



Claim Mobile:
Engaging Conflicting
Stakeholder
Requirements in
Healthcare in
Uganda

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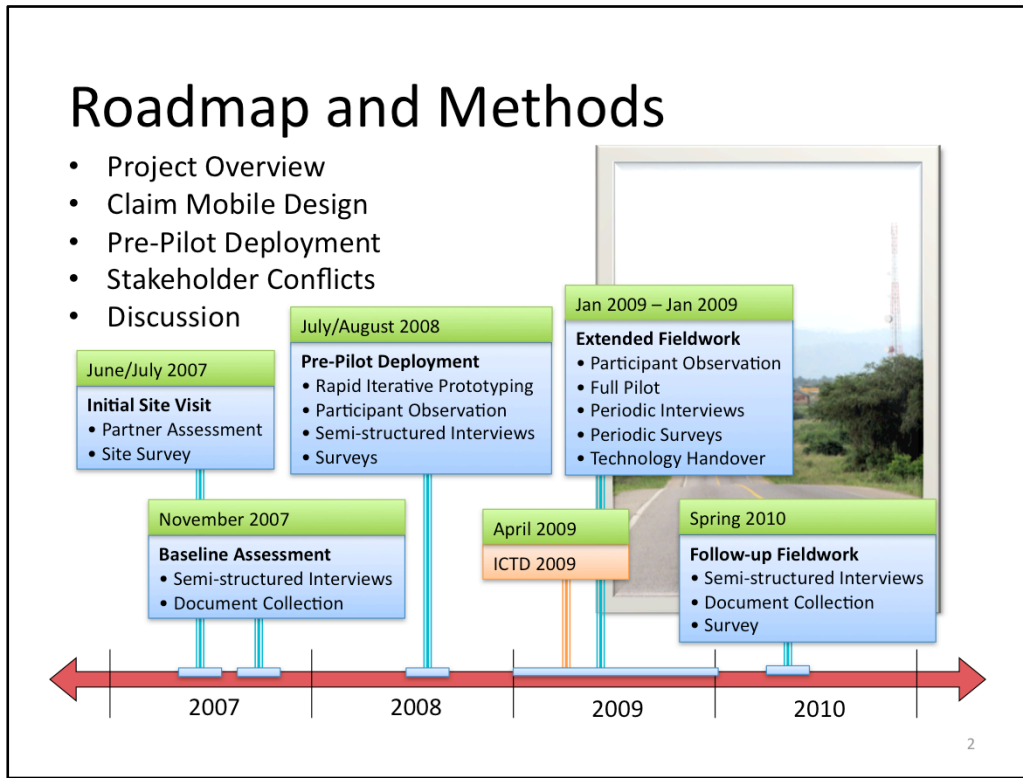
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Hi, my name is Melissa Ho, and I will talk to you today about Claim Mobile, a project in Uganda in which we are using mobile phones as part of a health care financing project. My co-authors, Emmanuel, and Paul send their greetings from afar.

The gist of this paper is to introduce an information technology intervention that, on the surface level seems pretty simple: Get data from point A to point B so the people at point B can pay the people at point A. Yet, as our work shows, close investigation of the relationships between the various groups of people involved both validated elements of our original design, and also necessitated changes to our software in the field.



This presentation will be roughly chronological, starting with an overview of the project and our methods. The next few slides will introduce the concept of “output based aid” and the initial design of Claim Mobile, based on [click] the results of our qualitative fieldwork in the summer and fall of 2007. From there I will discuss what happened when we actually tried to do a [click] pre-pilot deployment of Claim Mobile, delve deeper into some of the stakeholder conflicts that emerged through the course of the qualitative fieldwork we conducted in parallel with our deployment. We conclude with a discussion of the importance of understanding how design of technology plays a role in stakeholder relationships.

For your reference, this paper introduces an ongoing study, and I am in the midst of [click] extended fieldwork continuing through next January. As part of this extended fieldwork, we will conduct a full pilot and eventually handover the technology entirely to our project partners. We will then return in Spring 2010 to evaluate the subsequent sustainability of the technology – to see whether our partners have continued to use the technology following the researchers’ departure.

