Google Glass – The Next Generation Wearable Computing Technology

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Abstract— Google glass is also known as Project Glass. Google glass is a research and development program by Google to develop a Head-Mounted Display. It facilitates hands-free displaying of information currently available to most smart phone users, and allowing for interaction with the Internet via natural language voice commands. They have the combined features of virtual reality and augmented reality. Google glasses are basically wearable computers that will use the same Android software that powers Android smart phones and tablets. We understand that an alternative version is also being developed for iPhone users. Google Glass is one of the most modern gadgets we've seen in recent times. A useful technology for all kinds of people including handicapped/disabled. It is suitable for people who already wear glasses.

Key words: Project Glass, Touchpad, Tiny (But Powerful) Hardware

I. INTRODUCTION

With science and technology developing at such rapid pace, yesterday's virtual dreams are fast becoming today's reality. One such out of the box innovation which is almost ready to explode into today's reality is the Google glass which is being developed by Google.

II. WHAT IS GOOGLE GLASS?

Google Glass is a kind of wearable technology with an optical head mounted display. It was developed by Google with the mission of producing a mass market ubiquitous computer. Google Glass displays information in a smart phone like hands free format.

III. WHAT GOOGLE GLASS CAN DO?

It can accept/reject a call. We can view weather condition. It enables reading emails, playing online games, watching movies, taking picture, etc. It can show reminders and helps in GPS tracking and Navigation. It can be used in cloud computing for uploading, viewing and sharing files.

IV. HISTORY

On April 2012, Google announced an interesting project called Google Glass (or Project Glass). Sergey Brin wore a prototype of the Glass on April 5, 2012, Foundation Fighting Blindness event in San Francisco. In May 2012, Google demonstrated for the first time how Google Glass could be used to shoot video. Google entered in a partnership with the Italian eyewear company Luxottica, owners of the Ray Ban, Oakley, and other brands, to offer additional frame designs. In June 2014, Nepal Government adopted Google Glass for tackling poachers of wild animals and herbs. Gurkha Military currently uses Google Glass to track the animals and birds in the jungle. This operation led to the latest development in military operation. Google Glass was used in military for the first time in the world by Nepal. In January 2015, Google ended the beta period of Glass (the "Google Glass Explorer" program).

V. COMPONENTS

The Glass headset has a camera that captures photo or video. It also has a CPU including GPS. It has a includes a battery, speaker, a microphone to send and receive voice messages, touch pad and a prism display.

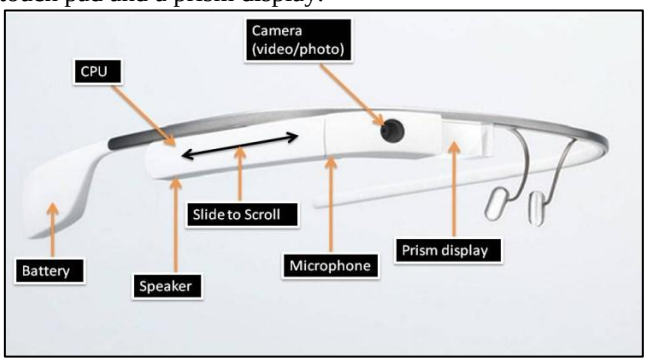

Fig. 1:

VI. DETAILED INFORMATION ON THE PRODUCT

A. *Touchpad:*

A touchpad is located on the side of Google Glass, which allows users to control the device by swiping through an interface displayed on the screen. current events like weather can be accessed by sliding backward and past events like phone calls, photos, circle updates, etc can be accessed by sliding forward. The home screen can be accessed by tapping the glass screen.

B. *Camera:*

Google Glass has the ability to take photos and record 720p HD video. Google Glass has a 5-megapixel wide focus camera, which could be good or bad depending on what clarity we want.

C. *Display Methodology:*

The Explorer version of Google Glass uses a Liquid Crystal LED illuminated display.

D. *Colour of the Product:*

The Explorer Edition which is available to the developers is in white, black, & grey. The two other colours like tangerine and blue are rarely available for the developers.

E. *Wearing:*

The small "screen" sits between our eyebrow and upper eye lid, but not in front of our eye. We can glance up and to the right to read the active display area.

F. Display:

It is used for viewing search results, texts, and everything we can do with the google glass.

G. Display Resolution:

It has a high-resolution clear display.
Controlling the Glass: There are two ways:

1) Voice recognition, which we trigger by saying "OK, Glass."
2) The device's touch pad on right side, they work in tandem with voice controls. We'll need to tap and swipe forward, or backward, or down to scroll and back out of screen.

