

# Empowerment of Digital World using Sixth Sense Technology

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*Digital World, Sixth Sense Technology, Camera, Gesture Recognition, IOT*

Technology is helping blind people to see using sounds, deaf people can hear using ear machines and moreover the people suffering from Parkinson's disease can eat very easily using Google Lift ware spoon and it's just the beginning of the technology. If we consider the words of the great author *Douglas Adams*– "Technology is a word that describes something that doesn't work yet", then what all we have seen till now in Hollywood science fiction movies like in Tony Stark opening the computer screen on the walls or commands are given by the gestures or calling the car or his suit remotely, this all be possible in the next few years. This all will be possible because of the Sixth Sense Technology. Sixth Sense is a wearable gestural interface that enhances the physical world around us with digital information and lets us use natural hand gestures to interact with that information. It is based on the concepts of augmented reality and has well implemented the perceptions of it. Sixth sense technology has integrated the real-world objects with digital world.

## Introduction

Why having only five senses in 21<sup>st</sup> century also!!!

It has become appallingly obvious that our technology has exceeded our humanity. - Albert Einstein (Scientist)

From the very previous time we are hearing about the sixth sense like "he has the sixth sense to predict what is going to happen." We all know about the five senses of the human body i.e. hearing, taste, smell, touch and sight. We have different sense organs for this. So, what is "sixth sense" and from where this new sense came from? The sixth sense is another term for extrasensory perception [2]. Extrasensory perception (ESP) [1] would involve the reception of information not gained through the recognized senses and not internally originated. If we consider the National Science Foundation, then extra sensory perception can be taken as pseudo-science. It falsely suggests that there is only one additional sense besides the traditional five senses of sight, hearing, touch, smell, and taste as told by the Aristotle.

## Origin of This Technology

This fabulous technology is because of Steve Mann- the father of the Sixth Sense Technology. He made wearable computer in 1990. He implemented this as the neck worn projector with a camera system in 1998 and hand worn gestural interface in 1997 at MIT media lab (which he referred as Synthetic Synesthesia of the Sixth Sense). Firstly in 2001 this name "Sixth Sense" was neither invented nor published. This term came in use when Mann used this term to describe such devices. Then his work was carried forward by the Pranav Misty- an Indian.

He was born on 14 May 1981 in Palanpur, North Gujarat, India. He completed his bachelor's degree from Ahmadabad after that he holds His master's degree from Media arts and sciences from MIT and then PhD from IIT Bombay.



*Figure 1. Pranav Mistry wearing a similar device in 2012, which he and Maes and Chang named “WUW” for Wear yoUr World.*

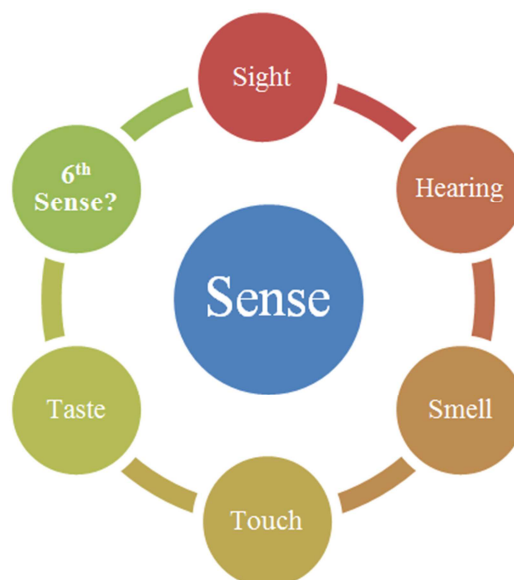
## About Sixth Sense

It is a blend of many exquisite technologies. The thing which makes it magnificent is the marvelous integration of all those technologies and presents it into a single portable and economical product. It connects various technologies like hand gesture recognition, capturing images, processing and manipulating them etc. It amalgamates the real world with the digital world [7].

Sixth Sense is a gesture-based wearable computer system. Gesture recognition is a topic in computer science and technology in which human gestures can be interpreted using some algorithms. Gestures are originated from the any bodily actions or emotions but mainly focusing on face and hand gestures. This feature is more accurate, highly stable and time saving to unlock devices. Gesture recognition had given birth to the Pen computing-computer interaction through drawing the symbols with a pointing device cursor. Wearable computer also known as body borne computer which are the miniature electronic devices that can be worn under, with or on the top of clothing like accelerometers and gyroscopes like Apple smart watches.

Today beside the physical world, digital world is also a part of our life. We collect information more from the digital world than the physical world. The digital world is as important as the physical world. With the help of the internet this digital world becomes wider than our physical world [10].

When we encounter over something then we use our five senses to collect data and then we take our decisions for some condition. But very possibly the most useful information on which we can take decisions are not obtained only using these five senses, namely the data, information and knowledge that mankind has accumulated about everything and which is increasingly all available online. But we don't communicate directly and efficiently to the digital world as we do with the real world. The sixth sense technology is all about interacting to the digital world.



