



Managerial and Entrepreneurial Competence in Public-Sector MIS: Theory and an Illustration from Two Nigerian Land-Information Agencies

Bitiyong, John Isa¹, *Dodo, Enoch Jacob², and Bitiyong, Fidelis Isa¹



¹Department of Management Information Systems, African Centre of Excellence on Technology Enhanced Learning (ACETEL), National Open University of Nigeria, Jabi, Abuja, FCT, Nigeria;

²Department of Information Systems and Technology, Faculty of Computing, National Open University of Nigeria, Jabi, Abuja, FCT, Nigeria.

*Corresponding Author's email: enochdodo46@gmail.com Phone No.: +2347082241514

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ABSTRACT

Management information systems (MIS) investments in public institutions often fail to convert technical capability into organisational value, yet explanations remain predominantly technical. This theory-building article proposes that managerial and entrepreneurial competence jointly convert information systems into public value. Integrating the DeLone and McLean IS success model, the resource-based view, dynamic capabilities and digital entrepreneurship, it derives seven propositions and one formal model for later estimation. A documentary illustration of two Nigerian land-information agencies, the Abuja Geographic Information Systems (AGIS) and the Kaduna Geographic Information Service (KADGIS), draws on 19 sources and scores outcome direction and evidence strength separately, distinguishing agency claims from verified outcomes. Both agencies report digitised records; sponsorship and revenue-oriented opportunity recognition are best documented, while verified fiscal capture, equity and openness are weakly evidenced. Of the three dimensions with independent evidence for both agencies, KADGIS is ahead on one (service speed), a result that a single contested code can reverse. The cases cannot test the propositions or support causal claims; the evidence is consistent, as a descriptive pattern only, with two of them. The article contributes a formal model, an evidence-graded illustration and make recommendations that follow from documented findings.

CITATION

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INTRODUCTION

Organisations invest heavily in management information systems (MIS), yet in developing countries many such investments fail wholly or partly (Heeks, 2002). The conventional diagnosis is technical: the wrong platform, weak integration or poor data quality. A growing body of scholarship points elsewhere. Value from digital technology is not a property of the artefact but of how an organisation senses opportunities, mobilises resources

and reconfigures itself around them (Teece, 2018; Vial, 2019; Warner & Wäger, 2019). In developing countries, failure typically arises from gaps between the assumptions built into a system and the realities of the receiving organisation (Heeks, 2002), and systematic evidence on government reaches a parallel conclusion: digital change proceeds through incremental organisational, process and role changes whose effects depend on leadership, capabilities and institutional context rather than on

technology alone (Haug et al., 2024; Mergel et al., 2019). Nigerian evidence is consistent with this reading. A study of ministries, departments and agencies (MDAs) attributes weak MIS maturity to the absence of an MIS vision, management policies and supportive objectives (Adetunji et al., 2022), and a survey of staff in federal agencies in Abuja found limited awareness of MIS and low use (Nwagwu & Akinyemi, 2025).

This article argues that managerial and entrepreneurial competence are not soft add-ons to MIS practice but a central mechanism through which information systems become organisationally and economically meaningful. *Managerial* competence is the discipline of planning, governing and leading so that a system survives contact with an organisation. *Entrepreneurial* competence is the capacity to recognise opportunities others have missed, mobilise resources under uncertainty, bear risk and create value that did not previously exist (Jafari-Sadeghi et al., 2022; Nambisan, 2017; Schumpeter, 1942). We propose that neither suffices alone: a technically sound system without managerial governance is likely to fail under its own ambition, and a well-governed system without entrepreneurial energy is likely to become an under-used database. These are the framework's propositions, not findings of the case analysis. The fusion is increasingly studied as digital entrepreneurship, which also carries distinctive personal costs such as role conflict and stress (Nambisan & Baron, 2021).

Terminology and level of analysis. *Competence* is an attribute of individual leaders and managers. *Capability* is an organisational routine or bundle of resources (such as MIS capability or dynamic capabilities) built from people's competence. *Competency* is a named dimension of competence rated in Instrument B. The theoretical level of analysis is the agency, and the jurisdiction is the level at which advantage is judged. In the illustration, competencies are inferred from agency-level documents, so ratings refer to documentary evidence that a competency was exercised in the agency and not to measured attributes of named individuals.

Nigeria is an instructive setting. With 109 million internet users at the end of 2025 (Kepios, 2026), a federal ambition to raise the digital economy's share of GDP to 21% by 2027 (allAfrica, 2025) and a long-pending omnibus digital-economy statute, it combines scale with policy intent. It also exhibits familiar constraints: uneven digital literacy,

infrastructure gaps, weak legal clarity and low organisational maturity in public information systems (Adetunji et al., 2022; Oghuvbu et al., 2022). Land administration is an especially informative domain because cadastral and title information is a high-value, high-contention public data asset, and because two sub-national agencies, the Abuja Geographic Information Systems (AGIS) in the Federal Capital Territory and the Kaduna Geographic Information Service (KADGIS) in Kaduna State, have pursued GIS-based reform under different institutional conditions.

Four gaps motivate the study. First, evidence on sub-Saharan African public-sector MIS and e-government is limited and often descriptive or agency-reported (Adetunji et al., 2022; Oghuvbu et al., 2022), and e-government research more broadly has been criticised as over-optimistic and under-theorised (Heeks & Bailur, 2007). A bibliometric review of 72 articles on digital transformation, strategy and value creation is consistent with geographic concentration, since only one African country (South Africa) was among the 17 meeting its coupling threshold (Gouveia et al., 2024; Figure 1); because that corpus concerns a different literature, we use it as indicative context only. Second, in the sources we reviewed purposively, IS-success and capability theories are seldom integrated with public-sector entrepreneurship (Kearney et al., 2008; Morris & Jones, 1999; Sadler, 2000; Sučić Funko et al., 2023), although IT capabilities and public value have been linked through organisational capabilities (Pang et al., 2014). The IS success model has been validated across contexts, including government (Wang & Liao, 2008; Scott et al., 2016) and accounting systems in least-developed countries (Al-Hattami, 2021; Jeyaraj, 2020), but we found no version with an explicit agency layer; this is an observation from a purposive review and not from a systematic search. Third, the land-administration literature stresses affordable, fit-for-purpose and equitable registration (Enemark et al., 2014; Deininger & Feder, 2009; Williamson et al., 2010) but gives less attention to the managerial and entrepreneurial capabilities of the agencies that run land information systems. Fourth, the legal status of enabling frameworks is sometimes blurred: a headline in the national press refers to a digital-economy and e-governance "Act 2026" that was only "ready in weeks" (ThisDay, 2026), which is why we date our own verification of the bill's status.

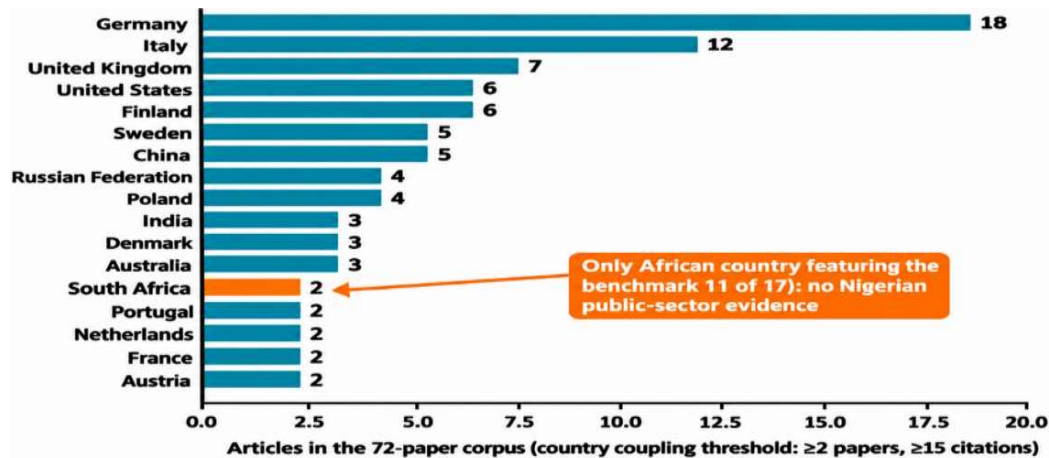


Figure 1: Geographic concentration of the literature on digital transformation, value creation and strategy. Bars show articles per country among the 17 countries meeting the bibliographic-coupling threshold in the 72-article corpus of Gouveia et al. (2024, Table 3); South Africa is the only African country represented. Indicative context only: the corpus does not concern public-sector MIS or e-government. Source: re-plotted by the authors from Gouveia et al. (2024)

We therefore ask three research questions. Q1 (theoretical): How can managerial and entrepreneurial competencies be conceptualised as jointly shaping the conversion of MIS investments into organisational and public value? This question is answered conceptually; the empirical illustration cannot answer it because two cases cannot show joint effects. Q2 (illustrative): What does documentary evidence on AGIS and KADGIS show about which competencies are documented as present, weak or absent, and about what evidence exists on outcomes? Q3 (applied): Which institutional, educational and governance interventions are suggested, given Nigeria's current legal and infrastructural position, and on what evidential basis? Each recommendation as following from a documented finding, from theory or from general policy knowledge is documented in the recommendation.

The article contributes (i) an integrative framework, seven propositions with stated mechanisms and boundary conditions, and one formal model in which each proposition maps to a distinct term; (ii) an evidence-graded illustrative analysis with two coding instruments that score outcome direction and evidence strength separately and distinguish verified outcomes from agency claims; (iii) a recommendation set with actors, indicators, horizons and an explicit evidential basis; and (iv) falsification conditions for each proposition and a replication package (coding sheets, search log, analysis script and second-coder materials).

Theoretical Background and Proposition Development *MIS value as an organisational outcome*

We treat MIS not merely as systems supporting planning, control and decision-making through routine and exception reporting, but as the organisational machinery through which information assets are built, governed and

converted into strategic and commercial value. This view is consistent with the strategic-alignment tradition (Henderson & Venkatraman, 1993), with research showing that digital technologies make products and processes generative and re-combinable (Yoo et al., 2010), and with reviews that stress strategy, structure and capability change alongside technology (Hanelt et al., 2021; Vial, 2019). DeLone and McLean's (2003) IS success model remains the most widely used lens for judging whether a system works, linking system, information and service quality to use, user satisfaction and net benefits. A critical meta-review finds the model empirically robust but warns that researchers often modify its constructs implicitly (Jeyaraj, 2020), and a validation in the accounting information systems of banks in least-developed countries suggests its core relationships hold even where institutional capacity is weak (Al-Hattami, 2021). The model describes what success looks like but is silent on who produces it.

