

LIFELOGS AND AUTONOMY

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Abstract

Autonomy seems to be a core issue for lifelogging technology as it can influence our understanding as well as our personal freedom but a comprehensive discussion on the effect of it on the autonomy of the lifelogger and others affected seems still missing in the current academic debate. In this article we provide a preliminary inquiry into this topic. First, the concept of lifelogging will be briefly clarified. In a lifelog, different data sources are combined in an archive that can be used to retrieve information about the lifelogger and the environment in which the lifelogger is situated. Second, we will discuss the effect of lifelogs on an element of autonomy, namely understanding. Lifelogs can both advance understanding as well as hinder it. Information of lifelogs is the result of social processes that can bias information and can be used to manipulate lifeloggers. Third, we will discuss another aspect of autonomy, namely being free from controlling influences. Also on this level the effect of lifelogs is ambiguous. Fourth, we will discuss the conditions under which prospective lifelogger become lifeloggers. By discussing both the effect of lifelogs on autonomy as well as joining the community of lifeloggers we aim to show the many ways in which lifelogs can compromise and advance autonomy. Fifth, some recommendations are provided that aim to address the above mentioned concerns.

Introduction

The surge of digital data that can capture personal information about the individual has led to the possibility of creating digital archives that can be used to search for information about an individual's life, namely lifelogs. Cathal Gurrin, a researcher at Dublin City University and auto-experimenter in the field of lifelogging has aptly described a lifelog as a "search engine for the self" (The Economist, 2014).

Autonomy is a core issue for lifelogging technology as the technology can influence understanding as well as personal freedom of lifeloggers and non-lifeloggers. However, a comprehensive discussion on the effect of it on the autonomy of the lifelogger and others affected is still missing in the current academic debate. Lifelogs are likely to affect autonomy, but it is not immediately clear if this effect is positive. By discussing both the effect of lifelogs as well as the conditions under which we become lifeloggers, we aim to show that autonomy is relevant on different levels. The gained knowledge can be used to design lifelogs that can account for the opportunities and challenges lifelogs pose to autonomy.

First the concept of lifelogging will be explained. Second, we will briefly examine some characteristics of autonomy. Third, we will discuss the effect of lifelogs on

understanding. Fourth, we will consider the effect of lifelogs on personal freedom. Fifth, we will examine some issues that can arise when joining the community of lifeloggers. Sixth, some recommendations are provided to address some of the identified concerns.

1. The technology

A general consensus about the definition of a lifelog is still missing. Our working definition describes the lifelog “as a form of pervasive computing consisting of a unified, digital record about an individual and the physical and digital environment in which the person is situated when lifelogging using multimodally captured data which are gathered, stored, and processed into meaningful and retrievable information accessible through an interface” (Jacquemard, Novitzky, O’Brolcháin, Smeaton and Gordijn, 2013, 2).

The term ‘lifelog’ has been coined around 2001 by the auto-experimenter Gordon Bell who was also involved in the first lifelog project, named MyLifeBits. MyLifeBits was a Microsoft project aiming to “to encode, store, and allow easy access to all of a person’s information for personal and professional use” (Gemmell, Bell and Lueder, 2006, 89). Since the MyLifeBits project that ran from 2001 to 2007 lifelogging has attracted considerable interest. A new generation of wearable devices has been developed especially for the purposes of lifelogging and are commercially available or will soon be commercially available, such as the Narrative Clip, Autographer, Sony’s SmartBand SWR10 and Sony has also recently announced to release its own lifelog camera. There are also various applications commercially available that transform existing devices, most notable the smartphone, into lifelogging devices, such as Saga, LifeBox, Chronos, and Sony’s LifeLog.

The ability to retrieve information about a person’s life can be useful in many contexts. Corporations can use lifelogging devices to control the productivity or safety of its employees. Already Tesco Ireland lets its employees in its distribution centre wear an armband that tracks their activity (Wilson, 2013). The army could profit from equipping soldiers with devices to create more detailed accounts of what happened on the battlefield (Schlenoff, Weiss and Steves, 2011). Medical institutions can use lifelogging devices for therapy with persons diagnosed with dementia (Piasek, Irving and Smeaton, 2011). Because the ethical analysis will differ between the fields in which lifelogging devices are deployed we will concentrate on one area, namely private individuals that use lifelogs as a gadget for non-professional and non-urgent purposes.

