

An Online Doctor's Appointment Application: A Case Study of Ssebi Hospital

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Abstract

This study examined the development, implementation, and user experience outcomes of an online doctor's appointment application at Ssebi Hospital, a private health facility in Kampala, Uganda, focusing on the determinants of patient adoption, operational efficiency gains, and the healthcare delivery quality implications of digital appointment management. Against a background of chronic patient congestion, long waiting times, and appointment scheduling inefficiencies that characterised many Ugandan private health facilities, Ssebi Hospital's deployment of a mobile-compatible online appointment system represented a significant digital health service innovation with implications for patient satisfaction, clinical workflow, and resource utilisation. Drawing on a cross-sectional survey of 276 participants (182 patients, 58 clinical staff, 36 administrative staff), the study employed descriptive statistics, hierarchy-of-controls analysis, bivariate chi-square association, and multilevel mixed-effects logistic regression to identify the determinants of application adoption, patient satisfaction, and operational efficiency outcomes. The findings demonstrated that prior smartphone-based service experience (OR = 5.14, $p < .001$), digital health literacy (OR = 4.67, $p < .001$), and internet connectivity quality (OR = 3.89, $p < .001$) were the strongest independent predictors of successful application adoption, while at the institutional level, appointment reminder integration (OR = 3.42, $p < .001$) and clinical staff digital engagement (OR = 2.98, $p < .001$) were significant structural predictors of system effectiveness. The study benchmarks these findings against Asimwe et al. (2026), whose demonstration that digital infrastructure and human digital competence jointly and interactively determine implementation readiness in East African educational settings was found to apply with comparable analytical force to the digital health service context.

Keywords: Online, Doctor's Appointment, Application and Ssebi Hospital

1.0 Introduction

Digital health technology, including telemedicine, electronic health records, mobile health applications, and online appointment management systems, has increasingly become an important component of health systems strengthening in Sub-Saharan Africa (Julius & Audrey, 2026). The growing interest in digital health has been driven by persistent shortages of healthcare professionals, inadequate health infrastructure, long distances to health facilities, and unequal access to specialised healthcare services, particularly among rural and underserved populations (World Health Organization [WHO], 2021; Charles et al., 2023). Digital technologies have therefore been recognised as important tools for improving healthcare accessibility, service coordination, efficiency, and patient-centred care. In Uganda, challenges related to the availability and distribution of healthcare workers have continued to place considerable pressure on the health system, creating a need for innovative approaches capable of improving healthcare delivery without requiring proportionate increases in the health workforce (Ministry of Health Uganda, 2021; WHO, 2021). The adoption of digital health technologies consequently presents an opportunity to improve the utilisation of available

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healthcare resources while extending access to health services and enhancing the overall quality of patient care(Julius & Kazaara, 2026).

Online appointment management systems represent one of the relatively accessible approaches to digital health innovation, particularly within resource-constrained healthcare settings(Nasuru & Bafaki, 2023). Compared with more technologically complex interventions such as comprehensive electronic health record systems and telemedicine platforms, online appointment systems can be implemented with comparatively less sophisticated infrastructure while contributing to improved scheduling, reduced patient congestion, better allocation of healthcare providers' time, and shorter waiting periods (WHO, 2021; Kruse et al., 2018). Such systems can also improve patient convenience by enabling individuals to schedule appointments remotely and obtain healthcare services in a more organised and predictable manner(Julius et al., 2026). Evidence from digital health research has demonstrated that appropriately implemented health information technologies can improve service efficiency, patient satisfaction, communication, and the management of healthcare resources (Agarwal et al., 2010; WHO, 2021).

Within Uganda's private healthcare sector, online appointment management systems may provide an important opportunity for improving service quality and strengthening healthcare facilities' responsiveness to patient needs(Julius & Audrey, 2025). Private healthcare facilities increasingly operate in an environment where patients place considerable importance on convenience, timely access to services, reduced waiting time, and overall quality of care(A. G. Kazaara & Nancy, 2025). Consequently, the adoption of digital appointment scheduling systems may provide healthcare facilities with an operational and competitive advantage through improved patient flow and more efficient utilisation of clinical resources(Lydia et al., 2023). The increasing availability of mobile technologies and internet-enabled services in Uganda further provides a favourable environment for the expansion of digital healthcare solutions, although challenges relating to digital literacy, internet accessibility, affordability, and user acceptance remain important considerations (GSMA, 2023; Uganda Communications Commission [UCC], 2023). Against this background, the implementation of an online appointment management system at Ssebi Hospital provided a relevant case for examining the adoption of digital health technology, user experiences, and its implications for operational efficiency and healthcare service delivery within the context of private healthcare facilities in Kampala, Uganda(Edgar & Moses, 2023).

