TIRO

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INTRODUCTION

Problem Statement

As of 2014, there are around 500,000 registered NGOs in China, and about three times as many unregistered ones. They operate in a country that recognizes value in the social services these NGOs provide, yet imposes limits on the NGOs' work in order to maintain what it considers a harmonious society. (The Economist, Apr 12, 2014) In particular, labor NGOs in the Pearl River Delta (PRD) area provide important services to migrant workers who need help navigating and negotiating the challenges of fast-moving urban life. Every year, over 80 million migrant workers in the PRD region need assistance dealing with issues relating to their employment or integration into the coastal areas. (Chan 2012) In 2005, more than 20 percent of all labor-related NGO services provided in China originate from the Guangdong province, and it is estimated that in the PRD region alone, there are more than 30 labor NGOs that provide free services to workers. (Chan 2012) In the last two decades, labor NGOs in the PRD have enjoyed breakthroughs in developing effective models to support migrant workers which have spread to the Yangtze River Delta region and beyond. Nonetheless, labor NGOs continue to experience difficulties relating to sustainability and efficiency, which hamper their ability to serve more clients and scale their operations.

Sustainability of NGOs

In recent years, the Communist Party's attitude on NGOs has gradually shifted from distrust to growing tolerance of strategic symbiosis. Without relaxing its political controls on the type of NGO work it condones, the government began in 2011 to ease the registration process for NGOs to become legal. (The Economist, Apr 12, 2014) Unregistered NGOs are still illegal, yet they are tolerated at the local level as long as the provincial government is able to see that they are not "Trojan horses stuffed full of Western liberal ideas first subverting and then overthrowing the regime." (The Economist, Apr 12, 2014) The national government recognizes the value these NGOs bring in alleviating social tensions and providing services that the government finds difficult to provide effectively. As such, the party had pushed forth new regulations in 2014 to allow more types of NGOs to operate on a local level, albeit on a short leash. (The Economist, Apr 12, 2014)

Although the Chinese political leadership has become more accepting of local NGOs who provide support services to citizens, they still view these activities with some suspicion. Therefore, it is important for NGOs in China to demonstrate, even advertise, their mission and nature of work so as to preempt any suspicions of inappropriate activities. Transparency of work activities is crucial for both registered and unregistered NGOs, but it is particularly important for unregistered NGOs to not give the impression that they are too independent or controversial. Even if they have no intention to participate in subversive activities, NGOs perceived as undermining the government's policies or otherwise disrespecting the government's image tend to invite unwanted scrutiny, requests to curtail the scope of services, or destruction altogether. (Jacobs and Buckley 2015) Cheng et al (2010) describes grassroots civic groups, such as the Wheatfield Project, that go as far as publicly posting their financial information online: "a tactical measure to remove the suspicion of Chinese authorities."

All things being equal, the key to an NGO's best chances for sustainability is for it to be able to clearly, compellingly, and forthrightly demonstrate that its work is aligned with the Party's goals, or else face risk of crackdown when authorities have doubts about the true nature of its work. In January 2015, our team travelled to the PRD region and interviewed one NGO that works in the space of worker injuries. This NGO has indicated during our research interviews that its strategy is to preemptively invite the local police to visit its office and witness the operations when the police calls to inquire about goings on. Similarly, Cheng et al (2010) talked about the demise of an NGO located in Shenzhen: When suspicions arose about the NGO's foreign ties and financing, "the Workers Center made no attempt to reduce such distrust, thus allowing the situation to fester,” while the better course of action would have been to make extra efforts to be open about its operations.

Efficiency of NGOs

In addition to operating within a challenging political landscape, small, local NGOs operate with limited capital, technology, and human resources, which reduces their efficiency in handling clients and their ability to communicate their work to authorities. It is common for Chinese NGOs to serve their clients through a hotline, and in our field research, we identified several NGOs that use a hotline to provide counseling to migrant workers on labor law issues, judicial documentation, and court case preparation. As a consequence of lean funding, these NGOs we observed do not use a sophisticated call center system; rather, one staff member or volunteer carries a mobile phone and answers calls 24 hours a day. He or she then writes down details about each call on a paper log. In our observations and our discussions with people familiar with NGOs, this is the most common setup for hotlines.

There are obvious limitations to this approach. Paper logs are inconvenient to manage and track, creating significant encumbrances to the hotline operator’s workflow and opening up ample opportunities for data collection errors. In our interviews with a hotline operator, she said: “I usually only log at the end of the day. Most of the time I forget to log some calls, so I only log calls that I can remember.” (Helpline Manager, Interview Transcript, 01/11/2015). If papers are misplaced or damaged, there are no backups from which to recreate the logs. Perhaps most importantly, NGO founders we have spoken with are very interested in doing data analysis on calls that come into the hotline, in order to glean insights about their callers and the issues which bring these clients to the NGOs; however, paper logs do not allow for easy aggregation of data.

These limitations have wide-ranging consequences that hamper an NGO’s ability to create impact. An NGO’s inability to present accurate and reliable data for showcasing its work handicaps its grant funding pursuits, thus constraining the NGO's cash flow necessary for day-to-day operations. Such operations also suffer from laborious data entry needs which burden the volunteers and staff and take them away from tasks closer to the NGO's core mission. Without systematically collected data, NGOs work in the dark, unable to accurately see what their time and resources are going towards. Furthermore, without data they cannot communicate to the Chinese authorities beyond anecdotal evidence the nature or value of their work, and thus cannot moderate any inaccurate perceptions when suspicions arise about their activities' alignment to the government's goals. This further undermines their long-term sustainability as NGOs.

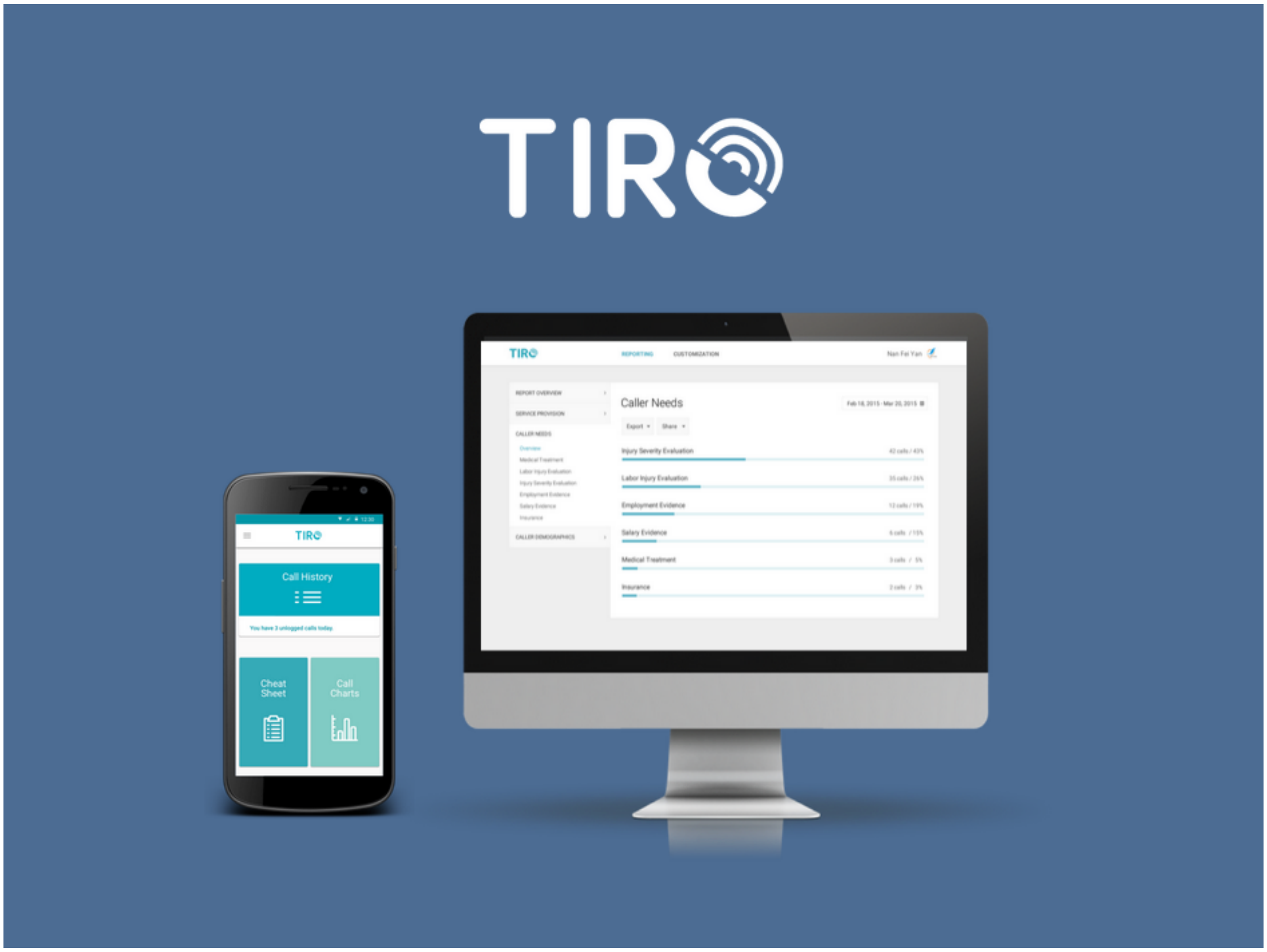
Solution

GOALS

We developed an ICT system for improving the efficiency and sustainability of local Chinese NGO helplines. The system will respect the unique requirements of our target user population: mobility, organization, accessibility, and privacy. We will initially pilot the tool with our partner NGO in the PRD region in China, with plans to expand the pilot study to six NGOs in the same region. The objectives of our pilot are to demonstrate that by using this system, the NGO can operate more efficiently, generate new insights to share with the Labor Department, and better communicate its work towards improving fundraising efforts.

APPROACH

Our approach is to equip Chinese NGOs with better tools for record-keeping and report-making. Specifically, because phone-based consultations remain the most integral part of an NGO's operations, we will develop a mobile phone application to log and manage information that surfaces through their helpline. Capitalizing on China's phenomenal smartphone penetration rate, we will develop an Android app that helpline operators can use to log conversation content and retrieve call details. An accompanied web application will permit NGOs to generate reports featuring demographic, caller relationship, and service provisioning metrics.


TIRO
TIRO
Call History
You have 3 unlogged calls today
Cheat Sheet
Call Charts
TIRO
REPORTING
CUSTOMIZATION
Nan Fei Yan
REPORT OVERVIEW
SERVICE PROVISION
CALLER NEEDS
Overview
Medical Treatment
Labor Injury Evaluation
Injury Severity Evaluation
Employment Evidence
Salary Evidence
Insurance
CALLER DEMOGRAPHICS
Caller Needs
Feb 16, 2015 - Mar 20, 2015
Export
Share
Injury Severity Evaluation
42 calls / 43%
Labor Injury Evaluation
35 calls / 26%
Employment Evidence
12 calls / 19%
Salary Evidence
6 calls / 15%
Medical Treatment
3 calls / 5%
Insurance
2 calls / 3%

Having access to an information management system directly their smartphone gives NGOs greater flexibility for collecting data about their operations. Our interviews with our partner NGO revealed the mobile nature of their work; on a typical day, helpline workers are not always in the office as they need to visit hospitals, go to court, attend fundraising events, etc. The ability to respond to calls while outside the office justifies the need for a mobile helpline, and provides a strong argument for collecting call information directly on the device.

An important component of our system will be a web application for accessing summary data on calls in order to prepare reports. Our partner NGO stressed the importance of using a desktop or laptop computer for this purpose, and envisioned logging into an online dashboard to export data in the form of charts and tables for use in their reports. The system may be utilized for generating statistics on caller demographics, including caller gender, age, hometown, location, and factory type. It may also be used for internal management purposes to track the NGO's relationship with its callers, such as the average duration of service provision or the percent of one-off calls. Finally, it can be used to describe service outputs and outcomes, such as the types of counseling it provided and the number of cases it resolved.

USER RESEARCH

Research Planning

BACKGROUND

The original motivation for conducting field site research was to understand how migrant workers adapt to city life and find reliable and safe work. We formulated some general hypotheses based on interviewing scholars, watching documentaries, and reviewing academic literature. Our team then took this research further and conducted a 10-day field site study in China during January 2015. We specifically chose Pearl River Delta as our destination because economic activity is concentrated in the region, and the PRD is known to be a place where migrant workers settle for work. We also have the practical benefit that our team members speak the local languages (Cantonese and Mandarin) and have personal connections to people in the PRD area.