2. Autonomy

Autonomy is composed of the Greek words ‘*autos*’, which means ‘self’, and ‘*nomos*’, which means ‘law’ and was originally applied to describe the political situation of Greek city states. If a city state could impose its own laws free from interference by external powers it had *autonomia* (Dworkin, 1976). In more recent times *autonomia* is also applied to individuals. The combination of these two words are a close approximation to the most general meaning of autonomy, namely to be a law to oneself. Autonomous agents are competent to reflect on the life they want to live and capable of pursuing that life. They act on motives, preferences and thoughts which are their own and which are not merely externally imposed. Autonomy has become an influential moral value in recent Western thinking. It has featured in a wide spectrum of philosophy ranging from bioethics to political philosophy.

There is great diversity between concepts of autonomy. Two seemingly undisputed elements of autonomy will be used throughout this article:

(i) *Understanding* is necessary to make autonomous decisions. We need to have a good understanding of the relevant aspects of a situation. Consequently, if we provide people purposely or because of negligence with insufficient or in any other way inadequate information, we will often fail to respect their autonomy. Besides information we would also need sufficient competence to understand the information presented to us.

(ii) *Being free from controlling influences* is another element of autonomy. The actions we perform and the beliefs and desires we hold are actually originating from us rather than imposed by others.

3. Understanding

The lifelogger might use personal information from lifelogs to create a better understanding of herself and her environment. Indeed this seems one of the underlying ideas behind the development of lifelogs. Take for example Saga, one of the first lifelogging applications for the smart phone, which has as a tagline on its website that reads as follows: "Lifelogging is better with friends. Share your *authentic* life with the people that matter most. ... Saga automatically records *your real life story*" (Saga, 2013: cursive text is added). However, this ignores the fact that lifelogs and lifelog information are shaped through social processes and that lifelogs might even be used to steer behaviour. Below some limitations to lifelog technology are discussed as well as ways in which lifelogs can improve understanding.

3.1. Bias

The idea that lifeloggers will fail to capture reality as it is has already been discussed in the literature on lifelogs (amongst others by Bannon, 2011; Curry, 2007; Dodge and Kitchin, 2007). However the idea of bias and that lifelogs might promote particular views on reality seems less explicitly present.

The assumption that lifelogs capture reality as it appears seems appealing. Suppose you have taken a photo of a situation, for instance, of your family at Christmas, and retrieve that picture to refresh your memory. The picture does not seem to convey any bias. It seems to present *facts* as they are and for that reason the photo seems more reliable than your or a family member's recollection of the event.

Indeed, a camera is unable to have bias or interests in the same way people do. However technology is the result of a process involving people with biases and interests and the fact that technology itself has its limitations. The content of lifelogs is partly determined by biases that creep into the design of lifelogs even though no one involved might aim to deceive or manipulate the lifelogger. The idea that there are social processes involved in the development of technology is not a novel one (Bijker, Pinch and Hughes, 1987; MacKenzie and Wajcman, 1999). Below we will briefly explain the developer's bias while not excluding the possibility of other biases such as a technological bias – there are technological limitations to what one can capture.

The choices of developers will have considerable consequences of how the lives of lifeloggers will be presented to them within the lifelog. For example, in order to improve the functioning of lifelog technology we require the augmentation of data with semantic meaning and significance. Developers need an idea of what the concept entails

and what is good. Sometimes these biases will confirm or strengthen existing prejudices and power relations. Masculine concepts and ideas could be overrepresented which would lead to people's life being defined (and maybe judged) by a male-dominated culture. With the low number of women in technology development, this seems a relevant concern. An example of such a perceived masculine bias can be found in some of the applications on one's smartphone that quantify sexual activities such as the application 'Spreadsheet'. This application provides an overview of 'thrusts', 'duration', and 'decibel peak' implying that these are the relevant variables to measure intimate acts. Besides it being vulgar, it promotes a very limited conception of sexual activity, which is doubtful beneficial in any other way than as amusement. Taken seriously, it would obscure that what is important by rewarding activities that fail to capture that which is truly significant. By doing so, it facilitates not only a skewed understanding but also implicitly seems to promote a heterosexual, male-biased conception of sexual activity.

