Augmented Life in the Public Sphere:

A Case Study of Google Glass, Google Cardboard, and Google Now

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A research paper submitted to the University of Dublin,
in partial fulfilment of the requirements for the degree of
Master of Science, Interactive Digital Media

2015

Declaration

I declare that the work described in this research paper is, except where otherwise stated, entirely my own work and has not been submitted as an exercise for a degree at this or any other university.

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Acknowledgements

I would like to thank my research supervisor Asst. Prof. Glenn Strong for his patient guidance, enthusiastic encouragement and useful critique of this research. I would also like to thank my mother, Noreen; grandparents, William and Patricia; and girlfriend, Louise for all their love and support. A special thanks also to my friend Edward O'Dwyer for his attention to detail in reviewing this work.

Abstract

This thesis will endeavour to answer the question of how the public sphere interacts and limits technological advancement and how it has shaped future products similar to Google Glass, Google Cardboard and Google Now. More specifically, this thesis aims to examine how the public sphere has influenced and limited Google. With Glass eventually being relinquished as a failed project, how has Cardboard proved that the private sphere is best suited to advanced technologies, and how does the public sphere continue to conflict with Google Now?

What, in a larger context, does this analysis expose? It exhibits the sociologically structured phenomenon of the public sphere, how it applies to the future of technological advancement, and points of contention between the public sphere and technology that must be resolved. Furthermore, it establishes a gulf in reasoning in the development of technology, often eschewing utility in favour of unrealistic perceived necessities of the public, while concurrently being limited by the technology available. The public sphere represents a structure of the subconscious of a unified mass and therefore establishes a formulaic approach to events that are seen as circumstantial.

A quantitative study, for the purposes of this thesis would result in enormous amounts of data, far beyond the scope of the question at hand. For this reason, a qualitative study of the public sphere's impact on Google Glass, Cardboard, and Now will be performed. Using a framework developed from the literature review, four key elements will be applied to analyse the question at hand: collectivity and exclusion; scandal; privacy; and publicity.

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Chapter 1

Introduction

1.1- Introduction

Opportunities to augment the world, and our lives, abound in today's technological landscape, with companies clamouring to offer new methods with which to fuse technology with everyday actions often blurring the line between novelty and necessity, convenience and infraction. Technology is now seen as an immediate threat through the dehumanising nature of the development of digital devices, and how they affect us, our culture, and our society (Pedersen, 2013). This thesis will aim to explore two main avenues of augmentation offered by Google: Mixed Reality (MR) devices, and Intelligent Personal Assistants (IPAs). Google, a company whose mission statement, to "organise the world's information and make it universally accessible" (Google, 2015), has led it to strain the boundaries of accepted privacy protocols offers an opportunity to examine how the public sphere has responded to these attempts to invade the private sphere by fusing reality and technology.

This thesis will endeavour to answer the question of how the public sphere interacts and limits technological advancement and how it has shaped future products similar to Google Glass, Google Cardboard and Google Now. More specifically, this thesis aims to examine how the public sphere has influenced and limited Google. With Glass eventually being relinquished as a failed project, how has Cardboard proved that the private sphere is best suited to advanced technologies, and how does the public sphere continue to conflict with Google Now?

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1.2- Methodology

A quantitative study, for the purposes of this thesis would result in enormous amounts of data, far beyond the scope of the question at hand. For this reason, a qualitative study of the public sphere's impact on Google Glass, Cardboard, and Now will be performed.

To begin with, Chapter 2 will introduce the topics at hand. The public sphere will be introduced, giving a brief outline of Habermasian theory and its context. Following this, the concept of Mixed Reality (MR) will be discussed in order to frame the introduction of Glass and Cardboard. Google Now will be introduced in a similar fashion as Glass and Cardboard, with an outline of the development process behind them, and any salient points beyond that being discussed.

In Chapter 3, scholarly articles, and the works of Habermas (1991), Adut (2012), Arendt (1998), Asen (2002), and Bohman (2008) will be used to develop the framework for the qualitative study. In order to effectively create such a framework as can be applied to modern society, theorists such as Arendt and Habermas will be used to ground the later exposition of modern theorists, such as Adut (2012), Asen (2002) and Bohman (2008), among others. This study will expose four main avenues of analysis: collectivity and exclusion; scandal; privacy; and publicity, in that order.

In Chapter 4, an analysis and discussion of Glass, Cardboard, and Now will commence, with online forums and the media, as a facet of the public sphere, offering an insight into public reaction and gauging publicity (Ku, 1998). The framework developed in Chapter 3, the four pertinent aspects extracted from public sphere theory, will be applied, and discussed. By applying this hypothesised framework, the key questions raised in the introduction will be answered and discussed.

Following the analysis and discussion, Chapter 5 will lead this thesis to the conclusion that the public sphere caused the downfall of Glass, the retreat by Google to the private sphere with Cardboard, and to continually push the public sphere through trusted pre-existing technology, with Now. The overall implications will be addressed and the future issues of the relationship between technology and the public sphere raised. The framework developed upon in this thesis, should be seen as exactly that, with a quantitative study being needed in a further analysis of the question.

Chapter 2

Google and the Public Sphere

2.1- The Public Sphere

To frame this investigation, a specific platform of the public was chosen in order to best extrapolate the issues and return a sound conclusion, this platform was the public sphere. The term "the public sphere", it is suggested, encompasses a realm of society in which something approaching public opinion can be formed, as Habermas (2010) hypothesises. Habermas continues in this discourse, specifying that a portion of the public sphere comes into being in every conversation in which private individuals assemble to form a public body, simultaneously working as a metaxical space between labour and economics. Jürgen Habermas's theories on the public sphere, while antiquated by the pace of the evolution of social interaction brought about by the digital age, still acts as a cornerstone to many modern theories or a basis for contention for others, such as Mah (2000). In either regard, its relevance to this discourse is without doubt. While most famous for his theories on communicative rationality, his theory of the public sphere rediscovered by scholars in 1989, when it was translated from German, and has since generated a continued academic discussion on the topic (Adut, 2012). In Habermas's *The Transformation of the Public Sphere* (1991), he charts the evolution of the public sphere and as he sees it, its decline. His book, while focused on more political aims, offers an insight into the sociological realm of the public sphere. A point of contention with Habermas's hypothesis is that it pre-dated the internet as we know it, whereby the scope of the public sphere has shifted to a more digitized spectrum with online forums now offering the public bodies his theories were based on. Indeed, while Habermas (1991) considered the differences between the model of the public sphere in the 18th century versus the 20th century, it is possible, though contested, to propose that it changed as drastically with the dawn of the digital age. Thus, while Habermasian theory is useful in this critique, in order to frame the later developments proposed by scholars in recent discussions, the digital age poses far too many questions to be limited by the mid-20th century theory and recent appropriations will be sought to bolster its modern reality.

2.2- Mixed Reality

Mixed Reality (MR) is not the new phenomenon often touted by the media, but rather one that is grounded in antiquity. According to Grau (1998), there has been a traceable aspiration in art to

create an immersive environment, dating back to the second Pompeiian style of late republican Rome, where relative perspective was applied to create an enhanced perception of a room's size. This illusionary method created an immersive 3D environment from which the constituent parts of the ideology behind modern MR can be formed. From late republican Rome to now, MR has become an elusive and multi-faceted technology, which can at times evade definition. Steed (2014) proposes a method to combat this, citing Milgram and Kishino's (1994) simplified representation of a "virtuality continuum". The scale they proposed placed real environments at one end of the spectrum of MR, and Virtual Environments (VE) on the other, with Augmented Reality (AR) and Augmented Virtuality (AV), or Augmented Reality (AR), providing the stepping-stones in between. It is a simple concept, but one which will be utilised in this argument to place two of the products on which we will focus, Google Glass and Google Cardboard. Glass and Cardboard find themselves situated at different points on this spectrum, marking themselves as different products within the same scope and adhering to the same base ideology: to enhance our natural senses and compound technology with life in a symbiosis which enhances or reimagines real experiences (Grau, 1998). However, the question must be posed whether or not society is open to such technological enhancements? Such a grandiose sentiment is prime for investigation, and just so are Google's Glass and Cardboard projects, as examples of the field.

