

Use of PDA and GPS device for data collection of Vitamin A Survey with reference to Appforge Visual Basic Software Package



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Introduction and Background

- ◆ What are PDAs and Handheld Computers?
- ◆ Why PDAs are Hot
- ◆ PDA Projects in Nepal in Health Sector

What are PDAs and handheld computers?

Personal Digital Assistant (PDA)

A small computer that literally fits in the palm of your hand. More limited than a desktop computer, but useful for survey, address books, and increasingly, other applications

Handheld Computer

Often used interchangeably with PDA, palmtop, or pocket computer; a broader term including PDAs, smart phones (PDA/mobile phone hybrids), tablet PCs, and other new products that shrink technology into smaller, more powerful pieces of equipment.



Palm m130

Key Differences in Devices

Operating System/Application Availability

- Palm OS (considered easier; currently more applications)
- Windows Mobile/Pocket PC (simplified version of Windows)

Physical Characteristics

- Size/weight (1.4 oz to 1 lb)
- Grayscale/up to 16-bit color

Power

- Memory (8 MB to 64 MB standard)
- Battery Life (AA or rechargeable)

Extras/Peripherals (wireless, headphone jack, voice recorder, camera)

Cost (\$99-\$700)

Why PDAs are Hot

- ◆ Mobility (On-the-go, 24/7 access)
- ◆ Simplicity (Instant-on; ease of use and understanding)
- ◆ Organization (Keeps schedules, tasks, e-mails, documents and other forms of information consolidated and coordinated)
- ◆ Low Cost (Very cost-effective relative to other forms of computer technology)

Hot Sync

Synchronization of your data from the PDA to your desktop. Compares data entered on the PDA and on the desktop and makes one new, complete record of data in both places.

Most often *sync* through a *cradle*, which connects through a cable to your desktop computer. Also through a modem (dialup), an Ethernet connection, an IR port



Hot Sync Button →

Beam



Using the infrared port, can share information with other users, called *beaming* – no wires, no direct connections

Convenient for sharing business cards or calendar events, trading applications, and more.

What are PDAs most commonly used for in health sector?

- ◆ Epidemiological survey
- ◆ Behaviour surveillance survey for HIV presentation
- ◆ Routine monitoring and logistics management
- ◆ Telemedicine with still images

Introduction and Background

- ◆ First time in Nepal, PDA technology in combination with GPS has been introduced to health care service providers
- ◆ This work is carried out by SatelLife Inc., Boston, USA in Partnership with HealthNet Nepal.
- ◆ PDAs and emerging technologies provide unprecedented opportunities to move information to where it is needed for.

Introduction

- ◆ Can put information in the hands of health workers in environments having lack of electricity, telephone lines and books not readily available and Internet may still years away.
- ◆ PDAs are powerful tools for data collection

Introduction...

- ◆ Provides rapid access to information to policy makers and health planners to respond and prevent disease outbreaks, practice sound resource management and track public health issues.

Introduction ...

- ◆ The pilot test was concentrated to two programs.
 - To assess compliance with facility and staffing standards for Nepal Family Health Project (NFHP)
 - To collect the data about the effectiveness of Vitamin A Survey for NTAG.

NFHP forms

- ◆ NFHP form is in English using the software package Pendragon

Vitamin A Survey Forms

- ◆ Used to measure the effectiveness of and bi-annual vitamin A distribution campaign
- ◆ Surveys are administered in the local dialect (Nepali)
- ◆ PDA unit first had to be prepared to display Devnagari Font

Vitamin A Survey..

- ◆ Survey see questions written in local script
- ◆ Backend database in Access will record the answer in English for reporting and analysis

Objectives

- ◆ To replace the conventional paper work
- ◆ Efficient data collection
- ◆ Time saving
- ◆ Introducing new technology by the combination of GPS and PDA.

Functions

- ◆ Gives easy interface the questionnaire for in Devnagari script.
- ◆ Allows to use pre-validation and post-validation at the time of data collection
- ◆ Can store large number of answers to the questionnaires

Functions..

- ◆ It allows to empty the database to the authenticated user
- ◆ It allows to search the particular record in the entire database.
- ◆ It allows to review the entered data in the database
- ◆ It allows to sort the records choosing index either in ascending or descending order.

Methodology

Procedure

Data collection

Field staff members recorded all data two times,

once Using preprinted paper data collection forms and

Other time using data entry forms on a PDA with the same respondent

Materials

Paper.

Created paper data collection forms to be completed for each community event.

Forms contained yes /no, numeric, multiple choice, check-all-that apply, and text field types. Forms varied in length and complexity.

Materials..

Devices used when data collected through PDA:

- ◆ M130 PDA
- ◆ eTrex GPS
- ◆ Data entry is pen based, meaning a pen-like stylus is used to tap or write on a touch screen
- ◆ AppForge Mobile VB and Code Warriror v 9.2 for palm (software used) for Devnagari script form

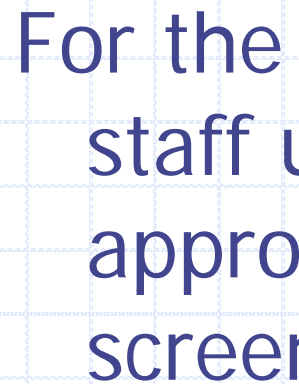
Materials..

