms of structure, the sector remains relatively young and operates on a smaller scale. Around two-thirds of CSOs have been established for less than ten years. A quarter have been operating for between ten and nineteen years, and only a small number have lasted more than thirty. Staffing levels are also lean, with over 60% of organisations having fewer than 15 employees, and only a few exceed 40. Most of these CSOs manage just 1 to 4 projects at a time, reflecting their limited scale and constrained resources. Interestingly, 64% said they have some form of specialised IS in place. However, that leaves more than a third without any, mainly due to costs, lack of technical expertise, or simply not knowing what is available. Even among those who have adopted IS tools, most are still relatively new to them, highlighting that digital uptake remains inconsistent and recent.

Respondents held a variety of roles. The largest groups included Directors (18.4%), Programme/Project Administrators (16.5%), Officers (15.1%), and ICT Officers (13.6%). The study also gathered insights from CEOs, Coordinators, and M&E Officers covering perspectives from both leadership and operational levels. Most respondents had 2–5 years of experience, with nearly 9% having over 15 years' experience. This mix created a good balance between younger, digitally savvy staff and more experienced professionals. Age-wise, the data clearly shows: 59.2% were between 21 and 40 years old, while only 7.3% were over 50. Therefore, we are looking at a relatively young workforce full of potential for driving digital change, but in need of training and stronger institutional support to achieve it.

The CSO landscape in Tanzania is young, small, and often under-resourced, but it is also driven. Yes, regional differences, staffing difficulties, and inexperience can slow digital progress. Nevertheless, with a growing number of young, tech-savvy professionals already in place, there is real potential to accelerate digital transformation if the sector gains the access, expertise, and long-term support it requires.

4.1.2 The Patterns of IS-Technology Adoption among CSOs

The findings indicate that IS adoption within CSOs varies significantly, with offline computer systems still dominating core management tasks like planning (47.5%) and budgeting (44.0%). This suggests continued dependence on familiar, low-complexity tools that prioritise ease of use over integration. Meanwhile, internet-based applications are becoming increasingly important for external-facing functions, with social media (65.3%) standing out as the most widely adopted tool. This shows the sector's focus on visibility, communication, and donor engagement. Functions such as data integration (33.3%), collaborative work management (30.0%), and progress reporting (27.4%) have moderate adoption, indicating a slow shift toward more interactive and connected systems.

