AVOIDING VAPOUR TRAILS IN THE VIRTUAL CLOUD: DEVELOPING ETHICAL DESIGN QUESTIONS FOR PERVASIVE MEDIA PRODUCERS

Constance Fleuriot

An important strand of enquiry for scholars of the attention economy must surely be the ethical issues associated with the development of 'pervasive media'. In partnership with the community of practitioners in the Pervasive Media Studio (PMStudio), I have been involved in a Knowledge Transfer project to uncover the myth, reality and challenge of pervasive media: what the language and values of this field might be, how to *not* reproduce the dystopian visions of science fiction (such as Spielberg's *Minority Report*) and how to think more positively about what we *do* want around us as our shared future. I have led the use of a critical workshop-based process of experience, description and reflection on innovative pieces of work in order to develop a set of shared understandings and ways to describe the language and values of this emergent field of practice. The other objective of this work is to encourage designers and developers of pervasive media to develop critical awareness of their own practice and to apply this to what they produce.

In March 2010 we convened 'Pervasive or Invasive?', a one-day symposium bringing together computer scientists, practitioners, developers and media theorists to generate shared understandings of pervasive media, and to start to define what might form ethical design in pervasive media. This event began a two-year process of creating a pervasive media 'cookbook': not as a list of rules and regulations, or even guidelines, but as a set of practical questions for designers and developers of pervasive media to ask themselves as an integral element of their design process. These questions have been further developed and explored as part of the Knowledge Transfer project between academics, in our team at the Digital Cultures Research Centre, and the PMStudio, which has brought together

experts and practitioners in workshops to explore key questions of shared values and language through shared experience and discussion. These questions then have a basis in reality rather than conjecture, and draw on many years of experience (Dovey & Fleuriot, 2011)

Not all developers have the experience and wider understanding of the world beyond their niche expertise to be able to think through the ethical implications of their design decisions. Neither may they necessarily realize that the hidden underlying structure of an 'app' or experience is as important as the aesthetics: decisions about where or what form an app takes will affect and be affected by the ways that data is used within and beyond the app. The ways that applications and software deal with data generated by users are not random but they may be accidental. All design decisions affect what data is kept and passed on to third parties, either deliberately or inadvertently. This data, which the user may have no awareness of, can be combined to put together a personal picture of the user over which they have no control.

The philosopher Bernard Stiegler writes on the importance of knowing and understanding in order to reach what he terms 'majority'. To be truly adult and enfranchised, Stiegler states that an essential part of a person's achievement of the state of majority involves developing critical evaluation and other competences to be able to discuss and engage with a subject (Stiegler, 2010). Achieving this 'majority' with regard to pervasive media is a complicated process. It would be interesting to explore whether Stiegler's literacy for pervasive media merely involves understanding the conceptual ideas or whether it also entails the need to know about everything that is happening beyond our view in the data cloud. As users we need to understand *why* we get adverts in the YouTube sidebar for things we have previously browsed online; we don't necessarily want to know exactly *how* it works on a technical level. However, I would argue that designers need to have a higher level of literacy and the obligation to make the 'workings' of their app as explicit as possible so that their users can make informed choices.

During one of our discussions on a new mobile game the use of Facebook as a default tool by the game designers was challenged; an open source social networking software (Diaspora) was suggested as an alternative. One reason for suggesting it was that, unlike Facebook's centralised storage of data, Diaspora allows each user to control where 'their' data is located within the social network.

People who wanted to play the game would not have to set up a Facebook account if they had not got one already. This conversation moved beyond the 'Facebook is bad, don't use it' stage because there were people present who knew the technical alternatives to the easy option that the designers had planned. Their level of literacy was higher than that of the designers because they were already interested in and aware of ethical issues.

What Are the Implications for Designers?

Designers of pervasive media need to achieve 'majority', in a Stieglerian sense, before they can hope to enable their users to do so. If the 'majority' has a responsibility not only to themselves but also towards minors, ethical design should encourage development of competences and an ability to critically evaluate design practice. This can be partly achieved through public questioning and discussion of that which we cannot see, through finding ways of showing the hidden algorithms and use of data and through designing 'provocations' that engage and develop criticality in some way.

There may be some fear among designers that openness about the way things work, perhaps in the form of explanations or disclaimers at the start of engaging with an app, experience or other pervasive media, may be off-putting and get in the way of the aesthetics and user interaction.