2.3- An Introduction to Glass and "Glassholes"

Google Glass was borne of Google X, a semi-secret facility that is invested in making major technological advancements a reality. In this effort, Google X has reportedly investigated some rather far-fetched concepts, such as a space elevator, and a teleportation device, the later of which was found to defy the laws of physics (Mack, 2014). So, as one can imagine, a working product advanced by a facility such as Google X brought with it much excitement within the technological world, even being listed as one of *Time*'s inventions of the year 2012 (Time Magazine, 2012). Given the general hype and subsequent notoriety it received, a general description of Glass would prove fruitless within the bounds of this thesis. Suffice to say, Glass itself was noticeable enough to have users draw attention upon themselves, and with it the derogatory term "Glassholes", which became synonymous later in its life. The project built enormous hype, being featured on *The Simpsons* (2014), *Vogue Magazine* and *Saturday Night Live*, as well as being worn by Prince Charles, Oprah and Beyoncé among others (Bilton, 2015). The hype continued with fashion designer Diane Von Furstenburg's involvement in some of the designs, and incorporating them into fashion shows. Even the presentation of Glass to the world in 2012 was engorged with fanfare by Sergey Brin, co-founder of Google, who, in a planned event, interrupted the keynote at the Google I/O conference by showing a live stream video by skydivers, being recorded via Google

Glass. How, so, did it transpire that on 15 January 2015, the product was pulled from production after such wide-spread attention? The answer lies in the constriction the public sphere placed on the technology, as will be analysed later.

It is not that Glass lacked innovation or even the technology to make it a success. In Bilton's (2015) article, he reports that the project began with the involvement of Sebastian Thrun, a researcher at Stanford University who was placed at the head of Google X. Thrun then recruited Astro Teller and Babak Parviz, who were seen as experts in the field of wearable computing. Soon after, a split supposedly formed within Google X, with dissent being caused by the function of Glass, whether it should be grounded in fashion, or whether it should be utilitarian, this dissent was solved, as evident by Diane Von Furstenburg's involvement as well as ties to the Luxottica Group, known for their Ray-Ban and Oakley brands (Bilton, 2015). The move to make it appeal to the masses through fashion alienated those who wished for utility, and brought with it the annoyance of the public, many of whom were excluded due to the $1,500 price, as well as the limited launch to Google Explorers (Metz, 2014). Starner's (2013) article contends that, on a more primitive level, Google's main intended selling-point lay in reducing access time to an individual's technology. Starner (2013), a technical lead and manager on Google's Project Glass, cited the goal of incorporating an interface that was an extension of the self, reducing the time between "intention and action", or more specifically, to make it less of an encumbrance than smartphones. While it succeeded in this respect, the backlash in media and forums, and to some extent, early scholarly debate, is palpable. Thus, even with such technological knowledge at Google X's disposal, and an imaginably large budget for research and development, the main feature of Glass's failure can be seen to be emerging, the public sphere.

2.4- Deployment under Development

A key aspect in the analysis of Glass in this thesis lies in its deployment. On launch it was still seen within the Project Glass team as a prototype, as Bilton (2015) states, citing a former employee of Google as his source, but the Google marketing team, spurred by Brin, pushed for its early release. This brought the development process into the public sphere, asking developers and Explorers to embark on a journey of discovery with Google, and opening Google to the backlash of technology reviewers who abhorred the abysmal battery life and bugs (Bilton, 2015). Even with the release of the model which doubled its available RAM to 2GB, many of these early adopters were echoed in their sentiments by Parviz who was quoted as saying: "The big question is, Why on earth would you put something like this on your head?" (Miller, 2013; Swider, 2015) Besides that rather obvious question, the marketing team behind Glass failed to understand the power of the public sphere, and of public opinion. Launching a product such as Glass, at such a tremulous

financial period, while charging exorbitant prices, excluding many of the would-be customers through limited release and its lack of utility, alienating technology aficionados through poor quality design, all while pushing the boundaries of acceptable public technology created a petri dish for the purposes of this study. The media and internet forums took flight with the tumultuous destiny that was to befall Glass. The camera installed on Glass, capable of recording 720p resolution videos, became a fulcrum about which debate began to revolve about privacy and wearable technology. Technology review websites began to digest Glass as it really was, once the novelty wore off (Honan, 2013; Schuster, 2014; Gibbs, 2014), pointing out the many flaws to the public, whose attention was taken by, firstly, the marketing campaign, and then by Brin's involvement in Glass, bringing with it scandal. This compounded all of the issues of Glass into a singular scope which was deconstructed by the public sphere, bringing its downfall.

Beta testing a product with as much hype as Glass had produced, while linking itself to major corporations and being spear-headed by Brin gave the public sphere an opportunity to display its ability to limit a large NGO's power, heralding the dawn of the regaining of strength by the public sphere, as Habermas once hoped. Teller later admitted, in a keynote address at *South by Southwest* earlier this year that, in his view, the project had failed due to negative publicity (Johnson, 2015). He reaffirmed his belief that releasing the product as a prototype was the right thing to do, however he cited bad marketing as the issue in not downplaying the reality of the device (Johnson, 2015). Thus, the public sphere had one of the most well documented impacts in restricting technology in recent years in Glass's failure, with Google moving instead to keeping MR in the private sphere, with Cardboard.

2.5- Cardboard

Google Cardboard was released in 2014, and profiled an incredible divergence from Glass within the scope of MR. While entirely different products within their own right, their existence is co-dependent in that the debate created by Glass and future it offered in MR, granted Cardboard a platform from which to evolve. Cardboard itself is a DIY VR wearable device, which works in tandem with a smartphone, allowing users to download apps designed specifically for the device and making use of the powerful technology already available in smartphones. Most apps are free to download, and if one wishes, the schematics for Cardboard can be printed, allowing you to assemble it entirely free. Otherwise, kits are available for home assembly generally at a price of $10. This low-key, low-cost, and completely open device places it in direct contrast to Glass, the only other MR headset released by Google. From its onset, it suffered from the same issue as Glass, in its lack of utility, however it was not marketed in the same way Glass was, with its

website carrying the tag line: “Experience virtual reality in a simple, fun, and affordable way.” (Google.com, 2015) Glass, as one of the first, and most publicised, advancements of wearable technology suffered from many issues, key among them its hype and publicity, Cardboard on the other hand came in the wake of Glass, the Durovis Dive, and the Oculus Rift. It was a much quieter affair when showcased at Google’s I/O conference last year; there were no skydivers and no drama. It set in motion the steady release of a product which received generally favourable reviews (Dashevsky, 2015; Lee, 2014; Prasuethsut, 2015), living up to its creed to provide an immersive experience “for everyone” (Google, 2015).