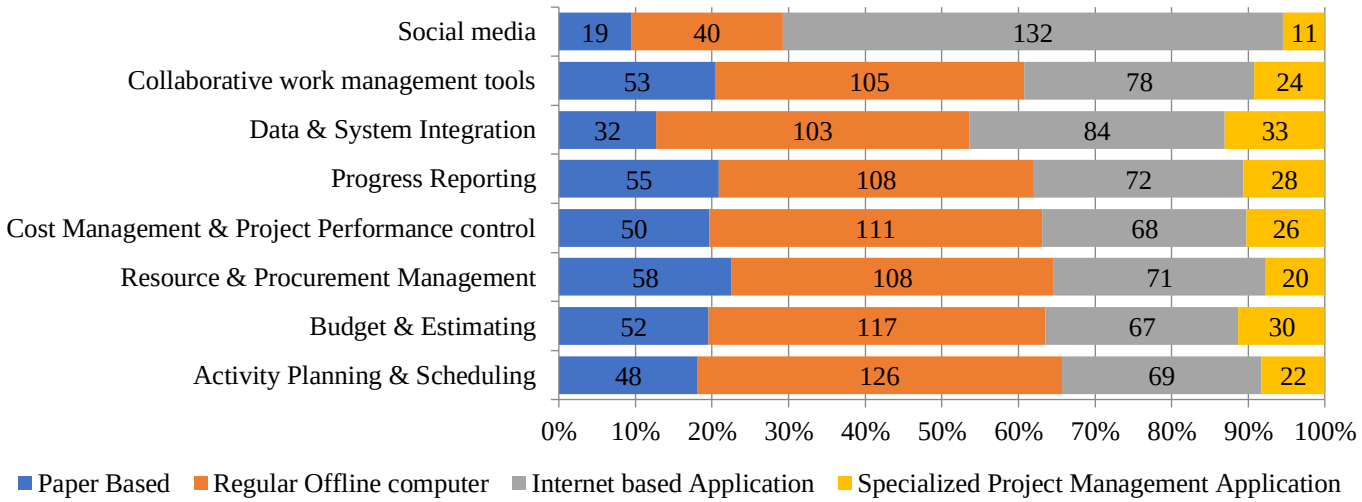

Figure 1

Frequency Distribution of the Type of IS Applicable in Organisational Functions

However, the minimal use of specialised project management software, rarely exceeding 13.1%, highlights ongoing barriers to adopting advanced solutions, such as cost, complexity, or lack of technical skills. The continued reliance on manual methods in resource management (22.6%) and cost management (19.1%) emphasises that traditional paper-based practices still coexist with digital tools, especially in areas where data credibility, compliance, or infrastructure challenges are more significant. Overall, the findings indicate a fragmented adoption landscape, where CSOs selectively adopt digital tools, focusing more on external communication than on improving internal project management systems. Inferential analysis confirmed that IS adoption levels vary significantly across organisational functions.

Table 1

Descriptive Statistics on Types of IS Applicable in Organisational Functions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Planning & Scheduling (Activity)	265	2.25	.846	.052	2.14	2.35	1	4
Budget & Estimating	266	2.28	.907	.056	2.17	2.39	1	4
Resource & Procurement Management	257	2.21	.880	.055	2.10	2.31	1	4
Cost Management & Project Performance Control	255	2.27	.894	.056	2.16	2.38	1	4
Progress Reporting (Project documents and data)	263	2.28	.914	.056	2.17	2.39	1	4
Data & System Integration (Portals and dashboards)	252	2.47	.876	.055	2.36	2.58	1	4
Collaborative work management tools	260	2.28	.893	.055	2.17	2.39	1	4
Social media	202	2.67	.722	.051	2.57	2.77	1	4
Total	**2020**	**2.33**	**.881**	**.020**	**2.29**	**2.37**	**1**	**4**

Presented in Table 2, the results for a one-way ANOVA revealed a statistically significant difference ($F(7,2012) = 6.858$, $p < 0.001$), indicating that not all functions adopt IS at the same rate.

Table 2

ANOVA on types of IS applicable

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	36.518	7	5.217	6.858	.000
Within Groups	1530.529	2012	.761		
Total	**1567.048**	**2019**			

Post Hoc tests showed that social media tools (M = 2.67) were adopted more than most other internal functions, with mean differences from –0.39 to –0.46 ($p < 0.05$). Data/system integration (M = 2.47) also had slightly higher adoption than planning, budgeting, and procurement, though these differences did not always reach statistical significance. A homogeneous subsets analysis grouped the functions into three categories: the first included resource management, planning, budgeting, cost management, progress reporting, and collaborative tools (M approximately 2.21–2.28), which rely on offline or hybrid systems; the second consisted of data/system integration (M = 2.47), just above the first group; and the third was led solely by social media (M = 2.67), clearly identified as the most adopted digital tool. This suggests that CSOs prioritise external-facing systems, especially for communication and advocacy, over back-office functions like budgeting and resource management.

4.1.3 IS Device Availability

Table 3 presents the descriptive statistics regarding the availability of devices for Information Systems (IS) functions. The table summarizes key statistical measures including the mean, standard deviation, and standard error, as well as the 95% confidence interval for the mean. It also provides the minimum and maximum values, the sample size (N), and the total sum of devices reported.

Table 3

Descriptive Statistics on the Availability of Devices for IS Functions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	Sum
					Lower Bound	Upper Bound			
Planning & Scheduling (Activity)	194	3.15	2.800	.201	2.76	3.55	1	35	612
Budget & Estimating	188	2.88	1.824	.133	2.62	3.14	1	15	541
Resource & Procurement Management	178	2.68	1.789	.134	2.42	2.94	1	15	477
Cost Management & Project Performance Control	186	3.02	2.575	.189	2.64	3.39	1	20	561
Progress Reporting (Project documents and data)	192	3.62	3.976	.287	3.05	4.19	1	35	695
Data & System Integration (Portals and dashboards)	192	3.39	3.655	.264	2.87	3.91	1	35	650
Collaborative work management tools	180	3.39	3.521	.262	2.87	3.91	1	35	610
Social media	166	3.56	4.199	.326	2.92	4.20	1	35	591
Total	**1476**	**3.21**	**3.164**	**.082**	**3.05**	**3.37**	**1**	**35**	**592**

The descriptive results in Table 3 show that device availability for IS functions varied significantly across CSOs, with a total of 1,476 cases (N) recorded across all functions. The number of valid responses per function ranged from 166 to 194, indicating good representation but also some differences in organisational reporting across functions. The functions with the highest average number of devices are progress reporting (N = 192, M = 3.62), social media (N = 166, M = 3.56), and data/system integration (N = 192, M = 3.39). These findings suggest that organisations allocate more digital resources to externally visible activities, especially those related to donor accountability and communication. The relatively high maximums of up to 35 devices in these categories further illustrate that some better-resourced CSOs can invest heavily in these areas.