Resources, dynamic capabilities and agility

The resource-based view holds that durable advantage derives from resources that are valuable, rare, inimitable and non-substitutable (Barney, 1991). In IT, hardware and packaged software are purchasable and therefore imitable, so advantage flows from complementary human, managerial and organisational resources (Bharadwaj, 2000; Mata et al., 1995; Melville et al., 2004). Leaders who act as deliberate strategic transformation managers, rather than mere technology adopters, drive advantage in digitalising firms (Jafari-Sadeghi et al., 2022). Dynamic capabilities theory explains how such bundles are renewed: by sensing opportunities, seizing them through investment and transforming the organisation (Teece, 2007, 2018; Teece et al., 1997). Digital transformation is

accordingly an ongoing process of strategic renewal (Warner & Wäger, 2019), digitalisation and organisational agility co-evolve (Ciampi et al., 2022), and big-data analytics capabilities influence business-model innovation through entrepreneurial orientation (Ciampi et al., 2021).

Digital entrepreneurship and creative destruction

Schumpeter's (1942) creative destruction frames entrepreneurs as disruptors of incumbent arrangements. Digital technologies intensify the dynamic by lowering the cost of experimentation and making legacy systems obsolete quickly, which motivates a digital-technology perspective on entrepreneurship (Nambisan, 2017) and a view of innovation as an ecosystem-level rather than firm-level property (Mariani et al., 2023). Disruption cuts both ways: entrants use information systems to out-inform incumbents, while incumbent systems are themselves exposed to replacement (Christensen et al., 2015). For MIS practitioners this implies dual vigilance: using systems to disrupt while recognising that their own legacy systems are vulnerable.

Public-sector digital transformation and public value

Public organisations pursue public value rather than profit (Moore, 1995), operate under different accountability structures and often cannot capture revenue as firms do. Public-sector digital transformation is a holistic change in organisational processes, relationships and service delivery enabled by technology (Mergel et al., 2019). Entrepreneurial behaviour in government is feasible but contingent on structural and cultural conditions (Kearney et al., 2008). Institutional theory predicts that public bodies adopt technologies partly to signal legitimacy,

producing adoption without use (DiMaggio & Powell, 1983), and the design–reality gap perspective predicts failure where designs assume resourced, skilled users that the organisation lacks (Heeks, 2002, 2006). Estonia shows how sustained political sponsorship, shared infrastructure and a narrative of national mission can produce a digital state (Kattel & Mergel, 2019). Learning requires converting tacit expertise into explicit, system-embedded knowledge (Nonaka, 1994), and IT governance with top-leadership support is associated with stronger performance (Lowry et al., 2024; Wu et al., 2015). Entrepreneurial energy in government must therefore be coupled with governance, accountability and equity safeguards (Osborne, 2006). We reinterpret competitive advantage for a public agency as *jurisdictional* advantage: a sub-national government's relative ability to attract investment, secure revenue, protect rights and earn legitimacy. In the case analysis we treat selection for federal programmes, secured revenue and documented rights protection as observable markers of it.

Integrative framework and propositions

Figure 2 integrates these streams. Managerial and entrepreneurial competencies combine into an integrated MIS capability, which operates through dynamic capabilities and shapes the IS success dimensions. Success yields organisational value (revenue, efficiency, service delivery) and public value and advantage. An institutional context of statutory backing, data-protection and identity infrastructure, procurement rules, skills and connectivity moderates the links. Table 1 states seven propositions with the observable indicators used later to code the evidence.

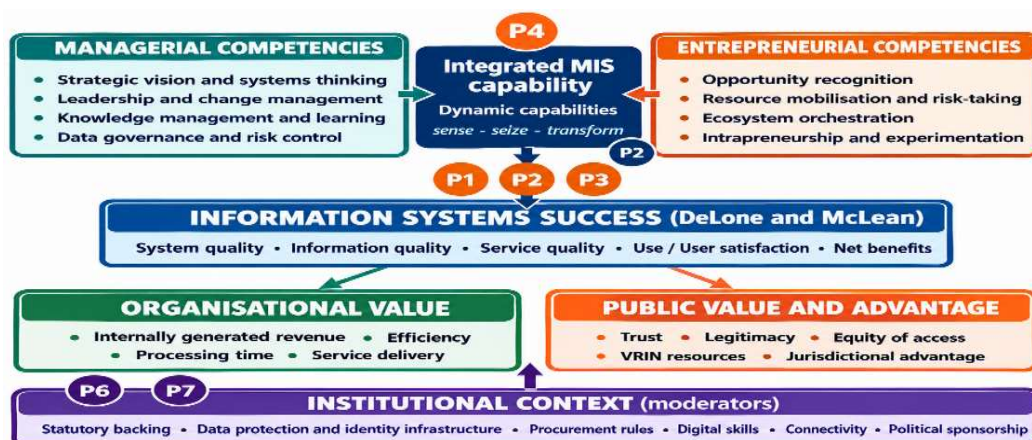


Figure 2: Integrated framework linking managerial and entrepreneurial competencies, MIS capability and dynamic capabilities, IS success, organisational and public value, and institutional moderators. P1–P7 denote the propositions in Table 1. Source: authors' own creation

Table 1: Propositions and the Indicators used to Code the Evidence. Source: Authors' Own Creation

No.	Proposition	Theoretical basis	Observable indicators in public-sector MIS
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P1	Strategic alignment and systems thinking strengthen the relationship between MIS capability and net benefits.	Henderson & Venkatraman (1993); DeLone & McLean (2003); Wu et al. (2015)	Statutory mandate; integration of registry, mapping and revenue systems; cross-agency coordination
P2	Top-level sponsorship, change management and knowledge management raise adoption and user satisfaction.	Lowry et al. (2024); Kotter (1995); Nonaka (1994)	Named executive sponsor; stakeholder forums; documented resistance and its handling
P3	Opportunity recognition and resource mobilisation increase the fiscal and service value extracted from public data assets.	Schumpeter (1942); Nambisan (2017); Kearney et al. (2008)	New revenue lines, services or data products; fee-based access; partnerships
P4	Managerial and entrepreneurial competencies are complements: joint presence yields more value than either alone.	Jafari-Sadeghi et al. (2022); Ciampi et al. (2021)	Co-occurrence of governance routines and new-service launches in the same agency
P5	Dynamic capabilities mediate between digital resources and sustained public value.	Teece (2007, 2018); Warner & Wäger (2019)	Iterative reform cycles; systematic sensing and learning routines
P6	Data governance and identity integration are necessary conditions (preconditions) for scalable, legitimate public MIS.	Federal Republic of Nigeria (2023); Heeks (2006)	Identity verification (NIN, BVN) in workflows; agent accreditation; access controls; dispute handling
P7	Institutional context (statutory backing, skills, equity, trust) moderates the conversion of capability into net benefits.	DiMaggio & Powell (1983); Heeks (2002); Mergel et al. (2019); Moore (1995)	Enabling law; digital-skills programmes; affordability and equity outcomes; federal programme selection

Mechanisms and boundary conditions. Each proposition is intended to hold under stated conditions. P1 operates through a shared understanding of how registry, mapping and revenue processes fit together, and holds where an agency controls enough of its own processes to realign them. P2 operates through the legitimacy and protection that senior sponsors give to change, and holds where sponsorship is stable; it weakens when it depends on one person who then leaves. P3 operates through the discovery of new uses for data assets, and holds where law permits fee-based or service innovation. P4 follows the logic of complementarity (Milgrom & Roberts, 1995): governance routines lower the risk of entrepreneurial moves, and entrepreneurial moves create the surplus that justifies governance, so the effect of each competency should rise with the level of the other; it holds for agencies with enough autonomy to launch new services. P5 operates through repeated sensing, seizing and reconfiguring, and holds where reform cycles are long enough to repeat. P6 states that without identity and data governance, scaling a system erodes legitimacy; it is a necessary, not a sufficient, condition. P7 is limited to the link from capability to net benefits, which statutory backing, skills and trust may strengthen or weaken (γ_7 in Equation 3). Public-sector dynamic capabilities, such as coordination, learning and stewardship, may differ from firm-level ones (Piening, 2013; Kattel & Mazzucato, 2018), and a public-value view of ICT (Cordella & Bonina, 2012) implies that net benefits should include equity and legitimacy and not revenue alone.

Formal specification

To make the propositions empirically tractable we express them as one recursive model for organisation i that follows the IS-success chain. Let DR denote digital resources (system, information and service quality, the first IS-success dimensions), MC and EC managerial and entrepreneurial competence, SP the sponsorship, change-

management and knowledge-management component of MC, SA strategic alignment, DC dynamic capabilities, U use and user satisfaction, NB net benefits (the final IS-success dimension), I institutional context, G data governance and identity integration, and Z a vector of controls (agency age, size and jurisdictional tier). Equation (1) links the competencies to dynamic capabilities; complementarity (P4) implies a positive interaction between them:

$$DC_i = \alpha_0 + \alpha_1 DR_i + \alpha_2 MC_i + \alpha_3 EC_i + \alpha_4 (MC_i \times EC_i) + \theta_1' Z_i + u_i \quad (1)$$

P4 holds if $\alpha_4 > 0$. Equation (2) models use and user satisfaction, which precede net benefits in the IS-success chain, and allows sponsorship, change management and knowledge management to raise them (P2):

$$U_i = \kappa_0 + \kappa_1 DR_i + \kappa_2 SP_i + \kappa_3 DC_i + \theta_2' Z_i + e_i \quad (2)$$

Equation (3) models net benefits. Strategic alignment moderates the link between digital resources and net benefits (P1), entrepreneurial competence acts on net benefits through opportunity recognition and resource mobilisation (P3), dynamic capabilities mediate the effect of digital resources (P5), and institutional context moderates the capability-to-benefit link (P7):

$$NB_i = \gamma_0 + \gamma_1 DR_i + \gamma_2 DC_i + \gamma_3 U_i + \gamma_4 EC_i + \gamma_5 (DR_i \times SA_i) + \gamma_6 I_i + \gamma_7 (DC_i \times I_i) + \theta_3' Z_i + v_i \quad (3)$$

The equations are not estimated here because the evidence is documentary and the case study cannot supply the variation they require. They define the model that a survey-based programme would estimate, for example by partial least squares, which suits small samples, or by covariance-based structural equation modelling, and they guide the construction of the indicators in Table 1. Table 2 defines the notation.

