Completion Assessment Executive Summary

IDinsight - Nano Information Systems
December 2021

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Investee	IDinsight
Main implementation country	Zambia
Additional implementation countries	N/A
Funding amount agreed	US$230,000
Funding amount disbursed	US$230,000
Co-funding	None
Investment Date	October 2018
Expected PYI at year 10 (ex-ante)	Not scored

GIF provided IDinsight a grant of USD 230,000 to create a functioning Nano IS system, an 'agile' approach to building information systems, for one chiefdom in Zambia. Following completion of the pilot, GIF decided against follow on funding. The pilot achieved the core objective of the grant – to develop and demonstrate Nano IS in one chiefdom. It produced actionable information and was used by the chiefdom to secure funding for local development projects. However, it has not been maintained, and there is no evidence of replication or scaleup. Nevertheless, the pilot produced valuable learnings on data collection systems and contributed to a shift in IDinsght's thinking on support systems for frontline workers.

Innovation

Envisaged as a decision-support system for frontline officials to improve the quality of execution of government services, IDinsight's Nano Information Systems (Nano IS) was a 'process innovation' to change how information systems are built by using fast, cheap, and flexible design and concentrating on a limited number of priority outcomes. It represents the application of the problem-driven iterative adaptation (PDIA) approach to developing management information systems. This 'agile' approach to building information systems focused on providing data as decision-support to directly improve *the quality of execution*, as opposed to large, top-down information systems designed to help higher-level officials *monitor execution.*

The premise was that a cheap, fast, and flexible decision support system could lead to social impact through improved decision-making and increased state capacity by interested public officials across sectors and by monitoring support service providers (Figure 1).

Figure 1: Nano IS Theory of Change
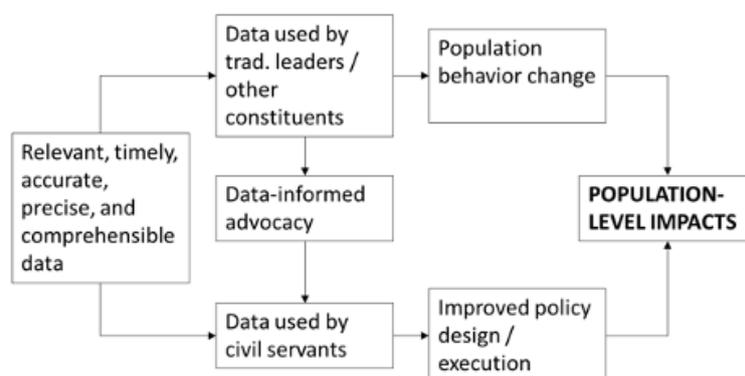
Nano IS was one of the first process innovations supported by GIF where the end goal and the stakeholders were well defined but the process to the goal was left to unfold in an iterative path. This route to success included a consultative process that entailed identifying felt needs of frontline officials and determining the least burdensome, most credible way of capturing that information. On the technical front, this entailed creating collection, storage and visualization components that could be quickly and cheaply deployed in other settings. The pilot was designed to provide information and learnings to inform on the potential to scale.

Goal of investment

The overall goal of the grant was to "develop and demonstrate a functioning Nano IS for one chiefdom in Zambia that is ready to be replicated elsewhere, generate evidence and learning to inform the scalability of the Nano IS approach in other sectors and geographies, and make efforts to integrate Nano IS into IDinsight's data-based decision making solutions."

To achieve the stated goal, the pilot had three specific objectives:

1. Develop a fully functioning Nano IS in accordance with a chief's needs to improve public service delivery and demonstrate it successfully in that Chiefdom.
2. Generate and make available evidence and learning to scale the Nano IS and enable third-party replication.
3. Adoption and advocacy of Nano IS.

Type of investment

GIF provided IDinsight a grant of US$ 230,000.

Implementation

The chosen focus for demonstration was the Chiefdoms of Zambia. Zambia's 287 Chiefs are traditional community leaders, who are supported by the Ministry of Chiefs and Traditional Affairs. During diligence GIF considered whether to pilot Nano with traditional leaders rather than the civil service. At issue was whether the pilot, focused on supporting a high-level leader with a snapshot of conditions in the chiefdom, was a good test of a system aimed at helping frontline civil servants improve quality of execution. The team decided to focus the pilot on traditional leaders because of their enthusiasm for IS services, absence of legacy IS-related demands, and unique influence over both community behaviour and administrative action. During a diligence trip to Zambia, the deal team found that Chiefs can be powerful drivers of change for instance in ending child marriage, reducing open defecation, and boosting student attendance,

Although the proposal submitted by IDinsight clearly fit the profile of a 'pilot' investment, the initial requested budget of $770,000 exceeded GIF's existing cap for pilot investments more than three-fold. Consequently, GIF and IDinsight agreed to reduce the scope of activities, and pilot the Nano IS approach in one Zambian chiefdom, instead of three, as initially envisaged.