RECRUITMENT

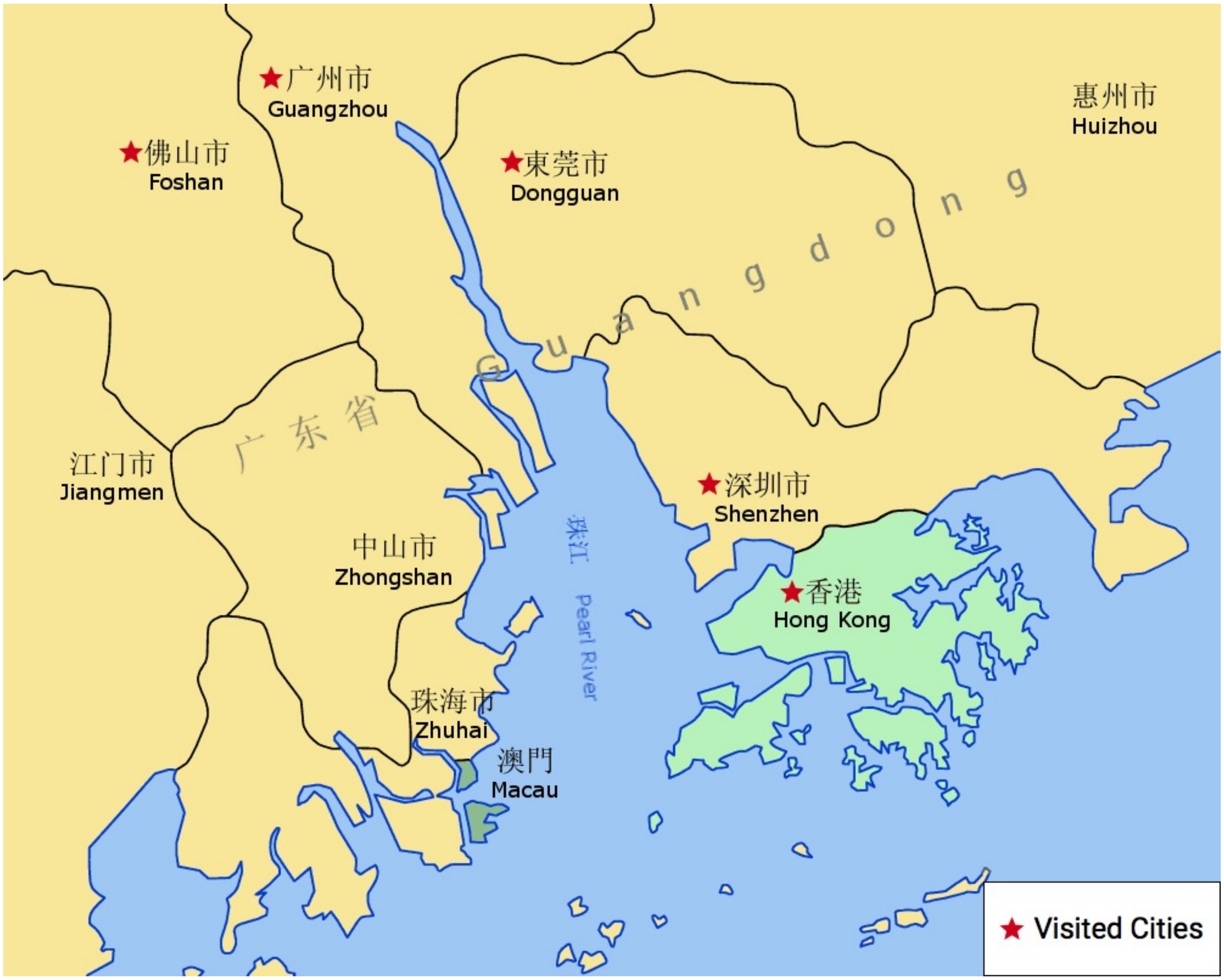
We planned our field site study with the intention to interview a broad spectrum of subjects who interact with migrant workers or are migrant workers themselves. Utilizing our personal networks, our team reached out to individuals in our personal networks who have connections in the PRD region, most of whom either own a factory or are employed in a managerial capacity in a factory.

We used this method of recruitment because we understood that gaining access to migrant workers would be difficult, given their strict work schedules and paucity of leisure time. Requesting time and access to migrant workers in a factory for interviewing purposes would most likely require permission from their supervisors. We met with Professor Jack Qiu, who studies ICTs in Southern China, and he provided several strategies and approaches to interviewing migrant workers. He suggested that we should look at their lunch or dinner schedules for opportunities to conduct in-person interviews, and observe our subjects' form of speech and talking tempo. He also advised that migrant workers are often suspicious people, and therefore establishing rapport with them would take time.

In addition to working in factories, migrant workers are found working in the service industry, public sector, construction and more. Therefore, aside from the scheduled visits to factories and NGO, we took any opportunities we had to talk to migrant workers that we met on the street, restaurants, construction sites, taxis and more.

Before arriving in China, we had arranged to visit two labor rights NGOs, both of which we found through our conversations with various Chinese scholars and China Labor Bulletin, a labor NGO in Hong Kong. Unfortunately, due to the activist nature of his NGO's work, the founder of one of the two NGOs was attacked by unidentified gang members before we arrived and therefore was not available to meet with us. Our team was able to meet with the other NGO with whom we managed to establish a working partnership for this project.

RESEARCH REGION



★广州市
Guangzhou
★佛山市
Foshan
★東莞市
Dongguan
惠州市
Huizhou
Guangdong
广东省
江门市
Jiangmen
★深圳市
Shenzhen
中山市
Zhongshan
★香港
Hong Kong
珠江
Pearl River
珠海市
Zhuhai
澳門
Macau
★ Visited Cities

FIELD RESEARCH ITINERARY

Day	City	Activity
Day 1 - 1/6	Guangzhou	• Travelled from Hong Kong to Guangzhou • Interviewed migrant workers in service industry • Interviewed construction workers
Day 2 - 1/7	Panyu	• Visited career fair • Observed recruiting process • Interviewed HR reps working in factories • Interviewed migrant workers about job searching experience
	Dongguan	• Visited a vitamins production facility • Observed factory setting • Interviewed migrant workers about job searching experience • Interviewed construction workers of job searching experience
Day 3 - 1/8	Dongguan	• Visited a shoe factory • Interviewed migrant workers of job searching experience and career planning • Interviewed HR managers on recruiting and CSR management • Interviewed factory managers of factory management • Observed migrant workers' recreational activities after work • Visited a vocational training school for migrant workers • Interviewed the owner of the school about training programs.
Day 4 - 1/9	Dongguan	• Visited a prefabricated houses factory • Interviewed migrant workers about job searching and career planning • Interviewed founder of the factory of recruiting and management

Day	City	Activity
Day 5 - 1/10	Foshan	• Interviewed migrant workers in service industry
Day 6 - 1/11	Foshan	• Visited labor rights NGO • Interviewed founder and NGO staff • Volunteered at their fundraising event • Visited migrant workers' community center
Day 7 - 1/12	Foshan	• Visited labor rights NGO • Interviewed founder and helpline manager • Explored our proposed solution • Observed the helpline manager working • Observed legal consultation workshops
Day 8 - 1/13	Foshan	• Visited labor rights NGO • Interviewed injured workers who are helpline callers • Conducted card-sorting activity with the helpline operator
Day 9 - 1/14	Foshan	• Interviewed the helpline operator
Day 10 - 1/15	Shenzhen	• Interviewed the head of sustainability at a design manufacturing company in China

Field Site Research: Study Areas

GENERAL MOBILE PHONE USE

We found that many of our interviewees owned a smartphone and have high mobile literacy. We also learned of the emergence of cheap Chinese smartphones, such as Xiaomi, which have become a strong alternative to high-end smartphones, such as iPhones. iPhones or other Western products sold in China are often fake or contain stolen hardware. For that reason, and also because Western products are much more expensive, many workers prefer to use Chinese phones. When asked about mobile phone usage, many migrant workers talked about using phones to call family members back in the rural areas, catch up with friends, find entertainment or use the phone as a way to mentally escape the troubles of work. Moreover, some workers mentioned how they need a phone in order to find work because employers increasingly expect to be able to reach potential candidates on a mobile phone.

NGO BACKGROUND AND SERVICES PROVIDED

In the latter half of our field site research, our team did an extensive study of a labor rights NGO in Guangzhou. The NGO's objective is to "provide guidance and help so that injured workers can then gain confidence and ability to return back to work." (NGO Founder, Transcript, Jan 2015) For labor rights NGOs, such guidance is often in the form of legal consultation, where they educate workers on issues relating to labor law, labor protection regulations, preparation of legal documents, or representing themselves in court. Activities conducted by this NGO include holding mock trials as practice for workers without lawyer representation, reviewing forms and documents prepared by workers, and advising workers on judicial procedures.

The NGO believes that by arming themselves with knowledge about labor law, injured migrant workers can then better safeguard their own rights and interests. The NGO founder is himself a migrant worker who moved to the Guangzhou for work many years ago. Shortly after his move, he suffered from a severe work injury. He lost three of his fingers on the assembly line, and he sought guidance from other labor NGOs to understand the process of injury compensation. The founder hopes to empower other injured workers through his organization's work.

HISTORY OF THE NGO'S HELPLINE

We recognized the importance of the NGO's mobile helpline early on in our conversations with the NGO. When the founder described the earliest years of the NGO's operations, he noted that he provided legal counseling by giving out business cards with his phone number displayed. He would receive and answer calls on his personal mobile phone, and calls would happen anytime in the day or night. Over time the organization grew, and as different forms of communication technologies became prevalent, he included other forms of outreach such as QQ and WeChat to connect with injured workers. However, the mobile helpline continues to be the most well-known and utilized form of communication for the organization.

EXPLORING PROPOSED SOLUTIONS

When asked about some of the organization's biggest technological needs, the NGO founder expressed a large need to track and analyze call logs. He has tried to maintain paper logs of all the calls that they have received for the past few years. The objective of logging is for them to produce regular estimates on the number of people that they have helped, catalog common questions, identify problematic behaviors among factories, and ultimately work towards publishing reports to local governments in order to openly demonstrate the nature of their work.

In response, our team proposed a solution to address the logging challenge and continued to refine our idea throughout our four days at the NGO. We started with the idea to create an interactive voice response (IVR) system to record, redirect and filter calls. We tried to validate this idea with workers who have called into the helpline in the past. However, workers expressed feelings of distrust and disrespect if they were to call into an auto-response helpline during times of dire need. This was one of our most important findings because we realized the importance of maintaining a system that supports human to human connection.

Based on the workers' feedback, we proposed building an application on the phone that can record phone conversations and then process speech into text for the NGO staff. The idea received some support from the NGO staff but failed on the technical front, because there are no natural language packages well designed for Chinese language. The NGO staff heavily emphasized the need for data to be in the form of text, rather than audio. As the NGO founder said, “Because when you do a report, the report is always in text. Or else, there is so much manual work to transcribe the audio.” (NGO Founder, Transcript, 1/12/2015) Recognizing these needs, we decided to create a mobile application that prompts the user to input structured data after a call ends. There would be no audio recording involved, and the output would readily be in their desired form. Our team decided to go forward with this idea and developed design constraints based on our research.

NGO’S USE OF HELPLINES

This NGO, like many other labor rights NGOs seen in our literature review, delivers most of its services through a helpline. As the founder said, “The main goal of the helpline is to give injured workers guidance directly. For example, when they go to the government, they will need some immediate guidance of how to react to the bureaucracy.” (NGO Founder, Transcript, Jan 2015) The majority of injured workers learned about the helpline during their stay at the hospital, where NGO volunteers typically have their first opportunity to reach out to injured workers and distribute materials about their helpline services. Therefore, the number of hospital visits by the staff can also impact the number of calls that they receive through the helpline.

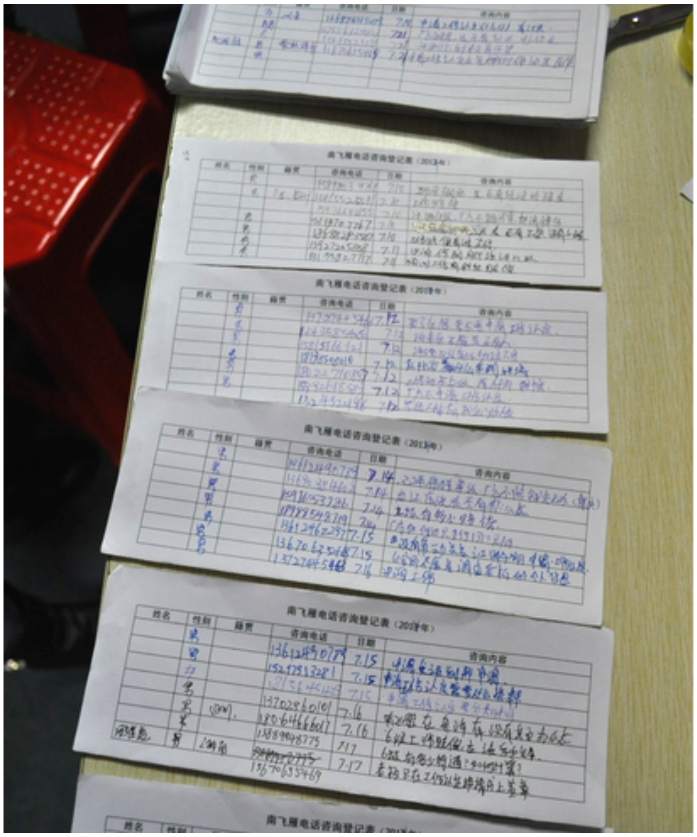
The NGO distributes a book about labor laws and injury compensation to injured workers. However, since migrant workers often do not have adequate education, they find it difficult to understand the book’s content, especially when the specific topic relevant to their situations is complicated. Injured workers prefer to call or visit the NGO instead of reading the book. The human-to-human emotional connection made possible through the helpline is also critical: ”Whenever they have problems, they can always call me. Actually, I personally understand. Because I had an injury before. I would be very happy to have someone to come help me and understand me.” (NGO Founder, Transcript, 1/ 2015)

CHALLENGES: HELPLINE MANAGEMENT

The NGO founder shared his challenges of managing a 24 hour hotline. Not only is the volume of calls unpredictable, but long hours of responding to calls can be extremely taxing due to the emotional nature of call content. Managing a helpline is a “division of labor process...[I have] no time and opportunity to manage all the calls [...] I can’t put it on a single person, because it will tire the one person. It will also be emotionally hard.” (NGO Founder, Transcript, Jan 2015) The hotline may receive up to 20-30 calls during the peak time, which is often around summer time because the increase in heat makes workers more prone to injuries.