Mapping of propositions to model terms. Each proposition corresponds to a distinct term: P1 to $\gamma_5 > 0$ (Equation 3); P2 to $\kappa_2 > 0$ (Equation 2, with use and satisfaction as dependent variables because they precede net benefits); P3 to $\gamma_4 > 0$, with net benefits measured as

fiscal and service value; P4 to $\alpha_4 > 0$; P5 to the indirect effect $\alpha_1\gamma_2$ (and, through use, $\alpha_1\kappa_3\gamma_3$), tested with bootstrapped confidence intervals; and P7 to $\gamma_7 > 0$. P6 states a necessary condition, which an additive coefficient does not test; it is assessed with necessary-condition analysis (Dul, 2016), with data governance and identity integration (G) as the condition and net benefits as the outcome. MC and EC should be mean-centred before the interaction is formed, and Z includes agency age, size and jurisdictional tier (Table 9).

Feasibility. Estimating the model requires a sample of comparable public agencies. The number of Nigerian public agencies running comparable information systems is limited, which favours partial least squares, several

respondents per agency and pooling across sectors and states. Single-respondent surveys are exposed to common-method bias (Podsakoff et al., 2003), which should be reduced by procedural remedies and by pairing survey measures with administrative outcome data. Reverse causality is also a threat, because successful agencies may attract entrepreneurial leaders; longitudinal data across leadership turnover (Table 9) or instrumental variables would be needed to address it.

Construct note. DR operationalises the “MIS capability” of Figure 2 as the quality of the system, its information and its service, and MC and EC act on it through DC. Dynamic capabilities may also build digital resources, so Equation (1) treats DC and DR as contemporaneous; separating the direction of effect requires longitudinal data.

Table 2: Notation used in Equations (1) To (3) and in the Coding Instruments. Source: Authors’ Own Compilation

Symbol	Meaning	Range or note
i	Organisation (unit of analysis in the proposed survey model)	–
j; k; d	Case (AGIS or KADGIS); competency index; outcome-dimension index	k = 1 to 8; d = 1 to 5
r _{jk}	Evidence-strength rating of competency k in case j (Instrument B)	0 to 3 (ordinal)
dir _{jd} ; str _{jd}	Outcome direction and evidence strength of dimension d in case j (Instrument A)	Direction –1, 0, +1 or not evidenced; strength 1 to 3 (ordinal)
DR, MC, EC, SP, SA	Digital resources; managerial competence; entrepreneurial competence; sponsorship, change and knowledge management; strategic alignment	Latent or composite scores in the survey model
DC, U, NB, I, G	Dynamic capabilities; use and user satisfaction; net benefits; institutional context; data governance and identity integration	Latent or composite scores in the survey model
Z	Controls: agency age, size and jurisdictional tier	–
$\alpha, \kappa, \gamma, \theta$	Regression or path coefficients	$\alpha_4 > 0$ (P4); $\kappa_2 > 0$ (P2); $\gamma_4 > 0$ (P3); $\gamma_5 > 0$ (P1); $\gamma_7 > 0$ (P7); $\alpha_1\gamma_2$ (P5)
u, e, v	Disturbance terms	–

MATERIALS AND METHOD

Research Design

The study is a theory-building article with an illustrative documentary case study. Conceptual development follows guidance for theory-building articles, which asks for explicit constructs, relationships, boundary conditions and a clear contribution (Jaakkola, 2020; Whetten, 1989). The empirical component adopts a comparative-case logic suited to showing how processes unfold in bounded institutional settings (Eisenhardt, 1989; Yin, 2018), but it is used to illustrate the framework and to show where

documentary evidence is thin. It does not test the propositions: two cases observed through documents of different kinds and periods cannot assess complementarity (P4), mediation (P5) or moderation (P7), and no statistical inference is attempted. Literature was sampled purposively following concept-centric review principles (Webster & Watson, 2002); we do not claim a PRISMA-style systematic review and use the PRISMA-guided corpus of Gouveia et al. (2024) only as indicative context. Figure 3 summarises the five stages and their quality safeguards.

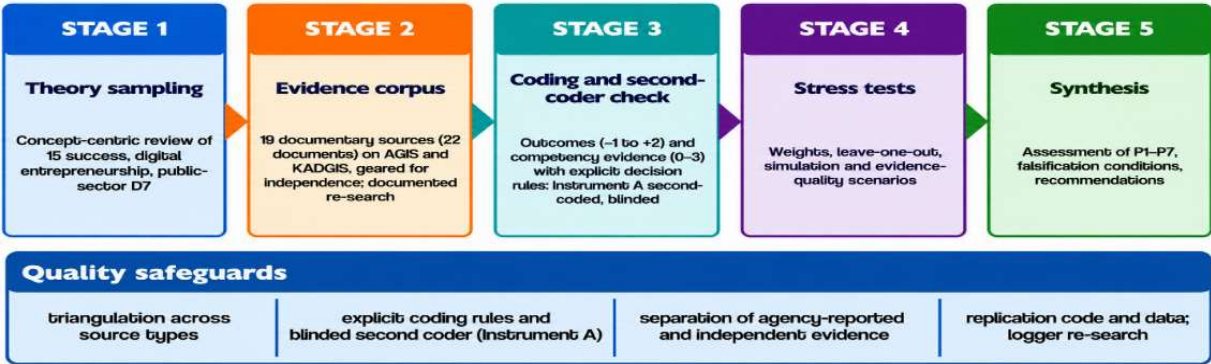


Figure 3: Research design and quality safeguards. Source: authors

Case Selection

AGIS and KADGIS were selected as a theoretically informative pair through purposive sampling. Both are public geographic-information agencies using GIS-based platforms to digitise land administration and link it to revenue, so their outputs are comparable. They differ in jurisdiction (a federal territory versus a state), age (AGIS was established in 2004; KADGIS by state law in force from 23 December 2015, replacing the state Ministry of Lands, Survey and Country Planning) and current policy standing (Kaduna was named a pilot state of the federal land titling programme in 2026). A further analytic link is that the governor who created KADGIS had, as Federal Capital Territory minister, established the first electronic land

registry in Abuja (Guardian Nigeria, n.d.a), which suggests possible model transfer between cases. The two jurisdictions are neighbours in north-central Nigeria, so the agencies operate in adjacent economic environments under different tiers of government (Figure 4).

The two cases are not independent in the replication-logic sense (Yin, 2018): the same political figure is linked to both, and model transfer is likely. The pair was also chosen for institutional contrast (tier of government, age, current policy standing) and not for variation in the competencies being studied. We therefore treat AGIS and KADGIS as a linked pair that illustrates the framework, not as literal or theoretical replications, and the consequences for inference is discussed in the discussion.

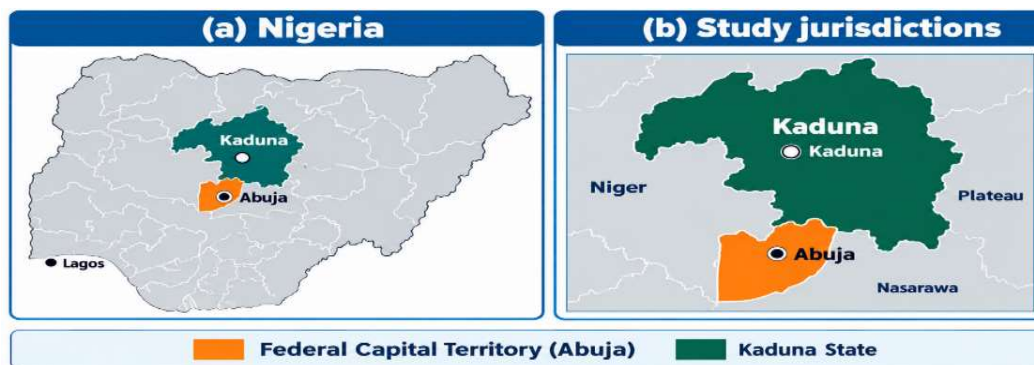


Figure 4: Locator map of the study jurisdictions: (a) Nigeria with the Federal Capital Territory Abuja and Kaduna State highlighted; (b) detail of the two jurisdictions. State boundaries: Natural Earth 1:10m administrative boundaries (public domain); city positions approximate. Source: authors' own map

Evidence Corpus

Evidence was gathered in two stages. The initial collection (September–October 2026) used structured web and repository searches of official agency and legislative sites, institutional repositories, conference proceedings and national press, using agency, platform and topic terms; its search strings and record counts were not logged. To make the selection reproducible and to test for missing independent evidence, we repeated and documented the searches on 19 October 2026. The documented re-search added two independent AGIS sources dated after 2015 (S18, S19) and found no further independent evaluation of KADGIS outcomes beyond S5 and S17. It also located legal

commentaries on the KADGIS Law (for example Kahuwai, 2025), which describe the statute and are not outcome evidence. Sources were included if they described an agency's mandate, systems or outcomes and were retrievable in full or abstract form. Agency-reported claims were retained but graded as such. Figure 5 summarises the search, screening and corpus-construction flow in a format adapted from PRISMA 2020 (Page et al., 2021); the format is borrowed for transparency only, because this is a documentary case comparison and not a systematic review. The Stage 2 searches returned 36 records, of which 30 were excluded and 2 new independent AGIS sources were added.

