STUDY ON SMART GLASSES
(Google Glasses)

Ashish Patil
Student, NCRD's Sterling Institute of Management Studies, Nerul, Navi Mumbai
ashishrpatil1234@gmail.com

Sandeep Prajapati
Student, NCRD's Sterling Institute of Management Studies, Nerul, Navi Mumbai
prajapatisandeep881@gmail.com

Dr. Murlidhar Dhanawade
Professor & HOD (MCA), NCRD's Sterling Institute of Management Studies, Nerul Navi Mumbai
murlidhardhanawade@ncrdsims.edu.in

Abstract-

During the last years, the improvements of new media have reformed people's conduct immensely. Especially cell phones have fostered an 'consistently and wherever online' attitude. However, what comes straightaway? Ongoing turns of events and gauges propose the ascent of another innovation that is named 'Wearable Augmented Reality Devices", where shrewd glasses (like Microsoft Hololens or Google Glass) address conspicuous examples.[1]

Thusly, this paper gives chiefs and scientists an applied portrayal of the innovation and a conversation of how it varies from existing versatile and expanded reality advances. At long last, a conversation of how brilliant glasses can build firm worth is given. For the most part, keen glasses intend to give life observing administrations, just as making a stage for taking more true photographs and video cuts. They can likewise be furnished with expanded reality innovation, planned to help you with your ordinary home and business life.

Shrewd glasses demonstrated to be one of the cutting edge registering gadgets that join the people and machines with the assistance of data and correspondence innovation (ICT). Lately, it is seen that shrewd glasses have been utilized in the clinical and gaming applications. Notwithstanding, the highlights of savvy glasses can contribute its administrations in different fields as well. In this paper, an investigation is completed to investigate the conceivable use of brilliant glasses in the schooling area. In the examination, most highlights of brilliant glass were discovered to be in favors with the necessities of instructing and learning measure received in the training area. Common utilizations of wearable keen glass in schooling incorporate the expanded reality, documentation of talk, nearby report arrangement, recording addresses as recordings, catching fundamental

focuses as pictures, telementoring, learner's assessment, understanding the audience's experience and nature, understudy fixation assessment etc[3].

***Keyword**: Smart glasses, google glasses, eyewear devices, Media Evolution, Augmented Reality, AR, Wearable's, Technology.*

INTRODUCTION:

Lately, keen glasses have been delivered into the market. Savvy glasses are outfitted with a transparent optical presentation, which is situated in the eye-line of human clients. The human client can see both this present reality climate and the virtual substance appeared in the presentation, which is viewed as the idea of expanded reality. Right now, expanded reality on cell phones is overwhelmed by cell phones. For instance, one of the greatest cell phone producers, Apple Inc. has dispatched its increased reality toolbox. The change in cell phones from cell phones to shrewd glasses will occur over the course of the following decade. It is projected that savvy glasses will turn into the following driving cell phone after the cell phone, as indicated by statistical surveying directed by Digi-captial. In this way, savvy glasses have extraordinary potential in turning into the significant stage for expanded reality.

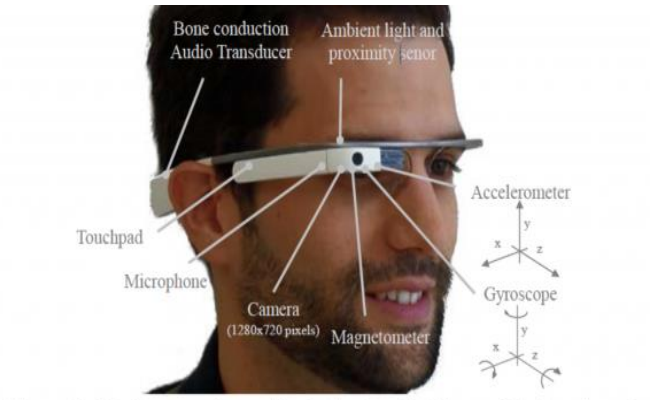

Figure. 1. Head-mounted wearable device Google Glass and the locations of some of the main sensors.

Fig1: Head mounted wearable device
(Reference-https://rb.gy/m5jc4d)

According to the figures forecast by Digi-Capital, the market value of augmented reality will hit 90 billion US dollar by 2020, in which no less than 45 % of the market share will be generated by the hardware for augmented reality. In the report by CCS Insight, it is estimated

that around 14 million of the virtual and augmented reality headsets will be sold by 2020 with a market value of 14.5 billion US dollar. One of the challenges that device manufacturers encounter before their smart glasses become widespread in the market, is the usability issue. The interaction between human user and smart glasses is still encumbered and problematic. That is, the virtual content on the optical display are not touchable and thus direct manipulation becomes a fatiguing and errorprone task. Additionally, compared with smartphones, smart glasses have more challenging issues such as reduced display size, small input interface, limited computational power, and short battery life.[1]

WORKING OF SMART GLASSES:

Smart Glass is a technical masterpiece. It combines numerous functions and features in a very small unit. In addition to phone and camera (photo, video), it offers Internet connection, including GPS.

