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# Learning to be Sustainable in ICT for Development: A Citizen Engagement Initiative in South Africa

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**Abstract.** The uncertainty and complexity of ICT4D projects call into question the suitability of conventional approaches to project management that are imposed exogenously, particularly in relation to the challenge of supporting sustainability and resilience. Attempts to transfer knowledge or ownership to local stakeholders or other responsible bodies fail, and consequently many worthwhile initiatives become unsustainable. The problem is particularly acute in the case of citizen engagement projects, where diverse stakeholders are involved and perspectives need to merge when identifying and realising the benefits of the initiative. Borrowing from literature on project management, knowledge management and organisational learning, this paper draws on experiences from a citizen engagement initiative for basic service delivery in a local municipality in South Africa, by reflecting on the learning processes that can contribute to ongoing sustainability in such projects in the global South. The findings highlight the value of emergent learning and negotiation rather than rigid processes linked to pre-determined success factors that are typically adopted in project-based ICT4D initiatives.

**Keywords:** sustainability, organizational learning, project management, e-government, citizen engagement

## 1 Introduction

While the value of ICT4D initiatives (usually donor-funded) has been confirmed over the past decade, projects are still plagued by failure and sustainability challenges. ICT4D projects are often more complex than expected [1, 2] and are not always conducted with adequate sensitivity and awareness of the environments and contexts they are targeting [3]. An ICT4D initiative, whether managed locally or not, is often driven by foreign funding agendas. The implementer, who may be an NGO or research institution, is often viewed as a proxy of the funder and has to meet specific objectives, typically within a defined time, scope, cost and quality. These aspects are fundamental to project management, and are often used as an assessment of the effectiveness of an implemented ICT4D initiative. This view is problematic as ICT4D projects are often associated with immense uncertainty and complexity in terms of the factors and

actors that make them ‘work’. The uncertainty has been a big contributor to the failure of projects, and to what Toyama [4] refers to as ‘pilotitis’. Dodson, Sterling and Bennett [5] point out that while there is plenty of ICT4D literature on failures, researchers and practitioners still do not take full cognisance of the failures to *learn* from them, to apply the lessons learned in practice, or to develop mechanisms and theories to address the failures – above the constraints of time, scope, cost and quality. This paper aims to address this by proposing strategies for learning to be sustainable in ICT4D projects. In doing so it asks the following questions: 1) How does the complex nature of ICT4D projects affect sustainability, 2) How can project management, knowledge management, and organizational learning contribute to learning to be sustainable in complex ICT4D environments.

The paper begins with a review of literature on sustainability and project management in ICT4D. Subsequently, the case for ‘learning’ in ICT4D is discussed. A case study of a digital citizen engagement project called Mobile Social Accountability Monitoring (MobiSAM) is then reflected on using theory on organisational learning, knowledge management, and project management. Finally, the findings are summarised, and the conclusion is reached that learning strategies enable the untangling of uncertainties and complexities in environments that are typically associated with ICT4D projects and international development. Most importantly, learning allows donors and project implementers to realise the true contribution of ‘taken-for-granted’ perspectives of local beneficiaries.

## **2 Sustainability, Project Management, and Learning**

### **2.1 Finding the Definition of Sustainability**

The definition of sustainability has evolved over time in ICT4D research and practice, and literature has played around with the term in an effort to understand what the concept really means in practice. Sustainability has been thought of as the ability of a project to continuously function in the context it has been operating in, without hindering the future opportunities of individuals from benefiting from the original initiative [6]. Sustainability has also been related to scalability, in an effort to replicate and maintain the initiative in other contexts [4]. Ali and Bailur [7] call for less emphasis on the term sustainability in ICT4D, as it will never be attained – but rather bricolage should be a focus. Pade-Khene *et al.* [6] proposed a set of critical success factors essential to supporting sustainability by drawing on existing ICT4D initiatives. However, the application of these factors are not clearly defined in relation to the strategies to allow a project to *learn to be sustainable*.

