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In 2015, how are the core constituents of privacy being infringed and compromised by the development of digital media technologies?

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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.

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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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Abstract

This study was carried out to fully understand the intertwining of digital media technologies and their effect on the core constituents of privacy. In this research paper, we outline the fundamentals of privacy through both a historical context, and its contemporary understanding and meaning as seen through the perspectives of scholars and academics.

We also introduce the pioneering digital media technologies that are heavily influencing the latter concept, focussing on its complex engagement with different societal aspects, such as commerce and the personal self.

This research was conducted via documentary research. This form was decided as the most relevant methodical framework; from analysing many broad, commissioned, external studies, we sought to fully understand and gauge the trajectory of the previously mentioned complex relationship.

Overall, we found that these developing technologies are affecting the key components of privacy in varying degrees. We also sought to identify different ways privacy can be maintained and retained on both a macro societal level, and a micro individual level.

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1.1 Chapter 1: Introduction

If we do not renegotiate our relationship with digital media technologies, the long-term effects could be severely harmful to our personal privacy. In this research paper, we are going to analyse this thesis statement in the broader context of privacy and its entwinement with developing digital media technologies. We will begin our introduction by offering a justification of our chosen subject matter; why it is relevant, new and something that is bringing an innovative perspective to the field.

In the second part of our introduction, we will briefly introduce the key concepts of our research project. We will give an outline of the current digital media landscape, how it is growing and its trajectory for the future.

For the final section of our introduction, we will present the general structure of our research paper; we will go through exactly what we are going to do, and rationalize why this is the most relevant and pertinent structure to follow.

1.2 - Justification of Topic

With digital media technology becoming increasingly embedded in the social fabric of our lives, this research project attempts to access the core of how privacy is being affected by this fast paced development. With digital technologies global presence becoming increasingly ubiquitous, privacy has progressed into becoming one of society's utmost important buzz topics.

There are many reasons why this project was of interest and of importance in doing. As alluded to, privacy is a concept that is being repeatedly surveyed in our contemporary culture; what it means to be private, has that term shifted in importance, and do individuals care if we lose or gain privacy were all questions of interest.

Whilst this subject is something that has been present in several of the MSc in Interactive Digital Media's lectures and courses, it is something that intrigued the author; how exactly are our personal liberties and freedoms being affected by this global phenomenon, and what powers do we have to maintain our virtues.

Investigating what the concept means today through the lens of digital media technology is of central importance to this research paper; as we will investigate throughout the paper, the growth and development of this concept has undergone fluctuations of meanings, interest and understanding. Privacy is a multifaceted, complex structure, and implies different perspectives to diverse communities, which we heavily document in our study.

Another justification for this research was to give the most up to date research on these developing technologies. As the landscape is changing so rapidly and quickly, we wanted to ensure we were giving a clear, succinct impression as to how they are influencing and affecting privacy today.

Finally, in a selfish manner, the author also wanted to learn personally how to maintain privacy in today's culture and society, and whether it can be achieved. With varying articles with different opinions and perspectives, we wanted to objectively learn through our own research if this could be a possibility.

1.3 - Introduction to Key Concepts

As previously stated, digital media technologies do not exist as a vacuum outside of our daily lives; they are culturally, socially, economically, among many other features, embedded in our lives. With the number of Internet and computer users growing exponentially daily, it is an area of large interest and fascination, with a sense of foreboding and trepidation.

A recent report published by the European Union showed that its citizens usage of the Internet has surged hugely within the last decade; in 2014, "almost two

thirds (65%) of individuals aged 17 to 74 in the EU28” use the Internet daily (Eurostat, 2014). Most interestingly, the report found that this figure is an increase from less than a third (31%) in 2006.

New York Times journalist Mark Scott commented on the findings, stating Europe currently matches the United States in terms of its Internet usage (Scott, 2014). Services like online buying and posting messages on Facebook are examples of activities that are largely becoming a part of everyday life for the continent.

With the report finding that only 18% of European citizens have not used the Internet, it’s a further indication of the embedding of technology in our everyday activities. But what does that mean for the people, in terms of maintaining and retaining their privacy? Are people aware of the effects the ubiquitous use of technology can have on their lives?

With varying perspectives, many claim we have resolutely reached the “end of privacy” (Preston, 2015). As Guardian journalist Alex Preston states, “our private lives... have been winnowed away to the realm of the shameful and secret”.

With the digital media technologies being seen as the ultimate beacon of globalisation, a truly globally connected world, we seek to understand the welcome and unwelcome ramifications of these developments. In a well-researched, objective fashion, we want to answer these key, important questions.

1.4 - Structure of Dissertation

To fully secure the successful implementation of a reasonable account of the topic, there has to be a fundamental structure in place. For this research paper, each section has a central subject matter to ensure the paper flows well, has a sense of cohesion and a consistent unity.

Beginning with chapter two, the literature review, we explore the theoretical framework of previous relevant scholars and academics in context with our topic. This chapter seeks to analyse the relevance of what has been published before, and to portray previous knowledge on the subjects.

This chapter is divided into subheadings to give a clear, succinct structure. These headings have been broken down accordingly, to ensure the paper has a logical layout, and to give our argument cohesion. We begin from a macro level, defining privacy, and introducing its key constituents. We continue by introducing key digital media technologies that have influenced privacy. Becoming more nuanced, we analyse how privacy engages with other key areas, such as commerce and its entwinement in society and people's lives.

In chapter three, the methodology, we will outline how we conducted our research. As will be explained in the section, this question was most suitable for documentary research. This was a topic that lent itself well to researching broad, commissioned studies completed externally. Here, we will further investigate our rationalisation for choosing this method of research, also stating the limitations of this methodical framework.

Moving onto chapter four, the discussion section, we examine and interpret our research within the context of the literature. This section serves to provide a 'link' between our research results and conclusions arising out of our insights. Here, we reiterate back to our literature review, and seek to understand how digital media technologies are affecting the core constituents of privacy. Taking each of them individually, we dissect their influence, examining how they have been shaped or influenced. We will analyse other emerging themes and clusters from our research, adding 'new' relevant research that can better explain our findings.

In the closing of our discussion section, we explore suggested and recommended areas of further study.

Finally, in the conclusion of our research paper, we will summarize our argument by reiterating our thesis statement, with a brief synopsis of our research findings. We will also document the implications of our study, the limitations of our research findings and briefly reiterate further areas of research. We will ultimately conclude by restating the importance of this study, justifying its purpose, and the relevant structure and layout of the research paper.

