Tongues

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Tongues is an accurate, real-time translation application powered by the crowd. When automatic translators just can't get it right, Tongues enables users to ask the people around them what the *real* way to say a word or phrase is. This project is being developed by Alex Wu (Team Manager and User Testing), Ishita Prasad (Visual/Interaction Designer and Documentation Coordinator), and Anna Yelizarova (Developer and Visual/Interaction Designer).

PROBLEM SPACE

When it comes to communicating across languages in day-to-day life, people often need to know how to say the right thing, both fast and accurately. Human-sourced translations are accurate, but aren't ideal for this kind of communication because they cost both money and time. Automatic translators (like Google Translate) were designed to solve part of this problem, but are unfortunately often incoherent and unreliable. How, then, can a person find a way to effectively communicate in a different language while on-the-go?

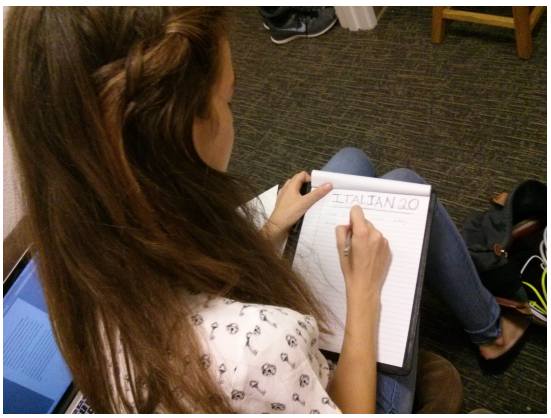
Our solution is **Tongues**: using the power of crowd technology to enable users to translate snippets of text. By using the knowledge of the masses, users can both find and curate effective translations of useful tidbits of text. Additionally, crowdsourced translations have the power to happen in real-time - a user could request a translation, and have a well-formed phrase sent back right away.

CONTEXTUAL INQUIRY CUSTOMERS

Our first interviewee was **Kiki**, a Stanford student currently studying abroad in Paris. We wanted to talk to someone who was currently immersed in a foreign language, so we asked a few acquaintances who were abroad for their time, and Kiki kindly agreed. Kiki has been in Paris for about one month now, and speaks French at an intermediate level. We interviewed Kiki over Skype because of her location. Although we know that Skype interviews are discouraged, we believe that the nature of Kiki's language immersion was an important point and would provide valuable insight.

Our second interviewee, **Chris**, is a German Language professor at Stanford with whom one of our group member is currently taking a class. Chris is a native English speaker who started learning German at a young age and began taking it more seriously in high school. As he teaches the introductory German class, and we thought that he could provide a great perspective from the educational side. As someone teaching a language to complete beginners his insights were useful in understanding effective teaching techniques and the language learning process.

Our next interviewee, **Audrey**, is currently a Junior at Stanford taking an Italian language class. Audrey is a friend of one of our group members, and was interviewed because of her passion for language learning, as well as her current involvement in a language class. Audrey started learning Italian freshman year, and went abroad last fall where she spoke Italian all the time. Because of her background as a current language student, we thought she could provide an interesting perspective as someone who was attempting to learn a language in a non-immersive environment (i.e. not in a country where that language is regularly spoken).



Finally, our last interviewee, **Noah**, is an international student who travels often. For instance, in the last nine months, Noah has explored Germany, Spain, Estonia, Scandinavia, Australia, and some pacific islands. One of our group members met Noah in Germany, and because of his background as a globetrotter, we thought it would be appropriate to ask him for an interview. Noah speaks French and English fluently, and has been learning German for about a year.

CONTEXTUAL INQUIRY RESULTS

The goal of our contextual inquiry was to understand how people currently interact across languages, and how this interaction can be improved. Our inquiry had two major aspects: we tried to understand both the language-related actions that people performed, as well as how people are motivated to use various digital applications and learn languages.

Our students all found themselves speaking a foreign language when they travelled abroad. Whether with their host families, at restaurants, or while talking to new friends, the language of the region inevitably came up. We asked our interviewees to imagine themselves immersed currently in the language, or reflect on a time when they were (and in the case of Noah, we conducted the interview in German). They were the first given a word in English and asked to use it in a sentence in their respective foreign language. There were no constraints - the participants could do anything to answer the question. After thinking for a couple of seconds, our participants turned to Google Translate and produced a formal, correct answer to the prompt within the minute. We then conducted the same experiment but this time with a complex expression (very hard to translate). The participants tried to express it on their own and be creative using signs, gestures and a mixture of other languages. After some time, Kiki even stood up and went to consult her host family in the other room. Google Translate was no longer the emphasis and was only used to look up individual words.

