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*What Works Case Study*

# WHAT WORKS: HEALTHNET UGANDA'S EVOLUTION FROM NGO TO SUSTAINABLE ENTERPRISE

Portable healthcare service  
delivery to Uganda's rural areas



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## EXECUTIVE SUMMARY

Technology continues to be vital to the development of many African nations. The digital divide between industrial nations and the developing world represents an opportunity for many micro-enterprises to build sustainable models for profitability and growth. HealthNet Uganda (HNU), a project funded by SATELLIFE, a U.S.-based non-profit organization, was created in an effort to demonstrate the effectiveness of using personal digital assistants (PDAs) in healthcare in Africa. The project, now in its third year, is at a crossroads. HealthNet Uganda is transitioning from a grant-funded project to a self-sustaining non-profit organization. The new organization will be called Uganda Chartered HealthNet.

This report is an analysis of HealthNet Uganda's business model, including a description of challenges HealthNet Uganda is likely to face and recommendations for how to forestall those challenges. The project conducted market and profitability analyses and identified potential clients. In addition, the underlying assumptions that define HNU's business model—including the willingness and ability of consumers to spend a premium on HNU services, the effectiveness of the technology, and ongoing support of critical partners and constituents—were scrutinized and evaluated.

The use of information and communications technology (ICT) has had a significant impact on healthcare worldwide and Uganda will be no exception. In fact, the analysis shows that Uganda, and potentially other developing nations, have an urgent need for ICT in the delivery of healthcare. HealthNet Uganda's services will be used by medical professionals, students, NGOs, and other individuals and institutions involved in the Ugandan health sector. All of HNU's targeted users see the value in having readily available real-time access to information. The availability of information ensures accurate reporting and analysis of health data and provides doctors with the ultimate tool to care for patients. Health workers in remote parts of the country will now be able to consult with peers, access information from medical journals and order drugs and medical supplies in real time. This ability to share information could have far-reaching benefits for the health sector in Uganda.

The Ministry of Health in Uganda has enacted policies which demonstrate its commitment to the use of ICT in healthcare. Currently the Ministry uses technology in its Health Management Information System (HMIS) for telemedicine. However, there remains lingering concerns about the necessity, applicability, and affordability of PDAs. Policy implications of PDA adoption will have to be considered as a necessary part of HNU's model.

As HealthNet Uganda transitions to a self-sustaining organization, the most obvious challenge is the scarcity of financial and human resources. With the support of stakeholders and partners, thorough strategic planning and analysis, and dedicated leadership, it is likely that HealthNet Uganda will not only succeed in its stated objectives, but will lead the way for further innovation in the delivery of services in the health sector in Uganda through the use of ICT.

## **WHAT WORKS: HEALTHNET UGANDA'S EVOLUTION FROM NGO TO SUSTAINABLE ENTERPRISE**

HealthNet Uganda was formed under the auspices of a grant from SATELLIFE, a US-based non-profit, in an effort to bridge the digital divide between African nations and the industrialized world. SATELLIFE supports six independent HealthNet organizations in Nepal, Kenya, Eritrea, Ethiopia, Zimbabwe, and Uganda. HealthNet Uganda is the most developed HealthNet operation in Africa and serves as a model for its counterparts in other African countries. HealthNet Uganda's vision is the transformation of the healthcare system in Uganda through the use of handheld computers and/or personal digital assistants (PDAs). The organization will provide services that will not only bridge the technology gap but also create social value by enabling health workers to access up-to-date medical information, communicate with peers throughout the country, and record and analyze sensitive patient data electronically. Established in 1998 and based at the Makerere University Medical School HealthNet Uganda is staffed by two IT professionals, Fred Kakaire and Caesar Scott.

The organization has several goals focused on advancing the use of information and communications technology (ICT) in the healthcare industry. These include:<sup>1</sup>

- a) Promote the use of and access to health information using information and communications technology (ICT) in all health related services, research and training
- b) Operate and manage a center or centers for training, research, dissemination, networking, outreach, advocacy, and acquisition of professional skill in the use of ICT in the health sector
- c) Solicit financial, material, technical expertise and otherwise facilitate access and use of health information using ICT
- d) Train, advise, and support health workers in the use of ICT in the collection, processing, and dissemination of health information
- e) Create and maintain a functional network of health information consumers
- f) Cultivate and nurture a sense of belonging to the network of health information consumers (HIC) through regular publications and discussions
- g) Carry out fundraising activities in a bid to raise funds for the fulfilment of the aforementioned objectives
- h) Organise seminars, workshops and conferences intended to disseminate information and sensitize members and the general public for the improvement of their welfare and health
- i) Establish the self-sustainability of the organization in a bid to avoid dependence on other individuals, donors, or associations and/or to supplement any other donation from friendly organisations, associations, companies, individuals, or institution

### **Current Healthcare System and Its Challenges**

Uganda currently has 104 hospitals, 57 of which are run by the Ugandan government, 44 by NGOs, and three of which are private. There are also 250 health centers, 179 of which are run by the government, 68 are run by NGOs, and three are private. There are three categories of government hospitals: national referral, regional referral, and district/rural hospitals.<sup>2</sup> The national referral hospitals are Mulago Hospital and Butabika Hospital. Additionally, the Uganda National Health Research Organization oversees research institutions in Uganda. Uganda also has three medical schools: Makerere University Medical School, Mbarara University of Science and Technology Medical School, and Kigezi International School of Medicine.

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<sup>1</sup> From Uganda Chartered HealthNet By-laws

<sup>2</sup> <http://www.health.gov.ug>, Uganda Ministry of Health

The Ministry of Health has undergone reform in recent years, including the decentralization of districts health facilities which gives autonomy to health centers on a district/sub-district level. While decentralization allows for immediate and local responses to health problems, there remains an opportunity to link work being done at the national level to work being done at the district level. The use of ICT represents an opportunity to fill that gap. The use of telemedicine has enabled remote diagnosis of disease and rapid response to contagious disease, resulting in better medical care for patients.

Despite the use of telemedicine by the Ministry of Health, an urgent need for the full adoption of ICT persists. Modes of data collection throughout the country are not standardized and processes remain almost entirely manual—from the initial signing-in of a patient, to diagnosis and referral to the appropriate doctor or facility, to the actual healthcare delivery, and finally to the release of a patient. Further, very few health facilities store patients' records electronically. At Mulago Hospital, patient files dating back 40 years are stored in boxes in a large room at the back of the hospital. Mulago has only recently begun the process of digitizing medical records. Similarly, communication between district facilities and the Ministry of Health remain primarily manual; currently, district hospitals prepare weekly reports which are faxed to the Ministry. A consequence of this system is that epidemics are hard to identify in their nascent phase.

### **The Need for ICT**

Information and communications technology (ICT) encompasses a wide range of infrastructure, services, content, and applications ranging from traditional telecommunications, the Internet, to advanced Information Technology equipment and applications. ICT functions largely as a tool or an enabler of other services. In HealthNet Uganda's case, ICT allows health units in Uganda to connect with each other and with the Ministry of Health. ICT will allow health workers to access real time data, leading to better prevention, diagnosis, and treatment of disease. The use of ICT will also lead to the collection of the most accurate health statistics, which will serve not only health workers but also the government and donors who rely on such information to allocate resources.

### **ORIGINS OF THE ENTERPRISE**

HealthNet Uganda was founded by SATELLIFE in 1998. Initially, HNU provided low cost e-mail service to medical professionals in Kampala, but as commercial providers increased, HealthNet Uganda could no longer compete. As a result, HNU shifted its focus to providing content and customized data analysis service through PDAs to health workers. SATELLIFE has funded the project since its inception with grants received from the Acumen Fund and the Rockefeller Foundation.

Over the last year, HealthNet Uganda, in conjunction with Makerere University Medical School and SATELLIFE, has engaged in two pilot studies using PDAs in the health sector. The success of the pilot has presented an opportunity for long-term sustainability. Participants in the pilot studies were able to quickly adopt the technology and provided valuable insight into how the HNU services can be customized to better meet the needs of health professionals in Uganda.

The International Development Research Center of Canada (IDRC) funded a stakeholder meeting in May of 2003 in Uganda to determine the organization's operational structure. As a result, a 30% rollout at the sub-district level around the country was agreed upon (approximately 20 sites). The funding from IDRC will subsidize the rollout by providing funds for the infrastructure needed for the business.

