The Ethic of the Code: An Ethnography of a 'Humanitarian Hacking' Community

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Abstract

Hackers and computer hacking have become important narratives in Sociology. These discussions have frequently portrayed hackers as deviant, framing them ethnocentrically within North Atlantic societies. Recently, however, events such as the politicisation of hacking through 'hacktivism' and those who hack for humanitarian causes have forced us to reconsider such typologies, although the body of empirical research in such areas remains relatively sparse.

The aim of this paper is to present the findings of an ethnographic study carried out during a hacking event in 2012 which focused upon those involved in 'Humanitarian Hacking'. Online and offline research explored the events that hackers took part in, the technologies they produced and the individuals involved. Based around the 'Humanitarian Hacking' event, this paper explores the motivations of participants, contrasting against previous studies and theory, particularly the idea of a 'hacker ethic'; the extent to which these groups comprise a 'community' and its nature; and finally the social shaping of the technological artefacts produced by these groups.

Drawing upon the works of previous researchers including Gabriella Coleman, Christopher Kelty and Pekka Himanen, the author will provide ethnographic evidence which demonstrates that not only is the 'hacker ethic' an important within narratives of open-source technology, but that elements of it are also increasingly seen in wider areas of society from open-data to crowd-sourcing to the Anonymous movement. By tracing the historical origins and context of 'Humanitarian Hacking' and exploring their practices, this paper seeks to explore something of the motivations behind this activity. By doing so, it will reveal the wider symbolic significance of hacking within a 'network society' in which informational networks hold a central role, and in which the ability of hackers to manipulate such networks can be both feared and revered.

Such groups present a methodological challenge for ethnographers since they are multi-sited, mobile, and take place both online and offline. This paper therefore draws upon emerging practices in the social sciences including virtual ethnography, multi-sited studies, 'shadowing' actors and 'following' technologies as cultural artefacts. The hackers engaged with in this project were often themselves academics, with research taking place within the ethnographers 'own tribe' and the degree of separation between fieldwork and 'everyday life' constantly blurred. This made a more participatory style of ethnography essential and challenged pre-existing notions of 'the field'.

Introduction

Background and Overview

This paper is based upon ethnographic research carried out over a two day period in May 2012, during which, I attended the UK element of Random Hacks of Kindness (RHoK) at Southampton University. RHoK (pronounced *rock*) comprises a regular series of simultaneous global events, which take the form of 'hackathons' during which participants engage in open-source software development and hardware modification with the aim of solving various social, environmental and humanitarian 'problems'.

This particular event was organised primarily by one individual, an employee of the university, and made up of approximately twenty attendees, predominantly Southampton University students, all males aged between 18- and 35. Some of the attendees knew each other from university, socially or from previous events, however, many did not. Participants divided themselves into five separate groups and each selected a 'problem' to address. These problems were either proposed internally by the attendees themselves or by external non-participants. In this case, members of two separate humanitarian organisations, based in Zimbabwe and South Africa, each proposed a problem using a Skype video-call projected at the front of the room. Several other problems were then also presented by the 'real-world' attendees using Power Point presentations to the rest of the group.

The problems selected were those presented by participants themselves and, due to the low number of choices, none were rejected. The projects included a tool to visualise the amount of water in foliage on a landmass using satellite data, a tool for visualising different charity projects based upon open-data, a VOIP (Voice over Internet Protocol) application to allow language translation and text-to-speech and an expansion of the open-source *Ushahidi* crowd-sourcing platform which allows users to submit reports via various methods which can then be aggregated and analysed centrally. The organiser of the event obtained Sponsorship from a number of corporate bodies to pay for food during the event and prizes for the winning teams.

Running parallel to the 'real-world' event was a linked online infrastructure of blog sites, Twitter feeds, IRC (Internet Relay Channel) and Github depository, some officially part of RHoK and others belonging to individuals involved. Participants also formed part of a wider network of global events. During the period of this research, twenty-five events were held across fourteen different countries involving 905 attendees (source: www.rhok.org). The Southampton event was also connected directly to some of these specific other groups through Twitter, Skype and live webcams.

Methodology

This research draws inspiration from previous ethnographies of hacker conferences (Coleman, G 2010) as well as the methodologies of Bruno Latour (1999) and Barbara Czarniawska (2007), both of whom have employed shadowing of relatively small groups and individuals through the course of their work, often over the course of just a day, and the following of objects with emphasis upon the social processes which lead to their construction.