In contrast, the internal project management functions such as budgeting (N = 188, M = 2.88) and resource management (N = 178, M = 2.68) were reported with the fewest device allocations. This suggests that the back-office operations are still under-resourced compared to outward-facing functions. Such lower averages and smaller totals in these functions point to the ongoing structural imbalances in how CSOs prioritise their digital investments. The wide variation in device counts (ranging from 1 to 35 across functions) further highlights the significant disparities in digital infrastructure among organisations. It is further noted that some CSOs have limited device capacity, which in turn restricts their ability to integrate IS technology in the processes, while others show greater infrastructure readiness. In general, the findings have revealed a selective pattern of digital tools allocation. The CSOs are directing limited hardware resources toward functions that align with donor and stakeholder expectations, leaving internal project management functions relatively under-resourced. Findings from the inferential analysis confirmed these disparities.

Table 4

ANOVA on the Availability of Devices

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	142.666	7	20.381	2.045	.047
Within Groups	14627.645	1468	9.964		
Total	**14770.311**	**1475**			

The Analysis of Variance (ANOVA) results revealed statistically significant differences in device allocation across functions ($F(7,1468) = 2.045$, $p = 0.047$), evidencing the uneven distribution of hardware within the organization and across project management functions. The Post Hoc analysis results have indicated that the most significant difference was between progress reporting (M = 3.62) and resource management (M = 2.68), with a mean gap of –0.94. Although the results did not achieve conventional significance ($p = 0.081$), they still show a notable trend. Since it is closely linked to donor accountability, the reporting function tends to receive more resources. The results of homogeneous subsets analysis clustered the functions into three tiers: resource management and budgeting at the bottom, cost management and planning in the middle, and data integration, collaborative tools, social media, and progress reporting at the top. The clustering further solidifies the previous findings that CSOs allocate device resources mainly to externally visible, donor-driven functions, while internal control and resource management remain under-resourced.

4.1.4 Active Devices for IS Access

When assessing the number of active devices dedicated to the IS access, the results indicate a total of 1,426 cases (N) documented across project management functions, while the individual response counts ranged from 156 to 188 per function. The results imply a broad coverage of organisational functions, and the manifestation of some

variation. On average, the responding CSOs reported an average of three active devices per function (M = 3.03), with minimal differences across functions. The functions with the most digital tools were progress reporting (N = 185, M = 3.43), social media (N = 156, M = 3.40), and data/system integration (N = 188, M = 3.20). This consolidates the suggestion that the functions related to donor communication, advocacy, and system-level integration tend to have slightly more active device support. Notably, maximums of 35 devices in some cases reflect the impact of a few well-resourced CSOs, highlighting significant disparities among organisations.

Table 5

Descriptive Statistics on Number of Active Devices

Number of Devices	**N**	**Mean**	**Std. Deviation**	**Std. Error**	**95% Confidence Interval for Mean**		**Minimum**	**Maximum**
					Lower Bound	**Upper Bound**		
Planning & Scheduling (Activity)	186	2.92	2.803	.206	2.51	3.32	0	35
Budget & Estimating	182	2.71	1.855	.138	2.44	2.99	1	15
Resource & Procurement Management	174	2.61	1.746	.132	2.35	2.88	1	14
Cost Management & Project Performance Control	182	2.90	2.498	.185	2.53	3.26	1	20
Progress Reporting (Project documents and data)	185	3.43	3.874	.285	2.87	3.99	1	35
Data & System Integration (Portals and dashboards)	188	3.20	3.542	.258	2.69	3.71	1	35
Collaborative work management tools	173	3.09	3.369	.256	2.59	3.60	1	35
Social media	156	3.40	4.133	.331	2.75	4.06	1	35
Total	**1426**	**3.03**	**3.084**	**.082**	**2.87**	**3.19**	**0**	**35**

Compared to other functions, budgeting (N = 182, M = 2.71) and resource management (N = 174, M = 2.61) had the fewest active devices, though their averages remained close to the overall mean. This indicates that, while these functions have fewer total devices, CSOs ensure most available devices are actively used. The few inactive devices across all categories show deliberate efforts to maximize limited digital resources.