## Stakeholders

Stakeholders in HealthNet Uganda include a wide array of individuals and organizations within and outside of Uganda. Each has a vested interest in the success of the organization and they all play vital roles in enabling that success.

- **HealthNet Uganda**

HealthNet Uganda is the axis of the entire enterprise. In order to bring to fruition its stated goal of revolutionizing the health sector in Uganda through the use of PDAs, HealthNet has the primary responsibility of executing its business plan with the support of its partners.

- **Uganda Ministry of Health**

The Ministry of Health has the overall responsibility of delivering health services to the Ugandan population. With a stated commitment to the use of ICT, the Ministry of Health is a natural partner for HealthNet Uganda. The success of HealthNet's model will mean that more health workers will have ready access to potentially life-saving information. Additionally, HealthNet's services will enable health workers to collect, analyze, and share data with unprecedented speed.

- **SATELLIFE**

SATELLIFE is an instrumental backer of HealthNet Uganda. As the principal sponsor of HNU to date and as the coordinator of HealthNet affiliates around the world, SATELLIFE supports HealthNet Uganda “by providing hardware and software, technical training for systems operators, technical support, and consulting on program development and business planning.”<sup>3</sup> SATELLIFE has invested significant resources in HealthNet Uganda and should remain an active partner as HealthNet transitions into a sustainable venture.

- **IDRC**

The International Development Research Centre (IDRC) is a public corporation created by the Canadian government to help communities in the developing world find solutions to social, economic, and environmental problems through research.<sup>4</sup> IDRC sponsored HealthNet Uganda's first stakeholder meeting and will continue to provide financial, technical, and other support to HNU.

## MARKET OVERVIEW

In April 2003, the Ugandan Ministry of Health published a comprehensive statistical abstract<sup>5</sup> that is the basis of much of the demographic data in this report.

Total Uganda Population	24.7 million
Female population	12.6 million
Male population	12.1 million
Percentage urban	12%
Below poverty line	35% (2001 est.) <sup>6</sup>

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<sup>3</sup> <http://www.healthnet.org>

<sup>4</sup> <http://www.idrc.org.sg/>

<sup>5</sup> Ministry of Health Statistical Abstract, April 1, 2002. Published by Uganda Ministry of Health Resource Center. <http://www.health.go.ug/docs/abstract2001.pdf>

<sup>6</sup> <http://www.cia.gov/cia/publications/factbook/geos/ug.html>

Population per doctor	18,700
Number of doctors	1,321
Population per nurse	3,065
Number of nurses	8,059
Per capita health expenditure	\$12.00
Recommended per capita health expenditure	\$30.00

There are 56 districts in Uganda<sup>7</sup> each equipped with an independent health governing body that reports to the Ministry of Health. There is at least one government health facility in each district, although a disproportionate number of health facilities are concentrated in urban areas.

There are a total of 3,075 health units in Uganda, including hospitals, health centers, and clinics. The regions with the highest concentration of health units are Kampala (885), Rakai (94), Iganga (93), Wakiso (75), and Mbarara (74). Roughly half of all health units are government owned while the remaining half are either fully or partially owned by NGOs.

### **Economic Profile**

Population Growth	2.6%
GNI Per Capita	\$281
GDP	\$5.7 billion

According to the World Bank, Uganda has been a robust economic performer over the last few years, with real growth averaging close to 7%. There has also been a 38% drop in poverty between 1992 and 2000.<sup>8</sup> Debt continues to be a debilitating problem in Uganda, despite recent debt relief initiatives by the World Bank and other development partners. Currently 50% of Uganda's national budget is sourced through donor aid.

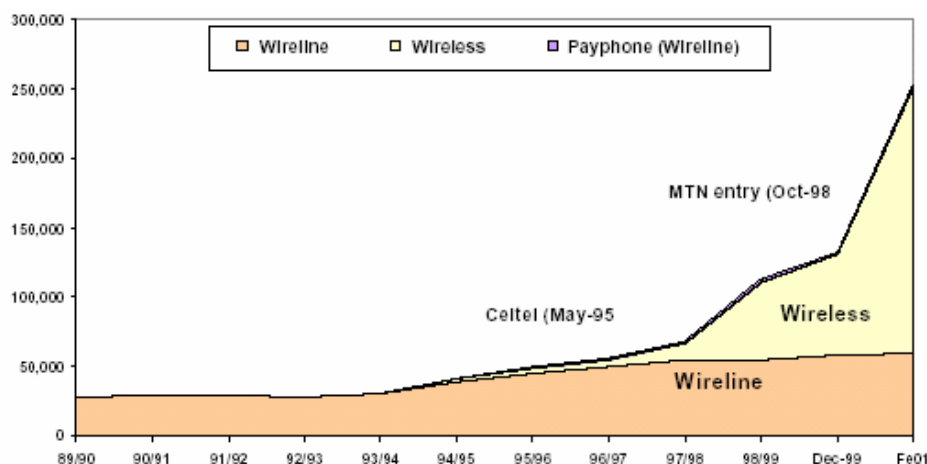
Based on Uganda's per capita income of US\$281, it would seem unlikely that cell phones would be as ubiquitous as they are. In Uganda, cell phones have a flat subscription fee of US\$5 per month plus usage, with average usage costs per month nearing US\$10. Further, initial purchase price for a cellular phone is approximately US\$100. Thus, for the first year of use, total expenditure averages US\$180. One would assume that only a small portion of the Ugandan population would be able to afford cellular phones. However, it is not uncommon to see street vendors, cab drivers, and university students with cellular phones. With relatively few and unreliable land-based phone lines, cellular phones serve a crucial role in Ugandan society as the primary mode of communication for the majority of the population. As such, Ugandans are willing to pay a premium to own a cell phone.

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<sup>7</sup> See Appendix 1

<sup>8</sup> [http://www.worldbank.org/afr/ug/ctry\\_brief.htm](http://www.worldbank.org/afr/ug/ctry_brief.htm)

**Figure 1. Uganda: Telephones in Operation<sup>9</sup>**



Arguably, PDAs perform less vital tasks than cellular phones and will probably not gain as big a market share. However, if used properly, PDAs could become an indispensable tool for the target population.

### **Customers**

HealthNet customers will be divided into two overlapping categories: Data Users and Content Subscription Users. Both Data and Subscription users will have access to HealthNet e-mail service. Data users will consist of NGOs, international organizations (WHO, UNFPA, UNDP, USAID), all health facilities, and the Ministry of Health. Content users will be data users as well as private doctors, nurses, and health workers.

### **Government Health Workers**

Statistics from the Ministry of Health indicate that there are approximately 17,000 government health workers in Uganda. Health workers include doctors, nurses, pharmacists, midwives, dentists, and Ministry of Health employees. In Kampala, which has the best infrastructure in Uganda, there are 2,600 government health workers.

### **Students**

There are approximately 2,000 medical and public health students throughout Uganda.

### **NGOs**

Uganda has slightly over 1,000<sup>10</sup> registered NGOs. This study estimates that 25% of all NGOs in Uganda are engaged in projects related to healthcare and are thus potential HealthNet customers. On average, it is estimated that each NGO will use five PDAs.

### **International Organizations**

Most of the major international development agencies have a presence in Uganda. This study estimates potential combined customers from international agencies to total 200.

<sup>9</sup> *Telecommunications Reform in Uganda* World Bank Research Paper, [http://www.econ.worldbank.org/files/15972\\_wps2864.pdf](http://www.econ.worldbank.org/files/15972_wps2864.pdf)

<sup>10</sup> <http://www.penhannetwork.org/Tekpaper2.html>



### ***Private Doctors and Clinics***

While the majority of healthcare facilities are government-owned, there is a small but burgeoning sector of private doctors and clinics. This group of doctors represents a minority of the potential market, but it remains an important group because it serves middle and upper class patients, who are likely to influence trends. Additionally, this group is more likely to be able to afford PDAs.

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## **PRODUCT/SERVICE OVERVIEW**

Initially, HealthNet's primary service was providing e-mail and Internet access to health workers. However, as the telecommunications sector in Uganda became deregulated, competitors flooded the marketplace and HealthNet soon found that it could not compete with commercial ISPs. Thus it changed its model to a more specialized provider of information.

