



eKichabi: Information Access through Basic Mobile Phones in Rural Tanzania

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Motivation

In Tanzania, phone ownership is widespread (upwards of 90% in study area), but there's no way to look up numbers.

How do unknown (to one another) users find one another?

Phonebook!



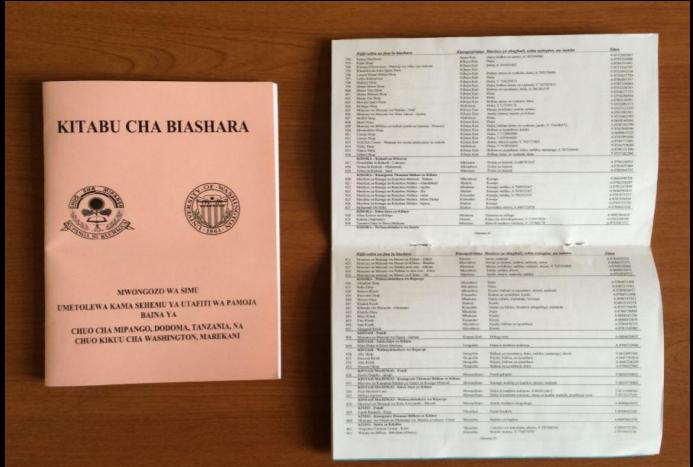
Previous Work

Brian Dillon, Joshua Blumenstock,
Jenny Aker, starting 2014

Survey of ~1500 businesses,
distributed paper phone books

Found positive economic effects of
having access, and of being listed

This project stems from 2 sources...



Research Questions

Develop and deploy a electronic phonebook – eKichabi

Assess:

- **Feasibility – is it possible?**

Is USSD a suitable technology for deploying a search- and browse-based information service in rural Tanzania?

- **Usability – is it usable?**

How well can the target users search for phone numbers, and what are the approaches users take to find a number?

- **Acceptability – is it viable in the long term?**

Does the electronic version of the phone directory meet people's needs, and is it something they will use on a day to day basis?

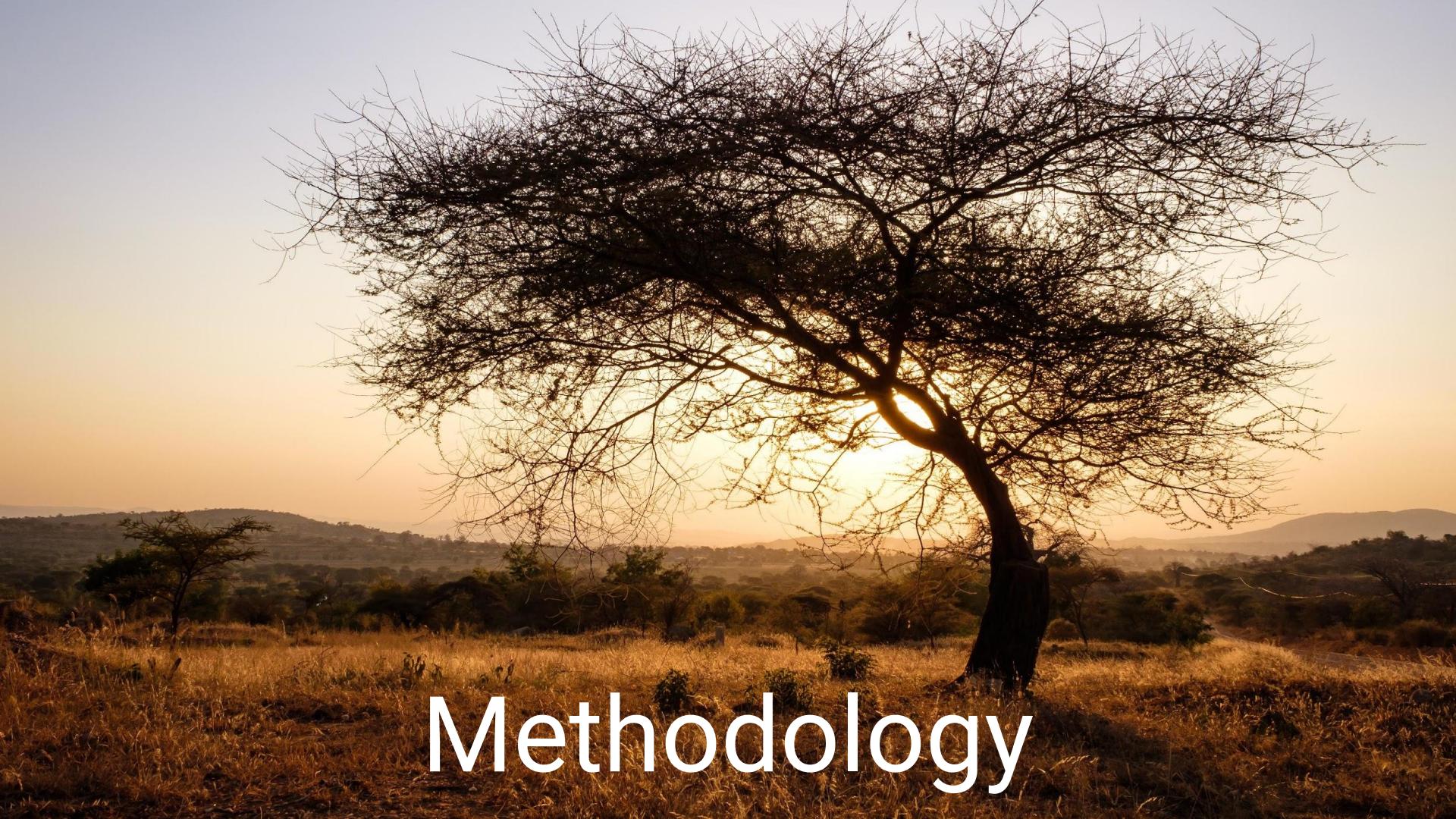
Why USSD?