*Figure 2. Types of Senses.*

### Why Should We Choose Sixth Sense Technology?

We the humans depend on our senses to take decisions. We gain the information from our physical senses and then take decisions. But the data or the information which can largely help us to take decisions is available on the internet. Although the information that we gather using traditional computers and mobile phones are restricted to the screen and they are also restricted to the geographical locations like network problem, remote areas or etc. There is no direct communication between the real physical world and virtual digital world [6].

This Sixth sense provides the way to interact with the digital world using hand gestures. This application is very useful in the artificial intelligence. Nowadays the concept of IOT is growing very fast. So, this concept along with this new technology can grow into a new technology in which new robots can be made which can interact with humans [9].

### Devices Which Are Required in The Sixth Sense Technology [3]

- 1) Camera
- 2) Colored marker
- 3) Mobile component/Smart phones
- 4) Mirror
- 5) Projector

### Block Diagram

The working of the Sixth sense device can be easily seen by the following block diagram.



Figure 3. Devices of Sixth Sense Technology.

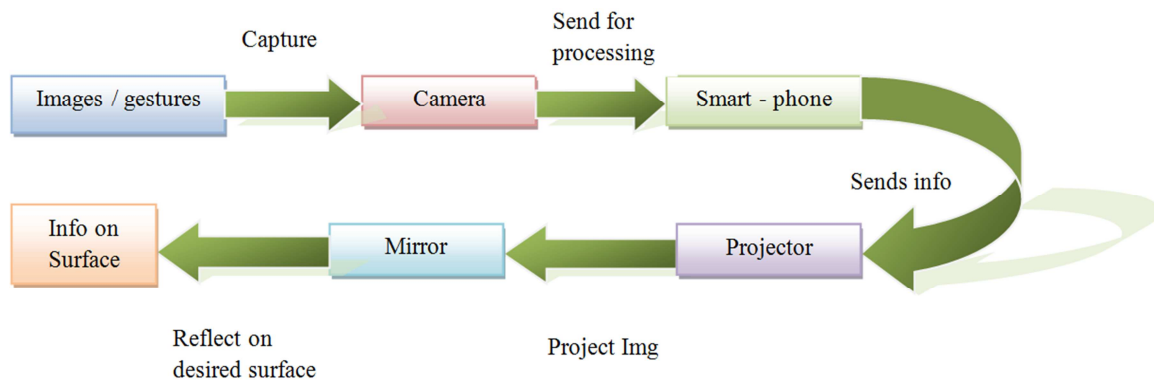


Figure 4. Working of Sixth Sense Technology Device.

## How It Works!

The model of the Six Sense technology consists of a pocket projector, mirror and camera. These all are connected to a smart-phone. Both the projector and the camera are connected to his smart-phone. The projector projects visual information on the walls or any physical objects around us to be used as interfaces and it also contains a battery; while the camera tracks users hand gestures and movements and the physical objects using computer, vision based techniques. The video captured by the camera is processed by the software that is used in this technology. It also keeps tracks of the fingers via colored markers that are on the tips of the user. The movements of these colored markers are interpreted into the gestures that act as interaction instructions for the projected application interfaces. The mirror is used because the projector is hanging from the neck of the user, and mirror will reflect the beams on any flat surface.

## Applications of This Technology

- 1) Viewing map- Lets the user to navigate through map and zoom in and out on any part of the map. It made tracking on our finger tips.
- 2) Taking pictures- Just arrange the index fingers and thumbs into a square and the photo clicks. He can view the images on any surface or any wall.
- 3) Drawing application- Six senses lets the user to draw anywhere, anytime and anything just using index finger.
- 4) Make a call- It allows a keypad to be projected on the palm of the user and then use that keypad to make a call.
- 5) Check the time- Just draw a circle on the wrist to see the clock.

And many more like to get any information like fight updates or checking mails by only drawing '@' symbol or reading newspaper and much more [4] [5] [7].

## Pros and Cons

- 1) Portable
- 2) Map the mind anywhere, anytime and anything.
- 3) Freedom from the traditional screens.
- 4) We must carry the devices with us always.
- 5) Cannot be possible without smart-phones and many of us don't have the smart-phones.

## Conclusion

Finally, I would like to conclude the Sixth Sense technology. This topic cannot be explained or concluded in one line. This technology frees us from the traditional screens. We can shape our thoughts at anytime, anywhere and anything. It recognizes our physical objects and connects it with our digital world. The users can interact with the computer or the digital world using hand gestures that we use in our daily life. It is the comfort of the laptops or palmtops with the flexibility of using it anywhere without those traditional screens. This technology is due to Steve Mann and Pranav Mistry (an Indian), so thanks to them. ■



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