Still in its pilot phase, HealthNet has delineated its service offerings into three distinct areas:

- Data collection and analysis
- Information dissemination
- E-mail service

In support of these three services, HealthNet will also offer:

- Training

### **Data Collection and Analysis**

The collection of accurate and timely data is critical in healthcare. A significant component of the work of doctors, researchers, or clinicians in rural Uganda is to retrieve and compile data. In collecting data, a PDA enables the user to increase efficiency by avoiding the need for time-consuming paper forms currently used to record information. HealthNet Uganda's service will allow researchers to use a PDA to input data into customized forms, store the data in a secure, electronic format, and transfer the data to a personal computer where further analysis can be performed. Customized forms will be available on the PDAs to effectively manage the collection and organization of a wide range of information, from disease monitoring to water quality monitoring.

PDAs will also prove to be useful in collecting and storing health records of patients. In the most advanced health facility in Uganda, Mulago Hospital, it can take up to two days for a patient's data to be updated into the hospital computer system. PDAs will make the process of recording patient data nearly instantaneous. Instead of manually recording patient information hospital staff can record the data directly in a PDA, which can then be transferred to a mainframe computer for permanent storage.

### **Information Dissemination**

PDAs allow for a constant flow of information to and from health workers. Information to be distributed will include current medical journals, drug information, and treatment recommendations. The medical school at Makerere University has only one library. Medical students wishing to research a particular subject currently have to fill out a request card which various librarians then use to secure journals and books for the student. The process is long and tedious and doesn't encourage consistent research. A lot of information that health workers need will be available in the numerous journals and books available on HealthNet's system. With PDAs, health workers will be able to request information on a particular subject, upload the request and receive the requested information on a subsequent download. Furthermore, doctors in rural areas have even less access to vital medical information and often have to delay a patient's treatment until further medical information can be sought, or choose to treat the patient with insufficient resources. With the use of PDAs, HealthNet Uganda can build an online database of medical journals, publications and medical tools available to all health workers throughout the country.

In addition to standard medical journals, briefs, and publications, all works produced by the Faculty of Medicine at Makerere University and Ministry of Health in Uganda will be made accessible to PDA users.

### **E-mail**

HealthNet Uganda will also provide basic e-mail service to all of its users. HealthNet Uganda's e-mail service will be limited to text-based messages and will not allow for graphics or file attachments. E-mail will be generated and stored on the user's PDA and transmitted each time the user "syncs" their PDA to the WideRay jacks, a device that transmits data using cellular networks (see Technology section below). At that time of transfer, the PDA will send and receive all pending e-mail.

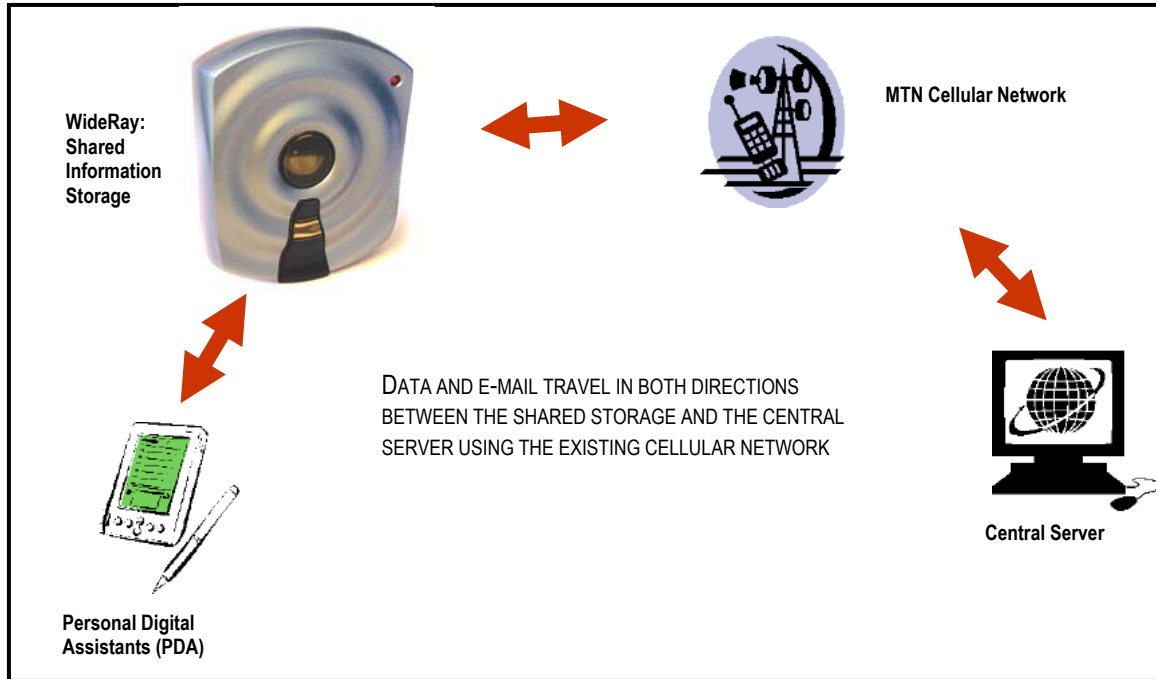
### **Training**

In addition to providing the above three services, HealthNet Uganda will be the primary trainer for all PDA users in its system. Thus, a secondary but important component of HealthNet's model will be training services. In the pilot phase, two HealthNet staff successfully trained health workers at the Uganda Red Cross Society. In addition, they distributed approximately 300 PDAs to key influencers in the health sector, including officials from the Ministry of Health, doctors at various hospitals, medical and public health students, and technicians and librarians in health services.

Training services could be an ancillary revenue source for HealthNet Uganda. While PDA usage is scant in Uganda, there is a compelling possibility that in three to five years, PDAs could become more readily accessible. Several leading Ministry of Health officials suggested that their counterparts in other ministries could potentially be interested in using PDAs for similar information and communication purposes. Thus, it is crucial for HealthNet to position itself as a skilled trainer and service provider of PDAs. Being the first in the market will provide HealthNet Uganda with a competitive advantage. It is important for HealthNet to continue to invest in developing training capabilities for future occasions.

## TECHNOLOGY

Figure 2. Information flow via HealthNet Technology structure



### PDA's

The Personal Digital Assistant, or PDA, is a portable handheld device that performs many of the same functions as a personal computer. PDAs have been in the interest of healthcare organizations throughout the world for their usefulness in research, effectiveness in monitoring epidemics, and treating patients. In fact, leading medical universities in the United States have mandated that their students own and utilize PDAs to facilitate their studies and research.

PDAs are manufactured by several companies, the largest being Palm, Compaq, and Hewlett-Packard. Recently, lesser known companies have begun producing PDAs capable of similar performance standards but at a remarkably lower cost. Although each company's PDA differs in look and style, the fundamental applications and technology are the same. Irrespective of manufacturer, PDAs are known to be equipped with a generally accepted user interface and with certain software applications.

The user interface typically is the entire face of the PDA, which is a touch-screen that enables users to select programs and navigate functions by touching the screen with their fingers or with the accompanied pen-shaped stylus. The bottom portion of the screen is the area where a user inputs data either by using the installed "graffiti" software which reads the handwriting of the user and translates it into text, or by using a virtual keyboard that appears on the screen.

PDAs are most always equipped with personal organization programs, such as an address book, diary/journal, calculator and meeting calendar; business applications such as Microsoft Word, Excel, and PowerPoint; and communications software that facilitate e-mail and navigation on the Internet. Also, PDAs are commonly equipped with an infrared sensor that enables the unit to communicate with other PDAs as well as with wireless networks using a connecting jack.

The power source for PDAs is a battery that is either rechargeable (Lithium Ion) or single-use (alkaline). Rechargeable batteries will power a PDA for up to four days of use without the need of a recharge. A full recharge can take one to two hours. Alkaline batteries will charge a PDA for up to two months. With both types of batteries, longevity is determined by the use of the PDA and how often the PDA is in low-power standby mode.

PDAs differ dramatically in performance specifications, usually corresponding to purchase price. Size of the memory space and speed of the processor are the most common traits related to performance on a PDA. Memory space ranges from 8 MB to 64 MB. The processor speed ranges from 33 MHz to 400 MHz.