Cardboard’s inception came because of Andrew Nartker, who is now head of Google’s Cardboard division. He was cited as explaining the early development process as being borne of a passion project with the ethos “VR for everyone” (Lee, 2014). It was not intended as a mass release product, aimed at hobbyists and enthusiasts instead, and the lack of ambivalence in its design and development perhaps plays a part in the positive reception it has achieved. Post-release, Cardboard is being developed in the way that Google had once hoped Glass could be. At release, apps such as Google Maps, and the chronicling of a Paul McCartney concert displayed the simple power of Cardboard as a novelty, recently however, Vice News has released an app through which users may view world events in an immersive way (Steel, 2015). The first VR experience they offer is the Millions March protest in New York, filmed from the centre of the crowd and offering an experience far beyond conventional methods of news reporting (Steel, 2015). It is an example of the realistic uses of MR to the public and is the first step in a long path of revealing the utility of Cardboard, which at first seemed so limited. The availability of the device, the use of technology trusted by the public, and the advent of utility offers a more tangible product to the public, and one that has thus far remained under the radar of public ire.

2.6- Google Now

Just as with Glass and Cardboard, Google Now, an IPA not overly dissimilar to Apple’s Siri, aims to augment or enhance daily life. By synchronising data into a single utilitarian application it synthesises information from the calendar, emails, text messages, and Google’s search engine to create an interface that can allow one to decompartmentalise the aspects of an individual’s life and offer useful suggestions on ways to augment experiences, such as performances in local theatres based on your web searches. Designed to work in tandem with Glass, though not doomed to the same fate, it acts as a stepping-stone between both products within this discussion, cultivating a richer analysis of the public sphere’s reaction to Google, and reinforcing the ongoing issues technology forces upon the public sphere.

The power of Now lies in its use of personal data, utilising everything it can garner from your Google account, smartphone usage, and other Google products to aggregate the information and organise your life (Hill, 2012). In January 2012, Google unified its privacy policies, amalgamating those from a wide variety of products into one, and within it informing users that it would be collecting data to share among its services in the future (Hachman, 2012). Reportedly, over thirty United States' state attorneys general protested, along with some senators and the Electronic Privacy Information Centre, all of which was dismissed by a federal judge and has since fallen quiet, eventually being settled out of court by the Federal Trade Commission (Hachman, 2012). Six months later, Google Now was unveiled at Google I/O with Android 4.1 "Jellybean", capable of utilising the information users had already agreed to. It operated using "cards" to help manage appointments, local weather, travel information, sports results and nearby points of interest, among many others. It also offered the ability to use voice commands to interact with it, much like Glass, with which it was designed to interact, and was named *Popular Science*'s 'Innovation of the Year 2012' for its advancements (Lee, 2012).

With the release of Glass almost a year later, the public sphere became a more hostile environment to the technological advancements being made by Google, taking the spotlight from Now and allowing it to continue in the same vein since. It has consistently remained a topic for discussion within the public sphere, most recently incorporating the data created by third-party apps (Olivarez-Giles, 2015) and evading the infamy of Glass, yet pushing the boundaries of intimacy and privacy.

Chapter 3

Literature Review

3.1 Origins and Habermasian Theory

While not wishing to enter the foray of political discussion, the applicable tenets of the public sphere as Habermas proposes them, collective spirit and exclusion, are both crucial in the discourse at hand and thus will be extricated. Similarly so are the contentions of Hannah Arendt (1998) on the public and social spheres, which set a new paradigm (Canovan, 1998). Arendt's (1998) work, *The Human Condition*, is an in-depth exploration of the sociological concerns governing its title, from publicity to privacy as well as labour, work, violence and wealth. The book, which lacks a definable argument, acts as a setting for political theory (Canovan, 1998). Rather than espousing any creed, it presents a much more discernible platform from which to disseminate the more political Habermas in the following pages. It also offers a view of the public sphere, as he would later define it, adrift from any political machinations to which it may be linked, thus offering a more unbiased interpretation within the scope of this thesis.

Arendt (1998), her work on the general human condition aside, deftly espouses her theories on the public, and private. She compartmentalises the definition of publicity, placing our most intimate thoughts and feelings in comparison to that which spectators can actually see in public and simultaneously placing a demarcation in what we define as privacy. It is a difficult theory to follow, placing several concepts within the same bracket while concurrently defining them. Published in 1958, the author expresses how storytelling and artistic expression were the most popular current mediums through which privacy could be transformed into publicity. By bringing these emotions, or thoughts, into the public sphere, she contends, are they brought into a reality, but one that is only defined by the reaction of spectators or actors (Arendt, 1998). These sentiments therefore require superficiality in order to be registered as a reality, in-turn creating a critique of the private sphere, which is derived from the public, essentially marking them as symbiotic. Regardless of our intimate feelings, those feelings have already been shaped by the wider public sphere however, as Arendt suggests, this does not necessarily nullify our private thoughts, rather their irrelevancy ensures their continuation in the private sphere.

The private sphere, as Arendt muses, is intrinsically linked to an existential discourse, for it is possible, that an entirely private individual is lacking the publicity that is borne of being seen and heard by others, and therefore lacking a truly human existence. It cannot be said that this author

entirely agrees with those assertions, however, they do propose an interesting insight into what constitutes privacy. Supposing, in our modern world, one were to live in absolute privacy. It is entirely possible that they would go unnoticed, as Arendt hypothesises. It is also possible that through our technology, that individual could be located and, in that instant, their privacy removed through their surveillance. There would be no choice as to whether or not they could maintain the privacy that went before them, as the surveillance has instantaneously incorporated them into the general public. With the growing inexpense of networked surveillance (such as relatively cheap terabyte RAID drives coupled with real-time data-integration software and CCTV) the idea of the isolated individual is growing less realistic (Duncan, 2007). Given that Arendt's hypothetical private being is employed in a much more abstract manner in her work, it still offers an insight into the immense change brought on by the digital age in that, at the time Arendt wrote her piece, there had been no precedent for general surveillance in the absence of CCTV. Now, we cannot avoid surveillance in our everyday lives such that only our homes, and the irrelevancies of intimate thoughts, remain private. I digress, and will return to this point later when examining Glass, Cardboard, and Now within the public sphere.

Arendt (1998) does note the trend towards general surveillance, though not in the scope of our modern reality. Privacy, she continues later on in her book, "lies in the absence of others". The "private man", in the eyes of the public does not appear and so does not exist as he remains irrelevant (Arendt, 1998). This isolation is eroded by mass society, which not only destroys the public realm, but also the private, saving only the "hearth" and "family" to act as an inner sanctuary of privacy. This hearth, or private property, as an extension of wealth into the public realm, means little to the occupants should privacy not be ensured. Perhaps, a tangible possibility into exploring the sense of privacy Arendt is conveying could lie in the feeling of someone committing trespass, when the occupants are away. The general feeling of violation, fear of reoccurrence, and distrust, in the event of such an act highlight our psychological need to sustain this privacy and supports its importance (Maguire, 1980). A fact reinforced in Arendt's book through the example of Greek and Roman slaves not being considered human, as they lacked the private property in which to live a private life (Arendt, 1998).

To talk of the public sphere, in relation to Arendt is to talk of a much more encompassing, global, sphere in antithesis to that of Habermas. Her interpretation is that of a shared space, such as the world itself, baring the hallmarks of a public sphere. The sharing of intimacies, in such a way as described above, relates and separates us, and is hindered only by authorities' inability to nurture such an environment. It is an interesting point, which counters Habermas's (1991) much more secular, partitioned theories in which he characterises the bourgeois public sphere as having three

elements in his "The Basic Blueprint" chapter: 1) the condition of civicness or civility, which essentially encompasses the collective spirit, or orientation, of the public. It also brings with it any bias or preconceived notions as he believes universal objectivity is impossible. 2) The conflation of the public sphere with citizenship, which identifies the public sphere as intrinsically tied to citizenship. 3) The ideal of widespread and egalitarian participation, which envisions the public sphere as an engaged community acting in a given space. These elements, baring the foundations of some of Alexander's (2007) *Civil Sphere* theories, sees the public as a malleable organ of democracy, open to selective involvement but essentially unified through their freedom and acting as a counterbalance to authority, all the while conducted in private. These elements stand true when applied to the bourgeoisie of the eighteenth and nineteenth centuries, but its inevitable degeneration was heralded in the twentieth century by industrial capitalism, mass democracy, the welfare state, and sensationalist media.

