Part 3 – CUSTOMER DISCOVERY

Interviewee 1:

Name: Shweta Mahapatra

Relation to the disability: Healthcare Unit at the Assistive Centre for Visually Impaired Individuals.

Contact of the Interviewee: Friend from middle school, is a nurse and a healthcare professional at an eye clinic. Certified Healthcare server.

Experience: 2 years of professional work experience with training throughout the nursing school.

INTERVIEW QUESTIONS:

1. What does visual impairment have on the person:
   - Adaptability issues to accept assistive devices and other technologically advanced devices to aid them in their daily life.
   - Tend to withdraw from the social groups as they feel that they're losing the balance of their body language and gestures.
   - Most of them fear darkness and total darkness.
   - Some of them has mental health issues because of this as they feel decline in achieving their dreams.
   - Because of low self-esteem and depression, they develop issues within their families.
   - Eventually, there has been cognitive decline with the patients.
   - They are not acknowledged properly for their disability.
   - Since, it causes a huge change in their mindset and their physical day to day life, their mental health suffers a lot and that is why they need psychological treatment and therapies.
   - Some of the people experience hallucinations due to their brain tricking them into believing things they can't properly make out.
   - Individuals with Age related macular degeneration finds it easier to move around perfectly, but the ones with glaucoma who lose their peripheral vision experience more difficulty even in their houses.

2. How to figure out who has visual impairment in normal environments:
   - People with guide dogs with them.
   - Walking with the help of white canes.
   - Electronic navigation aids either wearing them or is attached to their cane.
   - They try not to make eye contact directly to the person who they conversate.

3. Cases Handled:
   - 1. There was a very old patient who had age related macular degeneration, when he visited the first time and she was in-charge of him and in their first interaction he mentioned that how the newer technologies of the reception and appointments has made it more difficult for him to interact. The whole kiosk has been more digitalized and to maintain the silence in the waiting room and in the hospital, the things has been kept silent. There is a pre decision that all the patients will come with a friend or family member who will guide them. But that patient came by himself and he faced so many challenges from the entry gate to the doctor's waiting room.
4. Most important guiding techniques or how to acknowledge them politely:
   - Start with asking them politely, if they need any kind of assistance. It should be for all the patients who come to the hospital or any nursing home.
   - If you see them struggle, it's a good thing to offer your help or just offering arm to let you guide them.
   - You should always warn a visually impaired person about the change in the floor. Due to wheelchair usage in hospital, a lot of waiting rooms has ramps and stairs separately and they are generally placed side by side or near the lift. We should always warn them when they approach that place and most importantly when they are taking your help.
   - Never guide them to go backwards as their balance understanding has changed over the years.
5. Thoughts about having assistive aids for the visually impaired people who are living near the location of small town and basic jobs:
   - Somehow it is more necessary for people whose daily occupation rely on physical strength.
   - Having an assistive device would help them move better and considering the messy surroundings by owning a small shop with little to no organizational ideas can be very useful.
   - *Case*: The patient she helped with getting used to wearable assistive glasses which helps her detect obstacles and can detect the flatness of the road or the floor as the area tend to have uneven ground.
   - She own a small grocery market and she herself stays at the desk and her using this device and agreeing to be a part of this new experimental device made her life easy with the hospital getting positive data and continue to promote the device.
   - New additional research is going to detect cash money to avoid scammers especially for people like her, who deals with change money every day.
   - Using Image processing and OpenCV helps to detect the object infront of you can maybe detect the currency and the amount or coins.

Interview 2:

Name: Dr. Amoolya Rao

Relation to the Disability: Biotechnology Engineer (PhD)

Contact of the Interviewee: College Roommate during my undergrad years, moved to Sweden for PhD in Biotechnological Engineering.

Experience: 4 years of research experience in making devices such as munivo and other small assistive aids to help blind people move freely.

INTERVIEW QUESTIONS:

1. How much assistive devices has created a change in a person's life?
   - It has changed a person's life from having low self esteem as per the societal stigma to getting their confidence back.
   - For a person working in an office having an AT Device has made their life easier by letting them be super active and being present in the meetings and conversations through which they can present their ideas and thoughts.
2. How does working in labs made you understand about the people with disability?
   - The things they go through on daily basis especially if you live in conservative places where loosing an ability prevents you from achieving your dreams is worse than we can ever imagine. Letting go of your dreams because you something in your body stops you to is very hard.
   - People who develop some kind of disability, for example., severe visual impairment or blindness later in their life or basically after the consciousness is very difficult. To let go of the gift to see and accepting partial sight or complete darkness causes mental health issues which in turn causes depression, anxiety etc and having those causes lesser release of happy hormones such as dopamine and serotonin which let them to lose interest in things they were once passionate about.
   - We live in a world where new ideas come up every day and our progress is measured by the effectiveness of the use of those ideas in our daily lives. People with fantastic ideas which can help the humanity but not being able to express due to some disability is something that cannot be accepted.
3. How does Munivo helps people with visual impairments?
   - As we generally see people with lower visual acuity walks around with a cane in their hand which helps them to identify the obstacles in front of them and then they change their directions of their route.
   - It uses sensory gestures by using the user's mental modes and pressure recognition signs.