3.2. Manipulations

Manipulation is different from the above mentioned biases as for manipulation information is purposely altered to affect the judgments or actions of lifeloggers. There might be commercial, political or other interests in play. Manipulations could be aimed at the content of the lifelog as well as the information retrieval. There are cases known in which the retrieval of information was manipulated for financial gain. US Internet providers redirected search queries to an online marketing company that in turn directed it to retail websites (Giles, 2011). There are other ways to manipulate content. Slight alterations have proven to be profitable under certain conditions to sell products. For example, research (Yoshida, Tanikawa, Sakurai, Hirose and Narumi, 2013) showed that manipulating one's facial expression in real-time in a mirror makes one more likely to purchase a product. In other ways, lifelogs could misrepresent events, such as advancing a false idea of the healthiness of a product, to promote its sales. The issue of manipulation is slightly lowered because disclosure of these practices would undermine the reliability and thereby usefulness of lifelogs as a product. To become and remain a popular source of information a lifelog application or device needs to maintain trust from consumers.

3.3. Expanding understanding

Issues with bias are insoluble and insurmountable if one demands lifelogs to present unmediated facts. However, we do not (and cannot) require our information to be detached from values. Even scientific knowledge is said to be based on values that are presumed rather than proven (Putnam, 2002; Quine, 1963). Nonetheless it is important to acknowledge the potential for bias. Some biases can be mitigated or avoided. For example, the aforementioned bias towards masculine concepts might be avoided or alleviated by carefully designing the lifelog.

If we consider some bias to be acceptable, the lifelog can provide the lifelogger with information that she can use to better her understanding. For example, we seem prone to overestimate our physical activity. This can affect our health because overestimations could lead us to exercise less than we would require (Janevic, McLaughlin and Connell, 2012; Watkinson et al., 2010). With a lifelog these misconceptions might be avoided. The fact that a lifelogger becomes less directly dependent on accounts of other people might also be profitable to them. The data

captured can have an accuracy, which can surpass that of human perception. For predominantly empirical inquiries the lifelog can be useful.

3.4. Understanding of others

There are reasons why lifelogs can inform others. Besides being useful to inform ourselves, we can use our lifelog to inform others or obtain more information about their desires and wishes. The autonomy of others seems virtually left undiscussed in the current academic debate on the ethics of lifelog technology.

Sometimes, we will be unable to consult the person because she might be temporarily incompetent. Through lifelogging, we are more likely to have other people's wishes recorded. We can query the lifelog to assess their decisions in the past and if they expressed any wishes. The use of lifelogs for this purpose seems to be limited as privacy requirements demand a minimization of information about others.

In other cases, the lifelog can be used to correct mistaken beliefs. We can use lifelogs to help inform others by putting forward information about ourselves. For instance, we can use lifelogs to show how we manage our finance, how we combine work and leisure, the time we have to exercise, etcetera.

4. Freedom

Besides understanding also the freedom of the lifelogger or the people affected by lifelogs might both be reduced in some situations as well as advanced in others.

4.1. Lack of privacy

The revelation and distribution of personal information by lifelogs can diminish one's freedom. The issue of privacy and surveillance has featured prominently in the academic debate on the ethics of lifelogs (Allen, 2008; Bailey and Kerr, 2007; Dodge and Kitchin, 2007; Moreno, 2004; O'Hara, Tuffield and Shadbolt, 2009; Rawassizadeh, 2011). Governmental agencies, corporations and citizens could reduce or violate one's privacy and diminish liberty through lifelogs.

Lifelogs can facilitate surveillance. For lifelogs, the majority of searches by government agencies or corporations might be based on data mining procedures and algorithms that do not directly burden the lifelogger or the investigator to the same extent as, for example, body searches, house searches, cold calling or other marketing ploys. Indeed, one's data can be accessed without one knowing or ever noticing. For that matter, personal data might be harvested in bulk and subjected to algorithms without any human being actually having accessed personal information about a specific person. As a consequence we might become less vigilant to protect privacy. Nonetheless the existence of false positive, human errors and governments targeting individuals pose real threats. The NSA, for example, collected information to disrepute people who were solely targeted because of their religious conservatism (Greenwald, Gallagher and Grim, 2013).