According to Barbara Czarniawska (2007), the nature of modern societies means that activity can happen simultaneously in different places through various technological means, thus changing the nature of traditional ethnographic fieldwork. She therefore suggests need for a more mobile ethnology and various techniques to 'cope' with some of these issues

"Shadowing", for example, essentially involves following particular individuals of interest in their day to day lives. "Diary Studies" are the analysis of both digital and non-digital forms of narrating past events such as blogs, photographs or asking participants to maintain daily logs. Czarniawska suggests that diary studies present a solution to the problem of ethnographers being "all places at the same time", when their subjects are highly mobile. She also describes how participants can be asked to engage in "observant participation", carrying out their own fieldwork in situations where

the ethnographer would find it too difficult to gain access. And, finally, Czarniawska talks about "following objects", whether human or objects such as a particular piece of software. This technique might, for example, involve taking a piece of software and following it from its creation through various stages. On the other hand, one could look at the 'end' result, a hacker conference, for example, and retrace the processes involved, allowing the researcher to see within the 'black boxes' which lie behind some technologies.

In addition, the nature of studying groups who are not geographically grounded and can exist both online and offline, moving between various different sites meant that I drew inspiration from areas such as 'virtual ethnography' (Hine, C 2000) and 'multi-mode' ethnography (Marcus, G 1995).

As an ethnographer, I would argue, the above methods may help to avoid the issues involved in attempting to study a highly mobile and globalised group such as hackers. It is a 'bottom up' approach to carrying out research which negotiates and challenges the anthropologist as "*inquisitor*" power structures (Clifford, J and Marcus, G 1986: 77). In this way, the separation between 'researcher' and 'researched' begins to blur (Garfinkle, H 1996)so that, as Rosaldo argues, no longer can the ethnographer hide behind "the door of his tent" (Clifford, J and Marcus, G 1986: 77).

In light of such approaches, after listening to the initial problem presentations, I elected to 'shadow' one particular group for the duration of the weekend. However, I also regularly moved between different groups in order to gain a more detailed picture of the overall event.

My primary research method involved participant observation and I took on the role of attendee at this event relatively easily since many of the others were also postgraduate students. Despite my relative lack of programming skills I was able to volunteer to help in less technically demanding aspects of hackathon and participants were often keen act as teacher, instructing a new member of the group. With the use of a laptop, it was possible to 'blend' into the group, sitting alongside the other members in a circle and observing their actions will recording notes on the computer without this necessarily allocating me 'outsider' status.

I was able to carry out informal interviews and discussions with the majority of participants during the course of the event. Often, this would take the form of unstructured conversations, during a coffee break or as they hammered out lines of code late into the night.

In addition, I also gathered a quantity of online data in the form of Twitter feeds, website content, chat-logs and images. This kind of data would prove invaluable to a group who so freely bridge the gap between online and offline interaction.

In the case of several participants, I followed up these encounters with more formal interviews at a later stage using email, Skype and in person.

An essential part of this research was the exploration of the technologies produced by these groups as cultural artefacts. By viewing technologies as social constructions, I was able to 'trace' the journey that these objects took throughout the process of their creation. My aim in this was to interpret what these artefacts reveal about the groups which make them.

Research Framework

This paper is closely linked to previous sociological work I have carried out at other events and with participants in 'Humanitarian Hacking' and related activities. A core aim of this research generally has been to explore the origins of 'Humanitarian Hacking' as a distinct and emergent field and its relationship to other areas such as open-data, crowd-sourcing, 'the clean web' and ICT4D ('Information Communication Technologies For Development'). Of particular interest is the point at which we start to see groups such as RHoK emerge and what the social and cultural changes behind these technologies and groups might be.

A number of theoretical frameworks formed the basis for my analysis of ethnographic data, based primarily upon previous sociological and anthropological studies of computer hackers and open source software communities.

Of particular relevance has been the concept of a 'hacker ethic' as defined by several authors including Steven Levy (1984), Christopher Kelty (2008) and Pekka Himanen (2001). Although a fluid and homogenous term, this 'hacker ethic' is usually described as encompassing, but not limited to, openness, access to technology, informational freedom, antiauthoritarianism and a spirit of exploration that goes beyond the merely technological.

An important distinction in this discussion, however, is based around a particular argument; those who see the hacker ethic in *opposition* to mainstream corporate ICT and those who believe that this hacker ethic informed what would *become* mainstream ICT and thus shaped the markets accordingly. I would, however, also argue for a third option; that this 'hacker ethic' itself is part of a wider social and cultural change which informed not only computer hacking but also a range of other social movements and technologies including 'Humanitarian Hacking', open-data, open-gov, open-education, the clean web and crowd-sourcing. What this previous literature has failed to address is what this social change was and at what point it occurred. Although technological advances clearly facilitated such change, this argument alone is technologically determinist and, I would argue, insufficient. By exploring some of the groups involved in 'Humanitarian Hacking', my research aims to address these areas.

