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From Digital Investment to Development Impact

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Abstract: Digital investment is easy to count. Systems launched, users registered, kilometres of fibre laid and services placed online all appear in progress reports. Whether people are better off is harder to establish, and the evidence needed to say so is rarely collected. This article asks how public bodies and nonprofit organisations in Kenya and elsewhere in Africa can monitor, evaluate and learn from digital transformation so that decisions follow evidence of development outcomes and not counts of outputs. It develops the Investment-to-Impact Learning Framework, which has five components: a results chain with a test at each link, a portfolio of indicators that draws together the governance, capability, infrastructure and assurance measures proposed in the earlier papers of this series, evaluation designs matched to the question being asked, a learning system with defined decision rights, and arrangements for data, ethics and accountability. The framework is built from a document analysis of international evaluation standards, African and Kenyan planning and evaluation instruments, and the research on evaluation of digital programmes. Four propositions are offered for empirical testing. The contribution is a way of organising evidence so that a programme can say, at each stage, what it knows, what it does not know, and what it will change.

Keywords: *Digital Transformation; Development Outcomes; Monitoring and Evaluation; Nonprofit Organisations; Public Sector; Results Chain; Sustainable Development.*

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I. INTRODUCTION

The report on the progress of the digital programme always looks good. The platform is active, the targeted number of users are signed up, training sessions have been conducted, and the budget has been expended. All the statements are true. However, none of them specifies whether a trader in Kakamega does not wait any longer for a license, whether a mother in Turkana gets to a clinic any quicker, or a graduate earns more than before.

This is because of the structure of the process. Inputs and outputs are managed by the implementer and documented through its own system. The success depends on how the output is used by people and on the factors that are outside the control of the implementer. Reporting systems designed for being accountable to the donors will normally track those factors that are measurable internally. [6], the measurement has different purposes including accountability and learning, and organisations try to combine them in one system and fail to achieve either.

The stakes have become higher due to digital spendings growing. Governments and funders now invest in identity systems, payment rails, cloud platforms, training programmes and AI tools, usually in combination. The four earlier papers in this series proposed governance of AI in public institutions, a capability pathway for young people, a placement and platform framework for public cloud, and an assurance and resilience framework. Each ends with propositions that need evidence to test, and each assumes that someone is collecting it. This paper addresses that assumption.

Its question is practical. How can a ministry, county or nonprofit ensure monitoring, evaluation and learning for a digital project so that it can demonstrate development impacts, discover failures and pivot? This paper argues for a framework designed to be used by the project manager and the commissioner of the evaluation.

The argument starts from the global perspective, moves through the continental perspective to the national perspective. Section 2 outlines international evaluation guidelines and evidence. Section 3 discusses Africa. Section 4 discusses

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Kenya. Section 5 presents the framework. Section 6 applies the framework to three examples from Kenya. Section 7 states the propositions, limitations and conclusions.

II. THE GLOBAL POSITION: STRONG INDICATORS OF SUPPLY, WEAK EVIDENCE OF EFFECT

- *Digital Government Indices in International Organizations Evaluate the Supply*

[22] E-Government Survey rates countries for e-services, telecommunication infrastructure, and human capacity. The GovTech Maturity Index by the World Bank [4] evaluates the maturity of digital government. Both are useful for comparing capacity. Neither tells a country whether its citizens gained time, income or access as a result of the capacity it built.

The research literature on the value of digital government is cautious on the same point. [21], reviewing the public value of e-government, identify value of several kinds in the literature, among them better public services, administrative efficiency and open government, and observe that demonstrated value is less well documented than potential value. In their account the claims are plausible and the measurement is uneven. The best evidence on the effects of digital public infrastructure comes from a few national case studies, namely India [1], and [5] question whether the advantages are because of the digital public infrastructure itself or due to the surrounding institutional framework.

Criteria of evaluation provide us with the language for asking better questions. [16], there are six criteria now: relevance, coherence, effectiveness, efficiency, impact and sustainability. Coherence is the criterion that was added recently and measures how well an intervention aligns with other policy programs. That is a pertinent question for digital work, where a platform built by one agency often duplicates or conflicts with another's. The criteria are a spine for the questions in this paper and not a method.