2.1 Chapter Two: Literature Review

If we do not renegotiate our relationship with digital media technologies, the long-term effects could be severely harmful to our personal privacy. In order to fully understand our topic and provide a well-balanced, thoughtful argument, we are going to answer our research question and thesis statement under several different headings.

Firstly, we will begin by offering various definitions of privacy; to be succinct and clear, we will offer a working definition of the term. We will also aim to understand the key constituents of privacy. Continuing on, we will analyse how the term engages with technology and digital media technology; this will include investigating different developing aspects that could possibly be seen to be intrusive or possibly jeopardize what we deem as being personally private. From a theoretical perspective, we will also introduce some technological innovations that gain personal information about individuals, most notably HTTP cookies.

We will continue by investigating the effects of these technologies on people's daily lives. We will analyse this infiltration and interaction, as documented by academics, seeking to understand whether this has created a strain on individuals' individual rights, freedoms and fundamental privacy.

We will further seek to understand the commercial and monetary stakes of privacy today. In a recent article, an author stated that there are several similarities of today's culture to the development of mass consumer capitalism and industrialization. In this section, from a theoretical framework, we will seek to understand how this has formalized, and the possible trajectory this will have on the future of our society. We will conclude by analysing counter cultural movements of individuals trying to regain their control and autonomy over their data and information.

2.2 – Privacy

“Even the most strenuous advocate of a right to privacy must confess that there are serious problems of defining the essence and scope of this right” (Beaney, 1966).

To fully understand the mechanisms and parameters of our study, it is important to investigate the origin and meaning of the ubiquitous term. Derived from the Latin word meaning to “separate or deprive”, its original definition refers to the distinction of what belongs to the individual and the state (Walker, 2000). In their book entitled *Privacy, Information and Technology*, authors Solove and Schwartz investigate the other different sources of its meaning (Solove & Schwartz, 2011).

They discuss the fundamentals of the concept by introducing the differentiation between public and private spheres. In their book, the public sphere is defined as the “realm of life experienced in the open, in the community, and in the world of politics” (Solove & Schwartz, 2011, p.40). In contrast, the private sphere is described as a person’s place of “retreat to isolation or to one’s family”. The terms have developed over the history of Western civilization, with the latter being described by scholar Edward Shils as a sphere where the individual is not “bound by the rules that govern public life”; a realm where a secluded life can be lived, separate from the liabilities of authority (Shils, 1966).

In his own publication, Daniel Solove investigates this dichotomy of public versus private sphere more closely. He states it is rather reductive to simply carve out two spheres, commenting that what we perceive to be either public or private invariably changes with our contemporary time and culture (Solove, 2002). To simply try dividing complex social issues into these two spheres is difficult, he states, due to the metamorphosis of history including “changing attitudes, institutions, living conditions and technology”.

He elaborates by stating that this transgression from public to private is not always so clear, saying that the placing of certain issues into particular spheres is problematic, and a “rather general claim”. Although certain aspects have been historically private, such as the family, body, and home, to label them as such is “imprecise” as what is private today is different to the past. It is with Solove’s insight that we aim to be cautious and weary of what both public and private define and mean.

In a journal article investigating privacy, its constitutions and vicissitudes, scholar Shils also tries to further understand the nature of the concept. The author states privacy is concerned with multiple people, and a “matter of the possession and flow of information” (Shils, 1966, p.282). Extending from this, it is this transmission of this material without the “voluntary consent or initiative of those whose actions and words generate the information”. This quote really enters into the fundamental essence of privacy; although the journal article is from fifty years ago, it still contains immediate relevance and application today.

Similarly, scholar Charles Fried’s perception of privacy is not “the less that is known about us the more privacy we have”; rather, his view of privacy leads to the control we have over this information (Fried, 1968). Elaborating, he states that privacy is to have autonomy and control over your own personal information, disagreeing with the fact that privacy inadvertently means secrecy. Using the analogy of a “lonely man on a desert island”, individuals shouldn’t need to live a reclusive lifestyle to retain this virtue.

In a differing light, Judith Jarvis, a self-proclaimed reductionist on this issue of privacy, believes that privacy is not in and itself a right; she believes, instead, it can be simply reduced to other concepts and rights (Jarvis Thomson, 1975, p.295). She believes there is nothing particularly exclusive or useful to defining privacy; that the elusive concept is simply a combination of other human rights, such as the right to autonomy, property and liberty, amongst other virtues. In her view, a cluster of other rights can synopsise privacy.

In a more blanketing term, at its core, scholar Kent Walker exclaims that privacy acts as a shield to protect us from the sword of liberty, and is an essential aspect to “the capacity for creativity and eccentricity, for the development of self and soul, for understanding friendship and even love” (Walker, 2000). He believes its virtue is to defend citizens of the difficulties surrounding a democratic state, giving a state of temporary solace from the persecutions of modern life.

From researching through many academic sources, it became clear that defining privacy is an elusive task; as scholar Robert Post stated, “privacy is a value so complex, so entangled in competing and contradictory dimensions...I sometimes despair whether it can be usefully addressed at all” (Post, 2001). What is perhaps more applicable in understanding the concept is to gather and seek the term’s pertinent components and constituents. Here we will examine and study these five predominant, major parts.

These main constituents, as derived by Columbia University Professor of Public Law and Government Alan Westin in his article entitled *Privacy and Freedom*, are particularly relevant when aiming to gain an understanding of the foundations of privacy (Westin, 1967). The first constituent is solitude; defined by the Oxford English Dictionary as “the state of being or living alone; loneliness, seclusion, solitariness”, Westin alludes that the constituent comprises of being “separated from the group and freed from the observation of other persons” (Oxford English Dictionary, 2015). Westin states that this virtue is the most “complete state” of privacy individuals can achieve.

The second state of privacy, as perceived by Westin, relates to an individual having the agency to act as part of a smaller, intimate network. He alludes stating it would entail corporate seclusion, forming a relaxed, close relationship with two or more people. These relationships come in the form of spouses, family and friendships; Westin states they have an important function in privacy as they provide intimacy, which is important to the basic need of human contact.

