

Facilitating Grass-Root Ngo's Adoption of Information Systems and Information Communication Technologies

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Increasingly, information and communication technologies (ICTs) are being employed to share, generate and analyse information. In response to their decreasing cost, an increase in accessibility, and an increase in the adoption of modern ICTs across the globe, non-government organizations (NGOs) in developing countries are not only welcoming these technologies into their communities, but are using them to connect to resources outside their communities. On the lowest rung of a country's organizational ladder, are grass-root NGOs; these small organizations are often the life line for isolated communities, and it is through them, developing countries are making progress – both economically and socially, towards advancing a country's development.

This paper presents a pilot project that explored the adoption of information technology by a small grass-root NGO in Uganda. We found the adoption of an easy to use information system together with skills training in the use of the information system and communication technologies opened up opportunities, pride and professionalism in the NGO, with a flow on effect to the people within the communities they serve. The paper concludes with several guidelines that could be followed when facilitating the adoption of ICT by organisations in developing countries.

Category: H.4 Information Systems Applications

Key Words and Phrases: Information systems, ICT, non-government organisations

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1. INTRODUCTION

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The research presented in this paper is a pilot study that explores the use of Information and Communication Technologies (ICTs) by one grass-root Non Government Organisation (NGO) in Uganda; The Voluntary Services Trust Team (VOLSET). The paper reports on an instance where VOLSET embraced the development of a purpose-built information system used to systematically record Voluntary Counselling and Testing (VCT) data. The transferring of VCT data from an archaic, inadequate, paper-based system into an electronic application where data can be manipulated, analysed, graphed and reported, is critical as valid evidence is needed to further advance the benefits of VCT across the Ugandan nation.

The study evolved from two researcher's participation in a five week volunteer program in Uganda. The researchers, one education/information technology academic, the other a microbiologist, spent time with VOLSET during November/December 2005. The study design is retrospective, and uses an ethnographic approach influenced by participatory action research.

The paper commences with an overview of NGOs and VOLSET in particular, the state of ICTs in developing countries and Uganda in particular, the study design, observations, interventions, and concludes with a discussion of the outcomes of the research, including draft guidelines for the development of information systems for NGOs in developing countries who are on (or are moving towards) the path of ICT adoption.

1.1 Non-government organisations (NGOs)

Non-government organisations have traditionally contributed significantly to a country's future, however, to continue this work effectively in today's technological age, they need not only the technology but the skills to use and gain value from applications from which the technologies have enable. Furthermore, they require timely access to 'markets' to enable the sharing and dissemination of the information obtained. Often NGOs are at a 'grass-root' level; these organisations give assistance to communities at a local level by the local or common 'man'. Grass-root NGOs are a life line for many people in developing countries in improving skills, knowledge, and support from outside the confines of their small, isolated communities.

Uganda is a country with many NGOs that sustain life within the region. In 2003 (more recent figures could not be found) there were 3,499 registered NGOs in Uganda [The Uganda National NGO Forum, 2003], plus at least another 30% unregistered faith-based. These organisations are responsible for distributing approximately 25% of international aid funding [Ndegwa, 1996] , (more recent figures could not be found, however it is presumed to be higher in 2007-2008). The total amount of foreign aid entering Uganda each year approximately 11% of its GDP and for the fiscal year 2005-06 was predicted to reach about \$989 million [Worldpress.org].

1.2.1 Voluntary Counselling and Testing (VCT)

VCT refers to the process of giving people professional counselling before and after HIV testing. The process helps people prepare for and understand their test results. Over the past 20 years, VCT programs have helped millions of people learn their HIV status, nonetheless there are more than 80% of people living with HIV in low and middle-income countries who do not know that they are infected [World Health Organization]. In 2003, Uganda had approximately 6.5% prevalence of HIV in its adult population [Coutinho 2003] - a decline from 22% in 1992. One of the factors claimed to have brought about this decline is large-scale VCT. This testing has primarily been provided by the 2000 NGOs active in HIV work in Uganda (http://www.aidsuganda.org/pdf/role_of_VCT.pdf). Although this decline is impressive, one of the challenges that lie ahead is not only spreading VCT across Uganda but scaling up best practice of VCT [Coutinho 2003]. Furthermore, work conducted by (or through) such government organisation as the Population Secretariat (POPSEC), the Ministry of Health, the Ministry of Gender, Labor and Social Development, aim at strengthening leadership at national and district level in creating a supportive environment for family planning and reproductive health [Babikwa 2005]. It is claimed by Coutinho [2003] that VCT reinforces positive behaviour whether HIV positive or negative, and the more people who go through VCT, the less stigma will be attached to those who live with HIV/AIDS, and that early VCT can lead to a delay in HIV deaths [Coutinho 2003].