Marais and Meyer [8] talk about their experiences working in a donor-funded project in South Africa. They discuss the key systematic drivers for sustainability which include the question of ‘who’ defines changes among stakeholders (donors, project implementers, beneficiaries); whether the capacities and readiness of the beneficiary system are understood sufficiently from multiple perspectives; and the extent to which the project aligns change agents in the intervention with the ‘natural’ agents of change in the beneficiary system. All these speak to the need to shift the focus from the “do-

nor system of innovating on behalf of the beneficiary, to innovation that is driven by the beneficiary system in response to its natural dynamics” [8: 3]. Project managers need to probe and understand the beneficiary system, and to then react appropriately in order to direct and design the project toward effective sustainable practices. Development should not be seen as a problem that should be fixed, but rather a complex system that needs to be *understood* and explored holistically over time [9].

## 2.2 Project Management Complexity in ICT4D

Project management in international development and ICT4D is often an ‘offshoot’ of conventional project management [10]. However, some authors [9, 10, 11] argue that structured rigid approaches associated with conventional project management result in failure, especially in complex environments. In fact, Mansell [12: 3] argues that conventional project management approaches are a typical example of exogenous models of development (i.e. external to the context) that are imposed on ICT4D initiatives. With these, the focus is invariably on what should be done (scope, time, budget, quality) rather than what happens (learning). Like all international development projects, ICT4D projects face a broad range of issues as outlined by Ika and Hodgson [10: 1185):

*“...intangible and conflicting objectives and outcomes; changing scope of ambition levels, many layers of stakeholders with conflicting, if not contradictory, expectations; over-optimism and political interferences and manipulations including strategy misrepresentation or misinformation about costs,... media scrutiny; intolerance of failure; ...corruption, capacity building setbacks, recurrent costs of projects, lack of political support, lack of implementation and institutional capacity and overemphasis on visible and rapid results from donors and political actors.”*

Together, these add to the difficulties associated with the use of standard, exogenous approaches to projects and project management in the ICT4D sphere.

Many ICT4D failures are more institutional than technical, and project management in such contexts needs to take cognisance of this. Walton and Heeks [9] propose that ICT4D projects should adopt a process approach, highlighting the factors that should be considered. These are beneficiary participation; flexible and phased implementation; learning from experience; local institutional support and capacity development; and sound project leadership. All these speak to the need for a process and learning perspective, where success emerges from *“a wider understanding of the systems that make a particular context, which can always be improved upon further”* [9:19]. Here, success and failure are not associated with finality, but with an opportunity to incrementally learn and generate feedback for growth in an atmosphere of social experimentation and interaction [9-10, 12].

Project managers that work in ICT4D initiatives have to deal with a range of issues relating to power and influence amongst the diverse group of stakeholders [13]. The projects have more to do with people engagement than technology, and as a result the project manager needs to shift from being the “economic man, objective arbiter of

interest, or technocratic” to being more ‘proactive’ and ‘engaged’ with the actors that have the power and influence. In particular (s)he needs to engage key stakeholders that are local and benefit directly from the project in a process of realising/learning the operation and sustainability of the ICT4D initiative [13].

### 2.3 The Case for ‘Locally’ Learning to be Sustainable

Mansell [12] argues that ICT4D initiatives need to move beyond exogenous models of development that justify their implementation as a stimulator of economic growth in the developing world. Toyama [4] agrees on the basis of having previously implemented ICT4D projects with that view. He argues that technology is not transformative in and of itself, but is primarily an amplifier of existing institutional forces like differential access to technology, capacity to use the technology and motivation to see the value in using the technology for its true purpose [14]. Mansell [12] proposes that *endogenous* models should thus be applied, where insight is provided on the factors that influence development. No single endogenous model exists that can explain a context, and therefore ‘local’ learning with key stakeholders is fundamental. Endogenous models also embrace the idea of engaging through participatory approaches with multiple perspectives. These allow “meanings of technology to emerge through an open, emergent process of dialogue which respects multiple sources of knowledge” [12: 13]. Knowledge transfer and development occur in the evolving incremental learning processes of project implementation, typically *between and with* implementers, donors, and most importantly local beneficiaries of the initiative. The knowledge ranges from expertise knowledge on technology implementation and integration, to knowledge on practice and operations in the local context. Consequently, participatory approaches move beyond being just a *consultative* process to considering redistributions of power and influence over constructive decision-making among local beneficiaries of the project [4, 10].