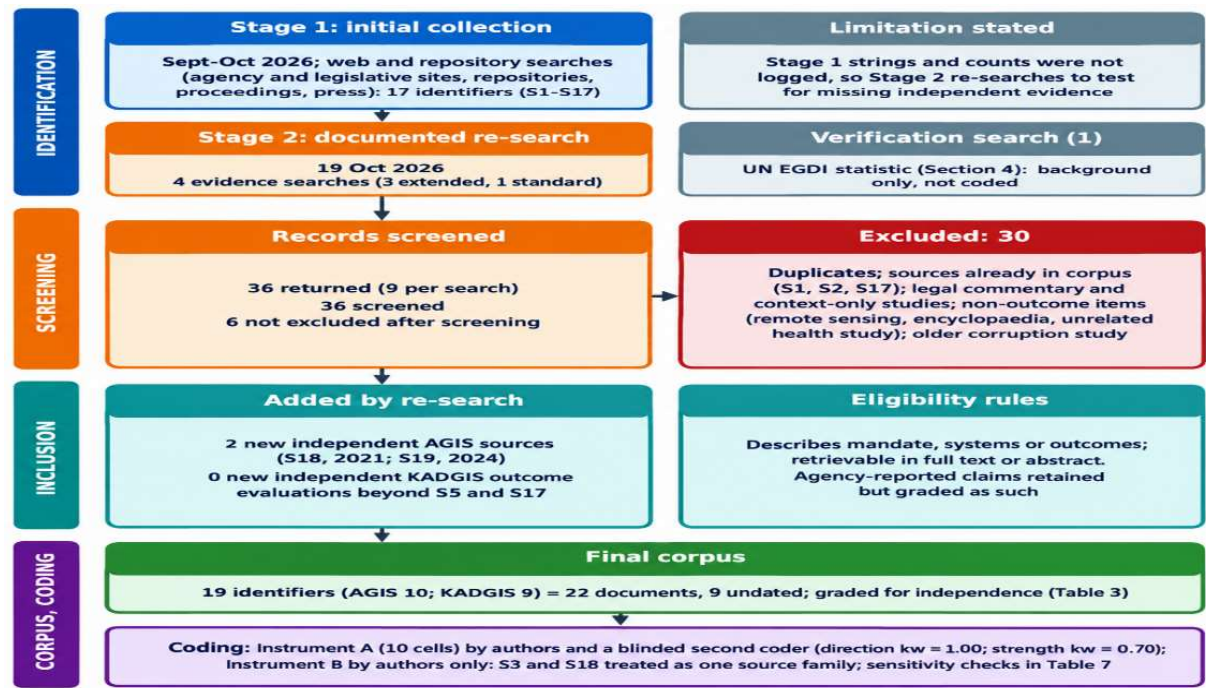


Figure 5: Evidence search, screening and corpus-construction flow for the AGIS and KADGIS case corpus (format adapted from PRISMA 2020, Page et al., 2021, for transparency only; the study is a documentary case comparison and not a systematic review)

The unit of evidence is the source identifier (S1–S19) in Table 3. Two identifiers bundle several documents (S13, two; S14, three), so the corpus comprises 22 documents, nine of which are undated (n.d.); we cite undated items by title and URL and treat them as lower-grade evidence. Counts and independence statistics in this article are by identifier. Table 3 grades each source for independence (the origin of the evidence) and adds a short quality appraisal (type, period and known limitations). S3, an undated thesis with no named author and unknown examination status, is graded “independent academic (unverified)”. Its findings parallel those of S18, a peer-reviewed article reporting 2019 field data, which may draw on overlapping fieldwork; we therefore count S3 and S18 as one source family when assigning evidence strength, and the result repeats the comparison without S3. S19 is

available to us at abstract level only and is used only as supporting evidence on service delivery. The corpus also spans different periods. Independent AGIS evidence now includes a survey with 2019 field data (S18) and a 2024 assessment (S19), alongside a 2012 dissertation, 2015 press reports of residents’ complaints and an undated thesis; the remaining AGIS items date from 2006 or are undated. KADGIS evidence runs from the 2015 law and independent studies of 2018 (S17) and 2023 (S5) to agency-reported outcomes of 2020–2026. We therefore treat the agencies as time-stamped episodes, a legacy AGIS episode (c. 2004–2015) with later independent checks (2019, 2024) and a current KADGIS episode (c. 2018–2026), and we do not claim that agency and period can be fully separated: we found no independent AGIS evidence for 2025–2026 and no independent KADGIS outcome evidence after 2023.

Table 3: Source Register for the Case Corpus: Independence Grading and Quality Appraisal. Docs = Number of Documents Behind Each Identifier (22 in Total). Source: Authors’ Own Compilation

ID	Source	Type	Case	Docs	Independence grade	Period; quality appraisal
S1	Akingbade (2012)	Doctoral dissertation	AGIS	1	Independent academic	2012; examined doctoral dissertation
S2	Adeoye (2006)	Conference abstract	AGIS	1	Practitioner account	2006; abstract cited (full text exists in the same proceedings)
S3	Ahmadu Bello University (n.d.)	Thesis (survey, n = 250)	AGIS	1	Independent academic (unverified)	Undated; author not named; examination status unknown; findings parallel S18
S4	Abdullahi (2020)	Agency presentation	KADGIS	1	Agency-reported	2020; promotional presentation
S5	Yusuf (2023)	Conference paper	KADGIS	1	Independent academic	2023; peer-review process not verified

S6	Voice of Nigeria (2026)	News report	KADGIS	1	Agency statements via media	2026; press relaying officials
S7	The Gazette NG (2026)	News report	KADGIS	1	Agency statements via media	2026; press relaying officials
S8	FCTA (n.d.)	Official description	AGIS	1	Agency-reported	Undated official web page
S9	Jibril (2006)	Agency presentation	AGIS	1	Agency-reported	2006; presentation by an agency official
S10	Daily Trust (n.d.)	News report	AGIS	1	Agency statements via media	Undated; press relaying the director
S11	Daily Trust (2015)	News report	AGIS	1	Press; resident complaints (independent)	2015; press reporting residents
S12	BusinessDay (n.d.)	News report and survey	AGIS	1	Press; mixed claims	Undated; survey method not stated
S13	Guardian Nigeria (n.d.a, n.d.b)	News reports	KADGIS	2	Press; official statements	Undated press
S14	Guardian Nigeria (n.d.c); Leadership (n.d.a, n.d.b)	News reports	KADGIS	3	Agency statements via media	Undated; press relaying officials
S15	allAfrica (2026)	News report	KADGIS	1	Official statements via media	2026; one deputy governor, one press item
S16	Kaduna State (2015)	Law No. 15 of 2015	KADGIS	1	Primary legal text	2015; statute
S17	Nwuba & Nuhu (2018)	Journal article	KADGIS	1	Independent academic	2018; peer-reviewed journal
S18	Oruonye et al. (2021)	Journal article (survey, n = 150; 7 interviews)	AGIS	1	Independent academic	2021; peer-reviewed; 2019 field data; findings parallel S3
S19	Babatunde (2024)	Journal article (questionnaire; staff interviews)	AGIS	1	Independent academic	2024; peer-reviewed; abstract-level evidence only

Coding and Analysis

Two ordinal instruments were applied. The decision rules were fixed before the coding reported here; because no registration or dated protocol exists, this cannot be independently verified. **Instrument A (outcomes)** scores two things separately for each of five dimensions: document security; fiscal capture; service speed; equity and affordability; and accountability and dispute handling. *Direction* is *-1 verified shortfall* (an independent source documents a shortfall), *0 mixed* (independent evidence of both improvement and shortfall), *+1 verified improvement* (an independent source documents an improvement) or *C claimed improvement* (a gain reported only by the agency or by media relaying it). Claims are recorded but not compared as outcomes: agencies can state gains without verification, whereas shortfalls surface only when someone independent looks, so treating the two alike would penalise agencies that have been evaluated more. A dimension that no document addresses is “not evidenced” and excluded, never scored as zero. *Evidence strength* is 1 (agency-origin only, always the case for C), 2 (one independent source; sources reporting the same fieldwork

count as one) or 3 (two or more independent sources). A strength of 2 requires a source that documents an outcome, so a statute providing a fee basis, or evidence on fee levels and affordability, is not evidence of a fiscal outcome (the latter counts toward equity). Legal mandate and process digitisation are inputs and outputs of reform and are not scored as outcomes, and each citation is used for one dimension only. Instrument B (competency evidence) rates the *strength of documentary evidence that each of eight competencies was exercised*: 0 (none); 1 (a single source or self-reported claim); 2 (consistent across at least two source types, or one independent source); 3 (multiple independent source types including one non-promotional). It rates evidence, not performance quality. A statutory mandate is an institutional endowment and not a competence, so it is context and not evidence of strategic vision; sponsorship is exercised by political principals, so it is rated as sponsorship in the agency’s authorising environment and marks the boundary between agency competence and political context. Table 4 gives the rules with corpus examples, and every code is traceable to a source in Table 3.

Table 4: Decision Rules and Corpus Examples for the Two Coding Instruments. Source: Authors’ Own Compilation

Instrument	Code	Rule	Example from the corpus
A, direction	-1	Verified shortfall: an independent source (academic evaluation, audit, primary legal text, or press reporting residents rather than officials) documents a shortfall	AGIS equity: fees unaffordable and unequal distribution unaddressed (S3; S18)
A, direction	0	Mixed: independent evidence of both improvement and shortfall	KADGIS service speed: titles in under six months, but congestion is the largest challenge (S5; S17)

A, direction	+1	Verified improvement: an independent source documents an improvement	No dimension in the present corpus
A, direction	C	Claimed improvement: reported only by the agency or by media relaying it; recorded but not compared as an outcome	KADGIS fiscal capture: new revenue lines without figures (S15; S4)
A, direction	Not evidenced	No document addresses the dimension; excluded, not scored	No dimension in the present coding
A, strength	1	Agency-origin evidence only (agency documents; press relaying officials)	KADGIS document security (S4; S14; S6)
A, strength	2	One independent source that documents an outcome (sources reporting the same fieldwork count as one)	AGIS equity (S3 and S18, one source family); KADGIS equity (S17)
A, strength	3	Two or more independent sources	AGIS service speed (S3; S11; S18); KADGIS service speed (S5; S17)
B	0	No evidence that the competency was exercised	None coded 0 in the corpus
B	1	Single source, or a self-reported claim	Resource mobilisation: bank interfaces (AGIS); federal programme (KADGIS)
B	2	Consistent across at least two source types, or one independent source	Knowledge management in both cases
B	3	Multiple independent source types, including at least one non-promotional	No competency meets this rule in either case

Two conventions apply. First, source type is judged by origin: agency documents and press relaying agency statements are agency-origin evidence, whereas academic evaluations, primary legal texts and press reporting residents’ own complaints are independent. Second, the shortfall rule is applied symmetrically to both agencies, including where independent evidence on KADGIS (S5, S17) predates the agency-reported gains of 2020–2026. Because the codes are ordinal and the cases are not a sample, we do not average them. Results are shown as code profiles and as rank-based comparisons under alternative readings of contested codes, and Instrument B ratings are summed within the five managerial and three entrepreneurial competencies and reported against their maxima (15 and 9).

The authors coded both instruments. For a reliability check, a second coder, blinded to agency names (Agency P and Agency Q) and working only from the decision rules and evidence summaries, coded the ten Instrument A cells. That coder’s +1 with strength 1 maps one-to-one onto C. Direction agreed in all ten cells (linear-weighted kappa and Gwet’s AC1 both 1.00) and strength in eight (80%; kappa 0.70; AC1 0.72; Cohen, 1968; Gwet, 2008; Krippendorff, 2018). Both disagreements concerned fiscal capture, where the second coder assigned 2 and the first coder 1 in each agency; we retained 1 under the rule above, because the only independent items touching fees (S16, a statute providing a fee basis; S18, on fee levels and affordability) do not document a revenue outcome, and Table 7 reports the alternative. The evidence summaries were prepared by the authors, so agreement concerns the application of the rules and not the retrieval of evidence, and with ten cells and one coder the statistics are

indicative only; two disagreements on one dimension point to a rule that needed clarifying. The study uses only public documents and involved no human participants, so formal ethical approval was not required; statements about named officials are limited to what the cited documents report and are worded neutrally.

