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The Study of New Business Development for Hearing-Impaired
Market in Taiwan

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The Study of New Business Development for Hearing-Impaired Market in Taiwan

本論文係蔡惠盈君 (R09749052) 在國立臺灣大學企業管理碩士專班完成之碩士學位論文，於民國 110 年 08 月 06 日承下列考試委員審查通過及口試及格，特此證明

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ABSTRACT

This paper is to present a business plan to bring in Hand Talk, a sign language translator originated from Brazil which is downloadable into mobile phones into the Taiwan market. The paper discusses the solutions available for hearing-impaired community and identifies a gap of supply for hearing-impaired who are proficient in sign language. In Taiwan, there is a lack of technology tools that can support them. Most of them rely on sign language interpreters or video relay interpreting services which require effort in arrangement and cost considerably high. Due to budget and resource availability constraint, the hearing-impaired doesn't fully benefit from them. Market research shows positive response on the sign language translator. The customer can use the translator conveniently without any cost incurred. Lastly, a plan is laid out for Hand Talk to enter the Taiwan market. The plan is taking conservative approach, gradually and low risk progression to ensure the value delivered to the customer sustainably.

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CHAPTER 1: EXECUTIVE SUMMARY

Hearing impaired, commonly known as deaf or hearing loss is a minority in the society. The population is getting bigger and cannot be neglected, especially the aging population in Taiwan which is one of the causes of hearing impairment. Sign language is the mother tongue of the hearing-impaired. Unfortunately, the qualified sign language interpreters, the communication bridge between hearing impaired and the hearing, are not proportionate to hearing-impaired community, to support the market needs. The cost of engaging the service is also considerably high for the hearing-impaired. Even though the technology in translation is well developed, there isn't any technology tool in Taiwan which can support the usage of sign language and protect this minority's right in using sign language, the language that they are good at in their daily communication. Hence, we would to set up a social enterprise via joint venture with Hand Talk Brazil, to bring in this award-winning sign language translator technology into the Taiwan market to fill the market gap and release the customers' pain.

A series of market study and market research, including target customers' current situation, customers' expectation, willingness to try, market competitors and substitutes etc. were done thoroughly. The responses from the market were positive towards sign language translators. The market opportunity has further raised with the approval to include sign language into the National Language Act in 2018. It means the promotion of using sign language will be raised and future market size will be expanded as Hand Talk can act as a learning tool for them to learn sign language and even help government agencies to promote the usage of sign language via plugin in the websites.

Hand Talk is a free downloadable mobile APP to act as a portable sign language translator for an individual. It also serves as a plugin to websites and translates the content of the websites. It is developed based on the market responses to ensure the value of the product is maximized – convenient and affordable. Since Hand Talk is not a high profit product, all the

planning and projection will be done under conservative approach to minimize the risk in the launch of the product and sustainable profit in the future to continue to deliver the value of the product to customers, including awareness campaigns and active engagement with customers. Hand Talk Brazil is expecting to hold a 70% of the joint venture share and the local team will be taking up 30% of the share. Local team will be in-charge of local marketing activities, data collection and avatar's animation design. Whereas the Brazil team will be focusing on training the translation system with the data collection and animation. The development is expected to be started in 2022 and launched to the market in 2023, with 90% accuracy of translation from text and voice message to sign language. Existing Hand Talk APPs will be upgraded to include Chinese language and Taiwan sign languages. After the launch phase, translator development will still continue, specially focusing on 2 areas – 2-ways communication to further improve the effectiveness of communication between hearing-impaired and hearing community, and cross languages translation such as from English to Taiwan language, enabling hearing-impaired's in exploring foreign languages and foreign countries and even wider their social network. With projected revenue and cost, Hand Talk expects to start making profit in 2026. Last but not least, because the joint venture is a social enterprise that delivers low profit-making product, the company will review the financial status yearly for adjustment to ensure sustainability of the profit of the enterprise, continue to develop the product and enhance customers' value in the long run.

CHAPTER 2: MARKET STUDY

A person is called hearing impaired or deaf when the individual is having hearing loss, unable to hear as well as normal hearing. Hearing impaired community is a minority in the world population. However, the growth of this population has been expanded and cannot be ignored. On top of the congenital factor and direct impact and/or sequela of other diseases, long term exposure under high noise level (ie. wearing earphones all day, urbanization, construction workplace etc.) and the increase of aging population worldwide are the unavoidable factors causing the increase of the hearing-impaired population. The hearing loss population has shown a very significant increasing trend and projection to reach 700 million people, 1 in 10 people by 2050.¹

However, hearing loss is always deemed as non-essential and as a consequence, it misses the critical period for treatment to get the best result of it. When hearing loss starts, an individual might not realise it as hearing loss is a gradual condition, with a process from distorted sounds to missed sounds. It is not easily detectable by individuals or might think that it is not to the extent to warrant a treatment. When hearing loss is suspected, an individual should immediately seek consultation from an audiologist to avoid the condition getting worse, instead of ignoring it or thinking it is not bad enough to seek treatment.

In the long run, it has a big impact on the economy and society. Generally, the education level and employment rate for hearing impaired is lower than hearing so the income level is also at the lower side. Study reveals that hearing loss might link to walking problems and flips the chances of developing dementia.^{2 3} Moreover, it will badly affect self-confidence and be emotionally unstable. Eventually, it might cause mental health issues.

2.1 Market Definition

2.1.1 Definition of hearing impairment

According to the World Health Organization (WHO), an individual with normal hearing range is 10-25 decibels (db) so an adult is considered hearing loss when the individual's hearing threshold is greater than 26 db, which is the normal hearing. Hearing loss can be divided into 4 degrees - mild, moderate, severe or profound. It might happen to one ear or both ears.

According to the Ministry of Health and Welfare (MOHW) in Taiwan, an individual would be considered suffering from hearing loss if the hearing is 55db and above. The individual will be eligible to apply for a handicap handbook in Taiwan with such a degree of hearing loss. The reference of the degree of hearing loss has categorized per below:⁴

Mild : 55 db to 69 db

Moderate : 70 db to 89 db - Cannot hear faint speech, difficulty at conversational speech

Severe : > 90 db (Cannot hear conversational speech, difficulty with loud speech)

Profound : Total Deaf

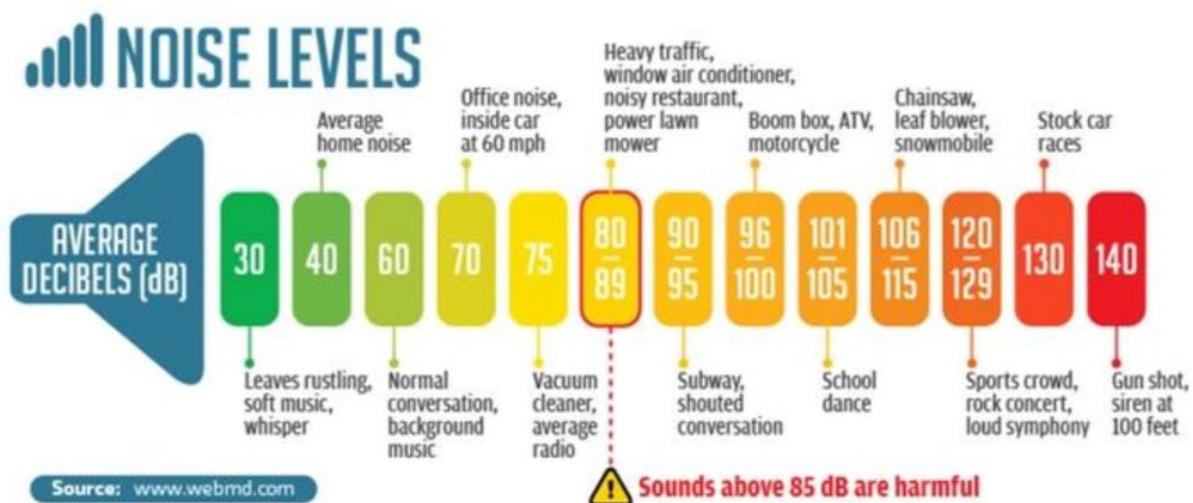


Figure 2.1 Hearing reference chart (Source: www.webmd.com)

2.1.2 Ways of communication by hearing-impaired

Communication is a process of transmitting a message from one person to another and achieving a common understanding between both parties (Keyton 2011). The message can be transmitted via verbal, non-verbal and written. It will be interrupted by noise such as language barriers, emotions, attitudes etc which will lead to ineffective communication. Finally, feedback from the receiver allows the sender to confirm the message is rightly conveyed and understood. (Cheney 2011)⁵

There are 4 main communication modes for a hearing-impaired individual to communicate with the hearing-impaired community and hearing community. He can choose to decode the message via listening, speech reading, written media or sign language, at their most comfortable and highest confidence level. Then, he will give feedback via oral speaking, written or sign language which very much depends on the language literacy of the opposite party.

Upon being diagnosed with hearing difficulty, patients are normally recommended to wear hearing aids or cochlear implant depending on the causes of the hearing loss to improve their hearing ability. The concept is similar to wearing glasses to correct eyesight.

Oral language

Same as a normal individual, hearing-impaired can speak, especially the individual 's hearing loss is acquired, after the language system has developed. With help of tools such as hearing aids, assistive systems or even cochlear implants can enable him to listen clearly. He might be able to verbally communicate with the audience. However, if the hearing loss is due to a congenital factor, he must put in extra effort in developing the ability to speak since young – less than 6 months old. In Taiwan, if the baby is hearing-impaired, parents are encouraged to get the hearing aid soonest to help them in touch with noise from the environment, including

speech. At the same time, babies can attend a language centre who specialize in training a hearing-impaired baby in developing his ability in speech. Parents must act as early as possible to avoid missing out on the golden period of kids in learning speech. No doubt, a hearing-impaired baby needs extra effort in developing these abilities, so their pronunciation might not be as good and as smooth as hearing babies.⁶

Written media

Same as normal hearing, hearing impaired who learned language can read and write. Hence, written media is always one of the highly used ways of communication between hearing and hearing impaired.

Speech reading

In contrast, speech reading is a nonverbal media technique used, visually interpreting the movement of lips, face and tongue to decode the message from the speaker. It is frequently used by the hearing-impaired community for communication with the public, especially under high noise environments that are unable to hear clearly. There is no formal education in teaching speech reading. This technique can only be learned by individuals who have heard and spoken before, with a certain level of language. He can read the lip better if he is in touch with such words and topics. Most of the speech readers will do necessary preparation before the class in order to understand the context better. Hence, if the individual with congenitally disability, speech reading is very difficult to be picked up because he never speaks and hears before. The best way in training speech reading includes watching news reporting programs, self-mirroring to observe the lip movement or continuously practicing with a partner. During speech reading, 2 parties must be face to face when communicating. The person who reads the

lip must be highly focused. In contrast, the person who is being read, must be patient, speak slower and clearer so that the lip can be read clearer.⁷⁸



Sign language

Last but not least, sign language is a language which is created for the hearing loss community to communicate with their network and is considered as the mother tongue of hearing-impaired. Same as other languages, individuals need to invest time to practice and learn. In many countries, linguists have developed the grammatical structure of the sign language of their own countries. It might be totally different from their vocal language, mistaken by the public that sign language is just translated from the vocal language. Taiwan sign language was developed during Japanese occupation, Japanese set up a school for hearing-impaired. There are 2 sign language systems from Japan: Tokyo and Osaka. Hence, the sign language between Taipei and Taiwan has a great difference too due to the source of influence from these 2 different areas in Japan. There are 3 types of sign language used by the hearing-impaired community in Taiwan, natural sign language between hearing impaired individuals like our vocal language, grammatical sign language, between hearing-impaired individual and non-hearing-impaired individual which would follow grammatical structure of vocal language and lastly, written sign language which is matched with Chinese character or alphabet (in US, it called fingerspelling), used to spell out names, technical terms and etc. to enhance the understanding between individuals.⁹

2.1.3 The importance of sign language (visual communication)

Firstly, some of the parents of deaf children choose to only focus on oral language development due to bias and prejudice (Humphries et al. in press) might delay the language acquisition of the children and affect the development of their neuro-linguistic structure in the

brain (Skotara et al. 2012) and caused biological and irreversible impact on brain. A study shows that cochlear implanted deaf children who sign from birth display comparable results of language testing from hearing children (Davidson et.al 2013) and score better than the implanted deaf children who don't sign from birth. So, authors recommended using sign language even before cochlear implant, (Amraei et al. 2017) to avoid missing the best period in developing the neuro-linguistic structure.¹⁰

Secondly, early exposure to language plays an important role in false belief attribution and the research result shows that the lack of early language exposure can be partially countered by exposure to a sign language. Hearing children and signing deaf children outperformed oral deaf children. Oral deaf children are performing poorer might due to late access to communication compared to second-generation deaf children (Harris 1987; Mayberry, 1989) because oral children are at a handicap compared to signing children in the learning process.¹¹ Visual perspective is the skill in developing theory of mind, signing children should develop theories of mind earlier than the speaking ones. The study on how children develop theory of mind (Piaget & Inhelder,1984) has shown that visual perspective is the first skill a child acquired to understand representational mind. The ability then changed from perceptual domain to the conceptual domain (Melot, Houde, Courtel & Soenne, 1995; Melot & Komano 1997). It might be the precursor in learning “false belief” and capable of understanding and predicting the action of others in accordance with what others know.

A qualitative research with experts in otolaryngology and language development also concluded that all deaf children should be taught sign language, despite spoken language can be developed with the help of hearing aids or cochlear implant. On top of the development of theories of mind mentioned earlier, the timing of intervention is critical for infants' language acquisition and cognitive ecosystem development with unambiguous linguistic inputs and rich interaction to prepare the infants to build strong base for their interpersonal skill and academic

development, regardless of visual or auditory modality. While the parents are deciding to acquire hearing aids and cochlear implants to develop spoken language, early sign language should be started too, as a bridge to spoken language in the future. The children who sign with their family show similar expressiveness to hearing children. Moreover, sign language correlates positively to oral and written language. Sign and speech facilitate each other but not hinder each other for better cognitive outcomes compared to monolinguals (Adesope et al.2010). Lastly, it is a choice for the deaf children to further develop and use in the future. The only disadvantage of sign language in the learning process is still over relying on sign language even after activation of hearing aids or cochlear implant. It will negatively affect the capacity of learning spoken language.¹²

Lastly, for an individual with severe and profound hearing loss, the hearing ability will not be very much improved by hearing aids so they will heavily rely on visual communication, which is sign language, speech reading or by written media.

Compared to sign language, speech reading can only have the best result of 60% accuracy in English. Sign language is an even better way for visual communication because the sender will naturally be facing the message receiver while using sign language, compared to speech reading that the speaker must consistently be cautious to face the audience and speak slowly to accommodate the reader. On top of that, speech reading also depends on other noises such as mask, light, lip movement (ie. mumble) etc. which will affect the message decoding process by receiver. The only disadvantage of sign language only happens if the individual does not have full use of hands, ie. Parkinson's patients, handicapped or hands are full of items.¹³



	Advantage	Disadvantage
Oral Language	Communicate with hearing community	Blur pronunciation
Written Media	Communicate with hearing community	Must develop the written skill before it can be used
Speech Reading	decode messages better by observing the lip movement in challenging listening environment	Only 60% accuracy Affected by external factor (e.g., speed of speech, mumble)
Sign Language	<ul style="list-style-type: none"> - develop neuro-linguistic structure, build false belief attribution and language acquisition for deaf children - convey clearer message for severe and profound degree of hearing-impaired adult 	Can't be used with full use of hand (e.g., handicapped)

Table 2.1 Advantage and disadvantage of different ways of communication (Source: This research)

2.2 Market Solutions

Hearing ability can be improved with the help of various tools and subsequently the effectiveness of communication can be enhanced too. On the other hand, with the help of others in interpreting and translation, the communication with the hearing impaired can be improved too.