Choice of method matters because the evidence base on what works is context-dependent. [23] assembles results from many impact evaluations and finds that effects vary a great deal across settings, so that a result from one place predicts little about another. [3] makes a related argument about randomised trials: they establish what happened in a trial and need further reasoning to say what would happen elsewhere. For digital programmes the implication is that evidence from a foreign deployment of a platform is a hypothesis for Kenya and not a finding.

Where experiments are impractical, as they are for a national system, other designs are available. [12] revisits contribution analysis, which builds a causal account of how an intervention contributed to change and tests the account against evidence and rival explanations. [17] argue that programmes working in complex settings need monitoring, evaluation and learning arranged around adaptive management, with frequent evidence and permission to change course, and they call the discipline needed to do this adaptive rigour.

[24] World Development Report on data makes the enabling point. Data create value for development when they are generated, shared and used under rules people trust, and low-income countries often lack the administrative systems, such as complete civil registration, that evaluation would draw on. Measurement of digital programmes is therefore limited by the quality of the data infrastructure that those programmes are themselves meant to improve.

- *The African Position: Donor-Shaped Measurement, Limited Evaluation Capacity*

Digital programmes in Africa are often funded by external partners and monitored against the funder's results framework. Reporting runs upward to the funder, and in-country decision-makers often see the data late, if at all. A programme with three funders may report against three sets of indicators with different definitions, and staff time spent on reporting competes with time spent on learning. [6] refers to this phenomenon as a consistent challenge in non-profit accountability whereby there is an increase in the obligation to report but very little utilization of the reports.

[2] call for evaluation models that are based on the African knowledge systems and values, and they criticize frameworks of evaluation that borrow the design and the measures from elsewhere without questioning whose definition of success it is. In the context of the current program, this means that a metric of empowerment or trust that is relevant in one context may be inappropriate in another one, and the beneficiaries must be involved in defining what success means.

[10], the share of internet users in Africa is about 35% of the population, and according to [7], more than 50% of the regional population living in areas covered by mobile broadband do not use it. A programme that reports coverage or registered users records a number that overstates reach by a wide margin. It must measure use, and it must say who is missing.

The evidence that does exist shows that digital access can change outcomes when conditions allow. [9] used the staggered arrival of fast internet to show effects on employment across African countries. [20] found that digital loans in Kenya made households more resilient to shocks. Both studies exploit a feature that digital programmes often have, which is phased rollout, and both required data that a programme can plan to collect from the start. Few digital programmes in Africa are designed to be evaluated this way. The common pattern is a pilot, a launch, a donor review and then a new pilot.

Evaluation capacity is growing. Peer-learning partnerships among African governments, such as Twende Mbele, and professional associations have built skills in national evaluation. Capacity within implementing agencies for the data work that evaluation needs, especially for analysis of administrative and system data, is thinner, and

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independence is hard to secure where the evaluator is paid by the party being evaluated.

- *Kenya: a Developed System on Paper and a Gap in Digital Outcomes*

Results framework in Kenya has been developed in a hierarchy form. National Integrated Monitoring and Evaluation System determines frameworks at the national level, whereas County Integrated Monitoring and Evaluation System implements these arrangements across the 47 counties. Kenya Evaluation Guidelines [15] define the requirements for the process of evaluation development and the Fourth Medium Term Plan 2023-2027 [19] states the strategic areas for national development according to the Bottom-Up Economic Transformation Agenda including the digital superhighway and creative economy among other areas.

Kenya National Digital Master Plan 2022-2032 [13] defines the strategic objectives under pillars of infrastructure, services and data management, skills and enterprises. To the author's knowledge, public reporting on digital programmes concentrates on inputs and outputs: investment made, infrastructure built, services placed online, people trained or registered. Reports that follow users through to changes in time, cost, income or access are rare. A reader of the public record can learn that a service is online and often cannot learn whether it is used by the people it was meant for.

Three features of the Kenyan setting shape the design of a framework. The first is devolution. Counties run their own programmes, collect their own data and report to their own assemblies, so a national digital programme is in practice dozens of local ones, and that variation is both a difficulty and an opportunity. Phased county launches create the staggered rollouts from which causal evidence can be built. The second is the Data Protection Act of 2019, which governs the personal data an evaluation uses and requires a lawful basis and data minimisation. Thirdly, the dependency of the nonprofit sector on a few external funders is an important characteristic. Sudden shifts in donor funding in 2025 revealed the rapidity with which programs may lose their funding; organizations with learning systems in place were in a position to determine what needed protection more easily than those with reports.

