



Visual Voicemail for Community Health

Information 213
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Agenda



- Motivation
- Problem definition through contextual inquiry
- Brainstorming design alternatives
- Visual Voicemail
 - Initial design, prototype iterations
- Demonstration!
- Evaluation design, refinement and results
- Summary and lessons learned

Health care challenges for migrant and low-income people



- Social
 - Unschooled; language barrier
 - Reluctant to register with official/government organizations
 - Transient
- Financial
 - No insurance; don't know about free/subsidized options
 - No transportation
- Health practice
 - Rely on emergency care
 - No habit of seeking preventative care
 - No continuity of care / health history

Existing IT Solutions - EMR



- Electronic medical records (EMR)
 - Made by large IT shops, implemented by consulting firms for hospitals/clinics for billing insurance companies
 - Not centered around the user
 - Records not portable
 - National compliance mandates discourage identity-sensitive users
 - A challenge to implement for grant-funded community health providers

Existing IT Solutions - PHR



- Example: Google Health, Mayo HealthVault, MiVia
- Centered around user, but still requires web browser
- Relies heavily on text, laden with medical terminology
- Used so far by early-adopters with chronic conditions
- Grant-fuel enrollment frenzies != patient engagement

Understanding the Problem



- Understand the requirements for migrant and low income patients to engage in better health practices
- We performed contextual inquiry and observational interviews with
 - Community health providers
 - North East Medical Services (NEMS)
 - Berkeley Free Clinic
 - San Francisco Immunization Clinic
 - Personal health record provider
 - FollowMe
 - Community health promoters
 - California Human Development Corporation

Brainstorming



- For patients
 - Short messaging?
 - "rich" mobile app?
 - Audio interface?
- For care providers
 - Web dashboard?

<main menu>

- Welcome; for help press *
- You have X new messages, to listen press #
 - (#) * <list messages>
- Press 1 to access issues
 - (1) * <issues menu>
- Press 2 to access services
 - (2) * <services menu>
- Press 3 for emergency information
 - (3) * <emergency information>

64842 9:05am

MiVia SMS system –
Issue: Broken leg
2009-02-13 (Dr. Feng):
How is your leg? We are
at Hearst & Oxford again
today from 10-6pm if you
want a check-up.
555-390-1439
[i4] Back to issue menu
[i4ap] Prompt for update

Inbox

1:04 PM, Mar 2
FROM: 64842
BODY:

Open Clinics for
03/02-21
1)Market & 1st, Salinas
2)Mission & Hyde,
Soledad
3)Fruitvale & Farm,
Salinas
4)Lancelot & Creekside,
Salinas

Reply

Cancel

Issue: Pregnancy 3/2/09	
Action	Diary
Recent Action: M.D. Visit Share 03/02/09 <input type="checkbox"/> Share Clinician: John Smith, M.D. Treatment: Information: Reminder:	Share <input type="checkbox"/> Took Vitamins
Action: Initial Visit <input type="checkbox"/> Share 02/28/09 Clinician: John Smith, M.D. Treatment: Information: Reminder: Set - 1 day before	
<input type="button" value="Edit Action"/>	<input type="button" value="Edit Action"/>
<input type="button" value="Add Action"/>	<input type="button" value="Add Action"/>

Initial Prototype



- Included two components of the system
 - A phone interface for indigent, transient, and uninsured people to access information
 - A web interface for community outreach organization staff to review/provide information
- Goal was to facilitate asynchronous communication that would allow community organizations to provide more help to more people and for needy populations to make requests at their convenience



Second Prototype



- We focused our efforts on the web interface and four tasks for clinical and administrative staff in community health organizations
- Staff Personas
 - Elizabeth Smith, Nurse
 - Victor Ruiz, Recruiting/Promoting



Logged in as: Elizabeth Smith (clinician) [Main](#) [Main](#) [Help](#) [Create New Member](#) [Create Issue](#) [Logout](#)

Patient Info

Patient Name: Maria Juanita Paras
[See Patient Medical Info](#)
Patient Phone: 831-254-9723
Patient ID: 22
Conditions: Pregnant
Date-of-birth: 1982-07-27