PDAs use complementary services to connect to the Internet, a local area network, or interface with another PDA. The most common ways for PDAs to interact is to use the built-in infrared sensor. By aiming this sensor in the direction of another PDA, a user can exchange files and documents and business contact information. Depending on the amount of information to be shared, this transmission can take from 1-2 minutes for small file transfers up to 15 minutes for larger transfers. Another method of transferring files from the PDA is by using a cradle and performing a “hot sync” with a desktop computer. For a hot sync, the PDA is connected to a desktop computer via the cradle and files on the PDA are copied to the desktop computer, and vice versa if the user elects. A third way of connecting to a network is via modem. This is generally less cost effective, especially in developing countries. The fourth and final way of transferring data is by using the infrared sensor to connect to a network jack that in turn connects to a local area network. This is the method intended to be used by HealthNet Uganda, utilizing the WideRay jack.

### **Wireless WideRay**

The WideRay jack is a brand name device that has built-in technology that automatically configures to cellular networks. Once the cellular connection has been made with the jack, PDAs can use the WideRay jack to retrieve up-to-date medical journals and information, transfer files to and from the network and send and receive e-mail. WideRay jacks are portable and can be wall-mounted in high-traffic areas and accessed by multiple PDA users. These jacks can support simultaneous syncing of multiple PDAs within a 15 foot range.

**Figure 3. WideRay Jack and PDA**



### **PenDragon Software**

PenDragon is used to create survey forms. With an easy-to-use interface, it does not require a lot of effort to design a form. For more information, see <http://www.pendragon-software.com/>.

### **Microsoft Access**

Access is a database management program that allows users to input data into pre-designed forms. Once a form has been designed in PenDragon, PDA users will be able to access and utilize that form with Microsoft Access. Clients will use Access to input and retrieve data received from surveys and patient care. Data can be searched for using various search methods and can be sorted alphabetically, numerically or by date of record.

### **Other programs**

Along with the name brand products such as Microsoft Office and Access, other programs will be custom loaded on to select PDAs by the HealthNet Uganda staff. Those programs are typically “freeware,” which means that they are available for free. These programs include 5 Minute Clinical Consultant (5MCC), an optional program that provides general information on medical disorders and is navigable with the PDA; 5MCC has been used in the pilot program and proves to be a very useful reference for immediate patient care. Several medical calculators are available for use on PDAs and are useful in analyzing lab results as well as for other types of patient care. These include such products as ABG Calculator, Apache II, and BMI Calc.

### **Benefits of the Technology – PDAs in Healthcare**

PDAs are becoming increasingly popular in the medical field and are appreciated for their portability, ability to store large amounts of information, efficiency, and connectivity. The ability of PDAs to easily connect to networks and to transfer data is an added advantage. Specifically in Uganda, the ability for a doctor or clinician in the field to be able to carry a portable research library, a patient log book, and a ream of survey forms in one small device is remarkable. Furthermore, the durability, compactness and longevity of battery life make the PDA a practical alternative to more traditional computing and data storage devices, i.e personal computers.

The benefits of PDA technology are countless. Doctors in the rural areas of Uganda will now have an “always on” consultant and referral center for information on drug interactions, disease control, and other medical questions (5 Minute Clinical Consultant.) No longer will a doctor have to wait to question the side effects of a drug, or wonder if there is an alternative to treating a specific illness.

Doctors, nurses, and clinicians will have the ability to select which specific documents to download based on their medical discipline. Thereafter, each time that user syncs with the WideRay jack, any new information on that user’s discipline will be automatically downloaded to his or her PDA.

E-mail service will complement the other two previously-mentioned components of the HealthNet Uganda network—data collection and information dissemination. If a user in the field has a question regarding a certain survey he/she is conducting, or if a doctor has a question concerning information found in the online medical journals, a simple e-mail can resolve the issue. In coupling cellular technology with the WideRay jack, PDAs users can continue to send and receive E-mails even when landline phone are down.

## IT Capabilities

HealthNet Uganda has been providing IT services to the Ugandan community through two pilot programs. The first pilot, in conjunction with the Uganda Red Cross Society (URCS) used PDAs in the blood screening process of URCS. HealthNet Uganda created PDA versions of URCS' blood screening forms and as blood donors came into URCS centers they were asked a series of questions which were available on the PDA. URCS staff entered responses to the questions on the form for each donor. The PDA form was created such that donors who failed to meet the minimum safety requirement were automatically screened and removed from the process. Thus, potential donors who did not meet the minimum safety requirements were eliminated in the first phase of the screening process, leading to greater efficiency, reduced costs, and most importantly reducing the risk of accepting infected blood into the blood bank. Six PDAs were issued and performed hot syncs nightly to transfer all new information to the main server at the headquarters. The pilot ended with positive results and the URCS is in negotiations with HealthNet Uganda to launch a full-scale implementation.

The second pilot is ongoing, with 300 PDAs distributed to key people in the government and education sectors. Users are finding the PDAs helpful in their daily time management as well as with reference for patient care. This pilot, now two months old, is further showing the positive effects of the PDA in healthcare.

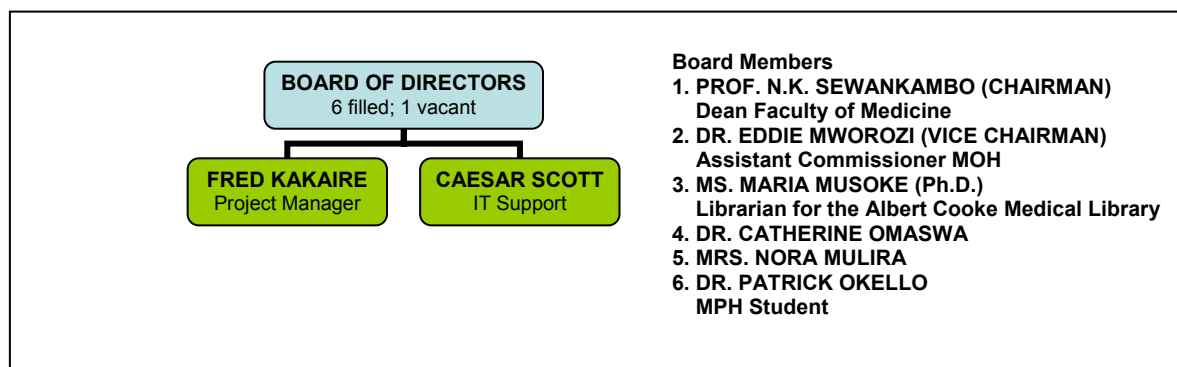
## ORGANIZATIONAL STRUCTURE

The Board of Directors currently consists of seven members from the medical profession. Members of the board hold positions at Makerere University, the Ministry of Health, and student groups. Of the seven positions, six are currently filled. The board is responsible for leading the strategic direction of the organization.

The board positions include President, Vice-President, Treasurer, and Secretary. The roles of Treasurer and Secretary have not yet been assigned.

While HealthNet is an independent NGO, it works in a close partnership with SATELLIFE, which has provided much of HealthNet's funding. SATELLIFE's role as the project sponsor involves providing input into the design and operation of the organization. SATELLIFE's role has primarily been to secure funding and establish strategic partnerships for HealthNet Uganda.

Figure 4. Organizational structure of HealthNet Uganda



### **Staffing and Development**

HealthNet Uganda is currently staffed by two IT professionals, who also serve as office managers, trainers, and liaisons to the Board of Directors. As HealthNet transitions to its new model, it will face an urgent need to employ more people to provide services to its customers. While sufficient talent exists within the local community to staff HealthNet Uganda, the organization would be well-advised to actively seek training opportunities for its employees—especially for technology developed outside of Uganda. HealthNet should be prepared to fully service PDAs and WideRay Jacks and should be sufficiently skilled to address most software related problems their customers will face.

### **PDA Distribution**

HealthNet Uganda currently does not have the capacity to sell PDAs to the target market. A system must be put in place to maintain the supply of PDAs to the customers. The current model assumes that HealthNet will sell PDAs to all of its customers, given that there are no other PDA vendors in Uganda. However, selling PDAs will prove to be a complex business and will require special attention from HealthNet Uganda. HealthNet Uganda could opt to secure PDAs on an as-needed basis from manufacturers or it could purchase a large number of PDAs which it can then sell to customers as they subscribe to HNU. Additionally, HealthNet could completely outsource the supply of PDAs.