Many scholars agree that intimacy is a core component of an individual's privacy. In his book, Jeffrey Rosen outlines how these close relationships are important to self-understanding and enable prevention of becoming "misdefined and judged out of context" (Rosen, 2000). He states that in our fast paced world where people form often oversimplified, misrepresented impressions of individuals, intimacy with close people allows mutual revelation and maintains "sanctuaries from the gaze of the crowd". It could be argued it is the slow development of intimate, meaningful relationships that divides private to public sphere matters.

Julie Inness, another proponent of the importance of intimacy in defining privacy, states it is the individual's control over decisions concerning matters of "meaning and value from the agent's love, caring or liking" (Inness, 1996). She states intimacy is the true common denominator of privacy; the agent being able to control decisions about access to themselves, "the dissemination of information" and their actions.

Anonymity is the third virtue outlined by Westin as necessary to a state of privacy. The scholar states this component occurs when a citizen has a public life, performing public acts, but still seeks and finds freedom from identification and observation. Relevantly, in a counter productive fashion, the author states, if an individual has knowledge or fear that they are being systematically surveyed, it creates a tension of anxiety and worry; it destroys the freedom that citizens expect and seek when they are in public spheres.

The fourth main, although subtler, component of privacy is reserve. This comprises the creation of a "psychological barrier against unwanted intrusion". It alludes to how we deal with our position in intimate and in-group circumstances, being attentive to how much self-information we reveal. Even in our closest relationships, the author states communication is always incomplete and information is withheld; the author says this is based on the fact that there is a need to hold back on some parts of the self because they are either too personal, sacred or profane to fully express.

This process of limiting information is defined as “reciprocal reverse and indifference”. It relates to how individuals create “mental distance” to protect the personality. With similarities to the sociological term “social distance”, the author states that it exists in every relationship as part of social norms and mores.

Stemming from this, the fifth and final component of privacy relates to control and autonomy of information. In his article, Westin alludes that the core of this component relates to how individuals should have the power to “determine for themselves when, how, and to what extent information about them is communicated to others” (Westin, 1967). Tightly aligned to the previous component, it relates to the “voluntary” transmission of information individuals should have a right to.

As can be seen, privacy is a rather elusive, complex structure. With polarising and opposing opinions of the concept, it can be difficult to fully grasp. By dividing it into its key components, it makes it simpler to digest and comprehend. With the ubiquitous development of technology and digital media innovations, these states of privacy however have been brought to the attention of the public, academics and other realms of society.

2.3 – Privacy, Technology and Digital Media Technologies

With the rapid development of digital media technologies, there have been large technical innovations that have given rise to the large questioning of privacy today. With portable interactive digital media devices increasingly capable of collecting and storing large data, privacy has become a subject discussed by the general public, media outlets and politicians.

A sample review of the public discourse surrounding the topic prompts terror and foreboding; one particular article by journalist Julia Powles argues citizens today are being increasingly seen as “mere physical masses of data for

harvesting” (Powles, 2015). A fellow expert in privacy, Julia Cohen, elaborates by stating there are strong similarities between today’s contemporary culture and the mass turmoil that followed mass consumer capitalism and the emergence of industrialisation. But what exact data is being collected for “harvesting”, and do citizens have a right to be worried?

One of the major innovations in terms of technology storing personal data is Hypertext Transfer Protocol (HTTP) cookies. Defined by the European Union Internet handbook as a “small piece of data that a website asks your browser to store on your computer or mobile device”, the rise of these technological innovations is complex and multifaceted (European Commission, 2015). Technically speaking, the original function of cookies was to “remember your actions or preferences” over time; this is, of course, a benevolent and respected objective, which is useful to everyday browsing.

As Kent Walker outlines in his journal article, there are various benefits to the collection of information. He states having some personal information in the public provides some real convenience, using the examples of billing and shipping addresses, credit card numbers, individual preferences, amongst other useful data collection examples (Walker, 2000).

There are different types of cookies, depending on their lifespan or the domain to which they belong. With the former, there is a session or temporary based cookie files, which are “erased when you close your browser” (Barnes, 2013).

Differently, there are also persistent cookies that are retained in your browser’s subfolders until they are manually deleted, or until the time based expiration deletion within the cookie file itself. These cookies, as explained by John Barnes, could possibly stay in your browser from anywhere between 18 months and 18 years.

The latter types of HTTP cookies are based on the domain it belongs to; first party cookies are set by the “web server of the visited page” and share the same domain (European Commission, 2015). The alternative are third party cookies,

which are stored by a different domain to the visited page's domain. Of the cookies written into your browser, about 50% of them are first party cookies and belong to that of the visited site; roughly the other half belong to third parties, including partners, services or advertisers working or collaborating with the site.

The original benevolent aim of HTTP cookies has however become altered and distorted; the Internet entrepreneurs in the 1990's needed an avenue to create revenue following the dot-com collapse. Today, as individuals do not inherently pay for the services they use on the Internet, these detailed dossiers are sold onto advertisers for revenue (Do Not Track, 2015).

There are other avenues where data can be collected via interactive digital devices. One of the largest innovations within mobile technology, geolocation allows the identification of the precise physical location of a device. With smart phones today having this large capacity, citizens are unsure as to what this information is being used or collected for.

A research survey completed by security company Webroot indicated that half of people are concerned about the "loss of privacy" with the development of geolocation technology (Halliday, 2010). The survey found that 52% of online users tag their locations in photographs. To combat this, the director of the latter company, David Bennett, states it takes about a year to adequately educate people about different elements of technology.

There are also pronounced, obvious examples of where geolocation data collecting could be an issue. Navigation services, such as Google Maps, are based exclusively on your personal input and geolocation. Being one of the largest of its type, there have been issues in the past relating to the sharing of citizens information, most notably when British intelligence was found to be collecting data from the mapping service and storing it in bulk (Ball, 2014).

On top of Google Maps, there are other more specialised, nuanced applications for mobile devices that also gather and store personally sensitive information,

such as the Nike+ exercise app. This innovation is specific to physical workouts, but collects information relating to mapped runs, the duration, possible health issues are also stored. With this information being in the hands of corporations and the Internet, do citizens have a fundamental right to be worried? And more importantly, what effect does this have on people as individuals?

2.4 – Privacy, Safety and the Personal Self with Digital Media Technologies

As can be seen, with a multitude of data supplemented when browsing the Internet, can individuals today really maintain a sense of privacy? Do citizens have to surrender some personal freedoms to be a part of our contemporary technological culture today?