H. Control Using Our Eyes*:*

If we look up at the Glass module, the screen would light up so we can verbally command it. Otherwise, we can move our eyes and head at will, and navigate the Google Glass through deliberate voice and manual controls.

I. Strength of the Device:

Made of titanium and plastic, the Glass adjusts by hard bending, so it is sturdy.

J. Non Waterproof:

The user needs to ensure that the Glass device or battery does not come into contact with liquids as liquids can get into the electronic components, leading to corrosion.

K. Battery Life:

Battery life will last a full day, if we do not use more-draining features.

L. Charging:

We will have to lay the device flat against a charging surface.

M. Storage Capacity:

Glass comes with 16GB of internal storage and Google cloud-syncing. But users have access to about 12GB to 12.5GB of the total.

N. Rebooting:

We need to just press the circular power button to turn the device on and off. To initiate a hard reboot, we need to press and hold the power button for 15 seconds.

O. Apps That Can Be Used With Glass:

We can download the MyGlass app from the Android Google Play store, but we also need to set up some things, like favorite contacts, from the My Glass Web site. Setup is fairly easy.

P. Input Commands without Using Voice:

Glass is made to use our voice and taps in concert, so we cannot really get away without talking to it in public.

Q. Voice Recognition Compared With The Smart Phone:

Glass uses the same recognition engine as in smart phone.

R. No Radio Emission:

Google Glass isn't a smart phone, which means that there is no cellular transceiver and hence it does not have a SAR radiation rating. The device connects to our smart phone through Bluetooth or Wi-Fi. Bluetooth transmits at a much lower power than a cell phone, so it should be just like wearing a Bluetooth headset.

VII. FEATURES

A. Tiny (But Powerful) Hardware:

The Project Glass team has managed to squeeze all the features into a tiny computer, supported on a lightweight yet strong frame.

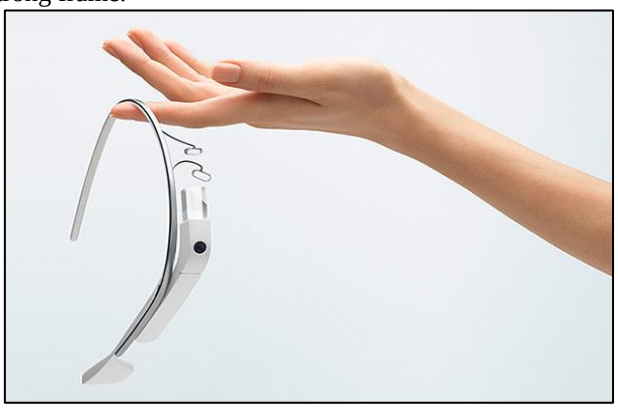

Fig. 2: (a) Tiny (But Powerful) Hardware

Google Glass is packed with Bluetooth, Wi-Fi, GPS, speakers, a camera, microphone, touchpad and possibly a gyroscope that detects head-tilts. Then there's the main piece, a tiny screen that displays all the information we need.

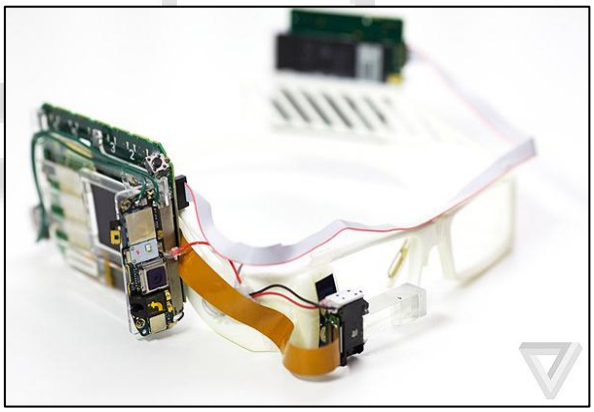

Fig. 2: (b) Tiny (But Powerful) Hardware

B. Heed My Command!:

Google Glass has voice input, which makes everything a lot more interesting. The built-in microphone combined with Google connects us directly to the search engine. We activate Google by saying "Okay Glass" then send a command or question. Tilting our head up also does the same thing.