Yet designers have a responsibility to make the implications of their actions clear to the user. If a user knows what they are agreeing to, they may still choose to go ahead – witness the number of people who sign up for Facebook apps even if they do understand to some extent that their personal data is then shared. Ideally as user literacy increases, awareness of alternatives will develop. One suggestion from the opening event of our Knowledge Transfer work, 'Pervasive/Invasive', was the development of an Ethical Brand, somewhat like the Fairtrade mark that today is widespread and understood, that would show an app's level of invasiveness, for example with regard to data storage and data mining.

As well as aspiring to achieve an Ethical Brand, another challenge for the designer might be: 'just because something is technically possible doesn't mean that it has to be implemented'. Discussion of the practices of pervasive media development, and of the inherent

ethical issues that arise, is an important way of raising awareness among designers of the implications of the design decisions that they make. This can help them develop better understanding of those implications, for example, of the potential uses of data generated by people's interactions with pervasive media. A key question for designers is how they contribute to the production of 'vapour trails' generated throughout the datasphere: whenever we send an email, visit a website, click on a link, make searches, sign up for applications or share family photographs we generate trails of data that we cannot necessarily see.

It is standard practice for search engines such as Google, Amazon, Twitter, Yahoo, ebay to gather and analyse a log file of all web searches made from one IP address, as well as analysing cookies that can be more reliably traced back to a particular client (Pariser, 2011). It has become more noticeable that we can look at something one day on an online shopping site and have it appear as a banner on a completely different website a few days later. It is not just that we may wish to keep information about ourselves private, or we might not care, but data processing today has the power to draw inferences about us from all these seemingly unconnected activities. Software can elicit all sorts of information from interactions with different sets of online content and then make assumptions about the owner of the computer, targeting them with what the system thinks they want to see or read.

Recently it has become more public that Google not only scans email sent and received using its own 'Gmail' service and sends out 'relevant' adverts, but that it also now has the ability to cross-reference between different Google-controlled activities to draw inferences about users, thus building a detailed image profile of an individual and then responding with targeted information that corresponds to that profile. This data profile becomes a way for advertisers, marketers and political parties to target us with adverts or election 'pamphlets' which they 'know' we will find interesting. This phenomenon of 'personalisation algorithms' or 'filter bubbles' of targeted information could lead to us never stumbling across anything on the Web that we don't already agree with (Pariser, 2011). According to Google's own video designed to explain changes in their privacy policy in 2012, they are creating a more 'beautifully simple' and a 'more intuitive experience' for us all, one that means we need make fewer decisions for ourselves.

If online interactions are then cross-referenced with user location (whether via background phone location data or deliberate foursquare log-in) then whole patterns of personal activity can be built up, not just every time the user posts a comment on Facebook or tweets where they are. The automated data can contradict what we say about ourselves.

Unlike physical vapour trails, our 'virtual trails' do not merge into the 'cloud' over time but can still be followed, even years later. It is because the data is stored on servers in large, mostly private, data centres, ready to be accessed by powerful search engines, collated, used to identify us as consumers and voters, and target us with 'relevant' information that either confirms or attempts to sway our beliefs. There is accordingly a need to make us all as users aware that we each generate a virtual vapour trail in a cloud of data, and that there are ways of clearing these trails to a certain extent by deleting web browser history and cookies as well as the history of what we have viewed on YouTube, etc. Yet why should such data be collected in the first place?

Designers need to be aware of how we inadvertently contribute to 'vapour trails' in the way we design and set up pervasive systems – we can choose to only collect names, email addresses, phone numbers and so on from our players for the duration of the experience. There is no need to keep such information beyond that, unless we clearly ask whether users wish to be sent information about the next event. Setting up a feedback form on a site such as SurveyMonkey allows the option to record the Internet Protocol address numbers of respondents, which is probably not necessary. The temptation might be to amass data on players/users/customers to target different sets of people with different versions of the next release, or to keep data just in case it is possible to sell it on to a third party.

There is always a balance to be struck between commercial, ethical and social tensions for even the most ethical of designers. However, with the huge growth of the apps market, there has been a relatively recent shift from stand-alone experiments to developing applications for commercial platforms where the developers have little or no control over the generation and storage of data, e.g. if they build an experience that runs on an iPhone. It is clear from recent media reports that platforms such as Apple and Google harvest and store huge amounts of personal data that users might reasonably assume to be private. App developers who choose to work with commercial

platforms can no longer control all the data that is being collected and collated about the user of their app or experience, or about how this data is commercially exploited by the platform on which their applications run. They should ask themselves whether their ethical practices fit with the platform that they chose in order to make their product more mainstream and commercial, and how they might counterbalance this if their app were to make hidden data gathering more explicit to the user, in the same way that Amazon tells us why they are recommending other books based on previous searches and purchases.