Habermas, while inherently political in his treatise, provides a reinterpretation, or development, of many of Arendt's views, with a gulf forming between them mainly with regard to the definition of what constitutes the public sphere, as can be seen above. His exploration of the development of the public sphere, from its non-existence in the Middle Ages (with the monarch, or ruler, acting as the only public person, and all others as spectators) to the bourgeois sphere he presents above, remains outdated. Crucial to the understanding of this section of his book, is his belief that the "bourgeois public sphere may be conceived above all as the sphere of private people come together as a public." (Habermas, 1991) Not as all-encompassing as it sounds, in reality the private individuals he speaks of comprised of well-educated property-owners, thus severely limiting the input of laymen.

It was this input of non-professionals, which, later in his book, blurs the line between the public and private spheres, as he believes, by economic and structural changes. As the phenomenon of the welfare state grew apace with the strength of the middle classes, so too was the private sphere separated from labour. The family unit, lost its ability to support itself, replaced with the need to work for others, and assumed a role of recipient of public welfare, partially deprivatising itself. Thus, with sensationalist media taking a particular role in the refeudalisation of society, whereby the spheres of the state and society once again became intertwined, mass media, as well as large NGOs, have taken steps to manipulate public opinion, and create a public where he believes none exists. His final sentiments lead to a promising avenue with regard to this thesis, with a hope that the public sphere can regain power, as will be examined later with regard to the public sphere's reaction to Google's projects.

To return to the topic at hand, Habermas's (1991) more historicised, overly schematic (as Bloch (2005) puts it) theory was indeed a step away from Carl Schmitt's (2007) vision of society as a fractious force which must remain concreted to authority, or Arendt's (1998) hypotheses on the entirely human relationship to society. Indeed, there are some flaws to this theory, as it presents a difficult manner in which to examine citizenship; it does not differentiate political actors working within the public sphere or influencing, through coercion or otherwise, those within; nor does it account for a great percentage of what can be termed public events; and, like much of the work by public sphere scholars, it ignores the relationship of the spectator to the event (Adut, 2012). However, his theory is one which allows for an examination of the cause of, and result of, public reaction to events.

As this thesis is not focused on any political motivations, it proves more fruitful to exclude the elements of Habermasian theory that are not applicable to this discourse. Therefore, in the interest of a more cogent argument, his insights into the collective spirit of the public, and exclusion forming the basis of a public sphere, are imperative to the understanding of the public sphere and technology. They also form the first elements of the frame work which will be applied.

3.2- Recent Appropriations of Habermasian Theory

As the public sphere has evolved beyond the imaginings of Habermas, and even those of Arendt, it can no longer be thought of as a forum for face-to-face interaction. With the ascension of the internet to the position of the primary form of media and the growth of its many platforms for communication, such as forums and social networking, the public sphere has once again challenge authority (Bohman, 2008). If, indeed, the public sphere is to be considered relevant to democracy and a challenge to authority, as Habermas argues, one of the most influential aspects of the internet must therefore be forums, where speakers can express, argue and respond to their views while allowing others the privilege to do likewise. The internet, as a network–based extension of dialogue, suggests the possibility if re-embedding the public sphere in a new, and potentially larger set of institutions (Bohman, 2008). Thus, an important step in the re-emergence of the public sphere, detached from authority and abiding by the elements proposed by Habermas, can be found in specialised forums (cnet.com; techist.com; xda.com, 2015). These forums offer the opportunity for those educated, or experienced in a certain sector, such as technology, to discuss products, advancements, or issues with products in an engaging manner which is separate, for the most part, from large NGOs. While most forums are open, allowing the general populace to view the discussion or join, rating systems attached to the respective commentators highlight a hierarchy, recreating a slightly maligned class system. Although inclusion is indispensable, extremists can

force their way into such conversations, even with mediation, in such a way that the paradigm of the discussion is altered to suit agendas (Asen, 2002). The existence of closed forums provides an opportunity to not only exclude such problems for the most part, but also to unify both Habermas's theories, and those of Arendt, by fulfilling the criteria espoused by Habermas while concurrently being generated in a global context. As Adut (2012) postulates, and in direct contrast to the assertions of Habermas, "any social exclusion undermines the existence of a public sphere", thus forums offer an almost impeccable balance between the three theorists.

Furthermore, Mah's (2000) argument against the historical interpretation of the public sphere, which introduced the possibility of the sweeping unification of social groups, such as with the bourgeoisie, is that it stands at odds with an empirical reality of conflicting social identities and interests, and that such a mass of unified people would be unerringly unstable. While the arguments are, in general, sound, against the reshaping of Habermas's theory for the use of historians, it highlights the fact that Habermas's (2010) dominant approach does not peruse the possibilities presented by a mass event, such as scandal. As a facet of the public sphere which is incredibly unstable it is an aspect which is overlooked, but was returned to the fore by Adut in his article, *A Theory of the Public Sphere*. He accurately highlights the shortcoming of Habermas's theory with regard to its neglect of what he sees as this "quintessential public event", and generalises how those who take part in it are apparently "self-interested". The link between scandals and citizenship is not one which is easily made as, essentially, scandals are contaminants which divide societies and degrade public morale by unifying large masses in a generally polarised manner. He explains that this shows a sharp discrepancy between participation and spectatorship and cites numerous sources in his claim that it is only the elite who take part as actors in scandals (Adut, 2012). So, while scandal was overlooked by Habermas it can be conceded that his theory left room for such an expansion, as the instability within the masses it creates is spurred by mass media and thus acts as evidence of his exposition. Indeed Ku (1998), among others, notices this point and argues that the media became a sphere of the public. In light of this, perhaps scandal is not the liability for Habermas's theory as Adut postulates. Indeed his momentous effort in delineating the subtle variations of the public sphere is still to be commended in the present day (Bloch, 2005). Instead, it is an event within the public sphere which is ubiquitous and engrossing and which can only be understood through an understanding of publicity and is an extension of such. All of which will prove fruitful later in this discourse when we consider the development of Glass, and the release of Cardboard and Now.

Publicity is a main contributing factor in making the public sphere a sociological issue (Adut, 2012). Indeed Bohman (2008) also contends that a social act only becomes public should two

criteria be met, with the first being nothing new to this discourse, highlighting that, a social act must be directed not only to an indefinite audience, but also must expect a response. Secondly, and more importantly, they must be made in a common and open space for interaction. This mirrors Habermas's own reflection that publicity in this broadest sense is simply "the social space generated by communicative action" (as cited in Bohman, 2008). It can be contended, however, that publicity should not be confused with what is purely communicative. Instead, it is not the serial transmission of information or something being made public, but rather that an event or rhetoric gains attention in a collectivity consisting of strangers who recognise each other as the spectators of the same (Adut, 2012). An event, therefore, such as Google Glass's open development process, as will be scrutinised fully later, was pushed into the public sphere by prompting collective attention.