'**Humanitarian Hacking' as Related to a Wider Social Movement: Organisation, Structure and Layout of the RHoK Event**

A RHoK Event in the Context of Hacker Conferences

> *The room is open and spacious and clean, not at all what I was led to believe from my previous readings of 'hacker cons'; those dark, chaotic circuses of code which drag on late into the night, fuelled by beer and fast-food and sprawling wires. But then this is not really like those other events – it does not seem related to a distrust of authority or even purely technology. The attendees are 'hacking' but they are not necessarily self-defined 'hackers' as defined. Of course they share a common interest in technology but they are geologists, social scientists, web developers. Their goal is to find out how technology can make the world a "better place" - that and the challenge of testing their technical skills [Field notes, May 2012, Southampton].*

According to Gabriella Coleman, hacker conferences are typified by the "condensed performance of a "*lifeworld*", the ritual acting out of their ethics and values in person, in public, within a geographically bounded space (Coleman, G 2010: 64).

Conferences generally have been described by Raghu Garud (2008) as "discourse spaces", sites of conversation between participants embracing different visions of the future and "selection environments" where certain approaches are legitimised over others (Garud, R 2008: 1061). In this way, he argues that conferences can serve as settings in which fields are defined, what he terms "field configuring events". Garud suggests that this makes conferences useful places in which to study new and emerging fields with no widespread agreement as to the boundaries and membership.

Aspers and Darr (2011) also studied a number of 'trade shows' ethnographically in order to explore the role played by these events in constructing the real time computer industry in the US. Starting with a thorough discussion of the history of trade shows from medieval market fairs to modern conferences, the authors then employed surveys, observations, interviews and informal conversations to test their hypothesis. They conclude that a full appreciation of conferences as holistic events are essential to gaining a deeper understanding of how new fields are created.

Coleman discusses some different *typologies* of conferences such as the anarchic 'festival' nature of hacker cons in contrast to more formal corporate events. However, she argues that that they are all based around an idea of social solidarity between those "scattered across vast distances" and, like Garud, views them as forums in which the field of the group is negotiated and confirmed (Coleman, G 2010).

Although an aggregated history of the hacker conference has yet to be written (Coleman, G 2010), the RHoK event upon which my research focused can be seen as typical of a wider 'type' of event. Briefly, this might include 'commons', hacker 'cons', 'hackathons', 'camps', 'fests', 'bars' and 'unconferences'. The origins of such events are slightly blurred, however, they can be traced to a number of sources – the BoF ('Birds of a Feathers') session in which hackers breakout from formal conferences to work on a particular topic of interest (Coleman, G 2010: 53), hacker and maker spaces where technological enthusiasts gather to hack (made famous by the 'Homebrew Computer Club') and the 'Foobar' hacker events inspired by 'Open Space Technology' and 'Temporary Autonomous Zones'.

This type of event tends to be quite informal and "semi-autonomous" (Coleman, G 2010) in nature. It also involves a high degree of online interaction and participation. Although such events may have their origins in the world of technology, and hacking in particular, their scope can now be considered much wider. These types of events are now becoming fairly common in academia, business, journalism, even government[1]. I would argue that they are indicative of a particular way of viewing the world which bears a strong relationship to the 'hacker ethic'. A social and cultural worldview associated with liberalism, collaboration, exploration and antiauthoritarianism, related to but not determined by hacking as a purely technological activity.

As such, events like RHoK reflect the fact that elements of this 'Hacker Ethic' are increasingly widespread in many fields beyond hacking itself from crowd-sourced data, 'the clean web', open-data, open-government, open-education and even the democratised activism of the 'Arab Spring', Occupy and Anonymous 'movements'. Rather than viewing this as a dispersal of the 'Hacker Ethic' into wider society (Kelty, C 2008; Himanen, P 2001), however, it is my contention that such 'Hacker Ethics' themselves form part of a wider social and cultural movement which comprises all of these above groups. Therefore, while hacker events of the type witnessed during RHoK may be somewhat anchored in hacker culture, they also form part of a wider range of similar events outside of hacking specifically which have resulted from a social and cultural movement which will be discussed below.

The Day Begins: 'Humanitarian Hackers' in their Wider Social Context

> *The day starts at a crawl. No agendas here, not a registration table or name badge in sight. A few people gradually start to trickle in. There is no strong structure around timings and a relaxed atmosphere sets the scene. People are after all, they say, choosing to be there. I volunteer to put up a few signs, hastily scrawled together on the back of a research paper. My general feeling is that people are friendly, welcoming and inclusive in a low key sort of way; a sense of 'in it together' comradeship that one might associate with a gym class. More informal say than a tutorial, perhaps, less so than a festival. There has been a pub meeting beforehand which a few of those here attended. The organiser of the event, organiser in the loosest sense of the term, goes through a set of slides, discussing the aims of the day, its structure, health and safety formalities – it's all fairly fluid. We then go around the room then and people introduce themselves, talking about their interests and what kinds of technical skills they have to offer [Field notes, May 2012, Southampton].*

This forms an interesting moment in the proceedings, the point at which the event takes on, for the first time, the feeling of a more formal conference or a class, the difference being that its participants are neither being paid to take part or required to - they are instead choosing to donate their weekend, their spare time, to take part in the type of activity which the majority of them have spent the preceding working week doing. It is the first moment at which one might begin to question the motivations for taking part in such an event, and indeed the wider social context into which this phenomenon might be situated. Pekka Himanen describes this concept as "turning Sunday into another Friday" (Himanen, P 2001). This provides some potential explanation for the motivations of those involved in these kinds of groups.