### **Social Impact**

As HealthNet Uganda transitions to its new model, it will continue to have a positive effect on the health sector in Uganda. While HealthNet Uganda has not been able to create many jobs or generate revenue per se, it has already dramatically affected the lives of doctors and health practitioners who were fortunate enough to participate in the pilot study. Dr. Patrick Okello participated in the pilot program and also serves on the board of HealthNet Uganda. As part of his Masters in Public Health course, he was required to conduct field research in malaria. Armed with his PDA and customized survey form, Dr. Okello was able to interview subjects, easily gather data on his electronic survey form, safely store the data, and finally analyze the data swiftly and draw meaningful conclusions that could influence prevention and treatment of malaria. Dr. Okello stated that conducting similar research without the aid of a PDA would have been difficult, tedious, time-consuming, and full of errors. When asked if the PDAs were revolutionary, he enthusiastically responded, “absolutely.”

As PDAs become widely used, the effect will be even more dramatic. Among other benefits, doctors will be able to spot a tuberculosis or cholera epidemic more quickly, blood samples will be screened more efficiently, and patient records will be stored in a secure and easily accessible format.

## **BUSINESS MODEL ANALYSIS**

To further the analysis of the HealthNet Uganda project we felt that it would be appropriate to review the cost model created by the Harvard Business School team. It is important to forecast as accurately as possible the costs and expected revenues associated with the project. We isolated what we feel are the core components of the cost model and analyzed them below.

## Business Model Assumptions

These are the components to be analyzed as stated in the current cost model:

**Table 1. Projected sales figures, five year model**

Projected Sales	2003	2004	2005	2006	2007
Number of data contracts	4	6	8	12	14
Number of data users	2,500	7,500	10,000	11,000	12,000
Of which new PDAs	2,500	5,000	2,500	1,000	1,000
Number of subscription users	5,000	10,000	10,000	10,000	10,000
Number of subscribers to other services	2,500	3,000	3,500	4,000	4,500

**Table 2. Cost Model**

Item	Value
Cost per PDA (device plus software)	\$110
Cost per solar charger	\$85
PDAs distributed per dedicated staff member per annum	\$5,000
Cost per upload facility (WideRay device)	\$800
WideRay server	\$15,000

## Economic Feasibility

The target market consists of doctors, nurses, NGOs, and other healthcare workers in Uganda. Estimated market size figures follow:

- Government healthcare workers: 17,000
- NGOs: 1,000 (25% healthcare related)
- Health students: 2,000

The following market share table shows percentage of market share amounts to sales figures:

**Table 3. Percentage of market share corresponding to sales figures**

Target Market	Current	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
Government healthcare workers in Uganda	17,000	1,700	3,400	5,100	6,800	8,500	10,200	11,900	13,600	15,300	17,000
Total NGO users (250 NGOs x average 5 users per NGO)	1250	125	250	375	500	625	750	875	1000	1125	1250
Health Students	2,000	200	400	600	800	1000	1200	1400	1600	1800	2000
Total users		2,025	4,050	6,075	8,100	10,125	12,150	14,175	16,200	18,225	20,250
Projected growth in 2007 (4% growth)		2,369	4,738	7,107	9,476	11,845	14,214	16,583	18,952	21,321	23,690



Based on this analysis, with a 30% capture of the market, the first year would see the number of subscription users to be 6,075. And with a 4% growth per year, by 2007 the figure would be 7,107. It would be a challenge to achieve the goal of 12,000 subscription users by 2007. An extraordinary increase in NGOs and healthcare or a capture of 60% market share would be needed to support the projected growth. A reasonable target for the first year of implementation would be to capture 20% of the market share, totaling 4,050 users. With an incremental growth of 10% market share each year, the second year total would be approximately 6,075; the third year, 8,100. A realistic target for 2007 would be to have 50% of the market share captured, totaling 11,845 (accounting for a 4% population growth).

### **Revenue and Costs Analysis**

The main components of forecasting future revenues are the price of the PDA, the price of the monthly subscription fees, the adoption process and the technology infrastructure. The base price of the PDA, estimated through our analysis to be around US\$75, would make the purchase of a PDA by a Ugandan one of the most expensive purchases in that person's life. In a country where the GNI per capita is \$281, potential users will need to be convinced that this product will be of correspondingly significant value in their administration of healthcare.

The adoption process will initially be slow, as the technology will be virtually non-existent in Uganda. Once the service is proven to be useful and once key people in healthcare are subscribers, we forecast a steep rise in the growth rate.

### **Pricing**

HNU intends to sell PDAs at cost or cost plus a small fee to cover logistical and administrative costs. This price is anticipated to be around US\$75. Monthly subscription costs, which would include access to e-mail, data dissemination, and access to medical journals, is expected to be between US\$5 and US\$10.

### **Product variety**

The main product sold will be the entire suite of services made available to PDA users. This includes access to two-way e-mail (without attachments), data dissemination, and medical resources. Users will have the ability to upload and download as frequently as they like using the WideRay jack. This "full-suite" service will be the initial flagship product sold through HNU.

Should the need arise in the marketplace, these services can be separated and sold individually. For example, if a firm is only interested in e-mail service, HNU will have the ability to provide the isolated service and charge them a negotiated rate. Instances like this will be on a one-off basis and will be offered as the need arises.

### **Promotion: Advertising and/or Point of Sale Activities**

HNU will rely primarily on word-of-mouth advertising sparked through the success of the first two pilot programs. HNU staff and its Board of Directors have excellent contacts in the Ugandan healthcare and NGO community and through this network HNU will likely receive most of its initial business.

### **Technical Feasibility**

With over half a million cellular users dispersed throughout the country, Uganda is well positioned to take advantage of telecommunications technology.<sup>11</sup> This makes the HealthNet Uganda model a natural fit as cellular service is a necessity to facilitate transmission between rural areas and Kampala. Beyond the cellular network coverage, though, one must consider the practical challenges faced with the rural population using and maintaining a PDA. In the metropolitan area of Kampala, inhabitants are reasonably tech-friendly and should have little problem owning and maintaining a PDA. However, rural

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<sup>11</sup> *Global Mobile*. Vol. 10, No. 7. April 2003.

inhabitants generally have far less exposure to technology will need more training and attention through the learning process. HealthNet Uganda will need to invest in a training team that has the ability to provide ongoing training sessions, especially to those inhabitants in the rural areas.

Once the technological leap has been made and rural inhabitants are successfully integrated in the PDA network, other practical matters need to be addressed. The PDAs need only be recharged every four days or so, but in areas where the electricity is spotty, coming and going without a schedule, this could be a concern for users in those areas. Furthermore, the WideRay jack placement is a strategic issue that needs attention. In areas where one jack supports several users from different clinics and NGOs, the efficient placement of the jack is critical. The jack will need to be placed in an area where several entities can access at any time to upload their information. In clinics and hospitals where enough users are present to support their own in-house jack, this will not be a problem. But in the rural areas where one jack supports several clinics and NGOs, the placement of this jack will decide the success of the project in that town.

Finally, cellular coverage in Uganda will act as a natural limit to the expansion of the HealthNet Uganda project. As cellular coverage improves, the HealthNet Uganda target market will increase. However, where cellular coverage remains spotty, with unreliable cellular signals, the project will face difficulties overcoming the state of the national cellular infrastructure.

## **COMPETITORS**

Currently, HealthNet Uganda does not have any direct competitors in Uganda. The research of this report shows HealthNet as the only provider of PDA content (health or otherwise) and the only PDA supplier in Uganda.

### **Competitive Advantage**

HealthNet has a built-in first to market advantage and will not be significantly threatened by competition. In Uganda, HealthNet is the sole provider of health data and information through PDAs. However, its product is imitable and should business thrive, HealthNet could face competition from regional players in Kenya and South Africa.

If Ugandan consumers come to value PDAs and the accompanying content and are willing to pay a premium for the service, PDA manufacturers and distributors will have an incentive to sell their products directly to the Ugandan market. Additionally, other health organizations will have an incentive to market their content to PDA users. If this were to occur, it is likely that HealthNet would retain its competitive advantage for two reasons. While HealthNet does not manufacture PDAs and will therefore be unable to compete against manufacturers, it does not plan on generating its revenues from PDA sales. Thus, even with the entrance of PDA manufacturers, HealthNet will retain its market position. It could even be argued that it will be in HealthNet Uganda's best interest for PDA manufacturers to enter the market directly. The manufacturers will be forced to sell PDAs at a low price, giving more people access to the machine and thus increasing HNU's customer base for subscription and e-mail services. Further, if other organizations decide to provide content and service similar to HNU's, they will not pose a significant threat to HNU since HNU would already have the trust of a large segment of the health sector and partnerships with all of the key players in the field including the Ministry of Health, Mulago Hospital, and Makerere University.