As you can see, we take a mixed methods approach, including document collection, surveys, semi-structured interviews, and participant observation. We followed up on the initial site survey in July 2007 spanning all 12 of the participating clinics with detailed qualitative interviews in November 2007 and intensive observation in two clinics in Summer 2008. Our pre-pilot fieldwork also involved semi-structured interviews and survey instruments, but primarily involved participant-observation – both of existing information processes, and of how the clinics and other stakeholders engaged with the Claim Mobile system.

Uganda

Population: 31,367,972 (cia.gov)
Landlines: 162,300 (2007) (cia.gov)
Mobiles: 8.2 million (est.) (Wireless Fed)

Mobile GSM Coverage

Images from coverage maps available on gsmworld.com

Sexually Transmitted Diseases are an especially critical problem in Western Uganda

- HIV prevalence: 10% of adult population (15-49 years)
- Syphilis prevalence: about 5-7% of adult population
- 1 in 4 households had at least one phone.
- 39% reported STI symptoms
- only 1/3 sought care
- 54% of respondents who sought any STI treatment reported using private clinics.

From 2006 Venture Strategies and Mbarara University population survey. <http://www.oba-uganda.net>

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Quick context: this work is based in Uganda, which CIA.gov's most recent statistics boast a population of 31.3 million and growing, and 162,000 landlines. While cia.gov claims 4.2 million mobile subscribers More recent statistics claim 8.2 million subscribers.

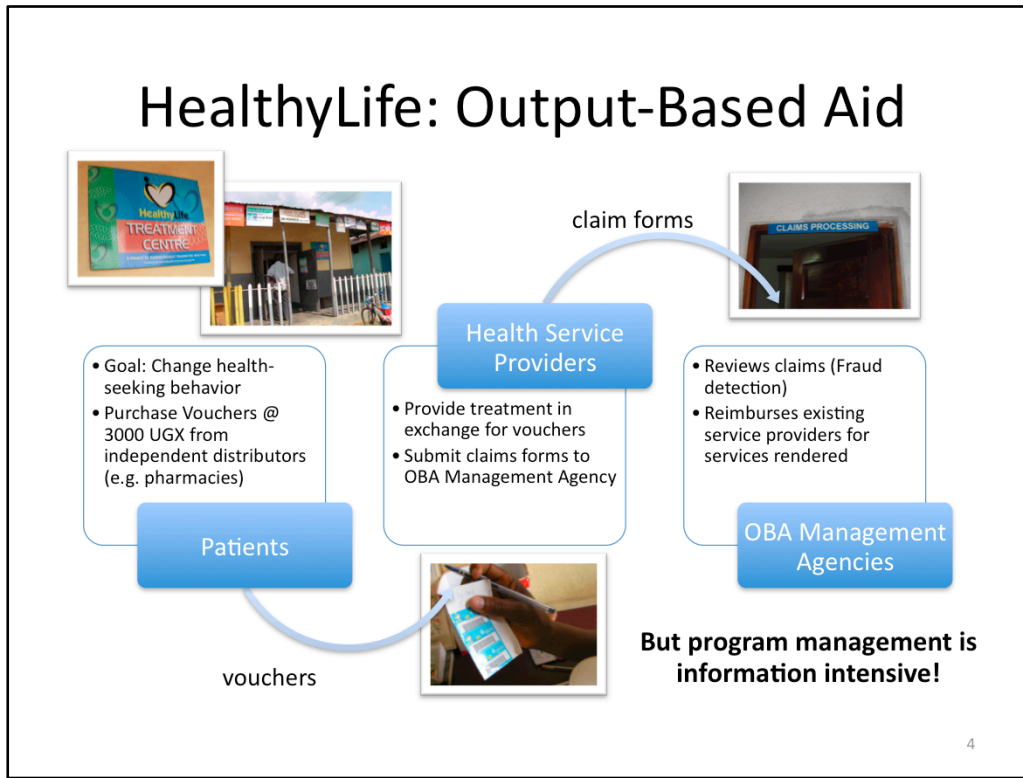
We work specifically in four districts surrounding the urban trading center of Mbarara, Uganda, which has fairly dense mobile coverage, generally with GPRS/EDGE capabilities of varying quality. This particular area, at a junction between Tanzania, Rwanda, and DRC has an especially high incidence of sexually transmitted infections, which is what our partner program seeks to treat.