Issue 14: Headaches

Issue Summary

Elizabeth Smith #24(2009-04-14 01:24:44): Pregnant mother, has constant headaches. Requested appointment for Wednesday before 12 noon.
Append new:

Entries

Date Time	Entry type	Play file	From	Notes	Reviewed
2009-04-30 11:50:45	audio		Elizabeth Smith	Append new: <input type="text"/>	<input type="checkbox"/>
2009-04-29 22:20:50	audio		Elizabeth Smith	Elizabeth Smith #24(2009-04-29 22:21:46): lkjlkjlkj Elizabeth Smith #24(2009-04-29 22:22:08): lkjlkjlkj Append new: <input type="text"/>	<input checked="" type="checkbox"/>

Demo



<http://www.thedailynathan.com/info213/prototype/>

- Tasks
 - Enroll a new patient
 - Listen to a message
 - Record a response
 - Annotate a message
 - View patient emergency information

Experiment and User Testing



- Sample Pool: work related to community health environment.
 - Age 20-50
- Control: conventional voicemail & handwritten notes on medical records
- Testing: Record observations & questionnaire for user at the end (useful health system?)

Results



- **Control:** Conventional voicemail & paper annotations
- **Results:** Conventional responses are FASTER
- **Feedback:** Users liked archiving voicemails, wanted better interface, learning curve
- **Future plans:** suggestions for community health and collaborative treatment purposes.

Refinement



- Clearer new messages
- Navigation
- State of message
- "Blank" screen area on right
- Some problems faced were anticipated in initial design
- Problems not involving LISTENING & RECORDING to voicemails!
GREAT!

Clinician: Elizabeth Smith My Messages Help Main Menu

Patient Name: Maria Buena Phone #: 831-645-2983
Emergency Medical Information... DOB: 07/27/1982
Conditions: Pregnant Patient ID: 435223

Issue: Persistent Headaches Issue #: 123456
Summary: Patient is experiencing frequent headaches and is concerned they indicate a problem with pregnancy.
Visit Info
enter info for an office visit

Messages:

Notes and Annotations:

New! message #: 1259
listen to message recorded by: M. Buena, 435223
04/03/2009 3:45:12
Annotate Respond
add notes, images, etc. record response

message #: 1254
listen to message recorded by: E. Smith, 1234
04/02/2009 18:50:06
Annotate
add notes, images, etc.

04/02/09: 13:21 E. Smith
04/02/09: 2:45
04/02/09: 13:21 [img_1235.jpg](#)

message #: 1250
listen to message recorded by: M. Buena, 435223
04/01/2009 13:21:05
Annotate
add notes, images, etc.

E. Smith, 04/02/2009: Headaches do not sound like an problem of this point. Requesting patient continue to monitor duration and frequency and to call if there is a change.

Office Visit message #: NA
Patient: Maria Buena recorded by: NA
Clinician: E. Smith 3/25/2009 9:00:00

E. Smith, 04/02/2009:
Weight: 142
Height: 57
BP: 121/68
Note: Patient's initial visit. Patient and baby healthy. Provided prenatal vitamins.

Log Off

Conclusion



Visual Voicemail has a place in community health and can:

- Engage otherwise disengaged patient populations
- Especially useful for identity-conscious or shy patients
 - Stigma around venereal disease
 - Mental health patients
 - a person "loveline"
- Facilitate continuity of care between occasional face-to-face encounters
 - Provides interaction model that allows grant-makers to stop requiring f-f encounters as basis of care
- Preserves original patient evidence for referencing cross care providers
- Moves towards a multimedia personal health record

Lessons Learned



- Performing observational interviews
 - Talking to a lot of people is useful
 - May not get the info you want or need immediately
- Design
 - Brainstorm, cull, repeat!
- Testing
 - Testing is also an iterative process
 - Yielded more reliable results as we refined methodology
- Different users needed varying levels of guidance and support
- Need continued user feedback to iterate on our design

Questions and Feedback?



Thanks!