Even when publicity does not impart new facts, the common knowledge that it generates imparts facticity and unavoidability to the private conscience of each spectator (Adut, 2012). Essentially, the bare truths of the event are cloaked in misinformation and here-say, yet they remain there and are ingrained in what Arendt submitted to be our most precious bastion of privacy, our thoughts. This gossip has the ability to both belittle and pervert the reality, minimising the thoughts of those involved (Warren and Brandeis, 1890). This is reinforced by Asen's (2002) development of the public sphere with a view to the imagination. Imagination in this respect is more closely tied to a unified imagination, or compounded memory, of the public. It is an entirely profound exchange, therefore, and can cause a sharp contrast between the focus and superfluous issues. This disjointed discourse, sociologically constructed through the scaffolding of the public sphere, creates a common interpretation with the spectators, often leading them to a belief in misconstrued or unsubstantiated claims. Negative publicity can thus lead to inaccurate assumptions in the common psyche (if it may be construed as such) of the public, and has proven to be far more difficult to alter these assumptions surrounding negative publicity than positive, after the fact (Adut, 2012). As Asen (2002) states, "some images linger in the public imagination", a conclusion echoed by Solove (2002).

Finally, attention, in most cases, begins in a neutral state with publicity acting as a catalyst to drive the focus. Publicity, with a company such as Google in mind, offers competitors and smaller media outlets an opportunity to achieve an improved public standing by successfully intimating a negative perspective on the focus. With Glass, Google painted a rather large target on its back, in many ways, but especially with the publicity that came with the Google's co-founder's, Sergey Brin, close, personal ties to the project. His publicity became intertwined with that of the product, creating a symbiotic amalgamation, offering competitors and opponents of the multi-national

corporation, and Brin, an opportunity to push public opinion through the media, as one facet of the public sphere, and through forums. Two more elements of the framework are seen in these recent developments of Habermasian theory in publicity and scandal. This will be examined in full later, but it does lead us toward our final avenue of inspection with regard to applicable social phenomena, and one that has thus far been given a rudimentary examination, privacy.

3.3- Privacy and Technology

The symbiotic nature with which privacy is tied to the earlier theories examined places it in high importance and deems it necessary to develop on it from a less philosophical point of view, and from a more pragmatic one. Privacy as a concept is one that is difficult to define, as Solove's (2002) rather wordy article attempts to achieve. He admits in his research that the many conflictions presented by scholars on the topic, as well as by lawmakers, have led to an ambivalence, in some respects, and an inability to succinctly tie all aspects of such a difficult concept together (Solove, 2002). Indeed, this thesis will not attempt to further the scholarly debate, but rather will draw on some components that prove most relevant to technology's impact on privacy. In so doing, a brief example will be made of Solove's in-depth article to define what he has discerned to be the key traditional points of privacy in the light of modern law, and theory.

John Locke's (1980) own *Second Treatise of Government* placed a value on privacy which can be found in his beliefs on the transformation of personal labour to property and sets a good benchmark for which to state that information, created by an individual, is therefore the property of the individual. Information protection alone cannot define privacy; in fact, Solove (2002) proposes six heading under which he scrutinises the many facets of the concept. He cites the right to be "let alone", limited access to the self, secrecy, personhood, and intimacy all as interdependent fragments of the same body. The right to be let alone is taken from Samuel Warren and Louis Brandeis's (1890) article, *The Right to Privacy*, which Solove underlines as a foundation for privacy law, then and now. Within it, they note the value of privacy in terms of the then recent advent of instantaneous photography and "newspaper enterprise", highlighting the fact that technology has long been at odds with privacy, and in a cogent manner, conveying the belief that every individual be granted the right to their "thoughts, sentiments and emotions", or being "let alone" (Warren and Brandeis, 1890).

Tied to the thought of being let alone, is limiting access to the self, in that the state and corporations must be cognisant of the individual's desire to conceal themselves and be separate from others. It is not to be equated to solitude, but rather is an embracement of freedom from government interference and from intrusions by the press and media. It includes privacy from watching,

utilising or invading the private sphere of an individual and is separated from the conceptualisation of privacy as a form of secrecy in that secrecy is solely confined to the concealment of information by an individual (Solove, 2002). Secrecy is then obviously tied to control over one's information, with such information easily transmitted, it cannot be unseen by another. Thus, while intellectual property law is often at the fore in protecting the more lucrative ideas we may have, it does not extend to general information, which may be passed about an individual, with defamation being unable to cope with the complexity of such personal information (Solove, 2002). This personal information is, essentially, a record of a segment of a person's being which is associated with personhood. Personhood, as Solove (2002) describes it, pertains to the individual's interest in "becoming, being, and remaining a person", effectively conceptualising it as the state's non-interference in decisions which define the person, or personality. Key to this issue is the role of an anti-totalitarian state, which allows for the expression and growth of its citizens.

Intimacy is considered in light of the fact that one may divulge information to certain individuals, and thus by that relationship, conclusions can be drawn, or information coercively gained. While elements of Solove's erudition ties succinctly with the theories of the public sphere, his study of intimacy as a key contribution ties most strongly with those of Arendt. It goes beyond Arendt's musings, stating that intimate relationships are as important as our intimate thoughts. The self-disclosure that can occur only away from the masses, offers the possibility of uniting all elements, which Solove espouses prior to this, in the fact that it draws on the need to reflect on oneself, limit information and ensure the secrecy of the information being passed.

Privacy, within the realm of social interaction, is indeed a litmus test of current feelings on privacy. The fear which new technologies have brought with them is not a new precedent, Fried (1968) wrote an article which expressed his fear at the time, that technology was outpacing privacy with the advent of "electronic devices to be worn on one's person which emit signals permitting one's exact location to be determined". He was not alone, Regan (1986) echoes his sentiments in light of government department's then recent computerisation, citing that just over 2 billion records had been computerised, allowing the information to be manipulated and analysed. One can imagine their abhorrence at the information we pass to unknown benefactors in modern day society, but they are only two examples of the ongoing discrepancies between privacy and technology.

After wading through the mire of the public and private spheres, what is there to be gained by applying these theories to Glass, Now, and Cardboard? This author sees four main elements which transpire on reflection of the above as key to applying these theories: Habermasian theory on the collective spirit of the public, mass media, and authority; scandal and the instability of the public;

publicity; and finally privacy, which also pertains to intimacy. Habermasian theory, as shown, is largely outdated but as a benchmark does provide essential aspects in his exploration of roles in the public sphere in the role of the media, exclusion, and authority. Scandal, provides another facet of consideration in that it acts as a fulcrum about which public opinion may turn, thus implying its instability. Publicity acts as a gauge with which to review the events and actions of actors, the nett results of which bare a synthesis of issues. Finally, privacy and intimacy act as an aspect of the public sphere that exhibits the general emotions of the public, proving to be the limiting factor in technology's expansion.

Chapter 4

The Interaction of the Public Sphere, Glass, Now & Cardboard

4.1- Applying Habermasian Theory

The three elements Habermas espouses in his chapter, "The Basic Blue Print", are less applicable now than they were in the 20th century, or on the bourgeoisie. Of the three, the condition of civicness or civility is one that has weathered time the best. The implications of a collective spirit, to imagine it as an a living organism which maintains a cognisance of events beyond their duration, on Glass are that, with its withdrawal, the civic nature of the public sphere will remember the mistakes made by Google, thence creating a continuum of discordance in its target market. Articles continue to proliferate on the subject of Glass, four months after its death (Scholz, 2015), making any further iterations much more difficult to market. The future of Glass aside, the civic cognisance generated by the whole affair, threw the public sphere back into relief with the private.