The Nano IS pilot was implemented between October 2018 and December 2019 with an initial completion schedule of seven months. The delays in implementation were primarily due to challenges in starting the pilot and organising the data collection process, in particular obtaining the necessary approvals from the Ministry of Chiefs and Traditional Affairs and the IRB.

Results

Key Performance Indicator	Detailed description	Status
Chiefdom information requirements have been identified	Carry out extensive consultation with chiefs and other relevant frontline officials to identify felt needs for decision-support information	The IDinsight team had frequent meetings with a Zambian Chief and other stakeholders both at local and national level. In the early stages of the pilot, the team consulted closely with the Chief to elicit his information needs and understand his ability to act in different topic areas. The initial list of potential modules was constructed solely based on interest from the Chief, as the team viewed his engagement as the primary factor in determining social impact. Following data collection, the team presented two rounds of data to the Chief, recording how key indicators in each affected his beliefs on the state of his community.
Information system solution has been defined	Details of platform to be developed have been established	Instead of using an existing application or displaying data in a stand-alone deliverable like a slideshow, the team opted for creating a new application to preserve scalability, speed, and interactivity. The application was produced as mobile-based rather than web-based to maximise functionality in a connectivity-limited region. Additionally, the team chose to build an application for Android devices as they are most common in low-resource settings.
Nano IS is functional	Technical development of Nano IS is completed successfully, including data collection, assimilation, storage and visualization components that meet Chiefdom requirements	Nano IS was successfully completed. It has a simple interface tailored to the end user with only two buttons on the landing screen buttons, *View Data* and *Request Data*. Nano IS includes modules and data on access to services, preventative health behaviours, attitudes toward education, beliefs and behaviours on child marriage, and school resources and challenges. The key technical outputs, including the code for the Android app have been published on GitHub.
Usage and effectiveness of system is established	Usage metric by the Chiefdom in support of decision making, and response times where applicable	IDinsight monitored how the chief used data for community decisions The team presented two rounds of data to the chief, recording how this information reinforced or changed his prior beliefs on the state of his community. In general, the Chief's perceptions were accurate, or more pessimistic than, the data showed. But there were some key areas, such as child diarrhea and toilets in schools, where he had lacked enough information to form a prior, and where Nano gave him actionable info. In other cases, the availability of solid data helped the chief take action.

		The chief shared the data with several district-level, national-level, and NGO stakeholders to advocate for improvement on critical indicators in his community. The chief initiated direct action himself by coordinating construction of a health facility in the area that data identified as the most underserved in the chiefdom. The data also helped the chief secure funding for a number of projects, as described above.
Sustainability & scalability parameters	Financial sustainability of pilot project (post-completion) clearly articulated and scalability across relevant/different sectors is well defined. Technical resources as well as development and deployment timeframe details are also documented	To benchmark the cost and speed of Nano, IDinsight constructed an estimate that compare standard data collection speed and costs to the same indicators under Nano, assuming set-up in a new region. The team estimated that at scale, operation in a new region will be about a third of the cost and half of the time of a traditional data collection process. The reductions in cost are primarily attributable to a lean sampling method and use of resident enumerators, which significantly shorten time spent sampling and surveying and eliminate unnecessary additional costs. IDinsight proposed a scaling strategy, but the GIF team felt the financial sustainability was not sufficiently well-articulated to warrant further funding. There is no indication that the Chiefdom plans to maintain the existing system.
Scaling and evidence learning	Develop learnings, evidence, and DIY documentation on Nano IS process (including challenges) and its applicability in contexts similar to Zambian Chiefdoms (frontline)	IDinsight developed a DIY guide, describing the process of building the Nano information system to help other organizations reproduce the Nano project. The guide provides learnings on:: 1. Stakeholder and user consultation 2. Module selection and design 3. Sampling 4. Enumerator management 5. Data presentation
Adoption	Make best efforts to integrate the Nano IS type approaches into monitoring systems and project management units that are being implemented by IDInsight – number of such projects where Nano IS has been adopted	Most of IDinsight projects involve data collection and the Nano enumerator management tools and processes are applicable across other IDinsight projects. To increase take-up of these tools, the team have published internal blog posts and spoken to project teams that could gain the most from deploying the tools. In addition, the lead Nano technician and a newly-hired software developer have developed skills and will use the Nano data pipeline, and other backend code, as

| | | well as the application and dashboard on other projects.

To date, no clear replications of the Nano approach have been identified. |
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| Advocacy | Make best efforts to disseminate this approach to data management systems so as to facilitate its widespread adoption by various stakeholders – number of presentations made and publications published. | IDinsight published two blog posts on Nano: (1) Using digital maps to collect high-quality data in rural Zambia, and (2) Geographic sampling methodology: Case of Nano.