Internet infrastructure

- Uganda currently doesn't have direct (i.e. wired) access to the global Internet, being located in East Africa.
- All Internet access ultimately sources from VSAT connections, which are high cost and low bandwidth
- Plans are underway to connect o India and Asia via several possible projects
- Uganda, however, does have an Internet Exchange, which means that ISPs can exchange data directly
 - with each other, which improves performance within the country
- Lots of Internet cafes available
- Internet also available through mobiles

Mobile Coverage

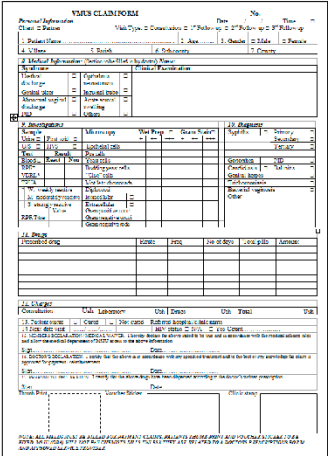
- 8.2 million mobile phones - that's 1 for every 4 people, in reality, probably about 1 in every 10-20 people have 2-3 sim cards
- This is a map of the GSM coverage for two of the providers




Providing effective health care in poor countries is an essential component to economic development and poverty reduction. Unfortunately donors supporting this endeavor often find that resources given are not matched by desired gains. The output-based aid (OBA) model of financing seeks to address this by paying healthcare providers directly for services rendered instead of paying for the service provision up front. These “healthylife treatment centers” treat patients in exchange for bar-coded vouchers. The NGO managing the aid money then pays the service providers the cost of the treatment. Unfortunately, the program management is information intensive, necessitating much paperwork to track and reimburse payment claims. Subsequent delays in payment cause hardship for participating clinics.

Claim Mobile

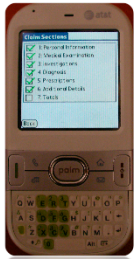
from paper form... to phone



from paper form...