Jurisdictional advantage is not coded separately: revenue security maps onto fiscal capture, rights protection onto document security and accountability, and legitimacy onto equity, speed and accountability. Selection for federal programmes is treated narratively, the attraction of investment is not observable in the corpus, and innovation is not measured as such; the corpus documents only new revenue lines, services and data products, which Instrument B treats as evidence of opportunity recognition.

Background: Nigeria’s Digital-Policy Setting
Connectivity, economy and e-government

This section is background for the reader. Its figures are not used in the coding in the results, and it contains no case evidence. Nigeria’s digital agenda is anchored in the National Digital Economy Policy and Strategy 2020–2030 (Federal Ministry of Communications and Digital Economy, 2019) and, for personal data, in the Nigeria Data Protection Act 2023 (Federal Republic of Nigeria, 2023). Internet users numbered 109 million at the end of 2025, a penetration of 45.5% (Kepios, 2026), and the government reports a rising but uncertainly measured digital-economy share of GDP against a 21% target for 2027 (allAfrica, 2025). Nigeria ranked 144th of 193 countries in the 2024 UN E-Government Development Index, with a value of 0.48 on the official country profile (UN DESA, 2024). The value has risen from 0.23 in 2003 while the global rank has barely

moved (145th in 2003 and 144th in 2024, after falling to 162nd in 2012), which is consistent with the argument that technical progress alone does not change a jurisdiction's comparative position.

Land governance setting

Land administration in Nigeria is shaped by the Land Use Act of 1978, which vests all land in each state in the governor, to be held in trust and administered for the common benefit of Nigerians, and which requires the governor's consent for the alienation of a statutory right of occupancy (Federal Republic of Nigeria, 1978). In the Federal Capital Territory the Minister exercises the corresponding executive authority on behalf of the President. Two consequences matter for this study. First, access to title is mediated by discretionary executive consent, so digitising registry processes does not by itself remove discretionary decision points; this is the institutional background to the discretion hypothesis. Second, AGIS and KADGIS operate within these arrangements, so a jurisdiction's advantage depends on executive decisions as well as on agency capability, which is a further reason why two cases cannot isolate agency-level competence. A cross-state survey that included Kaduna and the FCT likewise points to long registration

times and high costs of formalisation (Ghebru & Okumo, 2016).

The legal anchor: a bill, not yet an Act

The status of the omnibus digital-economy law is blurred in public reporting. Our verification found that it had not been enacted as at the date of checking. The measure began as a 2024 bill that passed first reading in July 2024 and was redrafted as the National Digital Economy and E-Governance Bill 2025. A joint public hearing in November 2025 predicted assent within weeks (NALTF, 2025); in June 2026 the Senate ICT committee chairman described the bill as in its final legislative stage (NALTF, 2026); and in July 2026 he said it would become law within weeks (ThisDay, 2026). A final check on 12 October 2026 located no report of presidential assent (Figure 6). The bill text assigns functions such as a national data exchange, digital-government infrastructure, digital maturity assessments, a national digital skills framework and ethical governance of artificial intelligence (National Assembly of Nigeria, 2025). We therefore treat the measure as *pending* legislation whose provisions are prospective, and the Nigeria Data Protection Act 2023 as the operative data-governance law.

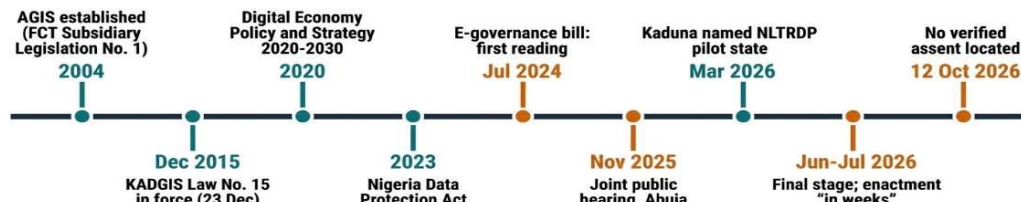


Figure 6: Institutional and legislative milestones relevant to public-sector MIS in Nigeria (teal: institutional and policy milestones; orange: passage of the national digital-economy and e-governance bill). Sources: FCTA (n.d.); Kaduna State (2015); Federal Ministry of Communications and Digital Economy (2019); Federal Republic of Nigeria (2023); NALTF (2025, 2026); allAfrica (2026); ThisDay (2026). Status last checked 12 October 2026

RESULTS AND DISCUSSION

AGIS: Mandate-Led Digitisation with Persistent Equity Shortfalls

AGIS emerged from a presidential directive to computerise land operations in the Federal Capital Territory after decades of manual record-keeping that had become slow and prone to abuse (Adeoye, 2006). It was established under FCT subsidiary legislation of 2004 as a centre of excellence for spatial data integration and computerised land administration, including the production of land titles (FCTA, n.d.). An agency presentation listed forged land documents, unauthorised bodies allocating land, land-use abuses and revenue generation among the problems the system addressed (Jibril, 2006), and an independent doctoral evaluation places AGIS within the wider trajectory of e-land administration in Africa (Akingbade, 2012).

Managerial evidence. Reports describe reforms led by the FCT minister that revived the statutory Land Use and Allocation Committee as the clearing house for land matters and improved coordination among planning, survey, land administration and AGIS departments (Daily Trust, n.d.). A press survey credited the system with reducing processing time and saving about N10 billion otherwise lost to racketeering and fraud, though not with reducing cost (BusinessDay, n.d.). Aligning departments around a single platform required inter-departmental coordination and sustained sponsorship, consistent with the logic of P1 and P2, but these statements come from officials or journalists quoting them.

Entrepreneurial evidence. The agency's director reported internally generated revenue above N1.5 billion per month, attributed to an application integrated with the land information system and with collecting banks' interfaces

so that revenue collection, file updates and auditing are automated (Daily Trust, n.d.). The FCTA also describes the AGIS Resource Centre as the official source of geospatial data for the territory, positioning the data as a product (FCTA, n.d.). Treating land information as a revenue-generating asset is the opportunity recognition that P3 describes. However, we found no independent verification of the revenue claims, and no source documents analytics products, property-market services or integrated taxation as realised results.

Counter-evidence. Independent material is less favourable. Residents complained of slow Certificate of Occupancy issuance (Daily Trust, 2015). A survey of 250 land applicants across seven districts found that AGIS had achieved only about 17% of good-governance criteria, did not address unequal land distribution, and operated within processes that took an inordinate time with fees many applicants considered unaffordable (Ahmadu Bello University, n.d.). A later peer-reviewed survey of 150 applicants and beneficiaries, with 2019 field data, reports a similar pattern: only about 37% of applicants were allocated land, about 79% found the process difficult or very difficult, forgeries and multiple allocations persisted, and 83 agency staff were dismissed for colluding in forged records; the same study concludes that AGIS had improved land administration from manual to computerised operation but had not incorporated good-governance norms (Oruonye et al., 2021). Its findings parallel those of the thesis and may draw on overlapping fieldwork, so we treat the two as one source family. A 2024 assessment of e-land administration in the FCT, available to us at abstract level, finds the agency's weaknesses to outweigh its strengths and concludes that it has not managed e-land administration effectively and efficiently (Babatunde, 2024). AGIS is thus documented as a case of technical and revenue-oriented delivery alongside weaker speed, equity, accountability and document security; this illustrates the pattern that P7 describes but does not test it.

KADGIS: Institutional Redesign and Agency-Reported Gains

KADGIS was established by Law No. 15 of 2015, in force from 23 December 2015, to replace the defunct Ministry of Lands, Survey and Country Planning and to computerise land records across the state. The law requires a database of all land with title history, location, size and use, permits access to land data for title searches at a prescribed fee, requires conformity with national geospatial standards and provides for approving and registering land vendors (Kaduna State, 2015). The agency consolidates geospatial data in a central database that produces maps, survey plans and certificates of occupancy, and reports improved document security that curtails land syndicates and forgery (Abdullahi, 2020). The governor signed the first

digital certificates and framed the agency as a contributor to internally generated revenue (Guardian Nigeria, n.d.a, n.d.b). The statutory provision for fee-based data access is a legal basis for the data-as-asset logic of P3, and redesigning structure and process, rather than merely automating them, can be read as institutional entrepreneurship (a conceptual reading, not a tested finding).

Managerial evidence. An independent evaluation using questionnaires and interviews found that title documents can be obtained in under six months, but that bureaucratic congestion remains the largest challenge (Yusuf, 2023). Recent accountability measures include mandatory agent registration with unique non-transferable codes, verification against national identity (NIN) and bank verification numbers (BVN), structured reconciliation before escalation to law enforcement, and reported resolution of over 5,000 land disputes together with the reinstatement of more than 150 revoked titles (Guardian Nigeria, n.d.c; Leadership, n.d.a, n.d.b; The Gazette NG, 2026; Voice of Nigeria, 2026). A town hall brought together professional bodies, traditional leaders, land agents and agencies (Leadership, n.d.a). These are agency statements conveyed by the media and have not been independently audited, but they show how digital identity infrastructure is used as a governance instrument (P6).

Entrepreneurial evidence. New revenue lines reported include sectional titling, shop registration and a farm lease programme, and more than 100 undocumented layouts are being regularised (allAfrica, 2026). In March 2026 Kaduna was named a pilot state of the federal Nigeria Land Titling, Registration and Documentation Programme, which the deputy governor attributed to the upgrade of KADGIS (allAfrica, 2026); we read the selection as a possible marker of jurisdictional advantage, although selection may also reflect political alignment or other factors and not agency performance alone. The agency's presentation also stresses property taxation (Abdullahi, 2020), but the corpus contains no revenue figures.

Counter-evidence. Independent work is more cautious than agency statements. A study of land registration in Kaduna reported a low level of registration and identified ignorance, affordability problems, inefficient processes, corruption and an inadequately skilled workforce as challenges (Nwuba & Nuhu, 2018). The agency reported reinstating more than 150 titles that it described as revoked under the previous administration and resolving a dispute that followed the 2021 demolition of over 200 properties (Leadership, n.d.a). We record these as reported episodes and draw no inference about the motives of any official or administration. They indicate that decisions on legitimacy and fairness remain with discretionary authority after a registry is digitised, which is consistent with the hypothesis that sponsorship can

accelerate reform and can also concentrate discretion; the corpus cannot test that hypothesis.