> *Hackers do not feel that leisure time is automatically any more meaningful than work time. The desirability of both depends on how they are realised. From the point of view of a meaningful life, the entire work/leisure duality must be abandoned. As long as we are living our work or our leisure, we are not even truly living. Meaning cannot be found in work or leisure but has to arise out of the nature of the activity itself. Out of passion. Social value. Creativity (Himanen, P 2001: 150).*

This emphasis upon 'work for works sake' can be seen as reflective of the hacker ethic as presented by Himanen and I certainly found evidence within my own group of informants that this blurring of work and leisure time did exist. In some ways, this should not be surprising since the notion of '*hobbyism*' among hackers is well documented (Himanen, P 2001; Levy, S 1984; Kelty, C 2008; Coleman, G 2010).

Some explanation, however, is required as to the wider social and historical changes in attitudes towards work and leisure which resulted in this hobbyism among hackers, however they are defined. Although some authors (Sterling, B 1992; Chandler, A 1996) have argued that hackers have always existed in the form of amateur scientists and technological tinkerers, there are a number of clear differences between these individuals and contemporary hacker *communities*. While those historical figures were few and far between, originating from social elites, hackers on the other hand represent a greater democratisation of science and technology – albeit within a relatively confined portion of society.

In terms of a wider context, Christopher Kelty sees these changes as the proliferation of the 'hacker rthic' into wider areas of society beyond ICT (Kelty, C 2008). Following in the footsteps of Eric Raymond (1999), Kelty argues that, rather than dividing 'true hackers' from the 'mainstream' corporate IT industry, we should instead view the hacker ethic as having shaped these commercial markets and technologies. After all, Facebook, Microsoft and Apple are all arguably examples of commercial IT products which originated to some extent within 'hacker' communities of North America.

I contend, however, that this 'hacker ethic' has had an influence upon areas beyond computer hacking. This can be seen, I would argue, across a range of interrelated emergent practices including crowd-sourced data, 'the clean web', open-data, open-government, open-education and even the democratised activism of the 'Arab Spring', Occupy and Anonymous 'movements'. Rather than being purely the result of technological advances then, these practices might be seen as indicative of wider social and cultural changes.

Manual Castells may provide some explanation for just what such changes might be. In an epilogue to Pekka Himanen's book (2001), Castells describes changes in working practices that emerged within the 'Network Society' since the 1960s with a greater emphasis upon capitalism, more focus upon informationalism, decentralisation and knowledge based working practices. Many of the traits of these societies described by Castells also appear to form important areas of the hacker ethic -

deregulation, liberalisation, privatisation and globalisation. It is therefore perhaps unsurprising that hackers emerged from the libertarian social and cultural movements of late 1960 North America and several authors have argued that these open-source communities and their technologies themselves are in fact reflective of this background (Rheingold, H 1993; Raymond, E 2000; Marx, L 2010; Healy, D 1996; Cooper, J 2000).[2]

This framework is important in situating hackers broadly as significant characters of the 'Network Society'. It is no coincidence that the point at which informational networks became vital to societies, was also the point at which hackers became demonised and criminalised in popular narratives (Sterling, B 1992). This was partly as a result of the perceived threat they posed not just to technological infrastructure but also, symbolically, to existing power structures, because of their ability to subvert these networks (Meikle, G 2002). But in following such narratives, we often forget that the 'hacker ethic' never was purely the domain of the 'crackers' and 'black hats'.

'Humanitarian Hacking' as a movement should be viewed within this wider context of Network Societies and the motivation of those RHoK participants with whom I carried out my ethnography can, I would argue, be further understood through this theoretical framing device. In addressing the question of why these individuals volunteered their weekend, none of them appeared to register this difference between working week and leisure time. Instead, it seemed rather to form one large and continuous part of their lives, a blurring of work, study and leisure time. Those involved in this activity comprise a homogeneous group and frequently cite a range of motivations from the thrill of technological exploration to civic obligation - a duty of those with the ability to contribute to society. They also strongly correlate with the hacker ethic creativity and passion as described by Himanen and Kelty. This group seemed fascinated primarily with the processes I will describe below, the working through of problems, the testing of skills - a hack is, after all, an overcoming of a problem, technological or otherwise[3].

The Formation of Groups and Topics

The second distinct stage of the RHoK event involves the presentation of 'problem definitions' in which several of the participants outline a rough idea for a technological solution to a problem, usually environmental, social or humanitarian. There are also two 'remote' presentations from representatives of development organisations, based in Zimbabwe and South Africa, using Skype. This is fairly typical of these events as they tend to involve an element of interaction with globally distributed groups and individuals sharing similar interests. A key part of RHoK and other such events is an emphasis upon awareness of this wider global network using social media. Some of the problems presented at RHoK events are in fact connected to other events, either held previously or occurring in other countries.