CHALLENGES: DATA LOGGING

The NGO’s current workflow relies on a logging system based on paper, which is prone to errors. While the helpline manager tries to hand-write logs for all the calls that come in, it is difficult for her to keep a complete record of call data because she is often on the go, may not have access to the paper logs at the moment, or simply forget the contents of the call. The NGO wants to implement a data logging system that affords better reliability and ease of use so that the NGO can “target where to distribute information, incorporate certain information in their booklet and provide information to government agencies and Labor Department on some suggestions” as to where they should focus more. (NGO Founder, Transcript, Jan 2015)



Paper logs from NGO.

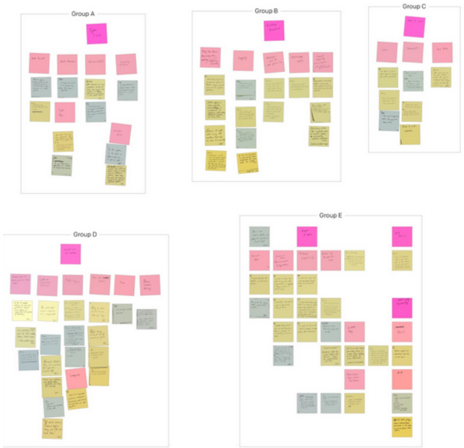
CHALLENGES: DATA FOR REPORT MAKING

The NGO founder is vocal about the importance and need for data as a way to communicate with external stakeholders, particularly the government. The founder noted that he compiles and submits annual reports to the Labor Department as a gesture of alignment and good intentions, which are essential for building trust and establishing a productive working relationship with the Department.

Affinity Diagram

ANALYZING FIELD SITE RESEARCH DATA

Organizing field research data.



Digital record of our affinity diagram.

Key Concept	Inquiry	Observation	Source
Observation of helpline operation	Callers tend not to provide their personal information	On average, only one out of ten callers leave their name	Observation
	Level of customer service	“Through the helpline, they can understand the compensation process better.	NGO Founder
	Typing can be difficul	I preferred calling helplines because typing is very complicate	Caller

Key Concept	Inquiry	Observation	Source
Observation of helpline operation	Frequent Questions	Documents for labor department	NGO Founder
		Evidence Searching	NGO Founder
		Compensation related	NGO Founde
		Problems at hospital	Helpline Operator
	Languages	Callers speak Mandarin and Cantonese, but we will ask them to speak Mandarin if the helpline operator doesn't speak Cantonese	NGO Founder
	Call Volume	Can have up to 20-30 calls per day	NGO Founder
		Number of calls relates to the number of hospital visits	NGO Founder
		Number of calls is higher in summer because the hot weather makes working conditions more dangerous	NGO Founder
	Time	A single call usually lasts around 8 mins	Helpline Operaton
	Distinguishments between callers	Annotating stars on the paper log with callers that need follow-up	Observation
Problems of existing solutions	Only one person answering the hotline	"I don't want to put all calls on one person to answer. Because it's emotionally difficult to answer repeating questions.	NGO Founder
	Logging	"Difficult to log on paper when I am on the go.	Helpline Operaton
		Forgetting to log some of the calls right after the conversation	Observation
	Retrieving	"The hardest part to retrieving information is remembering to log.	Helpline Operaton

Key Concept	Inquiry	Observation	Source
Purpose of collecting data	Reports to Government	“I want to have the info to provide to government	NGO Founder
		“To create reports, I need exact numbers.	NGO Founder
	Internal Improvement	“I want to have the data to better target where to distribute our material.	NGO Founder
		“I want to have the data to see where the problems are coming from the most, which village, area having the most problems then I can target and provide the help.	NGO Founder
	Follow up	“I need to go back to the data logs, when there are specific info that would benefit the callers.	Helpline Operator
Data to collect	Case	The type of factories where callers work at	NGO Founder
		Caller’s Question	Helpline Coordinator
	Demographics	Age	NGO Founder
		Education Background	NGO Founder
		Gender	NGO Founder
	Geo-Data	Geo-location of the caller	NGO Founder

Key Findings: Defining Our Design Constraints

MOBILITY

We chose to design for mobility both because we observed it to be a priority among Chinese hotline operators, and because smartphone adoption rates are high in China. As of 2013, smartphone penetration in urban China reached 42% (Kantar World Panel 2013), with forecasts predicting that smartphone users, both urban and rural, would grow from 436.1 million in 2013 to 704.1 million in 2018. (Mahajan 2014) These trends are supported by the increasing affordability of smartphone devices, particularly Android phones. A recent report by Kantar Worldpanel showed that Android devices occupy a 72.8% share of the smartphone market in China. (Smith 2015)

These research statistics corroborate with our field observation that Chinese labor NGOs are much more likely to use Android devices to operate their hotlines. NGOs in China tend to be small and scrappy, with few staff members and volunteers running multiple aspects of operations at the same time. Without dedicated staff to the hotline, the volunteers that we interviewed reported having to juggle multiple responsibilities on the go while answering calls. It is not uncommon for volunteers to answer calls while traveling on the bus or visiting injured workers at the hospital. Furthermore, small NGOs need the flexibility to adapt to changing staffing needs. There is a lot of fluidity in volunteers' availability and commitment; therefore, having its hotline operations entirely encapsulated on one mobile phone allows an NGO to quickly hand off the hotline duties from one volunteer to another.

DATA SECURITY & PRIVACY

We designed for privacy and security from the start, recognizing that an NGO's client data may be sensitive and that any breach of an NGO's data may harm the vulnerable workers served by the NGO. Chinese NGOs run a wide spectrum in terms of sensitivity of their work, adversaries they face, and legitimacy in the eyes of the government; hence, we decided to incorporate a variety of design features and considerations that meet different levels of security requirements, with the goal of improving the security of client data beyond the level afforded by existing practices (e.g. logging data on paper). In Section "Product Design: Data Security and Privacy" below, we offer a fuller discussion about the threats faced by Chinese NGOs, and our approach in addressing data privacy and security concerns.

WORKFLOW INTEGRATION

An important design goal is ease of use to afford efficiency and accuracy in data entry. A main concern expressed by interview participants was the uncertainties in transitioning from a paper-based tracking system to an electronic one. From interviews with the NGO founder, we understood that a primary objective of the system is to enable quality data analysis, which necessitates imposing structure at the time of data capture. On the other hand, the helpline operators we spoke with appreciate flexibility in how they log information about contents of a call; being able to record information in a free-form format allows helpline operators to note down idiosyncrasies of a caller's situation or details that do not otherwise follow established patterns. We established a design goal of mapping our information architecture as closely as possible to the hotline operators' workflow and mental models. The interface should allow for quick tagging of pre-defined data elements, while judiciously offering opportunities to record unstructured text in appropriate places of the interface. Furthermore, the interface will have prompts to remind the user of what questions to ask the caller, so as to ensure consistency in the information asked for and collected for each call.

SPECIFIC USABILITY CONSIDERATIONS

There are design goals that grew out of research findings specific to two cultural considerations. The first finding was that despite their high literacy rates and technological savviness, our target user population showed relatively low skill level in reading and interpreting data charts and visualizations. During usability interviews, they showed difficulty in interpreting the meaning of bar charts and line charts, and they could not readily see the relationship between granular and aggregate representations of the same data. Therefore, we designed our visualizations with the goal of readability in mind, sticking with simple chart types that we validated as familiar enough for them to read and interpret.

Another design goal was accessibility, to include as many types of users possible. We recognized from our research that many members of our target user population have sustained work injuries specifically on their hands: NGO volunteers who are former factory workers often have hand injuries, including entire fingers lost, which potentially hamper their ability to navigate a mobile phone interface. Other types of injuries are less common but evident. We decided that we would design our app from the ground up to be accessible to as many types of users as possible, and consider the ways in which we can accommodate varying levels of manual dexterity.

Similar Products

We wanted to identify whether the project has an existing solution that meets our design constraints. Moreover, our team has received a lot of feedback about whether our proposed solution overlaps with traditional customer relationship manager tools (CRM). Therefore, our team decided to look at similar products on the market to help us define our unique opportunities for differentiation.

Using the four main design considerations discussed above, we created a guideline for identifying and evaluating other products. We found that our competitors mostly fall under two types of products: helpline data-logging/management systems or customer relationship management systems (CRMs). In the former category, we have only been able to identify one competitor in this market. In the latter category, we identified Salesforce Foundation, Base and Zoho as the three main competitors in that market.

FINDINGS

iCarol

While iCarol has certain functionalities that are similar to ours, such as phone logging and report making, iCarol still lacks a lot of the required design considerations for our user group. From our user research with small NGOs in China, we identified the need for a mobile-first solution because hotline managers are mostly on the go. However, iCarol lacks the ability to be used on a mobile phone and does not support Chinese language, therefore failing to meet our first two requirements.

iCarol also does not allow users the flexibly to customize their categories and fields beyond minor adjustments. Any changes must be completed through a service agent. Moreover, their price range is beyond what many of the small NGOs in China can afford.

Salesforce Foundation, Base, Zoho

Many of these CRMs provide the basic functionality of our tool. Each can trace and log calls, edit call logs, and create and share reports. Base and Zoho meet one of our four main design considerations for having mobile-first options. However, none have security, language and flexibility for users to readily define and extend their information architecture. Such tools are mostly designed for sales and marketing users, whose information needs are different than those of our target population. None of the products examined here allow for modifications to the information architecture to move away from language like “deals,” “leads,” and other nomenclature associated with sales and customer relationship management.

PRODUCT DESIGN

Overview

During our user research phase, we collected, organized, and analyzed artifacts to map our user needs. These were then refined and structured into key findings to guide our design process. Our process began with defining users and use cases, followed by mapping our target user's information architecture, reviewing competing products, examining privacy and security constraints, and finally designing a low-fidelity prototype.

Personas and Use Cases

PERSONAS

NGO Founder: Mr. Xiao, male, age 42

Mr. Xiao is the founder of a small labor NGO in the Pearl River Delta, China. His NGO centers on providing legal advice and assistance to injured workers, and he mostly offers his services through a mobile phone helpline. He is very familiar with labor laws, legal proceedings, and government processes. He wants to better understand what people are calling about, and to find out where along their path to gaining injury compensation are workers having the most problems. He also wants to improve his working relationship with the government so that his applications for permits to do different activities can be approved more quickly. His NGO is very similar to many others in the region.

NGO Worker: Mei, female, age 24

Mei is a 24-year-old helpline coordinator at Shenzhen Labor Services. As an injured worker who had gone through the process of applying for compensation two years ago, she understands the struggles workers face. Answering the hotline is just a part of her work; due to limited human resources, she often has to also visit hospitals or courts to provide in-person help to injured workers while answering calls on the go.

NGO Volunteer: Zhang, female, age 19

Zhang volunteers at a labor NGO. She is pursuing a degree in social work at a nearby university, and is volunteering at the NGO to obtain experience in the field. She is not responsible for giving direct advice to workers. Instead, she helps to organize events, performs data entry tasks, and assists with fundraising efforts.

USER SCENARIOS

We identified two use cases for our product: helpline conversation logging and report-making. These cases are enacted in the following scenarios using the personas we defined above.