Resilience goes hand-in-hand with sustainability in ICT4D, as the project moves iteratively between failure, learning and success over time while strengthening its ability to recover through knowledge transfer. Knowledge management is a key component in ICT4D as it allows an initiative to realise its full potential and resilience through strategic and tactical decision-making. Conger [15: 114] defines it as the “systematic process of acquisition, organisation, and communication of organisational member knowledge for reuse by others in the community”, and indicates that there is limited work looking at this in ICT4D literature. Yet it is a fundamental component as initiatives need ongoing development and maintenance without the aid of the original implementation team. In order to acquire knowledge, a process of interaction between explicit and tacit knowledge needs to occur through processes of sharing [16]. This relates to organisational learning which is the “internal adaptation processes triggered by some kind of disjunction or unease in the relationship between the organisation and what lies external and challenging to it in its environment” [17: 160]. It is in the context of these processes that this paper explores strategies used for learning to be sustainable’ in ICT4D using a case study on digital citizen engagement i.e. citizen engagement supported by digital technology [18].

### **3 Research Methodology**

This study adopts a pragmatic research philosophy in which the experience of the researchers is based on reflective interaction between action and belief [19, 20]. By iteratively reflecting on existing theory and practice [19], it not only examines ‘what works’ but also ‘why it works’. A qualitative approach is applied to reflect on the MobiSAM case study as it seeks to ask ‘how’ a learning strategy is used and ‘why’ it worked in a particular way. Data was collected through participant observation, as one of the researchers is part of the project team and has played a significant role in applying project management practice and learning in the project. Further qualitative data was collected over time from project team meetings and engagements, from closed and public meetings with stakeholders (including citizens, municipal staff, civil society, and media), and from public forums held by the local municipality. Documents from a previous phase of the project were also analysed to identify lessons learned.

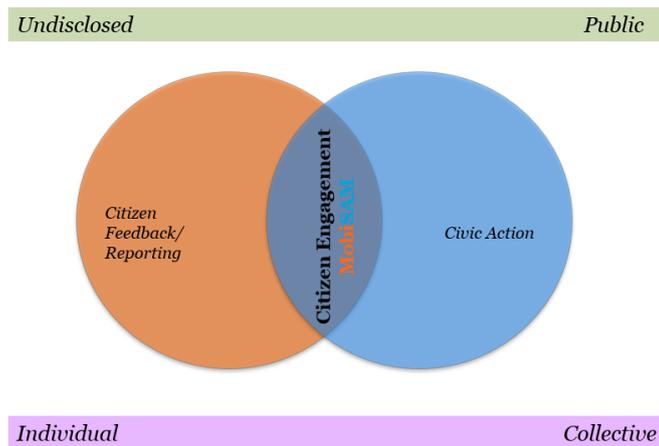
Data collection took place from February to December 2016 during the implementation of phase 2.0 of the MobiSAM project. The data was analysed using open thematic analysis to allow aspects to emerge from practice while reflecting on theory in project management, knowledge management, and organizational learning.

### **4 The Case of MobiSAM – A Digital Citizen Engagement Initiative**

MobiSAM is a project that uses mobile technology to support two-way communication between citizens and government about basic service delivery issues. It was founded in 2012 by local researchers who were frustrated by the growing issue of water service delivery in their municipality [21]. MobiSAM aims to support citizen engagement, through providing platforms (not only technology related) that citizens can use to engage in social accountability practices. It is widely promoted as a ‘game changer’ for development [22], as the voiceless become empowered to evoke change in society. For it to be effective, demonstrating results from engagement, designing multiple channels of participation, providing multi-tiered levels of engagement, reinforcing a sense of civic duty and collectiveness, and getting pre-commitment from citizens are all essential for increased participation [23].