Once these problems are presented, they are decided upon by the participants and smaller groups of between two and five formed around each topic. This decision process, however, does not take shape in an organised manner but rather occurs quite organically. Participants seem to gravitate towards a particular group as a result of a shared interest either in the topic or the technology involved.

Some of the participants arrive with well-formed ideas already and in-depth Power Point presentations, often relating to a previous project they want to progress. Others seem content instead to turn up and 'see what sounds interesting'. Where a 'clash' does occur between two individuals ideas or there is not enough interest in a particular topic, the participants tend to negotiate a middle ground, finding a crossover between the two topics or agreeing to look at their idea at another event. There has been a certain amount of discussion prior to the event (which will continue afterwards) around potential topics using social media and the RHoK organisers encourage

people to post problems on their website before the event. In this case, some participants form groups of two, or work alone on their idea but alongside another group with similar interests. After all, it seems important to the day's proceedings that people are choosing to be there and that everybody gets a chance, within reason, to do what they want.

The Structure of the Group

Once the topics are chosen and groups formed, the participants sit in loose circles around tables. Some sit off to one side, at on their own table where they can concentrate more intensely, only leaving at sporadic intervals to ask a question of the rest of the group. This layout is fairly typical of hackathons and seems to differ from more formal settings such as conferences. Even this physical layout, I would argue, is in some way reflective of the hacker ethic - the decentralisation, the "semiautonomous nature" (Coleman, G 2010). The approach of these participants towards the task at hand seems, at times, almost offhand, as though they don't really need or want to try too hard, as if it is all just a bit too easy. At other times it is intense, driven and focused to an extent which one rarely sees in conventional work settings. But this does not feel like 'work' as such – there is no obvious sense of obligation or hardship involved; only what hackers often describe as passion, joy and creativity.

> "*…I guess my reasons for attending were to use my skills to help people, to meet new people who are interested in similar things to me, and to have some fun…" [RHoK 2012 Participant]*

The groups divide in terms of skills and specialisms - a cluster of two coding Python over here, another coding PHP over there. No roles are ever assigned in any formal sense, no instructions given. People seem just to know what to do and find it obvious that they should – the kind of improvised and impromptu creativity of music or art. The groups often get on with their work in near silence and when they do break to talk it is to discuss a problem or ask a question before continuing on again in this way.

It strikes me that everyone is included not just those with the most skill. There is an unstated understanding that people are giving up their time voluntarily and so allowances should be made. Everyone's skills are made use of and the multidisciplinary makeup of the group includes web designers, geographers, engineers, computer scientists and knowledge from many other fields. It is apparent, however, that the focus of the event is largely technological and that there is little involvement from 'non-geeks' such as designers, user interface experts or development workers, a fact which some of the participants are keen to see change.

> "*…It is easy to end up with some great technology which solves some hard problems, but no-one can understand it, or wants to use it, because it hasn't got a sensible interface. I think in many ways the involvement of development workers is even more important. If we're creating technology to help people then we need to make sure we are creating technology that they actually want to use. This is the problem we are having with WaterMe (the project we started at the RHoK event and continued since then) at the moment. We have lots of good technological ideas, and could easily progress with developing them, but we are all rather concerned as to whether what we are doing will actually be useful to the people we are trying to help! Really we need to have contact with development workers right from the beginning so that we can develop projects that will actually be useful to people…" [RHoK 2012 Participant]*

> "*….project managers, 'virtual media PA's to help individuals connect to other currently running hackathon seeking synergistic projects, 'helpers' to*

> *google everyone's questions, evaluate what is out there and help drill down to the detailed information that is needed right away, designers and media people for sure, everyone's presentations and video production would have benefited from a lot of help, I fell into a project management role quite soon which was new and fun!" [RHoK 2012 Participant]*

As the weekend progresses, the room itself becomes increasingly messy with cables strewn around the room, half-drunk cups of coffee and empty bottles and pizza boxes. However, the event organiser sits somewhere around the middle of the room, moving between groups to collect progress reports and direct the course of the event in line with some of the overall RHoK requests. It is apparently important to the event that updates are recorded and shared across the different global participants, forming a networked community which will be explored more fully in the next section.

The 'Social Geek'

The idea that each of the RHoK events do not exist as disconnected, standalone entities but rather as part of a wider network of global hackathons seems of great importance to both the organisers and participants. Gabriella Coleman (2010) has noted this of other hackathons and suggests that the hacker's existence as part of a wider networked community, both locally and virtually, is central to the hacker "*lifeworld"*. Thus, Coleman describes the use of IRC, mailing lists, web pages and wikis before, during and after hacker 'cons' with hackers "fluidly moving" between the offline and online world to coordinate and comment upon events as they unfold (Coleman, G 2010: 56-57). For some of the RHoK participants, however, this sense of community was not always apparent.