to phone



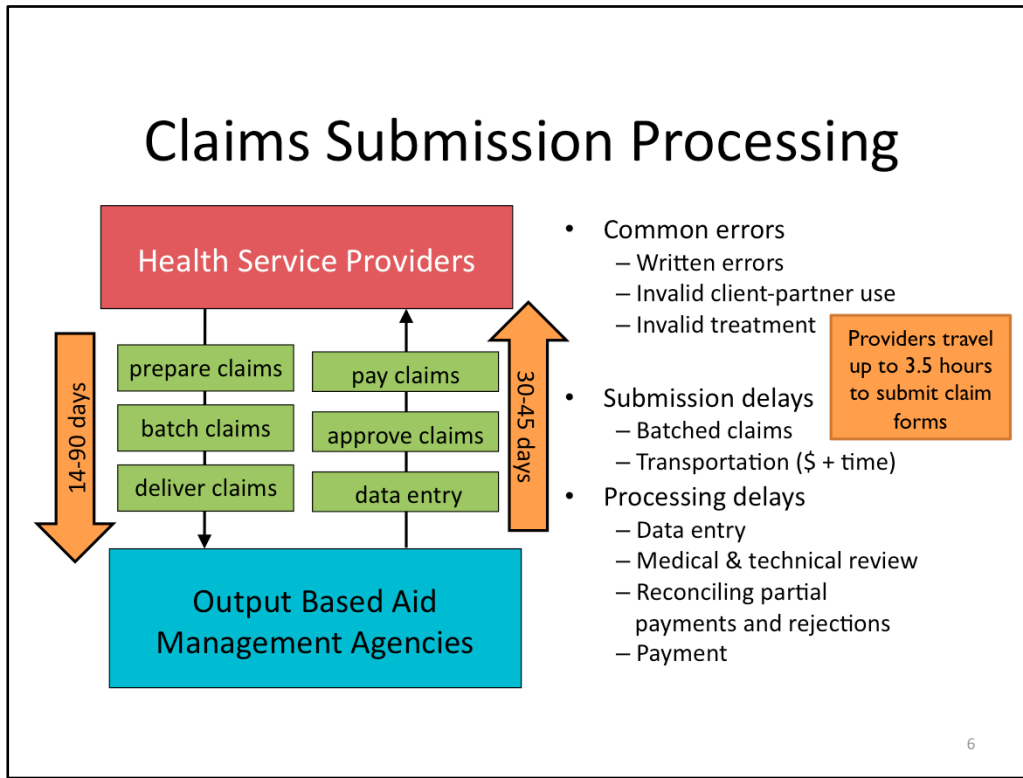
to phone

- Using mobile phones as a platform for facilitating information management
 - Dynamic, self-verifying forms reduce errors and provide ongoing training
 - GPRS-based form submission and approval
 - Phone-based clinic data management
 - Improved communications loop

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We were asked to investigate the possibility of using mobile phones to improve the efficiency of the program, increasing claims processing speed by using mobile phones to submit the forms from the health clinics to the management agency instead of submitting all of the data on the paper forms by hand. The “computer” on the phones could do pre-verification, reducing errors on the clinic side before they were submitted, and the communications capabilities and the data entry aspect would decrease the amount of time it would take to process the claims once they arrived.

Once approached with this idea, we went to Uganda to meet our potential partners and do a needs assessment, starting with a survey of the clinics to both better understand the claims process, where their struggles were, and how mobile phones might be of benefit.



Most of the processing time is consumed in data entry and validation - to some extent the role of the smart claims is to reduce the data entry process and to streamline the data entry, while pipelining the batch process.

Service Provider Perspectives

CLAIM DATE	FORM DETAILS			ACCEPTED CLAIMS				REJECTED CLAIMS				QUARANTINED C		
	SL NO	FORM NO	EXPECTED AMT.	FULLY PAID AMT.	ADJUSTED AMT.	VARIANCE	REASON	REASON	AMOUNT	VARIANCE	REASON	AMOUNT	REASON	AMOUNT
Second Half of August 2008														
26/Aug/2008	1	10786	6,920	6,920										
26/Aug/2008	14	10800	9,400		4,400	5,000	11							
26/Aug/2008	15	19101	19,200	19,200										
26/Aug/2008	16	19102	8,000	8,000										
26/Aug/2008	17	19103	13,700				11							
26/Aug/2008	18	19105	19,200	19,200								NO PREVIOUS FOLLOW UP	8,700	5,000

Most are unsure what is indicated by the 11

4/12 didn't know how many claims have been rejected

4/12 have computer training

12/12 own a mobile phone

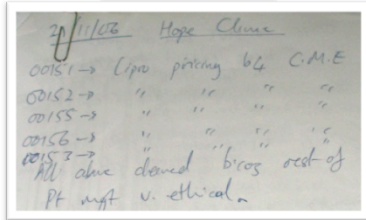
3/12 had not gotten feedback

Obscure and Infrequent Feedback

"I don't know. I don't know how we are performing. I don't know how we are faring... and of course it takes a lot of time."

Sequential Rejections

"Cipro pricing b4 C[ontinuing] M[edical] E[ducation]... All above denied b'cos rest of P[atien]t mgt n[ot]. ethical"
Often an entire month's worth of claims might be rejected at once for the same error



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The 11 here indicates that the service provider made an error on the form, indicating a price for the drug that was higher than what the management agency actually reimburses. This is more of a clerical error than anything else. But other common errors also occur, and the numbered codes are lost on the service providers. While a sheet of error codes mappings was provided early on in the program, most had lost that sheet – it was buried under a pile of other papers somewhere. And when asked, they told us that they felt that it was futile to inquire for more feedback or to try to dispute any rejections.