One thing that we observed was that even when looking up individual words, the process would take too long to execute. People had to type in “Google Translate”, load the page, then scroll down in a long drop down list to locate their language and only then could they enter

their word. Kiki also mentioned later that she wouldn't use Google Translate when out and about because it was too slow and was only useful for homework or when having time to plan something to say.

As a final task, as part of the master apprentice model, we gave our participants small quizzes with vocabulary words. We told them to fill out however many they wanted and that we would just observe how they worked on the task. There was no pressure to complete the whole page. The majority of the participants were not thrilled when they heard the instructions. The average number of questions attempted was 10. The double sided page contained 40 questions. When later asked what stopped them from attempting more questions, we learned that the list format was discouraging and since it was not a mandatory task and their performance wasn't recorded, they didn't have the motivation to put in the effort.

All in all, we learned that Google Translate and online dictionaries were the major translation tools, but our interviewees only used them to look up specific words. Our language teacher interviewee, Chris, agreed that it (Google Translate) is "bloody awful." Ultimately, the tools were too slow and clunky. They racked their brains for synonyms, try to mime the word or describe it in a different way, and finally look to their conversation partners or other nearby people for help. When it comes to learning, seeing a large list was a factor that affected motivation and wasn't something participants would do voluntarily. Being graded was something they said was a powerful incentive.

After we finished the tasks, we also interviewed out participants to collect more data and insights. Our traveller, Noah, brought up how he often felt "excluded" because although he studied formal German extensively, he often couldn't understand simple jokes, humorous asides, or the other colorful, colloquial language of his foreign friends. For him, understanding the colloquial variety of the language was very important, and something he couldn't get through an online translator, dictionary, or by finding another way to say it. On the other hand, Kiki didn't seem to care much about learning colloquialisms, and even said she preferred to speak formal French. This variety and depth of language use was a very intriguing point for us, because no computer-aided language use today could ever cover such different yet colorful styles of speaking.

In terms of application usage and motivation, we found that our interviewees typically did non-essential phone tasks (such as gameplay) when the tasks were addicting and repetitive (Angry Birds, Piano Tiles) and they were bored. Noah and Audrey also played quiz-like games (Sporcle, QuizUp, and Duolingo), and it seemed that what motivated them was the idea of competing against themselves to constantly do better. They also participated in casual

upvoting/downvoting on apps like Reddit and YikYak, but we believe that they did this only when the posts were humorous and/or relevant, or when they was bored/had free time.

Chris, the language instructor, was unaware of language learning games through technology in a formal language class setting, but we learned that for him, conversational practice and vocabulary building are the two most effective ways to learn a language. We did not conduct the master apprentice model with him as he was already an expert German speaker. It was a straightforward interview.

TASK ANALYSIS

Who is going to use the system?

The results from our contextual inquiry show that our main users consist of three different types of people.

The first type of person is someone who is trying to learn the natural, colloquial use of a language - as opposed to the formal language taught in the classroom. This is the kind of person that is looking for a more authentic way to learn a language, in order to better interact with the language's native speakers.

The second type of person is someone who is visiting/living in a foreign country, and is looking for a translation that is colloquially accurate to the region they are in. These are generally people who have a formal background in the language (i.e. they learned it in a class taught in their home country), who want to learn local terminology so they can avoid embarrassing themselves.

The third type of person is someone who is bilingual (or close to) and wants practice translating words/phrases between their main languages. This type of person is one who speaks multiple languages but only gets to use one language regularly, but wants to keep their skills in their other languages up to date.

What tasks do they now perform?

From our contextual inquiry, we have found that many of our target customers currently (when they come across a word/phrase that they do not know in their second language) use google translate to translate individual words, but rely on their existing (potentially incorrect) understanding of the language to translate phrases. Customers like Audrey keep up to date with their language skills by taking classes in the language.

What tasks are are desired?

When asked about what tasks they thought would be helpful in their language translation experience, most of our target customers mentioned that they would like a way to be able to accurately translate phrases (as opposed to just words). A few of our target customers also mentioned that they wanted a way to be able to learn slang/colloquialisms specific to certain regions (i.e. Noah was occasionally embarrassed in Germany when he used German terms that were not commonly used in the area he was visiting - the colloquial forms of those terms were the widely used/accepted versions).

How are the tasks learned?

Most of our target customers learned through various methods of trial and error. Noah would use the German phrases he had learned until someone corrected him, telling him the local version of that phrase, while Audrey would Google translate specific Italian words and try to string them together based on her intuitive sense of the word, learning via corrections by her professor.

Where are the tasks performed?