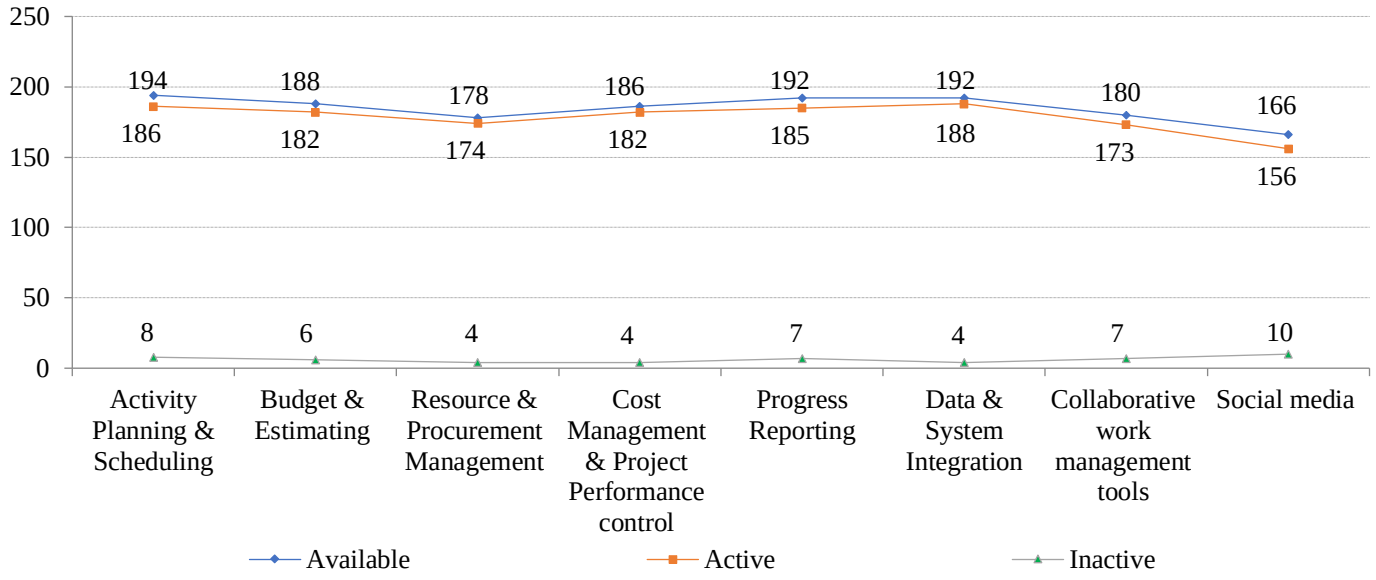

Figure 2

Descriptive Statistics on Active Devices (FIPs) Setup for IS Software Access

Overall, the results highlight a consistent pattern of device activation across different functions, contrasting with the uneven distribution of overall device availability. Once devices are acquired, CSOs seem dedicated to ensuring their active use across multiple functions, whether internally or externally focused. This reflects a resource-optimisation strategy in which organisations, even in limited-resource settings, aim to eliminate redundancy and ensure that available infrastructure supports various project management functions.

Table 6
ANOVA on Active Devices (FIPs) setup

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	110.551	7	15.793	1.666	.113
Within Groups	13440.212	1418	9.478		
Total	13550.763	1425			

Inferential results showed no statistically significant differences across functions. The ANOVA produced $F(7,1418) = 1.666$, $p = 0.113$, indicating that variations in the number of active devices are not meaningful. Post hoc tests supported this, with all pairwise comparisons being non-significant. Homogeneous subsets analysis grouped all functions into a single cluster, suggesting uniformity in device activation. These results indicate that once devices are available, CSOs deliberately ensure they are configured to provide PMIS access across all functional areas, whether internal or external. This contrasts with the uneven distribution of devices, demonstrating that activation practices are consistent even when resources are limited.

In general, the results highlight an uneven yet deliberate transition from paper-based to digital systems in CSO project management. While core administrative functions still mainly rely on offline tools, internet-based platforms are increasingly used for communication, collaboration, and donor visibility. The adoption of specialized project management software remains very low due to cost and technical barriers. Device allocation is inconsistent, with reporting, integration, and social media receiving the most resources, reflecting external accountability pressures. However, once devices are available, their activation for PMIS access is generally consistent across different functions. These findings thus confirm that CSOs are motivated and prepared to embrace digital transformation. Still, their adoption patterns remain stratified by function, influenced by resource availability, donor requirements, and organizational priorities.

4.2 Discussion

The findings show that the adoption of Information Systems (IS) technology among Tanzanian Civil Society Organisations (CSOs) varies significantly and is often specific to different functions. This variation is affected by internal constraints, donor expectations, and how organisations perceive the usability and value of these systems. Using the DeLone and McLean IS Success Model, the Technology–Organisation–Environment (TOE) framework, and Institutional Theory, the results suggest that technological features, organisational capacity, and external factors collectively influence these adoption patterns.