All above denied b'cos rest of P[atien]t mgt n[ot]. ethical": this is a sample medical advisor review of a claims summary, occurring often well after the original mistake has been made several times, before it could be caught and corrective measures could be made, as noted in the first line: "Cipro pricing b4 C[ontinuing] M[edical] E[ducation]"

The timeliness in claims processing is also a very critical issue – not just because people want their money faster, but because errors that are not caught early are repeated until a medical advisor has a chance to review the claims and see that an error is being made. In this case, cipro is an expensive drug, and this service provider has lost the cost of five doses of cipro, and probably the lab reagents for the accompanying consultations for repeating the same mistake. If the error had been caught within the first few days, they might have only lost one or two doses instead.

Claims submission

- Patient data is securely entered & transmitted.
- Check lists restrict data entry to only valid options.

1: Personal Information

Date: 9/8/08 10:15 pm

Claim No: 10785

Voucher No. : 0100856634

Patient Type: ▼ Partner

Visit Type: ▼ 1st Follow up

Patient Name: [REDACTED]

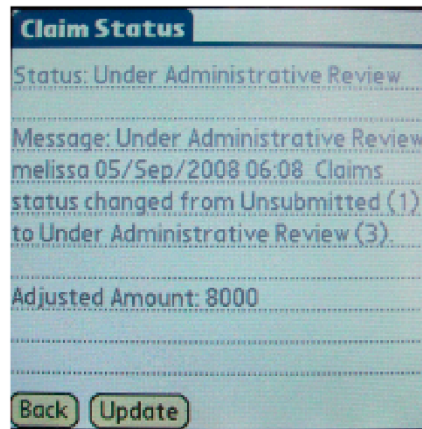
Age: 29

Cancel Save

In response to these findings we decided to come up with a system and designed Claim Mobile, basing the user interface on the original paper claim forms.

Closing the feedback loop

- Claim Mobile provides for live update on claims payment and enables ongoing communication between management and providers on disputed claims



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In additional we added some provisions for annotating each claim, so that service providers could get status updates on the review of each claim, and to dispute particular rejection reasons, which would be displayed as both codes and text.

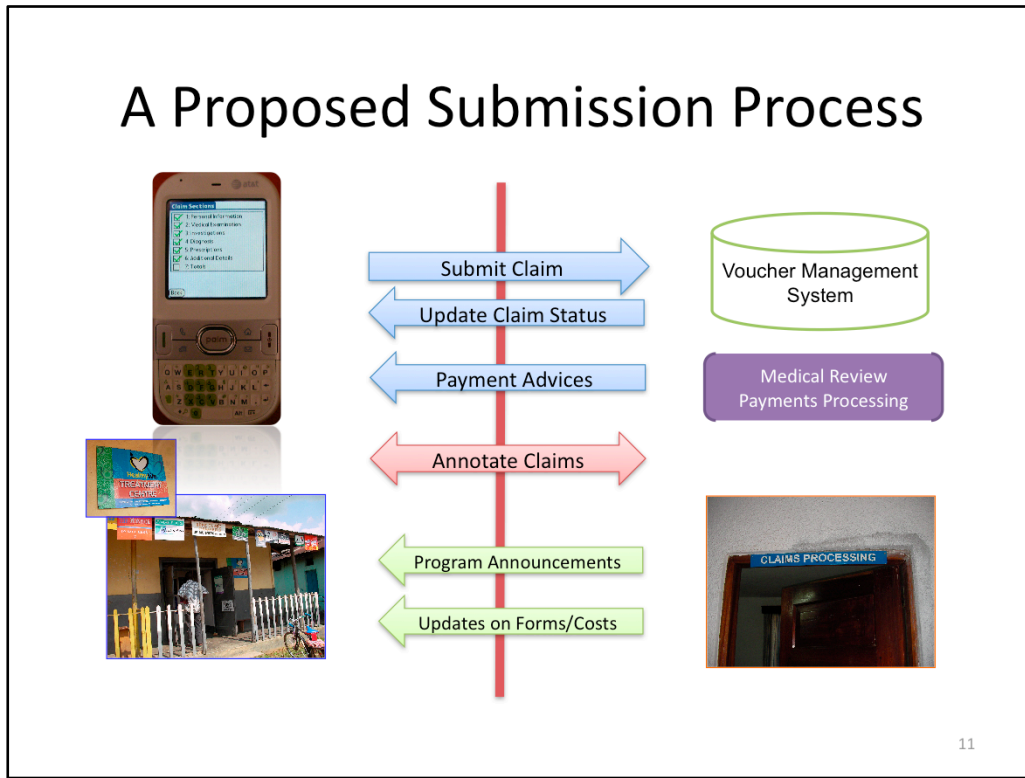
In-clinic claims management

- Unique voucher numbers link patients and their referred partners across multiple visits.
- Clinics can track trends over time