The tasks that our target customers perform generally occur when the customer is out in public, interacting with other people (i.e. somewhere they have a chance to interact with people speaking a different language). Sometimes the tasks can occur in a classroom setting (or even at home), when the customer is involved in some kind of language learning activity (i.e. writing an essay, filling out homework problems, etc.).

What's the relationship between customer and data?

There's lots of translation data available to customers through services like Google Translate, but the problem with all of that data is it's accuracy. Alot of the data that people have access to (especially with regards to translated phrases), is somewhat inaccurate. Additionally, customers have little to no access to data related to regional slang/colloquialisms. Both of these illustrate significant problems in the customer/data relationship.

What other tools does the customer have?

Most of our target customers utilized Google Translate to accomplish their translation-related tasks. Additionally, some of our customers (like Audrey) owned - and occasionally used - a physical dictionary in the language. Otherwise, the only other resource that our target customers mentioned was asking friends/acquaintances who were more skilled in the language (Kiki).

How do users communicate with each other?

Many of our customers interact with other people at the same language level as themselves (anybody that is a student is going to be interacting with other members of their class). Generally this happens face to face, with people asking questions and for advice from their peers.

How often are the tasks performed?

From our contextual inquiry, it is evident that the frequency our target customers are performing these tasks varies significantly. Audrey (our language student) needed translation assistance far less than Noah (our frequent traveler). It seems that the task frequency is directly correlated to the amount of time spent immersed in the language - someone like Noah, who spends his time in foreign countries, is going to perform the task much more frequently than Audrey, who only needs to perform the task when she is in class/performing class related activities.

What are the time constraints on the tasks?

A task like getting a phrase translated needs to be instantaneous. If a customer is talking to someone in a foreign language and can't figure out how to say something, they can't wait around for 10 minutes before they get a response. On the other hand, on the translator's side, they can translate on their own time. Unless a translating is someone's job, they're doing it for fun and only should have to translate when they feel like it.

What happens when things go wrong?

When someone can't get a word/phrase accurately translated, it can cause lots of confusion and embarrassment. If they use the wrong word in the wrong context, or a rarely used word, people will either laugh at them or misunderstand them entirely. To avoid this, people often try to explain things through hand gestures or combinations of simpler words, which is less efficient and much more time consuming.

REVISED TASKS

1. Translating a Phrase Quickly and Accurately

Translating a phrase quickly and accurately is a primary task because (as we discovered from our contextual inquiry) most of our target customers reported this as an area that current tools perform poorly in. Most of their current translation takes the form of translating individual words.

2. Translating to Informal Region-Specific Language

Translating a phrase into informal, region-specific language is another major task. As we (again) discovered from our contextual inquiry, many of our target customers felt there was

no easy way to learn regional colloquialisms, and some of them experienced negative repercussions as a result of this (take Noah's embarrassment, for example).

APPLICATION IDEAS

With the knowledge we gained through our inquiry and analysis, we moved on to an ideation phase. We built on our initial idea with the key insights that were gained. The first two insights were that people don't use Google Translate because it 1) takes too long to use on the go and 2) because it is not accurate for sentence fragments. Hence our app will need to have a very simplistic design and offer a one step translation (without complex dropdowns) in real time. Our third insight was that users had an experience with jokes, slang etc. that they had a hard time understanding. Since location is a major factor in we decided to expand on that aspect for our app ideas.

Idea One. Our first application idea was a voice recognition app which the user speaks into and has the translated response read out by the translator. This was an intuitive design which in theory would be very practical and would accomplish the task of translation the fastest possible way. However, although time was a factor in our goals, the accuracy of the app was a bigger priority. This would be a good extension project, but our solution implementation should solve a more pressing issues such accurate translation of sentence fragments. Furthermore there were not enough UI elements to consider viable this in the context of this class.

Idea Two. Our second idea focused on location as a key design element. The user would type in the word or phrase that they need to translate and the app would identify your location and have locals around you attempt to translate it. The advantage would be area specific translations which would include colloquialisms. Also this would solve the issue of accurately translating sentence fragments. The great difficulty would be to incentify locals to do the translations. Even with a very effective gamification of the app, there would be a lag and the translation could not be achieved real time. Hence we decided that although this idea some some good elements, we had to move away from it because of the delay in translation - which does not meet our goal in the time spectrum.