> "*We had various Skype conversations on the main screen during the day, and we could see video feeds from the other events, but I didn't really feel connected. I think that was partly because we were all so busy trying to get our code working that we didn't have time to get connected, and partly because the methods of getting connected were fairly difficult (Skype conversations were often difficult to hear, the video feeds were pixelated etc) …" [RHoK 2012 Participant]*

Since the publication of Coleman's article, social media platforms including Twitter and Facebook have taken off, allowing an ever greater degree of online interaction at events like RHoK. In fact, this kind of simultaneous online engagement now forms a central role at many conferences and events including more formal professional conferences.

Into the context of this interconnectivity, several of the participants of the Southampton RHoK create an Internet Relay Chat (IRC) channel, one of the oldest and arguably more stereotypical hacker communication tools of choice, in order to share more conveniently within that group. Added to this is a dizzying array of platforms including personal Twitter feeds, Github, Flickr, USteam and official RHoK websites, all used in different manners in whatever way best suits the situation with participants moving between them with ease.

> "*…our project is ongoing and is undergoing a transformation into a humanitarian startup, so it's very relevant to be in touch withall the other Rhok'ers to pass on any useful knowledge…" [RHoK 2012 Participant]*

The Southampton group is linked to a wider network of global events. On occasions where expertise is needed in certain areas, Skype is used to communicate with those in other countries who possess the required knowledge and skills. A projector screen at the front of the room also displays live video feeds of other global events which people seemed quite interested to dip in and out of, intended to give them a sense that they are part of something much bigger – global yet local, a typical feature of 'Humanitarian Hacking' as a movement. The event organiser uses social media

such as UStream, a live video broadcasting platform, to keep information flowing to participants and organisers in other countries. As well as a continuous live stream from a webcam, he captures regular updates and interviews which are then posted to the RHoK website and distributed widely through Twitter.

> "*Sketching out a plan for collecting sensor data in #taarifa and visualise it. @markiliffe gave us a tour of Dar via Skype. #RHoKSoton" [@NicoWeinert, Twitter, 02/06/2012 12:56]*

The participants of this event have travelled from across the south east of the United Kingdom, with the majority living in Southampton and several making the trip from Portsmouth, Oxford and London. It is apparent that previous events in London have attracted individuals from a broader geographical spectrum due to its size, however, the Southampton area does appear to have what might be described as an emerging open-source hacking community. Many of the participants are involved in other open-source projects and might be viewed as being part of a localised community of 'Humanitarian Hacking' events and groups, with some having further links to a wider community through global events such as RHoK, contacts and online forums.

It seems that the participants in this event form a complex community of some sort, however just what form that community takes is less obvious. There are clear relationships between those within the room and those beyond on a global level; a variety of weak and stronger ties including colleagues, friends or the exchange of code; those with shared interests and knowledge; virtual and real-world.

Communities of hackers have been described previously as 'gift societies' (Raymond, E 2000), 'virtual' or 'imagined' communities (Ziegler, H 2002) or communities of 'interest' and 'knowledge' (Kleinknecht, S 2003) in an attempt to explain the motivations behind them. It might be tempting to describe this group, and those involved in 'Humanitarian Hacking' more broadly, as something of a combination of several of these types. It is worth noting, however, that relatively little empirical data exists to substantiate previous theoretical frameworks used to describe hacker communities. There may, for example, be potential for the use of both quantitatively and qualitatively grounded Social Network Analysis (Shen, C and Monge, P 2011) to explore factors such as the sharing of code and social media interaction in shaping these communities and to map the distribution of 'power' and 'influence' among members of this group.

What is clear, however, is that these individuals differ significantly from the reductionist stereotypes of hackers and 'geeks' as reclusive or anti-social. In fact, far from being 'awkward', my findings make evident that the act of hacking relies heavily upon sociability and the ability to negotiate complex group dynamics. Although this may always have been the case to some extent (Levy, S 1984; Coleman, G 2010; Kelty, C 2008; Himanen, P 2001), it is increasingly true due to the importance of social media and the understanding of social issues required among those involved in activities such as 'Humanitarian Hacking' and hacktivism.

A Metaphor of Power Cables

> *Despite the division of the room into separate 'teams', there is little sense of rivalry or competition between the different groups. The event seems to operate more as one group with participants frequently assisting each other with both ideas and technical equipment. One interesting manifestation of this atmosphere can be seen through the way in which power, specifically power cables, are shared among the group. During my fieldwork, I several times note an occasion whereby a member of the group finds themselves without a source of power. This could be the result of having no spare plug*

> *sockets or to connect to the wireless internet connection. There is at once hurry among those present to rummage in their bags from a choice of countless different power adaptors, to rearrange their own sources and clear tables to make space in order to ensure that no one is left without this important commodity for longer than is necessary. This is particularly noted upon a new member, a latecomer, joining the group. Power, it seems, is a currency at this event and appears to hold a great deal of symbolic efficacy. So we end up with a huddle of people around a table, remotely focused on their individual screens yet closely connected, sharing each other's power sources – All 'hanging' of the same Wi-Fi, 'tethering' from a single smart phone, bridging off devices, sharing connection [Field notes, May 2012, Southampton].*