Hearing aids

Hearing aid is considered as an amplifier for hearing-impaired to assist them to listen clearer in their daily life. Generally, it is the first solution recommended by an audiologist if a hearing impaired is diagnosed. It acts as the same function of spectacles to correct the eyesight. It comes with different grades and generally it can be customized into the ear canal depending on the size of the receiver. There are 3 main components in the device, including the speaker, microphone and amplifier. The voice signal will be captured by the microphone and processed via amplifier then transfer the signal into the ear via the earpiece. The user can adjust the volume of the signal to send into the ear.¹⁴



Figure 2.2 Hearing aid components (Source: Oticon)



Figure 2.3 Types of hearing aids (Source: Starkey)¹⁵

Cochlear implant

If the patient has profound hearing loss, he might not be helped by normal hearing aid but need to go for a cochlear implant. Cochlear implant is to implant a device into the inner ear to stimulate the auditory (hearing) nerve, bypassing the damaged portion of the ears. It's

used to help restore sound perception in the hearing-impaired individual with profound hearing loss. There is a microphone and sound processor sitting behind the ear to receive the signal from the surroundings, then the transmitter sends the signal to the receiver and stimulator in the inner ear to stimulate the auditory nerve with electrodes to send the signal to the brain for processing. The device can be implanted in an ear or both ears.^{16 17 18}

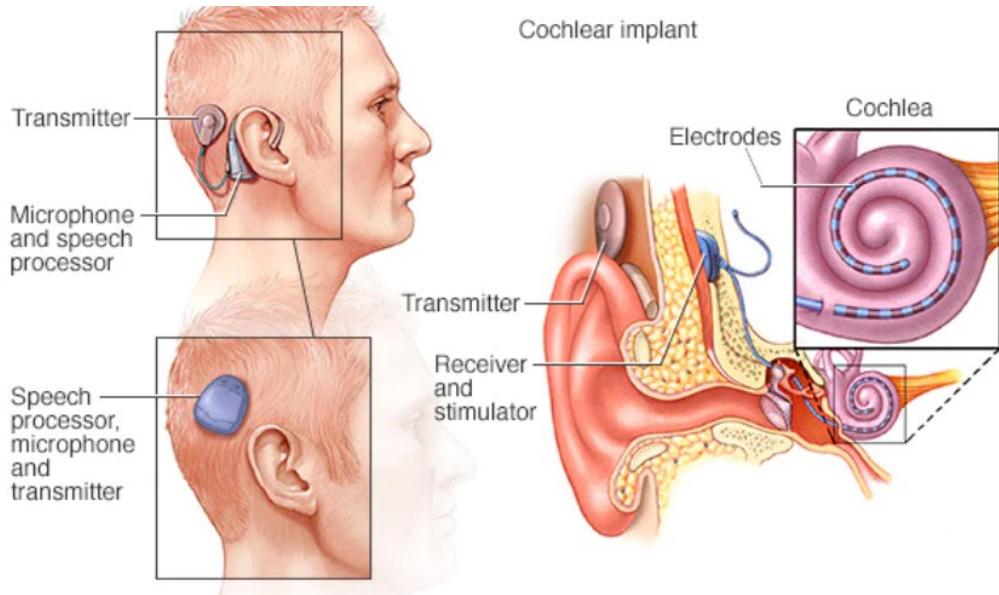


Figure 2.4 Cochlear implant components (Source: Mayoclinic.org)

Transcript mobile APP

There are 2 relatively famous transcript mobile APPs in the market - Yating Transcript and Google Live Transcribe and Sound Notification. Yating Transcript is downloadable and used in iOS and Android setup whereas Google Live Transcribe can only be downloaded in Android setup. Both APPs are used to convert speech into text and often help stenographer in recording a meeting or events. Hearing-impaired people use it as a communication tool to convert a speech into text.



Figure 2.5 Yating Transcript interface (Source: Yating Transcript)

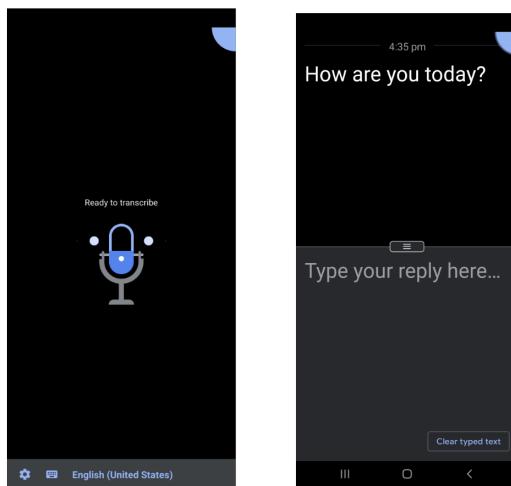


Figure 2.6 Google Live Transcribe interface (Source: Google Live Transcribe)

Yating Transcript is free to use under the basic version but charges for the advanced version – NTD 100/hour, NTD 270/3 hours and NTD800/10 hours.¹⁹ However, Google Live Transcribe is a free APP for the users.²⁰

Unfortunately, the accuracy rate of the transcription will drop with distance, environment noise and clarity of the speaker's speech. The words with the same pronunciation might be wrongly chosen too.²¹

FM assistive hearing system

FM system is using wireless technology to transmit the speaker's voice to the listener's ears across distance. This device has helped to increase the signal-to-noise ratio (the content of the speaker vs the background noise) and connect specifically to the receiver's hearing aid and help them hear clearly in noisy places. This device also allows the speaker to walk around. FM system is largely used in the classroom or meeting room setting. FM System contains 2 major parts, the microphone with transmitter and receiver. The microphone can pick up the speaker's voice and deemphasize the background noise and send the signal over directly to the receiver.^{22 23 24} If the receiver tunes to the same channel as the transmitter, the receiver can receive the information accordingly. Hence, it cannot be used at any private event because the signals penetrate through objects.

Non-FM assistive hearing system

Similar concept as FM system, non-FM assistive hearing systems are designed to be installed directly at a public place. Generally, this solution is specially used for solemn occasions or venues such as courts, parliament meetings, etc. It helps the hearing-impaired community to join any public events with barrier-free. Basically, the concept of using these assistive systems is the same but the signal is transmitted via different media such as infrared, Bluetooth, Wifi, magnetic field, etc.²⁵ The most common 2 non-FM assistive system used are AFILs and IR Hearing Aid Loop System

1. Audio-frequency induction loops (AFILs) or hearing loops

This is an assistive hearing system installed in public settings such as theatre, stadium, classrooms etc. As per the picture shown below, the audio source would be connected and go through the special audio amplifier and amplify the signal inside the hearing loop which is looped around a room. The cable generates an electromagnetic which hearing-impaired

individual who has a hearing-aid equipped with a telecoil in it can directly pick up the signal from the loop.

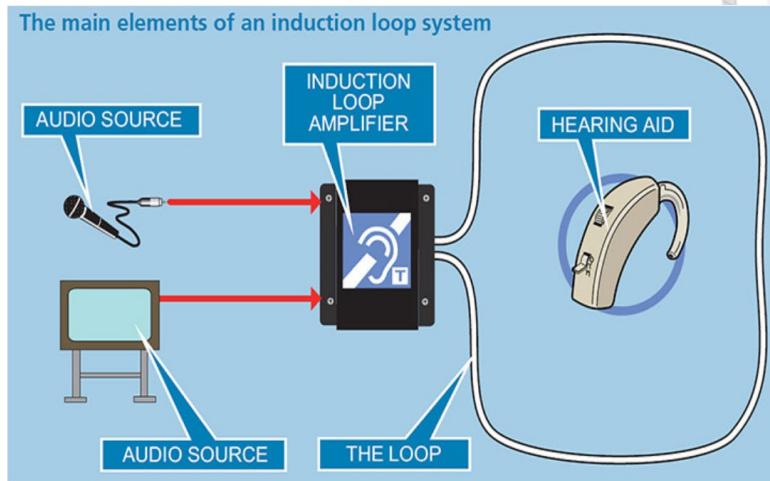


Figure 2.7 Audio loop systems elements (Source: Aurisloops.com) ²⁶

2. Infrared (IR) hearing aid loop system

Infrared (IR) hearing aid loop system is another alternative to induction loop system. A set of IR hearing aid loop systems consists of an audio source (e.g., microphone, sound system or any other audio source), an infrared radiator (transmitter) and infrared receiver. The signal was fed into the modulator, an electronic circuit that superimposes a low-frequency (information) signal onto a high-frequency (carrier) signal for the purpose of wireless transmission, to prepare the signal for subsequent IR transmission. Then, the processed signal is fed to the radiator and the radiator diodes produce the IR and radiate it into the room, like floodlights. The IR receiver would change the signal back to electrical signal then audio signal for the listener. IR hearing aid loop systems can cater for multiple channels for different sources of audio. Receivers can be turned to the designated channel for receiving signals. As infra-red cannot penetrate through objects, it is used for solemn occasions.



Figure 2.8 Infrared hearing loop system components (Source: Sennheiser)²⁷

Sign language video relay interpreting

In layman terms, this is how a hearing impaired can make phone calls. This service was provided by government bodies but only limited to enquiries on municipal administration. Moreover, this service is taken care of by the individual city government but not country wide.²⁸ Hence, the resource allocation is not equally fair to all the hearing impairment community. For other private enquiries such as ticketing, make appointments, enquiries on bank services, the individual has to approach other deaf related associations for similar services – Chinese National Association of the deaf R.O.C and Deaf Organization Taiwan. This platform acts as an instant interpreter between the hearing impaired and receiving party, communicating and translating via sign language or stenography



Figure 2.9 Illustration of video relay interpreting (Source: Youtube - TSLVRI)

Stenographer

Stenographer is also called Communication Access Realtime Translation. Besides sign language translation, this is an alternative service provided to hearing-impaired community. It uses text to convey the messages to them. For hearing-impaired individuals who are not familiar with sign language can request for a stenographer's service via the Ministry of Labour. The purpose of stenographer is act as the hearing-impaired individual's ears, bring him into the atmosphere and ensure he can "listen" to anything happen during the event.

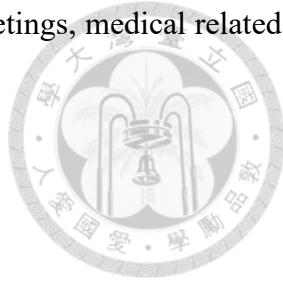
Human error is the main disadvantage of stenographer's service. As the interpretation varied by individual and the words might be wrongly chosen and it will confuse the hearing impaired or even convey the wrong messages.²⁹

Sign Language Interpreter

In Taiwan, the Department of Social Welfare provides sign language interpreting service and stenographer service to the hearing-impaired community in Taiwan. Hearing-impaired individuals can apply the service with a subsidiary for both sign language interpreter and stenographer. Sign language interpreting is a skill that needs to be qualified. In order to protect the rights and welfare of hearing-impaired in all perspectives, sign language interpreters are needed in the law courts, forums, ceremonies etc. The interpreter needs to undergo intensive training for 9 months to 1 year to prepare himself to be qualified after the test. According to the Ministry of Interior, the standard of sign language has been divided into 3 categories which are defined for different services.

1. Grade C - translation of simple and individual communication, counter services (ie. customer services)
2. Grade B - translation of meetings, activities, forums, court cases (ie. speeches, interviews)

3. Grade A - translation of major decision meetings, political meetings, medical related matters etc.



2.3 Chapter Summary

The definition of hearing impaired varies across countries and might different from the definition defined by the World Health Organization, to categorize the hearing-impaired population accordingly. Hence, the population might be changed with the change of definition. Although there are a lot of tools and services available to help the hearing impaired to enhance their communication with hearing-impaired, there isn't any perfect solution for the hearing-impaired community. Hearing aid is the basic tool and widely used among the hearing impaired whereas cochlear implant is the alternative if the hearing ability is not improving by using hearing aids. Hence, the development of hearing aids and cochlear implants are consistently increased to improve the quality of the tools and users' experience subsequently. Whereas for FM and non-FM assistive hearing systems is not for individual use but more for the room setting. Currently, the most welcomed and used tool by a hearing -impaired individual is the transcript APPs because it is convenient, downloadable into mobile phones and low cost or free of charge. This has reflected that convenience and cost are the 2 main concerns of the hearing impaired. However, the shortcoming of the APPs are choice of words and accuracy rate during transcription which might mean different and convey the message wrongly. Furthermore, it is not applicable for an individual who is not proficient with reading. Nevertheless, these transcript APPs have eased and improved the efficiency of stenographers and are frequently used by hearing impaired in their daily communication. It also shows that the acceptance level of accuracy translation is considerably low. Stenographer can amend the translated script accordingly and tremendously reduce the workload and increase accuracy of

transcription after vetting. Unfortunately, there isn't any tool for hearing-impaired who use sign language in the market.



CHAPTER 3: HEARING IMPAIRED MARKET ANALYSIS

3.1 Hearing-Impaired Population

According to the World Health Organization (WHO)'s record in 2018, over 5% of the world's population (about 466 million people) is suffering a degree of hearing loss at moderate and above, which is 432 million adults and 34 million children. Under such a situation, it is projected that 630 million people would suffer from hearing loss in 2030 and further increase to more than 900 million people in 2050. In the nutshell, 1 out of 10 people would be hearing impaired in 2025. From the affected population, one third of them are above 65 years old.

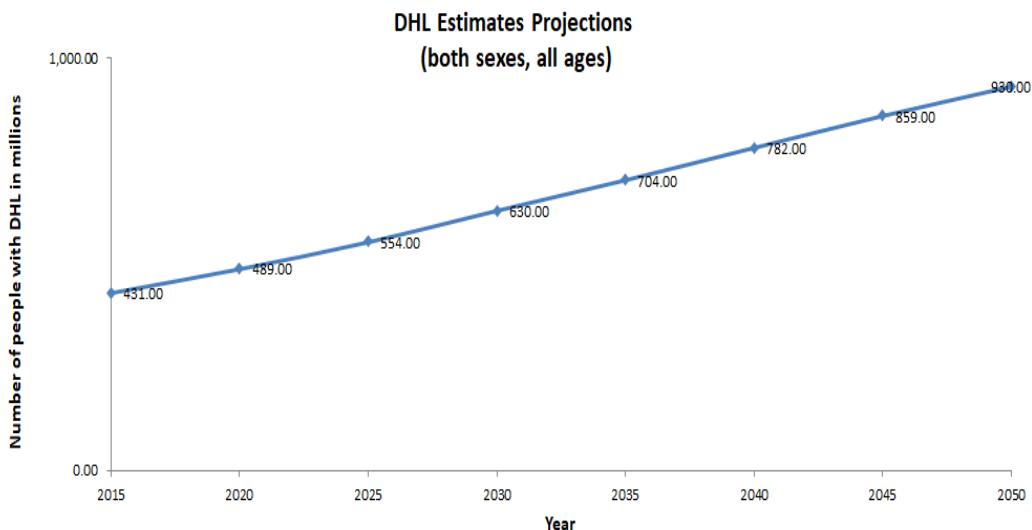


Figure 3.1 Projected trend of hearing loss (Source: World Health Organization)

Low- and middle-income countries suffered from disabling hearing loss more than high income countries. South Asia countries (Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan) covered 28.2% of this population, which is the highest region, followed by East Asia countries (ie. China, Hong Kong SAR (China), Macau SAR (China), Democratic People's Republic of Korea).

