Artificial Intelligence based Communication Device

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Abstract— The research is based on the communication device for disable people who are blind. The device has its own AI conceptualities or functioning's. Not only the blind person can use it but also the person who are ridding vehicles or working with busy handed, they can also use for their regular purpose. The users of the device will simple pass the commands through voice and the system will automatically recognize the user's identity by its voice. The voice is compared in the system from initial configurations settings done by the user. The device is very helpful for the new generation people, as the growth of technology has increased the people may require such device for their general use. The device is connected to a PDA using a wireless connectivity. We are using Bluetooth device to connecting for a short range communication. The person sends voice command with the help of Bluetooth to the handheld device, and then with the help of AI technology they perform specific task.

Keywords: Artificial Intelligence, Communication Device

I. INTRODUCTION

In today's world, every person and most of the systems are connected through wireless interface which we call as Internet. Basically, most of the human can't relate their life or regular schedule work without Internet. The technology have change from last generations till now, we have stepped to a new era of technology. The updates in our life have change our way of working. In this generation, most of the people just want to get the update by just a click, but as per the future scope people might require a quick response rather than clicking they will prefer, that their task should be done through their voice instructions. In 21st century, there are many devices based on voice command, here are some example such as Alexa, Siri, Google Assistant. Alexa and Siri is portable device but they cannot be used while riding or any other situation like this that means they are partially portable. While riding or working we use Bluetooth earphones connected wirelessly to PDA's, but simply Bluetooth earphone cannot work as Alexa or Siri. There should be new model which can be act as Alexa but should be precise like a Bluetooth device. The concept is to make the Bluetooth earphone similar to Alexa but it will be small in size and has its own Artificial Intelligence (AI) technology.

This will be helpful for the physically challenged peoples and riders too. It is completely portable and is connected to user smartphones. That means the commands will be passed to the smartphones and processed by it.

II. HISTORY OF COMMUNICATION

What differentiates us human from animals is the way we communicate with each other? Here we will show you brief history of how communication system evolved. The whole passage of communication started with the caveman. The cavemen used to gather around vigor to discuss their day to day activities. We can compare this to modern day social networking site such as Facebook. The one sudden day they decided to record their actions or knowledge. The cavemen then started to inscribe on the caves. We can compare this to modern day blogging. The problem with this communication method was it was localized. When inhabitants started moving out of the caves, long distance communication became very imperative.

Smoke signal was the first long distance communication. It was used in North America where each tribe has its own signaling system. A smoke from top of the hill signified danger. Smoke signal was used in Ancient China. The soldiers positioned at the Great Wall would alert for danger using smoke signal from tower to tower. In this way could transmit message as far as 750km within a few hours. The smoke signal is at rest used in Vatican to indicate the assortment of new Pope.

Due to natural homing ability of pigeons they were extensively used for long distance communication. The pigeons were used by Persians, Romans, Greeks, and Mughals. In 19thCentury Pigeons, were also used to transmit stock quotations from one city to another. Cher Ami, a homing pigeon, was awarded the French War Cross for her services during World War 1. TV series Game of Thrones has shown the use of Raven instead of pigeon for long distance communication.

From ancient time kings have been using human messenger to reply messages. Pony express was a first of its kind mail service delivering messages, mail, newspapers and small packages by horseback using small relay stations. It is regarded as the first courier service. It was used in the mid-19th Century to exchange a few words between East Coast and West Coast of America.

Semaphore Flag was used in naval during the late 19th Century. The word Semaphore is originally came from a Greek word 'sema' means sign and 'phero' means bearer. It is the telegraphy system conveying information at a distance by means of visual signals with hand-held flags rods and disk. It is still used during underway replenishment at sea and is acceptable mode of communication for emergency.
Telegraphy was the greatest breakthrough in the field of communication. Although the smoke signal and semaphore flags were unusual form of telegraphy however the harnessing of electricity in the late 19th Century gave birth to electric telegraphy. Morse code is still used globally as a mode of communication. Till a couple of decades ago Telegraphy was the most popular form of long distance communication. The US discontinued the use of Telegraphy in 2006. India's BSNL owned telegraphy service ended in 2013. It was reportedly the world's last existing true electric commercial telegraph system.

The term Radio in Latin means Beam of light. In 1864, James Clerk Maxwell showed mathematically that electromagnetic waves could propagate through free space. The effects of electromagnetic waves were observed before and after Maxwell but no one could detect its presence. In 1886, Heinrich Hertz established the existence of Electromagnetic Waves. In 1888, he demonstrated that one could produce and detect electromagnetic waves which we today call as radio waves. In November 1894, Jagadish

Chandra Bose at Town Hall of Kolkata ignited gunpowder and rang a bell kept at a distance using microwave. During the same -- time an Italian Scientist Guglielmo Marconi made an electric bell which went off during lightning. This was just the beginning of a whole new era of distant communication. Early 20th Century radio system transmitted message using continuous waves only. Amplitude modulation was demonstrated for the transmission of voice and music but with little success. World War 1 accelerated the development of radio for military communication. After the war commercial radio broadcasting began in 1920 and was a big hit. World War 2 again accelerated the development of wartime purposes for aircraft and land communication.