The Third Universal App (Perrier et al.)

In designing for *basic* mobile phones, a number of options:

- SMS – stateless, and text based
- IVR – stateful, and voice based
- **USSD** – stateful, and text based – best of both!

Primary considerations: Cost, and Usability

A photograph of a large acacia tree standing in a savanna at sunset. The tree's intricate branches are silhouetted against a bright, orange and yellow sky. In the background, rolling hills and other trees are visible under the warm light.

Methodology

June 2017 *Phase 0: Application Prototyping*

early July 2017 *Phase 1: Focus Groups (n≈40)*

late July 2017 *Phase 2: Initial Deployment (n=107)*

early Aug. 2017 *Phase 3: Phone Surveys (n=107)*

Phase 0: Application Prototyping

Three usage modes:

- Browse by Location
- Browse by Sector
- Search



Select an option:

- 1. *Browse by Location*
- 2. *Browse by Sector*
- 3. *Search*
- 4. *Help*

User Input: 1

- 1. *All Businesses (9)*
or Select Subvillage
- 2. *Kiteo - Marumba*
- 3. *Kiteo - Matinga*
- 4. *Kiteo - Muya*
- 5. *Kiteo - Nkundusi*
- 99. *Back*

User Input: 1

Select District

- 1. *Babati Mjini*
- 2. *Chamwino*
- 3. *Chemba*
- 4. *Dodoma Urban*
- 5. *Kiteo*
- 0. *Next*
- 99. *Back*

User Input: 1

Select Village

- 1. *Busi*
- 2. *Keikei*
- 3. *Kinyasi*
- 4. *Kiteo*
- 5. *Kwadelo*
- 0. *Next*
- 99. *Back*

Business Found

Select Business

- 1. *Ally Kiosk*
- 2. *Amiri Shop*
- 3. *Chavai Kiosk*
- 4. *Fundi Baiskeli*
- 5. *Genge la Mama Mtaa*
- 0. *Next*
- 99. *Back*

Ally Kiosk

Location:

Kiteo - Matinga
Phone: T653965711

Phase 1: Focus Groups

6 villages over 1 week,
several groups per village

3-12 participants per group

Discussed paper and
electronic Kichabi

Iterated on application
design



Phase 2: Initial Deployment

Four villages, 10-30 participants per village – 107 participants total

Diverse range of ages, genders, literacy, experience with phones

Enrollment:

Meeting of ~2 hrs, covering short code, whitelisting, main 3 browsing modes, and plenty of examples