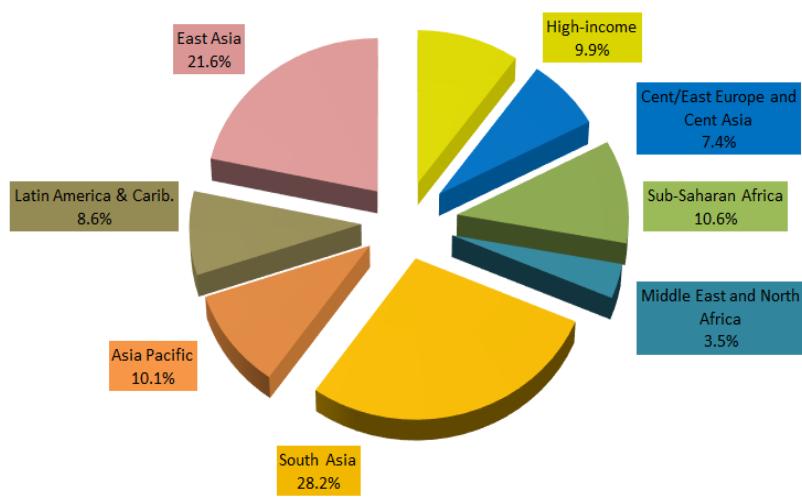


Figure 3.2 Distribution of disabling hearing loss across different regions of the world

(Source: World Health Organization)

On top of that, more than 1 billion young people between the ages 12-35 years old are at risk for hearing loss because of the recreational exposure to loud sound, especially the habit of hearing loud music by using earpieces.³⁰

The hearing impairment population in Taiwan also aligns with the world hearing loss population, at the increasing trend. According to the data from the Ministry of Health and Welfare, the hearing impairment population increased from 117,103 people in 2010 to 124,938 people in 2020 quarter 3, an average increase of 1% every year.³¹

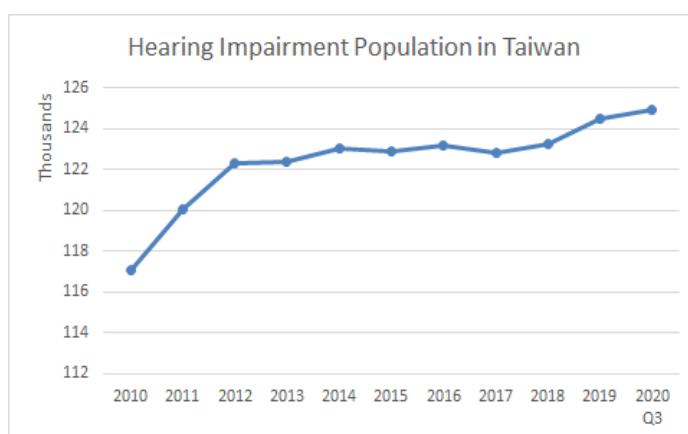


Figure 3.3 Hearing impairment in Taiwan (Source: Ministry of Health and Welfare)

By age group

According to the International Symposium on Hearing Impairment in 2018 reported that 77% of the impairment population in Taiwan is more than 65 years old and it is due to degeneration of sensory cells. This segment of population has increased about 45% from 2000. Hence, the hearing impairment population would expect to continue to increase with the increase of the aging population in Taiwan.³²

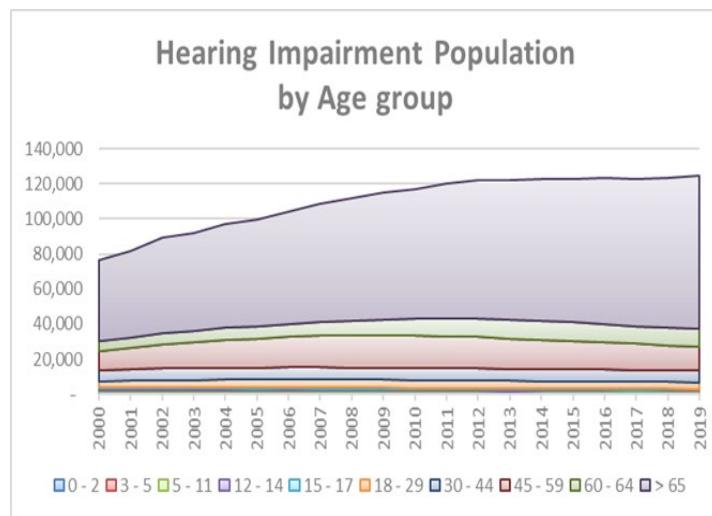


Figure 3.4 Hearing impairment of Taiwan population, by age group (Source: Ministry of Health and Welfare)

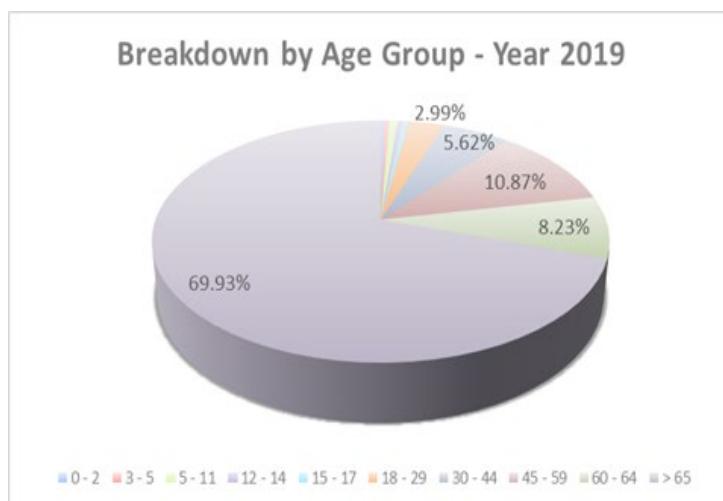


Figure 3.5 Breakdown of population in 2019, by age group (Source: Ministry of Health and Welfare)

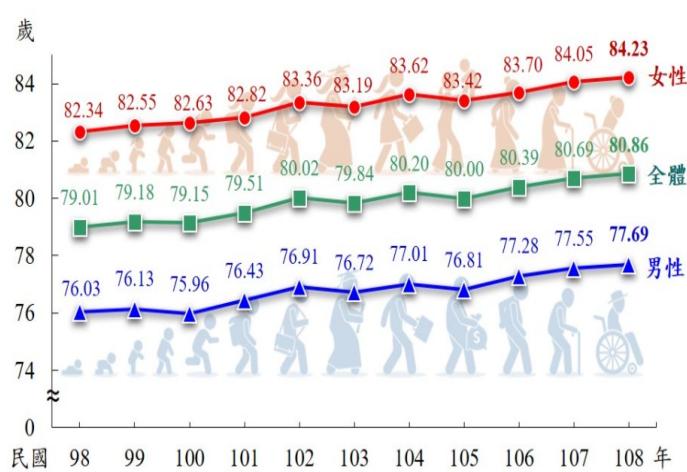


Figure 3.6 Average age of Taiwan population (Source: Ministry of Interior)

By severity of hearing impairment

There are 4 degrees of hearing impairment definition in Taiwan (mild, moderate, severe and profound) as per mentioned in chapter 2.1. The hearing impaired can apply for Handicapped Handbook from the Department of Social Welfare, by submitting the application form together with the identification and verification report on the appointed clinics and hospitals to confirm meeting criteria in application. Out of 125 thousand of hearing-impaired in Taiwan, 56% of the hearing-impaired individuals are at a mild degree, followed by 28% moderate degree and 17% is severe degree.

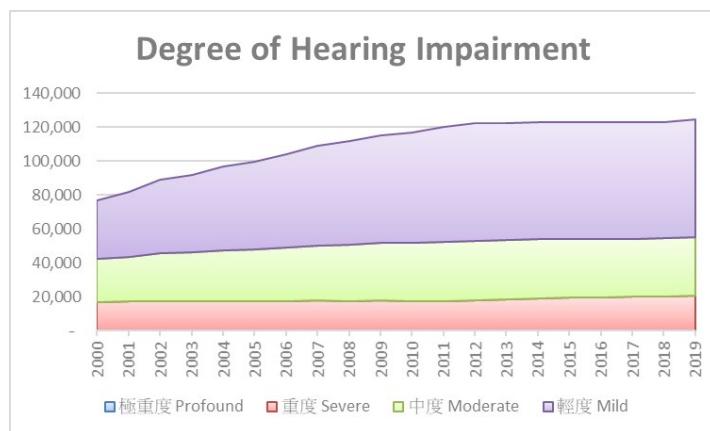


Figure 3.7 Hearing impairment of Taiwan population, by level of hearing impaired

(Source: Ministry of Health and Welfare)

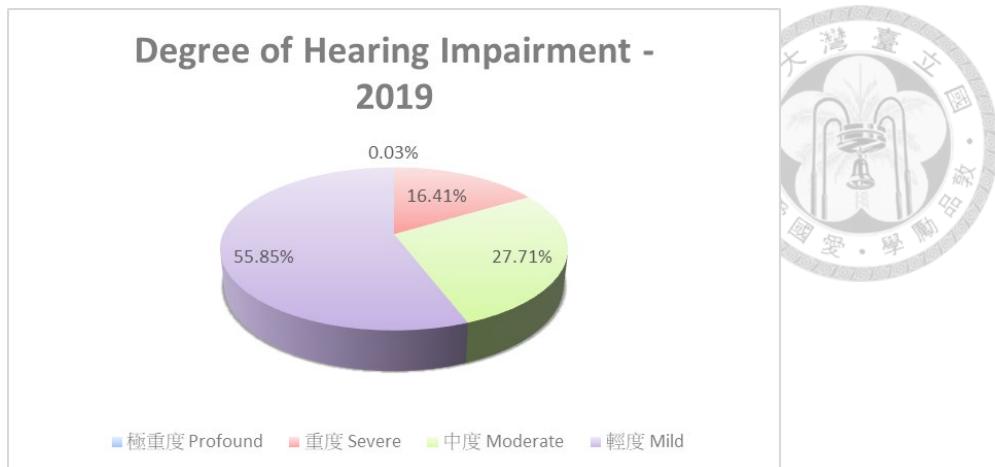


Figure 3.8 Breakdown of population in 2019, by level of impairment (Source: Ministry of Health and Welfare)

By cause of hearing impairment

Patients with hearing impaired are divided by 2 major factors, congenital or acquired. Congenital factors might include genetic factors or by certain complications during pregnancy and childbirth such as severe jaundice, Rubella, Anoxia, otosclerosis, inappropriate use of drugs during pregnancy. On the other hand, acquired causes might include disease or complication of disease or misuse of drug, ear infection (e.g., Meniere's disease), ear injury, collection of fluid in ear, long term exposure to loud sound including vocational harm, aging etc. From the ear's structure, there are 3 type of damage which cause hearing impaired: conductive hearing when there is problem transferring sounds along the pathway to the middle ear through eardrum, sensorineural hearing Loss (SNHL) when the nerve pathways from inner ear to the brain is damaged and mixed hearing loss which is combination of both. It can be corrected by using a hearing aid to amplify the sound waves for conductive hearing loss. However, cochlear implants might be needed for profound patients, especially the sensorineural hearing loss. Patient's hearing ability would get serious, from moderate to severe or even profound if it is not cured immediately.

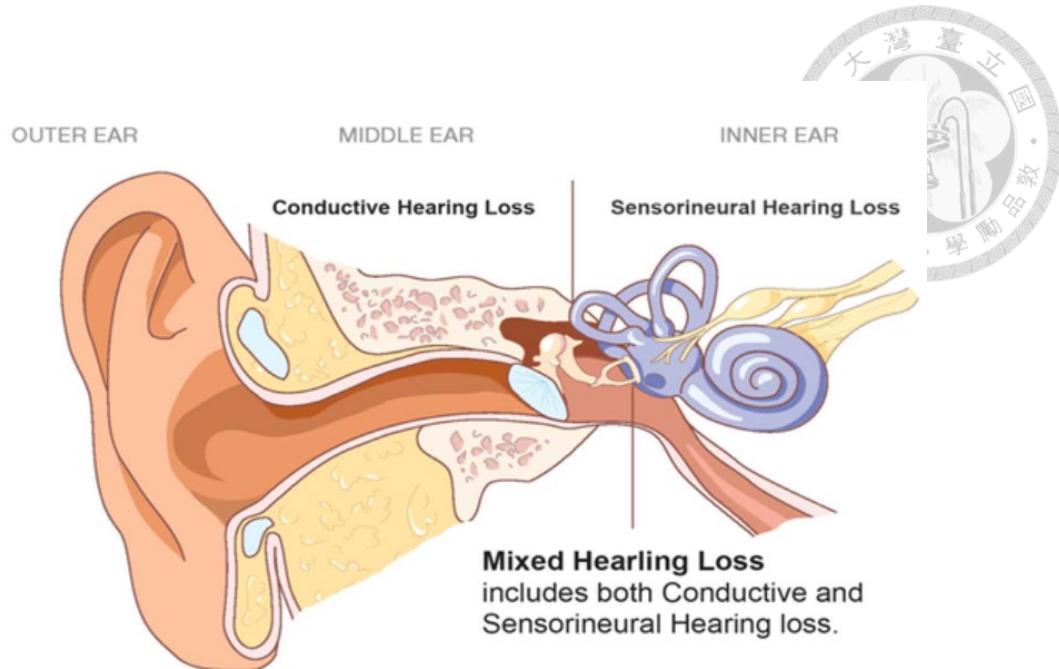


Figure 3.9 Cause of hearing loss (Source: www.hearingsol.com)

People who are hearing impaired not only have the function impact, communication issue but also social and emotional impact from ineffective communication with people and feel loneliness, frustration and eventually loss of productivity. Children with hearing impaired rarely receive a standard education compared to normal children and cause an unemployment rate in the future, especially in the developing countries. Eventually, it would have a subsequent economic impact too.^{33 34}

In Taiwan's hearing-impaired population, the main cause of the hearing impairment is caused by disease, with reference to the data captured by the Ministry of Health and Welfare. This category is showing an increasing trend. In 2019, congenitally deaf people will be 9.96% of the whole hearing-impaired population in Taiwan. For adventitiously deaf, hearing impairment caused by disease shows the highest percentage, 62.5%, followed by accidents and vocational harm both also recorded 3% of the 2019 hearing impairment population.