## **CHALLENGES**

An undertaking as extensive as HealthNet's would likely face challenges under any circumstance; the added burden of operating in a developing country with limited infrastructure and limited resources nearly ensures that HealthNet's model will meet with many additional challenges.

### **Financial**

The greatest challenge facing HealthNet Uganda is finances. The financial challenges inherent in HealthNet's model range from the relatively high cost of PDA purchase price to the willingness of subscribers to pay for content or sign long-term contracts.

On average, PDAs loaded with the necessary software cost \$100. For a country where the average citizen exits on less than \$1 a day, building a business around a tool that costs \$100 seems imprudent at best. Outside of individual users, NGOs, government hospitals, and the Ministry of Health are HealthNet's primary customers. Uganda's 250 health NGOs range in size from small, with less than five employees, to very large, with over 100 employees. One thing they all share in common is a reliance on donor aid for survival. Furthermore, depending on the year and the timing of their projects, it can be common for NGOs to be strapped for cash. And despite of all of the benefits of the PDA, the purchase of the devices and the subscription to the service will likely be met with hesitation from the management of NGOs.

Similarly, as stated earlier, the Government of Uganda relies on donor aid for 50% of its budget. The Ministry of Health is not immune to the implications of such a heavy reliance on external funding and as a result must be judicious in undertaking expensive projects like the purchase of a fleet of PDAs. However, because the Ministry of Health is staffed by doctors, public health workers, and information technology experts, it recognizes the value the PDA would bring to the Ugandan health sector. Yet, only recently has the ministry managed to secure Internet connections throughout its headquarters and in satellite offices around the country. And by its own admission, electricity and, consequently, computer connectivity is sporadic and unreliable.

### **Leadership Team**

Cultivating effective leadership can be a challenge in any organization, but is an especially conspicuous one in nascent organizations like HealthNet Uganda. Yet, an adept leadership team is vital to HealthNet's survival.

Ideally, HealthNet should be staffed by professionals with wide ranging business, technical, and medical skills. As HealthNet ventures to become a self-sufficient entity, it needs management with business skills to generate interest in the product, acquire customers, and deliver promised services, all the while keeping operating costs lean. Additionally, HealthNet's management team will need to raise funds from varied sources including donors, banks, and potentially private investors.

HealthNet's leadership should also include professionals with high technical competence who can respond to rapidly changing customer needs and customize software and hardware as needed. Additionally, the technical team should have the ability to train the full spectrum of customers, some of whom may have no technical skills.

In addition to business and technical managers, HealthNet will also need medical professionals in its ranks. This group would advise the former on health needs, trends, and other useful market information. Doctors, nurses, pharmacists, and public health workers are more likely to understand customer needs and anticipate uses of the services.

In its current state, HealthNet is staffed by two technical personnel and has a Board of Directors comprised exclusively of Ugandan health professionals. While all of HealthNet's board members and staff are extremely competent, we believe that such a limited scope of expertise amongst its leadership constricts the organization's ability to achieve its ultimate goal of sustainability.

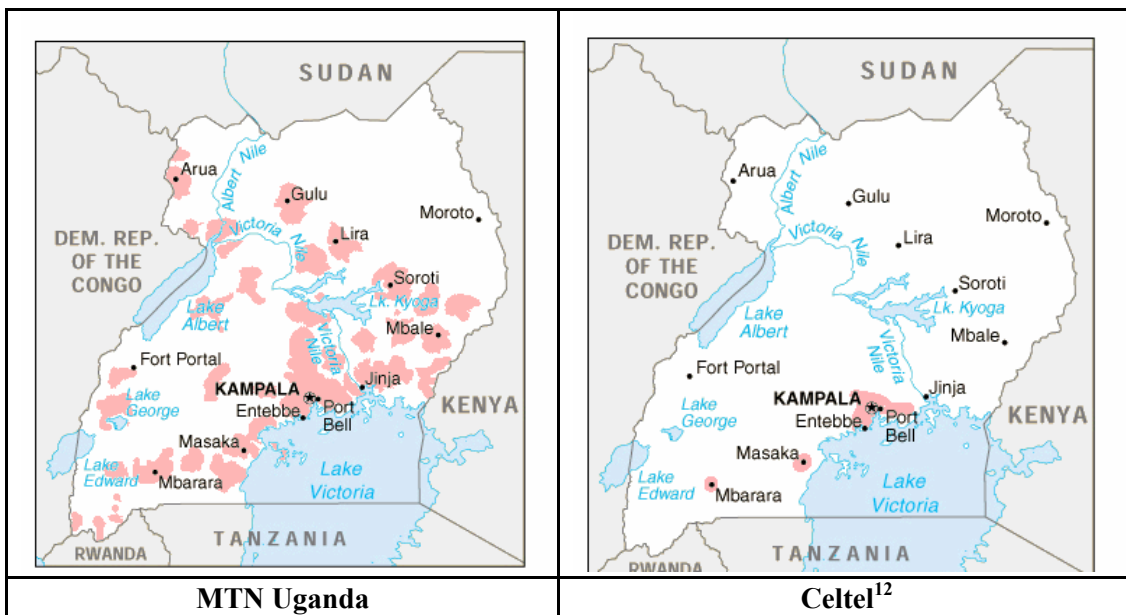
**Infrastructure**

Uganda faces several infrastructure constraints that could adversely affect HealthNet Uganda's operations, including energy, telecommunications, and transportation. While Uganda has significant hydroelectric power generation capacity, it currently produces less than 200 megawatts of energy, far less than what is required to provide constant electricity throughout the country. While battery life varies between models, most PDAs need to be charged at least twice a week. Without reliable electricity, PDA users may not be able to use the machine to its full capacity.

In addition to energy constraints, Uganda also has limited cellular coverage. While Kampala and other urban areas have cellular infrastructure, there are still many parts of the country, namely rural areas, where there is limited or non-existent coverage. The technology that HealthNet employs requires access to a cellular network to transmit data to and from the PDA users. Thus, HealthNet could potentially face a situation where doctors in the district hospital in Kaberamaido, a district with 122,000 residents, 30 hospital beds, and limited cellular coverage, will be unable to access HealthNet services reliably. It is difficult to imagine that health workers in Kaberamaido and other areas with limited telecommunications infrastructure will be willing to invest such significant resources to purchase PDAs and to subscribe to the HealthNet service if their access is sporadic at best.

The figures below show the coverage area of the two main carriers, MTN and Celtel.

**Figure 5. National cellular coverage by Uganda's two main providers**



While Uganda has excellent roads linking all its major cities as well as its primary trading partners, Kenya and Tanzania, the roads to the rural areas are of poor quality. HealthNet subscribers in these areas will need the most training and will have the least access to training resources and while HealthNet Uganda is

<sup>12</sup> <http://www.cellular-news.com/coverage/uganda.shtml>

committed to providing first-rate training to its users, transportation impediments could restrict its ability to do just that. If it takes a HealthNet staff member a full day to travel from Kampala to a health clinic in Arua, two days to conduct the training, and another day's travel to return, it is unlikely that the Arua clinic will receive the same level of service as Mulago Hospital in Kampala. Further, there will be cost implications of servicing customers in hard-to-reach rural areas and this is something that HealthNet needs to consider.

### **Security**

Security is another challenge that HealthNet Uganda will face. In the current model, WideRay jacks will be positioned in public spaces to enable multiple parties access to data transmission to and from PDAs. In HealthNet's current service model, customers will have to pay for the WideRay jacks, though this issue was still in discussion at the time of this writing. Whether or not HealthNet supports the cost for the WideRay jacks, there must be an emphasis placed on maintaining the security of the jacks, given their proposed placement in public areas. The WideRay jack is the most costly piece of equipment in the HealthNet technology system, and HealthNet cannot afford to compromise on the security of the WideRay jacks.

### **Technology**

PDA technology is maturing, as evidenced by the device's prominence in other parts of the world. Nonetheless, the full range of the technology has not been completely tested. The use of PDAs in healthcare is still relatively new, though growing rapidly. However, the countries in which such usage has been fully tested are typically developed countries with sophisticated infrastructure. Using PDAs in Uganda's health sector has a unique set of challenges, including technological challenges.