Study lasted 30 days, participants used their own phones

Phase 3: Phone Surveys

Follow-up with deployment participants

Addressed topics unavailable from logging

Gathered anecdotes

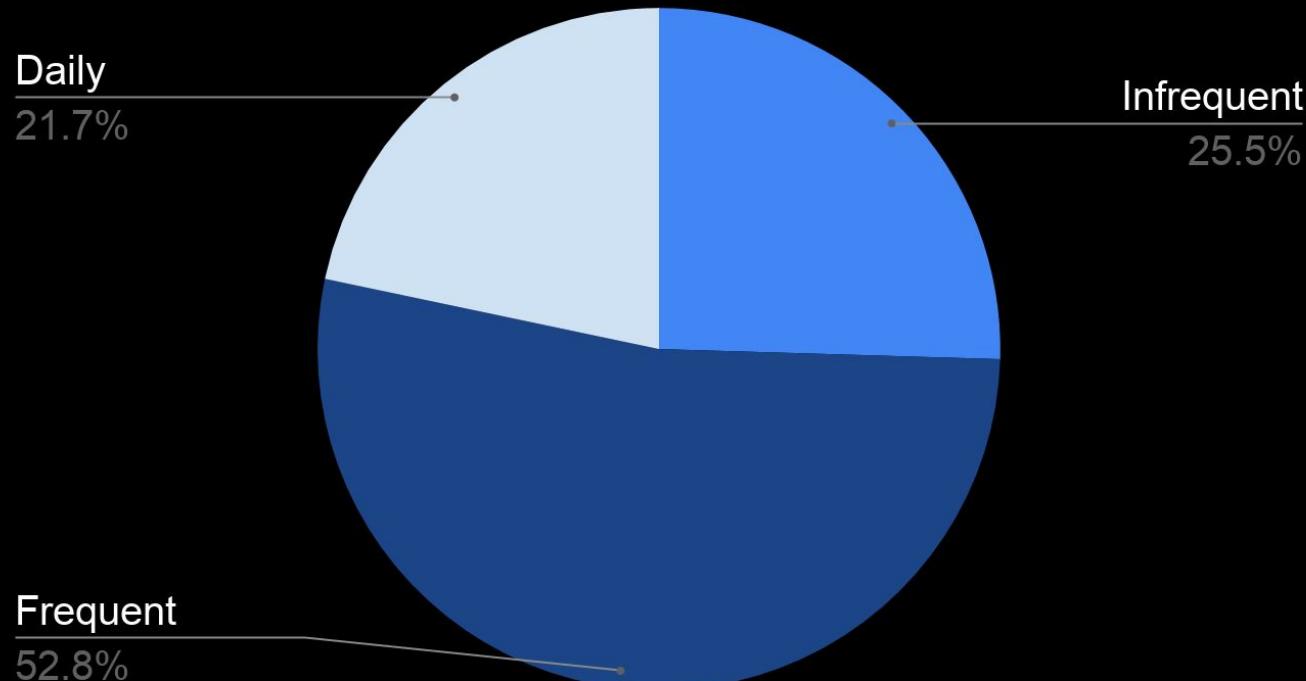


A photograph of a large, spreading acacia tree with a dense canopy of green and yellow leaves. In front of the tree stands a traditional dwelling made of a wooden frame and a thick thatched roof. The ground is covered in dry, golden-brown grass under a clear blue sky.

Results

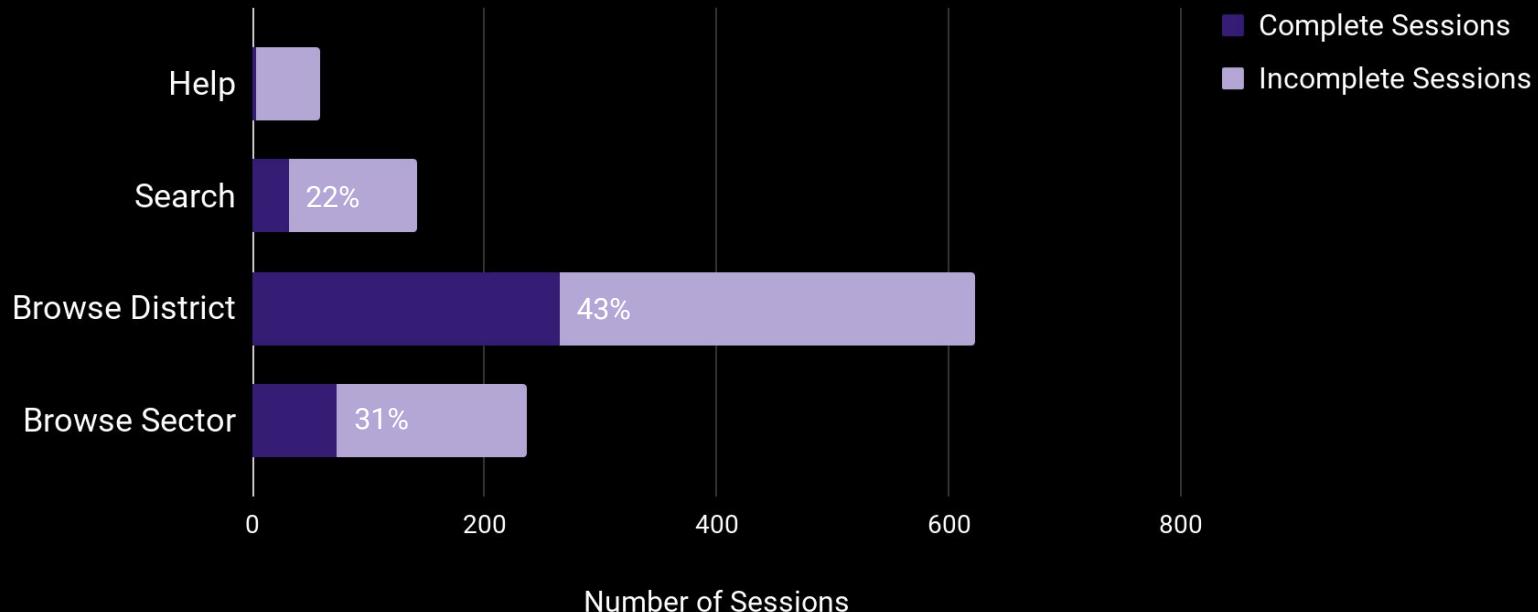
Usage

Session Frequency Per Participant (30 day duration)