Cross-Case Comparison of Outcomes

Table 5 compares the cases on five outcome dimensions and gives direction and evidence strength separately. Legal mandate and process digitisation are not scored as outcomes. Both agencies hold a statutory or directive-based mandate and report digitised registries (Table 6: strategic vision and knowledge management), which are the technically visible parts of reform. Three dimensions have independent evidence in both cases (service speed, equity and accountability), and they form the basis of the comparison. On these, independent sources report shortfalls in both cases, except on service speed in

Kaduna, where independent evidence is mixed. Document security has a verified shortfall for AGIS (strength 2) but only an agency-claimed improvement for KADGIS (code C), so the two cannot be compared as outcomes: the KADGIS claim is untested, not verified. Fiscal capture is a claimed improvement in both cases, resting on agency statements without revenue figures, so neither agency can be said to have achieved a verified fiscal outcome. Independent AGIS evidence includes a survey with 2019 field data (S18) and a 2024 assessment (S19), whereas independent KADGIS evidence dates from 2018 and 2023; agency, period and source type nevertheless still differ together, so Table 5 compares documented evidence and not measured performance.

Table 5. Instrument A: Outcome Code and Evidence Strength (A = AGIS; K = KADGIS). Code: –1 Verified Shortfall; 0 Mixed Independent Evidence; C Claimed Improvement (Agency-Origin Evidence Only; Not Compared as an Outcome). Strength: 1 Agency-Origin Only; 2 One Independent Source; 3 Two or More Independent Sources. Legal Mandate and Process Digitisation Are Inputs or Outputs and Enter Instrument B Only. Source: Authors' Coding

Dimension	AGIS evidence	A: code / str.	KADGIS evidence	K: code / str.
Document security	Independent 2019 survey reports continuing forgery and multiple allocations and the dismissal of 83 staff for forging records (S18); earlier agency material reports anti-forgery as a design objective and fraud savings (S2, S9, S12)	–1 / 2	Improved security and curtailed forgery reported by the agency (S4); agent verification reported by media (S14, S6); all agency-origin	C / 1
Fiscal capture	Director's claim of over N1.5 billion monthly revenue (S10); unverified	C / 1	Property-tax orientation (S4); new revenue lines (S15); fee-based searches have a legal basis only (S16); no figures	C / 1
Service speed	Inordinate delay (S3); slow issuance complaints (S11); about 79% of surveyed applicants found acquisition difficult (S18); weak service-delivery efficiency (S19, abstract level); press report of faster-than-manual processing (S12, not independent)	–1 / 3	Titles in under six months, but bureaucratic congestion persists (S5); inefficient processes (S17)	0 / 3
Equity and affordability	Unequal distribution unaddressed; fees unaffordable to many (S3); about 37% of applicants allocated land and many used insiders (S18); S3 and S18 counted as one source family	–1 / 2	Affordability problems and low registration (S17; 2018, before most reported reforms)	–1 / 2
Accountability and disputes	About 17% of good-governance criteria achieved (S3); no publication of allocations or income, weak inter-departmental communication (S18); one source family	–1 / 2	Corruption reported as a challenge (S17); agent codes, reconciliation and 5,000+ disputes resolved are agency-reported (S14, S6) and not counted as independent	–1 / 2

	AGIS	KADGIS
Document security	−1 strength 2 · independent	C claimed strength 1 · agency-origin
Fiscal capture	C claimed strength 1 · agency-origin	C claimed strength 1 · agency-origin
Service speed	−1 strength 3 · independent	0 mixed strength 3 · independent
Equity and affordability	−1 strength 2 · independent	−1 strength 2 · independent
Accountability and dispute handling	−1 strength 2 · independent	−1 strength 2 · independent

Red: verified shortfall; grey: mixed independent evidence; pale blue: C claimed improvement (agency-origin only, not compared).
Strength: 1: agency-origin only; 2: one independent source; 3: two or more independent sources.

Figure 7. Outcome code and evidence strength for AGIS and KADGIS across the five dimensions of Table 5 (C = claimed improvement, not compared). Codes are interpretive and reflect the evidence available, not measured performance. Source: authors' coding of the documentary corpus (Table 3).

Competency Evidence and a Conjectural Workflow

Table 6 applies Instrument B. Ratings were checked against the written rule for a 3, which requires multiple independent source types including at least one non-promotional source. No competency meets that rule in either case: the evidence for executive sponsorship comes largely from press quoting officials and from agency material, and the new revenue lines at KADGIS rest on one deputy governor's statement (allAfrica, 2026) and an agency presentation, with no revenue figures. Executive sponsorship and opportunity recognition are therefore rated 2 in both cases. Statutory mandates are treated as context and not as evidence of competence, and sponsorship is rated as sponsorship in the agency's authorising environment, because it is exercised by political principals and not by agency managers. Change management and data governance are rated higher for KADGIS because of its stakeholder forums, agent accreditation and identity-linked workflows. Resource mobilisation and ecosystem openness are weakly evidenced in both cases: we found no documentation of

structured partnerships with start-ups, universities or civic-technology groups, nor of open-data policies. Because absence of documentation is not proof of absence, we treat this as an evidence gap and not as a finding about how Nigerian public systems are built.

To make complementarity (P4) observable in principle, we classify strategic vision, sponsorship, change management, knowledge management and data governance as managerial, and opportunity recognition, resource mobilisation and ecosystem orchestration as entrepreneurial (Table 6). The managerial rating sum is 8 of 15 for AGIS and 10 of 15 for KADGIS, a lead concentrated in change management and data governance; the entrepreneurial sum is 4 of 9 for both. Instrument B rates how well a competency is documented, not how well it was exercised, and newer, more publicised agencies tend to be better documented, so neither the sums nor their pattern can evidence complementarity. Other classifications, such as treating data governance as institutional, are defensible.

Table 6: Instrument B: Competency Evidence Matrix (Ratings 0–3) and Rationale. M = Managerial and E = Entrepreneurial Competency (Authors' Classification). Sums are reported against their Maxima. Source: Authors' Analysis of the Sources in Table 3

Competency	AGIS	KADGIS	Rationale for rating
Strategic vision and systems thinking [M]	2	2	Integrated registry, mapping and revenue systems, with bank collection interfaces at AGIS (S1, S8, S10) and a central database and digital certificates at KADGIS (S4, S13); statutory mandates are context, not evidence
Executive sponsorship, political principal [M]	2	2	Minister-led reform (AGIS); gubernatorial creation and sponsorship (KADGIS); mostly press quoting officials and agency material, so the rule for 3 is not met; the same political figure links the two cases
Change management and stakeholder engagement [M]	1	2	AGIS: committee revival but persistent complaints; KADGIS: town hall, agent accreditation, dispute resolution

Knowledge management and digitised records [M]	2	2	Computerised registries and digital certificates in both; limited evidence on institutional learning
Data governance, identity and security [M]	1	2	KADGIS links titles to NIN and BVN and accredits agents; AGIS evidence on controls is thin
Opportunity recognition (revenue and services) [E]	2	2	AGIS: automated revenue collection; KADGIS: sectional titling, shop registration, farm leases and layout regularisation reported in one press item and an agency presentation, fee-based data access in law, no revenue figures
Resource mobilisation and partnerships [E]	1	1	Bank interfaces (AGIS) and federal programme (KADGIS) only; no structured private or academic partnerships found
Ecosystem orchestration and openness [E]	1	1	Geodata served as a product (AGIS); no open-data or developer-ecosystem evidence in either case
Managerial sum (maximum 15)	8	10	
Entrepreneurial sum (maximum 9)	4	4	

Figure 8 is a conjectural, stylised land-administration workflow reconstructed from the sources: identity and agent registration (Leadership, n.d.a); application, due diligence and title registry (Kaduna State, 2015); a central parcel database (Abdullahi, 2020; Adeoye, 2006); automated payment through collecting-bank interfaces (Daily Trust, 2017.); and fee-based data services (FCTA, n.d.; Kaduna State, 2015). Documented managerial controls cluster at the front end (identification, agent accreditation) and at the registry (reconciliation), whereas documented entrepreneurial moves cluster at the back

end (revenue capture and data products). The delay marks (!) are the authors’ hypotheses and not findings: the independent sources on AGIS (an undated thesis) and Kaduna (a conference paper and a journal article) report slow processing, congestion, inefficient processes and fees in general terms and do not locate delay at specific workflow steps (Yusuf, 2023; Nwuba & Nuhu, 2018). Verifying where delay arises requires administrative process-time data. The figure is not an official process map.

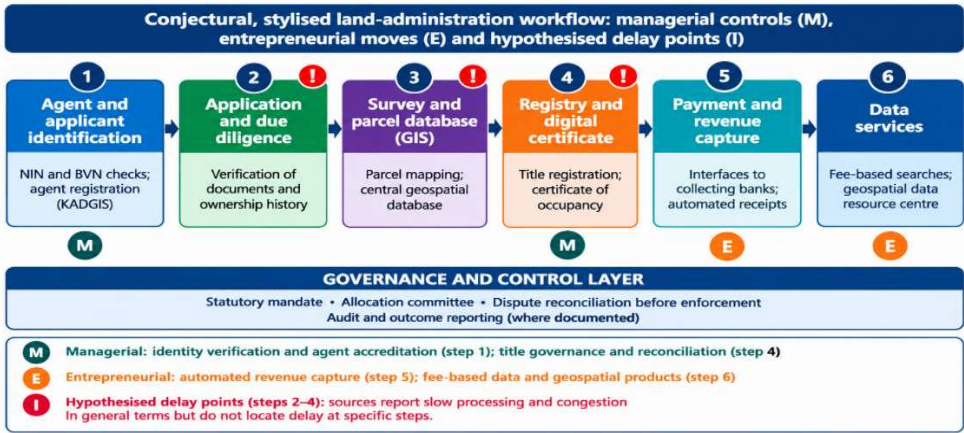


Figure 8: Conjectural, stylised land-administration workflow showing managerial controls (M), entrepreneurial moves (E) and hypothesised delay points (!). The delay points are the authors’ hypotheses; the cited sources do not locate delay at specific steps. Source: authors’ reconstruction from the sources cited in Competency evidence and a conjectural workflow

Rank-Based Comparison and Sensitivity of the Outcome Codes

Because the codes are ordinal and the cases are not a sample, we report no index values. Table 7 compares the cases dimension by dimension. The base reading uses only the three dimensions with verified evidence in both cases (service speed, equity, accountability); on these KADGIS is ahead on one (service speed), tied on two and behind on none. Crediting each agency’s own claims as

improvements would add document security and fiscal capture and put KADGIS ahead on two of five dimensions, but the document-security difference would then compare a KADGIS claim with an independently verified AGIS shortfall, which we regard as the least defensible reading. The base result is fragile. Reading the Kaduna speed evidence as a shortfall (two independent sources report congestion and inefficient processes), or crediting the press report of faster-than-manual processing at AGIS,

removes the difference altogether, whereas accepting the agency-reported accountability gains at KADGIS widens it. Dropping the undated thesis S3 changes nothing because S18 reports the same pattern; dropping both leaves only service speed comparable. Adopting the second coder’s strength of 2 for fiscal capture adds that dimension, on which the cases tie, so KADGIS is ahead on one of four. The

defensible reading is that KADGIS is somewhat better documented than AGIS, that its independently evidenced advantage is confined to service speed, and that a single contested code can reverse it. The more an agency has been independently studied, the more shortfalls are documented, so we make no claim of a performance difference between the agencies.