For CSOs, the ongoing reliance on offline tools and manual procedures for key internal operations is a clear trend in IS technology use. Based on the evidence, over 70% of CSOs surveyed were still utilising the standalone computers for planning and budgeting, and more than 60% depend on paper-based systems for managing resources and costs. These CSOs' preferences demonstrated their undeniable trust in the traditional offline tools, which are regarded as more familiar, dependable, and less technically demanding. Being in a resource-limited environment, simpler systems are often preferred by organisations because the more complex IS technologies can be costly and demand technical skills that many CSOs and users do not possess. This observation aligns with that of Kostalova et al. (2015), who found that smaller organisations frequently opt for the least complex IS technologies for smooth operation. Additionally, Nugawela and Sedera (2022) Affirmed that many organisations still rely on paper records for their auditability and compliance with donor requirements, describing it as "status quo bias." behaviour

The findings have also emphasized that only 13.6% of CSOs in Tanzania have adopted specialized project management software, despite recognizing its advantages. The main barriers were identified to include high costs, complexity, and poor compatibility with existing workflows. This tension between potential and actual use echoes the assertion by DeLone and McLean (1992) that technology fails to create value when it is not well-suited to its context. Similar patterns were observed globally in studies by Duarte et al. (2012) and Kolisch et al. (2005), who found low adoption of project-specific IS technology tools in Brazil and Germany, even in situations where IS technology is more readily accessible. The Tanzanian experience confirms that the availability of IS technology alone is not sufficient; Information systems technology must be adapted, supported, and integrated into the daily operations of an organisation.

The fact that the tools for external communication, such as social media, exhibited the highest adoption rates, with over 80% of CSOs using them, suggests that these platforms are appreciated for being affordable, user-friendly, and effective for donor reporting, advocacy, and stakeholder engagement. This supports Al-Adwan et al. (2021) conclusion that perceived usefulness and external visibility motivate IS adoption in non-profits. Similarly, Chen et al. (2025) highlights that digital adoption by CSOs is often externally driven. The Institutional Theory further interprets this finding as a response to donor pressure and the desire to conform to sector norms, as claimed by Zeng et al. (2021) and Arshad et al. (2020). From a critical perspective, the donor-driven adoption creates an internal-external digital

divide, where essential functions like budgeting, procurement, and performance monitoring largely remain offline as compared to other functions.

The study has further revealed uneven access to digital resources. Devices and connectivity are usually concentrated in departments responsible for reporting, communications, and M&E, while project management teams often remain under-resourced in terms of IS technology tools. However, many CSOs try to maximise the use of their limited resources; over 60% share devices across departments to broaden access to project management systems. The practice demonstrates a practical approach to resource constraints. It aligns with the ideal assertion by DeLone and McLean (2003, 2016) that continued system use, even with limitations, is vital for IS success. It also highlights organisational adaptability in the face of structural challenges.

The adoption of IS technology in Tanzanian CSOs is confirmed to be adaptable but uneven across organisational and project functions. This reveals a "dual digital reality". On one side, CSOs effectively utilise digital tools to meet donor demands and enhance transparency. On the other hand, the digitisation of internal management and planning functions remains poorly implemented and underdeveloped despite the existence of the IS technology. While these digital tools are in use, they are often applied in limited ways, with little integration into strategic decision-making. This illustrates what TechSoup (2021) describes as being "digitally active but digitally fragile" organisations operating with scattered tools and minimal infrastructure. The findings underscore the importance for Tanzanian CSOs to progress from superficial adoption towards a more strategic, organisation-wide digital transformation. Addressing the internal–external digital divide will involve dedicated efforts to enhance internal systems, adapt tools to local needs, and invest in staff capacity building. These actions can improve efficiency, promote organisational learning, and ensure that digital technologies meet both immediate donor requirements and long-term sustainability.

V. CONCLUSION & RECOMMENDATIONS

5.1 Conclusion

This study examined how Tanzanian CSOs adopt IS and revealed a clear trend of IS technology adoption across organisational and project management functions. However, the pattern of IS technology adoption is inconsistent, mainly driven by external forces, and remains incomplete. While tools like spreadsheets and paper-based processes still dominate internal functions such as budgeting and procurement, more sophisticated project management systems are rarely used in operations. Conversely, technologies supporting operational functions, such as social media, online reporting, and tools that enhance visibility and help meet donor requirements, are gaining popularity among CSOs. The trend indicates that external pressure, rather than internal strategy, is driving the shift to digital tools. In other words, many CSOs are adopting digital tools not because they improve their operations, but because they help them meet donor expectations.