Usage Modes

Number of Sessions by Usage Mode



Survey Findings

“I looked up the business in Itiso and called a boda boda guy to seek the transport.”

“I am a crop trader, and I called merchants in Dodoma to inquire about prices for my crops. I called several businesses to find who would give me the best prices.”

“I called a seed vendor in Kondoa, and negotiated over the phone, then he drove the seeds [to my village].”

Application Accessibility

Search – surprising that it was popular!

Potentially easier for those with poor eyesight.

Familiarity with other USSD applications improves fluency

Mobile Money

Airtime Top-up

A landscape photograph featuring a majestic mountain range in the background, its peaks bathed in the warm, golden light of sunset. In the foreground, several Aloe ferox plants stand tall, their long, pendulous flower spikes hanging down in vibrant shades of yellow, orange, and red. The surrounding terrain is covered in dark, low-lying vegetation.

Conclusion

Feasibility – Successfully demonstrated deployment of USSD-based information seeking application with thousands of entries.

Usability – Application was usable. Scrolling through long lists, and text entry for search were all handled.

Acceptability – Fulfilled an unmet need for business information to participants. Useful in many situations...

Future Work

Self-enrollment into the system

Scalability – more hierarchy in menus increases confusion

Cost and business models for expansion

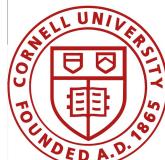


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FOUNDATION

The logo for the Digital Financial Services Research Group features a grid of nine grey squares in a 3x3 arrangement. To the right of the grid, the text "DIGITAL FINANCIAL SERVICES" is in blue capital letters, and "RESEARCH GROUP" is in blue capital letters below it.

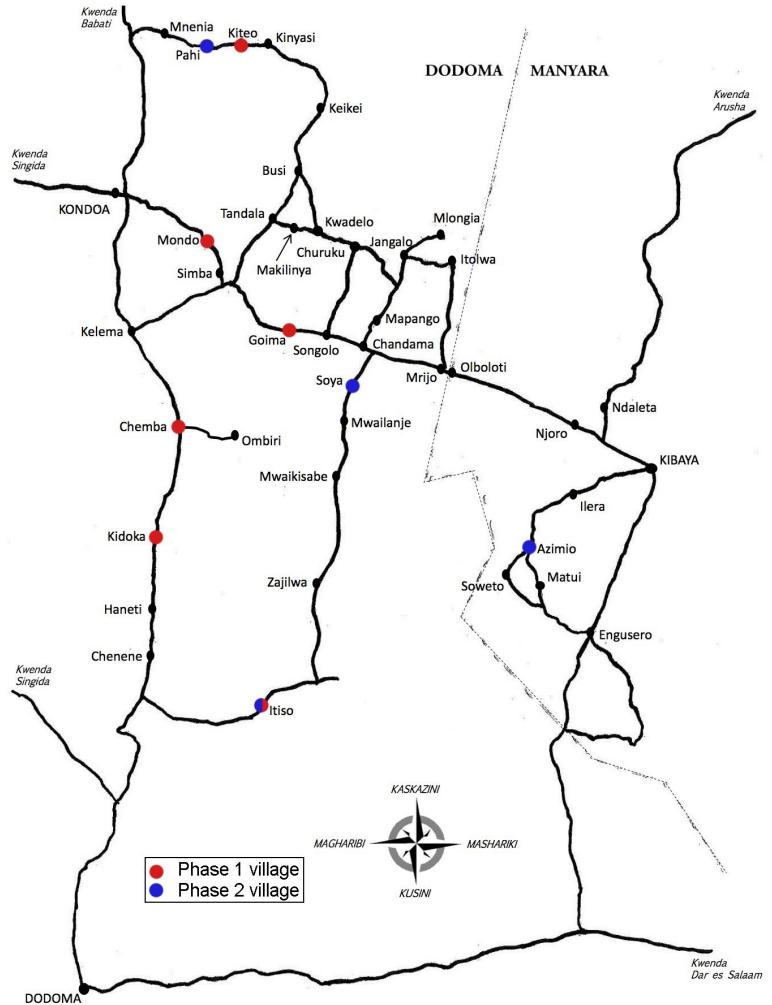
The Qchange logo features a stylized globe icon with a blue and white pattern, followed by the word "change" in a large, black, lowercase sans-serif font.