Also fellow citizens can decrease our personal freedom. Whereas we have generally accepted government agencies in liberal countries to show some restraint towards the sharing of personal information about private individuals (although the recent revelations about predominantly the NSA and GCHQ seem to indicate otherwise) or, at least, towards enforcing moral standards, private individuals can share information about themselves or others with value judgments on social platforms such

as YouTube, Facebook, and Twitter without having to exercise the same reticence. In China (and arguably other parts of the world) the phenomenon of human-flesh (or human powered) search engine exists (Downey, 2010). A human-flesh search engine is an ad-hoc group effort between (potentially) thousands of people who try to identify a person in real-life based on clues found on the Internet. These searches can be provoked by moral outrage. This was the case when a video of a woman killing a kitten attracted popular attention. She aroused the anger of an online mob who tried to identify her and the cameraman in real life in order to punish them. The vigilantes succeeded and they uncovered details of the culprits' lives such as their real names, phone numbers, and employers within six days. As a consequence, both lost their jobs and she had to move to another city. Despite the immorality of their behaviour, their acts were in fact legal. Private individuals are more likely than authorities to share information about acts they consider distasteful, immoral or otherwise notable even when that behaviour falls within the legal limitations of the law.

4.2. Sousveillance

There are also advantages to be expected from lifelogs with regard to personal freedom. We will mention two of them.

Sousveillance is often mentioned in conjunction with lifelogs (Allen, 2008; Bell and Gemmell, 2009; Mann, 2004; O'Hara et al, 2009; Rawassizadeh, 2011). The use of lifelogs would facilitate sousveillance as proposed by Steve Mann (Mann, 2002; 2004). Sousveillance is thought to alleviate issues with surveillance. Sousveillance is the monitoring of authorities by individuals. The concept of authority is interpreted broadly. Consumers can profit from sousveillance as misbehaviour by companies can be shared and targeted. Steve Mann has reported about abuse by McDonald's staff (Mann, 2012). The Rodney King Tapes 1991 and the following LA Riots in 1992 are an early example of sousveillance. The Arab Spring of 2010 in which people in multiple countries in the Arab world protested against their regime is a more contemporary example.

There are also other ways in which lifelogs can protect us. The insights and evidence we obtain through lifelogs can be used to demand more liberty. This function is similar to sousveillance in the sense that by capturing your life you (inadvertently) also capture your living or working conditions. It is dissimilar because you do not necessarily have to record others directly. Poor working conditions can be shown through data indicating bad posture or bad lighting without necessarily capturing information about supervisors or clients. Lifelogs are especially useful for this as they allow the capturing of information with little to no resources or time required from the lifelogger so that the capturing does not have to interfere with the daily goings-on while the characteristics of digital data facilitate distribution of the information to the relevant recipients.

5. Becoming a lifelogger

The conditions necessary to consider the choice whether to join the community of lifeloggers truly autonomous can be lacking (Jacquemard et al., 2013). For this inquiry we have distinguished disclosure and competence as necessary elements to understanding. All three conditions might be insufficiently met.

5.1. Disclosure

A researcher developing the SenseCam once described the device as "a black box data recorder for the human body" (Schofield, 2004), which is an apt description for several reasons. In the most ordinary sense it has the appearance of a black coloured box. The researcher however seems to refer to its functioning which has similarities with a device originally used in aviation that stores data about the flight. The concept 'black box' has another relevant connotation, namely that of a complicated device which functioning is not immediately clear or understood from the outside. There are several characteristics that make lifelogs a potential black box.

The outside of a lifelogging device will often reveal little about its functioning. The presence and activities of sensors are often invisible to the naked eye. As a result it may be unclear what exactly is or can be captured by the device. In addition the lifelogger might have little understanding over the data recorded or distributed. Sometimes devices gather more data than was communicated. For example, Apple recorded data that can be used to determine the location of users of the iPhone and iPad even with the location services turned off (Bilton, 2011). In addition the information that can be obtained from stored data might be unclear as algorithms do not reveal themselves when observing the components of a device or even when accessing the user-interface.