Even with these limitations, CSOs are doing their best with the limited resources at their disposal. If they acquire digital devices, they allocate and use them effectively across departments to improve efficiency. This kind of adaptability is praiseworthy; however, the digital transition remains superficial and has not reached the deeper levels of project planning, decision-making, or internal operations.

This study sheds new light on how CSOs in low-resource settings, particularly in Tanzania, adopt Information Systems (IS). It goes beyond surface-level observations to demonstrate that digital adoption is not uniform. Instead, it is function-specific, uneven, and heavily influenced by institutional pressures. By expanding the DeLone & McLean (2003, 2016) IS Success Model, the research indicates that perceptions of system quality, usability, and alignment with daily workflows often explain why many CSOs continue to rely on manual processes and offline tools.

By applying the Technology–Organisation–Environment (TOE) framework and Institutional Theory, the study deepens our understanding of IS technology adoption. It describes how donor expectations, infrastructure challenges, and internal capacity collectively influence the use of digital tools, whether, how, or why they are employed. Often, visibility is prioritised over internal efficiency. This insight is significant as it challenges the standard binary view of "adopted" versus "not adopted." Instead, this function-level perspective provides a more precise and heightened understanding of digital transformation in the non-profit sector.

5.2 Recommendations

Based on the study findings, the following are some practical, long-term recommendations to support CSOs in Tanzania in adopting digital technology in a meaningful and sustainable manner. CSOs should go beyond just offering tools. CSOs need more than just a few apps or gadgets; they require genuine support. This entails coordinated assistance from donors, technology providers, and policymakers. The emphasis goes beyond mere compliance; it's about investing in infrastructure, training staff, and ensuring access to truly user-friendly systems.

CSOs should incorporate technology into the core workflow. Users should not just use information systems (IS) for reports or online displays; instead, they should incorporate them into their daily operations. Consider budgeting,

planning, and resource allocation. That's where the real value lies. CSOs should invest in people, not just platforms. To keep up with digital transformation, CSOs' staff need to be ready for it. This requires a significant investment in digital training, allowing teams throughout the organization to confidently and effectively use the tools they're given.

Donors shouldn't just set digital rules and walk away. Donors should focus on helping CSOs grow digitally by funding infrastructure, offering relevant training, and making sure the technology they introduce can actually be used and maintained over the long term. Create an affordable shared tech solution. Policymakers and support organizations step in to help develop affordable, shared platforms that operate across organizations, thereby reducing redundant efforts. Close the digital gap with long-term thinking. This involves developing infrastructure, continuous skills training, and innovative policy reforms. This shift should transition away from short-term, donor-driven projects and instead prioritize strategic, inclusive, and sustainable solutions.

Ethical Approval

The study received ethical approval from the Directorate of Research and Postgraduate Studies at Mzumbe University, documented by a letter with reference number AL.3/267/01/170.

Funding Acknowledgement

This research article is derived from my PhD thesis, which was funded by my employer, the Tengeru Institute of Community Development. I sincerely thank them for their financial support.

Disclosure Statement

The authors declare no conflict of interest.

Authors' Contributions

Credit: **Simon Augustine Kilasara**: Conceptualization, Funding acquisition, Investigation, Methodology, Analysis, and Writing, Review & editing; **Robert Makorere**: Supervision, Formal analysis, Validation, Writing, Review & editing.

About the Authors

Simon Augustine Kilasara is a PhD student at Mzumbe University, in the Department of Marketing and Entrepreneurship, School of Business. He is pursuing a PhD in Business Administration. A Lecturer at Tengeru Institute of Community Development, Tanzania, under the Department of Project Planning and Management. He holds an Advanced Diploma in Community Development - Participatory Project Planning and Management of the Community Development Training Institute – Tengeru (TICD), Tanzania, and a Master's Degree in Business Administration from Mzumbe University of Morogoro, Tanzania.

Robert Makorere is a Senior Lecturer at Mzumbe University, School of Business, Department of Marketing and Entrepreneurship, Tanzania. He holds a PhD in Agricultural Economics from Sokoine University of Agriculture (SUA), a Master of Business Administration (MBA) in Marketing Management from the University of Dar es Salaam, and a Bachelor of Business Administration (BBA) in Marketing Management from Mzumbe University. With over 19 years of academic experience, his research interests lie in Marketing Information Systems, strategic marketing, consumer behaviour, service delivery, higher education financing, agribusiness development, and agricultural economics development. His scholarly work demonstrates a strong commitment to developing practical and sustainable solutions to real-world business and economic challenges in Tanzania.