Existing instruments provide hooks. The Auditor-General can examine performance as well as financial regularity, and the first paper in this series proposed registers and named owners that give evaluators something to start from. The fourth paper proposed resilience metrics and a record of finding closure. Those instruments produce data, and a results framework has to use it.

III. THE INVESTMENT-TO-IMPACT LEARNING FRAMEWORK

The framework has five components. The first organises the questions. The second decides what is measured. The third matches method to question. The fourth turns evidence into decisions, and the fifth sets the rules under which data are collected and used.

- *The Results Chain and its Tests*

A results chain for a digital programme has five links, and the framework adds a sixth monitored across all of them. At each link there is a question and a common point of failure. Table 1 sets them out.

Table 1 The Results Chain for Digital Programmes: Questions, Indicators and Typical Breaks

Link in the chain	Core question	Example indicators	Typical break	Principal data
1. Investment to system	Was the system delivered to specification, on time and within budget?	Milestones met; cost variance; uptime against objective	Delay and scope change	Project and finance records; system logs
2. System to adoption	Do the intended users use it?	Active users by sex, age and county; share of transactions completed digitally	Built but not used	System logs; user survey
3. Adoption to service improvement	Is the service faster, cheaper or more accurate than before?	Time to complete a service; cost to the user; error and complaint rates	Used but not improved, as when a poor process is digitised unchanged	Logs; user survey; audit samples
4. Improvement to reach and inclusion	Who benefits and who is left out?	Completion gaps by group; share completed through non-app channels; rejection rates	Improved, but not for those who most need it	Disaggregated logs; household survey
5. Reach to development outcome	Did incomes, health, learning or participation change?	Earnings stability; access to care; time saved; trust in the service	Reached, but conditions outside the system blocked change	Panel survey; comparison group
6. Harm and risk (monitored at every link)	Did anyone lose out?	Wrongful exclusions; privacy breaches; appeals upheld; service outages	Harms that nobody was assigned to measure	Complaints; audit; Data Commissioner records

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The table treats failure as informative. Programmes tend to fail at identifiable links. A system that is built and not used fails at link 2, and the remedy is about design, outreach or trust. A service that is used and no better than before fails at link 3, and the remedy is to redesign the process behind the screen. A service that improves and leaves out the poorest fails at link 4, and the remedy is to add channels and fix identity fallbacks, as the third paper proposed. A programme that reaches people and changes nothing fails at link 5, which usually means that the barriers lie elsewhere. The second paper's conversion factors for young people's livelihoods are an example. Knowing which link broke tells the manager what to change.

The sixth line deserves emphasis. Harm is measured at every link and by someone with that assignment. [11] show that digital identity can exclude those with the least recourse, and [8] names the broader pattern of adverse digital incorporation, in which people are included on terms that mainly benefit others. A results framework that tracks only gains will not see either.

➢ *A Portfolio of Indicators*

The framework proposes a compact portfolio and not a long list. Each programme selects indicators from five groups, always including at least one from the group for harm and inclusion. The groups follow the series.

Governance and AI use (first paper): the share of Tier 3 AI systems with a completed impact assessment and a named accountable officer, and the reversal rate of automated decisions on appeal. Capability and livelihood (second paper): assessed skill attainment, and the stability of earnings 12 months after training, following the sustainable livelihoods outcomes in [14]. Platform and infrastructure (third paper): service uptime against its objective, share of services using the shared identity and payment blocks, and completion gaps between users of app and non-app channels. Assurance and resilience (fourth paper): proportion of critical services with a restoration test in the past year, and the on-time closure rate of severe audit findings. Development Outcomes and Trust: Time and Cost to the User, as well as a repeat of the question of whether users trust the service.

Each indicator will have the following information included about it: Definition, Source of Data, Frequency, Owner, and Disaggregation Method. Standard disaggregation by gender, age, county, disability, and language is required, as the average may improve while the particular group is doing worse. The framework guarantees that each programme will have no more than twelve indicators, so that the process of reporting would not be too hard to hinder the actual process. And if the funding organisation wants more, it has to pay for it.

Common Core is what makes the process difficult and what makes it worthwhile. If a number of funding organisations and agencies use the same definitions for core indicators, a nonprofit will be able to report once to all of them, and a county will be able to benchmark itself against other counties. This is the one concession that a funder can make to learning which pays back most of all.