One of the largest innovations in our current contemporary culture is the ubiquitous development of social media platforms. As social media is becoming increasingly a part of the fabric of people's lives, the effect it will have on people's privacy is both an obvious concern and a widely discussed issue.

Facebook, the largest of the social media websites, has seen its audience grow hugely since its inception in 2004. With 936 million daily active users as of March 2015, they truly have a global influence, with 83% of their daily users coming from outside of the North America. Its monthly users have grown extravagantly since 2004, to 1.44 billion users (Facebook Newsroom, 2015).

In a recent study, the information individuals input into social media is extremely revealing. A collaborative effort by Cambridge and Stanford University, the research indicates that Facebook is more "accurate and valid" with judging personality types than that of their "close others or acquaintances" (Youyou et al., 2014). Revealing the deep insight these web companies can build from a users digital footprint, it is a large step forward in our understanding of sociotechnical capabilities.

To gain the pinpoint judgement of a person's character and personality, the correct input data is required; for this study, an individual's Facebook likes were found to be the most insightful in gaining a perception of an individual. The mechanism was so accurate and specific, it was able to predict people's personality and psychological traits better than friends and family; only spouses were able to sum up broad behaviours more adequately.

The research, which included 86200 volunteers completing a 100-question survey, allowed the team to judge and assess their likes. In an interesting insight, the researchers revealed that their software could predict an individual's character better than a work colleague could with analysing only 10 Facebook likes; 70 likes for a friend or flatmate and 150 likes for a parent. On average, Facebook users have 227 likes; the researchers state their artificial intelligence has the potential to know us better than our closest companions.

To judge the participants personalities, the researchers employed use of the widely consulted Five Factor Model of personality, comprising of the OCEAN psychological traits; openness, conscientiousness, extraversion, agreeableness and neuroticism. Each trait has certain aligned activities and attitudes that would indicate how along the spectrum of each trait the individual was; for example, participants surveyed as being high on openness to experience "tend to like Salvador Dali, meditation or TED talks". Differently, participants with high extraversion "tend to like partying, Snooki (reality show star), or dancing".

It is believed Facebook likes are a prediction of a given trait because they represent certain "activities, attitudes and preferences highly aligned with the Big Five theory" (Youyou et al., 2014, p.1037). However, researchers involved were sceptical about the effects this could have in terms of privacy, specifically in terms of users not being in control of their digital footprint. To assert this, they believe users should be given control over their information and data.

Combining the efforts made by the research team and the large developments with HTTP cookies, exclusively by your data, researchers can go beyond simply

personality; currently, they can document what sex, age, background, sexual orientation you are. Today it is so advanced, whether you have a mental health issue, if you are pregnant, if you're taking drugs, amongst other insights, can be documented.

However, the ubiquitous company has had much speculation on its privacy stance. In a recent statement, the European Commission (EC) advised European Union citizens to leave Facebook if they want to avoid being "spied" on (Gibbs, 2015). The comments, made by EC advocate Bernhard Schima at the Luxembourg European Court of Justice (ECJ), were in reference to the legislation entitled US EU Safe Harbour. This legislation was enacted following the European Union's strong stance on policy protection; as many of the multinational web corporations are based in the United States, it was created to ensure European citizens data was retained within Europe, not leaving to go the US.

However, the legitimacy of this being completed in practice has been scrutinized heavily by scholars. Schima's comment highlights that there is no direct understanding as to what large corporations like Apple, Facebook or Microsoft do with the data. Following the media hyped leakings by Edward Snowden, which revealed that European Union citizens information was passed onto US intelligence agencies, the ECJ has received numerous cases on data privacy.

Schima's comments also highlight the lack of understanding even the highest of authorities have in the European Union with social media websites. His advice, to simply delete your Facebook account demonstrates the anxiety and weariness surrounding the maintenance of a social media profile.

There have been other well-documented examples of individuals bringing their personal cases to court, most notably Austrian lawyer Maximilian Schrems (Bowcott, 2015). Similarly, he is aiming to prevent large US conglomerates from gaining access to his personal data and information. With his case brought to Ireland's Data Protection Commission, his initial complaint was also to the social

media giant Facebook; unsure of what was happening to his personal records, he sought to gain ownership of his data.

His actions may have the opportunity to change the legislation and policy shaped by Safe Harbour, but with the lawyer receiving a huge amount of support and praise for his actions and progress, it serves to show how many individuals also feel their privacy is something of a commodity and in jeopardy.

As can be seen, large corporations are capable of gathering large collections of sensitive, personal data about individuals; but have these enterprises done anything to commercialise or use this information? Commerce and privacy are two contested terms that are becoming increasingly prominent in our culture.

2.5 – Privacy and Commerce

“Personal data is the new oil of the Internet and the new currency of the digital world.” (Kuneva, 2011)

In our contemporary culture, our personal information and data is becoming embedded in the commercial, monetary world.

In alignment with the previously discussed research that can accurately judge your personality based on social media activity, recent enterprises have been started trying to monetize on this information. These particular companies have gained the potential to accurately assess your financial and health risks simply through your online, social connections.

For example, a recently developed financial risk assessment website called Lenddo.com, has the potential to judge how likely a user is to pay back a loan, based exclusively on their social media outlets. Calling itself an online platform that allows users to “use their social to build their creditworthiness and access

local financial services”, it is a pioneering development into the future of personality analysis for commercial use (Lenddo, 2015).

Similarly, health risk evaluations can determine many personal insights simply by your online activity. Whether an individual is obese, likelihood of having a heart attack, whether you engage in certain acts like unprotected sex, can all be identified.

To gain an understanding of the above behaviours and obtain an insight into our personal ways, a set of algorithms and correlations assess individuals intensely, and as the founders and other specialists believe, accurately (Do Not Track, 2015). It is believed these methods of gaining understanding of an individual will lead to a world where stereotypes and prejudices will become obsolete; that by handing over certain elements of what may be considered private to these corporations, we will enter into a more just society.

In a different light, corporations are also prepared to offer cheaper services for access to individuals data. Most notably, this year US global telecommunications giant AT+T offered a cheaper Wi-Fi package in exchange for access to the customers data; with the use of the package, an undeletable “supercookie” would be dropped onto their computer, tracking their activity and attempting to heavily monetize from their online movements (Cope & Gillula, 2015).