Voucher Number	Count
10099: [redacted]	(1)
27787: [redacted]	(3)
27788: [redacted]	(3)
27789: [redacted]	(1)
27790: [redacted]	(3)
27791: [redacted]	(1)
27792: [redacted]	(2)
27802: [redacted]	(2)

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And within the clinic there would be provision for claims management.




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The overall process would look somewhat like this

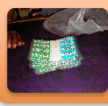
August 2008 Pilot Deployment

S	M	T	W	R	F	S
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6
7	8	9				




Kampala: Financial and Technical Management Agencies (FMA and TMA)

- Progress Report, Demo
- Project Planning, Coordination
- VMUS Integration Planning




Mbarara: HealthyLife Program Management Office (PMO)

- 2009 Study and Housing Arrangements
- Selection of two pre-pilot health service providers
- Stakeholder interviews



Mbarara and Rubindi: Service Provider Studies


- Comparative user study
- User training
- Observation of paper and electronics claims processing
- Periodic survey testing




Kampala: Financial and Technical Management Agencies (FMA and TMA)

- Review/Recap Initial Findings
- Review submitted claims forms
- Scheduling for 2009

Stage 1: Testing of hardware and software with data from submitted (and unsubmitted) claim forms.



Stage 2: Design interviews and user testing of Claim Mobile submission process from management agency perspective



Stage 3: User Testing: working with service providers to develop a intuitive, reliable, and useful system

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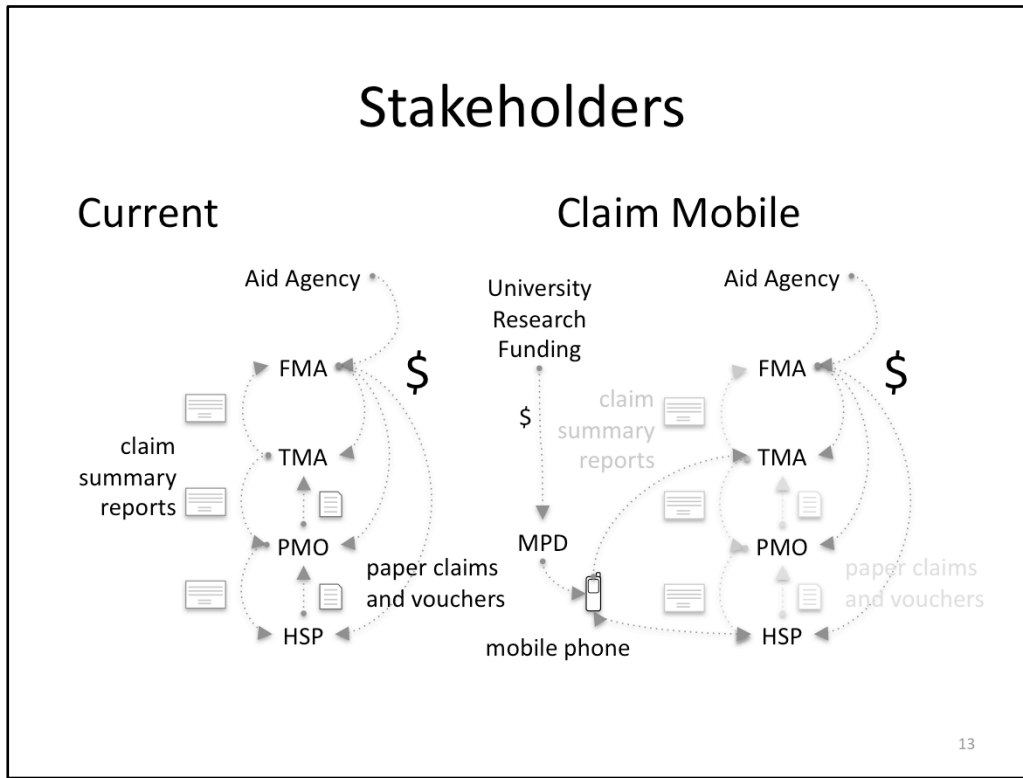
So last August Emmanuel and I went back to Uganda armed with this implementation of Claim Mobile, as informed by the initial surveys and interviews. We planned for a three stage iterative deployment, first visiting the management agency offices in Kampala and Mbarara to give a progress reports and demos, planning for integration of our software with their existing databases, testing our software and hardware by entering claims ourselves.