Idea Three. Our third application idea was also a text based translation app. To get rid of the delay we thought of a solution that involved using an existing tool as a backup plan - Google translate. It would work as follows; the user enters text to translate, if people have already provided a translation of that text, it is returned to the user, while if it is the first occurrence of the text, the user will be given Google Translate's answer and the text will be enqueued, to be later translated by crowdsourcing. This means that the app would continuously get more and

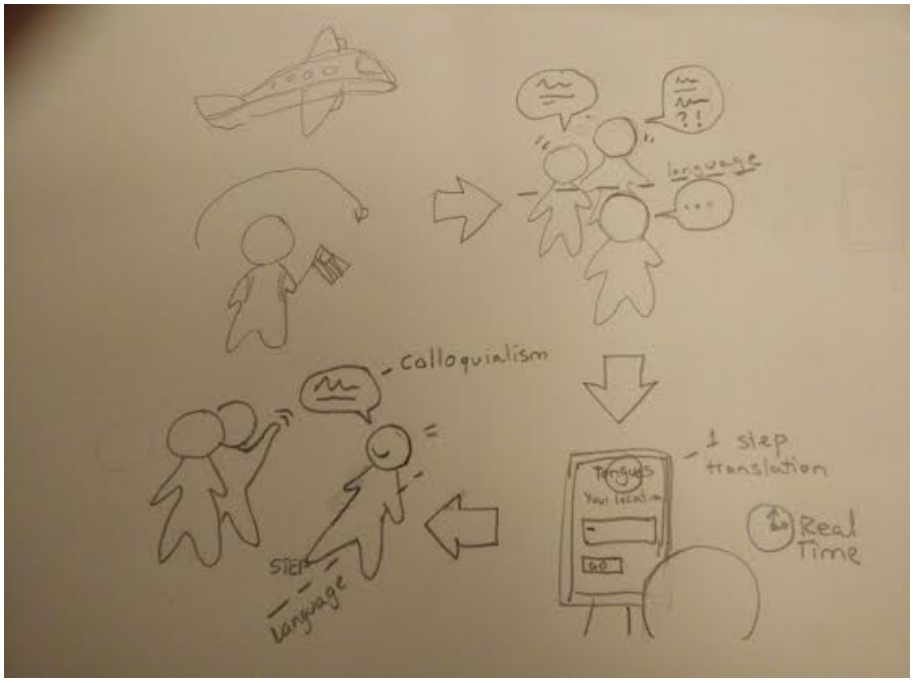
more accurate, as more and more people use it and more data is stored and mapped in the database. Google Translate would be used as a crutch to help the launch of the app, and the more it is used the farther it will move away from Google Translate. This would address our time goals as well as providing accurate translations to sentence fragments.

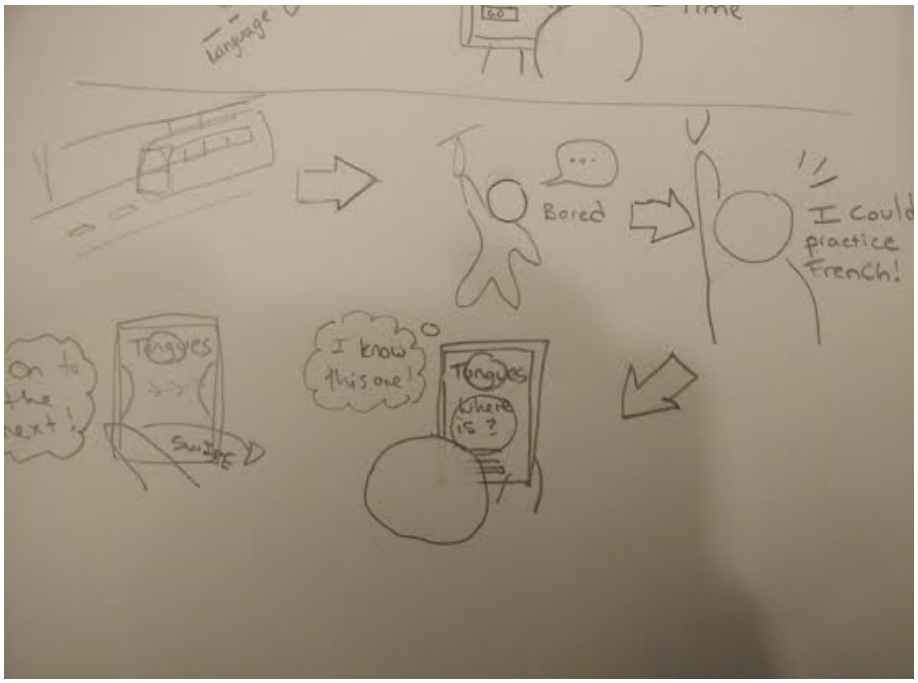
	Significance	**Feasibility**	**Interest**
Application Idea 1	Low	Medium	Low
Application Idea 2	Medium	Low	High
Application Idea 3	High	High	Medium