The users would have various emails sent directly to them with direct advertising based on the data received through their tracking. Essentially, the service entails “charging extra for privacy”. Further leading with the argument that privacy is becoming commoditised, critics believe that this development will lead to “social justice implications”, with poorer people being the people who are the most effected. Should privacy be reserved exclusively for the rich? Should people have to choose between privacy and what would have possibly been perceived as a right to broadband? And is this how to maintain privacy in the future, by simply paying more?

But what type of data are corporations after? There are currently three different types, with different costs for each type. The first is volunteered data; this is “content created and shared by individuals”, such as social media websites (Ehrenberg, 2014). Observed data, the second type of data, captures the recording of actions by individuals, such as geolocation from mobile phones. The third type, inferred data, tries to deliberate and work out as much about you from the two previous types. It is this type that has “real practical value”, which in turn costs the most to corporations.

The entwinement of privacy and commerce is also present when discussing the development of advertising. Through different avenues, online behavioural targeting, and subsequent targeted advertising, are two tools becoming increasingly common in the online experience. Behavioural advertising is defined as using “information collected from an individual’s web browsing behaviour to select advertisements to display” (Chen & Stallaert, 2014). Becoming described as the “Holy Grail” for corporations, information technology gives key information to businesses about their consumers, such as the monitoring of clicks on advertisements, amongst other insights.

Advertising using this method of behavioural targeting has become a large industry; market research company eMarketer estimated that online advertisers spent “more than \$1.3 billion in targeted advertising in 2011”; (eMarketer, 2010). The type of spending of online advertising is also shifting; mobile technology will account for 72% of US digital advertising spending by 2019 (eMarketer, 2015). If mobile technology is to dominate the market, are there any other issues this could possibly have for privacy? As previously stated, mobile technology has the capacity to collect large portions of data about individuals.

An example of one of the largest companies that creates revenue through targeted advertising is Google’s DoubleClick. In control of ad-serving, ad-delivery and behavioural targeting, the enterprise generates “segments” which band people together, delivering relevant advertisements toward them. These segments, for example, could include generic groupings like “football lover”,

“food lover” or “current affairs enthusiast”. To break the segments into further classifications, the company attempts to decipher your sex, age, sexual orientation, amongst other groupings (Geary, 2012).

This method of targeting is a large monetary source for the company; Google currently generates 96% of its revenue through advertisements, equating to \$36.5 billion (Geary, 2012).

In addition to Google, one of the key social media websites that utilise this type of heavy targeted advertising is Facebook. In a concise article, Vindu Goel explains that “every bit of personal information is a valuable data point that the company is eager to exploit” (Goel, 2014). Everything that can be accessed, including your Facebook activities, “wanderings on the web”, and activity on other mobile applications, is useful to Facebook’s monetary and economic future.

One of the most common critiques of social media is the lack of autonomy individuals have over their own information. On Facebook’s own website, its privacy policy is vague in explaining how users can control their information. The company maintains that it is acceptable to use anything users do on the site to target specific advertisements. As previously said, the site can also track what users do on other websites, requiring an opt out if they want to abstain.

This is, of course, the social media’s main avenue of income; Facebook earns more from businesses if advertisements are targeted accurately to relevant users. Facebook founder Mark Zuckerberg sees advertising as valuable content, with the social media website allowing users to choose specifically what advertisements they’d prefer to see.

However, recently, the company has attempted to be more transparent with their privacy policy, reminding users of who can see their content (Goel, 2014). In the past, the company received wide spread critique because of forced publishing of content as public. If the company wants to continue its growth, it’s believed a rigid, succinct privacy policy is mandatory; essentially, if people feel

comfortable sharing more, it would provide further expansion for targeted advertising. Ultimately, what the company wants to inevitably avoid is less sharing.

Does this serve as the future of digital websites in terms of growth? Having an adequate policy statement? Do individuals have a right to feel less cautious about what or who is seeing their information?

2.6 – Movements in Regaining Privacy

With our culture and society beginning to view privacy as a commodity, there have been movements to try regain a sense of discretion. In a recent study by the Pew Research Centre, nearly nine in ten Internet Users have taken steps online to remove or mask their digital footprint. Following an investigation in 2011 by the Federal Trade Commission, Facebook was found to be misleading users about the level their data was being shared.

As can be seen, there is a serious monetary aspect to the data submitted by users. Individuals, realising this, have tried to gain autonomy of their information, and be paid for their data. With the World Economic Forum (WEF) estimating that there will be 50 billion devices connected to the Internet by 2020, the amount of data stored on the Internet is also predicted to grow exponentially; 44 times larger in 2020 than 2009 (Ehrenberg, 2014).

With the WEF predicting online personal data becoming a major asset, there have been several high profile cases of individuals trying to gain monetarily through their online personal data. Dutch student Shawn Buckles recently sold his 'data soul', auctioning all his personal data to the highest bidder, for €350 (Solon, 2014). This included the selling of all his online records, including all his personal records, locations records, medical records, amongst many other personal insights.

However, this bulk amount is abstract; corporations buy individuals data in bulk, not per individual. This, of course, makes it far cheaper, with the average individual's data currently worth about 50 US cents. However, the reasoning behind Buckles, and many other people's actions, is to actively decide whom exactly gets access to his data and for what reasons.

Similarly, Do Not Track is an initiative proposed by the Federal Trade Commission in 2010 to regain control of users autonomy when it comes to tracking (Wingfield & Angwin, 2011). The standardised tool essentially allows individuals to keep track of their online habits and prevent them from being monitored. The tool, first released with Microsoft Corporation's Internet Explorer, led to all the major software developers including the tool on their Internet browsers.

The advertising industry has been resoundingly suspicious of the development of the tool; with insiders stating the prevention of obtaining data would slow down their business. With the digital advertising industry growing to \$42.8 billion in 2013, the reason why users can use their services free of cost is because of the data they receive which is in turn, as previously stated, sold to advertisers.

Stemming from this, a 2012 study by Harvard Business School entitled the Economic Value of the Advertising Supported Internet Ecosystem, outlined how at least half of the Internet's economic value is based on the collection of individual user data (Deighton & Kornfeld, 2012). The study, commissioned by the Interactive Advertising Bureau, also further outlined how almost all commercial activity on the Internet relies on to some extent, advertising.

Since its inception, several high profile websites have adopted the tool; in 2012, Twitter announced its inclusion of its tool on their website. Contrasting to this, Facebook and Google have not adopted the tool, as much of their revenue, as previously stated, depends on their control over users input and data (Arthur, 2012).