REFERENCES

Al-Adwan, A. S., Albelbisi, N. A., Hujran, O., Al-Rahmi, W. M., & Alkhalifah, A. (2021). Developing a holistic success model for sustainable e-learning: A structural equation modeling approach. *Sustainability*, *13*(16), Article 9453. https://doi.org/10.3390/su13169453

Ardito, V., Cappellaro, G., Compagni, A., Petracca, F., & Preti, L. M. (2025). Adoption of artificial intelligence applications in clinical practice: Insights from a survey of healthcare organizations in Lombardy, Italy. *Digital Health*, *11*. https://doi.org/10.1177/20552076251355680

Arshad, M., Farooq, M., Afzal, S., & Farooq, O. (2020). Adoption of information systems in organizations: Understanding the role of institutional pressures in a collectivist culture. *Journal of Enterprise Information Management*, *33*(2), 265–284.

Benbya, H., Nan, N., Tanriverdi, H., & Yoo, Y. (2020). Complexity and information systems research in the emerging digital world. *MIS Quarterly: Management Information Systems*, *44*(1), 1–17. https://doi.org/10.25300/MISQ/2020/13304

Chen, M., Martins, T. S., Zhang, L., & Dong, H. (2025). Digital transformation in project management: A systematic review and research agenda. *Systems*, *13*(8), 625. https://doi.org/10.3390/systems13080625

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information Systems Research*, *3*(1), 60–95. https://doi.org/10.1287/isre.3.1.60

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean model of information systems success: A ten-year update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

DeLone, W. H., & McLean, E. R. (2016). *Information systems success measurement*. *Foundations and Trends® in Information Systems*, *2*(1), 1–116. https://doi.org/10.1561/2900000005

Díaz-Arancibia, J., Hochstetter-Diez, J., Bustamante-Mora, A., Sepúlveda-Cuevas, S., Albayay, I., & Arango-López, J. (2024). Navigating digital transformation and technology adoption: A literature review from small and medium-sized enterprises in developing countries. *Sustainability*, *16*(14), Article 5946. https://doi.org/10.3390/su16145946

Duarte, F., Hecksher, S. D., & Bartholo, R. S. (2012). The role of information technology in small and medium enterprises in the Brazilian oil offshore industry. *International Journal of Computer Applications in Technology*, *43*(3), 285–293. https://doi.org/10.1504/IJCAT.2012.046316

Ishengoma, F., Mselle, L., & Mongi, H. (2019). Critical success factors for m-Government adoption in Tanzania: A conceptual framework. *Electronic Journal of Information Systems in Developing Countries*, *85*(1), 34-39. https://doi.org/10.1002/isd2.12064

Ishijima, H., Mapunda, M., Mndeme, M., Sukums, F., & Mlay, V. S. (2015). Challenges and opportunities for effective adoption of HRH information systems in developing countries: National rollout of HRHIS and TIIS in Tanzania. *Human Resources for Health*, *13*(1), 23-27. https://doi.org/10.1186/s12960-015-0043-1

Kalolo, A., Gautier, L., Radermacher, R., Srivastava, S., Meshack, M., & De Allegri, M. (2021). Factors influencing variation in implementation outcomes of the redesigned community health fund in the Dodoma region of Tanzania: A mixed-methods study. *BMC Public Health*, *21*(1), 19-24. https://doi.org/10.1186/s12889-020-10013-y

Kock, A., Schulz, B., Kopmann, J., & Gemünden, H. G. (2020). Project portfolio management information systems' positive influence on performance – The importance of process maturity. *International Journal of Project Management*, *38*(4), 229–241. https://doi.org/10.1016/j.ijproman.2020.05.001

Kolisch, R., Meyer, K., & Mohr, R. (2005). Maximizing R&D portfolio value. *Research-Technology Management*, *48*(3), 33–39. https://doi.org/10.1080/08956308.2005.11657313

Kostalova, J., Tetrevova, L., & Svedik, J. (2015). Support of project management methods by project management information system. *Procedia – Social and Behavioral Sciences*, *210*, 96–104. https://doi.org/10.1016/j.sbspro.2015.11.333

Lambiase, S., Catolino, G., Palomba, F., Ferrucci, F., & Russo, D. (2025). Exploring individual factors in the adoption of LLMs for specific software engineering tasks. *arXiv*. https://arxiv.org/abs/2504.02553