Helpline Conversation Logging

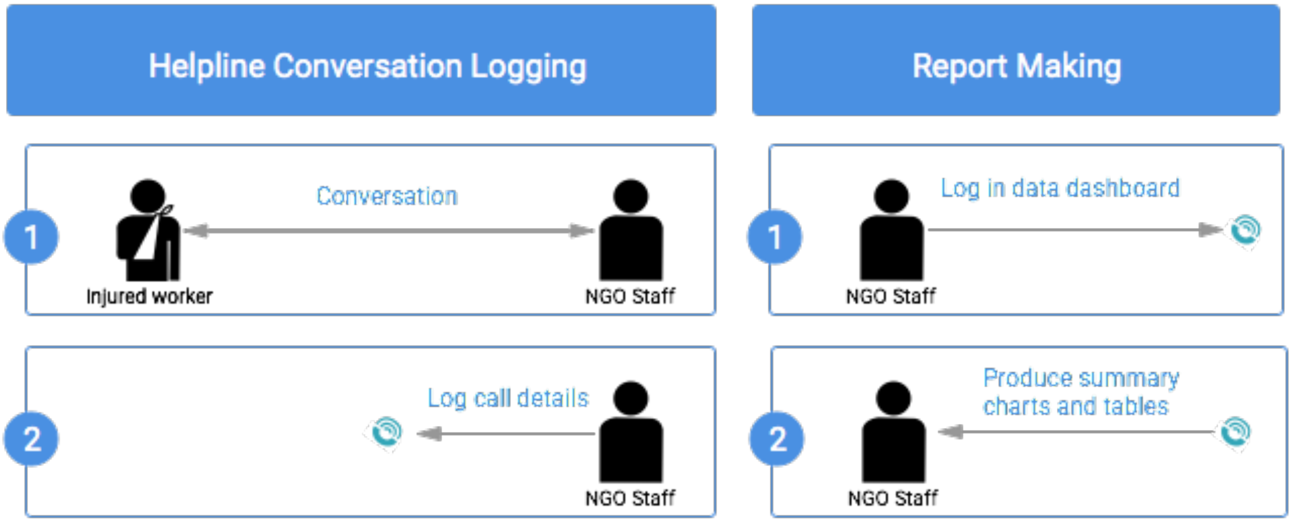
While riding a crowded bus on her way to the hospital, Mei, the helpline operator, receives a call on the NGO's mobile device. An injured worker is calling with questions about what evidence to collect when applying for compensation, and what to do if his employer declares bankruptcy. To better understand the problem, Mei asks him personal information and details about the factory he works in. After providing him with clear suggestions and hanging up, the phone displays a form for Mei to log information about the call. The form includes the most common caller needs, which she can quickly select without needing to type text. She can also create new options within the same form. Mei completes and saves the call log form.

Report Making

Mr. Xiao wishes to begin sharing his NGO's work with the Labor Department. His goal is to be open about his work, and to share with them the insights he gathers through his helpline service. Every six months, Mr. Xiao uses TIRO to retrieve summary metrics and charts of caller demographics, caller needs, and services provided, and he includes these outputs in a report that he sends to the Labor Department.

Meanwhile, Mei is asked to prepare data for a monthly staff meeting where workers and volunteers discuss trending issues to improve the efficiency of their operations. Mei uses TIRO to retrieve month-by-month summary metrics and charts of caller demographics, caller needs, and services provided. Using the generated reports, the staff identifies that callers face a recurring issue in finding the appropriate documentation for evaluating injuries. As a result, the workers decide to provide more information about injury evaluation in their distributed pamphlets.

User Flow


Helpline Conversation Logging
Report Making
1
Conversation
Injured worker
NGO Staff
2
Log call details
NGO Staff
1
Log in data dashboard
NGO Staff
2
Produce summary charts and tables
NGO Staff

Information Architecture

In our NGO's current paper logging system, helpline operators use freeform text to describe caller needs. Part of our solution entails imposing structure to how they input data in order to readily support data aggregation and analysis in the future. To achieve this, we designed a classification system for caller needs using a card-sorting exercise.

CARD SORTING

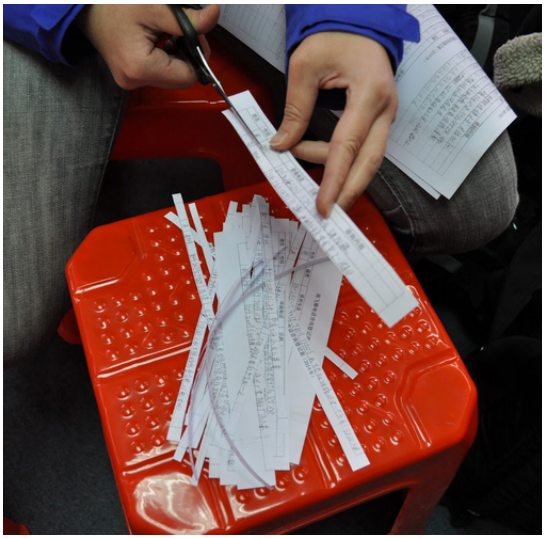
Near the end of our field site trip, our team conducted an open card-sorting exercise using the NGO's past paper logs. It was an inexpensive and effective way to observe how helpline operators tacitly group, sort and label content. Results from this exercise provided us with an understanding of how our users organize information about caller needs.

Research Questions

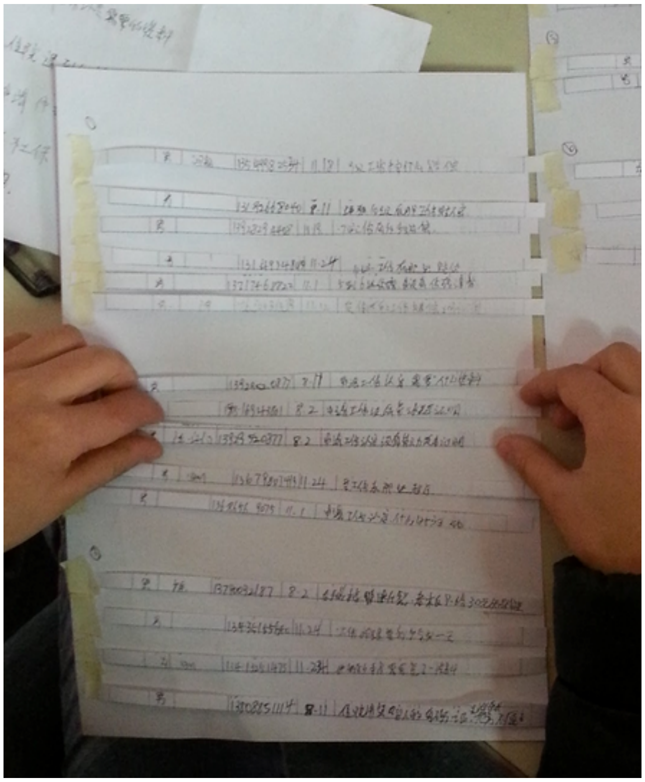
- How do helpline operators mentally group these calls?
- What are the defining characteristics of these information groups?

Process

Our team randomly selected and photocopied 2 sheets of call logs recorded over the past year. We cut out each log and asked the helpline manager to group the paper strips into common themes. The test was based on the paper logs because each record had a consistent level of granularity and represented a single call.



Cutting out each paper log for helpline operator to group.



The helpline operator grouped the paper strips.

After the participant finished her first round of grouping, she was asked to label the groups and explain her choice. We then entered a second round of grouping and asked her to label the groups again.

Findings

The participant grouped the records into 6 main categories: compensation, documents needed to apply for an injury evaluation, problems faced during hospital visits, legal arbitration, issues related to social insurance, and other. These 6 groups formed the basis of our information architecture.

Within the logs on the sheets we sampled, compensation was one of the most frequently discussed topics. When asked about the 'other' category, the participant noted that the category included cases that were more complicated or uncommon. This included cases that required follow up because the helpline operator was unable to answer the caller's questions. However, not many paper strips were labeled as 'other,' making the overall category the least prevalent and important.

OVERARCHING INFORMATION ARCHITECTURE

After returning from our field trip, we conducted a remote information architecture ranking exercise with the NGO founder and staff. Our team interviewed a few helpline organizations in the area and found some similar patterns in terms of data needs (Refer to Section: Extensibility and Design). Recognizing the common data needs from these organizations, we created an initial information architecture: 1) Current Stages, 2) Encountered Problems 3) Services Provided and 4) Demographics. We incorporated the results from the card-sorting exercise into the 'Current Stages' section. We hoped these sections would encompass all of an NGO's information needs.

The NGO founder and staff responded with their critique and suggested grouping 'Current Stages' and 'Encountered Problems' into one section, and keeping 'Services Provided' and 'Demographics' as separate sections. However, after several rounds of iteration, we concluded with the NGO that the final structure of the information architecture should only include 'Current Stages,' renamed 'Caller Stages,' and 'Demographics,' renamed 'Caller Demographics.'

Competitive Usability Test

Our team drew parallels between our project and several products that currently exist in the market. These primarily include two mobile-based Customer Relationship Management (CRM) solutions and one helpline management system that is popular among large and established organizations. Our goals were to gain design inspiration and to leverage industry best practices.

CRM SOLUTIONS

The team installed and tested two CRM solutions, Zoho and Base, over a period of two weeks to evaluate their data input flow. As CRM products, their information architecture focused more on customers, leads, and sales, making the architecture irrelevant to our project. However, they employed flows that were similar to those we envisioned, such as having forms appear once a phone call ended.

Another interesting insight was their modular data entry process. The apps prompted users to specify the call topic and outcome as two separate steps within a “Call Summary” screen. Completing each step always brought the user back to the call summary screen for review. We contrasted this approach with a sequential data entry process, where upon completing one section, the user would automatically be taken to the next section. We observed that the sequential data entry framework is more appropriate for applications where consistent, complete data capture is required for every field. In our application, however, where a hotline conversation may or may not touch on every topic addressed by the information architecture, it makes sense to give hotline operators more flexibility and agency in deciding which fields to log data for and the order in which data should be entered.

HELPLINE MANAGEMENT SOLUTION

We were fortunate to find iCarol, a product very similar to ours. However, there are still many differentiating factors, the most prominent ones being that it lacks Chinese language support and is unavailable on mobile devices. The interesting aspect of the product was how they designed data entry forms to accommodate the needs of their numerous users with heterogeneous information requirements. Every organization that signs up for the product is given an initial consultation session geared towards discovering their information needs. The company then sets up the appropriate data entry forms, and gives the organization the ability to perform light customizations.

This highlighted a challenge of providing diverse organizations with data entry forms: in order to be useful at capturing information about the organization’s unique services, forms must have sufficient levels of specificity and relevance. This is a challenge that iCarol meets with human intervention. For our application, however, we propose an extensible templating system where groups of organizations can take advantage of pre-established information architectures appropriate for the organization's type of work. (See Section: Extensibility and System Design: Templating System)

Data Privacy and Security

CHALLENGES

The expectations and realities of data privacy and security are different in China than in the U.S.: it is well known that the Chinese government practices digital censorship and surveillance according to its political ideologies. Our overarching goal for this project is to enable NGOs in China to fully cooperate with the government and easily demonstrate the nature and impact of their work, without compromising the safety and anonymity of the vulnerable individuals they serve. In designing this system, we established a minimum design criteria that data pertaining to an NGO's vulnerable clients should not end up in the wrong hands. Our design approach prioritizes improving the security of client data beyond the level afforded by current practices (i.e. logging data on paper), and considers the ways that the NGO can best protect itself in the event of a crackdown.

THREAT MODELS

Our approach to security and privacy design begins with identifying the specific threats to our system. Threat models describe situations that we wish to protect against, and are useful for designing and assessing the effectiveness of our security features. That said, no security system is perfect, and the accepted heuristic is to design a system that aims to minimize damages in the event of a security breach.

Document surrender

Our user research has shown that local law enforcement has asked NGOs to surrender business documents in the past, which may include log sheets detailing the needs of vulnerable callers. Our system digitizes call logs, which subjects us to the same, if not greater, risk because of its portable, easy-to-consume, and easy-to-share format. From our interviews with NGOs, we understand that the police's primary motive for requesting documents is to get an overview of what the NGO is up to and whether any of its work activities are causes for concern. The request is also sometimes used as an intimidation tactic, where the police demands to examine an NGO's information in order to instill a feeling of subordination. In extreme cases, the police might make requests in response to specific suspicious activities.

In all of these cases, the primary threat we consider is the NGO's client data falling into the wrong hands. Log data in paper form enjoys a certain level of protection afforded by the materiality of paper: even though the police can walk into the NGO's office and grab the stacks of paper logs, it is still cumbersome and impractical to photocopy the papers and make sense of all the documents. Transitioning log data into digitized format introduces an inherently higher risk of unauthorized access, stemming mainly from ease of duplication and dissemination. Therefore, in our design approach we must consider ways to limit the amount and distribution of any data accessed by the police.

Situations of duress

There are rare but documented cases of thugs hired by factory owners to attack NGO staff who help injured workers win lawsuits. One of the threats we face is that malicious parties coerce NGOs into surrendering information about specific callers. Situations of duress are extreme, and we have not yet encountered any direct evidence of this.