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OF COMPUTER SCIENCE & ENGINEERING

The ICTD Lab logo features a stylized globe icon with a network of lines and dots, followed by the text "ICTD Lab" in a large, purple, lowercase sans-serif font.

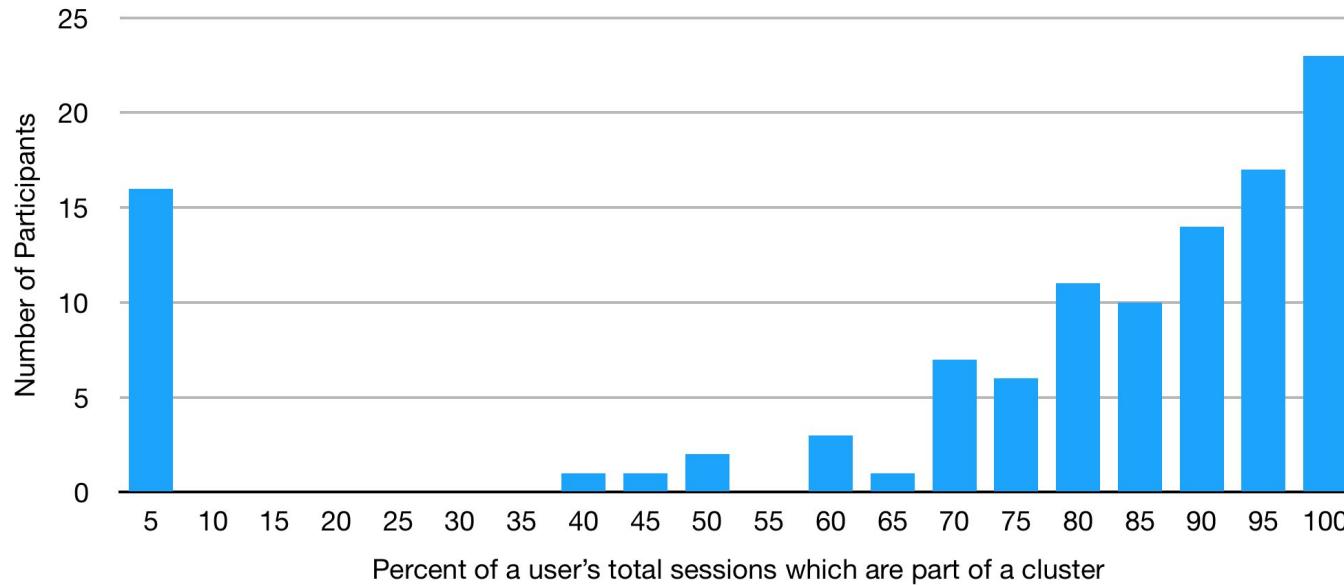