### **Testing**

With the introduction of new hardware and software, technical glitches are inevitable. HealthNet has distributed over 150 PDAs to health workers, but has not yet made the full range of technology available to them (e-mail, interactive communication). Thus, there has not been a conclusive test of the infrastructure model (WideRay to PDA to central server) that HealthNet plans to utilize. Nor does HealthNet have a contingency plan for when WideRay and PDA hardware and software systems malfunction.

### **Adaptability**

With only .5 computers per 1000 people, it will take time for Ugandan customers to adapt to PDA technology and fully utilize its resources. However, since the majority of targeted customers are educated health workers, it is believed that with adequate training HealthNet users will be able to adapt to the everyday use of PDAs.

### **Implementation**

Implementation is a very important element to consider, with several variables involved. A staged approach of implementation is recommended corresponding to the level of infrastructure in the district.

Operational challenges could plague HealthNet Uganda unless they are addressed early on. In order to gain the confidence of its customers, HealthNet has to provide first-class customer response systems.

### **Customer Service**

HealthNet needs the staff and the support to respond to customer needs as diverse as training, servicing PDAs, handling malfunctioning WideRay jacks, and managing theft, among others.

### *Billing*

HealthNet will need systems that address billing customers, tracking payments, handling late or delinquent accounts, and terminating services when necessary.

### *Privacy*

HealthNet must guarantee that all information uploaded to its servers through the WideRay jacks will be secure. Health records and health expenditures are just a few examples of the information that customers will demand stay secure.

## **KEY LESSONS**

In summary, HealthNet Uganda is well positioned to lead the way for the use of ICT in healthcare in Uganda. Through the support of SATELLIFE, HNU has created a competent staff of workers, a Board of Directors that consists of major players in the health sector in Uganda, and has identified a need for technology in healthcare Uganda.

The implementation of this ambitious project will undoubtedly face challenges along the way. Uganda's technical infrastructure is still evolving and will soon require further bolstering of its technology. Uganda's limited cellular network and unreliable power supply create natural limitations to the growth of HNU. Additionally, the price of PDAs and HNU service will be a deterrent to widespread adoption. However, by following a thoughtful and staged strategy, HNU can overcome its numerous challenges and achieve its stated goal of revolutionizing healthcare in Uganda in particular and Africa in general through the use of ICT.

In its early stages of development there are several steps that HealthNet Uganda must take to ensure that the rest of the implementation goes according to plan. Imminent steps include raising sufficient funds to implement the project, hiring qualified staff to support the current HNU staff, and putting in place the recommended advisory board. As with any new venture, the project will need enough funding to support the building of the needed infrastructure and cover operational costs until the venture reaches breakeven.

There is an important need for a dedicated and visionary Board of Directors that would set the strategic direction for HealthNet Uganda. However, there is also a need to have an advisory board that can advocate for HNU to key constituents, partners, and donors. We firmly believe that HNU will benefit tremendously by attracting individuals from the business community, social investment community, government, and international foundations. These individuals will not only promote HNU in their various industries, but would also advocate for HealthNet's and SATELLIFE's larger vision of transforming healthcare in Africa through the use of ICT.

HNU is well suited to be a leader in its chosen space—it has a clearly articulated and achievable vision, it has a competent and well connected staff and Board of Directors, it has the support of leaders in the health sector in Uganda, and it has sufficient international backing. In conclusion, we are confident that with continually good leadership, active support from international partners and Ugandan health officials, and the confidence of health practitioners, HealthNet Uganda will successfully transition to a self-sustaining social enterprise.

## **APPENDIX 1. Recommendations**

The following recommendations are aimed at addressing the challenges outlined in the section above. They are in no way exhaustive, but are rather a guide which the authors believe HealthNet Uganda can expand upon and manipulate as they see fit to address the aforementioned challenges.

### **Consumer Education**

In order to tap the full potential of a new market, a critical first step involves creating awareness among the targeted users. HealthNet Uganda must invest in educating health workers in Uganda on the benefits of the PDA and corresponding HealthNet service. There are numerous, cost-efficient ways to embark upon building consumer awareness.

### **Pilot Project**

The two pilot projects that are underway at HealthNet Uganda will have far-reaching benefits for the organization. As previously mentioned, the first pilot was in collaboration with a customer, Uganda Red Cross Society (URCS). The pilot was so successful that URCS is considering a full implementation in the near future. The success of this pilot will give other potential customers the confidence to invest in HNU services. The second pilot involved distributing 300 PDAs to influential individuals in the healthcare sector. The participants included officials at the Ministry of Health, doctors and administrators at several Kampala hospitals, administrators at Makerere University and medical and public health students. The expectation is that this group of individuals will serve as advocates for HNU products and services. In order to maximize the benefits from both pilots, it is necessary for HealthNet Uganda to emphasize the power of their offerings. An active approach should be taken to ensure that pilot participants are fully aware of the ground-breaking benefits of HealthNet Uganda offerings. This can be accomplished through monthly demonstrations and case reports, where an aspect of the PDA is examined in depth or where success stories are reported.

### **Business Strategy**

As a service provider, HealthNet Uganda must also proactively find ways to develop strategies and tools to enable their customers to perform better. By actively reaching out to individual NGOs, health centers, and universities with customized solutions, HealthNet can broaden their base, especially if they intend to expand outside of the health sector.

### **Advertising /Communications**

HealthNet Uganda should make use of all available vehicles to get their message out. The Albert Cooker Medical Library publishes a widely read Health Digest three times a year. HealthNet has been mentioned in the Digest, but has not yet been featured prominently. HealthNet should arrange for a full profile in the Digest, complete with services, benefits, and general cost information. Additionally, HealthNet should focus on getting profiled in international journals and papers to further strengthen their brand. Newspaper ads, University publications, and Ministry of Health reports are additional mediums through which HealthNet can communicate their message.

### **Training**

HealthNet currently provides training to its customers and should continue to engage its audience by encouraging the development of broader skills in technology while demonstrating the specific benefits of the PDA. HealthNet must position itself as a conduit of change in the health sector by holding workshops for health workers on the benefits of ICT in healthcare and the applicability of PDAs.

As with most new technologies, demand is expected to increase dramatically once the market is aware of the benefits of the tool and recognizes the value it brings.

## **Funding**

While HealthNet Uganda aims to be a self-sustaining enterprise, it should still seek external funds to supplement its revenue. As a social enterprise, HealthNet Uganda has access not only to government funding, but also to capital from social investors. HealthNet Uganda must engage in strategic partnerships to share its operating costs. Obtaining ancillary funding will allow HealthNet Uganda to launch its services from a position of strength, thereby increasing its chances of success. A few sources of external funding sources are as follows:

### ***Local Investment***

Opportunities exist for HealthNet Uganda to secure local investment from the private sector. Telecommunications companies, banks, and other private businesses that have a record of supporting social causes will undoubtedly be attracted to HealthNet's model. However, prior to approaching potential investors, HealthNet should clearly define its funding and ownership strategy.

### ***Social Venture Philanthropists***

In the non-profit capital market it is important to understand the return sought from the investor, i.e. social or financial. Social Venture Philanthropists (SVPs) provide seed capital for innovative social or economic programs.<sup>1</sup> Unlike traditional investors, their return is seen in the social value that the venture creates. HealthNet Uganda should explore funds from SVPs.

### ***Foundations***

HealthNet Uganda is already in discussions with international agencies that support development activities using ICT including, IDRC, the Gateway Development Foundation, and the World Bank. In addition, HealthNet Uganda should target private foundations for grants and technical support. The Bill and Melinda Gates Foundation supports healthcare and technology development in Africa. HealthNet should explore a partnership with such a foundation and continually explore opportunities with other foundations.

### ***Major Corporations***

HealthNet Uganda can make investments available to major corporations interested in telecommunications and its development in Africa. Many U.S.-based companies including Microsoft, Motorola, and Lockheed Martin are already investing in infrastructure development in Africa. HealthNet needs to position itself such that it is attractive to broad set of investors.

Pharmaceutical companies have lately come under heat for failing to provide affordable antiretroviral drugs to AIDS patients in Africa. A few companies have responded to the criticism and are working in partnerships with some African governments, including Uganda, to provide affordable AIDS drugs. HealthNet should target such companies as potential partners and sponsors. HealthNet promises to revolutionize healthcare with technology. Pharmaceutical companies would be wise to partner with an organization that provides tangible solutions to healthcare delivery. Doctors wishing to learn more about a particular AIDS drug will be able to access that information instantaneously with the use of HealthNet Uganda PDAs. Similarly, PDAs can be used at HIV testing sites and will provide better accuracy and a simpler way of tracking statistics.