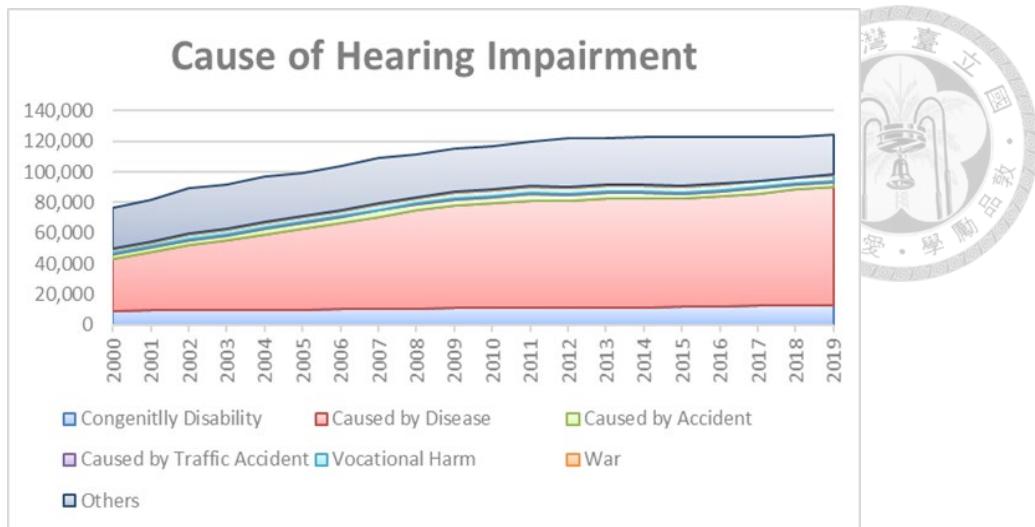


Figure 3.10 Hearing impairment of Taiwan population, by cause of hearing impairment

(Source: Ministry of Health and Welfare)

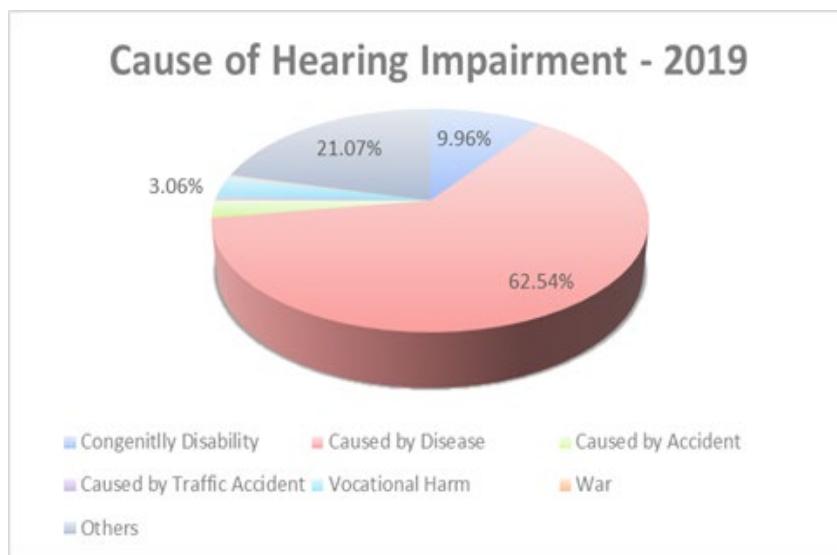


Figure 3.11 Breakdown of population in 2019, by cause of hearing impairment

(Source: Ministry of Health and Welfare)

In summary, the hearing-impaired community in Taiwan will continue to increase, following the same trend as predicted by the World Health Organization (WHO). From 2010 to 2019, the hearing-impaired population increases at an average 1% per year. Most of the hearing impaired are having mild degrees of hearing loss, which might be due to the aging and

vocational harm because these 2 factors are causing hearing loss gradually, from mild to moderate. Sequelae of diseases is the main cause of hearing impaired. Unfortunately, there is no data to further break down on the ratio of sequelae of diseases due to aging. One of the trends to be focused on is congenitally disability, which has increased 12% from 2009 to 2019.

This group of hearing-impaired people specially need to be focused because the acquisition of language at their childhood will affect their life in the long term. The related discussion was done in chapter 2 on the importance of sign language for them.

3.2 Hearing-Impaired Market Research

From the market study done in the previous section, especially on the solutions in the market, we realise there isn't any technology tool specially for hearing-impaired who is proficient with sign language. Therefore, we are doing market research to find out Taiwan's market response towards a sign language translator, a tool that acts as a sign language interpreter to be a self-help tool in converting sign language for their daily communication.

The market research was done via market survey and qualitative market research to have a better understanding on the current Taiwan market situation and potential. The survey was sent out on 23th April to some hearing-impaired individuals and got their help to further forward to their hearing-impaired network. On the other hand, qualitative market research was done by interviewing 5 interviewees at the same time frame. 4 of the interviews were done by asking open ended questions via text messages and 1 of the interviews was done face to face with the help of a sign language interpreter.

Total 18 responses received from the market survey. The respondents of this survey are mostly having severe and profound degrees of hearing loss, compared to mild and moderate degrees. Therefore, it can represent the true needs of hearing-impaired community in Taiwan. From these respondents, the causes of their hearing loss are half by half for congenital and

acquired, including sequelae of disease, aging, and vocational harming. One of the respondent's lost her hearing during pregnancy dystocia.

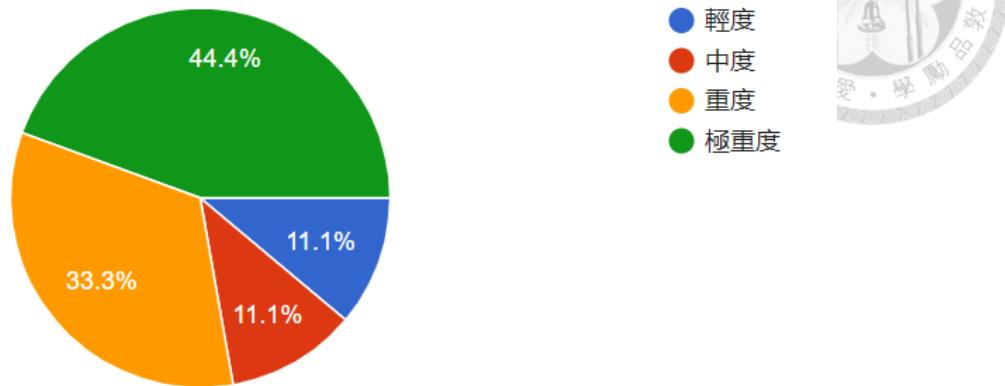


Figure 3.12 Market survey – respondents' degree of hearing impaired (Source: This research)



Figure 3.13 Market survey – respondents' cause of hearing impaired (Source: This research)

Out of these 18 responses received, 53% of them are wearing hearing aids and 11% are having cochlear implants. Surprisingly 39% of them didn't wear either of them which takes up a considerably high percentage among the responses received.

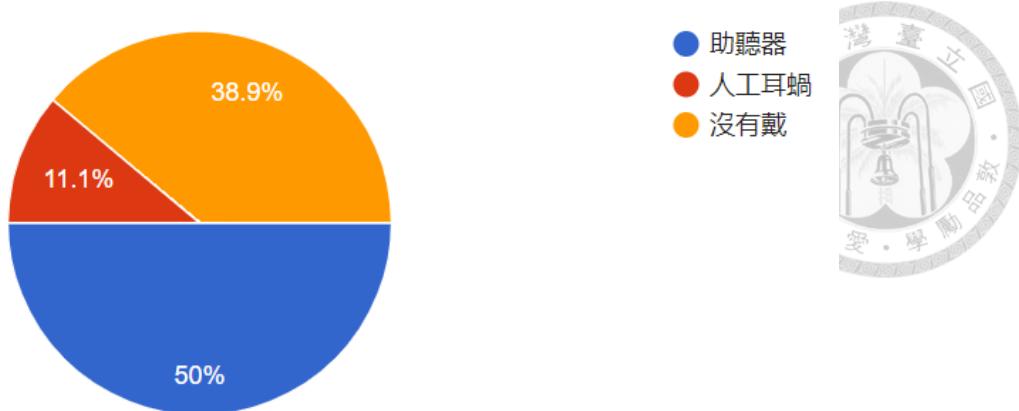


Figure 3.14 Market survey – respondents' usage of basic tool (Source: This research)

Most of them are technology savvy as 78% of them utilizes technology in their daily interaction, be it frequently or occasionally. Even though some of them claimed that this technology can only solve part of their daily issue and it also depends on the communicating parties. But generally, technology still helps them in one way and another in their daily life.

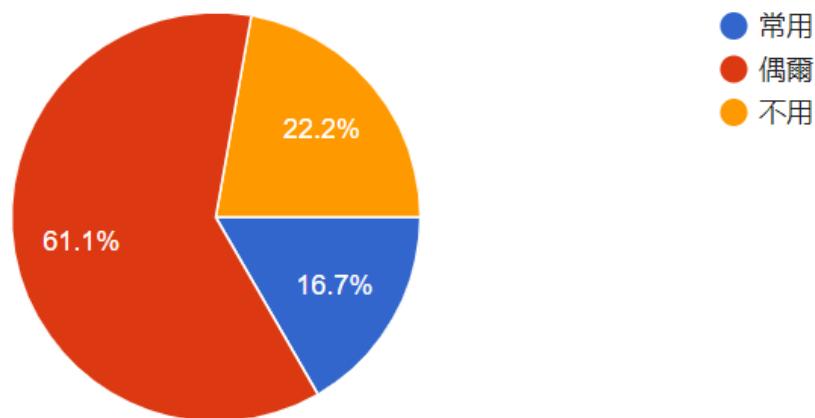


Figure 3.15 Market survey – respondents' usage of technology in their daily life (Source: This research)

Minority of them, only 28%, applied sign language interpreters' services and video relay interpreting services to help them in their activities, medical appointments etc. Most of the respondents know more than 1 communication mode such as written language, oral

language and/or read lips. 12% of respondents said that they only know sign language. The individuals who know sign language are mostly profound and have severe hearing loss now.

Level	Ways of Communication
Mild	Oral Language, Written Media, Speech Reading
Mild	Sign Language, Oral Language, Written Media, Speech Reading
Moderate	Oral Language, Written Media
Moderate	Oral Language, Written Media
Severe	Oral Language, Written Media, Speech Reading
Severe	Sign Language
Severe	Sign Language
Severe	Sign Language, Oral Language, Speech Reading
Severe	Sign Language, Oral Language, Written Media, Speech Reading
Severe	Sign Language, Written Media
Profound	Oral Language, Written Media, Speech Reading
Profound	Sign Language
Profound	Sign Language, Oral Language, Written Media, Speech Reading
Profound	Sign Language, Oral Language, Written Media, Speech Reading
Profound	Sign Language, Oral Language, Written Media, Speech Reading
Profound	Sign Language, Oral Language, Written Media, Speech Reading
Profound	Sign Language, Oral Language, Written Media, Speech Reading
Profound	Sign Language, Oral Language, Written Media, Speech Reading

Figure 3.16 Market survey – respondents' language literacy (Source: This research)

Last but not least, most of the respondents are low to medium income individuals and have high willingness to try the sign language translator, to improve their daily communication with the hearing community. However, they hope the charges are affordable to enable them to use it frequently without financial burden. This shows that there is a market needs for sign language translators.

On top of the market survey, 5 interviews were conducted with hearing-impaired individuals too, to further find out their daily and mental models behind their behaviours. All interviewees are from different backgrounds, including student, sales executive, operator, cafe owner etc. Some of them need to communicate with the public daily but some might choose to avoid unnecessary interaction with colleagues. Hence, the market needs can be understood from a wider perspective.

Interviewee	Degree of impairment	Cause of impairment	Language Literacy
Kai	Mild	Congenital	Vocal & Text
Bravo	Moderate	Congenital	Sign Language, Vocal & Text
Aki	Severe	Acquired	Vocal & Text
Louis	Severe	Acquired (Fever)	Sign Language & Text
Anima	Severe	Acquired (Fever)	Vocal & Text

Table 3.1 Interviewees' information (Source: This research)

A surprise insight from a market survey found that 39% of hearing-impaired don't wear hearing aids or cochlear implants. It was explained by the interviewees that hearing aids have amplified all the noises, including environment noise which make them feel uncomfortable from their usually quiet world. As much as they can, they will choose not to wear hearing aids. Another insight found out from the interviewees is some of the hearing-impaired individuals choose not to learn sign language even though they are having severe or profound degree of hearing loss because they want to blend into and be accepted by the hearing community. They might suffer for the whole schooling period with this choice. This is a sad situation due to community bias that impacts them. Moreover, they will not choose to learn sign language if their closed networks, friends and family are not sign language proficient because it is not "applicable" to them in their daily interaction. Nevertheless, all interviewees were giving good feedback and high willingness to use the sign language translator in the daily life, especially one of the interviewees who is oral language trained, see it as learning tool for her to pick up sign language and aim to contribute back to the hearing-impaired society in the future. Same as the response from the survey, all of the interviewees wish the charges of the sign language interpreter is affordable for them. This shows that the hearing impaired are

generally cost cautious. Lastly, the interviewees mentioned that the sign language interpreter for 2-way communication will be a better tool for them.



Supply and demand of sign language interpreter in Taiwan

Since there are sign language interpreter services available, why do the respondents still have such a high willingness to try out a sign language translator? This is because there are constraints for hearing-impaired to get the sign language interpreting service. The projection of the hearing-impaired population is not proportionate to the increase of sign language interpreters to keep the high service level to these needy and help them to have a smooth and accurate communication with the public.³⁵

Since the inception of sign language in 1993, there are only 504 qualified interpreters in Taiwan who possess licences from then to year 2020 - 52 interpreters have Grade B licenses and 452 interpreters have Grade C licences. Grade A assessment is not open to the public due to the limited market needs for this area. As a sign language interpreter's income is based on cases assigned by the government body so there is less than 5% of full-time interpreters in Taiwan, handling administrative matters, teaching, etc.