Analysis. To summarize, the first idea didn't improve the translating experience tremendously as it didn't add anything existing tools couldn't do. We decided it should have low significance because it only makes the process of translating faster without actually addressing issues like accuracy of sentence fragments. It was a somewhat feasible project, but we were not very interested in pursuing that route because it does not have many UI elements. The second idea had a significant element of location based translation, but because it was not real time its significance was average at best. It was not a feasible project because we would have a hard time incentivizing users to translate the words as quickly as possible and not have an hour long delay - making the app useless. We were very interested in the aspect of location that came out of it. Finally, the last application idea was the most significant as it actually provided a real time solution to translate sentence fragments, which we discovered is essential to this project. It was also much more feasible because the first steps involved building from something already in place like Google Translate. We were also interested in this solution, but thought it lacked the location based element of design which we found unique and worth pursuing.

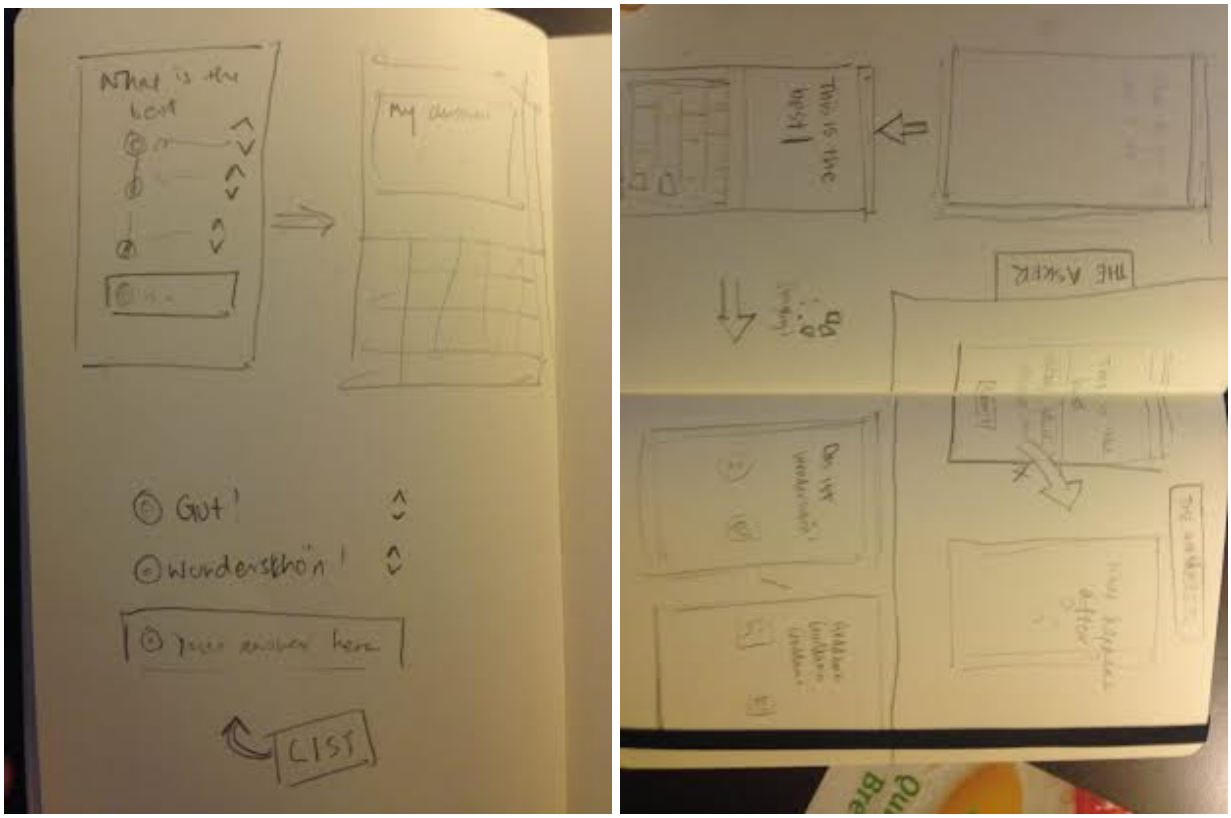
Upon reflection, we decided to focus on the third idea but incorporate the location element from the second idea (the reflection of which was described above). In this manner all our needs would be addressed - the app would always provide an answer real time, sentence fragments would be accurately translated by locals, and since the app would rank translations done closest to you the highest, you would get the local interpretation of the word or expression first.

Sketches





Concept sketches by Anna



Features and Task sketches by Ishita

UI Design sketches By Alex Wu