APPROACH

In considering these threats, we approach the design of TIRO in the following ways:

1. Rate limiting

We will grant users limited access to individual records (i.e. accessing one record at a time), and will put systems in place to monitor and control access to those records. Because of the sensitive nature of the data and our NGO's lesser need to revisit past records, we can place limits on the number of records that can be accessed per day. This prevents users from abusing record retrieval and downloading or accessing caller data en masse.

2. Client-side controls

We will prohibit users from bulk exporting individual records. Our user research has indicated that NGOs have no need for such a feature, and it puts vulnerable users at risk should the data fall into the hands of untrusted parties.

3. Kill switch

We will implement a feature allowing users to, under the most dire circumstances, block all access to data associated with their account. The feature will be available on both the Android app and the web application, and can be accessed by either pressing a button while inside one of the apps or by logging into the system with a specific set of credentials. If triggered from within the Android App, all data stored locally will be deleted. This feature is also useful for when an NGO's phone is lost, stolen, or confiscated, preventing unauthorized access and potential abuse.

4. Bait and switch

Under situations of duress, an NGO may have no choice but to give a threatening party information about callers. To prevent staff from revealing sensitive data in these situations, we will offer them an alternate password that loads a “cleansed” account to show innocuous versions of data.

5. Encryption

We will encrypt stored and in-transit data, and adopt security best practices in compliance with HIPAA requirements and national online banking standards. Moreover, we are still in the process of consulting with security experts to best understand the tradeoffs of private key storage and rotation, and will aim to finalize our security and encryption models by end of summer 2015.

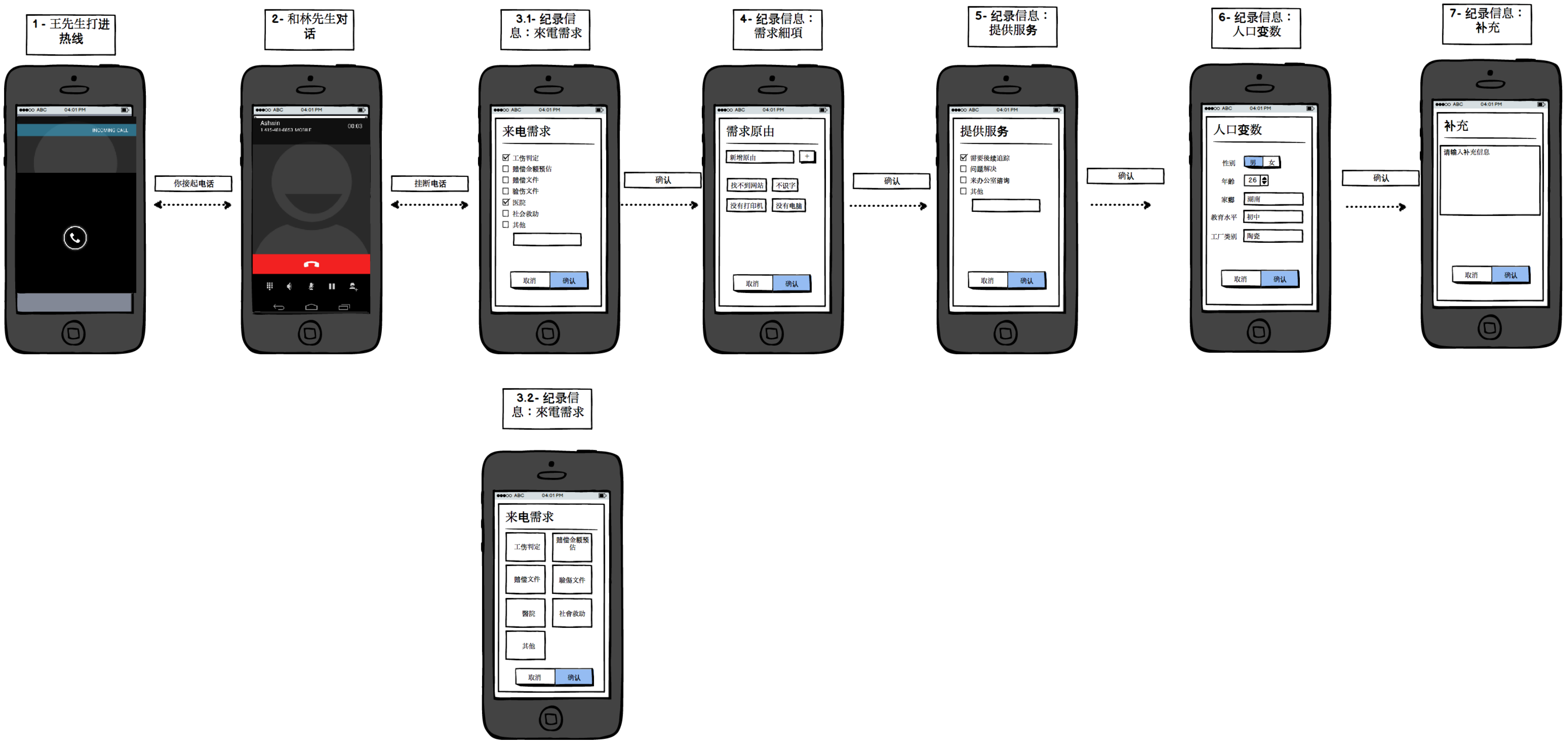
6. Granular, personally-identifiable data

As a standard practice, personally identifiable data (e.g. names and phone numbers) will be collected only as needed. During our pilot study, no names or phone numbers will be collected at all, and individual records will be uniquely identified only by a hashed phone number.

Low-Fidelity Prototype

To gather concrete feedback on our proposed workflow and information architecture, we designed a low-fidelity prototype mockup using Balsamiq. The mockup included the screens for logging “caller needs”, “reasons for calling”, “demographics”, “provided service”, and more.

Due to the constraints of using remote usability testing tools in China, we sent the mockup to the NGO founder as a PDF over email and went through each screen during a QQ call. The mockup gave the founder a tangible artifact to critique, and allowed us to collect his suggestions on the information architecture and user flow.


1 - 王先生打进热线
●●●○○ ABC 04:01 PM
INCOMING CALL
你接起电话
2- 和林先生对话
Ashwin
1 415-481-8853 MOBILE
00:03
挂断电话
3.1- 纪录信息：來電需求
来电需求
☑ 工伤判定
☐ 赔偿金额预估
☐ 赔偿文件
☐ 验伤文件
☑ 医院
☐ 社会救助
☐ 其他
取消
确认
3.2- 纪录信息：來電需求
来电需求
工伤判定
赔偿金额预估
赔偿文件
驗傷文件
醫院
社會救助
其他
取消
确认
确认
4- 纪录信息：需求細項
需求原由
新增原由
+
找不到网站
不识字
没有打印机
没有电脑
取消
确认
确认
5- 纪录信息：提供服务
提供服务
☑ 需要後续追踪
☐ 问题解决
☐ 来办公室谘询
☐ 其他
取消
确认
确认
6- 纪录信息：人口变数
人口变数
性别
男
女
年龄
26
家鄉
湖南
教育水平
初中
工厂类别
陶瓷
取消
确认
确认
7- 纪录信息：补充
补充
请输入补充信息
取消
确认

PRODUCT IMPLEMENTATION

Proof of Concept

OBJECTIVES

Our goal was to develop a version of the product that validated our design across several criteria, including:

- The product integrates into the organization's workflow;
- The information architecture aligns with the organization's needs;
- The interface design effectively addresses operational, accessibility, and cultural constraints.

SHORTFALLS OF MOCK TESTING

While testing our low-fidelity prototype, we encountered the limitations of simulated or mock environments. Our participants struggled to validate our design against simulated workflows, and requested to test our prototype after answering real phone calls. We decided to develop a High-fidelity prototype that could be installed directly on their phone and be triggered to launch right after users end a call.

High-Fidelity Prototype

Over the course of two weeks, we developed a functioning Android app. The basic functionalities of the app included listening for phone state, triggering the app to open after a call ended, displaying basic call information, and presenting menus for selecting information about caller demographics and needs.

TECHNICAL REQUIREMENTS

We developed the app to accommodate a wide range of users. Our app targets Android SDK 8, which supports over 99% of all Android devices available to the public (Android Developers, 2015). To maximize exposures to real calls, we also incorporated measures to ensure the app would launch after a call ended. The software uses the

Android telephony package to subscribe to the device's phone state, which indicates whether the phone is in an idle, off-hook, or ringing state. The app listens for phone state from the moment it is installed until the time it is removed from the device, including after the phone restarts or when the app's process is manually terminated.

The app also maintains an internal database for storing menu options and tracking whether calls are logged. Calls themselves are never stored. To display past calls within the app, we rely on the phone's call log, which stores up to 500 calls at a time depending on the model and make of the device.

DEPLOYMENT PROCESS

After each phase of development, we deploy the app by publishing an APK file and sending it to users over email. Users download the app from their Android devices and initiate installation by selecting the file either from their notification bar or from their Downloads app.

Remote Usability Testing

We conducted several rounds of remote usability tests to validate our design against our organization's workflows, and continued to refine their information architecture.

RESTRICTIONS ON DATA COLLECTION

We faced limitations when collecting quantitative and qualitative user feedback. As a result of an incident that occurred during our field site research in January, UC Berkeley CPHS requested that we refrain from collecting usage data. We relied instead on qualitative assessments of our prototype, mostly collected through interviews on QQ, screenshots sent over email, and videos sent over WeChat.

OTHER CHALLENGES

It was also difficult for us to conduct video conferencing with the NGO founder and staff because of China's inconsistent internet bandwidth. Moreover, the staff was unfamiliar with Skype and preferred using QQ video, which had inferior video quality. Considering these constraints, it was important for us to find different ways of collecting feedback from our users.

HIGH-FIDELITY PROTOTYPE VERSION 1

Research Questions and Objectives

Information Architecture:

- Do we have the right mental model for categorizing caller demographics, caller needs and reporting?

Technical:

- Does our application work on their devices?
- Are there any other technological or operational constraints that we have not considered?

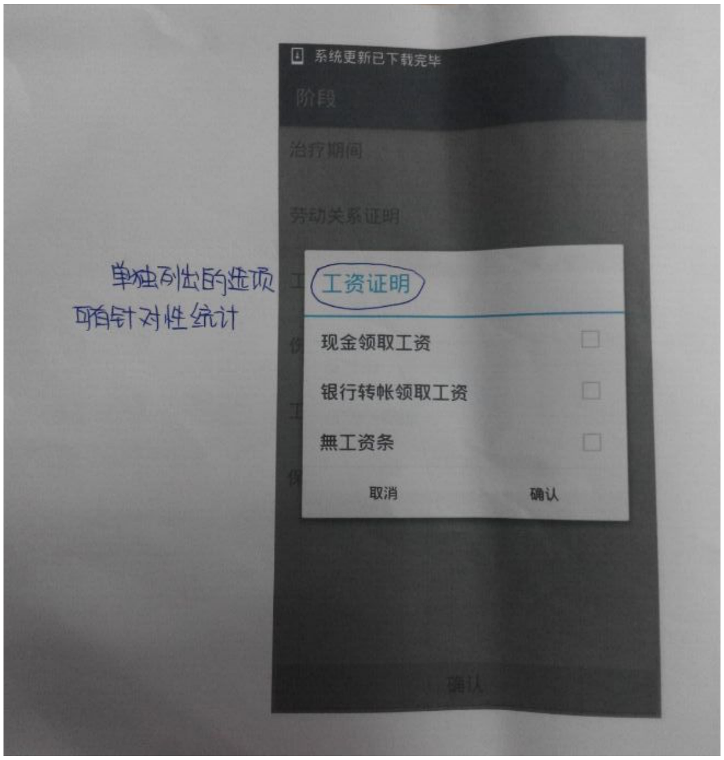
During our first round of testing, we sent them an APK file of the app, helped them install, and provided questions for them to consider as they were testing the app. We also sent instructions and interface screens of the high-fidelity prototype for them to critique. After receiving their response, we conducted a follow up interview for some clarification on their critique.

Research Method and Findings

From our preliminary information architecture research, we were able to compile a list of caller needs that we used to pre-populate our app's menu selections. (See Section: Information Architecture). The objective of our first usability test was to continue to refine the information architecture after the card-sorting and information hierarchy ranking exercise.

The NGO founder provided a lot of critique on the fields that were listed in the first Highfidelity prototype. Some of the major feedback was the lack of an ‘add other’ field. The founder felt that “some issues are more complicated” and that the information architecture needed manual input in the ‘other’ field. However, we were trying to find a way not to duplicate form fields and create a more controlled vocabulary to avoid a long tail effect of various field inputs. Therefore, we decided to include an ‘add other’ button in our prototype to learn what were the missing field options and to observe how the button would be used. We requested users to send regular screenshots of their customized caller needs menu over WeChat, which enabled us to better understand their mental model and approach to organizing caller needs.

We also received interface critique from the NGO staff. We implemented a checkbox input type assuming it was familiar and easier to interact with than other types of form elements. Our users complimented us on this decision and confirmed that checkboxes were simple and easy to understand.



