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A Review on Google Glass Technology

S.Archana, N.Nishanth

PG Scholar, Dept. of Computer Technology, Sri Krishna Arts and Science College, Coimbatore, Tamil Nadu, India

ABSTRACT:Google has developed a wearable computer with an optical head mounted display (OHMD) in 2013. Glass displays information in a hands-free format. It is a wearable, android devices that resembles apair of eye-glasses. Google glass can be controlled by natural voice command. Google Glass offers an augmented reality experience by using visual, audio and location-based inputs toproviderelevantinformation. It can do everything else that a smart phone can do. It can do everything from capturing a picture to homeautomation. In this paper, the applications of the Google Glass will be discussed along with thetechnologies, such as 4G, Smart Clothing, Smart Grid, that let it performs such cool task.

KEYWORDS:Augmented reality, Virtual reality,Technologies, Working, Eye Tap.

I.INTRODUCTION

Google Glasses are a sort of wearable technology, developed by Google as an initiative to pervasive computing. Initial versions of Google Glass were titanium-framed glasses to show communications from your smart phone. We can do everything with Google Glasses which we can do with a normal smart phone with faster access like Wi-Fi connectivity, giving voice commands, searching through GPS, etc. It is can help visually impaired person in a way like people wearingsuch eyewear may be able to recognize strangers in publishing facial recognition, It is based on the Androidoperating system with 5 megapixel of Camera and 16 GBstorage. As technology is a consecrate for a human being, but also be shrew solikeothertechnology Google glasscanalso have major inadequacies. Prime of all is security concern like taking photographs or recording videos of people without their knowledge. And if theGoogle Glass is stolen, then the information stored can bemisused. But all depends on how we are using thistechnology with virtuous will, we can rule over thisworld. The idea of a new pioneering invention forecasting to change the lifestyle of persons, has a way of raisingdoubts within the culture. Society was uneasy for the first computer and for the first smartphone, but they slowly became more accepting. Society will need to beopen-minded for this product to be able to use it to its full benefit. Google Glass will be the next big thing for centuries to come. Consumers will be able to have access to the world's information, interact with people while using their Google Glass and even more.

II.TECHNOLOGY USED

Google Glasses will undoubtedly communicate with mobile phones through Wi-Fi and display contents on the screen, respond to the voice commands of the user. It mainly concentrates on the social networking, navigation and communication. The video camera senses the environment and recognizes the objects and people around. The whole working of the Google glasses depends upon the user voice commands itself. Various technologies used by Google Glasses is as follows:

(a) **Ambient Intelligence:** It refers to electronic environments that are sensitive and responsive to the presence of people. Ambient intelligence is closely related to an intelligent service system in which technologies are able to automate a platform embedding the required devices for powering context aware, tailored and anticipatory services. The concept of Ambient Intelligence provides a vision of the Information Society, where the stress is on greater user friendliness, more efficient services support, user-empowerment, and support for human interactions. People are surrounded by intelligent, intuitive interfaces that are embedded in all kinds of objects

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and an environment that is capable of recognizing and responding to the presence of different individuals in a seamless, unobtrusive and often invisible way.

(b) **Wearable technology:** Wearable technology is a category of technology devices that can be worn by a consumer. Other wearable tech gadgets include devices that have small motion sensors to take photos and sync with your mobile devices. Wearable technology will have some form of communications capability and will allow the wearer access to information in real time. Data-input capabilities are also a feature of such devices, as is local storage. Examples of wearable devices include watches, glasses, contact lenses, and caps, jewelry such as rings, bracelets, and hearing aid-like devices that are designed to look like earrings. While wearable technology tends to refer to items which can be put on and taken off with ease, there are more invasive versions of the concept as in the case of implanted devices such as micro-chips or even smart tattoos. Whether a device is worn on or incorporated into the body, the purpose of wearable technology is to create constant, convenient, seamless, portable, and mostly hands-free access to electronics and computers. The goal of wearable technologies in each of these fields will be to smoothly incorporate functional, portable electronics and computers into individuals daily lives. Prior to their presence in the consumer market, wearable devices were primarily used in the field of military technology and had the biggest implications for healthcare and medicine.