The original plan with the tool, as previously stated, “would let users opt out of the collection of data about their habits through a setting in their web browsers” (Campbell, 2014). However, the debate around the tool has been on going for years; although advertisers were technically accepting of the application, the definition, scope and application of ‘Do Not Track’ have all been divisive areas.

However, there is current difficulty, as an industry-working group is currently creating a “carve out” that would prevent key web corporations to obliging to the tool. As time pushes forward, it is becoming clear that digital privacy advocates don’t fully understand the workings of the Internet and online advertising. As previously stated, in some way, all businesses utilising the Internet are engaging in some way with online advertising.

In moving forward, industry insiders believe it is with different types of cookies the attention should be on; by limiting what third party cookies are able to do, meaning smaller advertising agencies, would allow for more privacy.

Although there was a sound ideology behind the Do Not Track application, it did not represent the key, reality workings of the online digital advertising sector.

2.7 – Paying for Online Digital Media Services

Scholars state, in the 1990’s, the Internet could have gone a different direction; one focussed more so on paying for services, instead of individual’s privacy becoming a commodity (Do Not Track, 2015). However, the looming question ensues; would citizens be willing to pay for online digital technology to protect their privacy?

One such interactive application that provides privacy with a minimal pricing point is the popular Whatsapp; with it being free for the first year of service, the app charges 99cent per every year following. The application also claims to offer

users peace of mind; there are no advertisements within the application, and there is no geolocating or tracking of users data. With Facebook buying the interactive application in 2014, Zuckerberg stated in a press conference that the company is in no rush to start deliberately advertising to users (Frier, 2014).

In contrast to the advertising heavy applications that collect various data from users, Whatsapp offers a possible revolutionary avenue for the future of mobile applications.

3.1 Chapter Three: Methodology

3.2 - Statement of the Research Objectives

For this research paper, we wanted to investigate the effects digital media technologies have had on the predominant constituents of privacy. The main objectives of this research project included;

- A clear, succinct and thorough understanding of the effects technology has had on key elements of privacy.
- What relevant technologies today are strongly affecting the future of privacy.
- If a certain consensus and underlying thread can be seen running through the evolution of privacy.
- If there was a possibility of preventing the decline in privacy today.
- If so, how can this be achieved.

With these aims and objectives in mind, we aimed to complete them through a fair and just means.

3.3 - Methodological Framework

For this research paper, the most suitable and effective methodological framework to obtain an understanding of this topic was by secondary resources. This was felt to be most appropriate because of the nature of the research title. As we wanted to gain a concise yet succinct understanding of the topic, we utilised previous research completed by other institutions, scholars, amongst other established avenues.

As privacy and its entwinement with technology are developing concepts, it was also relevant to try and engage with the current information and data that was already present and contemporary.

3.4 - Rationalisation of Documentary Research

There were many reasons why documentary research was the chosen method of research (University of Portsmouth, 2015).

As we required a broad understanding of the topic, it was relevant to gather various research studies completed by previous groups and institutions. The research question lent itself well to documentary research. It allowed a broad scope to obtain a deep understanding of the topic. As the question is titled as a “what”, it required a deep, rigorous investigation with a broad exploration of concepts and topics.

Secondly, this method of research allowed a large sample size. Through analysing the data of large commissioned bodies, it allowed themes and generalisations to build, which wouldn't be possible with a smaller quantitative or qualitative study was to be conducted. The larger sample size also allowed for varying perspectives and understandings that might not have been otherwise possible to document.

This methodical framework also allowed access to data that would have otherwise may not have been possible. The issues that we discuss throughout our study are often quite personal, and not something individuals discuss openly quickly. Elaborating, it would have been difficult to track down enough people willing to share this information to make the study valid.

Another main reason why this was an effective method to take was because the research studies were of a very high quality. Often also very detailed, it allowed the author to gain a very thorough understanding of the topic, without having to pay the high costs of mandating the research or commissioning bodies.

The use of this form of researcher also presented the elimination of the ‘Researcher effect’, otherwise known as the Hawthorne Effect. From analysing data from a third party, it allowed the author to gain a close to objective view of

the work. This reduced the effect the author as an individual has on the subjects; many personal characteristics would have an effect and may cause interviewees to act differently, which could have influenced and changed the behaviour of the interviewees, and ultimately would not benefit the research.

As longitudinal studies over long periods of time were also analysed, this would not have been possible with the short time frame to complete this project within. From analysing different forms of longitudinal studies, it gave the research a stronger relevance and background.

Also, as this is an area the author is passionate and curious about, it allowed a deep investigation into the matter. The chosen method of research allowed the author to really progress deep into the subject matter. It also permitted the author to use a certain style of writing because of the particular subject matter.

3.5 - Data Analysis

To ensure we gained the most relevant understanding in analysing the vast amount of data and material we utilised, a thematic content analysis was the most accurate form of data analysis. This was felt as most appropriate as we were analysing the effects of digital media technologies by their effects on the constituents of privacy. By dividing these themes into five sections we could accurately explore the effects. This required rigid organisation and maintenance of data.

3.6 - Limitations of the Methodology

With the documentary research approach, there were several limitations to our chosen method of study.

One of the first major limitations involved with this study is the vast time consumption. With a study with such scope, it required a lot of time to fully

understand the topic, find relevant primary data, amongst other duties. Also, as this was the author's first time in completing such a study, it took time to become accompanied with the general structure and layout.

Another possible limitation is the fact that the author did not uniquely create the information analysed; it was the product of other researchers.

3.7 – Summary

Overall, this methodical framework was crafted to ensure a fair and equitable study for my research. Through rigorous investigation, we reached a just conclusion.

4.1 Chapter Four: Discussion of Results

In this chapter we are going to critically analyse the results and findings from our documentary research within the context of the literature review. This will aim to provide the link between the research and conclusions arising out of the research.

We will divide this section into three separate parts. In the first section, we will attempt to critically understand the effects digital media technologies have had on the core constituents of privacy. As documented in the literature review, we will revisit these five components and endeavour to critically assess the full effects current innovations have had on them. This will form the basis of our thematic content analysis; giving rise to different trends and clusters emerging from the research, and an insight into similarities and differences.

Within this section, we will attempt to also fully assess whether privacy has been in fact lost, within our working definition of the term. We will also introduce 'new' literature where applicable to better understand and articulate our argument.