Glass bolstered this Habermasian view of the public sphere, excluding many to the opportunity of owning or using the device through their explorer scheme. At the time, it seemed a positive approach to such an advanced product, allowing those who were proponents of Google, or tech savvy reviewers and developers, the opportunity to offer feedback. It also recreated the exclusion of Habermasian theory, whereby education and ownership, came to be limiting factors in the discourse once again. While it failed, as Teller admitted, it failed mainly due to the public backlash of the marketing campaign. The public sphere Google itself had created revolted at the reality of the device that was touted as a huge advancement and one of *Time* magazine's inventions of 2012. The many issues of the device were not only returned as feedback for Google, but also to the internet where mixed reviews abounded, exhibited by *EndGadget.com*'s (2015) collection of reviews from both users and critics. This also fell in with Habermas's third blueprint, of the public sphere acting as an engaged community within a given space. In this, Google created the sphere and engaged the community through marketing, while the internet and media became the given space. Admittedly, it does not entirely abide by all of Habermasian theory, but if allowed to replace the state with a large NGO such as Google, it does develop upon the open-ended conclusion of his book, whereby authority is limited by the public in a replica of the conditions he found in bourgeois society. Thus showing a re-emergence of the public sphere as a powerful entity within itself.

Forums act as one of the limitations to applying Habermasian theory to the modern landscape. He postulated that public opinion took the shape of either manipulative opinion, or critical. Critical

publicity, he believed, was the only true from and was found in the debates of the bourgeois public sphere, and has since disappeared to be replaced by the manipulative publicity portrayed by the media. Contrary to his views, forums now offer an opportunity to discuss issues on a global scale, often swaying those who stand as spectators. As such, they have had a part to play in the continued debate on Now. *AndroidCentral* (2015) presents a discussion on Google Now by android users, who highlight several concerns with the software, including the tracking of their location, their trust of Google, and various conspiracies. For the most part the discussion is not technologically fruitful though it does expose an undercurrent of fear among the commentators, and of wilful ignorance of Google's actual terms of use policies. The debate tapers off in March 2013, just prior to the release of Glass. While it is entirely possible this could be coincidental, the sharp reaction to Glass and intense debate it generated cannot be ignored. In particular, *Techist.com*, a forum for those who are technologically inclined, offered a glimpse into this public sphere and their reactions to Glass. While much of the discussion is positive, praising the concept, they also highlight a reticence to be seen in public with it. Other factors discussed in the thread include the exorbitant price, poor aesthetic design, and overall size (Techist.com, 2015). The price was the major issue, with the self-stated developers citing the fact that they couldn't develop for it if they couldn't afford it (Techist.com, 2015). Another forum, *cnet.com* held a poll and discussion on Glass, with 55% voting that they would not be interested in buying the device, 33% voting that they would, and 12% undecided (cnet.com, 2015). The discussion highlighted many of the same issues as in the *Techist.com* forum, with more criticism focusing on the lack of utility (cnet.com, 2015). This conflicts with the main aim of the general release by Google, which urged developers to push Glass into new frontiers. By limiting the developers, or at least those who commented in the forums, Google limited the effect of the general release (Techist.com, 2015).

Finally, the impact of mass media, seen as an intrusion to Habermas by manipulating the public, is negated by the creation of the excluded public sphere by Google. With the opening of Glass to all who were interested, the developments of Habermasian theory, and it appropriations, come to the fore as seclusion is no longer a consideration (baring the economic exclusions of the price), and the role of mass media becomes more apparent. This also falls true for Cardboard. While it cannot be stated that Google actively moved to stem the impact of a reinvigorated public sphere, Cardboard exhibited the continued, quieter, advancement of technology that has historically seen it overstep the bounds of public acceptance. In keeping with its auspicious beginnings, Cardboard's openness detached it from Habermasian theory, going beyond the general release of Glass, and any other VR device, and offering something free. There are several possible answers as to why, however, an extraneous factor could be in the acclimatising of the public to the idea of

VR, while rebuilding a positive public image within the field. The many differences between Glass, and Cardboard, justifies such a conclusion, as no privacy, or scandal could feasibly transpire from a free, device which operated using a trusted technology. With Glass 2.0 a possibility in the future, and Google losing ground to competitors in the growing wearable technology sector, Cardboard offered the opportunity for the company to maintain a presence, while simultaneously rebuilding public opinion. It also spurred the continued involvement of developers in the software through its SDK releases (Lee, 2014).

4.2- Scandal

Mah (2000) argued that theories, which applied Habermasian aspects to unifying social strata, could only be unstable in nature. It can be agreed then, that in tying this to Adut's (2012) postulation that exclusion undermines the public sphere, scandal is the common denominator in instability. As a modern development of Habermas's theory, which overlooked scandal, Adut proposed that scandal, as a mass event can act as a segment of the public sphere, simultaneously introducing the role of the spectator to this discourse. In the following analysis Glass will be primarily inspected as, thus far, neither Cardboard nor Now have been embroiled in any scandal or been linked to any of the elite of Google, possibly for that reason.

The role of Sergey Brin in the development of Glass brought with it the scrutiny of public attention. The idea that the co-founder of Google was taking a hands-on role encouraged publicity, improving the profile of Glass, and showing the belief Google placed in the product. However, as it became apparent, it ended being a contributing factor to Glass's failure. Brin's affair with colleague Amanda Rosenberg was returned to the public's attention following a *Vanity Fair* article (Grigoriadis, 2014). It had surfaced a year earlier, but its re-emergence prompted an onslaught of criticism from mass media outlets and tabloids, with *The Daily Mail* (Anon, 2014), *The Business Insider* (Yarrow, 2014) and *NY Daily News* (Goldstein, 2014) among the many who reported on the affair.

While the sources may be mainly sensationalist in their cultivation of the story, one common aspect emerged which placed Rosenberg as being involved with another high-level Google employee at the time of the affair. Brin subsequently left his wife, with Rosenberg leaving her partner, however rumours circulated of a spat between Brin and current Google C.E.O. Larry Page due to the affair. Exacerbating the situation was the tension it likely caused between Brin and his wife's sister, who was, and remains, the director of YouTube (Yarrow, 2014). This internal strife presented a fractious image of Google, especially its elite, spurred by the scandal that failed to be silenced. The scandal erupted in the early months following Glass's release and continued through

for the following year, and shook consumer trust as well as the integrity of the company (Yarrow, 2014). The involvement of the elite of Google in the controversy reinforced Adut's theory, and revealed the spectators he hypothesised about to be an enormous mass, unified in their spectatorship, but unstable in the manner in which they processed the issue. As for its effect on Glass, it became apparent that the negative publicity further aggravated the problems poor marketing had begun. The media, as Ku (1998) argued, can be interpreted as a facet of the public sphere and thus it can be said that it represented public consensus on the issue by its continued publication. In this way, it can be stated that the yearlong involvement of the press in exposing the affair reflected the level of public interest at hand, strengthening the public sphere.

4.3- Privacy

The scandal involving those in the upper echelon of Google presents a myriad of questions regarding the privacy of those involved, but more importantly raises the issue within the context of this thesis. A major point of contention, and much debate, with Glass was the inclusion of a camera which, while it could only record ten seconds of HD video, could also transmit the video feed to, what Google termed, a "Hangout", in keeping with the Google+ colloquialisms. To combat discomfort others feel when conversing with Glass users, a red light was fitted which illuminates when the camera is active. Regardless of the presence of such a light, having a private conversation within the presence of someone with a sophisticated camera mounted on their person left many either annoyed or distressed at the invasion of their privacy. Many reviewers noted the discomfort they felt when either talking to someone who wore the device, or noticed the discomfort of those they spoke to while they wore it (Marshall, 2013; Arthur, 2013; Hong, 2013; Pogue, 2013).