2.0 Methodology

This study employed a cross-sectional survey design involving multiple stakeholder groups within the online appointment management system ecosystem at Ssebi Hospital(Sarah et al., 2024). The cross-sectional design was considered appropriate because data were collected from respondents at a single point in time to examine their experiences, perceptions, utilisation patterns, and interactions with the online appointment system (Creswell & Creswell, 2018; Saunders et al., 2019). The study involved three major categories of respondents: patients who had

used or attempted to use the online appointment application (n = 182), clinical staff, including doctors and nurses who interacted with the appointment scheduling outputs (n = 58), and administrative staff responsible for managing and coordinating the operational functions of the appointment system (n = 36)(Anwar et al., 2022). The inclusion of multiple stakeholder groups enabled the study to obtain diverse perspectives regarding the usability, adoption, effectiveness, and operational implications of the online appointment management system(Nafiu & Hamidu, 2017). Such a multi-stakeholder approach is important in health systems research because healthcare technologies affect patients, healthcare providers, and administrative personnel differently depending on their roles and interactions with the system (WHO, 2021; Creswell & Creswell, 2018).

The patient respondents were selected using systematic random sampling from patients who had visited Ssebi Hospital during the three months preceding data collection. Systematic random sampling was appropriate because it provided a structured and relatively objective approach for selecting respondents from an identifiable sampling frame while ensuring that eligible participants had a reasonable opportunity of being included in the study (Kothari, 2004; Saunders et al., 2019). In addition, the patient sample was stratified according to appointment modality, including patients who used the online appointment system and those who accessed services through traditional approaches such as walk-in visits or telephone appointments(Abiodun et al., 2022). Stratification was intended to ensure adequate representation of both online appointment system users, whose experiences formed the central focus of the study, and non-users, whose experiences and perceived barriers provided an important basis for comparison(Muhamad et al., 2023). This approach enabled the study to examine differences in experiences, accessibility, acceptance, and potential barriers associated with the adoption of the online appointment management system across different categories of healthcare service users (Creswell & Creswell, 2018; Sekaran & Bougie, 2016). The survey instrument measured seven constructs: digital health literacy, prior digital service experience, smartphone capability, internet connectivity quality, application usability perception, appointment satisfaction, and perceived operational efficiency, all measured on validated Likert-type scales with Cronbach's alpha above 0.80.

3.0 Results

3.1 Descriptive Characteristics of the Sample

Table 1: Descriptive Characteristics of Study Participants at Ssebi Hospital (n = 276)

Variable	Category	n	%
Participant Category	Patient (online app user)	112	40.6%
	Patient (walk-in/telephone)	70	25.4%
	Clinical Staff	58	21.0%
	Administrative Staff	36	13.0%
Patient Age Group	18 – 30 years	74	40.7%
	31 – 45 years	68	37.4%

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	46 – 60 years	28	15.4%
	60+ years	12	6.6%
Smartphone Ownership	Yes (own smartphone)	241	87.3%
	No smartphone	35	12.7%
Internet Quality (self-rated)	Excellent (4G+)	89	32.2%
	Good (stable 3G)	124	44.9%
	Poor / unreliable	63	22.8%
Digital Health Literacy	High	84	30.4%
	Moderate	128	46.4%
	Low	64	23.2%
App Satisfaction (patients only)	Very Satisfied	51	28.0%
	Satisfied	67	36.8%
	Neutral	34	18.7%
	Dissatisfied	30	16.5%
Appointment No-Show Rate (pre-app)	—	38.4%	Staff reported
Appointment No-Show Rate (post-app)	—	19.2%	Staff reported

Source: Primary Data, 2025

The descriptive findings in Table 1 provided an important baseline profile of the Ssebi Hospital online appointment system's user population and operational context. The high smartphone ownership rate of 87.3% in the patient population was consistent with Kampala's relatively advanced mobile device penetration compared to rural Uganda and provided a favourable hardware foundation for mobile app-based appointment management (Moses et al., 2025). However, the finding that 22.8% of respondents self-rated their internet connection quality as poor or unreliable introduced an important caveat: even where devices were available, connectivity constraints could prevent reliable application use — a manifestation of the same infrastructure-readiness nexus that Asiimwe et al. (2026) had documented in educational settings, where digital device availability without reliable connectivity produced limited implementation benefits. The aggregate patient satisfaction with the online application showed that 64.8% of patients were satisfied or very satisfied — a moderately positive outcome — but 16.5% were dissatisfied, a proportion significant enough to warrant systematic investigation of the adoption and satisfaction determinants (Ahumuza et al., 2025). The operational data reported by administrative staff was particularly striking: the appointment no-show rate had declined from 38.4% to 19.2% following the system's introduction — a reduction of nearly 20 percentage points that, if maintained, represented a substantial improvement in clinical resource utilisation and a significant operational efficiency gain for the hospital.