➢ *Evaluation Designs Matched to Questions*

No method suits every question. Table 2 pairs common questions with designs and the conditions each needs.

Table 2 Evaluation Designs by Question

Evaluation question	Design	Conditions	Kenyan illustration
Is the service working as designed this month?	Routine monitoring with dashboards and sampled verification	System logs available	Queue times and completion rates on a county licensing platform
Does design A work better than design B?	Rapid-cycle test, randomised at the level of the user where risk is low	Easy to randomise; short feedback loop	Kiswahili against English instructions on a payment screen
Did the rollout change outcomes?	Staggered rollout with difference-in-differences or event study; matched comparison where phasing was not random	Phased launch by county or site; baseline data collected before launch	County-by-county launch of a shared revenue platform
Did a national system contribute to change that many factors affect?	Contribution analysis or process tracing (Mayne, 2019)	No credible comparison group	A national payments or identity platform
Why did it work in one place and not another?	Comparative case study with realist questions	Variation across sites using the same system	Two counties on the same platform with different adoption
Was it worth the cost?	Cost per beneficiary and cost-effectiveness against alternatives	Cost data tracked from the first month	Digital training against direct provision of the same service

Two points of design follow. First, the framework asks programmes to plan for evaluation before launch. Phased rollout by county or site, with baseline data, gives the cheapest credible comparison and costs almost nothing if arranged in advance and a great deal if attempted afterwards. The studies by [9] and by [20] rest on that kind of variation, which in their cases was found. In a programme it can be arranged. Second, a national system with no comparison group is not exempt from evidence. Contribution analysis [12] requires the evaluator to state how the system is thought to have produced

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change, to gather evidence at each step and to test competing explanations. It gives less certainty than a trial and much more than a list of outputs.

Cost needs its own attention. Many digital programmes cannot say what a completed transaction, a trained and placed graduate or a restored service costs, because costs are recorded by budget line and not by result. The framework asks for cost data to be tracked from the first month so that cost-effectiveness against alternatives can be examined, including the alternative of improving the non-digital process.

- *A Learning System with Decision Rights*

Evidence changes nothing unless someone is entitled to act on it. The framework therefore defines the learning system as a set of routines and rights. Each programme states a learning agenda of five or fewer questions at launch, such as "why do women complete the service less often?". A quarterly review looks at the indicators for the chain links that matter now. Incidents and failed launches are followed by a short after-action review that records what happened and what changed.

Adaptation triggers turn an indicator into a decision. A programme might agree in advance that if completion among women is below 80 per cent of the rate for men after six months, the team will test a redesign, or that if a restore test fails the service moves to a higher assurance tier. The threshold is a proposal for the programme to set. The principle is that the response to a bad number is agreed before the number appears. [17] make a similar case for explicit decision points in adaptive programmes.

Decision rights complete the system. The programme manager can change design within the approved scope. The steering group, with county or beneficiary participation, can approve bigger changes, stop a rollout, or terminate a component. [6] warns that the need to report to the funder and learn within the organization are in tension, as reporting will be rewarded by success, but learning will require honesty about failures. The framework keeps these apart: a report for accountability, and a learning review whose notes are not used to inform performance evaluations. Negative evaluation results are made public, and a log is kept of what has been tried and what has failed.

- *Data, Ethics and Accountability*

Evaluation utilizes personal information and must adhere to the same principles as services. According to the Data Protection Act, any evaluation must have a legal basis and should collect only what is required by the particular inquiry while utilizing aggregate or anonymous data where possible. In the surveys, there is an informed consent process; and where the findings apply to a small number of people, then such individuals cannot be identified. Agency-to-agency data sharing for evaluations adheres to the purpose-limited exchange model suggested in Paper 3.

Independence is arranged by design. An evaluation of a system should not be written solely by its builder, and the framework asks for an independent evaluator, drawn from a university, a research institution or an evaluation unit, for any programme above a funding threshold set by the commissioning body. Citizen feedback channels, such as the complaints and counter services discussed in the third paper, are treated as a data source and are analysed by sex, county and service. Findings return to the people the data came from, in plain language and in Kiswahili and local languages where the programme uses them.

Public bodies and nonprofits differ in their upward accountability, to Parliament and county assemblies in one case and to boards and funders in the other. They share the downward accountability to the people served. The framework uses one results framework and many reports, so that an organisation reports different aggregations of the same indicators and does not maintain parallel data systems.