It should perhaps not be surprising that this particular metaphor emerges since hacking is ultimately about sharing, collaboration and inclusion. To be without power, to be disconnected, within a Network Society based around informational networks is to be disenfranchised and without voice. This is, in some ways, the power of hacking - to find connection in situations where one might not otherwise, both in a literal and metaphorical sense. After all, one of the ideas which first inspired the ICT4D movement and, I would argue, still holds a certain degree of hesitant influence in 'Humanitarian Hacking', albeit controversial and perhaps outdated, is that of a 'Digital Divide'.

This is the idea that there is a 'gap' between those with access to ICT and those without. Proponents allege that this gap can emerge for a variety of reasons, economic, educational, and can be as strongly felt within societies as it is globally (Korupp, S. and Szydlik, M 2005). An aim of some involved in ICT4D and 'Humanitarian Hacking' has been to address this 'Digital Divide' through facilitating greater access to ICT for those who are currently excluded. In some ways, the sharing of power cables within this small group might act as quite an interesting metaphor for this idea.

This sharing is intrinsic to the process of hacking and to the 'hacker ethic' (Himanen, P 2001). The idea of hacker communities as 'Gift Economies' has been a central feature of many attempts to explain the motivations and how they might shape the structures of such groups (Raymond, E 2000). So, for those involved in hacking, the freedom to access technologies often walks side by side with the idea of an open and sharing society.

Coding the World: Different Phases of the Process and the Social Shaping of Technological Artefacts

Previous notable studies of science and technology have focused upon a research method of '*following*' the various phases through which an object moves and thus revealing something of the processes by which it is shaped by its creators (Latour, B 1999; Czarniawska, B 2007). These same authors have also proposed the ethnographic '*shadowing*' of individuals as they go about their working day. I would argue that such research methods translate well to an exploration of the social construction of technological artefacts, not only in terms of these processes involved, but also what the final products of this process might reveal about the groups which produce them.

In the case of the RHoK hackathon, I have identified three unique phases which can be identified as part of the process by which hackers construct their technologies and which, I would argue, reveal some interesting insights as to their nature.

Phase One: Once the groups and topics are decided, the initial phase for the participants is to gather around their table and discuss the problem at hand, their ideas for solving it and to transfer these thought processes onto paper in the form of diagrams and plans. In the case of this particular team, for example, they begin with a discussion of the overall problem and the background before beginning to sketch out a potential solution. One team member with less technical skill volunteers

to carry out online research to identify drought locations which might be used for their project. This phase is a creative process, a team effort in which collaboration and working together is assigned importance. It is also a stage during which even the less technically skilled members of the group are included, before tasks are divided up among those with particular expertise. Once transferred onto paper, the ideas take the form of diagrams and sketches. These are quite rough and sketched out in an animated way, with boxes, lines, scored out, redrawn. This is quite different from the way in which code is carefully crafted through structured processes and defined stages. Instead, this phase provides everyone with an opportunity to work through ideas without having to worry about making more significant mistakes.

Phase Two: In the construction of these artefacts, the next stage is the translation of this paper-based plan into code. This stage seems based around the idea that there are many smaller problems to be solved along the way. The majority of these kinds of projects involve, for example, accessing open-data from various different sources and in different formats and aggregating these into one platform to create what is known as a '*mashup*'. The hack, as such, occurs when the group make us of 'workarounds' and innovative scripts to make this work.[4] Various tasks are allocated based on skills or programming expertise so one person might be knowledgeable in, for example, management of SQL databases while another may have experience in Java web development. The subsequent work is then carried out mostly alone or in pairs with often only minimal contact during this process. This is seen as the main phases of the weekend and a number of participants stay up all night working on it. Their activities are only interrupted by occasional requests to provide video updates to the event organisers.

Phase Three: Once the code has been written and some kind of artefact produced, the next stage of the process is to share and distribute this artefact using various different means. The sharing of code and ideas is part of a continual process throughout the event with participants required to upload their source code to Github and upload video diaries to YouTube. As the event nears its conclusion, however, the event organisers begin a more formal process of encouraging participants to upload their code and create links to the official RHoK site. At this stage, the groups also rush to give themselves a name. The culmination of this is a presentation in Washington in which all videos from global participants are compiled and displayed. Finally, the participants are asked to vote on their favourite hack within the local event and the event organiser presents various prizes to the winning teams. For many of the teams, the process of building these technologies will continue after the event itself through online collaboration and subsequent meetups.