In the second part of our discussion, we will attempt to investigate how privacy can be maintained and retained in our current contemporary culture and society. Through different avenues, such as education, policy, behavioural changes, we will aim to provide a thorough background as to maintaining the virtue in today's society.

In the third and final section, we will suggest and recommend further research areas relating to our study.

4.2 - Research in Context with the Literature

As clear from our literature review, technology is having an effect on the future of privacy in individual's lives. Here, we are going to investigate and discuss further the implications these developments will have on the specific constituents of privacy; solitude, intimacy, anonymity, reserve and control of information.

Beginning with solitude, as Westin states, relates to how we have freedom and separation from the observation of other people. This virtue is certainly something that is rather contentious and rigorously debated today; with the development of smart phone technology, never before have individuals been so closely monitored with their personal details. As portrayed in the literature review, all facets of individual's daily life through their devices are stored, commoditised and sold.

This, as can be seen, is having damaging effects on the future of maintaining a sense of solitude; if people's location, shopping preferences, even the cafes and bars people frequent are being noted by large looming corporations, having a sense of isolation and seclusion is becoming intangible. Of course there are benefits to some information being remembered, but there needs to be a larger discourse around what information is valid and not.

Our second component, intimacy, is different. The term has been closely debated, with sides saying intimacy has become increasingly possible through the digital world, others however have stated we are currently watching the demise of the concept. One academic, Martin Jacques, eloquently states that the "rise of communication technologies...are contracting our private space, erasing our personal time and accelerating the pace of life" (Jacques, 2004). He believes it is more the physicality of the machine, rather than the software per se, that is really infringing on individual's intimacy.

Stating the family as the centre of intimacy, in his perspective relationships between members of this unit are becoming increasingly fractured; most notably the parent child relationship is more strained than ever due to “cut in income, loss of time, greater pressure”. The future effects of this could be even more damaging.

As can be seen throughout the research, anonymity is divisive; on one side, society has never been more connected. Yet, individuals are becoming increasingly separated and estranged to each other. Relevant to this discussion, scholar Dennis Bailey investigates the entwinement of privacy and anonymity, alluding to his introduction of society as a Masquerade Ball (Bailey, 2004). From our previous “tight knit social fabric”, he states we don’t know many of the people we pass on the street, knowing very little about them. He continues by stating the people we live our lives with are completely anonymous; we don’t know their names, with their entire identities being unknown to us.

There is a strong dichotomy occurring in society today; never before have people been so connected, which would of course break down the development of anonymity. Yet, as the above scholars state, we are living increasingly fragmented, distanced lives, where the development of anonymity is becoming pervasive. In terms of technology’s development on privacy, it has more so changed individual’s leading of a certain lifestyle.

Reserve, as stated previously, is one of the more understated yet important components of privacy. In terms of this concept, how we deal with different social settings and audiences is interesting to analyse, and becoming increasingly divisive, especially with the development of social media. It has been argued with social media that individuals are playing a “part”, as scholars Solove and Schwartz state in their book, people play many characters in their lives (Solove & Schwartz, 2011); “every individual lives behind a mask”, exploring and shaping their identities. With a historical context, the authors state the first etymological meaning of the word “person” was mask. This example possibly illustrates a

strong basis of social media's contentious development; there is a "conscious and expressive" presentation of the self to the public, a social audience.

The authors continues by stating if this "mask" was to be torn off, diminishing one's privacy, it would be detrimental to an individual; in a world where each of us maintain this façade, "the masked performance", the individual could expect searing, selective forced exposure. The effect would be quite clearly detrimental to the exposed individual, giving the impression that appropriating our identities to each different social audience is not only important but also vital.

However, maintenance of this "mask" is becoming increasingly difficult in our social lives, as all aspects of our personality are represented and accessible though online means. Technology is facilitating the growth of these multiple facades without much time to ourselves. In Westin's article, he explicitly states the requirement for "emotional release". He says that these multiple roles we act out create "both physical and psychological health", stating it is essential to have time for release. However, with technology becoming more ubiquitous, it is becoming difficult to find a place for release. Similarly to the Masquerade ball, Westin states that people can only maintain like "actors on the dramatic stage" for a while.

The searing effects of one's masked performance being lifted can be with events such as the twitter explosion following the infamous Slane Girl (O'Brien, 2013); although a rather more extreme example, it is a relevant and pertinent instance of the effects of being exposed to damaging results. With the "mask" society being maintained, and the young teenager being exposed, her reality was seriously affected, with the young girl being so distraught she was checked into hospital.

Control of information, the final component alluded to, is one of the most severe privacy threats in our contemporary culture. With little known about what happens to the information individuals input via technology, it has led to a tension and anxiety amongst the public. However, as stated in the literature

review, there is a growing change within corporations to provide a more visible, transparent policy statement. Of the 90% of Europeans that use Google and the 71% of Americans that have a Facebook account, there is a growing trend towards providing “meaningful control” over users data, which is thought to be also beneficial to business (Brown, 2014).

As alluded to in the literature review, there are currently large corporations giving access to services for cheaper prices in exchange for the users privacy. As Solove and Schwartz state, “individuals seem willing to exchange privacy for services or small rewards and generally fail to adopt technologies and techniques that would protect their privacy” (Solove & Schwartz, 2011). The question remains; why don’t individuals protect their privacy, if it something that has been covered extensively through the media and public life?

In their article entitled *Privacy and Rationality in Decision Making*, scholars Alessandro Acquisti and Jen Grossklags state several reasons as to why there is a “divergence between stated privacy preferences and actual behaviour” (Acquisti & Grossklags, 2005). Similarly, novelist Jonathan Franzen states that people care about privacy in the abstract, however are unaware of the benefits of sacrificing privacy in order for tangible gains in health, safety or efficiency (Franzen, 2003).

He expands by giving examples of privacy infringements that benefit the safety of society, such as remote monitoring of automobile transmissions, x rays, amongst other examples. In his view, truthfully, we require the involuntary searching through out material to ensure we live a harmonious society. Although people complain about this intrusion, in his view, it is imperative.

One major theme appearing through much of the research is the development of a surveillance economy. Defined by the Oxford English Dictionary as ‘watch of guard kept over a person’, it has led to a culture that is ridden with anxiety and fear (Oxford English Dictionary, 2015). As Westin notes in his article, the fear of being systematically watched is creating a tension within citizens. In public and private spaces, the freedom that individuals expect to experience is dwindling.