Interface Critique on the User’s Needs screen.

HIGH-FIDELITY PROTOTYPE VERSION 2

Referring back to our key findings, it was critical for our system to integrate into our users' workflow and enable the timely capture of call and caller content. We had to keep their previous workflow in mind and continuously evaluate our proposed workflow to ensure users could comfortably and easily adopt the new system. Moreover, we needed to validate that our solution met their data needs.

We included an 'add other' field and wanted to learn whether they found the feature useful, what fields were missing that required them to use that field, and whether users had problems discovering and using the feature.

Research Questions and Objectives

Workflow:

- How well does our application integrate into our user's workflow?
- Is the application able to work in various contexts of their day to day life?

Information Architecture:

- What do they need to input in the 'add other' button that is not currently available?
- Did we improve in capturing the right mental model for categorizing caller demographics, caller needs and reporting?

Human Memory:

- Are users able to completely remember all the relevant contents of the call for data-logging?
- What can we do to aid their ability to remember the conversation?

Research Method and Findings

Our second usability test was critical in helping us validate our application's ability to integrate with our user's workflow. It also validated our application's information architecture in achieving the right level of granularity and abstraction. We learned that no high priority items were missing from the information architecture, but we decided to keep the “add other” button in order to continue to learn from how our users expanded their list of options. All new options are persisted in the app’s database.

Our users used the prototype for a few days and then provided us with their feedback. They rated the application as ‘very smooth’ in terms of the application’s ability to integrate into their workflow. When we proposed a change to the workflow, such as encouraging them to log calls during conversations, our users responded with negative feedback. Logging during the call was considered distracting and difficult. Moreover, the helpline operator felt that it would be hard to stay attentive during the call if she had to log and talk at the same time.

We were also concerned that our users would not be able to remember all the contents of a conversation by the time the call ended. To address this research question, we reviewed our past video recordings, created hypothetical caller scenarios laden with caller needs and demographic information, and conducted a task-based usability test. We asked our user to respond as if she were receiving a real call on the mobile helpline, and to then record herself logging the call with our prototype. We reviewed the screens afterwards and found that all field inputs were correctly provided.

Conducting remote usability test with helpline operator.

A follow up interview with our user revealed that, while the nature of the conversations is often serious and the content can be very complicated, there are actually very few fields that need to be logged. The more pressing item to remember is not the call content itself, but the very act of logging, especially when operators are interrupted or are in a hurry after a call ends. This informed our final prototype design, and allowed us to focus on reminding or notifying users about calls they failed to log.

Extensibility and System Design

Part of designing and implementing our app's data entry forms and internal database required us to think broadly about the current and future information needs of our users. Additionally, we needed to understand how our data model design could potentially accommodate the needs of new and different kinds of organizations. In February, we conducted an interview with MAITRI, a domestic abuse helpline in the Bay Area, which helped us formulate a comprehensive and extensible framework for organizing helpline data.

Helpline data can be summarized along three axes:

1. Service Provision Metrics

These metrics are derived from calls, specifically phone numbers, call dates, call durations, and call types (incoming or outgoing). They are universal across all helplines and do not vary by organization.

2. Caller Demographics

These metrics are derived from callers, who are characterized using demographic factors that vary slightly by organization. Common factors such as age and gender are found across all organizations, but organizations may choose to create factors that are specific to their services and reporting objectives. Different callers may have different demographic factors associated to them, depending on what information they are willing to disclose.

3. Caller Needs

These metrics are derived from calls. They are the most variable type of data collected, changing from caller to caller and from organization to organization. Since caller needs can be completely different from one organization to the next, the most challenging part is assisting organizations with creating a model that is most representative of their services and data collection goals.

CHALLENGES

Caller needs are challenging to model across organizations. In one extreme, a fully-flexible, do-it-yourself system for defining caller needs requires organizations to have expertise in information design. Poorly designed information models lead to creating reports that are not useful to the organization. For example, inexperienced administrators may define and group together information fields that differ in levels of specificity or granularity. This problem is shown in the figure below, taken from one of our competitors' products, in which fields "Information" and "Treatment Information" are included together in a pie chart.

In another extreme, designing a one-size-fits-all architecture leads to a less-useful system. It prevents the organization from describing the issues callers face with sufficient specificity, and downplays the relevance and importance of the data collected.

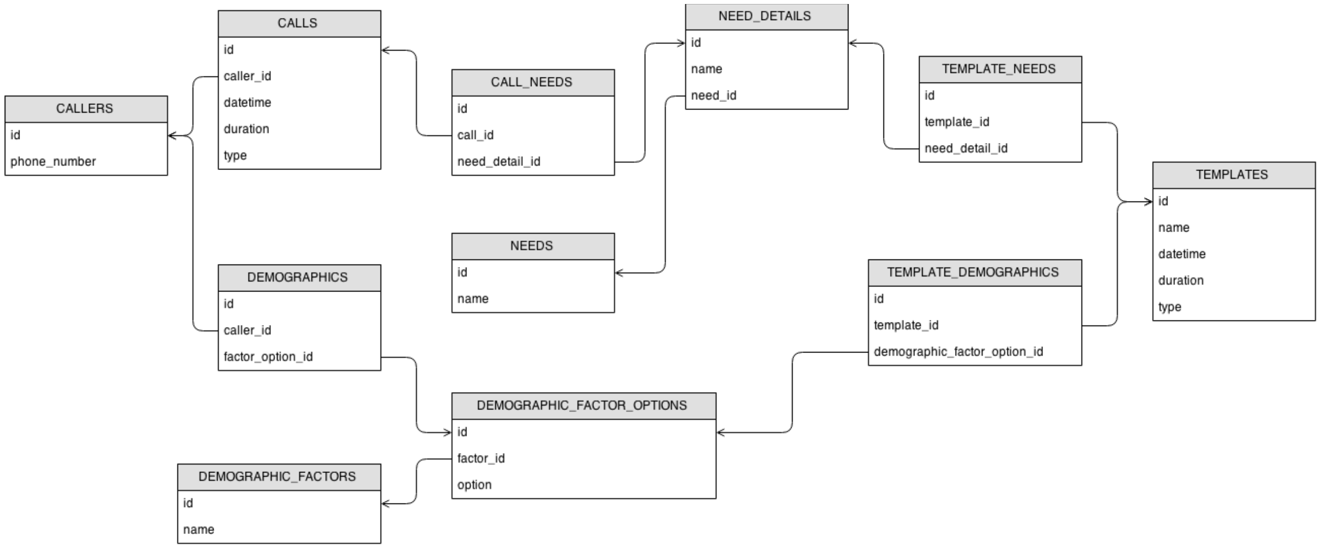
TEMPLATING SYSTEM

Our approach to designing quality caller needs forms is to create a repository of templates derived from the organizations that use our product. We envision creating and curating templates for different types of helplines, e.g. domestic abuse helplines, child abuse helplines, worker injury helplines, etc, and allowing new organizations to use those templates as a starting point.

The data model we designed supports a templating system, and our research has allowed us to create one template specific to helplines that assist injured workers in China (i.e. Chinese labor NGOs). As we expand to other helplines, we will create formal procedures for creating and sharing templates, which will hopefully encourage best practices for collecting and organizing caller needs data.

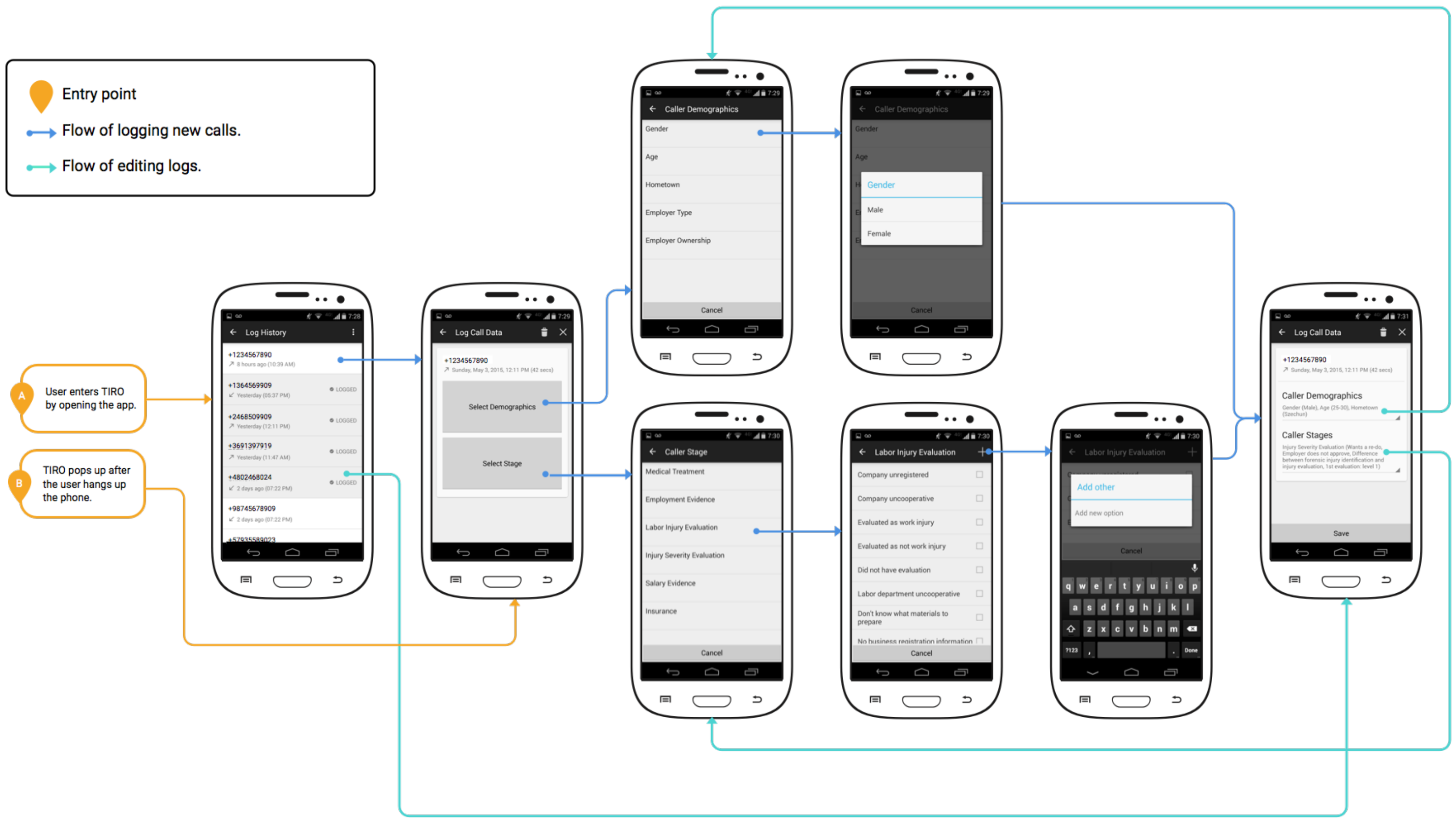
ENTITY RELATIONSHIP DIAGRAM

The diagram below depicts our data model. It omits details about users and organizations, as well as table metadata.


CALLS
id
caller_id
datetime
duration
type
NEED_DETAILS
id
name
need_id
CALL_NEEDS
id
call_id
need_detail_id
TEMPLATE_NEEDS
id
template_id
need_detail_id
CALLERS
id
phone_number
TEMPLATES
id
name
datetime
duration
type
NEEDS
id
name
DEMOGRAPHICS
id
caller_id
factor_option_id
TEMPLATE_DEMOGRAPHICS
id
template_id
demographic_factor_option_id
DEMOGRAPHIC_FACTOR_OPTIONS
id
factor_id
option
DEMOGRAPHIC_FACTORS
id
name

Final Work

The final product focused on delivering a basic experience for creating, reading, updating, and deleting call logs. Our latest Highfidelity prototype is presented in the flowchart below, emphasizing two entry points (entry by manually starting the app or entry by ending a phone call), call editing flows, and new call logging flows. The screens are taken from our functioning Android app, tested through two iterations and now deployed with our partnering organization in China.