When an individual citizen has a service delivery issue in South Africa they typically report it to the municipality at a front-desk (face-to-face), by telephone, or through a Ward Councillor or Community Development Worker. These reports often remain as individual *undisclosed* reports which the public may not be aware of. Civic (collective) action may also be used to draw attention to service delivery issues. However this is often isolated and may not reflect the true nature of the problem for the wider population. MobiSAM plays a strategic role as it brings together individual and collective action with real time access to mechanisms to report issues to all stakeholders. Figure 1 illustrates where MobiSAM sits in local municipal contexts.

The MobiSAM technology incorporates both a reporting interface for citizens (via a mobile application, website, and SMS), and a ticketing function (mainly used by the municipality to address internal communication challenges). Initially, before system launch, Facebook and WhatsApp social media platforms were used to ‘experience’ the idea of reporting using technology. MobiSAM has a Facebook page for citizens to report and the municipality to make service delivery announcements.



**Figure 1.** Citizen Engagement in MobiSAM (adapted from [18])

#### 4.1 The Stakeholders in MobiSAM

The MobiSAM stakeholders include the donor, the project implementation team, and the beneficiaries, and as with all citizen engagement projects the beneficiaries consist of citizens, government, civil society, and the media. The project manager needs to continuously engage with all these stakeholders as they interact in a web of complexity and uncertainty in an environment that is politically influenced and marginalised. Conflicting perspectives on what MobiSAM is expected to achieve exist between stakeholders and even within stakeholder groups. The project manager needs to devise strategies to engage all the stakeholders, either separately or together, in order to address the conflicting perspectives and to learn how the digital citizen engagement initiative can best function within its context.

#### 4.2 Learning Strategies in the MobiSAM Project

This section reflects on strategies applied in the MobiSAM project to support learning. It draws on organisational learning theory, with knowledge management and project management literature providing additional insight. According to Easterby-Smith and Araujo [24], organizational learning can be viewed as a technical process [25] or a social process [26] that emphasizes situated learning and learning within communities of practice. The perspective of Argyris and Schön [25] on organisational

learning presents two often conflicting modes of operation, namely espoused theory, which is the formalized part of the organization, and theory-in-use, which reflects the implicit mental models and theories people actually use to get things done. By questioning the theories in use of an organization this can help to adapt and to learn from an unexpected situation. This reflection provides insight into double-loop learning in the MobiSAM project, taking cognisance of the unique nature of ICT4D and digital citizen engagement projects in the global South. This is added to by drawing on social perspectives on the transfer of knowledge within the project. The section concludes with a look at the role of the project manager in creating a climate of learning in the MobiSAM project.

#### **4.2.1 Double-Loop Learning**

Phase 1.0 of the MobiSAM project experienced some challenges which mainly emanated from the contextual political influence of government stakeholders. It adopted a somewhat adversarial approach to implementing citizen engagement which was met with resistance from government. This led to despondency among citizens who felt that reporting service delivery via the platform would not result in a response from government. The lessons learned in Phase 1.0 [21] were reflected on, resulting in the development of a new approach for Phase 2.0. This double-loop learning focused on studying and learning from the contextual influences in order to build government responsiveness, civil society partnerships, and citizen capacity to become engaged citizens. In going from Phase 1.0 to Phase 2.0 the MobiSAM project had to reflect on 'why we do what we do'. The goals and values of Phase 1.0 had to be re-evaluated and reframed, not through a once-off process, but an incremental process to define the operational model of Phase 2.0.

The MobiSAM operational model involves activities that are more than just about the technology; they include mechanisms to manage the uncertainty and complexity of the context of digital citizen engagement initiatives. Five key aspects make-up the operational model: 1) citizen education and training, 2) building government responsiveness and citizen engagement capacity, 3) stakeholder engagement, 4) iterative technology development, and 5) comprehensive evaluation throughout the project and embedded in learning.