5.2. Competence

To deal with lifelogs intellectual capabilities may be required that some of the potential lifeloggers may not have. The potential consequences of using lifelogs are complicated, far-reaching and potentially negative. Suppose lifelogs are available to children of all ages. In general, during childhood one has less competence to make intricate decisions; for example, children often have a limited capacity for self-control and are susceptible to peer pressure (Schurgin O'Keeffe and Clarke-Pearson, 2011). Their decisional capacity is usually developed. In some situations a child will be competent to make decisions. An uncomplicated and unimportant matter might be settled without strong demands on the level of competence. More complex matters can be more demanding. The decision to become a lifelogger and create an archive that can contain information that can be harmful to them or their environment is possibly too complicated for individuals with lesser (or reduced) competence.

5.3. Being free from controlling influences

Prospective lifeloggers may not always be sufficiently free to consider them to have an autonomous choice to become a lifelogger. There are a few sources briefly mentioning this issue although a thorough inquiry seems to be missing (Allen, 2008; O'Hara, 2012). Lifelogs might be enforced by people in one's social environment to control the behaviour of the lifelogger. For example, parents might coerce their children to lifelog in order to check their daily goings-on. Potential targets could also be girls who are already allowed little freedom and whose behaviour can affect the family honour. In contrast with lifelogs enforced by authorities or corporations, the fact that lifelogs are imposed within a family makes it more difficult to protect the victims.

The scope of this issue depends largely on the social acceptability of imposing lifelogs. It is our estimation that the usage of lifelogs for these purposes will often be judged disproportional. The most likely victims are those that are already under close scrutiny by their social environment; in this sense lifelogs will also infringe the principle of justice as it could lead to vulnerable groups becoming even more targeted.

6. Recommendations

This preliminary work in identifying issues with lifelogs and autonomy shows that there are some concerns that can be alleviated by offering the following recommendations:

1) The quality of information offered by lifelogs should be of a high standard and lifelogs should not be designed as to persuade or manipulate the lifelogger in behaving in a particular fashion unless this is explicitly and justifiably the purpose of the lifelog (e.g. a lifelog that helps people improve their health) and unintended bias should be minimized.

2) Designers should acknowledge and anticipate the level of competence assigned to various groups. Children might lack the competence to make intricate decisions regarding their privacy and that of others. The elderly might not be accustomed to the novelty of technology (and the vocabulary associated with it) and fail to properly grasp its possibilities.

3) To allow a potential lifelogger to make an informed decision when deciding to become a lifelogger, sufficient and understandable information needs to be presented about the functioning of the device.

4) The fact that lifelogs should be secure against third party access seems first and foremost an integral part of the lifelog, which should not need further explanation. Developers should have security at the heart of their design.

5) Privacy should be safeguarded. There seems to be an intimate relationship between privacy and autonomy. Information about others should be kept to a minimum and preferably avoided. Devices should only store this kind of information when there is no anticipated concern to privacy or when the functionality gained outweighs privacy concerns. The purposes for which lifelog information can be used should be limited and the main body of data would preferably be in the possession of the lifelogger rather than in the hands of a corporation.

7. Conclusion

We have identified various concerns regarding autonomy and lifelogs in this preliminary inquiry.

We have shown that lifelogs can both harm as well as promote understanding. Lifelogs can skew understanding by promoting information that is biased or by offering information to manipulate the lifelogger. If we succeed in minimizing or avoiding some of these issues, lifelogs could improve the lifelogger's understanding about some matters.

We have also shown that lifelogs can both harm as well as promote personal freedom. Lifelogs might reduce the privacy of the lifelogger or others and by doing so the people affected can suffer a loss of personal freedom. However, as was the case with understanding, lifelogs can also promote freedom either through sousveillance or by offering information that can be used to address poor living or working conditions.

We have also discussed some issues with the conditions under which one becomes a lifelogger and autonomy. We have identified issues regarding prerequisites for autonomous decision-making, namely disclosure, competence and being free from controlling influences.

Finally we have provided five recommendations that can be used by developers of lifelogging devices and applications as guidelines to meet the challenges and reap the opportunities that lifelogs pose towards autonomy. These recommendations are

broadly formulated which makes them applicable to any possible lifelogging device or application.

This inquiry has shown several ways lifelogs can affect autonomy but fails to address all of them. Another thorough inquiry into the effects of lifelogs on autonomy is needed especially because this technology is still at an early stage of adaption. An early identification of the challenges and opportunities lifelogs pose can prove beneficial to the further development of the field.

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