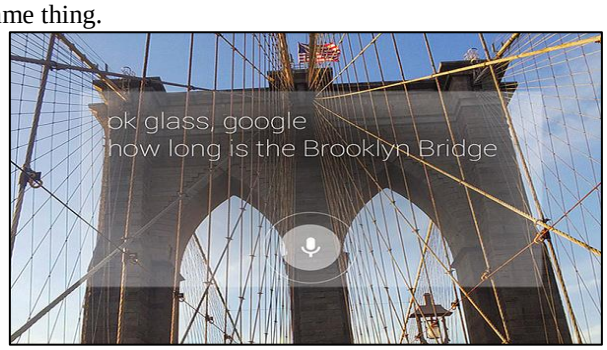

Fig. 3: Heed My Command!

We can take a photo or record a video, by just saying the command for it .On the right, is a touchpad where we can swipe through, to get to menus; tapping, registers our selection.

C. Life Pauses for No One:

Google Glass users can now live in the moment, and keep that memory in pictures or videos. No more foraging around for a camera. Just say, "Take a Photo" and our view at the moment is captured, hands-free.

Fig. 5: Life Pauses for No One

D. Never Get Lost Again:

Since it's built with a GPS chip, it'll be able to help us navigate, with help from Google Maps. This will take away the need to look down at our smart phone and it will be especially handy when we are driving or travelling.

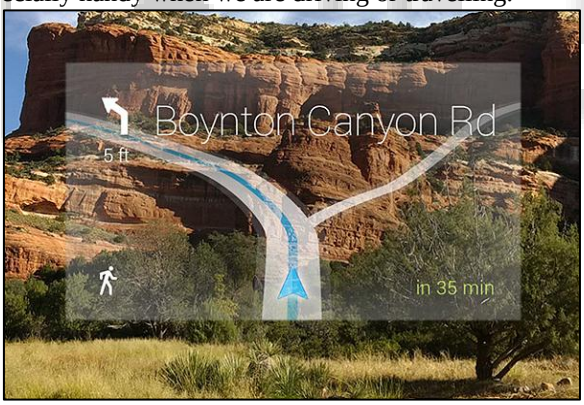

Fig. 6: Never Get Lost Again

E. Blend In With the Locals:

Google glass helps us while travelling and visiting a place where we don't speak the local language. We can now convert the currency rate, understand the measurement system (metric or not), or translate our questions and their answers immediately.

Fig. 7: Blend In With the Locals

F. OS Compatibility Not an Issue:

Google Glass works not only with Android phones but also with the iPhone. Apart from the GPS chip inside, Google Glass is dependent on the Wi-Fi or mobile connectivity to deliver its features.

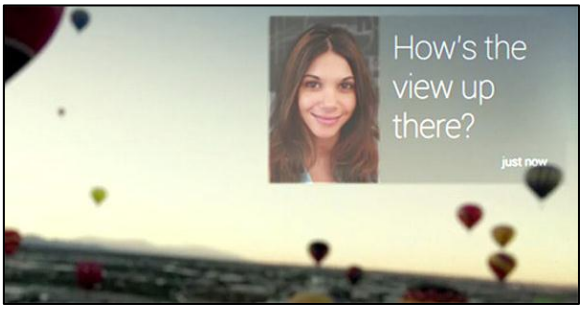

Fig. 8: OS Compatibility Not an Issue

G. Still Elusive But Almost Here:

Google first made Glass available to developers during the Google conference. We understand that google is ready with the product and may launch the same anytime.

VIII. ADVANTAGES

The device is easy to wear and simple to use. The device is designed to complement the smart watch, smart phone, tablet or a computer. It is designed to be in when u want it and to be out when u don't need it. Google glass can be made to work as a hands-free computer. It becomes the most handy when the moment would be over if we had to take the time to reach to our smart phone to take a picture. We can use voice and text and see the map as well, while we travel. A spectacle shaped computer that reside directly infront of our eye rather than in our pouch or pocket. A useful technology for the physically challenged. Suitable for people who already wear glasses. It performs almost all applications of a smart phone and also runs on Android platform.

Looks the best when we want to access some quick information or answer to some quick queries, with our hands busy such as cooking or fixing something urgent.

IX. DISADVANTAGES

It can be easily broken or damaged so users should be very careful taking care of it. Privacy of people may be interrupted by this. Since these glasses display the retrieved data in front of users eyes , it will be a tough experience for users since they will focus on that data and can eventually miss the surrounding they travel which can lead to accidents while driving.

X. CONCLUSION

In the pursuit of human lookout for converting virtual world into reality, inventions like google glass which relies on operation by human voice and touch, with the broad agenda of usability by both physically abled and differently abled is an outstanding success of human efforts. This is a shining example of the continuously evolving human thought process bringing in byproducts of vibrant technology for the development and satisfaction of the never ending urge of achievement of human kind.

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