Lashayo, D. M., Alkawaz, M. H., & MD Johar, M. G. (2018). Adoption of e-learning systems in Tanzania's universities: A validated multi-factors instructor's model. *Journal of Theoretical and Applied Information Technology*, *96*(20), 6864-6876. https://www.researchgate.net/publication/329031223

Mboera, L. E. G., Rumisha, S. F., Mbata, D., Mremi, I. R., Lyimo, E. P., & Joachim, C. (2021). Data utilisation and factors influencing the performance of the health management information system in Tanzania. *BMC Health Services Research*, *21*(1), 498. https://doi.org/10.1186/s12913-021-06559-1

Namayala, P., Kondo, T., & Mselle, L. (2024). Analyzing the institutionalization of free and open source software adoption in Tanzanian higher education institutions. *Journal of ICT Systems*, *2*(1), 1–18. https://doi.org/10.56279/jicts.v2i1.56

Ngulugulu, M. M., Rwela, E. G., & Mkwizu, N. Y. (2023). Adoption of human resource information systems in public sectors in Tanzania. *East African Journal of Information Technology*, *6*(1), 66–76. https://doi.org/10.37284/eajit.6.1.1191

Nugawela, S., & Sedera, D. (2022). Status quo bias in users' information systems (IS) adoption and continuance intentions: A literature review and framework. In *Proceedings of the Australasian Conference on Information Systems (ACIS 2022)* (Vol. 1). University of Melbourne.

Nyandongo, K. M., Lubisi, J., Mwana Nyandongo, K., & Lubisi, J. (2019, July). Assessing the use of project management information systems and its impact on project outcome. In *Proceedings of the International Conference on Industrial Engineering and Operations Management (IEOM 2019)*, Pilsen, Czech Republic (pp. 1501–1512). IEOM Society International.

Pitao, J. V. S., Nabas, J. P., Matias, J. B., Timosan, J. Q., & Rollorata, G. G. (2022). Development and evaluation of enhanced National Greening Program monitoring and document archiving system using DeLone and McLean

IS success model. In *Proceedings of the 2022 11th International Conference on Networks, Communication and Computing (ICNCC 2022)* (pp. 334–340). ACM. https://doi.org/10.1145/3579895.3579945

Rahman, H., Shafique, M. N., & Rashid, A. (2018). Project success in the eyes of project management information system and project team members. *Abasyn Journal of Social Sciences, 11*(2), 34-39.

Sandra, C. J., & Alexander, K. (2025). Tech solutions on effectiveness of monitoring and evaluation in health programs in Kenya. *Open Science Journal, 3*(1), 185–201. https://scholarnestpublishers.com/index.php/osj/index

TechSoup Global Network. (2021). *Data handling and digital readiness in civil society: Global study 2020*. TechSoup Global Network. https://www.techsoupglobal.org/TechSoup-Global-Network-Summit-2021-Publication.pdf

Twi-Brempong, C., Gu, H., Oppong-Baah, T., Owusu, I., Gyamfi, E., Pinas, J., Kim, E., Nsaful, A. A., Boateng, F. A., Ofosu, D., Nketiah, E., Adjei, M., Fianko, S. K., Gyamerah, K. K., & Owusu, J. A. (2020). The impact of access to electricity on e-commerce adoption in Ghanaian SMEs: An empirical analysis. *Open Journal of Business and Management, 8*(1), 245–261. https://doi.org/10.4236/ojbm.2020.81015

van Besouw, J., & Bond-Barnard, T. (2021). Smart project management information systems (SPMIS) for engineering projects – Project performance monitoring & reporting. *International Journal of Information Systems and Project Management, 9*(1), 78–97. https://doi.org/10.12821/ijispm090104

Varajão, J., Lourenço, J. C., & Gomes, J. (2022). Models and methods for information systems project success evaluation – A review and directions for research. *Heliyon, 8*(12), e11977. https://doi.org/10.1016/j.heliyon.2022.e11977

Wijatmoko, S., Akbar, B., Sartika, I., & Elsye, R. (2025). Collaborative governance in digital transformation policy implementation for MSMEs in Jakarta: A socio-legal perspective. *Jurnal Hukum Unissula, 41*(2), 366–393. https://doi.org/10.26532/jh.v41i2.45941

Zeng, F., Chan, H. K., & Pawar, K. (2021). The effects of inter- and intra-organizational factors on the adoption of electronic booking systems in the maritime supply chain. *International Journal of Production Economics, 236*, 108119. https://doi.org/10.1016/j.ijpe.2021.108119