Thus, the issue for Google was that the camera was instrumental to the little utility Glass had maintained from GoogleX, and was the main selling point Brin had shown at its first demonstration. For the public, it brought the issue of privacy to the fore, a discussion which had begun with Google Now a year earlier. Privacy for Google revolved around a privacy policy, which proved more difficult for the public to trust (Arthur, 2013). Issues such as face recognition software, targeted advertising, and data collection were brought to the attention of the public by the media, and the possible ramifications inflated (Pogue, 2013). There were kernels of truth, with the device open to developers, face recognition and data collection were possible through the device, with the information undoubtedly invaluable to companies who could see what attracted consumers to certain products (Arthur, 2013). It was not only the issues conflated by the media which impacted on the take-up of Glass, although the civic cognisance discussed earlier could have increased the impact, but also the physical reality of the device in public. Those who saw the

device and felt uncomfortable, or disliked the aesthetics could be dissuaded from purchasing it due to their first-hand experience (Marshall, 2013). Essentially, Google's worst enemy was the combination of civic memory, coupled with the media and its own design.

How so did Glass threaten privacy to such an extent? Mostly, it was through what the public perceived as a threat, the front-facing camera incorporated into the device (Marshall, 2013). If we return to Arendt (1998), it appears she was correct in her hypothesis on the advancement of surveillance. Her sentiments on privacy lying in the absence of others being tied to the rise of mass society can indeed be seen echoing in the reality of what posed the threat of having millions of mobile cameras within society, charting every aspect of our lives, even within our homes. Steve Mann (2012), a professor who has spent thirty-five years wearing his own augmented reality headsets, relates the idea of having so many mobile cameras as performing sousveillance. Not only will the authorities be recording us, but we in turn will be recording them. This would have a major impact in the manner in which we carry out our daily tasks, creating a perceived threat to the public.

An example of its impact even within the private sphere is found in a study, brought to the attention of the public, involving a man who suffered from an addiction to Glass, going through withdrawal from the device as he underwent therapy (Yung et al., 2014). The patient had begun envisioning his dreams through the device, and was seen making an involuntary movement of his right hand to his "temple area and tapping it with his forefinger." (Yung et al., 2014) The effects of Glass's long-term use on this patient were substantial, even though he had been only using it for two months prior, and exhibits the level of integration into daily life the device could have and its penetration into the private sphere.

The perceived threat of such issues were compounded by the loss of protection offered by the irrelevant memories of individuals, with Glass being used for surveillance, or in tandem with facial recognition software (Wagner, 2013). For example, the strangers who surround an individual in a restaurant will be lost to memory, or simply remain an irrelevant thought not passed to anyone else. The idea of Glass capturing the images of strangers made the irrelevancy impossible, placing those classed as "strangers" in a location, at a given time, without their consent. Regardless of the reality of what Glass could actually do, the perception it gave the public was much different.

Glass quite obviously intruded on the right to be let alone, as Solove (2002) proposed, it simply existed through the choice of those surrounding us and therefore the right to be let alone was removed without agreement. This impacted the ability for those surrounding the user to limit access to their selves, and avoid detection by unknown third-parties. Secrecy was also removed,

if examined within the context of protecting one's personal information. With both Glass and Now, it was possible that the user of the device could have their shopping habits tracked, bank statements analysed, or even the information belonging to others which may pass by Glass's line of sight. With the information being recorded, it passes beyond the bounds of human memory, posing the threat of theft of information, duplication, or misrepresentation, the possibilities are almost limitless. This would have a negative impact on the idea of personhood, with the fear of such repercussions as might arise from the digital transmission of anything in the public sphere inhibiting the individual's interest in "being, and remaining a person" (Solove, 2002).

Google Now has also suffered from a bad reaction from the public sphere, though not to the same extent as Glass. Now, released a year prior to Glass, was met immediately by trepidation in the media. To refer back to Arendt's (1998) private individual, it was immediately seen as software which would impinge on our privacy, removing the choice of being "let alone". One article made reference to "the uncanny valley" with regard to the software, citing it as a step too far beyond the comfort zone (Wortham, 2012). The reference to the uncanny is a hark back to Sigmund Freud's 1919 essay, *The Uncanny*, in which he deliberates on the factors which can lead to uncomfortable feelings. Wortham (2012) uses the theory, which has since been developed upon Freud's original, and explores the discomfort felt by people in the face of robotics and graphics that overstep familiarity. It is an apt association to make, despite Now recreating no tangible physical elements of the uncanny, the sheer knowledge Google possesses, and showcases, in the software does offer an uncanny feeling. As previously mentioned with regard to forum discussions earlier, this uncanny feeling is echoed by the public. A source of fear for many was the reality of the different Google products combining their information before them, exhibiting the level of integration they had already given Google to their lives (Wortham, 2012; Hachman, 2012; Crowe & Al-Hamdani, 2013).

Despite the obvious privacy concerns that surrounded Now, it fell in with a larger fear of insecurity with smartphones (Mayer, 2013). Our reliance on smartphones, with not only our most intimate relationships but also much of our lives being co-ordinated through them, proves privacy is of utmost concern. Or, at least it should be. As a technology which has steadily evolved in the eyes of the public, a sense of public trust has grown with it, even with reported privacy cases being publicised (Mayer, 2013). In 2013, as an example of major points on privacy in a given year, HTC was reprimanded for not securing the software in millions of its smartphones, while articles proliferated on the issue, exhibiting how to protect your privacy on your mobile (Mayer, 2013; Wood, 2014). Now continues to slowly improve relations with the public as Glass, as a new and untrusted technology failed to lull possible customers into a sense of security. A cognisance of

such privacy issues in the technology sector could have driven Google to use a different tact with Cardboard. The possible privacy ramifications of Cardboard's reliance on smartphones depends entirely on the apps that are released, to date none require more information beyond location and usage. In the future, it is possible that privacy concerns arise; however, Google has successfully sidestepped the issue of privacy by relying on the technology of others, the Google Nexus series aside.

Intimacy is the single most important aspect concerning Google Glass and its impact on the public sphere. While the discomfort of being recorded can all be attributed to the reasons analysed above, the public backlash against the invasion of privacy fell mainly to the removal of intimacy. The act of conversing and passing thoughts from the sanctity of our private consciousness to another was eliminated with Glass. The thought of divulging private information when faced with a camera, attached to what was touted as an everyday device, brings a discomfort which is reinforced by Solove's advancement on Arendt's proposal that intimate relationships are as innately important as our thoughts. The public may be comfortable with smartphones, although it must be reiterated that smartphones, and technology in general, have asked similar queries of our privacy in the past (Fried, 1968; Regan, 1986), however, Glass placed a camera in such an obvious place that it could not be ignored. The *New York Times* reported an incident that occurred at a Silicon Valley event, in which two men, sitting behind a woman wearing Glass, made a sexist remark (Streitfeld, 2013). She heard and responded by turning, taking a photo using Glass, and posting it on Twitter. One of the men was recognised and subsequently fired, with critics targeting the woman involved for her disregard for privacy and in causing someone to lose their job (Streitfeld, 2013). The woman was then dismissed for her part in the ruckus which ensued and was later quoted as posting on Twitter that she couldn't have imagined how the issue "would have exploded into the public consciousness" (Streitfeld, 2013).