Data from the PDA were synchronized with a desktop PC via a cradle attachment.

Using Pendragon Forms 3.1 PDA software data entry form were created that were nearly identical to the paper forms of English language i.e.NFHP

Materials ..

The scripting feature of Pendragon Forms 3.1 allowed to create multiple field types as well as real-time data validation for the PDA in the form of automatic branching, range limits, and mandatory fields without using any formal programming language.



For the majority of field types, the field staff used the stylus to tap the appropriate response on the PDA touch screen.

Materials..

- ◆ Questions on the PDA were presented one at a time to the user. When a given question was answered, the next question was automatically displayed.
- ◆ Data from the PDA were synced directly into an MS Access data-base immediately following data collection.

eTrex GPS

- ◆ The eTrex operates on information gathered from satellites.
- ◆ The eTrex need to receive at least three strong satellite signals to find the location
- ◆ It has a built-in GPS antenna and five user-buttons.

AppForge Mobile VB and Code Warrior for palm

- ◆ AppForge Mobile VB and code warrior software is a is designed specially for the mobile devices.
- ◆ It supports mobile computers, phones, barcode scanners, and other devices running Palm OS, Microsoft pocket PC, or symbian OS.

Steps involved in Mother Survey Application of Vitamin A Project

- ◆ Create the palm compatible database
- ◆ Create the palm compatible font
- ◆ Form design
- ◆ Software used were Appforge v 4.0 and CodeWarrior 9.02.
- ◆ Since the Appforge does not have facility of integrating GPS code in the survey form so CodeWarrior was used.

Create Palm Compatible..

- ◆ First step is to convert Access database into Palm compatible palm database.
- ◆ Has extension PDB
- ◆ PDB is converted through utility of Appforge Mobile VB

Palm Compatible Font

- ◆ Convert the True Type Font into Palm Compatible Font.
- ◆ Has extension .CMF
- ◆ Font Conversion Utility of Appforge Mobile VB used for conversion

Form Design

◆ Fields identified are of 8 types:

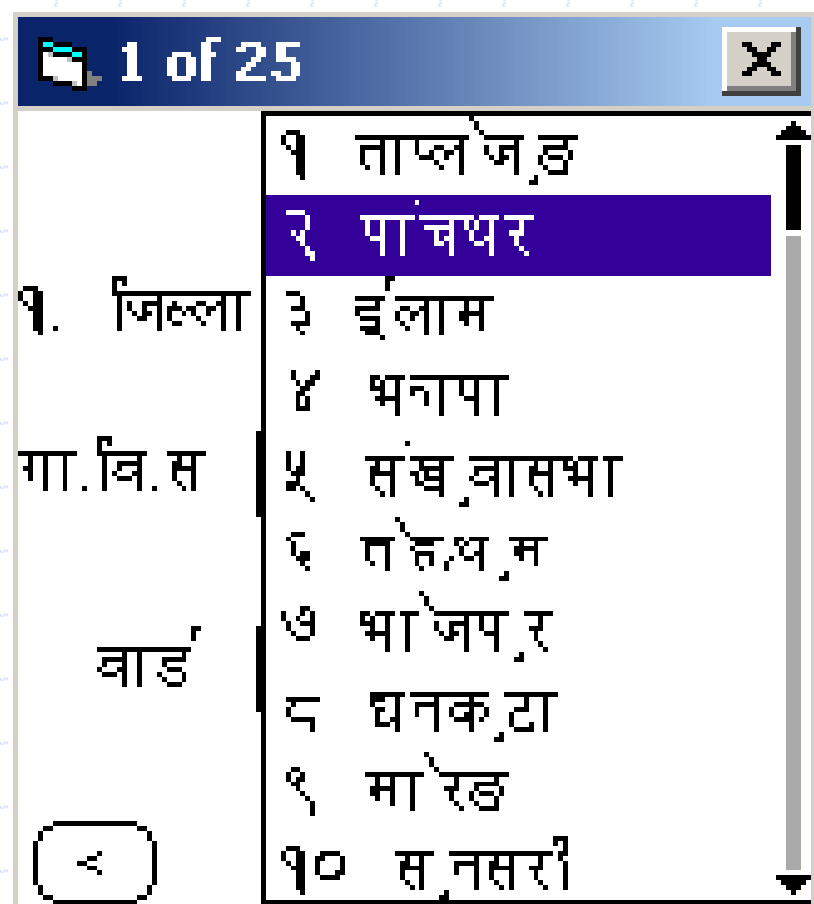
- Date Field
- Text Field
- Numeric Field
- Pop-up Field
- Numeric Table

Form Design..

- ◆ Radio Button
- ◆ Yes/No Check Box
- ◆ Yes/No/Don't Know Check Box
- ◆ Multiple Selection Field

Form Design: Pop-up Field

- ◆ These field is generally used to list out two or more than two value from which only one is to be selected.