1.2.2 VOLSET: One Ugandan NGO

The Voluntary Services Trust Team (VOLSET) was established in 1997 by a small group of concerned Nakaseke (a village) Ugandans in response to the government's concern with the HIV/AIDS pandemic, and an increase in the number of needy children orphaned by HIV/AIDS and poverty. The small group made it their mission to "alleviate human suffering caused by disease and poverty" [VOLSET] VOLSET is a International Journal of Computing and ICT Research, Special Issue Vol. 1, No. 1, October 2008.

registered non-political, non-partisan, non-religious, non-governmental organization, operating in the districts of Mukono and Luwero/Nakaseke. Over the last ten years, VOLSET's mission has changed little, though it now specifically includes HIV: "to alleviate human suffering caused by HIV/AIDS, disease and poverty in rural and less served communities" [VOLSET]. VOLSET's office is located in Ntenjeru Town: a town with few shops, no running water, dusty roads, limited transport, and a very intermittent electricity supply. However, VOLSET does own (through donations) a mobile phone, two computers, has a website (<http://volset.org/>) and an e-mail address.

VOLSET operates within a grassroots community, and is managed by a small dedicated group of village Ugandans. Year-round, year after year volunteers come from all over the globe to work with VOLSET for one month to three years. These volunteers are primarily from developed countries, and bring skills which they willingly share with VOLSET and villagers they interact with to build capacity and educate the villagers in an attempt to break the poverty circle. It is through the learning from and sharing these skills that enable VOLSET to grow, to be productive, and recognized as leader in the community in which it serves.

One of the programs carried out by VOLSET is the VCT program. VOLSET members and volunteers counsel and HIV test villagers in their districts around and on Lake Victoria. The use of mobile phones the Web e-mail and computer applications are changing the way VOLSET (and other NGOs) engage with their communities, and doing business.

1.3 Information and communication technologies (ICTs) in developing countries

In many developing countries, traditional information and communication infrastructure such as telephone landlines and reliable electricity supply, are not in abundance across the nation, or accessed by the general populace as a whole. However, modern information and communication technologies have emerged, and are becoming increasingly popular for the 'common man' therefore, enabling them to become connected to the world outside their village. In particular, mobile phone telephony, basic computer applications, and the Internet have taken on an acceptance and ownership level not seen before. The adoption of ICTs in countries such as Uganda, compared to developed countries where they have become the norm, ubiquitous and pervasive, have brought the power of communication, immediacy and the world to these people, and have enabled them to share information, and communicate with others beyond their communities.

Billions of dollars every year are given to African nations to assist them in developing their nation's skills. Funding for the use, training, implementation and development of ICTs is seen as a pathway out of poverty as they are seen as change agents that are capable of empowering the populace with capacity building, self efficiency, and education. Information technology has been identified as one of the rapidly growing areas that has the potential to 'leap-frog' developing countries, into the globalised economy [United Kingdom, Parliamentary Office of Science and Technology, 2006]. The study reports that access to ICTs in developing countries is on the increase; for example; in developing countries the total (fixed and mobile) telephone access increased from 2% in 1991 to 31% in 2004: and Internet usage has also grown rapidly from 0.03% in 1994 to 6.7% in 2004 of developing country inhabitants accessing the Internet. Uganda is no different, and though it is one of the poorest nations in the world, ICT implementation is high on its lists of national priorities [Uganda National Council for Science and Technology, 2002].

