Mobile Home-based Healthcare

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Agenda

• Introducing the KUJALI Project
• Healthcare beyond healthcare facilities
• Technology to facilitate care
• Mobile technology as an option
• How to design technology solutions collaboratively
Home-based Healthcare Landscape
Care giver perspective

How can/should ICT be used to provide for better communication between healthcare professionals and care givers?

How can/should ICT be used to better support the care service?

How can/should ICT be used to better capture care data without taking the attention away from the patient?
Sister, Care Giver and Patient
Care coordinator with care forms
The Context

Motherwell & Idutywa, Eastern Cape

The Need for Care

Current Technology – Paper-based

The Method: Co-Design

By Whom: Interns

The Solution: Mobile Applications
The need for HBHC in South Africa is enormously high due to

- High incidence of HIV/AIDS, TB, cancer and other chronic illnesses
- TB is the highest cause of death countrywide according to Stats SA
- Home-based healthcare provides an alternative service to deal with
  - The large amount of population living in rural areas cut off from services and infrastructure
  - overburdened public facilities
  - In South Africa these services are provided by local non-profit, non-governmental organisations
  - a decentralised health service offered at local clinic level can improve the delivery of services;
  - it would reduce transport costs and significantly improve service access and utilization
Data Capturing Findings

• In the home-based care service path little to no attention is given to the caregiver’s data recording and communication needs;
• patients and their supporters have little to no access to useful information that may be relevant to their care;
• data recording and processing is still manual resulting in many hours spent by caregivers and administrators on these activities rather than the care service;
• reporting of cases is cumbersome because access to data is not easy and processing is still mostly manual;
• managers do not have sufficient quality data to manage their caregivers’ visits.
Purpose of accessing m?

**Definition** of m-health (WHO, 2011):

- **mHealth** is a **component of eHealth**. To date, no standardized definition of mHealth has been established. For the purposes of the survey, the Global Observatory for eHealth (GOe) defined mHealth or mobile health as **medical and public health practice supported by mobile devices**, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices.

- mHealth involves the use and capitalization on a mobile phone’s core utility of voice and short messaging service (SMS) as well as more complex functionalities and applications including general packet radio service (GPRS), third and fourth generation mobile telecommunications (3G and 4G systems), global positioning system (GPS), and Bluetooth technology.

- By the **end of 2010**, there will be an estimated **5.3 billion mobile cellular subscriptions** worldwide,

- Access to mobile networks is now available to **90%** of the world population and **80%** of the population living in rural areas.
Why use Mobile Technology?

• There is a need for a healthcare system that is usable anytime, anyplace and to anyone authorised is growing (Katz & Rice, 2009; Lee et al., 2009)
  – removing location, time and other restraints while increasing coverage and quality
  – benefits in terms of portability, immediacy, convenience, comparatively low unit cost and efficiency
  – mobile solution at the point of care
  – ideal for home-based healthcare (take it to the patient)
  – can also provide location identification

• It enables the connecting of different communities to exchange data and experiences — result in better connection to healthcare service providers — enable citizens to become more involved

• It supports the shift away from treating acute and chronic diseases to prevention and wellness
A SYSTEMS PERSPECTIVE

the Use Case diagram
co-design
PROTOTYPE

prototyping scenarios

PATIENT DETAILS:
Vuyiso Mbane
7205116813482

STATUS:
CAT 2
Diabetes Type 2
Wound Care

OBSERVATIONS:
Temp: 38°C
H/R: 85 bpm

ACTION PLAN:
Clean wound
Ointment
Dressings

CAREGIVER LOGIN

ENTER PATIENT NO.
Co-Design Findings

- Initially the caregivers were sceptic of the phone capability
- navigation and data capturing preferences indicated that they preferred not to enter text but to use drop down lists and selection boxes
- lo-fidelity prototypes are easy to understand
- The care givers were excited about the digital memory and automatic functional advantages.

Findings specific to the method are:
- hand drawn materials are friendlier than hard coded technology
- hand drawn materials are more susceptible to change than hard coded technology
- paper prototyping saves valuable time on programming.
Mobile Interface

Java
Open source DBMS
JSON to retrieve and send Information to the DB
WAP to send and receive data
LWUIT framework to create The look and feel on the Mobile phones
Admin Application

Platform:
J2ME
VAADIN
Findings of the Development Phase

- The **role of designer** was crucial to obtain a good understanding of how to design an appropriate mobile interface.
- The **translation of the mobile interface design to code** was difficult because the limitations of mobile phones used as well as the level of the users presented serious constraints on what was possible and appropriate.
- **Different versions of code** is necessary to support the **different mobile phones** used.
- **Network coverage and availability** is an important consideration that influences how and when data is transmitted.
- The **translation from the emulators** used to develop the mobile application on a personal computer to the actual phone did not always produce the same results on the mobile phone.
- It was difficult for **team members to understand what each other** has done and to learn how to use the new development tools.
- **Testing was much more difficult** than expected where mobile applications introduce more variables to consider during testing.
Complexities of using Mobile Solutions
Training Caregivers on Social Media
I had a very busy week with my patients most of them are bedridden and some are very emotional. One of them is going to hospital today for his legs; they are going to amputate both his legs. I really felt sorry for the other day because he didn’t want to go through with [it]. I had to talk him through it because there’s nothing doctors can do to save his legs because the gangrene did spread right through both his legs. I really felt for him because his going through so much pain...wish I could take the pain away.

IN KHANYISWA’S SHACK EARLY AFTERNOON
Khanyiswa (28 years old, tall dark and slender) is lying in bed with beer bottles all around her shack; her mother walks in and starts collecting the beer bottles trying to clean the room. Khanyiswa wakes up to the noise. Thembeka (65 years old, medium height) speaks to Khanyiswa as she cleans the shack

THEMBEKA
My child you know you cannot live like this, I think you need to move in back home with me

KHANYISWA
Mother please, I don’t need you constantly coming here

THEMBEKA
Just come home with me Khanyiswa, please

KHANYISWA
(shouting)

What is the point mother, The reality is that I have Aids and I am dying mother, maybe you need to accept that.
MULTIPLE NATIONALITIES

- South African
- Cameroon
- Angolan
- Nigerian
Collaboration with users and external stakeholders
TEAM WORK

Working together and building teams
CO-DESIGN
PROTOTYPES
This mobile application is intended to supplement and replace the paper forms used by the Caregivers in their day-to-day activities.
Patients’ information are safely and easily captured and then transmitted to the care service providers.
The CDA was developed with close assistance of the Stellenbosch Hospice in Cape Town.
This project focuses on creating patients’ health records which can be used in a variety of potential situations within and outside of consulting rooms and consulting hours.
With this application, caregivers can have access to patients’ medical data on their mobile phones at any given time.
The mobile interface will allow community members to have access to informative and educational contents anywhere and anytime.
“Edutainment” contents are used to inform the public about important issues ranging from sexual education to awareness of diseases such as HIV/AIDS and TB.
This is a research into the process of impact assessments on the Socio-Tech Project (projects that attempt to use technological innovations to contribute to or address some aspect of society).
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