Table 7: Rank-Based Comparison of Outcome Codes under Alternative Readings. Counts Are Numbers of Dimensions; no Index Values are computed because the Codes Are Ordinal and the Cases are not a Sample. Source: Authors’ Calculations from Table 5 (Script Analysis.Py in the Replication Package)

Reading of the codes	No. compared	K ahead of A	Tied	K behind A
Base: dimensions with verified evidence in both cases (speed, equity, accountability)	3	1 (service speed)	2	0
Agency claims credited as +1 (all five dimensions)	5	2 (document security; service speed)	3	0
Claims credited, and KADGIS agency-reported accountability gains accepted (+1)	5	3 (document security; speed; accountability)	2	0
KADGIS speed read as a shortfall (–1)	3	0	3	0
AGIS speed read as mixed (0), crediting the press report of faster processing (S12)	3	0	3	0
S3 excluded (S18 retained): AGIS codes unchanged	3	1 (service speed)	2	0
S3 and S18 both excluded (AGIS speed rests on S11; other AGIS dimensions not evidenced)	1	1 (service speed)	0	0
Second coder’s strength codes adopted (fiscal capture verified in both cases)	4	1 (service speed)	3	0

Evidence Quality and Asymmetry

The central threat is evidence quality and period: KADGIS evidence is newer and mostly agency-reported, whereas AGIS evidence is older and more critical. The coding addresses this in part. Claimed gains are recorded separately and not compared, so the more heavily evaluated agency is not penalised for being evaluated; undocumented dimensions are excluded and never scored as zero; the shortfall rule is applied symmetrically (S5 and S17 are treated like the AGIS sources); and the base comparison uses only dimensions with independent evidence in both cases. These steps do not remove the asymmetry in time and source type: independent KADGIS evidence of 2018 and 2023 predates the agency-reported outcomes of 2020–2026, gains reported in 2026 cannot yet

have been independently evaluated, and independent AGIS evidence is at least two years old. The comparison is therefore indicative, and the replication package reproduces Table 7 and Figure 7.

Discussion

Assessment of the propositions

Table 8 reads the case evidence against each proposition on a three-level scale: “consistent with the evidence”, “cannot be assessed with this design” and “in tension with the evidence”. We use no stronger labels because two cases, observed in different periods through different kinds of sources, cannot establish causation and, for P1, P2, P4, P5 and P7, neither vary nor measure the factors the propositions involve.

Table 8: Assessment of Propositions against the Case Evidence. Source: Authors’ Analysis

No.	Evidence from AGIS and KADGIS	Assessment	Main caveat
P1	Integrated registry, mapping and revenue systems in both cases; alignment is not varied and no capability–benefit link is observed	Cannot be assessed with this design	Governance quality is not alignment; one outcome contrast cannot test moderation
P2	Sponsorship rated 2 in both cases, so it does not vary; AGIS has persistent complaints; KADGIS adds stakeholder forums and reports reinstating titles it described as revoked	Cannot be assessed with this design	Adoption and satisfaction are not measured; sponsorship may concentrate discretion (a hypothesis)
P3	Opportunity recognition documented in both: automated revenue collection (AGIS); fee-based data access, new revenue lines and federal pilot selection (KADGIS)	Consistent with the evidence (descriptive pattern only)	Revenue figures are agency claims; no verified fiscal outcomes
P4	KADGIS has the higher managerial evidence sum (10 versus 8 of 15) and ties on the entrepreneurial sum (4 versus 4 of 9); both instruments favour better-documented agencies	Cannot be assessed with this design	Complementarity needs variation in each competency independent of the other and a measured outcome
P5	Agent coding, identity verification and reconciliation added in sequence resemble sensing–seizing–transforming	Cannot be assessed with this design	Agency-reported; mediation needs measures of DC and NB across several agencies
P6	Identity-linked governance documented for KADGIS; thin evidence for AGIS; an independent study still reports corruption in Kaduna	Consistent with the evidence in one case (descriptive pattern only)	A necessary-condition claim needs several agencies; no independent audit of data security or privacy compliance

P7	AGIS technical delivery coexists with equity and affordability criticism; Kaduna registration is low; enabling law pending; neither case varies the national legal position	Cannot be assessed with this design	Context is confounded with agency age, tier and period
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Table 9 states what would count *against* each proposition and the data and test that would show it. Making disconfirming patterns explicit is what turns the framework from a plausible narrative into a theory that can fail (Whetten, 1989), and it sets out the survey-based programme that follows from Formal specification section.

Table 9: Falsification Conditions, What Would Count Against Each Proposition? Source: Authors' Own Analysis

No.	Pattern that would disconfirm the proposition	Data and test
P1	Capability–benefit link no stronger where strategic alignment is high ($\gamma_5 \leq 0$)	Survey of agencies; test γ_5 in Equation (3) with controls for age and size
P2	Adoption and satisfaction do not rise with sponsorship, change and knowledge management ($\kappa_2 \leq 0$), or fall when the sponsor leaves	Panel of agencies across leadership turnover; user-satisfaction and usage data; Equation (2)
P3	New revenue lines produce no verified fiscal gain in audited accounts ($\gamma_4 \leq 0$)	Audited internally generated revenue before and after launches; difference-in-differences; Equation (3)
P4	Agencies strong on both competencies do no better than those strong on one ($\alpha_4 \leq 0$)	Interaction term in Equation (1) estimated by PLS-SEM or CB-SEM
P5	Indirect effects of digital resources through dynamic capabilities include zero, with the direct effect dominating	Bootstrapped mediation from Equations (1) and (3)
P6	Agencies with weak identity and data governance achieve equally high net benefits, or governance excludes poorer applicants	Necessary-condition analysis of NB against G (Dul, 2016); compliance audits linked to registration, equity and complaint data
P7	No difference in the capability–benefit link across contexts ($\gamma_7 \leq 0$), including before and after enactment of the pending law	Multi-group comparison across jurisdictions; pre- and post-enactment waves; Equation (3)

The case evidence is consistent with two propositions as a descriptive pattern. For P3, opportunity recognition in both agencies is documented as revenue lines, fee-based data access and geodata products, but the corpus contains intent and agency assertions rather than verified fiscal outcomes, so it does not show that opportunity recognition raised measurable value. For P6, identity-linked governance is documented for KADGIS and thin for AGIS, but P6 states a necessary condition that can be assessed only across several agencies, and independent evidence still reports corruption in Kaduna. P1, P2, P4, P5 and P7 cannot be assessed. For P1, the evidence concerns governance quality, not strategic alignment, and one outcome contrast cannot test moderation. For P2, sponsorship does not vary between the cases. For P4, neither the rating sums nor the outcome codes can separate complementarity from generally better management or better documentation, and the instruments are not independent of publicity; we therefore do not describe P4 as supported, even weakly. For P7, both agencies operate under the same national legal position and differ in tier, age and period, so the moderator is not varied.

Three observations are offered as hypotheses for future work and not as findings. First, sponsorship is documented as the most consistent enabler and, because it depends on individuals, may be the least transferable; that the same political figure is linked to the first electronic land registry in Abuja and to KADGIS is consistent with models

travelling with sponsors, but one figure and two registries cannot show it. Second, documented entrepreneurial moves are revenue-led; an agenda driven mainly by internally generated revenue may under-invest in equity, but the corpus holds no equity evidence on KADGIS reforms and one thesis on AGIS. Third, the corpus contains no documentation of partnerships or open data in either agency. Because absence of documentation is not proof of absence, the evidence supports only the statement that such arrangements are undocumented in the sources reviewed; it does not show that public MIS in Nigeria are closed, agency-centred systems.

Alternative Explanations and Reverse Causality

The contrast between the agencies cannot be separated from several alternative explanations. (i) Period: AGIS evidence is mostly from 2006–2015, with later independent checks from 2019 and 2024, whereas KADGIS evidence is from 2018–2026. (ii) Setting: a federal capital territory differs from a state in resources, politics and land-market structure. (iii) Scale, land-market complexity, funding and staffing are not documented in the corpus. (iv) Promotional incentives: the 2026 claims come from agencies and officials with an interest in reporting success. (v) Selection as a federal pilot state may reflect lobbying or political alignment and not agency performance. (vi) Reverse causality: successful agencies may attract entrepreneurial leaders, so competence may follow performance. (vii) Model transfer: the same political

figure is linked to both agencies. (viii) Evaluation intensity: AGIS has been studied by more independent evaluators over a longer period, so more of its shortfalls are on record; the separation of claimed from verified outcomes limits but does not remove this. The design deals with these only in part. Scoring evidence strength separately and excluding undocumented dimensions limits the effect of (iv); presenting the agencies as time-stamped episodes makes (i) visible; and the other factors cannot be controlled with documentary evidence. Matched comparisons across agencies and periods, with primary and administrative data, are needed.

Contributions and Propositions for Future Work

The contribution of this article is primarily conceptual. It integrates IS-success, resource-based, dynamic-capability and digital-entrepreneurship perspectives in one chain with an explicit institutional layer (Figure 2), derives seven propositions with observable indicators, specifies one estimable model in which each proposition maps to a distinct term, and states falsification conditions (Table 9). Three refinements are proposed as propositions for future work, not as findings of the case analysis: the IS success model may need an explicit *agency* layer identifying who converts quality and use into net benefits; the resource-based view may need a public-sector reading in which rarity attaches to institutional legitimacy and data custody, so that competitive advantage becomes jurisdictional advantage; and dynamic-capabilities research may need to give more weight to *governing*, since in public organisations reconfiguration is constrained by procurement, audit and political cycles. Empirically, the article offers an illustrative evidence-graded comparison that separates direction from evidence strength and independent from agency-origin evidence; we did not find this practice in the African e-government studies we reviewed, although we did not conduct a systematic search. The observation that the national digital-economy and e-governance measure remained a bill on 12 October 2026 is dated and may be superseded before publication. Practically, the article reframes competitive advantage for public agencies as a jurisdictional outcome combining revenue security, rights protection and legitimacy.