In stage 2 we planned to incorporate feedback from the stage 1 stakeholder interviews, and reviewing the Claim Mobile submission processes from the management agency perspective, receiving the digital claims, providing feedback,

Stage 3 involved user testing in the health service provider clinics, training them on the use of claim mobile phone. Through the course of the deployment we would be able to make changes to the software as requested, and also simultaneously observe their practices around the paper-based claims process, which they would be conducting in parallel with the Claim Mobile process.

Just to checkpoint, you'll want to note a few acronyms, which I'll breakdown a bit for you on the next slide. The management agency operates as two partners, a financial management agency (FMA) which administers the money, and a technical management agency (TMA) which manages the database and processes the claims. The program management office (PMO) is a sub-office of the FMA and located in western Uganda, closer to the service providers.

One of the first things that we learned was that there had been some major changes in the claims management process, namely that in the time between the 2007 and the 2008 studies, the claims processing had moved from the PMO office in Mbarara to the TMA office in Kampala, changing some of the dynamics in finance and information flows in the project.



FMA = financial management agency
 TMA = technical management agency
 PMO = program management office

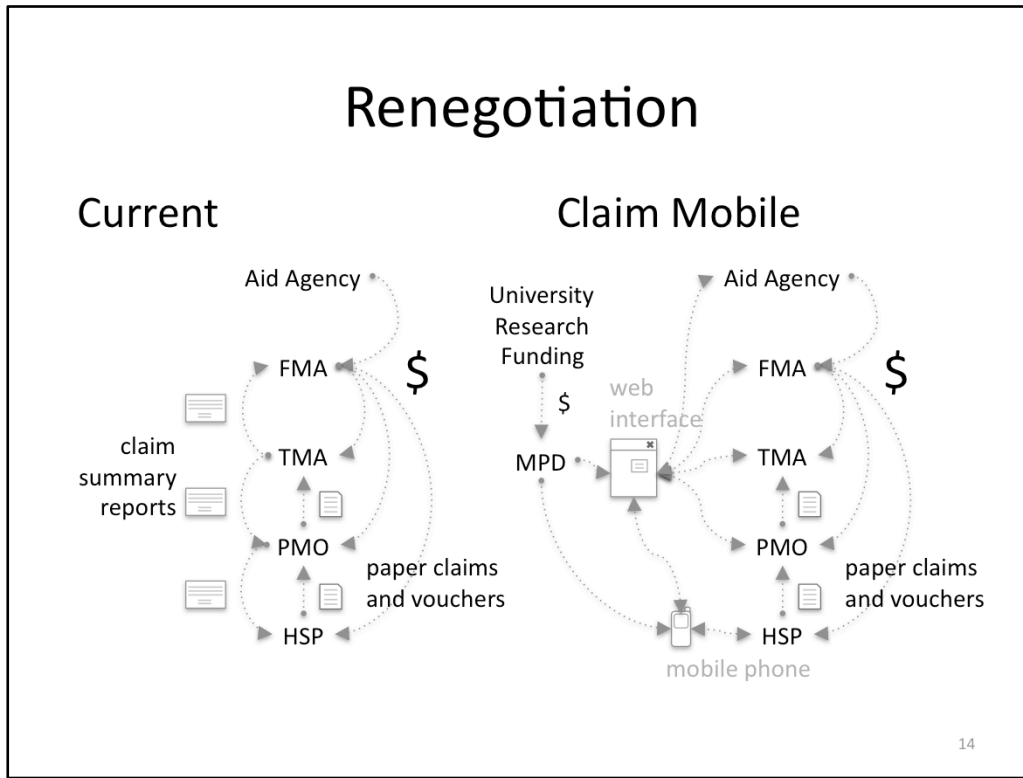
This had ramifications on the claims management process, which played out in a number of ways.