- *Application to Kenyan Scenarios*

The following three stylized cases demonstrate the workings of the framework. They have been constructed for illustration purposes and are not meant to be descriptive of any known institutions.

County A establishes an online system for the issuance of business licenses. In the first report on progress towards achieving the objective, the county reports that 60 per cent of the licenses were issued online during the first quarter. If applied to this case, the chain would establish that the aforementioned number is at the level of link 2. It does not say anything about link 3, that is, whether the time for issuing the license was reduced, or link 4, which would ask whether those small traders who lacked access to smartphones had to pay an agent to get the job done.

The non-governmental organization operates a learning platform for youth using a donor's logframe. The logframe includes enrolment as its performance indicator. The logframe introduces completion, skills assessment and earnings stability after 12 months of use based on the capability stack described in the second paper. Quarterly assessment reveals that completion rates are very low for youth in two counties with low connectivity levels. An adaptation trigger agreed upon at launch includes moving some of the learning materials into a phone delivery format using the low bandwidth in Kiswahili.

National payments-linked cash transfer involves a single identity framework. This is because the intervention is national, and there is no possibility for comparison groups. In the framework, the key methodology is contribution analysis with a clear explanation of how identity verification and payments will prevent fraud and delay. The account will be evaluated through logs, audits and surveys. The framework will measure all forms of harm through wrongful exclusions, appeals granted and the number of people who were not able to receive payments without help. An increase in exclusions of individuals without documents will initiate evaluation of contingency plan.

In each case the framework substitutes description of what was done with an explanation of what happened to people.

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IV. PROPOSITIONS, LIMITATIONS AND CONCLUSION

➢ *Propositions for Empirical Testing*

The framework implies relationships that can be tested with programme records, evaluation reports and funder data.

- *P1.* Programmes that monitor adoption, service improvement and reach, as well as inputs and outputs, will detect implementation failures earlier than programmes that monitor inputs and outputs alone.
- *P2.* Digital programmes designed with phased rollout and baseline data will produce credible effect estimates at lower cost per estimate than programmes evaluated retrospectively, and few programmes will have such data unless it is required at design.
- *P3.* Programmes with adaptation triggers and defined decision rights will make more design changes in their first 18 months, and will show smaller adoption gaps for under-served groups, than programmes with annual review alone.
- *P4.* Grantees whose funders accept a common core of indicators will report fewer staff hours on reporting per grant, without a decline in data quality as judged by independent verification.

A first test could use programmes of similar type across several counties or several grantees of one funder, comparing those that adopt the framework's routines with those that continue under current practice.

➢ *Limitations*

This is a conceptual and documentary paper. The model has not been tested and the claims made about practice in Kenya are based on policies, guidelines and secondary sources rather than interviews with programme managers or evaluation reports. The scenarios have been invented. The results chain is an oversimplification, since real programmes cycle, omit links and interact, and a linear process might imply a greater degree of control than is really there. The 80% threshold and the dozen indicator rule of thumb are illustrative and should be calibrated.

Three further limits deserve mention. Evaluation costs money and attention, and small programmes may not be able to afford independent evaluation without shared services of the kind proposed for assurance in the fourth paper. Measurement can distort what it measures, since people manage to the indicator once it becomes a target. And evidence only informs decisions made by people with other pressures. A framework that produces uncomfortable findings needs a political and organisational setting in which they can be heard, and a framework cannot supply one.

➢ *Conclusion*

Digital investment in Kenya and across Africa is large and growing, and its returns are mostly assumed. The framework in this article asks programmes to test the assumption at each link between an investment and a change in people's lives, to measure harm alongside gain, to choose methods that fit the question and to decide in advance what they will do with the answer. It treats a failure found at link 2 as a success of the monitoring system, since it can be repaired.

The five papers in this series share one move. The first asked of an AI system not whether it is accurate but who answers for it. The second asked of a training programme not how many enrolled but whether livelihoods held. The third asked of a platform not whether it is hosted but whether it can be relied on and reached. The fourth asked of an audit not whether controls exist but whether services survive. This paper asks the same of the whole programme: not whether it was delivered, but what changed. Kenya has the planning instruments, the legal base and the phased delivery that make the question answerable. The remaining requirement is to collect the evidence and to act on it.

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