### ***Government Funding***

Discussions have already begun in the Ministry of Health to add the PDA support to the national budget. HealthNet Uganda must be prepared to make a presentation to the National Steering Committee and make

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<sup>1</sup> Emerson, Jed (Fellow in Philanthropy), [The Nature of Returns: A Social Capital Markets Inquiry Into Elements of Investment and the Blended Value Proposition.](#)



a case for the benefits the PDA. Highlighting the economic and social benefits associated with HealthNet services should be a major part of their presentation.

### **Partnerships**

Developing productive, mutually-beneficial strategic partnerships inside and outside of Uganda will be key to HealthNet's success. HealthNet Uganda must identify relevant industries, firms, and individuals and vigorously pursue those relationships that could facilitate its transition to a self-sustaining enterprise. We have concluded that it will be extremely difficult for HealthNet to pursue its objectives to sell PDAs and content to health workers if it purchases the machines at market prices and uses standard telecom rates to transmit data. Rather, HealthNet can hope to succeed by finding alternative ways to do business with PDA manufacturers, telecom providers, and even large customers like the Ministry of Health. We recommend that HealthNet pursue partnerships with firms or individuals in the following arenas:

#### ***PDA Manufacturers***

Pursuing relationships with PDA manufacturers should be a priority for HealthNet Uganda. There are several ways to do this. HealthNet may simply contact one of the large manufacturers and state its case and request PDAs at reduced prices. In return, the manufacturer may use their relationship with HealthNet for publicity purposes. Since HealthNet is a non-profit organization, it is conceivable that it could receive a number of machines this way.

Additionally, HealthNet should explore using refurbished PDAs through a partnership with a manufacturer. The benefit for the manufacturer will be exposure in a new market as well as positive publicity.

#### ***Uganda Ministry of Health***

The Ministry of Health is a natural partner for HealthNet Uganda. This partnership has existed from the beginning of the venture. Therefore, HealthNet should focus its energies on exacting maximum benefit for both parties from the relationship. The Ministry of Health, through public service announcements, brochures, and site visits, should promote the use of PDAs to health workers. The Ministry of Health has already made the use of ICT a strategic objective and HealthNet's work promotes that goal. For HealthNet, the Ministry of Health could potentially be its largest client. It is in HealthNet's best interest to work in conjunction with the Ministry of Health.

#### ***Wireless Providers***

HealthNet will rely heavily on the networks of one or several of the telecom companies in Uganda. If HealthNet were to use these any of the networks at their standard rates, the entire business model would collapse. Thus, HealthNet has to secure at least one telecom company as a partner. HealthNet should focus on negotiating long-term rates with one of the telecom providers.

Additionally, HealthNet should sell the telecom company on the correlated benefits of their service (i.e. the PDA will facilitate better healthcare delivery; more healthy Ugandans means more cell phone users). Further, the government of Uganda stipulates a minimum social contribution from all private enterprises. Therefore, HealthNet can negotiate a deal with a cellular provider to receive discounted rates as part of that provider's "social contribution."

#### **Strategic Leadership Team**

If HealthNet Uganda is to revolutionize healthcare in Uganda through PDAs, then it has to have the full cooperation of all stakeholders, service providers, donors, peer businesses, and the government of Uganda. An active, informed, and involved Board of Directors is one way to achieve the goals defined by HealthNet Uganda.

Typically, board members are selected for a number of reasons, including a vested interest in the company, technical expertise, or exceptional accomplishment in their chosen field. However, their common purpose should be to advance the goals of the organization drawing upon the resources for which they were selected to join the organization's board.

We have identified a need to diversify HealthNet Uganda's current board. Because the current board is operational, it would be imprudent to change its structure without offending sitting members, who may prove to be future allies.

Thus, we recommend the formation of an ancillary board that would serve as an advisory group and as ambassadors for HealthNet Uganda worldwide. We will henceforth refer to this group as HealthNet Uganda Advisory Board. Members of this board should be selected based on strategic needs of HealthNet Uganda. We have identified strategic partnerships that would be beneficial to HealthNet. An extension of that would be to select board members who can establish and maintain those partnerships. A few recommendations are as follows:

#### ***Telecom Representative***

An alliance with a major telecom service provider is arguably the most critical of HealthNet Uganda's partnerships. Data to and from PDAs, e-mail, and customized forms will all be transmitted through a network owned and serviced by a telecom company. We highly recommend that HealthNet targets the senior-most management of the major telecom companies to serve on its advisory board. The role of this representative will be to assist HealthNet Uganda in negotiating the best contracts with the telecom service providers and in maintaining and improving upon the established relationship.

#### ***PDA Manufacturers***

While HealthNet Uganda plans to source PDAs from several manufacturers, it is advisable that HealthNet Uganda target a leading executive in the industry to serve on its board (regardless of whether or not HealthNet Uganda exclusively sources PDAs from the representative's company). The role of this representative will be to help HealthNet get the best value for PDAs and to keep HealthNet's technology team in touch with the latest innovations in the PDA space..

#### ***Minister of Health***

Rather than have junior officers from the Ministry of Health, we believe that by having the Minister of Health serve on the advisory board of HealthNet both organizations will exact maximum leverage. Further, the presence of the Minister illustrates the commitment of the Ministry and the government of Uganda to ICT as a whole and HealthNet specifically, which will in turn boost the confidence of investors, stakeholders, and donors.

#### ***Consulting Firms***

A senior partner in one of the major consulting firms operating in Africa should be a member of the advisory board. Consulting firms could provide indispensable strategic and financial advice to HealthNet. Some of the major consulting firms operating in Uganda include, Ernst & Young, PriceWaterhouse Coopers, and KPMG. Others firms like McKinsey & Company, Bain, Boston Consulting Group, and Abt Associates operate in other parts of Africa but may conduct business in Uganda.

#### ***Social Venture Philanthropists***

A representative from this burgeoning field would be a natural addition to HealthNet Uganda's advisory board. The role of the social venture philanthropist would be to assist HealthNet Uganda in raising money.

### ***Pharmaceutical Companies***

With growing pressure on pharmaceutical companies to provide discounted drugs to Africa and with the mounting willingness of pharmaceutical companies to partner with African companies, it is advisable for HealthNet Uganda to target senior pharmaceutical executives to sit on its advisory board.

### ***Foundations***

A representative from one of the major foundations that provides grants to health and ICT organizations in Africa should be targeted to sit on HealthNet Uganda's advisory board. The role of the Foundation representative will be to assist HealthNet Uganda in securing grants and donations.

### ***Scalability and Transferability***

HealthNet Uganda must equip their team with the necessary skills to predict the needs of their customers. Thinking beyond e-mail, data collection, and information dissemination, HealthNet must package their services as application development. Customized applications can be developed quickly for their clients, ensuring success of their clients with the use of ICT and the growth of their organization. Encouraging the development of innovative technology services will be vital to its sustainability. HealthNet must be ready to provide upgrades to their services and be able to respond to technological advances and changing customer needs.

HealthNet Uganda must consider taking the model to regional locations. The use of PDAs will not only prove of use in Uganda but also in neighboring African countries. In defining its model of operation in Uganda, HealthNet must be aware that of the regional opportunities that exist. Having a model that is both scalable and transferable will provide room for growth and expansion.

## **APPENDIX 2. District Listings**

Adjumani, Apac, Arua, Bugiri, Bundibugyo, Bushenyi, Busia, Gulu, Hoima, Iganga, Jinja, Kabale, Kabarole, Kalangala, Kampala, Kamuli, Kapchorwa, Kasese, Katakwi, Kibale, Kiboga, Kisoro, Kitgum, Kotido, Kumi, Lira, Luwero, Masaka, Masindi, Mbale, Mbarara, Moroto, Moyo, Mpigi, Mubende, Mukono, Nakasongola, Nebbi, Ntungamo, Pallisa, Rakai, Rukungiri, Sembabule, Soroti, Tororo, Kaberamaido, Kamwenge, Kanungu, Kayunga, Kyenjojo, Mayngc, Nakapiripiti, Pader, Sironko, Wakiso, Yumbe

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