(c) **Eye Tap Technology:** An Eye Tap is a device that is worn in front of the eye that acts as a camera to record the scene available to the eye as well as a display to cover computer-generated imagery on the original scene available to the eye. This structure allows the user's eye to operate as both a monitor and a camera as the Eye Tap intakes the world around it and enlarges the image the user sees allowing it to overlay computer-generated data over top of the normal world the user would perceive. The Eye Tap is a hard technology to categorize under the three main headers for wearable computing like constancy, augmentation, mediation. For while it is in theory a constancy technology in nature it also has the ability to augment and mediate the reality the user perceives. In order to capture what the eye is seeing as accurately as possible, an Eye Tap uses a beam splitter to send the same scene to both the eye and a camera. The camera then digitizes the reflected image of the scene and sends it to a computer. The computer processes the image and then sends it to a projector. The projector sends the image to the other side of the beam splitter so that this computer-generated image is reflected into the eye to be super imposed on the original scene. Stereo Eye Taps modify light passing through both eyes, but many research prototypes only tap one eye.

(d) **Smart Grid Technology:** A smart grid is a modernized electrical grid that uses analogue or digital information and communications technology to gather and act on information, such as information about the behaviors of suppliers and consumers, in an automated fashion to improve the efficiency, reliability, economics, and sustainability of the production and distribution of electricity. Smart grid is a generic label for the application of computer intelligence and networking abilities to a dumb electricity distribution system. Smart grid initiatives seek to improve operations, maintenance and planning by making sure that each component of the electric grid can both talk and listen. Another major component of smart grid technology is automation.

III. WORKING OF GOOGLE GLASSES

There are a few different ways to control Google Glass. One is by using the capacitive touch pad along the right side of the glasses. The touchpad responds to changes in capacitance, which is essentially a weak electrostatic field generated across the screen. When your finger makes contact with the panel, a controller chip detects the resulting change in electric capacitance and registers it as a touch. Swiping your finger horizontally allows you to navigate menus on the device. Swiping downward on the touch pad backs you out of a choice or, if you're at a top level menu, puts the glasses in sleep mode. Another way to control Google Glass is through voice commands. A microphone on the glasses picks up your voice and the microprocessor interprets the commands. As of early 2015, the processor in the Explorer version of

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Google Glass is from Texas Instruments. It's an Open Multimedia Applications Platform chip (OMAP). These chips belong to a larger classification of microchips called systems on chip.

Start tap:

To start using Google Glass, you tap the frame of the glasses and you are taken to the home screen. You don't see a bunch of icons like on smartphone home screen, just a simple overlay box that carries any information.

Video Content Search:

With the arrival of corporate video coming from Glass, there will be a growing problem of how to find specific content within a rapidly expanding video library. Traditionally, video content search has been limited to asmall amount of manually-entered metadata, andgenerally required the viewer to either watch an entirevideo, or skip back and forth by hunting through the video's timeline. This problem is compounded atwork, where corporate videos often run 60 minutes orlonger. Considering that the average knowledge workerspends 19% of the work week simply searching forinformation to do his or her job effectively, the ability toquickly and efficiently locate content will increasinglybecome critical to improving workforce productivity. Tomeet this need, there are new video search tools enteringthe market that use Automatic Speech Recognition ASRand Optical Character Recognition OCR technology toautomatically timestamps and index every word spoken ordisplayed on-screen. Searching for a word or phraseproduces results with links to specific moments in thevideo where those words appear.

Camera:

Google Glass is making it easier than ever to capture atask, demonstration, or event from different perspectives.This capability opens up new opportunities for knowledgesharing in a range of fields including healthcare, engineering, energy, real estate, and construction. Whilethe advantages of seeing an intricate procedure frommultiple angles are obvious, finding a way to knit all ofthis video together has traditionally been a challenge. In the past, it is required a team of professionals andexpensive equipment to record the procedure, and avideographer to manually synchronize the feeds andswitch between various camera angles. Today, new videoplatform software that supports multi-camera videorecording, editing and viewing enables organizations toautomatically combine the video captured from multipleGoogle Glass wearers without the need for expensive andtime-consuming video post-production.