Entry point
Flow of logging new calls.
Flow of editing logs.
A
User enters TIRO by opening the app.
B
TIRO pops up after the user hangs up the phone.
Log History
+1234567890
8 hours ago (10:39 AM)
+1364569909
Yesterday (05:37 PM)
LOGGED
+2468509909
Yesterday (12:11 PM)
LOGGED
+3691397919
Yesterday (11:47 AM)
LOGGED
+4802468024
2 days ago (07:22 PM)
LOGGED
+98745678909
2 days ago (07:22 PM)
+57935589023
Log Call Data
+1234567890
Sunday, May 3, 2015, 12:11 PM (42 secs)
Select Demographics
Select Stage
Caller Demographics
Gender
Age
Hometown
Employer Type
Employer Ownership
Cancel
Caller Demographics
Gender
Male
Female
Cancel
Caller Stage
Medical Treatment
Employment Evidence
Labor Injury Evaluation
Injury Severity Evaluation
Salary Evidence
Insurance
Cancel
Labor Injury Evaluation
Company unregistered
Company uncooperative
Evaluated as work injury
Evaluated as not work injury
Did not have evaluation
Labor department uncooperative
Don't know what materials to prepare
No business registration information
Cancel
Labor Injury Evaluation
Add other
Add new option
Cancel
Log Call Data
+1234567890
Sunday, May 3, 2015, 12:11 PM (42 secs)
Caller Demographics
Gender (Male), Age (25-30), Hometown (Szechun)
Caller Stages
Injury Severity Evaluation (Wants a re-do, Employer does not approve, Difference between forensic injury identification and injury evaluation, 1st evaluation: level 1)
Save

PILOT STUDY

Partnerships

The NGO we identified during our field site research agreed to be our partner for the first year of implementation, which will be our pilot study. Our arrangement with this NGO is that they will use our prototype (free of charge) as part of their normal course of business, and both the NGO founder and his staff/volunteers will participate in regular usability tests.

We have connected with six other NGOs that are also interested in potentially working with us to improve their hotline operations. After the pilot, we will provide the system to these NGOs as well, and monitor their experience to gain additional product feedback.

Measuring Success

Since this is a pilot of a new tool, we are focussed more on "proof of concept" than on proof of impact. We will measure success qualitatively and quantitatively by comparing how the NGO operates today with how the NGO operates in 12 months, after experimenting with our tool.

To measure success, we identified three areas that map directly to our goals of improving the efficiency and sustainability of our pilot organization:

- Tool Usage: The NGO uses the tool on a regular basis.
- Analytic Capabilities: The tool provides better methods for describing and analyzing the NGO's operations, leading to improved client service and new tools for internal management.
- Use of Results: The NGO uses the tool to produce reports that are shared with the government or other stakeholders.

TOOL USAGE

Over the course of the pilot, we will closely monitor the extent to which our ICT is incorporated into the NGO's workflow. To measure this, we will collect through our system log how many times per day, week, and month the system is used, and compare these metrics to incoming and outgoing call volume observed in the native Android call log.

ANALYTIC CAPABILITIES

Next, we will need to measure the extent to which our ICT's analytic capabilities surpass those from the NGO's preexisting data collection and analysis tools.

Data Collection Speed

The current solution is paper logging. After each call, NGO workers write down the caller's phone number and demographics, along with the call date and content. Using results of our field site research, we can estimate the average length of this process, and compare this with data input times using our ICT system.

Data Collection Accuracy

The existing data collection process is prone to inaccuracy. Carrying paper logging sheets outside the office is inconvenient, and NGOs often forget to log calls. Our pilot NGO estimates that between 40% and 60% of calls are never logged. We can compare this estimate with the percent of calls that are logged using our ICT system. Additionally, assuming call volume remains constant, we can use a before-and-after comparison of call log volume as a proxy.

Data Collection Completeness

There are some data points that we will collect that the NGO does not currently collect. One includes call duration, which may be useful for contextualizing caller relationships and NGO time spent to potential donors.

Data Analysis Speed: Currently, NGOs require data to be entered in electronic form before it can be analyzed. Afterwards, NGOs manipulate the data in spreadsheets to produce their desired metrics. Using results of our field site research, we can estimate the average duration of this process and compare it with the speed of our intervention data analysis system.

Data Analysis Quality and Completeness

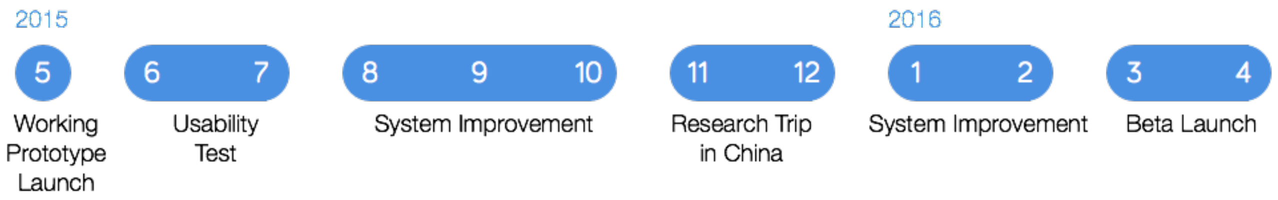
This evaluation will compare the number of analyses that can be performed using our system as compared with the previous system. We will also evaluate the extent to which our system reduces analytical errors; by reducing steps humans have to take when entering, manipulating, and aggregating data, our system will be much less prone to errors. Additionally, by automating chart and table generation, our system will improve consistency across reports. Finally, we will compare the level of detail in the current reports versus the level in the new reports generated using our system.

USE OF RESULTS

We plan to perform qualitative assessments of the extent to which the NGO uses our system to share insights with its stakeholders. Defining a baseline for this will be difficult, because the reports produced thus far by this NGO are a product of haphazard aggregation of paper-based data and incomplete considerations of metrics to be reported. Our goal therefore will be to conduct interviews with the NGO throughout the pilot to better understand how reports will be shared with government bodies and what responses they will receive. We also plan to evaluate how analytical results impact the NGO's internal operations, and whether they feel like having a greater understanding of their clients' needs has allowed them to operate more effectively or efficiently.

Timeline

Our timeline begins with a working prototype, which is planned as the final deliverable for our final project. Due to our commitments with CPHS, we were not allowed to collect data during the academic year. However, we hope to begin collecting data after May 2015 to continue to refine the product and ultimately measure the success of our pilot. After our first year of implementation, we expect to have a working beta-version of our solution. Furthermore, the timeline includes a 3-month evaluation period wherein we can determine whether our goals - to improve the efficiency and sustainability of the pilot NGO - were achieved.



September 2014 through May 2015

MIMS Final Project: In January 2015, we conducted user research in China, and by May 2015 we will have a high-fidelity prototype of our mobile app solution.

June through July 2015

Usability Testing and User Interviews: We will conduct several more rounds of remote usability testing and interviews with our partner NGO in China. Usability tests focus on identifying issues related to the user interface and user flow. Interviews will be used to evaluate the users' comfort in adopting the system and integrating the product into their workflow.

August through October 2015

System Improvement: Insights from our usability tests and interviews will inform the changes needed for our mobile app solution. In August, we will begin developing our web application and then conduct 4-week cycles of testing and development. By the end of October, we should have an alpha version of both the mobile and web application.

November through December 2015

Research Trip in China: Our goal is to use this trip to conduct in-depth studies of our alpha version and recruit 1-2 more NGOs to take part in our future beta test. In December, we will travel to China for 15 days and hold participatory design workshops, focus groups and in-person usability tests to collect feedback on the alpha version. We will also introduce our services to other NGOs who are interested in using and testing our tool in the future.

January through February 2016

System Improvement: We will analyze data from our field-site research and then conduct biweekly cycles of testing and development to incorporate our insights into our mobile and web app design.

March through May 2016

Beta Version Launch: We will launch the beta version of our solution to all partnering NGOs in March 2016 and closely monitor metrics of interest until May 2016.

May 2016 and Beyond

Scaling: Depending on the success of our pilot, we will release our product to all six NGOs we are currently in talks with, as well as new NGOs that express interest in the product. To market to new organizations, we will rely on word of mouth and direct marketing, leveraging our connections in the Chinese NGO circuit.

ABOUT THE TEAM

We are an international, multidisciplinary, culturally-sensitive, and socially-attuned team passionate about using technology for social good. With our roots in Hong Kong and Taiwan, we are fascinated by the contradictions of growth that we have witnessed in China's fast-moving economy and the social chasms leaving behind millions of unrepresented, unrecognized migrant workers. In embarking on this project, we are deeply fortunate to be able to draw on our personal backgrounds and language skills, our research experience around the topic of Chinese internet censorship, and our family ties to the Pearl River Delta area which enabled us to connect with migrant workers and NGOs in meaningful and relevant ways.

Faye Ip has more than 5 years of professional experience managing technology social enterprises. In particular, she has experience setting up 24-hour hotline support systems for small-medium businesses. She brings a wealth of client management experience and is also fluent in Cantonese.

Sophia Lay has a focus on user experience design and research. She has more than 3 years of professional experience as a user researcher, conducting ethnographic research, user interviews, and usability tests across Asia. Sophia has also hosted design thinking workshops for corporations in Taiwan and is fluent in Mandarin. She has design experience in both mobile consumer app and web applications for corporate clients in SAP.

Jenny Lo has more than 3 years of experience as a market researcher, advising companies on their marketing campaigns in Asia. Jenny is born and raised in Hong Kong and is fluent in Cantonese and Mandarin. She has also conducted various field-site research projects around Asia.

Timothy Meyers has 4 years of experience as a software engineer and analyst. Tim developed and deployed an Android app in the US for large relief organizations to collect and analyze sensitive data about the needs and locations of homeless individuals. He has also worked in Vietnam for an NGO, and has participated in ICT4D initiatives based in Thailand, China, and India.

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APPENDIX

A. Research Media Records Release Form

As part of this project we will make photographic, audio, and/or video recordings of you while you participate in the research. Please indicate below by initialing what uses of these records you consent to. This is completely up to you. We will only use the records in the way(s) that you agree to. In any use of these records, your name will not be identified.

1. The records can be studied by the research team for use in the research project.

Photo __________ Audio __________ Video __________
initials initials initials

2. The records can be used for scientific publications.

Photo __________ Audio __________ Video __________
initials initials initials

3. The records can be shown at meetings of scientists interested in the study of China and Information and Social Entrepreneurship.

Photo __________ Audio __________ Video __________
initials initials initials

4. The records can be shown in classrooms to students.

Photo __________ Audio __________ Video __________ initials initials initials

5. The records can be shown in public presentations to non-scientific groups.

Photo __________ Audio __________ Video __________
initials initials initials

6. The records can be used on television and radio.

Photo __________ Audio __________ Video __________
initials initials initials

I have read this form and give my consent for use of the records as indicated above.

Signature ____ Date _________________

B. Interview Transcript with the NGO Founder

Date: Jan 13, 2015
Location: Foshan, China

Interviewer: Please start by introducing yourself.
Founder: In 2006, I came to Foshan and within 3 months, I got into an accident and lost 3 fingers. I was intensely trying to understand injury compensation. I met the Panyu organization during their hospital visit. I needed to learn how to advance my own personal rights. In October 2006, I joined the Panyu organization as a volunteer until June 2007. The Panyu organization never started in Foshan, but then as I realized Foshan also has a lot of factory injuries. So I came here alone and started this organization myself. In 2007, one of the injured workers that I helped became one of my organization’s volunteer. Between 2007-2012, I have been doing this under my own name and not under an organizational title to avoid certain troubles. And during that time, it was encouraged for organizations to register and become a non-profit organization.

Interviewer: What is the mission of your organization?
Founder: My original intention was simple. I was hoping that under our guidance and help, we can help workers gain confidence and ability to return back to work. Other than self-help, issues with the legal system and a lot of social issues cause this problem.

Interviewer: What is the value of the helpline?
Founder: Whenever workers have problems, they can always call me. Actually, I personally understand. Because I had an injury before. I would be very happy to have someone to come help me and understand me. But when they come out, they will be confronted with a lot of problems.

Interviewer: What is the purpose of the helpline?

Founder: The purpose of the helpline is to give them some direction, so that whenever they have problems, they can come talk to us. They can understand the information better through the helpline.

Interviewer: Can you describe the history of the helpline?
Founder: The helpline is usually known through our card distribution so whenever they have problems, they can call us. During the busiest times, we can receive up to 20 to 30 calls per day. Injuries often happen around summer or at the end of the year. We also do more hospital visits during summer. If we do more hospital visits, then there will be more people calling. Also, there may be no ACs in the resting area and staff workers may not be able to concentrate, relax well.

Interviewer: Can you describe how you manage the helpline?
Founder: It is a division of labor process. As a founder, I have no time and opportunity to manage all the calls. But in the future, I am hoping to split the work among all the workers. Because I can't put it onto one single person. It will tire that one person. It will also be emotionally hard and also a lot of questions can be very repetitive.

Interviewer: What are some repetitive questions?
Founder: A lot of repetitive questions relate to injury level evaluation. They don't know where to get certain information. After they have evaluated their injury level, they also face a lot of problems with collecting documents and evidence. Other issues are related to individual problems/situation.

Interviewer: Can you give me an example of a compensation problem?
Founder: For example, I have gotten my evaluation, so how much will I get? If my boss doesn't pay for the compensation to me, then what should I do? We get all kinds of questions.

Interviewer: What is the difference between the information in the book versus providing legal consultation through the hotline?
Founder: They might not be able to understand the material. Not everyone can immediately understand. So information is all in the book, but they might not understand.

Interviewer: What are the major problems with the existing helpline?
Founder: They can't record which questions happen more frequently and which phase do workers encounter the most number of problems. It helps us better target information to people, incorporate missing information into our booklets and provide information to government agencies and labor department on some suggestions so they can focus more on certain areas.