Thank You





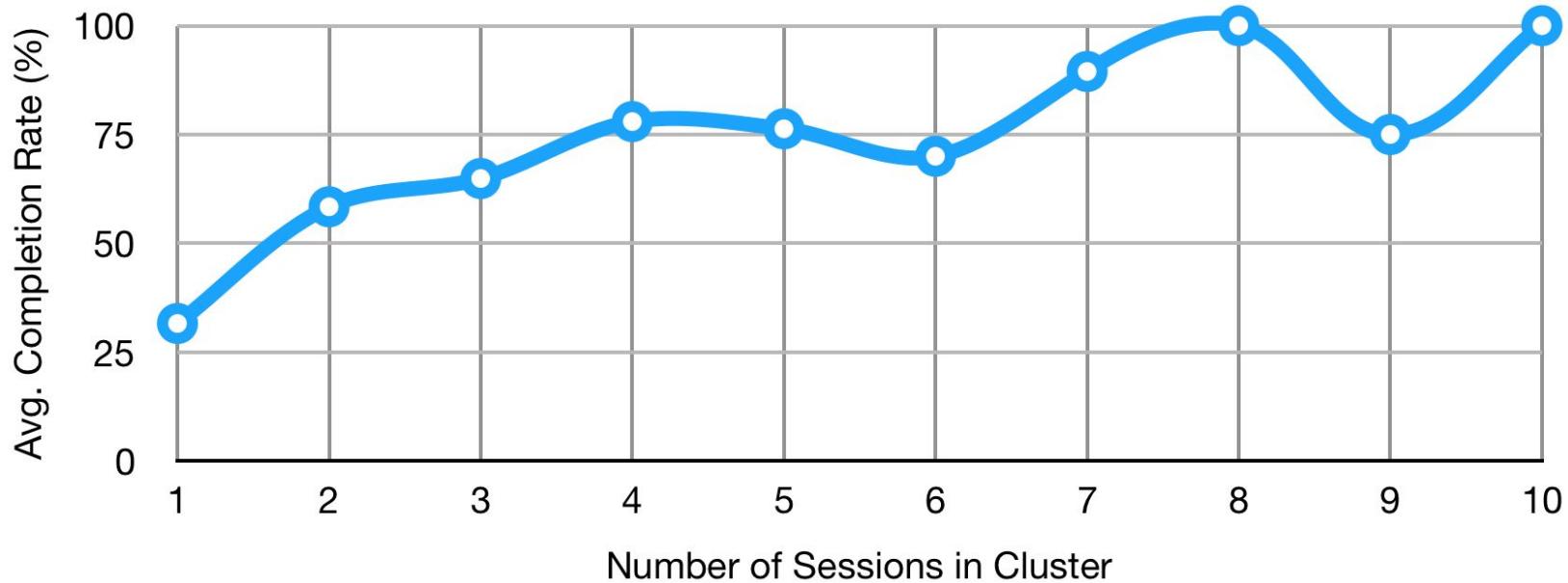
Clusters

Histogram: Percent of Sessions in Cluster



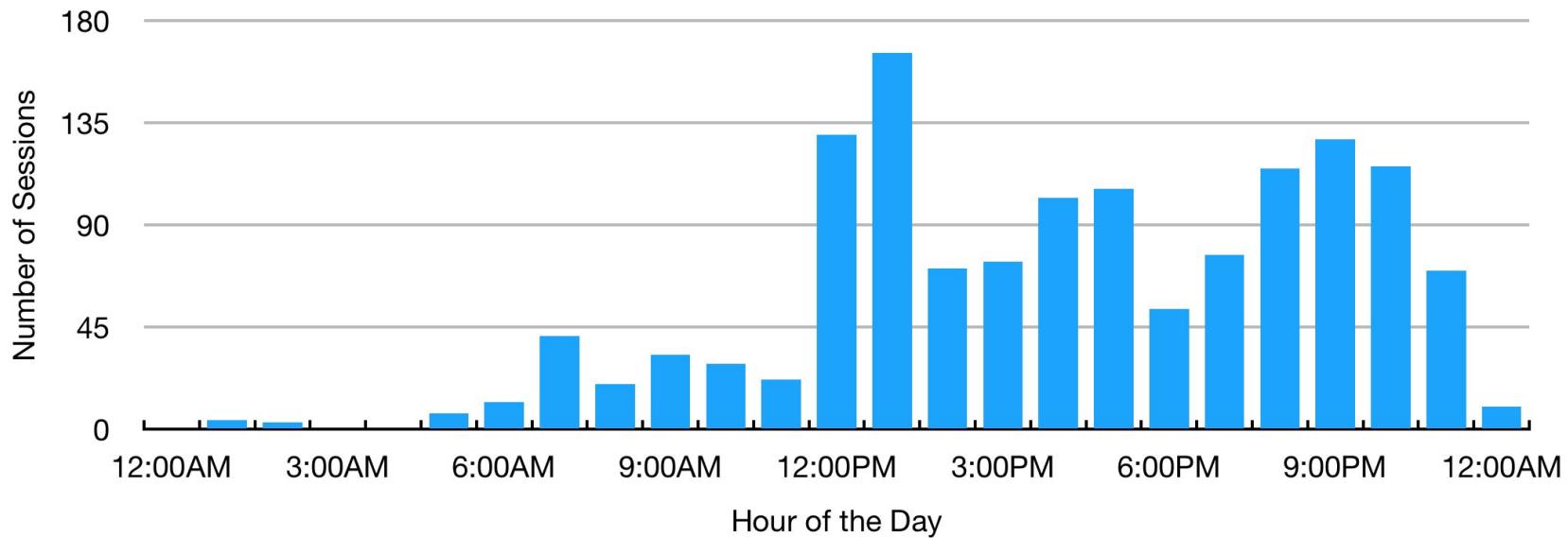
Clusters

Completion Rate by Size of Cluster

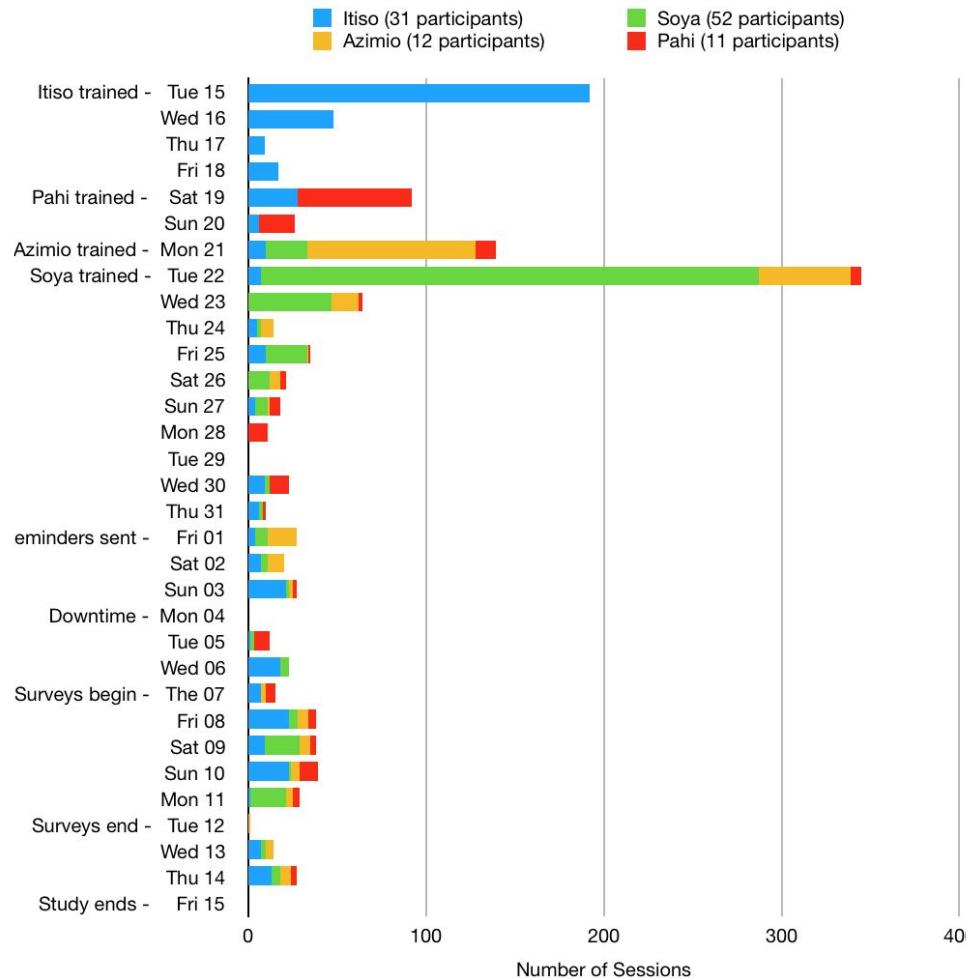


Usage

Histogram: Sessions per Hour of Day