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१. जिल्ला	१ ताप्लेजुङ
गा.वि.स	२ पांचथर
वाड	३ इलाम
	४ भनपा
	५ संखुवासभा
	६ ललेश्वर
	७ भाजपुर
	८ घनकटा
	९ मारेङ
	१० सप्तरी

Form Design: Multiple Selection

◆ The multiple selection allows the multiple values to be selected. It uses the series of checkboxes each for one selection.



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१२. क्यापसल वितरण बार कसरी/कसबाट थाहा पाउन,भया ?

मं.खा.ख.सं./गा.खा.का.

टो.भि

लिप'नलेट (पचा)

प.चारप.सार बजारमा भएका

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Form Design: Yes/No Field

- ◆ The YES/No field uses two radio buttons for Yes/No selection and three radio buttons for Yes/No/Don't know field. The radio buttons allows only one value to be selected.

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२१. आमाका लागि मात्र: के तपाईंलाई 'कहिल्यै' रतन्धा भएका छ ? (आमा तभएमा उत्तरदाता महिला भए निजकै बारेमा साहेन)

छ छैन

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२०. के तपाईंकाे बच्चालाई रतन्धा/रतानै भएकाे छ ?

छ छैन

थाहा छैन

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Form Design: Look-up field

These are similar fields as described in popup fields

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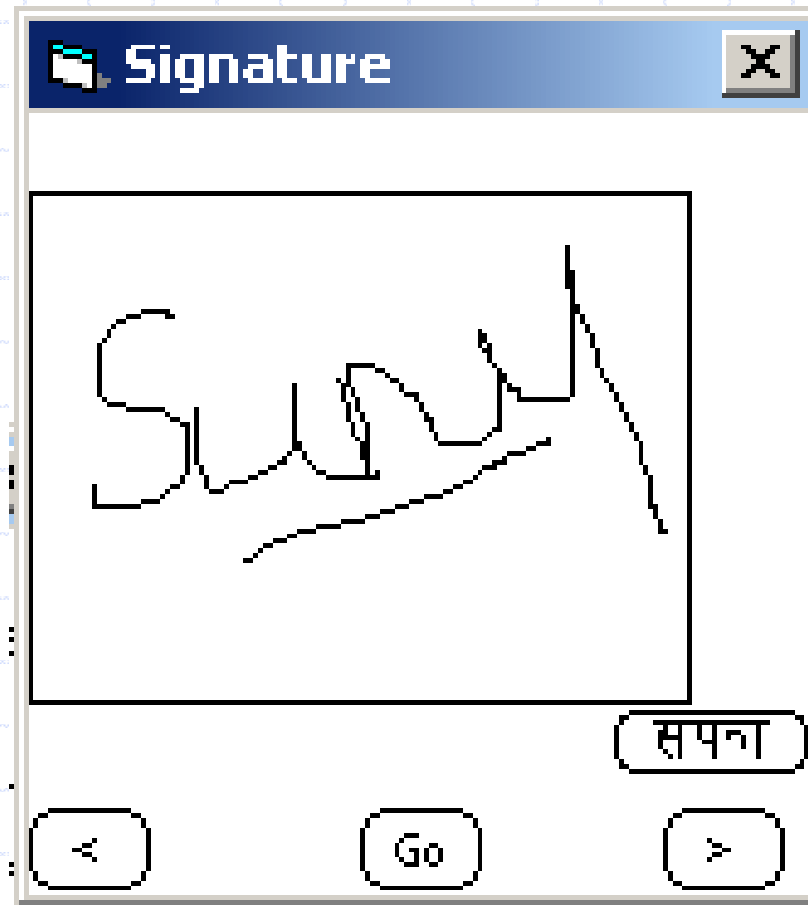
२. अन्तरवाता' लिएका' मिति
(वर्ष / महिना / गते):

२०६१	०२	०२
२०६०	टिप्पण,हास	
२०६१	/०२/०२	
२०६२		
२०६३		

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Form Design: Signature Field

The signature field captures the signature written in the picture area. This field is used for the verification of the survey enumerator.



Result

- ◆ Field data collection with a PDA may present additional challenges to the researcher
- ◆ First, the quality of data collected with PDAs is unclear
- ◆ Data safety is another important issue to consider when comparing paper versus PDA data collection methods, as battery failure, damage, or loss of the PDA could result in the data being lost.

Result..

- ◆ Ease of use of handheld computers is another issue that needs to be explored. In some data collection contexts, the PDA was used by individuals with minimal computer skills, which could lead to difficulties in the field

Result..

- ◆ Finally, implementation costs of using PDAs versus paper for data collection is an issue to consider
- ◆ Constraints are:
 - Expensive hardware
 - Need of skilled programmer for developing form and frequent change of forms

Conclusions

- ◆ Nepal is still in preliminary stage in telecom infrastructure development
- ◆ PDA has great potentiality in rural health care
- ◆ Technology acceptance is challenge
- ◆ Perceived usefulness and ease of use principle has to be applied for its success
- ◆ Overall, this study suggests that reasonably priced PDAs are viable tools for field data collection.