The number of Ugandan's subscribing to a mobile phone service has increased from 500,000 in December 2002 to just over 3 million in March 2007 [Uganda Communications Commission, 2007]. Prior to 1996, Uganda's communication infrastructure was among the least developed in Africa, furthermore, even today approximately 70% of the communication services are concentrated in urban areas, leaving the rural areas with the least access to these vital communication service [Uganda Communications Commission, 2007]. Internet service providers (ISP) have also been on the incline- from two in 1996, to 17 in 2002. Uganda's communication systems favour those living in and around the capital city of Kampala, with at least 25 Internet cafes in Kampala (the capital), with more being established every year. Mobile phones and the Internet are not the only ICTs in existence, however, they are the ones most reported in the literature.

Regardless of the insurgence of ICTs into developing countries, their benefits are not fully realised as many countries have inadequate infrastructure and human capacity to support ICT [Uganda National Council for Science and Technology, 2002].

2. THE STUDY

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Studies exploring the role ICTs play in developing countries have been conducted by international originations (for example, the Canadian International Development Agency (CIDA), and studies specifically in Uganda have been conducted by the International Development Research Centre (IDRC)). However, the participants of their studies have commonly come from large, well financed urban Ugandan NGOs; but, little is known about the adoption of ICTs by grass-root, rural-based Ugandan NGOs. The study conducted and presented in this paper, looks at the adoption of ICTs by one rural, grass-root Ugandan NGO. The study itself is a pilot, however the results of the pilot have informed a wider project that is in the early stages of design and implementation.

The study emerged from a five week volunteer program with VOLSET by two volunteers who also happened to be researchers; one a researcher in education and information technology, the other, a microbiologist. The study design is retrospective, and uses an ethnographic approach influenced by participatory action research (PAR). Furthermore, data has been collected since November 2005, and is continuing. As the study falls in to the PAR domain there is no research question per se nor hypothesis, however the impetus of the pilot study was exploring the adoption of information and communication technologies by grass-root NGOs in Uganda.

2.1 Research methodology

The study follows the paradigm of ethnographic research. This methodology is described as “.. the ethnographer participating, overtly or covertly, in people's lives for an extended period of time, watching what happens, listening to what is said, asking questions” [Hammersley & Atkinson 1995: 1]. More recently, Johnson (2000) defines ethnography as "a descriptive account of social life and culture in a particular social system based on detailed observations of what people actually do" [Johnson 2000: 111]. The study explored the social structures and social dynamics surrounding the NGO and the villagers they interacted with, thus enabling a view of real-life situations and behaviours, which hopefully contributes to an empirically stronger theory which in turn can contribute to grounded theory.

Ethnographic research is holistic, with no element examined or observed in isolation. Consequently the use of ICTs by VOLSET needs to be looked at in the frame of the environment in which it exists: that is isolated, rural, poor transport, poor health services, dusty roads, high unemployment, subsistent village life, non-existent or very limited power supply, and limited financial resources. Together with the adoption of ICT the researchers were also interested in the transference of ICT related skills from the volunteers to VOLSET and the community. This interpretation and how it relates to a plan to bring about a different desired state for the culture is common in ethnographic research [Garson 2008].

Participatory action research is embedded in a study as the researchers were also two of the volunteers who worked with false set to five weeks and have continued to work with VOLSET from their own country. PAR can be defined as "collective, self-reflective enquiry undertaken by participants in social situations in order improve the rationality and justice of their own social...practices" [Kemmis & McTaggart 1988: 5], it embraces the principles of participation and reflection, and empowerment and emancipation of groups seeking to improve their social situation. This is a common stimulus for PAR, and therefore it is suitable method for the research.

2.2 Methods

The data collection methods for the research were primarily qualitative, and include the personal journals of the researchers, email communications, observations, and interviews.

2.3 The participant: VOLSET

As previously described, VOLSET is a small grass root NGO working in the towns of Ntenjeru and Nakaseke, Uganda. Its first foray into the use of ICT was in 1998 when it acquired a mobile phone for which it users to communicate with government authorities and other similar NGOs. In the same year, a VOLSET volunteer developed the website and established an e-mail address. In 2003 they were donated a computer, a scanner and a printer. The computer was used to keep a record of volunteer information, typing letters for VOLSET and the community, the scanner was used to scan school report cards for sponsored children and as a photocopier. During 2005 the first digital camera was donated, which was used to capture images for the Web site, and of the sponsored children for emailing to their sponsors.