IDinsight presented on Nano at the 2nd African Evidence to Action Conference and Exhibition 2019, on a panel organised by GIF. The team also presented on Nano to the Ministry of Chiefs and Traditional Affairs. |

The learning objective formulated for Nano IS was to generate and make available evidence and learning to scale the Nano IS and enable third-party replication. The KPI that was intended to capture progress towards achieving this objective was to develop learnings, evidence, and do-it-yourself documentation on the Nano IS process (including challenges) and its applicability in contexts similar to Zambian Chiefdoms.

IDinsight sought to achieve and demonstrate significant reductions in the cost of gathering data. Results were as follows

- *Demonstration of a low-cost approach to creating sampling frames for conducting representative surveys of a rural population.* The sampling frame is based on satellite imagery, rather than using a household registry (often unavailable) or undertaking a household listing exercise (expensive and time consuming.)

- *Demonstration of an approach to locally recruiting, training, quality-checking, and remotely supervising enumerators.* The hope was that this would be faster, cheaper, and as accurate as hiring and transporting enumerators from outside the area. The quality control process involved audio audits of survey interactions, GPS tracking, daily review of submissions, and bonus payments. Enumerators were also required to achieve an 85 percent score on a remotely administered test on survey content. Achieved accuracy (as measured by agreement between enumerator and auditor) was 75 percent (auditor or technical issues may account for some of the discrepancy). IDinsight estimated that use of NanoIS could reduce the cost of surveying 700 households to $25,999 versus $78,103 using standard methods; and would reduce total time from initiation to completion to 7 weeks from 15. (The assumptions depend on re-use of the same survey modules.)

- *Development of short, flexible data collection modules*, drawing on existing standard surveys. The intention was for these to be re-usable, so that subsequent surveys would have lower set-up and analysis costs.

- *Publication of a do-it-yourself guide and of code* for implementing Nano platform and modules.

However, these learnings did not provide a sufficiently comprehensive analysis of learnings and evidence of impact that would de-risk further scale-up. A key issue, that had been discussed during diligence, was the generalizability of the Zambian demonstration case. In retrospect it is apparent that there was misalignment between IDinsight and GIF on the theory of change and impact narrative. The IDinsight team was driven by the element of fast, cheap, flexible design of the information system, but not the decision-support it can provide to frontline officials. It saw Nano IS as a bottom-up, smaller version of its work on the 'data on demand' approach implemented at large scale in India. Consequently, in practice, Nano IS ended up being 'a network of data agents that received requests originating from the Chief and a team that fed back in data presentation for the Chiefs'. GIF's conception on the other hand was of a product that provided front-line decision-support to directly improve the quality of programme execution. This raises the question of whether a system that provides feedback to the Chief captures the potential of

a PDIA-type system that provides rapid feedback to frontline workers. Also unresolved is whether Nano should aim to complement vs replace existing, unwieldy management information systems.

In sum, the pilot was deemed useful to the Zambian Chief. The information provided actionable information and was used to secure funding for projects. The pilot also demonstrated a potentially widely applicable approach to reducing the cost of field surveys. Nevertheless, the Chiefdom has not maintained the systems, and the pilot has not led to scale up or third party replication. In particular, it did not provide sufficient information on how to make the product demand-driven, locally customizable and yet cheaply scalable.

Gender considerations

Although Nano IS in itself does not have explicit gender considerations, after identifying areas of interest to the Chief and areas where he appeared to have some ability to improve outcomes for his community, a number of gender elements were identified. The data collection included modules intended to meet distinct needs of women and girls, for example on the incidence of and attitudes to child marriage, attitudes to girls schooling, and maternal health services.

In addition, IDinsight ensured that all data could be disaggregated based on household / respondent gender. The team undertook gender analysis on school data and reported to Chief Mukobela student enrolment and attendance (including reasons children are not enrolled and reasons for missing school) separately for boys and girls. The team also reported share of teachers by gender, and teacher absenteeism by gender. Within the focus on child marriage, the team reported respondent views on the "appropriate age for marriage" disaggregated by gender.

Key learnings

- There was a successful demonstration that data collected through the Nano IS could be useful to a Chief.
- The development and dissemination of feasibility of substitutability of locally-recruited survey enumerators rather than more expensive outsiders is an output of potentially wide use— though there are unresolved question about degree to which these savings result in lower quality data.
- The lack of evidence of replication or scale-up raises questions about the sustainability or cost effectiveness of the model and the usefulness of the chiefdom-based demonstration to stimulate take up for other use-cases.
- Scale and replication prospects were undermined by fundamentally different visions of the innovation (between GIF and IDinsight), including the understanding of who are front line workers and how the information is used in decision making.
- Keeping the budget within the Pilot stage cap came at the expense of learning in wider context.