Until now real time communication was confined to diplomatic purposes or for broadcasting. Still telegram was the fastest one to one communication used by common people. In 1876, Alexander Graham Bell invented the telephone. At first, the benefits of a telephone exchange were not exploited. Instead telephones were leased in pairs to a subscriber, who had to arrange for a telegraph contractor to construct a line between them, for example between a home and a shop. It was a luxury that only rich people could afford. Later telephone took advantage of the exchange principle already employed in telegraph networks. Every telephone was wired to a local telephone exchange, and the exchanges were wired mutually with trunks. Networks were joined in a hierarchical manner until they spanned cities, countries, continents and oceans. This was the establishment of the public Switch Telephone Network or PSTN. The foremost progress took place after the Second World War.

Here we have seen the history of communication started from caveman to telephone. After that many new technologies were came into collision. The 21st generation has stepped to AI technology; so many devices are embedded with some AI techniques. The devices of this generation will automatically collects the information from surrounding and process according to the users need and recommend the user accordingly. This will help a lot in many ways for example suppose you wake up 5 to 10 minutes late because your alarm rings by taking a delay of 5 to 10 minutes, here the AI system has automatically checked the GPS location of train and notified the alarm by allowing you to sleep a bit more.

The technologies which we have used in are model are explained below:

III. BLUETOOTH

Bluetooth is a wireless technology standard for exchanging data between fixed and mobile devices over short distances using short-wavelength UHF radio waves in the industrial, scientific and medical radio bands, from 2.400 to 2.485 GHz and building personal area networks (PAN) .Bluetooth supports both one-way and two- way authentication. It was originally conceived as a wireless alternative to RS-232 data cables. Bluetooth is now the largest radio-based technology after GSM.

IV. ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) as a field of scientific research (also called machine Intelligence in the beginning) is almost as old as electronic computers are. A possibility of building devices/software/systems more intelligent than human beings has been from the early days of AI "on the horizon". The system which we will design is based on machine learning which subset of Artificial intelligence. According to Tom Mitchell "A computer program is said to learn from experience E with respect to some class of task T and performance measure P, if its performance at task in T, as measured by P, improves of experience E"[1]. We have witnessed the solving of a number of intelligently hard problems by computers like playing good chess, for instance. During the early days of computing the chess playing was considered a benchmark showing a real intelligence. Even in seventies of the last century, when the computer chess was on the masters level, it seemed almost impossible to make a program that could beat the world champion. However, this happened sooner than expected. This had three reasons: increased computing power, development of a good search algorithm (that can be used in many applications beside chess), and well organized knowledge bases that included all available chess knowledge (first of all, opening and end games). In essence, the chess problem could be solved because it was a specific intellectual problem belonging to so called narrow AI.

A different case is translating from one language into another that requires general AI. After N. chumski's work in structural linguistic, It was expected that the natural language translation problem will be solved soon. It has not happened yet, although success is visible in some specific applications like, for instance, Google's AI linguistics. The reason is that this requires artificial general intelligence -- possessing of and ability to handle large amounts of knowledge in every field related to human activities.

Basically, artificial intelligence (AI) is the ability of a machine or a computer program to think and learn. The concept of AI is based on the idea of building machines capable of thinking, acting, and learning like humans. Here, AI plays an important role in technology. It help in many ways like voice recognize, guiding us to take decision, and many more.

V. FUNCTIONING

The working of our AI device is to communicate with a PDA. The communication is built through Bluetooth signal. The data is transfer through the Bluetooth signal that means the connectivity is for short range communication. The AI device has its own intelligence to recognize and understand the voice of the owner of the device. The device by itself checks the voice is error free or not, if there is any error the device will filter out the noise and send the clear sound to the system. The system converts the noise into signals and performs the operations. The operations are those which the user will speak in the microphone.

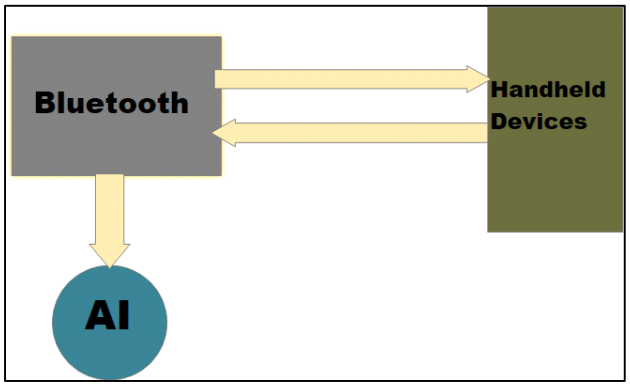

Fig. 1: Block Diagram of AI based Bluetooth Device

VI. CONCLUSION

In this paper, we have summarized the major use cases of cellular-connected AI Bluetooth device applications. We have highlighted the main wireless and security challenges that arise in such scenarios while introducing various AI-based solutions for addressing such challenges. Preface replication results have shown the benefits of the introduced solutions for each cellular-connected Bluetooth device application use case.

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