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3. REFLECTION, PLANNING, ACTION, AND OBSERVATION

The PAR cycle revolves around four elements: reflection, planning, action, and observation. The interplay between VOLSET and the research is described through the lens of these elements.

Reflection: To reflect one needs to have an understanding of what they have been doing, where they want to go, how to get there, and the influences along the way. Since VOLSET's establishment in 1997, and its first volunteer intake, there have been many opportunities for VOLSET to reflect its mission and accomplishments. The directors of VOLSET are the first to admit that their accomplishments would not have been achieved without the knowledge, time and skill transference from volunteers to the VOLSET community. This is not to say that it is a one-way reflection. Personal communications with volunteers show that they themselves have reflected on the skills and knowledge in particular that members of VOLSET and its community have transferred to them and how it has made an impact on their own lives. This co-construction of knowledge through collaboration is significant, and is visualised when one reflects.

Planning: Strategic planning and long-term planning is not a strength of ANON_NGO, neither is it for many grassroot NGOs in developing countries. However, day to day and short-term planning is always through the lens of the mission of VOLSET. Much planning depends primarily on the resources available at any given time, in particular money / cash. Volunteers come from across the globe, some directly via the website, others by word of mouth, and others through intermediaries such as Global Volunteer Network [Global Volunteer Network]. With every volunteer comes a plan, a plan that is devised what the volunteer joins VOLSET in Uganda. The plan is a nexus between what the volunteer brings to VOLSET- that is their skills, and what VOLSET needs 'today'. Furthermore, the volunteer may have had an agenda, aim or preference of their own, such as teaching English, or counselling or agriculture. VOLSET and the volunteers co-operate together to develop a plan for projects that are rewarding and beneficial to the VOLSET community and to the volunteer.

Action: Volunteers involvement is always focused within the bounds of VOLSET's mission bringing about actions and interventions. These interventions could be as simple as the payment of patient transfer to hospital or health clinic, the donation of a mobile phone with extended battery life, contribution to 'air time' for mobile phone communications or Internet connection, or more strategic as presented in the example below. The addition of volunteers swell the human resources of VOLSET enabling it to physically be in more places, furthermore, with more people comes the opportunity to build the capacity of those whom they share their skills.

Observation: The last element of PAR before the cycle repeats itself in full or only in part, is observation. The organisation continually refers to their mission and on the many projects that they could explore to fulfill their mission. During the rollout of any particular project, leaders of VOLSET assessed its benefit to the community, financial commitment, use of human resources use of human resources (VOLSET members and volunteers) and its chance for success. It is observation by VOLSET members and volunteers alike that reflection, planning and action are legitimized. The following section presents an overview of one intervention related to the use of ICTs by VOLSET.

3.1 VOLSET, ICTs and one intervention

The researchers spent five weeks in late 2005 with VOLSET. The professional skills that they brought with them were in education, ICT and microbiology. Upon arrival in Ntenjeru, they gathered information, observed, and participated in planning the flexible schedule for the following five weeks. ICTs played a significant part in their influence and contribution during their stay - and after they left. Of the number of projects that were conducted with and without ICTs, the one outlined below is the most significant and has actioned a significant change: the development of information systems to capture VCT data.

3.1.1 Pre-intervention

VOLSET regularly runs education seminars in mainland and island villages around and on Lake Victoria. They talk about the importance of healthy living, education, and VCT. An attendance list is recorded in a International Journal of Computing and ICT Research, Special Issue Vol. 1, No. 1, October 2008.

small notebook and used in annual reports to illustrate the number of people attending these sessions. During these seminars another meeting time is organized where VOLSET specifically conducts VCT. VCT data has been collected by VOLSET since March 2004. When a person attends a VCT session, VOLSET writes the information into a small book. The data collected includes demographic data such as name, gender, age, village, occupation, and the result of their last HIV test. The dataset, however is often more incomplete than complete. For example, 132 people participated in VOLSET's VCT program between August 2004 and October 2005, during these consultations basic demographic data such as gender and age were only collected in 40% of cases, with marital status collected in 60% of cases. Using this current method of data collection, the information obtained during VCT was often *ad hoc*, inconsistent, incomplete, and difficult to retrieve for analysis and reporting.