Video Analysis:

The types of video that can uniquely be captured by Glass,such as point-of-view (POV) reports from the field andPOV demonstrations of proficiency, create newopportunities for businesses to ensure compliance and getinsights from a globally distributed workforce. Doing sorequires analytics and reporting that are built specifically for the needs of video. For other types of organizations, like retailers whosebusiness depends on the success of front-line staff, POVvideo enables these employees to visually demonstrateproficiency with key processes and share best practices. Management can then use analytics to view aggregatedata on staff completion rates.

Video management:

As businesses seek to better leverage Glass and othersmartphones and tablets, they will need to ensure thatvideos are easy to share, discover, and view from anydevice. Too many organizations have invested in videoonly to see usage falter because they failed to plan foradequate storage, file conversion, or other unique aspectsof enterprise video content management. In the past, thesetechnical considerations required the use of custom,internally-built file systems. Today, a new class ofenterprise software called video, content managementsystems VCMS is dramatically simplifying this aspect ofworking with business video. A modern VCMS addressesthree major challenges of managing mobile and POVvideo. First, a VCMS enables video files in any format tobe uploaded and shared from a central, secure

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repository.This means that, with a few clicks, video captured withGlass or with any of the other wearable devices currentlyin the market can be distributed to colleagues around theworld. Second, a VCMS will automatically convert everyvideo captured with wearable and mobile devices intoformats that can be viewed on any PC, Mac, tablet orsmartphone, regardless of whether the device is hardwiredto a gigabit Ethernet connection or receiving videowirelessly over 4G.

IV.APPLICATION OF GOOGLE GLASSES

Recording Videos:

Just say the word and Google Glass will take a picture orrecord a video, you will never have to touch thehardware. The photos and videos will be stored on the4GB flash memory of the device, and can also be sharedon social networking websites or emailed.

Text messages:

Google Glass will show you text messages as well asemails you receive and allow you to reply to them viavoice commands.

Browsing:

If you are in the habit of Googling things a lot, you willfind that your task has been made easier by the newGlass. You simply need to ask a question and the devicewill pull the answer from the internet. For example, youcan ask when Red Fort was built or to give you a fewphotographs of the monument and the device willprovide appropriate replies on the small screen in frontof your eye.

Translate:

This is a neat feature that may come in handy when youtravel abroad. You simply need to ask Google Glass totranslate a phrase or sentence from one language toanother and it will speak that out.

V.SECURITY CHALLENGES TO GOOGLE GLASSES

Hacking Attack:

Just by getting Glass to see a malicious QR code, anattacker could force a connection to a malicious Wi-Fi orBluetooth connection, then eavesdrop on allcommunications. Admittedly, the attack wouldn't havetriggered a countdown to global doom, but it didhighlight the automated, promiscuous networkconnectinghabits of mobile devices, Glass included.Therein lies a problem with wearable computing devices:They lack either physical or virtual keyboards, and thusrequire a relatively greater degree of automation thanyour average Android device or iPhone. With thatautomation, however, comes the risk that the device mayautomatically do something bad, from either aninformation security or privacy perspective.Unfortunately, as the Glass QR vulnerability patched byGoogle in June -- illustrates, wearable computing facesstill some tricky security and privacy questions.Furthermore, useful solutions to these problems may not yet to be on hand.

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Piracy Concern:

Google Glass is a wearable computer that looks like apair of glasses, except it has a small prism display thatprojects images to the wearer's right eye. The deviceoffers much of the same functionality as smartphones,allowing people to watch movies, check emails, and takephotos, and record audio and video. Unlikesmartphones, however, the device is easily accessible.Glass wearers who want to, say, watch a video clip, neednot fish a phone out of their pockets.Glass also may record events more unobtrusively thansmartphones do. Wearers need only give a verbalcommand or press a button at the top of the device to start recording. People who want to take photos can doso by winking with their right eye. Google Glass alsocan be outfitted to prescription lenses. Wearing a devicewith the capability to record video was inappropriate atthe movies. The National Association of Theatre Ownerssaid last May that it expects to develop policiesregarding the use of Google Glass in theaters. Glasswearers who become accustomed to reflexively capturingtheir lives with the devices could end up violating those laws without realizing it. While the same could besaid for smartphone users, most people don't walkaround with their phone's video camera already pointedat a subject.