- It uses basic ultrasound technology, the distance sensors carry two axes, x and y between the user and the upcoming obstacle and sends the information to the electronic control unit. It then processes signals from the sensors and sends it to the silicon material directly to the contact with the skin of the palm. The spherical actuators give signals to the user in two axes making gestures. Through the gestures, the user is able to figure out the environmental situation like a haptic communication system.

4. What is the necessity behind this design?
    - The main reason to design this is the ergonomics and freedom of both hands.
    - The device is very simple to understand and explain.
    - Having a cane in one hand blocks one hand and the balance gets disturbed if the individual is carrying something. Using this can help the user to use both the hands with full flexibility.

5. How do you choose the target user and to whom to distribute?
    - Started with an employee whose wife had severe vision loss because of past disease.
    - She was a middle-aged woman with kids of middle school.
    - We start with the background history and their experience with adaptability.
    - With every individual, we assign different set of groups according to their expertise to let them familiar with the device.

6. Concerns from the focus groups?
    - It is sometimes hard to make the healthcare professionals believe that they need assistance or assistive aids.
    - Behaviour should not be the measure to decide the counting factors, people tend to get anxious, and their confidence decrease when they come across a professional.
    - It is easy to be judgmental on the competencies of the blind people, people around usually consider them helpless so them being a guardian is mostly disapproved the professionals.
    - The healthcare professionals sometimes refuse to talk about the technicality of the aids and their issues as they match low visual acuity with illiteracy and making the individual more confused.
    - From some horrifying past experiences, some users were hesitant at first to be even a part of the groups to check the device.
    - There is a big concern of respect and trust that happens between the groups in both directions.
    - The dataset varies results from place to place.

Interview 3:

Name: Joseph Leach

Relation to the disability: MPhil student at Glasgow University

Contact of the Interviewee: Referred by a healthcare therapist.

History: Accident caused to loose vision.

INTERVIEW QUESTIONS:

1. What are the challenges an individual face with visual impairment in universities?
   - First and foremost is the limitations of the accessibility of the students with disabilities. There is shortage of devices that help the students with visual impairments, or the professor is not well informed enough to make it easier for the student to help them out.
   - There is no proper healthcare professional who can personally teach and inform the students about the resources available in the university.
   - Since the number of students with disabilities like this is very few, makes it very discouraging to propose a new technical help.
   - Because of less numbers, the school prefers to have less to none healthcare professionals to help these students.
   - Getting jobs and internships is comparatively more difficult than any regular person.
2. What can be done to improve the entire system?
   - There should be abundance of therapy available for the students and healthcare professionals.
   - Everyone has the right to learn and be understood so there should be motivational lectures during the orientation and information of all the necessary resources for the students in need.
   - Students have to be vocal about their wants and needs. Everyone should get equal opportunity.
   - Because of past experiences, students tend to be discouraged and conceal their problems instead of any help. There should be a very comfortable environment where students feel the ease to express themselves.
3. What are your thoughts on Advancement of the Assistive Technological devices specifically designed for blind people?
   - With the advancement of the technologies, there should be transition of low tech devices to high tech devices with gradual increase.
   - People should be more open to the reality and accept the fact that the technology is designed to help them.

- Of course, all the devices are not fit for all the people but with tries and counselling and recording their needs its easy to figure out what will help them the most.
- The person should be motivated during the entire process to see the growth.
- As from today's world, we know that the awareness has increased since past 20 years of digitalization, so there are many resources and centers and organizations which can help the person in need.
- Most of the devices are getting smaller and more compatible with the individual.
- Finding the right solution is still the most important thing when customizing a device for the customer.
- High-cost issues are something to be considered of but with enough proposals, it is still plausible to get it for cheaper price.
- The importance of the needs changes from person to person with different ages, as a kid, one of the most important thing to learn is by reading, but gradually movement in unknown locations to working or operating a machine are also considered.

4. What are the devices that you can suggest?
   - Most important and easiest device is the Universal reader, Talking word processor or book, text to audio applications etc.
   - Wearable AT devices uses image processing to detect obstacles to map out the environment which in turn signals the user to choose a different route.
   - Canes and Electronic Canes are very useful for anybody who moves around the city by themselves.
   - Nowadays, many companies are creating smaller devices which uses computer vision, Image processing and reinforcement learning to help the user by mapping out the environment and then creating best possible path by many given algorithms, using OpenCV helps in detecting objects in motion and then creating the entire navigation route for a person to move from one place to the other.
   - The technology and algorithm use is very similar to algorithms used in robotics to automatically let them detect path using controls and Artificial intelligence.

Conclusion:

With the increase in the advancement of technology, every day, people are coming with new ideas to modify the AT devices and humanity is still alive to make it possible. There are people in the world who wants nothing but to help people in need and let them express freely.