3.1.2 *The intervention*

The ICT intervention was multi-faceted with each element relating to each other in some way.

Education seminars. The first intervention was re-designing the attendance list collected at the education seminars. The purpose of this list was to record not who attended, but how many people attended, and their gender, therefore, the requirement for attendees to write their name were removed, and the following data were collected instead: village name, date, how many people attended, and their gender. The data are still collected in small exercise books, however the cover now includes a summary indicating that dates and the villages where the data collection was conducted. The summary data enables easy retrieval of the primary source data when and if required. Upon return to the VOLSET office where there is a computer and (intermittent) power, volunteers, senior school students or a member of the community entered the data into a spreadsheet.

VCT data. The second intervention was more detailed in that it involved the development of a detailed spreadsheet with appropriate data fields, embedded macros, and selection boxes. After consultation with VOLSET, additional questions were included such as number of children, and date of last HIV test. VCT participants are now given a small business card sized word-processed note stating the date and that they have participated in VCT, therefore giving them a record (and a reminder) of their VCT. In-the-field data collection booklet or sheets were designed to discourage incomplete responses, and to ensure consistent and comparable data were captured. Upon return to the VOLSET office volunteers, senior school students or members of the community entered the data into a spreadsheet. The dataset has now reached over 1800 with greater than 95% usable responses in regards to collection of basic demographic data between November 2005 and February 2008. The data collected over the last two years can be used by VOLSET to find ways to improve their service to communities, for example by determining what age groups are under represented in current VCT and understand what extent of home care is required by HIV positive community members.

The benefits from using the spreadsheets in particular the VCT spreadsheet is that the data can now be retrieved and manipulated for graphing and analysis showing a true picture of VCT and education, and thus can be embedded into reports. These reports can be used to attract funding or in annual reports that portray the work in progress of VOLSET.

Basic computer literacy. As a subsequence to the above there is a requirement to enter data into a spreadsheet and awareness in the community of the skill transference from volunteers to VOLSET members. These brought forth the need for rudimentary computer literacy training in such areas as data entry and word processing. Though not an information system, these skills are crucial to the adoption and advancement of ICT's, therefore face-to-face, one-on-one training was given by the volunteers, and a manual was written for village Ugandans on 'An introduction to word processing'. The face-to-face training together with the word processing manual have enabled the up skilling of a number of villagers and schoolchildren in basic computer literacy.

4. DISCUSSION AND FUTURE WORK

The project outlined in this paper is continuing and evolving as VOLSET develops a greater understanding of the power of good, reliable data, as well as further developing their ICT skills. The cycle of developing the spreadsheet, and the associate paper collection instrument, is evolving as VOLSET volunteers continue to work in the field and beyond. Not only do the volunteers see the benefit of what they are doing, and continue to refine the instruments, VOLSET itself is developing more effective process and systems to advance their cause.

It is through such projects as this, that the vision of those that lead Uganda can be realized as VCT becomes more common throughout the far reaching villages of Uganda, and the people become more aware and take action to overcome the HIV pandemic. Putting aside the benefits of the implementation of a computer based information system to capture, manipulate and report data; the people of VOLSET's exposure to computers and other ICTs, other than as typing and talking tools, is a change that cannot be ignored.

As a consequence to the work, the volunteers have set up a web site in their own country (<http://www.friends-of-volset.org>) to enable a wider dissemination of the work and respective outcomes. Future work, though is dependant on funding, involves extending the pilot study. The full study will be robust (methodological, conceptually and in execution) and explore opportunities and instances of the adoption of ICTs by grass-root NGOs in Uganda and, if possible to cross-validate the findings with other developing countries. The outcome of the full study is the development of guidelines that can be viewed by policy makers to hasten the adoption of ICTs, the skills required to benefit from them, and services and systems that take advantage of them.

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