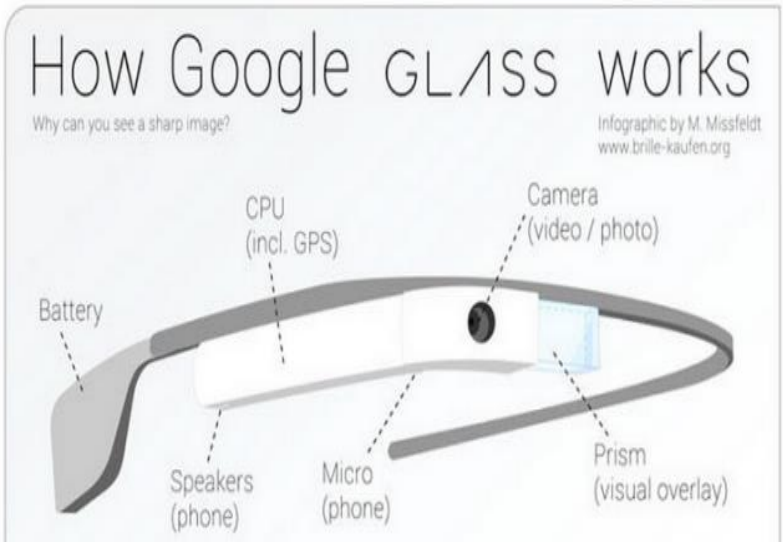

Fig 2: smart glass info.[14]

(Reference: https://bit.ly/3ismAkB.)

The core feature of Google Glass is a visual layer that is placed over the reality ("*augmented reality*"). This layer opens a door to amazing new possibilities. But how does it work? In the Google Glass contains a mini-projector, which projected the layer via a clever, semi-transparent prism directly on the retina in the eye. Because of this the image, even though it is so close to the eye, is sharp and clear. You can move the front part of the Google Glass easily to optimize the focus.

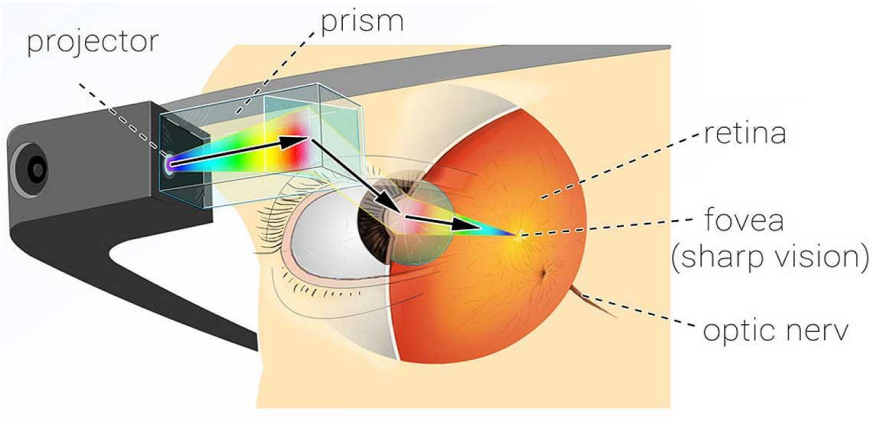

Fig 3: working of smart glass[14]

(Reference: https://bit.ly/3ismAkB.)

Depending on how you wear the Google Glass, the layer appears in the upper right corner or in the middle of the visual field. When the Google Glass is high on the nose, so that you can practically see through underneath, you must turn the eye up to view the image sharp. Because the prism is semi-transparent you can also place it directly in front of the pupil. In that case, you have the sharp layer directly in front of the eyes.

Literature Review:

- Shrewd glass is an optical head-mounted show include a creation by Google in Google x exploration place in the California to use the Android working system.
- It gets the photographs, video interface between them in singular contact, guide, and individual data. In maker has thought about a particular favoured outlook of this framework is that it both passes on the interest to the PC and encourages the conversational associate concerning the wearer's use of the machine.
- In maker has confronted the troubles and assume that fourth and fifth period progressed eyeglass will show more useful than various advances as the issue of the clarification of pictures in camera, inquiries out from the extent of laser light are furthermore affirmed.
- Maker has considered using electronic eye with wearable preparing which will support maker has moreover said about the issues that can arise as a result of it.
- Show advancement Steve Mann to analyse the including visual memory. In maker Thad Starner has worked on the time an area of this development. Maker has

diminished the period of correspondence. The maker is using wearable advancement since latest 20 years.