The MobiSAM operational model is not static, but evolves with changes in the environment that relate to both internal and external influences. There is no clear start and end to the project, but rather a model to allow for its evolution over time, as it becomes embedded in citizen engagement practice as well as government practice. Applying this approach has been instrumental in garnering beneficiary support and engagement in the project from both citizens and government.

#### **4.2.2. Promoting Transfer of Internal Capabilities**

Knowledge transfer is a fundamental component of organisational learning [27]. However, in ICT4D contexts knowledge transfer processes are usually formalised through communities of practice that include project team members and experts from other projects but usually exclude local beneficiaries. At times, the knowledge or

expertise associated with implementing an ICT4D initiative resides with the ‘temporary’ implementer who leaves with this expertise when the project ends or funding runs out [4]. To promote sustainability these capabilities should be transferred to local beneficiaries (as well as other local project implementers), in order to support the continuity and progressive development of the initiative. Furthermore, knowledge on the local system in which the ICT4D initiative is implemented needs to be transferred to the project team and funding agencies. For knowledge transfer to be meaningful in the ICT4D context, where there is an interactive exchange of project *and* context knowledge, identifying the right source and recipient matters [27]. Both the project team and beneficiaries can play the interchangeable role of ‘source’ and ‘recipient’ depending on the knowledge shared. The MobiSAM project applies various strategies to support learning, which can be explored using Szulanski’s four stage process [27]:

1. *Initiation*: This first step leads to a decision to transfer knowledge. It is an exploratory process resulting in the identification of a need for and feasibility of a transfer. In MobiSAM Phase 2.0 the project team had to devise ways in which knowledge could be shared within the team and with other key stakeholders as implementation still remained uncertain. Furthermore, new relationships and partnerships needed to be developed with local citizens, government, civil society and media, allowing a space to share perspectives that contribute to the direction of the project. The project managers needed to provide an environment to encourage and motivate people to communicate and share their knowledge with others [28]. The kind of knowledge that needed to be transferred related to government practice, protocols for working with various local stakeholders and citizens, communication designs and ecologies that work best in particular contexts, discipline specific expertise from the diverse project team, and how to collaborate with specific municipal wards, etc. In this context, knowledge from all stakeholders was essential, and needed to be shared and appreciated as essential.
2. *Implementation*: This stage is associated with establishing transfer-specific social ties between the source and recipient. Here, the transfer practice is adapted to suit the needs of the recipient – in this case, not only project team members, but also target beneficiaries of the project. The project manager of an ICT4D initiative is the one that lobbies for this transfer in the first place, as beneficiaries may not yet realise the true potential or benefit of the project. Therefore certain strategies have to be applied to ensure that a suitable environment is developed for transfer. For example, from the perspective of beneficiary transfer practices, the MobiSAM project had to run strategy formulation workshops. The first two workshops were held separately, with the first group being the government staff, and the second group being citizens, civil society and media. The aim was to provide an environment that allowed for transfer, avoiding conflict between stakeholders. Once commonalities were established, a joint workshop was held with all stakeholders, to provide a shared understanding on how best to implement the MobiSAM project.
3. *Ramp-up*: This stage occurs when the recipient begins to use the knowledge. In MobiSAM all stakeholders, including the project team, are recipients. New knowledge contributes to learning about how the project can function and operate

among citizens and government. The MobiSAM project team proceeded with caution, now understanding the political dynamics and operations in the municipality. Municipal staff had also now begun to integrate MobiSAM in their communication policy and strategy documents in collaboration with the project team, and had suggested that MobiSAM be part of a new citizen engagement initiative from government known as *Masiphathisane* meaning “let us help each other” (based on an integrated service delivery model). Civil society advised and committed to integrating MobiSAM in its existing activities, and local media has incorporated MobiSAM into its local broadcasts and publications.