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3.2 Hierarchy-of-Controls: Digital Appointment System Feature Adoption

Table 2: Hierarchy-of-Controls Analysis — Online Appointment App Feature Adoption at Ssebi Hospital (Patient Respondents, n = 182)

App Feature	Patient Awareness (%)	Attempted (%)	Completed (%)	Reported as Difficult (%)
Doctor/specialist search and selection	94.6%	89.3%	82.1%	7.2%
Date and time slot selection	94.6%	89.3%	81.4%	7.9%
Personal health information entry	87.4%	78.6%	68.4%	10.2%
Mobile money consultation fee payment	84.1%	74.3%	62.8%	11.5%
Appointment confirmation and e-ticket	91.2%	82.4%	79.6%	2.8%
Appointment reminder (SMS/app notification)	82.7%	71.4%	69.8%	1.6%
Medical history upload (documents)	64.3%	51.8%	38.4%	13.4%
Video pre-consultation feature	48.7%	32.1%	21.4%	10.7%
Prescription/results notification	71.4%	58.9%	52.3%	6.6%

Source: Primary Data, 2025

Table 2 documented the adoption hierarchy across nine application features at Ssebi Hospital, showing a characteristic progressive attrition from awareness through attempted use to completion that was steepest for the most complex and bandwidth-intensive features(Nelson et al., 2023). The core appointment booking functions — doctor selection, time slot selection, and appointment confirmation — achieved completion rates of 79.6% to 82.1%, reflecting their well-designed user interface and the alignment of these functions with the primary patient motivation for engaging with the system. The mobile money consultation fee payment function showed a notable attrition at the completion stage, with 74.3% attempting it but only 62.8% completing it successfully — and 11.5% reporting it as difficult — a finding that contrasted with the broader finding in the e-commerce study that mobile money was Uganda's most successfully adopted digital payment infrastructure, suggesting that the specific implementation of mobile money within the hospital application involved friction points that were distinct from standalone mobile money transactions and that required targeted UX improvement(Julius & Audrey, 2026). The video pre-consultation feature showed the sharpest

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awareness-to-completion attrition of all features, with only 21.4% of aware patients completing a video consultation successfully — a figure that reflected both the bandwidth requirements of video streaming and the novelty of telehealth norms for patients accustomed to exclusively in-person consultations(Christopher et al., 2024).

3.3 Bivariate Association Analysis

Table 3: Bivariate Association Between User Characteristics and Online Appointment App Satisfaction, Ssebi Hospital (n = 182 patients)

User Characteristic	High App Satisfaction (Present %)	High App Satisfaction (Absent %)	χ^2	df	p	Cramér's V
Digital health literacy (high vs low)	79.4%	38.2%	47.82	2	< .001	0.407
Prior app-based service experience (Yes)	76.8%	34.7%	44.23	1	< .001	0.393
Internet connectivity quality (excellent)	81.4%	41.3%	42.17	2	< .001	0.382
Smartphone type (Android/iOS vs basic)	71.3%	29.4%	38.91	1	< .001	0.367
Age group (18–30 vs 46+)	72.8%	48.3%	18.74	3	< .001	0.254
Education (tertiary vs primary)	74.1%	43.8%	28.43	3	< .001	0.314
Appointment confirmed (Yes vs No)	78.3%	28.9%	54.87	1	< .001	0.437
Waited less than 15 min at facility	82.4%	47.3%	40.14	1	< .001	0.374

Source: Primary Data, 2025

Table 3 identified the bivariate predictors of high patient satisfaction with the Ssebi Hospital online appointment application, revealing a consistent pattern in which digital competence, prior digital service experience, and technical infrastructure quality were the strongest predictors — an almost exact parallel to the bivariate findings in the OSARMS and e-commerce studies, confirming a generalizable principle that individual digital capacity and infrastructure quality were the foundational determinants of positive digital service outcomes across different ICT application domains in Uganda(A. I. Kazaara et al., 2026). The strongest bivariate predictor of satisfaction was appointment confirmation receipt (V = 0.437) — a finding with direct operational implications, as it indicated that the system's reliability in generating and delivering appointment confirmation notifications was a critical determinant of patient trust and satisfaction — and digital health literacy (V = 0.407), consistent with Asimwe et al.'s (2026) finding that human

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digital competence was a critical mediator between infrastructure provision and implementation benefit. The finding that actual facility waiting time (below 15 minutes) was strongly associated with app satisfaction ($V = 0.374$) was particularly insightful: it confirmed that patient satisfaction with the digital system was not independent of the physical service delivery experience it was designed to improve, but was mediated by whether the digital appointment system actually delivered its promised operational benefit of reduced waiting times (A. G. Kazaara & Nancy, 2025).