VI. BARRIERS TO GOOGLE GLASSES

Google Glass is an innovative, unpolished technology.But it is a fundamental flaw: Designed to be worn on theface throughout the day, Glass is a barrier between usersand the real world around them.

For those who have somehow avoided the hype, Glass isthe new computer from Google that's shaped like aneyeglass frame.

The Glass is designed around a display that's contained ina small, clear box connected to the device's frame justabove a user's right eye. Users interact with Glass eitherby talking to it or by swiping or tapping its touchsensitivetemple. Glass responds by displayinginformation on its screen or by transmitting sounds andwords to your ear through a speaker that uses bone conduction technology.

Comfort:

When text appears in the interface, it simply overlays therest of what the user sees. But a test drive reveals that theinterface is, at present, a smallish prism-based projectionjust above the user's right eye. Looking up at the displayis fairly uncomfortable, and this reporter found himselfsquinting to take in the information on the projection.While Glass owners at the conference, said that they likedwearing the device, less intrepid technology users willcalculate the inconvenience/reward tradeoff differently.

Walking Spectacle:

Earing Glass is equal to being a human in-store demo.The Explorers talked about how, during the course of anaverage day, dozens of people approach them, wanting toask questions about Glass, try on their pair, and otherwisemake a big deal of their special status. That's fine if you'rean extrovert, but, for most people, it would becomeannoying after about the 50th day of nonstop interactionswith puzzled strangers, asking to borrow the computer onyour face for an Instagram selfie.

Price:

Google Glass may be far more affordable than thecumbersome tele health carts or surgical camerascurrently in vogue, but for the buy-in to be universal, thepurchase price has to be lower. Although it's not quite yetfor sale the fancy pair of specs is nearly four times theprice of other popular mobile devices. And if youwear glasses, a prescription pair will run

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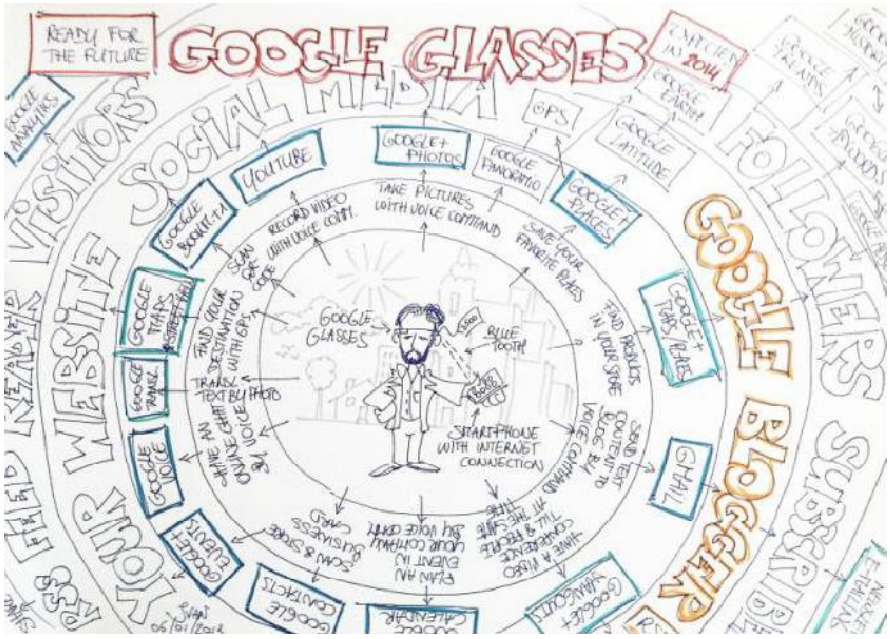
you an extra$250.00. For Glass to have some skin in the game,Google will have to get competitive when it comes to costcomparison.

VII. CONCLUSION

Google glasses are basically wearable device computers which uses the evolving familiar technologies. Also brings the ease of communication, sophistication and information access even for the physically challenged or handicapped class of people those literally could not use general way of palmtops and mobiles. It will bring relief and stress less life to human kind with the help of new technology.



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