4. *Integration*: This stage is reached when transferred knowledge becomes institutionalised. For beneficiaries this may still be early in the adoption process but within the project team shared knowledge has become embedded in routine practices. For example, the team has a shared understanding of how to reflect on citizen engagement and government practice based on discipline specific knowledge. Behaviours and events have become understandable, as types of actions are associated with types of actors. The project team learns to understand the project more holistically, not only from an information systems or computer science perspective, but also from a sociological and journalistic perspective.

Integration remains ongoing in MobiSAM, as engagement with additional stakeholders takes place.

In digital citizen engagement projects, engaging with diverse stakeholders’ perspectives coupled with issues of power and political influence can result in the need for ad hoc solutions to knowledge transfer problems. It becomes difficult to apply a traditional approach to knowledge transfer in such a dynamic environment. Nonetheless Orlikowski [29] argues that sharing knowledge enables better understanding of practices relating to “know-how”, and hence better understanding of the origins of knowledge stickiness [27] and how to work around it. Such ad hoc processes of learning have enabled the MobiSAM project to operate in the conditions that have emerged.

#### **4.2.3 The Development of Trust among Stakeholders**

In creating a climate of learning the project manager needs to establish a climate of trust between stakeholders where “it is safe to make mistakes, sharing knowledge is the norm, and helping others is promoted” [30: 13]. Stakeholders need to feel they can trust the engagement process especially where unlearning or learning from mistakes can occur as failed aspects of a project are likely to yield more valuable knowledge than focusing on the successful aspects [16]. Knowledge sharing in digital citizen engagement can evoke feelings of conflict of interest among individuals or groups involved [31]. In the MobiSAM project, the project manager’s role is to manage the knowledge bases of the project team and stakeholders so that they combine in the best possible way to learn from each other. As highlighted previously, conflict already exists between stakeholders, and an environment of trust is fundamental to project activities that enable learning. For example, MobiSAM had to hold workshops to engage stakeholders in a process of learning and work had to be done to ensure stake-

holders felt comfortable to engage. Affective commitment by the project manager also influences knowledge sharing, as this plays a significant role in determining perseverance in the conflicting interactions and reactions among stakeholders. The project manager, and even the project team in MobiSAM, had to play a neutral role, open to understanding the conflicting perspectives of the main beneficiaries - that is, government and citizens - in order to establish a common ground for learning and engagement. A project manager in this case has to be affectively committed, and highly motivated by a concern for the community and a desire to serve the interests and values of the public and government for the greater good [13]. This is one of the key lessons that the project managers had to learn in the MobiSAM project.

## 5 Limitations and Future Research

This research reflects on only one case study. Nonetheless, it highlights key aspects that can resonate with other ICT4D projects, based on the challenges experienced and the need for iterative incremental learning to occur [9]. This research also serves as a foundation for further exploration of the theories and concepts of project management, knowledge management and organizational learning in ICT4D practice. At this stage the research only provides a high-level view of what could be explored.

## 6 Concluding Remarks

ICT4D is a growing field that seeks to understand how sustainability can be realised in projects that have been proven to hold value in socio-economic development. These projects are characterized by complexity and uncertainty; as a result, rigid conventional approaches to project management, which are quite typical of project-based donor funded initiatives, result in project failure. Previous research advises that ICT4D projects should be flexible, iterative and incremental over time, providing an opportunity to incrementally learn and generate feedback for growth in an atmosphere of social experimentation and interaction. Reflecting on organisational learning, knowledge management, and project management, the MobiSAM project provides an example of a case in ICT4D of 'learning to be sustainable'. Three key strategies are fundamental in the learning approach applied; these are double-loop learning, promoting the transfer of internal capabilities, and development of trust among stakeholders. The MobiSAM project continues to function and grow based on this approach, with stakeholder buy-in. The strategies can be applied in general ICT4D practice in an effort to untangle the uncertainties and complexities of environments that are typically associated with such projects. Most importantly, learning allows donors and project implementers to respect and realise the true contribution of 'taken-for-granted' perspectives of local beneficiaries.

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