**Summary of research results**

Interviews and questionnaires:

Our participants’ identities range from business professionals, students, backpackers, tourists, professors to new immigrants. Most of them experience a language barrier when they travel to a developing country. They interact with people who speak a different language besides English weekly on average. Most of them are bilingual and usually take 5 days on average for them to pick up a new language. They usually learn new phrases in general greetings, such as “Hello”, “How are you doing?”, “Thank you”, “Bye”, local famous dishes, local popular destinations, direction: “How do I get there from here?” understanding their directions and learning to count. They heavily relied on online translation applications and tour guides to overcome their language barriers. Meanwhile, roughly 50% of the time, Wi-Fi was not accessible to them and native companions were often not available, and they have to use body language and drew pictures in the worst case. However, no one had language barrier problems that were significant enough to impact their trip in a negative manner. Almost everyone brings some of their electronic devices with them; the most common items were phones, tablets, and iPods. Business conferences, meeting with clients and researchers, academic talks, shopping and bargaining, hailing a taxi, ordering food and sightseeing require a great deal of communication. They think that a physical translator (e.g. dictionary or a tour guide) would strongly help but is often not available and electronic aids would somewhat help. Most of them agree that electronic aids, such as online translation applications have its own limitations. And most of them believe that picture dictionary through voice recognition or keyword search would be a great solution to the problem with today’s online translation application.

Observation:

Participants do prefer to defer to a visual form of expression whenever they are faced with a language barrier, however, visual representations cannot guarantee to solve a language barrier problem, which was evident in the game stimulation. Through series of trials, it was confirmed that visual element will still be part of our solution to a language barrier problem.

**User need list:**

1. Offline portable translation device
2. Combination of statistical and grammatical rule-based approaches
3. Fast and accurate translation, which allows the user to instantly respond back
4. Visual representation of words feature
5. An fast and efficient way to get ideas across in the form of visual representations
6. User friendly interface

**Stakeholders’ descriptions**

1. Business professionals
2. Travelers
3. backpackers
4. Mobile phone manufactures
5. App Developers
6. Local hotels
7. Local shops
8. Language educators
9. New immigrants
10. Travel agencies
11. Tourist guides

**Primary Personas**

Peter, the business professional

Peter is 35 years old bilingual Canadian and works as a sales with a vacuum cleaner company based in Toronto. This firm has business operations in developing countries in South America, such as Brazil, Argentina and Chile, and Peter always make business trips to these countries.

Peter often experiences a language barrier when he interacts with his customers while his local business partner is not available for translation. He finds himself using the online language translation application on his iPhone all the time. However, Wi-Fi can only be accessible 50% of the time when he is abroad. Peter wonders if he would be able to cope with the language barrier by drawing pictures and using body languages.

Daichi, the hard-working traveler.

Daichi is a 26 years old Japanese male that works as an accountant at a famous local Japanese company. He got this job straight out of University of Tokyo and has been working full time 50 hours a week ever since. Daichi has always wondered what the world is like outside of Japan since he was little, he is fascinated by everything that he has heard and seen about the Western and European world. He wanted to travel, but he was also constantly worried about settling down so he doesn’t really have a diverse range of friends, nor did he have time to study and grasp the Western and European culture. Daichi finally decides to use his two week vacation as a way to travel to Europe and explore the rest of the world. Then suddenly one thing hit him, he realized that he could only speak Japanese and there weren’t that many tour companies that supported Japanese travelers, and all the ones that did seemed to be full. He suddenly got really scared because he has also heard that the traditions and customs in the Western world are vastly different from Japanese traditions and customs, combined with that and the language issue he would be clueless! He doesn’t really want to cancel because his company had a strict rule about vacation time and that would mean he would have to forfeit his two week vacation for this year.

**Additional Personas**

1. Backpacker James
2. Professor Kim
3. Journalist Jane

**Scenarios**

1. Daichi is a Japanese male who went traveling but doesn’t know a single word in any language other than Japanese. While he was eating at a restaurant in Paris he completely forgot he had to meet up with the Tour guide as well as the rest of the group at 1pm. When he rushed to the meeting location he doesn’t see anyone he knows around. He tries to gesture and speak Japanese but no one even seemed to understand what language he was speaking. He was completely lost.
2. James is a lone backpacker who often travels to the developing countries in South-East Asia. One day, he shopped around in one of the less developed cities of Thailand, Pattaya, where Wi-Fi is limited, and he came across a small jacket boutique. He wondered what materials are the jackets made of, so he decided to ask the shop keeper. However, she does not speak English. After a few attempts of using body languages and drawing pictures, yet the shop keeper still could not understand what James meant.