But what effect this will have leading into the future? Is there a possibility of curtailing this development, or maintaining the above futures more rigidly?

Many believe that educating individuals about the fundamentals of digital media technology is one of the main progressions in protecting privacy. As David Bennett of security company Webroot states in the literature review, education is where there needs to be large growth for the public. Expanding into the implications that social media in particular has in people's lives, he uses the example of a family that recently moved into a new home and take a photograph outside their house; what's to stop a certain portion of your social audience progressing into cyber crime and possibly robbing your house?

As Bennett states in his article, it takes about a year for users to adequately learn the fundamentals of different aspects of these pioneering technology. It is difficult to understand how to accelerate this, but as large corporations have begun doing, educating users where and what your data does, is shared with, is a beginning.

In terms of current developments of policy in protecting people's privacy, the EU Safe Harbour is attempting to maintain data and information within Europe. As spoke of earlier, there has been controversy with the hazy law; however, it is attempting to rectify the injustices that have been acted upon before. Other legislative acts in trying to retain privacy for individuals include the 2002 Directive on Privacy and Electronic Communications.

Also called the E-Privacy Directive, it outlines data protection and privacy in the current digital age (ePrivacy Directive, 2002). Stating it is "technology neutral", it does not specify certain technologies. Its main provisions include providing security of services and ensuring confidentiality of information is maintained. It is in this judicial and political arena where individuals can achieve fundamental rights.

However, one of the lingering questions when discussing the attempt to regaining privacy in today's culture relates to one's behaviour; in order to maintain these different attributes, does an individual essentially have to reconfigure and manage their actions to ensure they can have privacy?

As can be seen with many of the examples in our research, technology is becoming increasingly capable of gathering some of our most personal data. As stated in the literature review, privacy is not about living on a remote island where no data or information can be created out of fear. It is important for individuals to live a life harmoniously with these technologies. Changing one's behaviour for the sake of trying to maintain something that people should have control over is abstract and irrelevant.

From the vast amount of literature analysed, one certain prospect constantly reappeared; giving more control to users for their digital footprint is the most reasonable and important stance going forward. As the large research project conducted by Cambridge and Stanford Universities concluded, this is of paramount importance to ensure a fair and equitable service.

Through allowing people the access to control and have autonomy over their information, it would provide a sense of calm and reduce the anxiety and tension felt by individuals today. Through allowing people to rationally decide where, when and why, under their own terms, their information is going, is the beginning of privacy being retained and maintained.

4.3 - Suggestions and Recommendations for Further Research

With the time limitations associated with our study, there are certain areas that would be interesting to expand and develop upon.

Firstly, including different forms of primary research for future research would gather relevant and interesting insights. Qualitatively, it would be interesting to

investigate the perceptions and views of privacy through the lens of different communities.

In terms of different communities, it would be insightful to compare and contrast how different groups perceive their privacy; whether or not it is being infringed upon, if they feel in control over their information. These different groups could be wide ranging, from differing sexes, age, race and sexual orientations.

What would be especially interesting, as discussed in the main body of the research paper, is how people of lower economic means view privacy today. As the term is becoming increasingly commoditised, with services and products being reduced in price if privacy is handed over to corporations, it would be fascinating to view how lower socioeconomic individuals view this development. Similarly, attempting to view how minority groups view their privacy would also reveal the compromising development of technical innovations.

In gaining information through qualitative means, to ensure it was fair and equitable, we would conduct ten semi structured interviews from each community or grouping. We would ask an assortment of questions relating generally to how much autonomy and control participants feel they have, do the individuals feel they can retain privacy today, and people's awareness of technological innovations. We would attempt to cluster the emerging themes and findings, also utilising a thematic content analysis.

If doing a quantitative analysis, we would similarly attempt to gather similar emerging trends and themes arising from participants. Quantitative analysis would allow for more generalizable findings, different to a qualitative study.

5.1 Chapter Five: Conclusion

This study aimed to understand the complex mechanism between privacy and digital media technologies. Through this process, we attempted to specifically understand and identify the intertwining of privacy's main components and how they are being affected by pioneering technologies.

As can be seen, there are numerous benefits to these revolutionary, innovative developments within the technical sphere. Individuals today are capable of completing tasks that were never possible in the history of our species.

If anything was to be gathered and answered from this study, it is for individuals to be aware and mindful of our relationship with these instruments. That what we hold as truly private is currently at stake in our current contemporary culture; our solitude, anonymity, reserve, control of information and intimacy are all things that are important to our identities and of our future prospects of maintaining our core self. If we don't renegotiate our connection and association with these devices, we will lose something that cannot be regained.

5.2 - Limitations of the Findings and Recommendations for Further Study

As this was the author's first progression into this type of study, there are some limitations to be wary of. Firstly, as this was a large topic with many different elements and links, and with our time restrictions, it can be seen as a limitation.

Although there was relevant literature to this topic, specifically for the entwinement between developing technologies and privacy there were works lacking. We relied heavily on research studies by universities, which were of course helpful; however, specific books for this topic were difficult to find.

In terms of recommendations for further study, as specified in detail in our discussion section, aiming to focus more heavily on primary research would add

various insights into people's interaction with privacy and technology. It would give a more recent portrayal of current views of different groups.

It would be particularly interesting, as said, to investigate how different communities are similar and different to each other in terms of their perspectives and views of these concepts.

5.3 - Conclusion

Overall, throughout this study we have demonstrated the effects digital media technology developments are having on privacy.

We began by opening with our introduction, where we introduced and explained our rationale for the subject and why it was a relevant and important topic to research. We continued into chapter two, the extensive literature review, by analysing and critically appraising the previous relevant works published. Briefly, in the literature review we attempted to define privacy in the most open and complete way possible. We continued by identifying and analysing the technology that is infringing on privacy, and what exact effects these are having on the term.

In our subsequent chapter, the methodology, we set out to fully explain how we were to gather, organise and analyse our data and information. In chapter four, the discussion, we aimed to discuss the literature in context with the literature. To provide a 'link' between itself and the literature review, we also observed certain results and findings arising out of the research. We also introduced certain relevant 'new' literature, and also suggested and recommended areas to further research.

Overall, if we do not renegotiate our relationship with technology, the long-term effects could be severely harmful to our personal privacy.

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