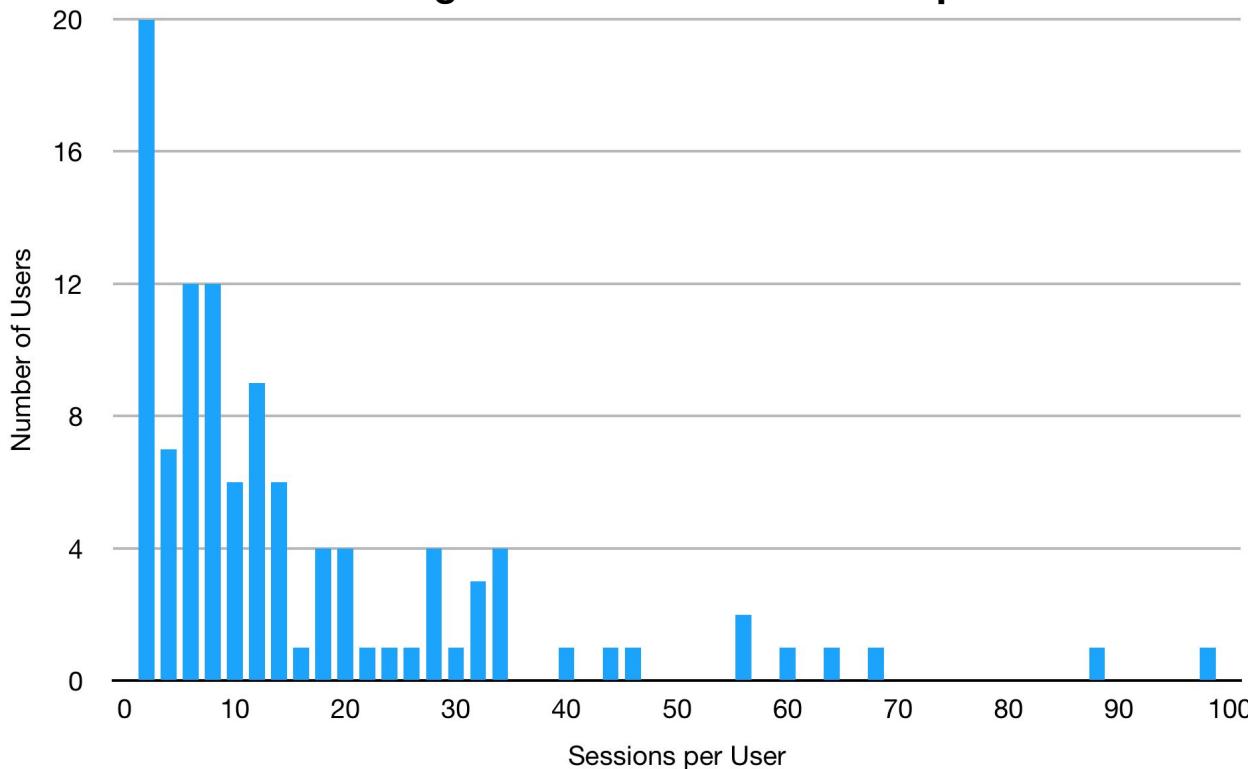


Usage over Time



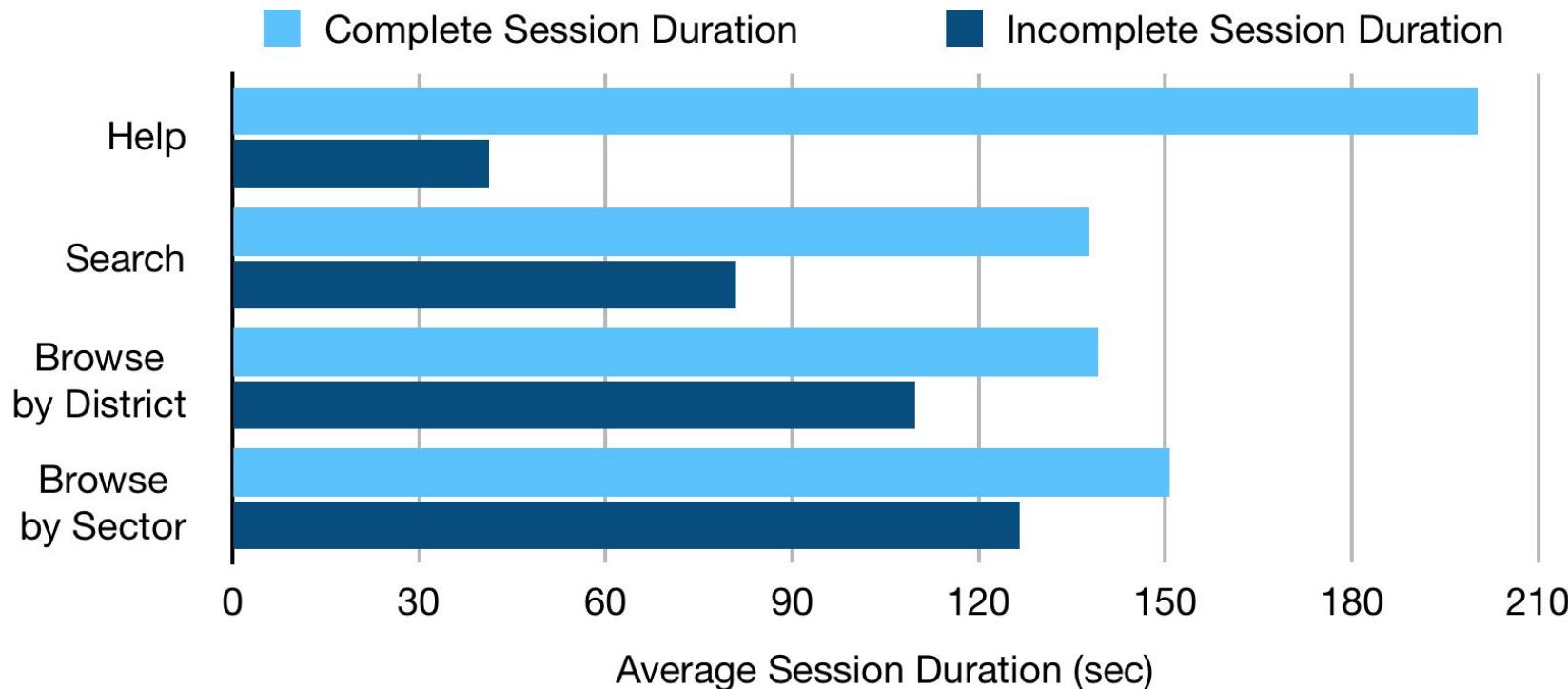
Usage

Histogram: Sessions Per Participant



Usage

Average Session Duration



Context

Two sources of collaboration for this project...

Technologists interested in infrastructure appropriate implementations

Work on studying existing apps, and barriers to usage

Interest in building accessible mobile apps *for all*

Development economists interested in the impact of information

Extension of previous work developing a paper phonebook, with more publications on the impact on the way