Practical Implications and Relation to Prior Work

For managers, MIS programmes should budget for stakeholder engagement, identity and data governance, and benefit tracking at the outset and not as post-

implementation add-ons; this is a theory-based suggestion. For policymakers, enabling law is likely necessary but not sufficient. The pending national bill concerns a national data exchange, digital-government infrastructure and a digital skills framework, whereas both agencies operate under their own enabling legislation (AGIS subsidiary legislation, 2004; KADGIS Law No. 15 of 2015), so whether implementation capacity, and not only legal authority, constrains the wider reforms is a hypothesis for testing. Our findings align with a bibliometric review that identified strategic alignment, digital leadership and resource constraints as recurring themes (Gouveia et al., 2024) and with evidence that e-governance in Nigeria is impeded by limited ICT knowledge, insufficient legislation and inadequate infrastructure (Oghuvbu et al., 2022). Evidence on land registration suggests that outcomes depend on the governance environment and state capacity and that formalisation is not a panacea (Deininger & Feder, 2009), and fit-for-purpose approaches stress affordable, flexible and incremental design (Enemark et al., 2014). The access problems documented independently for both agencies (S3 and S18; S17) are consistent with these accounts, as is a cross-state finding that nearly 80% of beneficiaries reported registration taking more than two years (Ghebru & Okumo, 2016; pooled and not agency-specific, so not coded). Studies adapting the DeLone and McLean model to e-government examine system and service quality and satisfaction (Wang & Liao, 2008; Scott et al., 2016), and work on public-sector IT value proposes that organisational capabilities mediate between IT resources and public value (Pang et al., 2014), which is close to P5 but without a separate role for managerial and entrepreneurial competence; the agency layer proposed here remains to be tested. Prior independent evaluations of the two agencies (Akingbade, 2012; S3, S18 and S19 for AGIS; S5 and S17 for Kaduna) are in the corpus, and the documented re-search of 19 October 2026 located no others; it did find legal commentary on the KADGIS Law that describes the statute and notes that much remains to be done (Kahuwai, 2025).

Strategic Recommendations

Table 10 converts the analysis into six recommendations, each with actors, instruments, indicators and a horizon. R6 responds to the evidence-quality gap identified in results section.

Table 10: Recommendations, Responsible Actors, Instruments, Indicators and Horizons. Source: Authors’ Own Analysis

Recommendation	Primary actors	Key instruments	Indicators	Horizon
R1. Embed entrepreneurship in MIS curricula [Basis: theory and general policy; provisional]	Universities including NOUN-ACETEL; NUC	Opportunity recognition, business-model design and venture management; design-thinking studios;	Share of MIS programmes with applied venture modules; student projects adopted by agencies	1–3 yrs

		public-sector case clinics and capstones	
R2. Develop executive MIS leadership [Basis: theory and general policy; provisional]	Federal and state commissions; institutes	Cohort programmes on governance, change and strategy using Nigerian cases; certified chief digital officer track	Programme completions; project-governance maturity scores
R3. Establish public-sector MIS innovation hubs [Basis: theory and a documentation gap]	Federal and state governments; AGIS and KADGIS; universities; private sector	Open-data sandboxes with privacy safeguards; public-private partnerships; shared test environments	Agency problems piloted and scaled; start-up products using agency data
R4. Strengthen data governance [Basis: documented finding]	Data protection regulator; NITDA; MDAs; agencies	Compliance with the Nigeria Data Protection Act 2023; data inventories; interoperability standards; audit of identity-linked workflows; readiness for the pending law	Audit findings closed; data-quality indices; privacy complaints resolved
R5. Cultivate public-sector intrapreneurship [Basis: theory and general policy; provisional]	Head of Service; agency leaders; development partners	Innovation challenges, ring-fenced funding, secondments and career pathways, drawing on Estonia (Kattel & Mergel, 2019)	Internal proposals funded and scaled; MIS staff retention; service-time reductions
R6. Build outcome transparency [Basis: documented finding]	Agencies; independent evaluators	Publish service-time, fee and dispute statistics; commission independent audits and fee-affordability reviews	Share of outcome claims independently verified

Table 10 labels each recommendation by its basis: a *documented finding* (it follows from a finding in the corpus), *theory* (it follows from the framework) or *general policy* (a plausible suggestion without direct support in the corpus). R6 responds to the main limitation of the corpus, that outcome claims are rarely independently verified. R4 responds to thin evidence on controls at AGIS, agency-reported identity-linked workflows at KADGIS (data governance rated 1 and 2) and the absence of independent audits. R3 follows from the framework and from the absence of documented ecosystem links (Table 6), noting that absence of documentation is not proof of absence. R1, R2 and R5 are provisional hypotheses for piloting and evaluation: nothing in the corpus concerns training or skills at AGIS or KADGIS beyond a passing reference to an inadequately skilled workforce (Nwuba & Nuhu, 2018), and the discretion risk behind R2 and R5 rests on a small

number of reported episodes. Because the evidence is documentary and two cases cannot support causal inference, all six are proposals and not tested interventions.

Figure 9 illustrates the orchestration logic behind R3. In the current configuration, documented links run from the agency systems to banks, identity systems and the federal programme (solid lines), while links to universities, start-ups, civic-technology groups, citizen portals and private surveyors are not documented in our corpus (dotted lines; absence of documentation is not proof of absence). The proposed configuration treats the agency platform as an open, orchestrated hub in an ecosystem, consistent with the view of innovation as an ecosystem property (Mariani et al., 2023). Figure 10 sequences the six recommendations over five years.

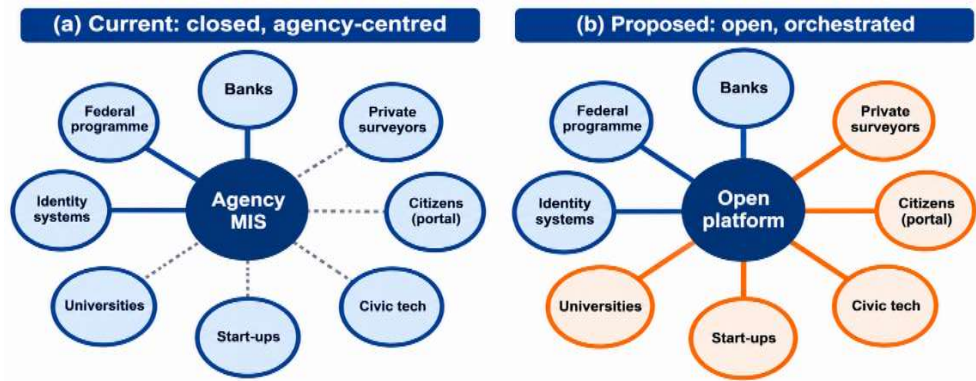


Figure 9: Ecosystem configuration of agency MIS: (a) documented links in the current corpus; (b) proposed open, orchestrated platform. Source: authors' own creation



Figure 10: Proposed phasing of recommendations R1–R6 over five years. Source: authors' own creation

Two principles run through the recommendations. Equity safeguards should accompany every revenue-oriented innovation, so that monetising public data does not entrench the exclusion documented at AGIS, and openness should be the default for non-personal data, so that the ecosystem benefits the literature associates with platforms (Gouveia et al., 2024; Yoo et al., 2010) can accrue to Nigerian agencies. International reference points, such as Estonia (Kattel & Mergel, 2019), can inform but not be transplanted wholesale.

Limitations and Future Research

This study has limitations that readers should keep in mind. The evidence is documentary and relatively small (19 identifiers and 22 documents, nine of them undated). The two cases are also documented differently: AGIS sources are older and more critical, while KADGIS sources are more recent and mostly agency-reported. This may affect the comparison in either direction, and separating claimed from verified outcomes reduces this difference but does not remove it. Coding involved interpretation. Only the ten Instrument A cells were second-coded, by one coder working from author-prepared summaries, and one contested code could change the comparison (Table 7). Instrument B reflects what agencies document, so it partly captures publicity and cannot show complementarity. The initial collection was not logged, so reproducibility rests on the documented re-search of 19 October 2026. Finally, two linked cases in one sector do not support causal inference or broad generalisation, and the framework still requires empirical testing.

Future work should (i) collect primary data: about 8–12 semi-structured interviews per agency (registry, survey, revenue and ICT staff, applicants and agents), agency process-time records by workflow step for a defined cohort of applications, and audited revenue and budget documents from audit offices and revenue services, all analysed with the same instruments so that documentary and primary evidence can be compared; (ii) extend second coding to Instrument B and to several coders, and use a dated, registered protocol; (iii) match time windows across agencies and add independent 2025–2026 evidence on

both; (iv) test P1–P5 and P7 with survey-based structural models across agencies and states, and test P6 with necessary-condition analysis; (v) compare land administration with health, tax and civil-registration systems; (vi) measure equity outcomes and digital-exclusion effects beyond revenue; (vii) examine how the pending legislation changes procurement, interoperability and data sharing once enacted; and (viii) study the personal costs of public-sector digital entrepreneurship (Nambisan & Baron, 2021).

CONCLUSION

This article proposed a framework in which managerial and entrepreneurial competence jointly convert MIS investment into public value, derived seven propositions with stated mechanisms and one formal model, and examined their plausibility with documentary evidence on two Nigerian land-information agencies. On Q1, the answer is conceptual; the illustration cannot show joint effects. On Q2, both agencies hold legal mandates and report digitised records; sponsorship, revenue-oriented opportunity recognition and, for KADGIS, identity-linked governance are best documented, while verified fiscal capture, equity and openness are weakly evidenced. KADGIS is better documented than AGIS, but on the three dimensions where both have independent evidence it is ahead on only one (service speed), which a single contested code can reverse and which rests on sources from different periods; its other apparent advantages are unverified agency claims. The evidence cannot test the propositions, including complementarity; it is consistent, as a descriptive pattern only, with opportunity recognition (P3) and identity-linked governance (P6). The national digital-economy and e-governance measure remained a bill at the time of review. On Q3, Six interventions of differing evidential basis: R4 and R6 follow from documented findings, and R1, R2, R3 and R5 from theory or general policy (R1, R2 and R5 as provisional hypotheses) are proposed.

The study is limited by its documentary evidence, by second coding that covered only the outcome instrument and by the absence of primary data, and the propositions

remain untested. Future work should test them with primary data, several independent coders and matched agencies and periods, and agencies should publish independently verifiable outcome data so that claims about public-value creation can be checked.

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