PROBLEM DEFINITION:

May take a toll on your vision:

Google cautions potential Glass clients they may feel eye strain or foster a cerebral pain when wearing the gadget — very much like when wearing typical glasses. Google additionally cautions individuals who've had Lasik medical procedure to talk with their PCP about the potential adverse consequence Glass may have on their eyes. What's more, in case you're under 13 years of age, wearing Glass could hurt creating vision.

Could be a distraction:

Another investigation has discovered that Glass may diminish your normal fringe vision. This is very hazardous on the grounds that it might make vulnerable sides that subvert security while you participate in ordinary errands — like driving or strolling. The examination contrasted wearing Google Glass and normal glasses and decided there is a "clinically significant" loss of vision in the upper-right quadrant which might actually cause a mishap.

OBJECTIVE:

- The objective of the paper is it explores the use of the wearable technology especially eye worn smart glasses in based on the features of smart glass, applications explored.
- Apart from this, the possible benefits and challenges were also explored so that the use of the technology would help in the development in future.

FUTURE OF SMART GLASSES:

- Smart Glass is as futuristic a gadget we've seen in recent times. It's limited in scope right now. The future, Google believes, is bright and the device itself is "incredibly compelling". Google is trying their hardest to push the Project Glass through the FCC this year.

- Reports demonstrate that Google is endeavouring to get the endorsement by the FCC this year yet there are now a few hundred glasses made for testing inside.
- Google glasses are basically wearable computers that use the evolving familiar technologies that brings the sophistication and ease of communication and information access even for the physically challenged class of people those literally could not use general way of palmtops and mobile.
- This into a useful, self-ruling putting out fires benefit.[8]

RESEARCH METHODOLOGY:

- These days, contact screen input is the essential association methodology for the present keen gadgets, and these touchscreens are estimated from savvy wristbands to cell phones.
- Concerning the shrewd wearable's, like savvy glasses, discourse acknowledgment is the significant contribution of decision in light of the fact that these wearable gadgets don't have a touch-screen show that fills in as the info gadget.
- In spite of the way that touch screens are well known in cell phones and savvy watches, the screen contact interfaces have not moved into little measured brilliant gadgets with following reasons.
- A touch screen interface doesn't completely exploit human expertise.
- It requires the client to contact a little screen on the gadget redundantly and continually, and henceforth contacting the screen for input blocks the client's sight of the showcase.

The objective of having the smart glasses. The following points will explain the objective behind in building this system.

- Smart glasses could be used as a body camera.
- The ability to take photos and videos and then share exactly what the user is seeing through Google Hangouts.
- The option to use the Google search engine through the glasses, using Wi-Fi or a smartphone's data connection.
- The ability to have translations streamed straight to the wearer through the screen.

- Reminders to complete certain chores or tasks with an added visual aspect that will prompt a notification to appear on the user's screen every time they look at a particular object.
- The ability to sync the glasses to calendars stored on phones or computers in order to receive reminders of events and meetings.

This makes the basic errands like menu route turning out to be redundant and drawn-out activities. In this manner, concentrates in the writing have proposed various ways to deal with associate with brilliant wearable's of little size including savvy glasses. Offering keen glasses with better information approaches makes the connection experience more natural and proficient, which empowers the clients to deal with more confounded and outwardly requesting undertakings. All in all, the upgraded cooperation experience brings brilliant glasses from their restricted utilization of miniature collaborations to day by day utilization as found in the present cell phones. In this part, we centre exclusively around the communication approaches for keen glasses.

ANALYSIS FINDINGS:

Although there are already many solutions used for navigation, smart glasses could be used to create a better experience. In cars they could be used to highlight the way and propose a speed for the driver. In warehouses they could be used to navigate employees to the objects they need to transport highlighting those with some color. Video streams could be used to ask experts or support questions while doing work. Imagine having to do a difficult maintenance task once a year. This could be done while being connected to an expert from that products company seeing exactly what you do, giving advice and in case something goes wrong maybe even being liable for damages. This is a lot cheaper than having an expert travel to once location. Smart glasses could be used to track eye movement of employees. Analysing this data could help determine when a employee is overworked and needs a break or when a employee runs out of work and starts working.[9]

LIMITATION:

1. High Price (around $100/m²)

The biggest drawback of smart glass remains its price, which is very high despite the energy savings it generates. If the range can vary from one manufacturer to another, count around $100 per m² for this glazing marketed by specialized companies. For this reason, electrochromic glass is still not very widespread: it is currently mainly used for professional and public premises (offices and museums). [16]

2. It's Necessary Use of Electricity

Although smart glass saves over 30% of home energy, it also uses electricity from the grid, so this can also be called a disadvantage. If electricity is not available in the house, smart glass cannot be used. [16]

3. Installation can be Difficult

In order to install smart glass, it is necessary to know what you are doing; both window installation and electrical installations. Therefore, before installing, you will need to hire a master who is qualified for the job. [16]

4. Electrical Consumption

Regardless of the fact that Smart Glass saves a lot of energy and thus reduces costs by up to 30%, they also consume electricity. Electrochromic (smart) glass works on very low electrical voltage (12-36 W) and energy consumption is approximately 3 to 5 watts per square meter. [16]

5. Smart Glass Isn't Yet Widespread

Although this technology greatly reduces energy costs, it is not yet widespread, and you don't have it in every city. Therefore if you would decide to install switchable glass in your home, you will need to find the nearest shop where you can order it, and that might be a little harder.[16]

CONCLUSION:

A review of key literature highlighted factors that were unaccounted for by existing

technology acceptance models but which might affect the social acceptance of Google Glass was adapted accordingly and used to conduct a study evaluating Google Glass'

acceptance and attitudes towards the device. Perceived usefulness, input and interaction, and privacy and security were found to have the greatest influence on the social acceptance of Google Glass (RQ1).

In order to be adopted, Google Glass must prove useful to potential users. At present,

it replicates existing smartphone functions without offering anything new. A promising area for development is the implementation of Google Glass into workplace settings. Furthermore, the input and interaction methods were an appealing aspect of the device for users. However, the novelty and unconventionality made users reluctant to use the device in public. Therefore, 50 despite participants' enjoyment of the interaction methods, time is required for the development of their social acceptance. This study also suggests that in order to further the social acceptance of Google Glass, its security features must be improved to prevent others from freely accessing data on the device. Moreover, to minimise the chance of participants being overheard/overlooked, there should be more discreet ways of interacting with the device. If Google are able to successfully tackle these issues, future editions of Google Glass may have more success.

REFERENCES:

1. Andrea Colaco et al. Mime: compact, low power 3D gesture sensing for interaction with head mounted displays. In Proceedings of the 26th annual ACM symposium on User interface software and technology (UIST '13), 2013.

2. Valentin Heun et al. Smarter objects: using AR technology to program physical objects and their interactions. In CHI '13 Extended Abstracts on Human Factors in Computing Systems (CHI EA '13), 2013

3. Roberto Manduchi, James Coughlan. (Computer) vision without sight. ACM Communications, Volume 55, Issue 1, Pages 96-104, January 2012

4. Steve Mann. Continuous lifelong capture of personal experience with EyeTap. In Proceedings of the the 1st ACM workshop on Continuous archival and retrieval of personal experiences, (CAPRE), 2004.

5. Gabor S ´ or¨ os, Florian Daiber, and Tomer Weller. ¨ Cyclo: a personal bike coach through the glass. Proceedings of SIGGRAPH Asia 2013 Symposium on Mobile Graphics and Interactive Applications, 2013.

6. Feng Zhou et al. Trends in augmented reality tracking, interaction and display: A review of ten years of ISMAR. In Proceedings of the 7th IEEE/ACM International Symposium on Mixed and Augmented Reality, 2008

7. Thomas O. Loos P. Nüttgens, M.: Hybride Wertschöpfung - Mobile Anwendungssysteme für effiziente Dienstleistungsproduktivität im technischen Kundendienst. Springer, Berlin, Heidelberg (2010).

8. http://www.catwig.com/ google-glass-teardown/ teardown/ glass-clearshade-isometric.jpg
9. http://www.dailymail.co.uk/ sciencetech/ article-2306382/

10. http://www.brueckner.com/en/ brueckner-servtec/ services/ remote-services/ remote-service-tools/

11. http://www.techradar.com/ reviews/ gadgets/ recon-instruments-mod-live-hud-1141185/ review

12. http://www.glassappsource.com/castar 13. http://www.gizmag.com/ oculus-rift-hands-on-2014/ 30396.

14. https://bit.ly/3ismAkB.

15.https://www.researchgate.net/publication/325406206_Interaction_Methods_for_Smart_Glasses_A_Survey

16. https://www.thehomehacksdiy.com/the-pros-and-cons-of-smart-glass/