

## **IDEA OR APPROACH DETAILS**

**Ministry Category:**Department of Empowerment of Persons with Disabilities, Ministry of Social Justice & Empowerment

**Problem Code:**#DEPD3

**Problem Statement:** Development of customized keyboard for use of persons with intellectual disabilities

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**Project Title:** Nivezya

### **1. Abstract**

India which sees itself as a promising super power and an economic hub, is still trapped in the need of development and learning for people with intellectual disabilities. The development of our people can be brought by involving them in the participation of Information and Technology. This project explains the basic idea underlying Nivezya which is to develop a keyboard that could include both learning and creating at the same time. This would encourage our people to move forward to new world of development bypassing their disabilities. This project will also contain an gesture touchpad so they could learn by gestures as well as use as a pointing device. Therefore Nivezya is the next breakthrough to bring development to the country through technology involving people.

### **2. Introduction**

The device, named as “**Nivezya**” is a keyboard specially designed for people having intellectual disabilities. It is a simple and easy to carry device with magnanimous functionality. The basic approach is to create a way where using an input device such as keyboard is as simple and easy. Consisting of backlit feature depending on the keys they press alerts the users of the pressed key through timed blinking of backlit assisted with a vocal speech to let them aware of the key pressed. Currently the work is under process to develop a audio feedback feature to keys so that Nivezya could pronounce the words entered by the user by setting spacebar as a

limit. Nivezya being wireless can be portable and used as per the convenience of the user.

### **3.Description of Use Case**

The device can be actuated by three ways namely, **pressing keys, gestures and voice**. The device is framed respective to the alphabets with vowels matching a colour code and consonants within a range at different colour codes within backlit. For typing it, the user just have to understand the colour codes of respective letters is sufficient. When the device is pressed a voice feedback is send registering the key pressed along with a interval timed blinking of the pressed key. A mere press of a info key present in the top right of the keyboard will help the user to learn the respective letters to their matching words as learned in childhood thus creating a effective learning method while they use Nivezya. As the keyboard is powered and could be activated as per users ,enabling connectivity to any output devices it also provides a gesture touch method letting the user to interactively draw what they want in the touchpad to create the same visual in the output device.

### **4.Description of Technology Stack**

**Overview:** In this we are using a PCB and a case with electro luminescent backdrop to create a backlit keyboard.Uses voice recognition system to give audio feedback and gesture touchpad for sketching the imagination of the user.

**Layout and keycaps:**The keys has humongous fonts.Well backlit with colours according to the alphabet pattern.Keys are easy to understand and can be arranged as per the accessibility of the user.Customisable layout is interfaced for easy convenience in usage and for typing at ease.

**Plate and Case:** The primary focus of Nivezya was durability.Its built with aluminium casing so that it has durability to tough conditions.It helps in creating a waterproof and spill proof environment to the user.Short circuiting within the device is also safeguarded keeping in mind of the connections required.

**PCB:** The switches are connected with the keys in the PCB.The layout is integrated together to create the body of Nivezya. PCB is designed by keeping in mind of the layout and method of implementation.It acts as a

skeleton to the device. The switches are connected together in rows and columns instead of directly to the controller.

**Voice/Speech Recognition System:** It is HM2007 IC based device. The speech recognition system is a completely assembled and easy to use programmable speech recognition circuit. Programmable, in the sense that you train the words (or vocal utterances) you want the circuit to recognize. An audio transmission to the user is provided through the 3.5mm audio jack that can be added to the keyboard.

**Microcontroller:** ATMEL 89C51 has 4KB of Flash programmable and erasable read only memory (PEROM) and 128 bytes of RAM. It can be erased and program to a maximum of 1000 times. It is interfaced with 8051 micro processor. It controls the overall working of the keyboard. Providing interval backlit feature to the pressed keys, integrating voice assistance and also to control the gesture touchpad. Creating a wireless connectivity to the processing system.

**Touchscreen:** A gesture based touchpad is used to write and act as a pointing device to the keyboard. The touchscreen helps the user to write as per their imagination which is given as output. The pointing device helps the user to replace the conventional mouse and act as a stand alone device for their computer related activities. Thus the user is able to integrate both a typing and a gesture based input to the device making the user easy to operate.

## **5. Description of Show stopper**

The limitation of these devices are negligible considering its advantages. There can be a situation considered where the amount of usage will depend on the learning capability. It could also be installed in a device that is not universally used by each individual. Storage and networking issues of the above ways can also be considered.

## **6. Conclusion**

As a whole Nivezya is an innovative technology that could bring development a step closer, bring an amazing change to the society. This technology will help in reducing the barriers faced by people with intellectual disabilities and create a sense of use of their innovation and

technology in development. This will be the stepping stones to the change of a developed India and Nivezya will be its foundation.