The questions that we ask of developers are designed to make them think about these issues and about where they locate themselves in the range of ethical practices. Legal implications are often focused on the content copyright issues, rather than on the data being built up on the individual who is accessing that content. The developer does not think beyond their immediate app and who might be linking the data it generates with other databases generated by supermarket loyalty cards and online shopping sites. This attitude could be caused a failure to understand the alternatives or by sheer laziness.

Beyond the ethics of the design and performance of pervasive media experiences there are also, of course, the broader effects of the designed object and its impact on the public; the environmental impact of the design and production process (see Taffel in this issue); and what legal and legislative frameworks might need to be introduced (see e.g. Pearson *et al.*, 2010). Nevertheless, the ethics of the design of experience remain a key issue to be considered. Returning to 'Pervasive/Invasive?', one of the speakers, Professor Nello Christiani – who attempts to educate his students on their ethical responsibilities as computer programmers – has offered a compelling call to action:

> There is a need to engage with current debates around pervasive media in order that we don't stumble into the future with our eyes shut, but are more aware of the possible futures; develop the right concepts, laws, and societal values. (Christianini, 2010)

This short essay is the beginning of an outline of some of the key ethical issues in the design and implementation of emerging pervasive media technologies and their associated media

experiences. It is a nascent but growing area of the creative economy and an emerging field of academic study. Yet there remains significant uncertainty about the implications of such developments. However, building on knowledge transfer engagements with the PMStudio, I have demonstrated how it is possible to create frameworks for critically and ethically contextualizing design practice in emergent fields. In many ways the underlying motto of this work, contrary to a prevailing technological determinism, is, as Howard Rheingold succinctly states: 'in the interval before the new media sphere settles… what we know and what we do matters' (2002: 215). By following a critical framework, such as the design questions outlined here, designers of pervasive media can encourage and participate in the formation of an informed and ethical 'majority' with, and not in spite of, pervasive media.

A Critical Framework for Designers/Developers

- Is it possible to design an application so that people are able to choose which information they share?
- What levels of user consent are needed?
- When does anonymity matter?
- Is there a right to data anonymity?
- Is data log-ON your default setting?
- Is the app/experience set up so that user has to opt-out, i.e. they are added by default, or opt-in, i.e. they choose to engage?
    - Who initiates the interaction between the user/device and the system/app? - Is it push or pull?
    - Does it use Bluetooth scanning, i.e. looking out for people's devices as they pass through a space?
- Is the content made available only to people who visit a particular space or have access to a particular technology?
    - Is it your intention to restrict access to the content, or will you set up other ways to allow access?
    - Do users have to log in to engage?
- Are you creating a social network?
- Can you allow your user to be anonymous? Do you need to know their real name, date of birth, phone number, etc.?
    - Can people use fake ID?
    - Are multiple identities allowed?
    - How does this affect prizes, leader board, high scores, etc.?

- o If so, how much information do people have to give you for your app to work?
- What is necessary for the game and what is superfluous data?
- Is permanent data collection necessary and/or planned?
- Have you made the collection and storage of data explicit to the user?
- Once you have collected data from your user, what do you do with it?
- Have they given permission to you to use it?
- Who has access to the data?
- Do you allow mining of that data by others?
- What is the value of the data
  - o economic
  - o social
  - o personal?

Acknowledgments

References

Cristianini, N. (2010) Opening remarks of the presentation at Pervasive/Invasive? DCRC 2010.

Cristianini, N. (2009) 'Patterns In Personal Data - The Privacy Delusion',
http://www.see-a-pattern.org/?q=content/patterns-personal-data&page=0,0

Dovey, J. and Fleuriot, C. (2011) 'Towards a Language of Mobile Media', in M. Rieser (ed.), *The Mobile Audience. Media Art and Mobile Technologies.* Amsterdam and New York: Rodopi.

Pariser, E. (2011) *The Filter Bubble The Filter Bubble: What the Internet Is Hiding from You.* New York: Penguin.

Pearson S., Tancock D. & Charlesworth, A. J. (2010) 'A Privacy Impact Assessment Tool for Cloud Computing', *Proceedings, Second IEEE International Conference on Cloud Computing 2010*, pp. 667-676.

Rheingold, H. (2002) *Smart Mobs: The Next Social Revolution.* Cambridge, MA: Basic Books.

Stiegler, B. (2010) *Taking Care of Youth and the Generations.* Trans. S. Barker. Stanford, CA: Stanford University Press.