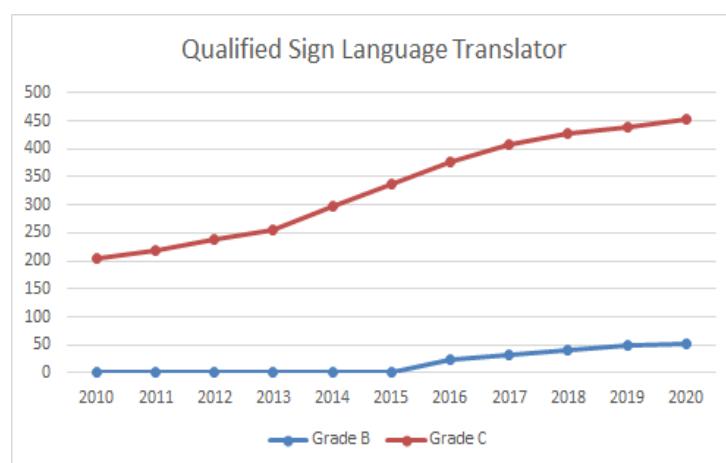


Figure 3.17 Qualified sign language interpreter (Source: Ministry of Labour)³⁶

Time invested in learning sign language to get a Grade C license needs 3 to 5 years, and further study to get a Grade B license. Compared to the other 200 technical qualifications assessed by the Ministry of Manpower, which has an average passing rate of 60%, sign language interpreters only have a 20% passing rate. Hence, the qualified sign language interpreters in Taiwan are limited to support the needs, especially the projected increase of hearing-impairment population. The supply of qualified sign language interpreters is growing much slower (average increase of 32 pax/year from 2011 to 2019) compared to the growth of hearing-impaired population (average increase of 556 pax/year from 2011 to 2019). On top of that, most of the needs and applications of translation service are from the medical field and there are only 52 Grade B license holders in the whole of Taiwan that can handle these cases. ^{37 38}

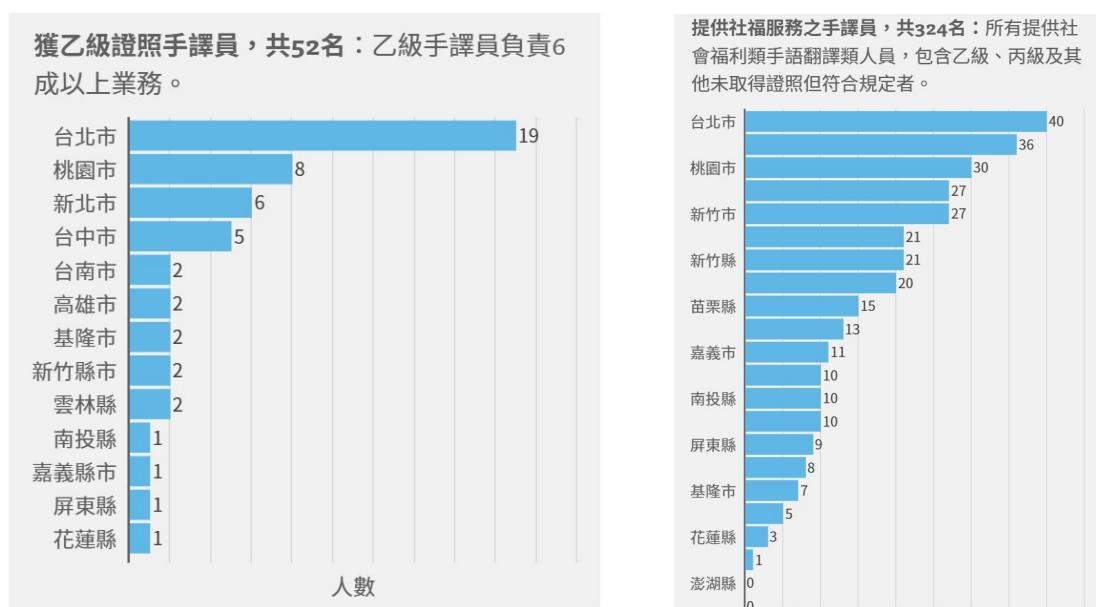


Figure 3.18 Spread of qualified & non-qualified sign language interpreter across Taiwan provinces (Source: Social and Family Affairs Administration - Ministry of Health and Welfare)

The mismatch of supply of interpreting services and hearing population might imply that the actual demand of the services is hidden due to various reasons. Data extracted particularly for Taipei City. Between 2015 to 2019, the hearing-impaired population in Taipei

City has reduced 4%, but the service hours across these 5 years still keep between 3000 hours/year to 4000 hours/year.³⁹ The hearing-impaired population should be positively correlating with the service hours. However, the data shows otherwise. This phenomenon implies that there is demand for the interpreting service but due to some reasons such as schedule mis-match between the interpreters and the applicants, the services wasn't being utilized. The actual demand of the service might be hidden and only defined by the capacity available. Taipei City Government subsidizes the services up to 30 hours per applicant per month and data shows that all the service hours are subsidized. This also signal that cost is one of the concerns by the hearing-impaired applicants. The individual will not apply for the service after 30 hours.

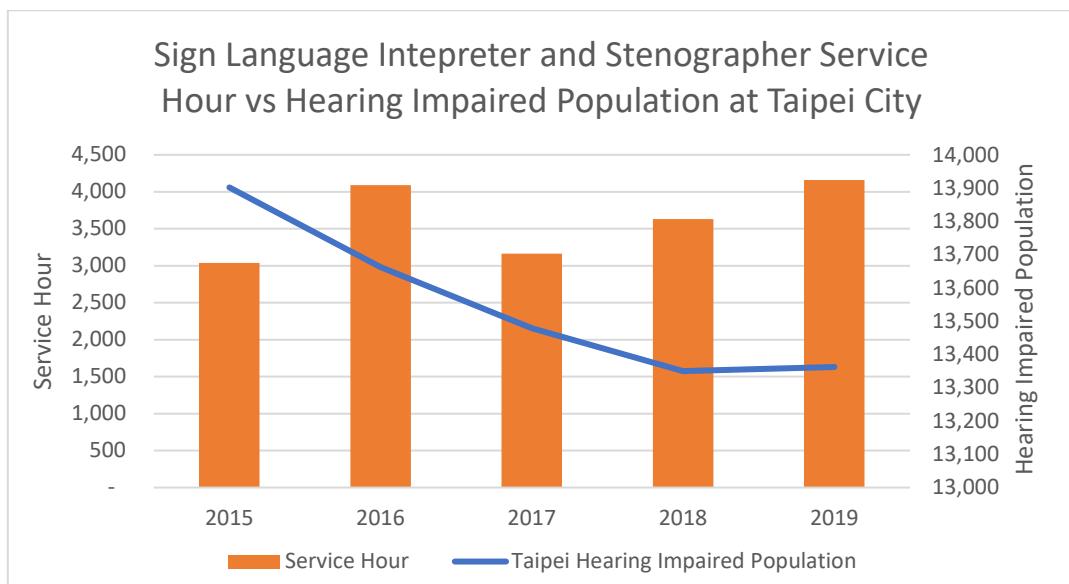


Figure 3.19 Sign language interpreters and stenographer service hours vs hearing-impaired population at Taipei City (Source: Department of Social Welfare, Taipei City Government)

In conclusion, cost and resource availability are the 2 main constraints. Both cost and qualified interpreters have limited the supply of the interpreting services to the hearing-impaired community. Demand for sign language interpreters is unpredictable and varies across the countries. Some areas in Taiwan do not even provide such service to the locals. The

purpose of sign language interpreter's service was set up by the Department of Social Welfare to serve the hearing-impaired community but it is limited by these constraints – resource availability and cost. Consequently, applications need to be prioritized accordingly, between an individual's needs versus events' needs. Even though hearing-impaired community only applies necessarily and might not be allocated resources too. Most of the time, they will still need to depend on themselves or rely on friends and family's support in their daily activities. The society still unconsciously creates a biased environment towards this minority population and forces them to make necessary choices to be included in the hearing society.

3.3 Hearing-Impaired 's Need and Market Opportunity

Firstly, from the survey and interviews, we understand that the customer who is proficient with sign language is hard to continue to communicate with the public by using the language they are good at without a sign language interpreter as the bridge of communication. The willingness to use sign language translation tools is considerably high from the survey and responses from the market.

Secondly, the supply of qualified sign language interpreters is growing much slower (average increase of 32 pax/year from 2011 to 2019) compared to the growth of hearing-impaired population (average increase of 556 pax/year from 2011 to 2019). Moreover, from the data extracted from Taipei City Government has implied there is a hidden actual demand of interpreting service. The service hours in 2019 showed the highest point but the hearing-impaired population in Taipei city dropped to the lowest point. Various reasons might stop the hearing-impaired from applying the services such as mis-match schedule between the interpreter and applicants or the subsidized hours has fully utilized.

On the other hand, in 2018, sign language got approval to be included into the National Language Act to protect and promote the cultural value of Taiwanese sign language.

⁴⁰ ⁴¹ It has provided the sign language translator tool a market opportunity from another perspective. Under the "National Language Development Law", schools need to provide ethnic language courses for students to "choose one of them to learn". The syllabus of the 12-years National Basic Education Curriculum outline will be further adjusted to include these national language classes, ie. sign language.⁴² This is to protect the ethnic languages from the inheritance crisis. Instead of bridging the communication between the hearing-impaired and the public, it also can act as a learning tool for those who are interested in learning sign language as their national language class. With reference Google translation which has 500 million users daily has proven that such a high technology translation tool is the best and instant learning tool in acquiring a language. This might not only limit to hearing-impaired students but also other students who choose sign language class. On top of that, all services provided by government units have to be standardized with the multilingual to guarantee the rights of citizens to use the national language.⁴³

3.4 Value Proposition for Hearing-Impaired

In order to continue to support the needs of the hearing-impaired who are proficient in sign language, a sign language translation tool can be introduced to the market to bridge the gap of communication between them and the public instantly, instead of only rely on the sign language interpreting service or video relay interpreting services which need further efforts in coordinating. The tool can be used directly by the hearing-impaired for their daily communication as a substitute to sign language interpreters. Furthermore, it can help to ease the interpretation job of the sign language interpreter too, by using this translator for normal public events whereas the sign language interpreter themselves can focus on the solemn events or forums (ie. medical forum, summits etc.) which needs advanced interpreting skills. On top

of that, the tool should be charged at an affordable price as most of the hearing-impaired are from low to medium income groups.

3.5 Chapter Summary

From the market response, we know that there isn't any tool which is similar to the transcript APPs in sign language translation. Sign language interpreter is a profession that acts as a communication bridge between hearing-impaired and hearing. However, the qualified sign language interpreter is seriously mismatched with the hearing-impaired population with the ratio of 1:248. Moreover, the cost of acquiring the service is high in the long term for the hearing-impaired. The interviews also gave a signal that the population of learning and using sign language is reducing. In order to blend into the hearing community, they choose to attend normal school instead of special school. Furthermore, most of their network is not sign language proficient so there aren't chances to use sign language. In order to enhance the communication for the hearing-impaired who are proficient in sign language, they need a tool to help themselves in sign language translation because the availability of sign language interpreters is low. The tool not only acts as a substitute for them to do translation instantly, but also helps to ease the workload of sign language interpreters and gradually increase the efficiency of translation services to them. With this, the sign language interpreters can focus on more complicated and professional forums and events such as medical events, legal related issues etc. whereas the tool can help in translating daily activities or public events for audiences involved with the hearing-impaired.

On top of the positive response in acquiring the sign language translator from the market research and low availability of sign language interpreters compared to the hearing-impaired population, the inclusion of sign language into the National Language Act also provides another opportunity for the sign language translator. Upon the launch of the syllabus

of national language to schools, the students are required to learn one of the national languages in school. Since sign language is the mother tongue of the hearing-impaired, we expect the sign language will be acquired by the hearing-impaired students. The sign language translator can be their learning tool in acquiring sign language. Moreover, government bodies have to ensure multilingual services provided to the public too which the translator

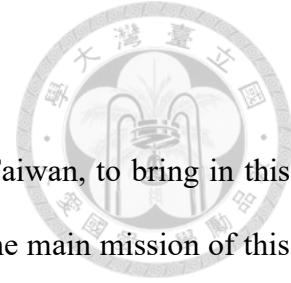


CHAPTER 4: BUSINESS MODEL

4.1 Hand Talk Business Model Description

We will be inviting Hand Talk to form a joint venture⁴⁴ in Taiwan, to bring in this successful sign language translator to expand to the Taiwan market. The main mission of this product is to break the communication barriers through technology. The joint venture will be registered under social enterprise and expected to be funded 70% - 30% between the Hand Talk Brazil and the local team. We expected Hand Talk to fund up to 70% because all the branding and marketing will be aligned back to Hand Talk, as part of the market expansion and company development for Hand Talk. Moreover, the core technology was held by Hand Talk. Eventually, after the product launch phase, all the future feature enhancement of Hand Talk will be developed and updated by Hand Talk. In addition, from the conversation with Hand Talk, Brazil, internationalization is part of the company's aim and future plan. Chinese is the next widely used language in the world, after English. Hand Talk, Brazil has done the expansion into American Sign Language. Hence, if Hand Talk successfully penetrates into Chinese market, it will capture a wide market share in sign language translator. Since Chinese language is very different from Libras and American Sign Language, the local Taiwan team can act as the cultural bridge in this market expansion plan. Lastly, Taiwan sign language is influenced by Japanese Sign Language and Chinese Sign Language so by choosing Taiwan as the first market to enter Asia can help in paving the way ahead for Hand Talk to enter Japanese market and China market.

Hand Talk was founded in 2012 in Brazil, makes translation from Portuguese to Libras, the Brazilian Sign Language and won a lot of awards including World's Best Social App by the United Nation. In 2019, Hand Talk is also one of the grantees for Google AI Impact Challenge. With the grant's support, Hand Talk not only further increased the quality of translation, it also further developed the translation system from English to American Sign



Language and ready to go international market. Chinese is one of the most widely used languages in the world. By expanding the market into Chinese speaking environment will open up another wide market for Hand Talk future expansion.⁴⁵ After the development of Chinese language and Taiwan sign language in Hand Talk, the tool can also further develop on English to Taiwan sign language translation. The translation combination of different languages can be flipped subsequently. With the involvement of a local team, each of us can leverage on each other's strength to build the market in Taiwan.

The local team will lead the activities in Taiwan including liaison on administration matters, collection of data, animation design and awareness and marketing activities. On the other hand, Hand Talk Brazil will be focusing on training the translation machines with the data collected in Taiwan.

4.1.1 Customer segment

Hand Talk is targeting a niche market, the hearing-impaired community and yet needs to be further segmented based on the response from the market research.

From the survey and interviews, there are a few characteristics that can be summarized and directly affect the willingness in using Hand Talk.

Firstly, the cause of hearing-impaired is one of the main factors. Hearing loss caused by congenitality might rely on sign language more than others because most of their first language is sign language. Although they develop other communication modes, they are mostly sign language proficient. The same concept applies to those who lost their hearing due to sequela or disease or accident, especially this happens at a young age. They might develop sign language as their second communication mode, when hearing is not an option or too weak for certain situations. The hearing loss due to vocational harm and aging might not motivate them to learn sign language for their interaction because they are well equipped with oral

language. They will just focus on correcting the hearing ability but not the communication (coding and decoding message) issue. Next factor is the degree of hearing loss. Understand from the market response, a mild degree of hearing loss can be corrected by hearing aids and live a normal life but moderate and above might need help from visual communication. Hand Talk is translating written messages and voice messages to sign language. Hence, language literacy is the utmost important factor. Lastly, most of hearing-impaired are low to medium income level so the pricing needs to be affordable for them.

Under the characteristics defined from the market segmentation, the main target market is an individual with at least moderate hearing loss community who literate with sign language. The cause of hearing loss is congenital and sequela of disease but income level is low to medium range. These are the group of people who use sign language the most and likely to use Hand Talk too. As per data extracted from the Ministry of Health and Welfare, 44.15% are under this category – about 55,000. However, not all of them are literate with sign language. Assume 70% of them, the ratio defined from the survey, are literate with sign language, the anticipated market size is 38,500.

Market Segmentation	Target Market
Hearing Impaired Reason	Congenital, Sequela of disease, Vocational Harm, Aging
Hearing Impaired Level	Mild, Moderate, Severe, Profound
Language Literacy	Oral Language, Written Media, Speech Reading, Sign Language
Income Level	Low, Medium, High

Figure 4.1 Market segmentation & target market (Source: This research)

4.1.2 Value proposition

From the market research done in Chapter 3, we understand that there isn't any technology tool that can substitute a sign language interpreter, similar to the role of transcript

APPs to substitute stenographer. The willingness of using the sign language translator is very positive according to the market survey received to help them in their daily liaison. However, the respondents also wish the charge of the tool is affordable for them. This is also further supported from the data extracted for the sign language interpreting service hours, none of the applicants use the service more than 30 hours per month. Hand Talk can conclude the jobs, pains and gains of the target market and how Hand Talk can fit into the market.

Hand Talk's value proposition is free of charge, convenient, instant, accurate and grammatical translation of spoken and written language to sign language. It is a product to cover the supply gap of sign language interpreter and video relay interpreting services, minimizing the reliance on a 3rd party in communication, especially during face-to-face communication. With this, Hand Talk hopes it can help the hearing-impaired to further pursue their interest independently.