This diagram lays out the relationship between the various stakeholders in the program and how information and money flows between them. While in our initial information gathering, it seemed that the FMA and the TMA operated as one entity, our August fieldwork revealed that their relationship was actually highly contentious.

[explain diagram]

Over the past year, the project has faced re-budgeting issues and delays in grant financing, leading to a situation in which both the FMA and the TMA had been operating without pay from April 2008 to September 2008. These payment stoppages are part of the reality of dealing with aid-funded projects – yet while the FMA is powerless to address the issue, the TMA often chooses to respond by cutting off access to the program database, [click] ceasing claims processing and refusing requests for reports until their problems have been resolved.

Looking at the claim mobile architecture in this context then, the mobile phone comes alongside the program, and the HSPs are directed to submit their claims DIRECTLY to the TMA.



FMA = financial management agency
TMA = technical management agency
PMO = program management office

We realized that our architecture actually entirely bypassed the program management office, exacerbating their information poverty, making it even harder to do their work, and further disengaging the health service providers that are so critical to the day to day operation of the program.

In response, we completely rearchitected the system, introducing a web interface that would serve as an intermediate application for the mobile phone, and a universal claims access mechanism for all of the stakeholders in the system. Thus the PMO could monitor claims as they were being submitted by the HSPs, and as the TMA was reviewing them.

The Aid agency would also have a new capability of overseeing the claims processing, with the ability of generating reports as necessary from the web interface..

Pre-Pilot Results



“We can learn”

- Rural Clinic
 - 12/86 claims via CM
 - Discrepancies noted on paper claims that would have been avoided via CM
 - Non-monetary errors go unreported
- Urban Clinics
 - 18/18 claims via CM
 - 5 following study
- Usability
 - Onscreen keyboard is preferred
 - “Qwerty” keyboard is acceptable

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We tested the full system as we were designing it, deploying Claim Mobile and submitting claims from the mobile phone to the web application from two clinics, a rural high volume clinic and an urban low volume clinic.

Over and over their refrain was that “we can learn” – that even with very little experience with computers or qwerty keyboards they were happy to learn new things and new technologies that this was something they were happy to work with.

Discussion

Intermediate Findings

- Parallel qualitative study informed iterative design process
- Initially proposed system would have bypassed the PMO in Mbarara
- Claims information is used as leverage in negotiations between stakeholders in the project – which has implications for a mobile system intended to improve its flow

Further Questions

- How will the flow of information continue to be negotiated within the project?
- How does democratization of access to information affect stakeholder willingness to participate in the project?
- Will access to Claim Mobile improve communication between the management agencies and the service providers?
- Can the phones be used to improve health information management in the health clinics?

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There is still a lot left to be uncovered around claim mobile, a lot left to study.

For now I will note that by conducting an in-depth qualitative study in parallel with our design process we were able to realize that our initially proposed system, really the “obvious” design for a mobile data collection system, would have bypassed the PMO in Mbarara. Indeed our work as mobile platform developers need not be limited to design and deployment of technology, but we can actually discover a rich world of information processes, stakeholders, and social dynamics – groups of people all engaged in choosing to use our systems and other information and communications technologies.

In this case, we learned that claims information is used as leverage in negotiations between stakeholders in the project – which had implications for the mobile system intended to improve its flow.

As we continue this pilot we have yet to learn – how will the democratization of access affect the TMA’s willingness to participate in the project – will the improvement in the system overall be worth their loss of control over the information? Will access to Claim Mobile actually improve communication? Or will they find other mechanisms and information processes? How can we make this system financially sustainable? While we start to address some of these in more detail in the paper, we look forward to learning more as we push forward with the pilot in this coming year.

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