



*Designing an Architecture for Delivering  
Mobile Information Services to the  
Rural Developing World*

By Tapan S. Parikh & Edward D. Lazowska

*Review and discussion slides by Oliver Wilder-Smith*

# Overview

- In this article Parikh and Lazowska present a new framework, CAM, for developing mobile applications targeted for users in the developing world based upon their experience with the limitations of current mobile platforms.

# *Why do we need a new framework?*

What limitations of previous systems does CAM address?

- Intermittent Connectivity - applications must seamlessly work in both online and offline modes.
- Text-Dependent UI - hardware and operating system constraints often prevent effective localization of text-centric UIs.
- Excessive Documentation - interface should be easy to use, and require minimal training to learn how to operate it.
- Assumptions about Usability Based on the Developed World
  - The concept of a private, personal mobile device.
  - The WIMP (Windows, Icons, Menus, Pointer) user-interface concept.

# What did Parikh and Lazowska develop in response to these limitations?

- The CAM architecture makes use of camera phone technology to provide a flexible platform for efficient processing, navigation and transmission of paper-based information.

# What does this look like, in practice?

01243 Mahakalasm Trust  
Def. Association Scheme  
Mahakalasm, Dist. Solapur

Header is for scanning one-time static data

Date \_\_\_\_\_ Member ID \_\_\_\_\_

Internal Loan Repayment External Loan Repayment

Principal \_\_\_\_\_ Interest \_\_\_\_\_

Interest \_\_\_\_\_ Interest \_\_\_\_\_

Fee \_\_\_\_\_ Fee \_\_\_\_\_

Total Payments \_\_\_\_\_

Buttons are for various actions

Submit  Edit  Reset

Courtesy of Tapan S. Parikh. Used with permission.

Image source: Parikh, T. S. (2005) CAM: A Mobile Interaction Framework for Digitizing Paper Processes in the Developing World.

(452) 5552589-101 Record ID \_\_\_\_\_

Loan Application Mahakalasm SHG Trust 7

1 Date \_\_\_\_\_ 3 Loan Amount \_\_\_\_\_

2 Account No. \_\_\_\_\_ 4 Installments \_\_\_\_\_

5 Loan Purpose \_\_\_\_\_ 6 Submit

STAFF USE ONLY

Approved? Comment

8 Yes / No 9 \_\_\_\_\_

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Image source: Parikh, Tapan S. and Edward D. Lazowska (2006). "Designing an architecture for delivering mobile information services to the rural developing world." In *Proceedings of the 15th International Conference on World Wide Web, 2006*.

# Key Features of the CAM framework

- Automatic download of applications from scanning a bar code.
- Download and install done over MMS or WAP as needed.
- Applications and data are automatically cached on the phone for offline use.
- Seamless upload & download of data when the user returns to an area with network coverage.
- Leaves a paper record of transaction with the client.
- Use of audio prompts as well as image based text in the local dialect work to maximize comprehension on the part of both the client and the agent.

# How might this be useful in our ongoing Nextlab Projects?

- One possible example from the *Nextmap Project*
  - CRS Disaster Management wants users to be able to enter answers to a survey on a mobile phone, for automatic transmission to the head office.
  - What would the advantages and disadvantages of a CAM style user interface be useful for such an application?
  - How does its usability compare to more traditional totally phone-based UIs?
  - Is this type of UI useful only for those unfamiliar with computer use, or does it have application with users who have experience with WIMP-based computer interfaces as well?

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