The unique selling points of Hand Talk:

1. It is a portable translator, a mobile APP that can be downloaded into the mobile phone and used for translation anytime. It is also a website translator for companies
2. It can translate text and voice messages to sign language. For example, a student can use Hand Talk in the class to translate the lectures into sign language, by capturing the voices of lecturer
3. Translation is done in a 3D animated avatar. Sign language will be shown with gesture and facial expression to convey the message to the user
4. Grammatical and sentence translation, instead of "finger-spelling" translation
5. Free of charges for individual user

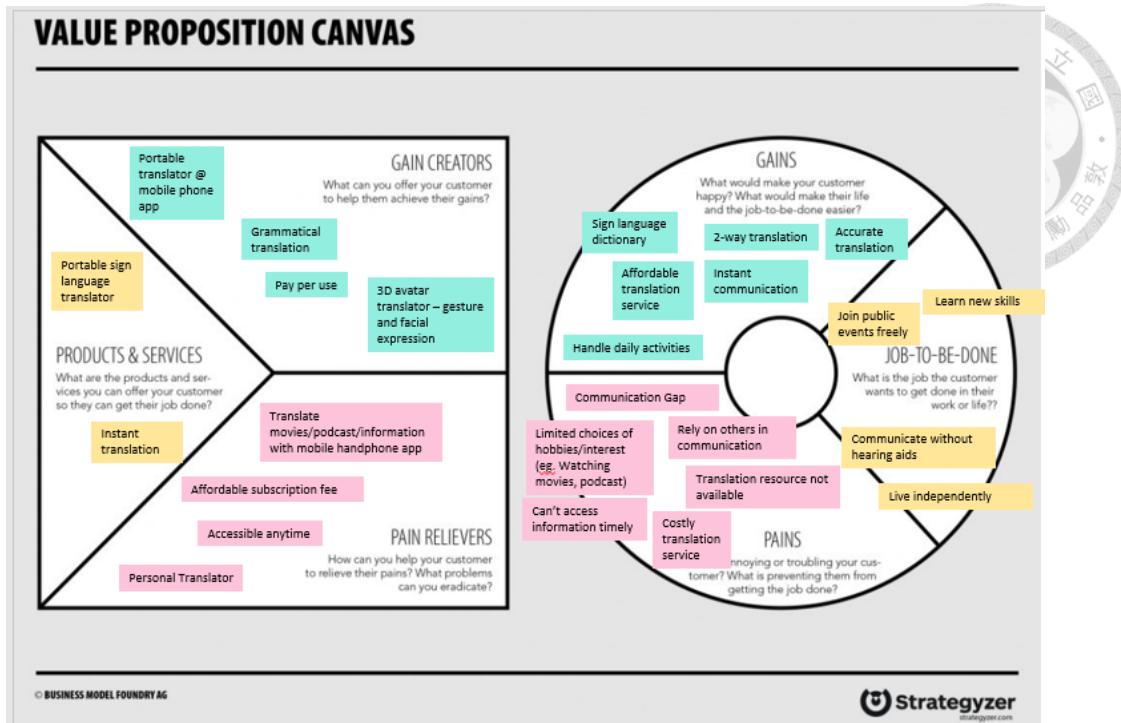


Figure 4.2 Value proposition (Source: Strategyzer)

4.1.3 Channel

Hand Talk will reach out to the customer via various social media channels including website, Youtube, Instagram, Facebook, Twitter and Line Account in Taiwan. These are frequently used and accessible channels in the Taiwan market. Hand Talk in Taiwan will link back to the main website of Hand Talk but switchable to the traditional Chinese version. This is to align the overall branding and development of Hand Talk. The Taiwan market will be one of the achievements in Hand Talk's milestone into the international market. It will include more detailed information about Hand Talk such as blogs, customers' testimonials, user guidelines etc, to provide more comprehensive materials for our customers. On the contrary, Hand Talk in Taiwan will have its own social media channels which are customized to local context. Youtube will upload vlogs of Hand Talk in Taiwan, such as how to download the APP, what is the feature of the Hand Talk etc. Hand Talk will also post tutorial lessons to teach the public on simple Taiwan sign language. The content of the different marketing campaigns will

be aligned and released via all social media channels such as activities, tutorials, announcements, achievements etc.

Hand Talk can be used in 2 ways. It is downloadable as an APP in iOS and Android mobile phones for an individual. It also can be used by companies as a plugin to the website to translate the website content into sign language to further reach out to the audience who is sign language proficient.

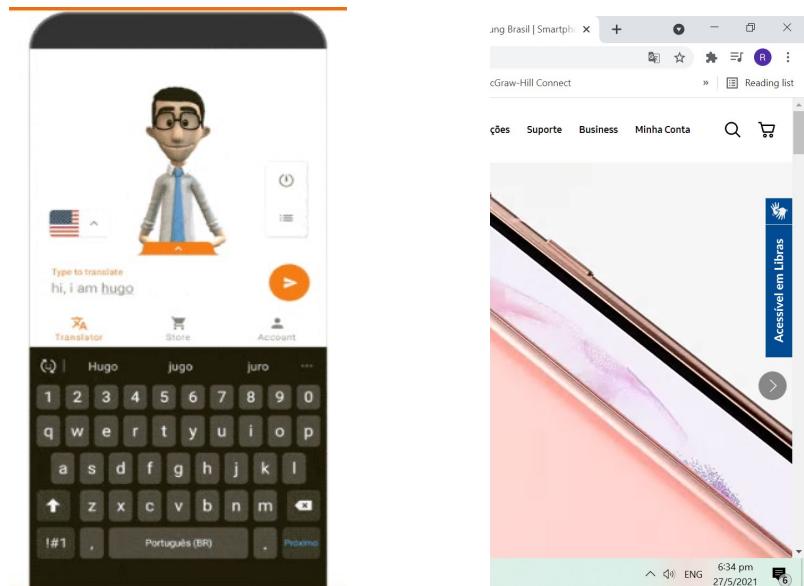


Figure 4.3 Hand Talk – mobile APP (Source: Hand Talk) & website translation (Source:

<https://www.samsung.com/br/>

4.1.4 Customer relationship

In Taiwan, there are a few organizations set up specially for the hearing-impaired community such as Speech-Language-Hearing Association of Taiwan, National Association of The Deaf R.O.C (Taiwan), Taiwanese Association of Sign Language Interpreters etc. On top of that, there are 3 hearing-impaired schools in Taiwan. These are the channels that Hand Talk will reach out to the target market. On top of that, Hand Talk will also utilize social media such as Instagram, Twitters and YouTube etc to engage the public and raise awareness and

interaction with the public. Of course, any enquiries, feedback and technical support can definitely email to Hand Talk for further communication.



4.1.5 Key resources

To develop Hand Talk, the main resource needed is human resources. Taiwan team will be in charge of activities in Taiwan and Brazil Team will be developing a translation system. We will be approaching Taiwanese Association of Sign Language Interpreters (TASLI) to collaborate in collecting translation data as they have the full resources in sign language interpreting. From a financial perspective, since it is a joint venture, Hand Talk Brazil is expecting to invest 70% of the capital and the local team will be investing 30% of the capital. In Taiwan, government agencies and financial institutions will be part of our capital resources as we will be seeking financial aid or raising funds to support the investment from Taiwan.

4.1.6 Key activities

In order to successfully launch Hand Talk into the Taiwan market, the team must firstly collect data on both Chinese languages, written and pronunciation and 2 Taiwan sign languages, the hand sign, gesture and facial expression. This data will be collected by the Taiwan team from TASLI and sent to the Brazil team to develop the translation system and update existing Hand Talk App. On top of that, since Hand Talk is the brand-new product in Taiwan, Hand Talk also needs to raise awareness to the target market and to the public as well and maintain active interaction with the customers via various social media accounts to continue to improve the product and deliver the highest value to them.

4.1.7 Key partners

Hand Talk Brazil is the key partner to support the launch of Hand Talk in Taiwan. The Brazil team is the source of technology know-how and 70% of capital investment. Hand Talk will also try to get additional financial resources such as potential venture capital, fundraise platform (e.g, Kickstarter), angel investors and financial aids from the government to raise funds for Hand Talk in Taiwan and do financing with banks to support the operation of Hand Talk in Taiwan. Next, we identify TASLI as our key partner in data collection in training the translation system at the beginning stage. Moreover, they are Hand Talk target customers too. Lastly, as Hand Talk will be launched through mobile phones, Apple Store and Playstore are our key partners to get approval and deliver the translating A PP via these platforms to the market after update of existing Hand Talk APP.

4.1.8 Cost Structure

The 3 main costs in launching Hand Talk in Taiwan – human resource, working stations and marketing activities. Human resources have included technical support from Brazil. Since Hand Talk is services provided to the market without any costly tangible assets needed, a big portion of the cost is used to hire the appropriate employees in Taiwan, and pay Brazil team for developing the translation system and work stations. Hand Talk doesn't expect to have any office at the first stage of launching Hand Talk in Taiwan. Moreover, the team will be mainly working outstation with the partners. Lastly, Hand Talk is a brand-new service in Taiwan, hence relative marketing costs need to be spent to raise awareness to the market.

4.1.9 Revenue Stream

For individual users, Hand Talk is giving it free of charge. Hand Talk understands the income level of the hearing-impaired are usually low to medium income and the aim of

Hand Talk is to bridge the gap of communication between hearing-impaired and hearing. Hence, users' experience and quality of life is the utmost important. Therefore, the main source of revenue of Hand Talk mobile APP is via advertisement based on cost per mille on impression and website translation charges to the companies. The individual subscribers can buy coins to shop in the Hand Talk store to buy cloth and accessories to doll up the avatar translator. Lastly, the individual subscriber can pay a small token if they want to remove the advertisement for better user experience.

The second source of revenue is website translation plugin that the companies acquire to translate the website content. The companies will be charged depending on the number of characters translated every month.

4.2 Competitive Analysis

Porter's five forces further analyse the market situation and the positioning of Hand Talk in Taiwan.

Competitive Rivalry

In Taiwan, there is no direct competitor to Hand Talk, with the confirmation from our interviewees. There are similar translation devices under research and development but none of them are launched out for market use. These devices include hand sign translation, glove translator (translate sign language to text), or translation via camera.⁴⁶

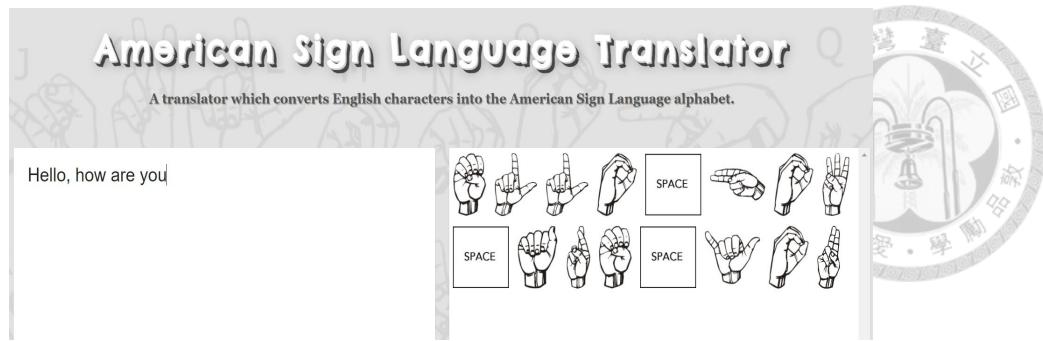


Figure 4.4 fingerspelling translator for American sign language

(Source: <https://wecapable.com>)⁴⁷

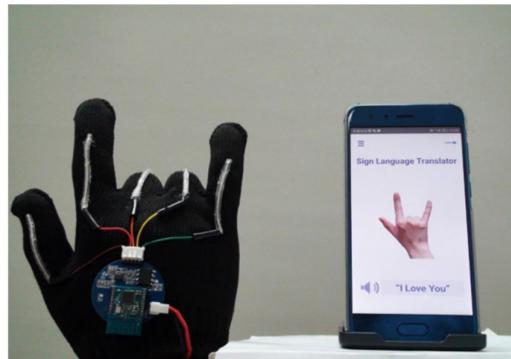


Figure 4.5 sign language to text translator by hand gloves (Source: technews.tw)⁴⁸

Threat of New Entry

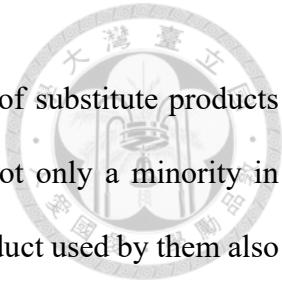
The potential of new entrants into the industry is considered low because this industry is not a profit focused industry. Moreover, the effort put into developing and training a translation system is much bigger relative to the project profit in the future. In general, the return of investment for this industry is not an attractive point for new entrants.

Supplier Power

Hand Talk is a mobile APP for the users. The main supplier would be the human resource and experts to develop the program and system. Definitely, the supplier bargaining power is very high as the experts in this unique field are still considered tight supply.

Buyer Power

Customer's bargaining power is high because there are a lot of substitute products available in the market. Moreover, hearing-impaired community is not only a minority in Taiwan but the sign language literacy is even lower. The choices of product used by them also very much depends on the convenience with interacting parties.



Threat of substitute

Yes, the threat of substitute products is very high. As mentioned in the previous section, there are a lot of substitute products available in the market. The customers can choose their comfortable and effective ways of communication but not only rely on sign language. Sign language is not the dominant language used by Taiwanese population, even for hearing-impaired due to community bias or personal reasons.

4.3 Market Entrance Strategy

4.3.1 Positioning

For the hearing-impaired who are proficient with sign language, there is a translator to always be with them to communicate fluently with the public and receive information with no difference from other hearing.

On top of the hearing aids and cochlear implant, there are a lot of additional tools and services available in the market to help the hearing-impaired. As mentioned in chapter 2, the diagram below shows the positioning of Hand Talk compared to other tools in the market, with reference to the customer needs.

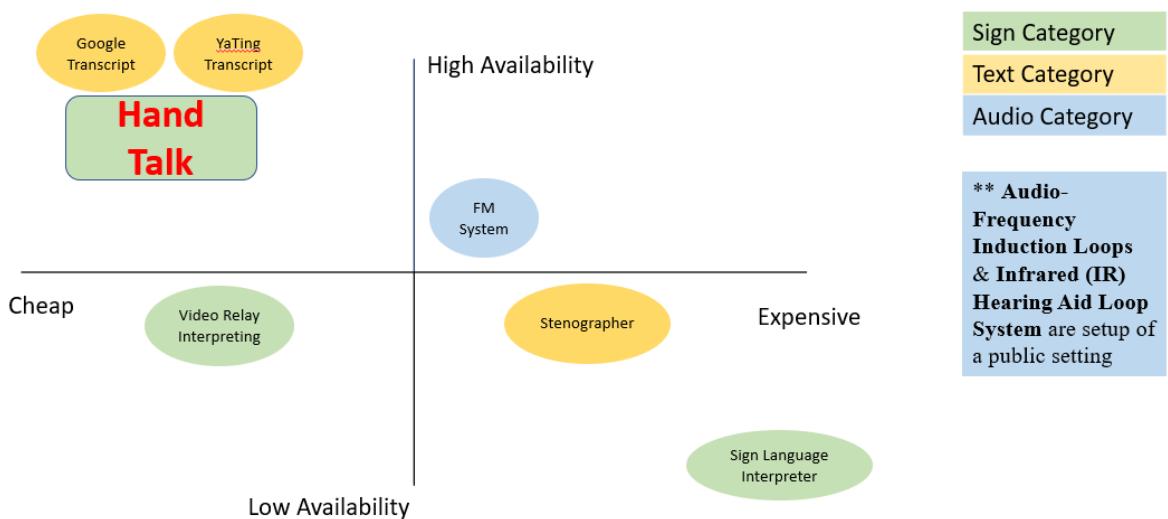


Figure 4.6 product positioning against competitors/substitutes (Source: This research)

In the nutshell, sign language interpreters and stenographers are the most expensive assistance to the hearing-impaired because they are charged by hours and subject to availability. The fee can be very costly if an individual engages their services frequently. (e.g., Sign Language Interpreter costs NT1000/hr and more than 2 hours must work in pairs). On the other hand, FM systems can be used for a longer term so the investment in buying this assistant tool is comparably cheaper than the interpreter and stenographer, but definitely more expensive than mobile APPs and it is designed more towards classroom and conference room settings. Audio-Frequency induction loop and Infra-red Hearing Aid Loop System are systems that need to be installed by the building owner as the infrastructure setting but not decided by the individual user. Lastly, mobile phone APPs are the cheapest support for hearing-impaired individuals and accessible.