Thus, Glass penetrated the realm of the public sphere and the fear of weakening the private sphere brought with it the anxiety of the public. This anxiety is compounded by the lack of experience the public has with wearable computers (Hong, 2013) and can be seen manifested in the attack on a woman wearing Glass in San Francisco. It reportedly occurred when the woman, who was in a restaurant, was confronted by other patrons who were upset at the possibility of being recorded, and had Glass forcibly taken from her by a man (Vazquez, 2014; Anon, 2014). The reliability of the account aside, the reality of Glass's impact on the public sphere was very real, as was the reaction to it. Thus causing its removal from production.

The public has been more exposed to wearable technology since Glass's release, through the Oculus Rift and Apple Watch, as well as the news of upcoming projects such as Gear VR by Samsung, and Project Morpheus, by Sony. Continuing in this acclimatisation, Cardboard plays a role in allowing the public to freely use the device in the comfort of their own home. It is not a device designed for use every day, nor in public. Instead, Cardboard is entertainment to be enjoyed in the privacy of our homes or among friends. Thus, it does not impede others their right to be let alone, nor does it infringe on any of the other aspects of privacy raised above. It does not cause intrusion, fear, or discomfort in others, and from my personal use, it simply inspires wonder and excitement. Watching another use the device, seeing their private reactions, evokes a sense of intrigue and curiosity, entirely natural sentiments when faced with new technology, and vastly different from the reactions to those wearing Glass. The use of Glass in the public sphere opened the users to criticism, embarrassment, and as shown, even harassment. Cardboard relies on the private sphere, away from the reproach of others, allowing users to test the device, and familiarise themselves with MR, potentially, for free. Google's competitors, possibly also learning lessons from Glass, or simply seeing releasing a technology such as Glass in the public sphere as a bad decision, have also sought the safety of the private sphere.

4.4- Publicity

While it is fair to say that Habermasian theory, scandal and privacy all have a significant role to play in how the public sphere, publicity, as Adut (2012) postulated, is the main contributing factor in making the sphere a sociological factor. It offers a synthesis of the factors of the public sphere, compounding them to affect public opinion. The publicity garnered by Google Now began a public narrative on Google which continued until the removal of Glass from the market. Public opinion carried with it a wariness of the technology, but unlike Cardboard and Glass, it was shipped with Android 4.1, giving little option to Android customers apart from ignoring the application. As such, reviews of the product are rare, with media, as shown earlier, providing the bulk of public discussion. It created a very different public sphere than that which was created by Glass. Glass's open development through the explorer scheme pushed Glass into the realm of public sphere by prompting such mass attention, and that the Habermasian sphere, along with the larger sphere alluded to by Arendt, Adut and Bohman were all coaxed into existence as a result of the open development of a prototype.

Publicity, as a collectivity of strangers who recognise each other as spectators of the same event, leads to misconceptions and misinterpretations. With the above charting of Glass's fortunes with scandal, media coverage, forum discussions, and public incidents, one can endeavour to expose

how the public imagination was affected. The images which lingered in the public consciousness from the discussion on Now, and that began as positive, were constantly undermined by the negative publicity Google received, and continued to receive with Glass. From Brin's scandal, to the media reporting on a man with an addiction to Glass (Ghorayshi, 2014), to reports of headaches associated with its use (Swider, 2014) these negative images remained in the collective imagination of the public leading to a more biased belief in what the media reported. It was incredibly difficult for Google to recover from such bad publicity, with the common fear of the public of having their respective private spheres encroached upon persisting, as negative publicity does (Adut, 2012; Solove, 2002; Asen, 2002). Thus, publicity, as a facet of the public sphere and one that can be easily gauged, brought the downfall of Glass.

In an effort to curb the downward spiral of publicity following the Glass fiasco and change the public memory, Google released Cardboard. Cardboard has since evaded negative publicity; in fact, it has almost evaded publicity in its entirety. There was no drama at its launch, no debate on its functionality, no scandal, no effect on intimacy or privacy, and included the public as a whole as an entirely private device, returning discussion to intimate conversations, and away from public discussions. Even forum references are few, proving that Google has achieved its aim of bringing MR into the public sphere, by targeting the private sphere. Underlying issues remain due to Now, which continues in its attempt to compel the public to acclimatise to the benefits of the application of personal data to a personal device.

Chapter 5

Conclusion

5.1- The Future of Augmenting Life

In a recent article, Microsoft HoloLens was discussed with regard to the failure of Glass (Gilbert, 2015), further demonstrating the lasting effect its failure has had on the MR sector. HoloLens is a forthcoming Microsoft AR device that relies on the overlaying of holograms to achieve an augmented workspace. This, one of the first reviews, highlights the author's initial fear of the same fate that befell Glass reoccurring with HoloLens, and hoping that Microsoft will play down expectations, thus learning from Google's mistakes (Gilbert, 2012). While the article itself offers a mixed review of HoloLens, it reveals the depth to which Glass's failure has affected the technological community. Similarly with Apple Watch, the public sphere has yet to act on whether or not it is a novelty that will slowly decay into irrelevance. Even the much loved Oculus Rift has not seen an emergence into the market as many would think possible, with its new partnership with Samsung promising a change in this precedent. Samsung's Gear VR has, so far, garnered generally positive reviews, which are working with an enormous marketing campaign (in partnership with Marvel's Avengers) to push the concept of VR onto the public (*EndGadget.com*, 2015).

5.2- Conclusion

This push into the public has been primarily made through the private sphere. Only the smartwatch, such as the Apple Watch, has attempted to breach the public sphere once again, and the results of such a move will be found in the future. The devices studied in this thesis show the sharp contrast between technology and the public sphere. While companies, such as Google, press forward to explore the possibilities technology can offer, in the hopes of finding a device which can return a substantial profit, the public sphere has regained some of the power Habermas (1991) once hypothesised it would lose. Forums have re-established the bourgeois debates of the 18th century, while exclusion has become the antithesis of public sphere theory in light of the internet. A global sphere has proven it can act as a regulator of technology, a sphere that Glass could not combat. It is entirely possible that Glass will return, however, the public must have acclimatised to the prospect of losing some privacy, and to the idea of surveillance. If it returns, Glass will take

a very different form echoing the many companies, such as Microsoft, who fear their AR devices will be placed in the same scope as Glass, even within the private sphere (Gilbert, 2015).

Google has returned to the private sphere with Cardboard, away from the privacy intrusions that have often followed the company. By unobtrusively targeting the private sphere, and steering clear of debate in the public sphere, Cardboard has begun to reclaim some of Google's public image. This effort is made more difficult with the continued efforts of Google Now to augment life through organisation. It is a step too far for many, emerging and remerging in debates in the public sphere. The fact that it comes in the guise of a trusted technology, the smartphone, or rather one we have come to trust, has forced many into acquiescence. Ever aware of the debate in the public sphere, Google has, since 2012, allowed users to opt in and out of certain features of the app.

It remains to be seen how the power of the public sphere will continue to interact with technology. Greater clarity is certainly required from companies concerning the use of personal information, which, as Arendt (1998) postulated, encapsulates much of our private self. Privacy will continue to be a point of contention, as will scandal, publicity and the effect exclusion can have on a product's release. The gulf between the necessities of the public perceived by technology companies continues, with the line often blurred with novelty. The often over-looked reaction of the public to technological devices has therefore been shown in this thesis to be formulaic, rather than coincidental.

Further study, quantitative in nature, should be carried out in order to specifically and unequivocally prove the limiting effects the public sphere has had on technology by scraping data from forums and media to represent the level of negativity regarding these products. It would also further the proposed framework by, hypothetically, reinforcing some points, while exposing the weakness of others. As stated, however, this thesis has merely outlined a framework for such a study, by examining key aspects of public sphere theory and the Google products, Glass, Cardboard and Now.

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