Interviewer: How are you doing it now?
Founder: We are not doing analysis now. I can only record here and there, but not consistently.

Interviewer: Can you take a guess at the moment? Can you give us an example?
Founder: 110 [Referring to the emergency number] is the police hotline. I remember going into the police office and immediately after they answer a call, they will know the location of the caller, the family background and everything. So maybe this system can do the same. Maybe it can help me identify where most of the problems are coming from, which village and area are having the most number of problems so that I can better target and provide advice to that particular problem area.

Interviewer: Why can't you make an estimate?
Founder: If there is evidence and data, that is better.

Interviewer: What's the difference between estimate and exact?

Founder: If I have to give certain suggestions, then I can provide the data as evidence. To push forward my agenda, I need exact numbers.

Interviewer: What kind of purpose are you trying to achieve for receiving and sending such data to relevant agencies?
Founder: To give them recommendations, so that labor department can give clearer advice and better manage compensation procedures. But you know people are people. Because of certain reasons, they won't be able to clearly explain to the their supervisors. But I'm taking note, as least to give them advice. Whether they act or not, at least they know there is someone who is observing and monitoring them.

Interviewer: What kind of data do you need to collect?
Founder: We want to know, because I do know the answers to these questions: During the injury evaluation phase what is the most common problem? Throughout these phases, where can the problem be solved? Is it a problem that is to be solved by the factory? Or by the labor department? If we have the scientific data point, it would better support us.

Interviewer: You already mentioned about some data you're looking for, like the geographic data, time period, gender data. Are there any other types of data you expect to be useful?
Founder: Like what type of factory the worker worked for? Injured worker's age, his education background. All these are needed. Because the education background tell us how well can the injured worker comprehend the information. It's the fact that more educated he is, faster he figure out the process. It is difficult to teach uneducated people, they just don't get it.

Interviewer: You said that the labor department or the government can resolve some issues, can you explain?

Founder: The labor department is the government. In the end, all problems need to be resolved by the labor department. But when the (injured worker) is facing these problems, can the labor department instantly provide some guidance or directions to simplify the process? Doing nothing until the injured worker has broken his head is not appropriate…

Interviewer: Can you tell more about the scenario of people intimidated by your questioning?
Founder: If you ask the first-time callers so many questions… It should be he asks us for help, but if it turns out that we are asking him the questions, then people will definitely have concerns about that.

Interviewer: In what ways do you and your staff try to get at that information?
Founder: We are unable to get this information through the current hotline. At most, we will ask about their age, their hometown and the location of the factory. These are all we can ask. The basic information. But even if we ask about their name or their hometown, a lot of people refused to answer.

Interviewer: Can you describe more about the ideal hotline system that you are looking for?
Founder: If it is possible, I imagine that whenever someone dials in, it will automatically record the conversation and save it simultaneously to the other computers or mobile phones our organization is using. Also, if the audio can be automatically transcribed to texts, it will be the best. Like, you know, there are only two main languages used in our organization: Mandarin and Cantonese. No other languages are used. Even they speak in their hometown dialect, we ask them to speak Mandarin. In terms of how to categorize the content, if it needs to be done manually, it is also do-able. Because I think if the categorizing process is done by the computer, it will not be precisely done. If the system can do this thing, I think it will be good enough!

Interviewer: You mentioned about the feature of speech to text, can you tell us more about why you need this feature? Why is it important to have text?
Founder: It will be easier to organize and analyze the information by having text. If it is audio, you still need to transcribe the data manually. Because when you do a report, the report is always in text. Or else, there are so much manual work to transcribe the audio. Like you guys will have to listen to our recording when you get back and do all the transcript.

Interviewer: So we would like to know how many phones are in operation and how you manage the mobile helplines.
Founder: We currently only have one helpline. That is the one on the business card.

Interviewer: Is it the cellphone?
Founder: Yes yes. Because the cellphone can be carried to everywhere. If it is a office phone, we will unable to answer the phone when we are out.

Interviewer: So there is only one phone operated by the hotline manager. And was it used to be your phone number?
Founder: Yes.

Interviewer: So you are no longer using your phone as a hotline?
Founder: No. But sometimes I still get some calls. If the system can have the feature that it can be used on different phones, it will be better. Or if the system only ties to one phone, then the same phone will have to be used eternally. Just like downloading app, if you download the app on your phone, you can use it; I download the app, I can use it on my phone.

Interviewer: So can you explain how you receive calls even when your phone number is not on the flyers?
Founder: Oh those are the workers that have closer relationships with me. They become our volunteers and they sometimes will just call me. Because between the volunteers and I, we have set up a short number (短號）so that the phone calls are free.

Interviewer: Short number? What is that?
Founder: That is a package sold by the China Mobile for business. Like if I call the helpline operator, the call is free.

Interviewer: How about if the workers call you? Do they get charged?
Founder: Yes, they get charged. You will have to have enroll the package [to call for free]. It is free only between our staff. That is the package by the mobile company.

Interviewer: So are there any other reasons why people can reach you through your personal phone number?
Founder: We will give our personal phone to the volunteers, because they will not call you for nothing.

Interviewer: How about general workers?
Founder: We will give them our helpline then. We do not usually give our personal numbers to injured workers or callers. But if it is the workers that I personally have to follow up, like if I have to represent him to the court, then I will give him my number, since it is easier to contact.

Interviewer: So can we say that if it is an unfamiliar worker, you give them the number ot the helpline. But if it is a familiar worker calling, then you might give him your personal number?
Founder: Yes yes.

C. Interview Transcript with the Helpline Operator

Date: Jan 14, 2015
Location: Foshan, China

Interviewer: What kind of questions will you ask for sure when you answer the call?
Helpline operator: If that person has called several times and every time they have asked a similar question, then I know what to ask. If it's a stranger, I won't purposely go and ask certain questions. I will only ask if it pertains to their case. I will wait for them to say it and then follow on with what they have provided me.

Interviewer: Do you know whether other NGO staff also do the same?
Helpline operator: Sometimes. I think in general they do the same.

Interviewer: How will you be using the data logs?
Helpline operator: Monthly estimates on how many people call for inquiries.

Interviewer: Other than monthly estimates, what else do you do?
Helpline operator: Other than estimates, I also look at the kind of questions that they have asked in the past. I would also try to see what are the most common problems.

Interviewer: How are you counting or analyzing right now?
Helpline operator: I will look at the kind of questions that were asked. I will also do some simple categorization and grouping because a lot of workers ask similar questions. But when we face a question that we haven't heard before, then I would tell the NGO founder during our meeting and then follow up on that particular case.

Interviewer: Can you give me an example? What are some new kinds of cases?
Helpline operator: This is very much related to what we do in this organization. In this organization, sometimes we have cases that are fall through legal loopholes (法律肠道).

For example, child workers and retired workers are special cases. The NGO founder said that those cases require follow up. For example, last time I had a case where the worker reached 50 and retired, but then went back to work and got injured. Those people won't get compensation. Children and retired workers don't have legal protection because they are not within legal age to work. They are not legally protected and don't have the same legal protections as other people, so I have to pass it to the NGO founder for follow ups and see how those cases develop. After learning the problem, we would try to follow and see how the case develops.

Interviewer: How long is a call in general?
Helpline operator: Phone calls can be around 8 minutes long. That's just a rough number.

Interviewer: When you record down information, what is the most important information? Can you give me an example?
Helpline operator: The most important information is the caller's questions. For example, they might ask, how much compensation can I get for a category 9 injury? But then I would ask, how much salary do you get per month? Who paid for your hospital fee? I will then ask more, like, do you have a contract? Do you have social insurance? I ask follow up questions in order to figure out how much compensation they can get and give them an estimate.

Interviewer: Do you have any other examples?
Helpline operator: If the caller asks, how do we apply for labor evaluation? Then I'll need to explain things like, which department they should go to, what documents they should prepare and where should go to get that information.

Interviewer: Do you ever share these data logs with other people?

Helpline operator: Yes, with people in this office but not with people in other offices. Other people don't need to look at this. I would usually show the NGO founder once a month, around the end of the month.

Interviewer: What's the most challenging part of logging?
Helpline operator: It's not so convenient to record these phone logs when I am outside. It's easier to be done when I am in the office.

Interviewer: Categorizing the data logs?
Helpline operator: Before when I am an intern at another organization, there is a specific person who logs data onto the computer and then organize the information. If I have the phone, then it'll only be me managing the helpline.

Interviewer: Were there any situations that you had to go back and review the logged data?
Helpline operator: When there are specific events that would benefit some specific callers. If the person/caller mentioned that they would attend an event, then I would go back and try to find their name. Or if it's a case that I need to go back to review, then I will also go back and review the log.

Interviewer: In general, would you say that 'name,' 'time,' and 'content' are the most important information?
Helpline operator: 'Name' and 'time' and 'content.'

Interviewer: What's the hardest part to retrieving information?
Helpline operator: I can't remember. Because I talk to so many people all the time, i forget their content or their name so I try to use other information.

Interviewer: Can you tell me an example what of you might do in that case?

Helpline operator: I will have to use other information that I can find. For example, if they have been to an event before then I have documentation recording about them through the event log registration.

Interviewer: In the future, what might make your job easier?
Helpline operator: Perhaps whenever I receive questions, their questions can automatically be recorded onto my phone or the computer.

Interviewer: Can you explain a little more?
Helpline operator: For example, if I receive a call and the caller asks a common question and I know the response, maybe you can record the response down. For example, if it's about compensation, it automatically plays back a recorded response to that question.

Interviewer: When it records on the phone or computer, what do you want to record it to?
Helpline operator: To a document or file. If it's a software then it would be much better.

Interviewer: What kind of information do you have to categorize?
Helpline operator: For example, if someone is calling and needs to reach to Mr.He then I need to call and let him know. If Mr.He needs the call, then I just pass it to him. Or sometimes I will pass Mr.He's phone number to them and let Mr.He know that someone called and he should expecting a call from them.

Interviewer: What kind of feature would you really hope to have?
Helpline operator: Maybe, when someone's question is very common, then it just automatically responds. It's not particularly important, but it's somewhat important. but it happens all the time, so it would be useful. it would respond with the computer's voice.

Interviewer: Why computer voice?

Helpline operator: Because computer voice is better. But it also doesn’t matter if it’s my voice.

D. Usability Testing Transcript with the NGO Helpline Operator

Date: April 23, 2015
Method: QQ Video Screening

Interviewer: In regards to the new ‘other’ field, do you: ‘really like’, ‘like’, ‘not like’, or ‘very dislike?’
Helpline operator: It’s pretty okay, because the previous version doesn’t have it. When there was no ‘other’ field, I wasn’t able to capture that level of detail. It’s more complete now in capturing content.

Interviewer: Can you tell me more?
Helpline operator: Because sometimes there are some edge cases...I can’t follow or if it’s the same injured worker. If I also recorded it 3 times, then i won’t be able to retrieve back the previous information. It would be great if I can go back and know what they recorded.

Interviewer: What is the difference of our application versus paper?
Helpline operator: It is now much easier to get statistics on questions asked by injured workers. So that when there are repeat callers, then I can better understand their situation.

Interviewer: What do you mean?
Helpline operator: Because through the phone, they can’t explain the situation in full detail...Because if it’s through the phone, then I can only explain/answer the question directly but not give that much detail. If they come to the office in person then we can go deeper in finding alternatives or look at other scenarios.

Interviewer: In regards to the app's integration into your current workflow, is it: 'very smooth', 'smooth,' 'not smooth,' or 'very not smooth.'
Helpline operator: Very smooth with our workflow

Interviewer: Reasons?
Helpline operator: Because previously, the interface would pop up, so I can immediately record. It's very simple and the choices are very straightforward.

Interviewer: What is the most common type of setting when you receive a call?
Helpline operator: Not predictable. Because when we're at the hospital doing hospital visits, then we might have calls. But it's most often during office hours, 9am - 8pm evening. If it's from Monday to Sunday, people still call, but there are usually fewer calls on Sunday.

Helpline operator: Usually I record after the conversation.
Interviewer: Would you use paper along the side?
Helpline operator: Usually, i just record afterwards. First I will get them to say all the problems out first, then advise them on their approach. As for recording, I will try to record what they have to say.

Interviewer: Do you have situations where you can record everything that they have said?
Helpline operator: not really, because i have been able to record everything since it's immediately afterwards. But after some time then I won't be able to remember.

Interviewer: After logging, what do you want to see?
Helpline operator: I want to see the text of what I just input.

Interviewer: Were there any situations where you couldn't log data?

Helpline operator: Yes, because I couldn't do it in time. I forget to do the data logging sometimes. It's before this application existed.

Interviewer: Why would you delay logging the calls?
Helpline operator: Like yesterday, the person called and because I was in a meeting, and I had to get back to it later and didn't get to log in-time. I just went back to the meeting. So after the meeting ended, I went back to log data Because I still remember that I had a call.