These tools are helping the hearing-impaired in one way and another but none of them is providing an accessible solution for the individuals who are sign language proficient. On the contrary, Hand Talk will be the solution for them. Instead of putting in effort in arranging video relay interpreting or sign language interpreting which might incur considerable cost in

it, Hand Talk is free of charge for an individual to download into their mobile phone and act as a portable translator for them, to be used at anytime and anywhere.



Branding

In order to align the branding of Hand Talk Brazil, Taiwan market will be using the same name and same logo as Brazil. However, in order to differentiate these 2 markets, Hand Talk will have a local avatar translator as the market ambassador. It carries a brand personality of “sophisticated” which sends the message of advanced technology used in translation because the avatar is a lively translator, translating text and speech into sign language with full gesture and facial expression.

Competitive advantage

Hand Talk has different functions from other competitors/substitutes that are frequently used by the users. It is focusing on sign language communication whereas other substitutes are focusing on other communication modes. In contrast, the 2 major differentiations between Hand Talk and other sign language translators are grammatical translation by Hand Talk and the convenience and accessibility of translation without additional tools needed to bring along.

4.3.2 Development strategy

At the launching stage of Hand Talk, the targeted achievement is branding and product awareness. Since the product is under diversification, Taiwan market is not aware of the product and brand. The product advantage, function and benefit must be consistently communicated to the public to raise awareness in the public. At the same time, dialogue and

feedback will be considered and handled accordingly to increase the confidence of the product to the market. Market interaction is important in awareness campaign

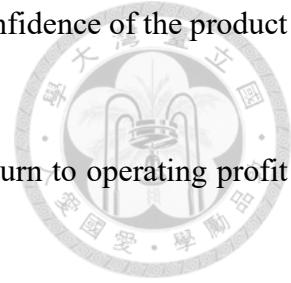
After 2 years, Hand Talk target measurement will gradually turn to operating profit as an achievement of the operation and usage of the APP itself.

Lastly, Hand Talk will collect data on customers' profile and customers' behaviours such as usage frequency, returning customers, content of translations, customers' feedback etc to further enhance the translation system to increase users' experience and translation accuracy.

Although hearing-impaired is a considerably small and niche market, Hand Talk will launch the product step by step. First launch will be done when a translation system is capable of translating from speech and text to sign language with 90% accuracy. The product development will further continue, to translate the sign language to speech and text to achieve a perfect effective 2-way communications and then cross language translation.

For individual users, Hand Talk's first targeted market is hearing-impaired schools. This is because students have a longer lifetime value. Moreover, a hearing-impaired school would have the most updated information on language development, be it sign language or oral and written language which can provide direct feedback to Hand Talk.

On the other hand, for companies, Hand Talk will approach government agencies, publishers, media and broadcast companies to promote the website translation service to them as these companies are playing very important roles in promoting languages under the National Language Act. This has aligned with the market opportunity raised in Taiwan which sign language got approved to be included in the National Language Act. On top of that, the articles and media write up published in the website provides higher value in translation for Hand Talk testing. Hand Talk will be in touch with a few publishers and media companies to have a collaboration in testing out the add-on functions with an option of collaboration extension with special pricing.



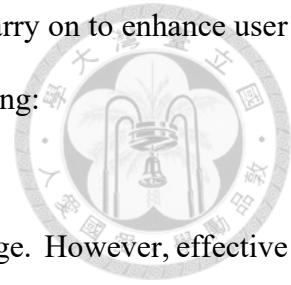
After the launch phase, the translator development will still carry on to enhance user experience. There are a few developments aim that Hand Talk is targeting:

1. 2-way communication

Current Hand Talk is translating text and voice into sign language. However, effective communication is 2-way communication. Hence, in order to carry out effective communication between hearing-impaired and hearing, sign language should be able to be translated into text or voice, by using a normal mobile camera to capture the motion of sign language. Once the development of this translation is successful, the market size of Hand Talk will tremendously increase, with immediate expansion into a hearing-impaired individual to his network such as family and friends.

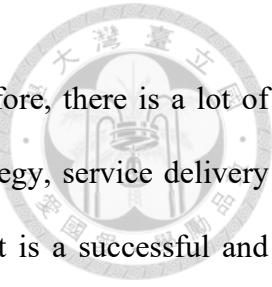
2. Cross language translation

Current Hand Talk is performing single language translation - Portuguese to Libras and English to America Sign Language. By looking up towards the success of Google Translate in multi-languages translation, Hand Talk also aims to develop cross language translation, to bring Hand Talk usage across countries, instead of limited to a specific country. With this, it can bring Hand Talk to another level higher, helping those hearing-impaired who are interested in foreign language to pursue their dream, increase their confident in expanding their horizon into foreign countries and even enable hearing-impaired to expand their social network by making friends from other countries.



CHAPTER 5: OPERATING STRATEGY

Hand Talk is a brand-new product in Taiwan Market. Therefore, there is a lot of detailed planning from all aspects – product development, pricing strategy, service delivery and promotion strategy are needed to ensure the launch of the product is a successful and sustainable operation in the long run to keep delivery value based on Hand Talk's mission.



5.1 Product Development

Hand Talk is using Neural Machine Translation System technology,⁴⁹ similar to Google Translation, to train the sign language translation system. This AI technology can increase the accuracy of the translation in grammatical and structure of sign language, instead of “finger-spelling” translation. The translation will be done by a lively virtual 3D avatar who can do the translation with full gesture and facial expression to the user. The data scientist in Taiwan is aiming to have collaboration with TASLI to collect data, including signs, gestures, facial expressions in translating the speech and text into sign language and send it to the Brazil team for translation system training. The overall development is expected to be completed in a year's time; a similar time frame was taken for the Brazil team in developing Libras back in 2012. This is because collection of data to train the translation system is time consuming. Furthermore, to ensure high quality of user experience, the accuracy of translation grammatically is necessary. After the launch of the product, the translation system also needs to keep updating, aligning with the development of the language system, both Chinese and sign too. Development further continues in exploring translation from sign language to text or speech to achieve 2-way communication.

The features of mobile APP are designed to enhance the user experiences. There is a translation speed that the user can adjust accordingly to find the suitable speed for an individual. It also provides translation from text or translation from voice. The translated history will be

stored if the user signed up an account in Hand Talk. Currently there are 2 choices of languages, American Sign Language or Libras. The development of Taiwan sign language will be included upon the completion of development.

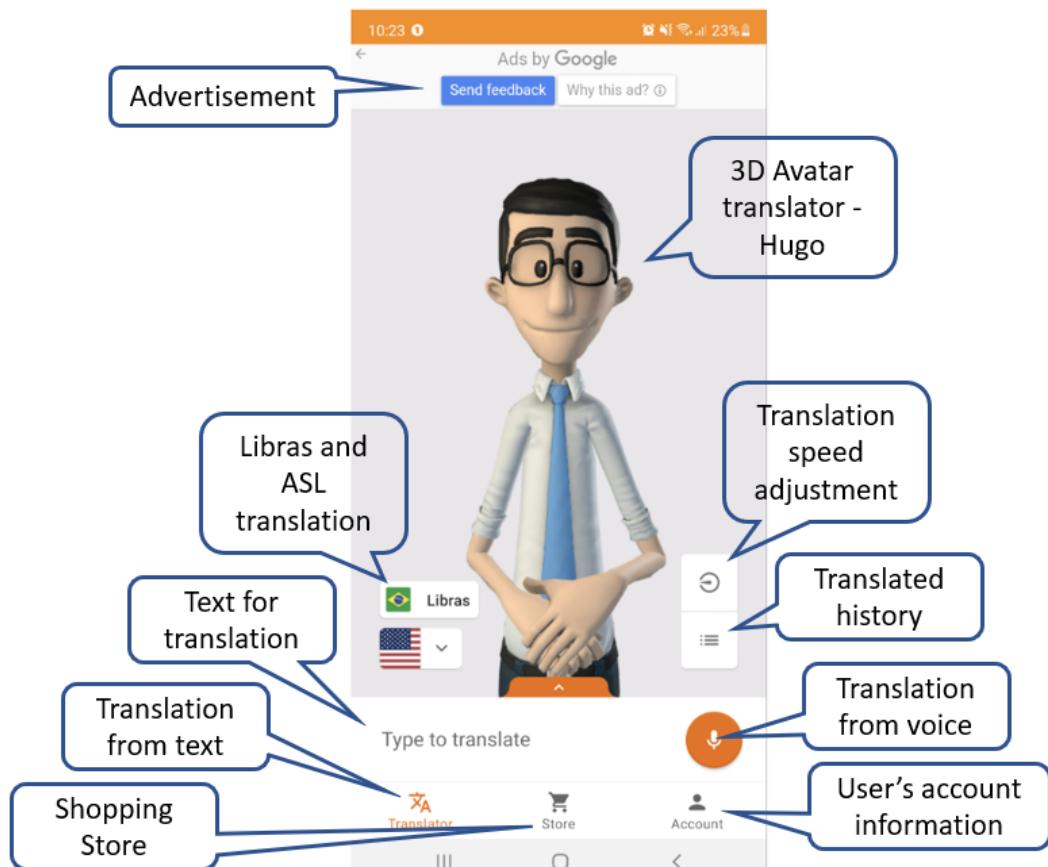
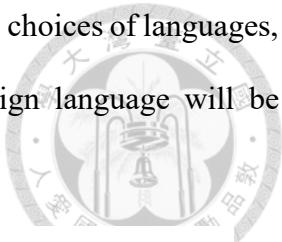


Figure 5.1 Hand Talk feature 1 (Source: Hand Talk)

5.2 Product Pricing

For individual users, Hand Talk is giving it free of charge. Hand Talk understands the income level of the hearing-impaired are usually low to medium income and the aim of Hand Talk is to bridge the gap of communication between hearing-impaired and hearing. Hence, users' experience and quality of life is the utmost important.

Therefore, there are 2 sources of revenue of Hand Talk - advertisement based on cost per mille on impression and website translation charges to the companies. By referencing the

pricing model from Google Translation service, the website translation pricing for companies will depends on the number of Chinese characters translated every month stated per below:⁵⁰

Package A: 1 million characters/month = NT10,000/month

Package B: 1 million to 3 million characters/month = NT15,000/month

Package C: 3 million to 8 million character/month = NT30,000/month

Package D: >8 million character/month = NT40,000/month

Lastly, the individual subscribers can buy coins to shop in Hand Talk store to buy cloth and accessories to doll up avatar at the package below:

10 coins – NTD 76

30 coins – NTD 210

50 coins – NTD 340

100 coins – NTD 610

200 coins – NTD 1,060

Alternatively, if the individual subscriber wants to remove the advertisement, he can pay NTD 39 to be a premium user. The revenue from this source is minor so it will be neglected in financial projection in the next chapter.

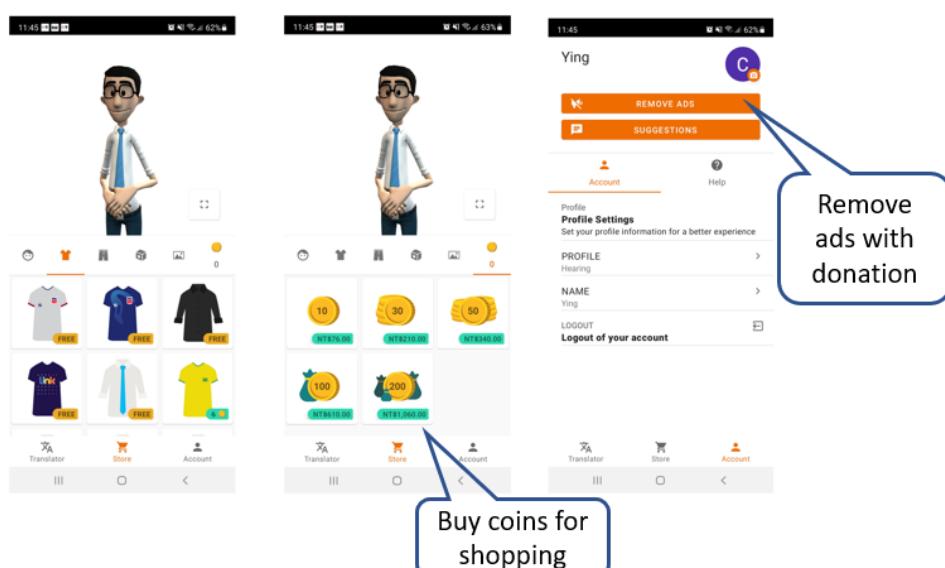


Figure 5.2 Hand Talk feature 2 (Source: Hand Talk)

5.3 Service Delivery

Hand Talk offered translation services via 2 ways.

An individual who wishes to use Hand Talk can download it from their Android phone or iPhone. Upon the installation completed, the APP is ready for use. The user can choose the sign language needed to be translated, type in the text or press the “mic” button to speak, the content then will be translated by the 3D avatar.

On the other hand, a company which wishes to use Hand Talk to translate the website content to reach out to their hearing-impaired customers contact with Hand Talk to apply the plugin. The plugin will be installed at the side of the website per shown. The side window will appear with the 3D avatar when the user clicks on it. The user can use the cursor to point at the phase of the website and click it, the avatar will translate the phase to sign for the user.