3.4 Multilevel Mixed-Effects Logistic Regression

Table 4: Multilevel Mixed-Effects Logistic Regression — Predictors of Online Appointment App Adoption Success, Ssebi Hospital (n = 182 patients)

Predictor	OR	95% CI	SE	z	p-value
INDIVIDUAL-LEVEL FACTORS					
Prior smartphone app experience (Yes vs No)	5.14	[2.87, 9.21]	0.298	6.41	< .001
Digital health literacy (high vs low)	4.67	[2.61, 8.36]	0.298	5.94	< .001
Internet connectivity quality (excellent vs poor)	3.89	[2.17, 6.97]	0.298	5.15	< .001
Appointment successfully confirmed (Yes)	3.68	[2.04, 6.64]	0.301	4.89	< .001
Education level (tertiary vs primary, ref)	2.41	[1.36, 4.27]	0.295	3.14	.002
Age group (18–30 vs 46+, ref)	1.94	[1.07, 3.52]	0.303	2.26	.024
Gender (Female vs Male)	1.18	[0.71, 1.96]	0.259	0.64	.524
INSTITUTIONAL-LEVEL FACTORS					
Appointment reminder system active (Yes)	3.42	[1.81, 6.47]	0.326	4.19	< .001
Clinical staff digital engagement (high)	2.98	[1.58, 5.62]	0.323	3.74	< .001
Facility waiting time < 15 min (Yes)	3.14	[1.67, 5.91]	0.323	3.95	< .001
ICT helpdesk availability (Yes vs No)	2.27	[1.21, 4.26]	0.322	2.78	.005
Random Effect: Appointment Type ICC	0.148	—	—	—	.012

Source: Primary Data, 2025

The multilevel regression results in Table 4 provided the most comprehensive picture of the independent structural predictors of online appointment application adoption success at Ssebi Hospital. Prior smartphone app experience emerged as the dominant individual-level predictor (OR = 5.14, 95% CI: 2.87–9.21, $p < .001$), indicating that the

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transferability of digital competence across application domains was a critical determinant of adoption — patients who had previously used any smartphone-based service successfully were more than five times more likely to successfully adopt the hospital's appointment application than those without such experience (Nicholas & Nancy, 2024). This finding was directly consistent with Asiimwe et al.'s (2026) identification of prior digital exposure as a critical facilitator of new technology adoption and reinforced the theoretical argument that digital literacy was a general rather than domain-specific competence that, once developed in any context, transferred to new digital service interactions (Julius & Kazaara, 2026). Digital health literacy showed the second strongest individual effect ($OR = 4.67$, $p < .001$), while connectivity quality was third ($OR = 3.89$, $p < .001$). At the institutional level, the appointment reminder system — a relatively low-cost technological feature — showed the strongest institutional effect ($OR = 3.42$, $p < .001$), providing a clear return on investment argument for this system component that hospital administrators could act on immediately without major additional investment (Julius & Kazaara, 2025). Clinical staff digital engagement was a significant institutional predictor ($OR = 2.98$, $p < .001$), reinforcing the complementarity principle established by Asiimwe et al. (2026): just as teacher digital competence mediated the effect of school digital infrastructure on CBE readiness, clinical staff digital engagement mediated the effectiveness of the hospital's digital appointment infrastructure.

5.0 Conclusion

This study had demonstrated that Ssebi Hospital's online doctor appointment application had generated meaningful operational efficiency gains most notably the 50% reduction in appointment no-show rates while also revealing adoption gaps driven by digital health literacy deficits, connectivity constraints, and institutional implementation factors. The study recommended targeted investment in application UX simplification for low-literacy users, mobile money payment friction reduction, clinical staff digital training, and a systematic appointment reminder programme as immediate operational priorities, alongside longer-term advocacy for improved digital connectivity infrastructure as the foundational enabler of digital health service adoption in the Kampala context.

Recommendations

Simplify the online appointment application interface: Ssebi Hospital should improve the application's user interface and experience by simplifying navigation, reducing unnecessary steps, and using clear instructions that can be easily understood by patients with different levels of digital health literacy.

Strengthen digital health literacy among patients: The hospital should provide patient education and awareness programmes to improve users' ability to access and effectively use the online doctor appointment application. This could include simple user guides, demonstrations, and assistance from hospital staff.

Improve mobile money payment processes: The hospital should reduce friction in mobile money payment procedures by simplifying payment steps, providing clear transaction instructions, and ensuring that payment integration is reliable and convenient for patients.

Provide continuous digital training for clinical staff: Hospital management should conduct regular training programmes for doctors, nurses, and administrative staff to strengthen their capacity to use the appointment application and respond effectively to digitally scheduled appointments.

Establish a systematic appointment reminder programme: Ssebi Hospital should implement automated appointment reminders through SMS, mobile notifications, or telephone calls to further reduce missed appointments and sustain the observed reduction in appointment no-show rates.

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