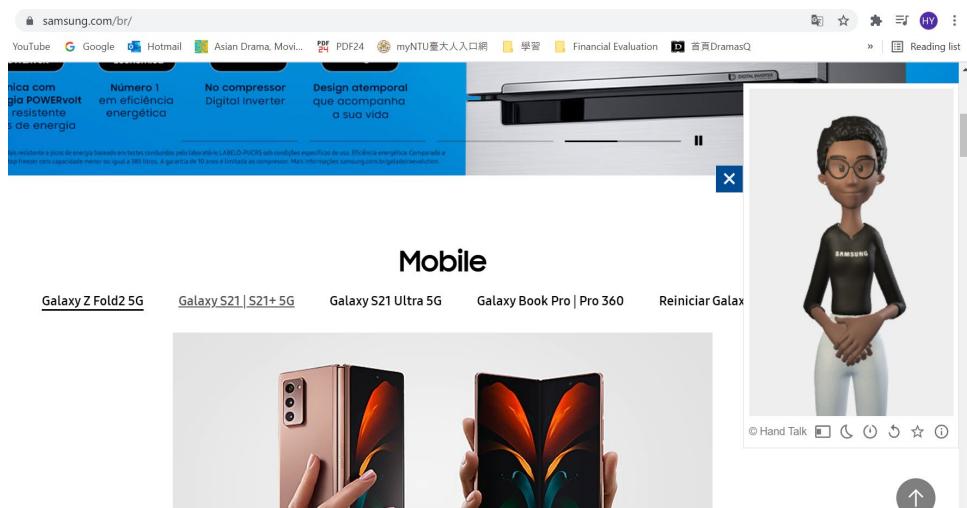


Figure 5.3 Hand Talk feature – website translation (Source: <https://www.samsung.com/br/>)

5.4 Promotion Strategy

Raising awareness is typically important at the first stage of Hand Talk marketing strategy. Since data collection is very important to train the translation system, Hand Talk first promotion would start to focus on Taiwan hearing-impaired schools to get hearing-impaired. Hearing-impaired school is also Hand Talk's first targeted customer segment. With this, it will

start to raise awareness to this main target market on this exciting technology via road show and activities. They can provide feedback to the team to improve the accuracy of the translation, which is the most important part of the Hand Talk, including the latest development of languages including new vocabularies. Aligned with the schedule on the National Language Act, Hand Talk can sponsor hearing-impairment schools as their learning tool in learning sign language. Simultaneously, Hand Talk will start to vlog and manage social media posting, including YouTube Channel, Facebook, Instagram and Twitter to record the development of the Hand Talk in Taiwan, deaf community's myth and truth, their communication difficulties etc. and have customer engagement at the same time. These postings also can start to build Search Optimization Engine (SEO) which is a time-consuming marketing strategy yet powerful and reliable source to the public. When Hand Talk is ready to launch, the official launching date and campaign can be announced and communicated to the audience via social media channels.

Aligned with the campaigns in promoting National Language – providing multilingual service to the public, Hand Talk will first approach government agencies for website translation plugin. Next, Hand Talk will target publishers, media and broadcast companies to promote the website translation service to them as these companies are playing very important roles in promoting languages under the National Language Act.⁵¹ Furthermore, these companies are publishing a lot of information to the public such as articles, news, updates etc. It increases chances for hearing-impaired community to be in touch with the latest information in their mother tongue. Gradually, Hand Talk will approach other companies on this website translation plugin too. The 3 main selling points to the companies are:

1. Response to promoting National Campaign Act

Several native languages including sign language have been included into the National Language Act. In response to the campaigns to promote and protect the value

of national language which is in the inheritance crisis, the corporate can use Hand Talk plugin to support the activities.



2. Corporate Social Responsibility (CSR) image

CSR image is a type of company branding. It can indirectly affect the customers' purchasing decision making, choosing from one brand to another brand. Moreover, this is an action that shows support for the National Language Act in preserving sign language in Taiwan.

3. Reach-out to minority

Public might think that disability is not technology savvy. However, the feedback from surveys shows that the hearing-impaired are technology savvy, using advanced technology devices to support daily activities but most of the websites have not provided this accessibility to them. By including this website translation, the companies can reach out to these minorities and give them an equal chance to receive the same information as the hearing community.

Last but not least, Hand Talk will approach Key Opinion Leader (KOL) such as Anne Lin, a deaf youtuber for content interviews or posts as part of Hand Talk's marketing strategy for both portable translator and website translation.

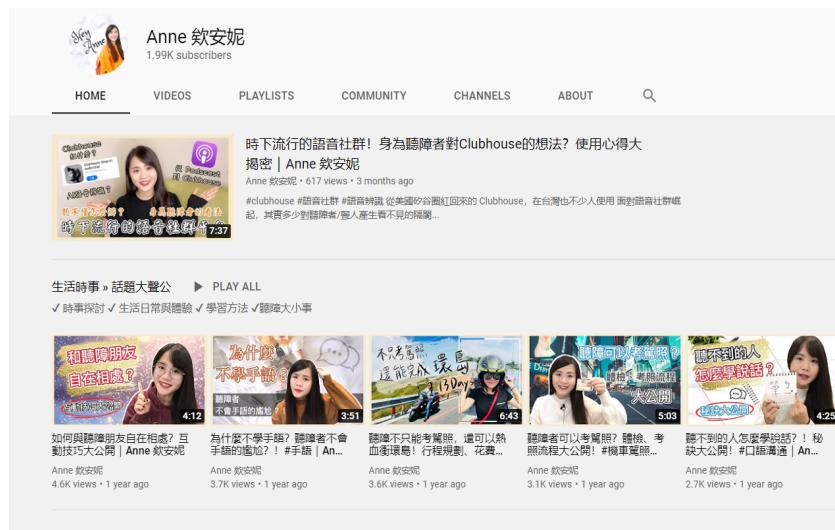


Figure 5.4 Hearing-impaired KOL in Taiwan – Anne Lin (Source: Youtube)

5.5 Management Team

Hand Talk will be invited to form a joint venture to expand this technology into Taiwan. As the joint venture is a small company with a tight budget, we will only hire essential employees. A project manager with a marketing background will be hired as the main in charge of the company. A data scientist and an animation designer who will take charge of the data collection and main point of contact with the Brazil team for the development of the translation system. Since it is a small group, instead of hierarchy organization, the working model will be project mode. The project manager will be overall facilitator of the project schedule, cost, administration and marketing matters,

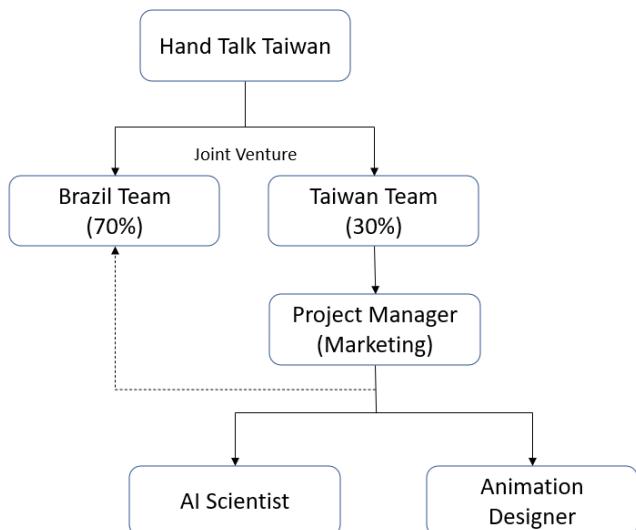


Figure 5.5 Management Team (Source: This research)

5.6 Chapter Summary

By taking conservative approach and anticipation in planning, the success of the launch will be increased. The product development process can be smoothed with the technical support from the Brazil team and fully deliver the value of the product via 2 channels – downloadable APP in mobile phone and website translation. Moreover, Hand Talk also adopted the opinions gathered from the market research – to be affordable for the targeted

customers. Hence, Hand Talk will focus the stream revenue from advertisement and website translation instead of directly incurred the cost to the customers. For promotion, awareness is particularly important since Hand Talk is new in Taiwan. Then, Hand Talk will continue to actively engage with customers for retention and feedback for improvement. Last but not least, since Hand Talk is a small start-up in Taiwan, instead of a hierarchy organization, we will work as a team and manage the project launching together. Key technical experts will be hired to support the data collection and design the animation for translation and project manager with marketing background to oversee the overall schedule, cost, progress, administration and marketing activities.

CHAPTER 6: FINANCIAL PROJECTION

For financial projection, Hand Talk has made the necessary assumptions to anticipate the income for next 5 years, including market size anticipation, funding, projection of stream of revenue and projection of income.



6.1 Market Size Anticipation

Hand Talk is targeting the hearing-impaired individuals with moderate hearing loss and above. In 2019, there will be 125 thousand hearing-impaired individuals registered with Handicapped Booklet for hearing-impaired. As per data extracted from the Ministry of Health and Welfare, 44.15% are under this category – about 55,000. However, not all of them are literate with sign language. Assume 70% of them, the ratio defined from the survey, are literate with sign language, the anticipated market size is 38,500. Hand Talk conservatively anticipates this market demand, without taking into consideration the closed network around them, such as friends and families who might potentially use the translator.

6.2 Revenue Projection

The main revenue stream is from the advertisement from the mobile APP and the website translation charges to the companies. Hand Talk assumes very minimum revenue from the store shopping and payment of subscribers to remove advertisement mentioned in 5.2

1. The advertisement from mobile applications

Our first target market is hearing-impaired students. In 2020, there was 3,567 ⁵² hearing-impaired students in the school which is about 10% of anticipated market size. Assuming 10% of our market size download and use Hand Talk in Taiwan in 2023 – 3,850 users and constantly increase of 10% per year, and all users use Hand Talk 15 mins per day (1.73mil minutes per month)

- Advertisement display count as impression has to be up for 30 seconds – 1 min 2 impressions – 3.46mil impressions reached audience per month ^{53, 54}
- Effective cost per mille, advertising revenue generated per 1,000 impressions
Assume average eCPM = NTD 70/1000 impressions ⁵⁵
- Fill Rate - the number of times an advertisement was shown to users (impressions) compared to the number of times an advertisement was requested from a specific advertisement source (requests).

Fill Rate = number of advertisements delivered / number of advertisements requested

- assume 95%

Estimated Revenue = (3.46mil / 1000) * NT60 * 95% in year 2022

2. Website translation charges from companies

In the launching stage, Hand Talk will approach government agencies because under the National Language Act, all the government agencies should provide multilingual services to the public. Hand Talk can act rightly to this campaign, to provide the plugin at government agencies websites. Assume these websites fall under package B (Package B: 1 million to 3 million characters/month = NT15,000/month) and there are 5 major websites, e.g., Ministry of Health and Welfare, Ministry of Labour, Ministry of Education etc. installed with Hand Talk plugin in 2023 and gradually growth in subsequent years.

At the same time, we will also approach media and publishing companies in our promoting strategy which they are falling under package D (Package D: >8 million characters/month = NT40,000/month) because most of the hearing-impaired might translate the articles published, involving a high number of characters' translation. By assuming this, Hand Talk expects 2 companies will hit package D to use the website translation services launched in 2023. Then, the overall revenue is expected to grow 20% per year for subsequent

years with the expansion of plugins in other government agencies websites and company websites. With this, Hand Talk will start to make profit in 2026.



6.3 Cost Projection

The main cost of Hand Talk is human resource, equipment, marketing and general administration, assuming employees work from home or meeting Hand Talk Community for data collection and machine training.

1. Human Resource

Hand Talk will hire a data scientist in Taiwan to collect translation data in Taiwan with annual budgeted salary of NTD 650,000 ⁵⁶ and an animator with annual budgeted salary NTD 500,000 ⁵⁷. On top of that, a project manager with marketing background with an annual salary of NTD 600,000 ⁵⁸ will be hired to take care of marketing and administrative activities. On the other hand, the training of the translation system will be done by the Brazil team, which budgeted 2 AI scientists at an annual salary of 100,000 Brazil Real (~NTD 540,000) each. ⁵⁹

2. Equipment expense

A relatively powerful and high-end processor workstations are needed for AI machine learning, training the translation system and animation design. Hand Talk budgeted NT100,000 for the equipment, expected 3 workstations to support the data scientist, animator and project manager.

3. Marketing expense

Hand Talk budgets 10% of the Taiwan labour cost as marketing expense for the first 3 years, 2022 – 2024, then reduces to 7% of Taiwan labour cost because the marketing activities will be shifted from awareness to conversion. As Hand Talk is under diversification stage so product and brand awareness are very important. Hand Talk

will start to do necessary exposure via digital marketing, blogging and social media posting even during the development stage.



4. General Administrative expense

Other general administrative expenses including registration of company, application launching fees and any unforeseen expenditure to be covered under this cost. Hand Talk budgets 5% of the labour cost under this expense.

6.4 Income Projection

With all the assumptions done for revenue projection and cost projects stated previously, Hand Talk will only be expected to start making profit in the 2026.

	In NTD Assumptions	2022	2023	2024	2025	2026
		Development	Launching			
	# of user, with 10% growth/year Valid Impression = 2 impression/min Every user 15 mins/day = 30 impressions/day/user # of impressions per month		3,850	4,235	4,659	5,124
			3,465,000	3,811,500	4,192,650	4,611,915
	Advertisement Income, with 95% fill rate @ NT60/1000 impressions A: 1mil character/mth = NT10,000/mth B: 1mil to 3 mil character/mth = NT15,000/mth C: 3mil to 8 mil character/mth = NT30,000/mth D: >8mil character/mth = NT40,000/mth Assume 5 websites under B and 2 websites under D		197,505	217,256	238,981	262,879
			1,860,000	2,232,000	2,678,400	3,214,080
	Total Revenue		2,057,505	2,449,256	2,917,381	3,476,959
Taiwan Budget Cost	1 x Data Scientist @ annual salary NTD 650,000 1 x Animator designer @ annual salary NTD 500,000 1 x project manager with marketing background @ annual salary NTD 600,000	1,750,000	1,750,000	1,750,000	1,750,000	1,750,000
Brazil Budget Cost	2 x AI & Machine Learning Scientist for translation system development @ annual salary NTD 640,000 each	1,080,000	1,080,000	1,080,000	1,080,000	1,080,000
Equipment Depreciation	Computer budget NT100,000 depreciate 4 years	25,000	25,000	25,000	25,000	25,000
Marketing Expense	10% of labour cost until 2024 and reduce to 7% of labour cost until 2027	175,000	175,000	175,000	122,500	122,500
Selling, General and Admin	5% of labour cost until 2026	87,500	87,500	87,500	87,500	87,500
EBIT		-3,117,500	-1,059,995	-668,245	-147,619	436,959
Taiwan Corporate Tax @ 20%		-623,500	-211,999	-133,649	-29,524	87,392
Net Income		-2,494,000	-847,996	-534,596	-118,095	349,567

Table 6.1 Financial Projection (Source: This research)

6.5 Funding Strategy

The main objective of Hand Talk is to serve the minority on achieving a better quality of life. In order to keep this mission ongoing, Hand Talk needs to ensure a consistent source of funding at the beginning and continuous profit in the future of the organization. These funds aim to cover the projected cost until 2025 to avoid hiccups of the operation for the coming 4 years with negative profit anticipation. By looking at the projection, the total expense from 2022 to 2025 is about NTD 13 million. The setup of Hand Talk in Taiwan is a joint venture between Hand Talk Brazil and Taiwan Team. Since all the branding and activities will be aligned back to Hand Talk in Brazil, Brazil is expected to invest 70% of the initial capital – NTD 9,100,000 (~ USD 313,000). By contrast, the Taiwan team will invest 30% of it – NTD3,900,000 by submitting applications for loans to financial institutions which are under SME Innovation Development Project Loan, Ministry of Economy or other potential funds that support social enterprises.⁶⁰ Lastly, Hand Talk will review the stream of revenue and budget and make adjustments accordingly by further exploring any potential collaborations to ensure consistent sources of funding to keep the launching going.

6.6 Chapter Summary

Hand Talk is not a high profit generating product in the market. It is a social enterprise to support the minority community in Taiwan. Therefore, the launch of Hand Talk in Taiwan is taking a very conservative approach in projecting the income for expansion. This is to ensure the objective of breaking the communication barrier between hearing- impaired and hearing community is achieved yet profitable at the same time to sustain the mission. With a slow and steady forecast to ensure Hand Talk has room for leverage along the way, maintaining the operation and continuing to bring value to the minority in the community.

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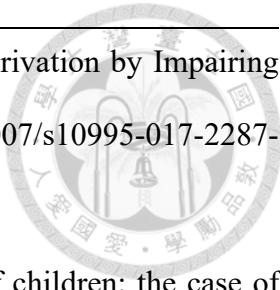
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