I would argue that this process by which ideas are transformed to paper and then to code which is finally presented to and shared with a wider community, can be effectively explored by using the steps by which Bruno Latour (1999) and Czarniaswka (2007) used to describe the methods in which the material world is transformed into items of scientific knowledge. While scientists tend to capture and record the physical world, the hackers I observed begin with ideas which are then transformed into a physical format on paper which can then be regulated and controlled (Latour, B 1999). These paper based plans are turned into code, a format which, like a piece of architecture, the skilled hacker is able to manipulate. The final outcome is a set of user-interfaces and technologies which are shaped by this process and also reflective of the social context in which they are created. This 'digitisation' is all part of the process by which, I would argue, a "*lifeworld*" (Coleman, G 2010) is 'translated' into code.

The artefacts created by the RHoK groups tend to be quite 'open' in nature. They are free to be manipulated by anyone with the technical skill to programme and often to some without those skills. They also are what might be described as 'democratic' to the extent that they often focus upon the visualisation, through maps and charts, of crowd-sourced data. Often, they can be

populated using SMS where internet is not available, taking into consideration regional variations in internet access. Therefore, it might be argued that the final artefacts which were produced by these groups are reflective of the process in which they are created – an open process; a democratic process; a fluid process; a lack of centralisation. This is similar to the process which Eric Raymond describes as a "bazaar" in contrast to the "cathedral" construction of corporate IT companies (Raymond, E 1999).

But the artefacts created could also be seen as indicative of a wider social context in which the above ethics are valued. In some ways, the very code itself is a reflection of these 'Hacker Ethics' and imbued with something of these values. A code can be both a string of symbols and a way by which one lives their life. This visualisation of the world through data and information symbolically takes it apart, deconstructs it, and rebuild it within a 'box' where it can be controlled and manipulated. After all, as already discussed, this ability to manipulate informational networks is where some of the power, both technically and symbolically, of the hacker lies.

An Overview of Some Commonly Used Narratives

One of my interests in this research project was in exploring what, if anything, might be seen as uniting this particular group into some sort of shared community, and thus explore the wider implications for hacker communities generally. It might appear rather obvious at first, however, for the participants, an interest in *technology* is a central theme which gives them some sort of distinct shared interest. This interest is what brings these people together, most of them do not know each other previously and many come from fairly different backgrounds, despite at first appearing quite similar (*see Figure 1*).

During my observations at the event, I carried out some analysis of these different narratives as a way of exploring this interest in technology. Among more generally discussions and 'techie' jokes, I found that narratives often fall into a number of main themes which I coded and further explored. Overall, I found that this shared interest in technology went beyond just the event at hand or 'Humanitarian Hacking' specifically and covered a range of different subjects, many of them quite revealing in terms of motivation and their relationship to the 'Hacker Ethic'. These narratives are indicative of ties which go some way to explaining the ways in which this community which forms around, not just technology, but also wider interests. It is interesting to note that people tend to talk in terms of hacking as an activity rather than describing themselves as hackers. This is in fact true among many of the hackers I have spoken with.

Narratives of Openness and Sharing

There was a high level of discussion among the group that these types of events should be more open to a range of different people. In particular several individuals mentioned the idea that 'non-techies' are often excluded for technical reasons and spoke positively about the involvement of professionals such as designers, social scientists development workers.

This theme was reflected in narratives around the types of technologies which 'Humanitarian Hackers' produce and the ways in which these kinds of technologies could be made more inclusive through user interface, adaption for smart phones and so on. I noted several conversations regarding the ownership and sale of data by corporations and governments which tended to involve an emphasis upon the democratisation of information, strongly rooted in the open-data 'movement'.

This democratisation even extended into the event itself with participants discussing the ways in which the judging of the event could be made more 'democratic' using online crowd-sourcing technologies. These types of discussions might be viewed as indicative of an interest among this group in the 'democratisation' of technology, an important component of the hacker ethic. It also reflects an understanding that hacking is not just a technological pursuit but rather governed by a philosophical ethos which goes beyond technology and into wider areas of society.

Narratives of Technology

As mentioned above, the primary shared interest among this group is technology itself and narratives of technology are a primary means for sharing and consolidating ties between members. This takes the form of a range of conversations both during hacking, in the numerous breaks between activity and even afterwards by email and message boards. Common discussions involve the new Ubuntu interface, the development functionality of Windows 8, rumours and gossip regarding new kinds of motion controlled laptops and touchscreen devices, stories of building homemade drones, ECG controls, and robots. There is a strong interest in 'dev kits', prebuilt devices which allow hackers to create interfaces between hardware devices such as buttons or sensors and software based applications. A common theme of discussions also surrounds user interface and how many operating systems are badly made from a design point of view, thus excluding many users. The collaborative process of open-source is generally put forward as a more reliable solution to creating effective user interfaces than corporate IT development. Primarily, this can be viewed as a community which forms around a shared interest in technology. However, I would also argue that these views of technology also originate from within a wider 'world view' of openness, liberalism, and collaboration.

Antiauthoritarian Narratives

While a great deal of literature on hackers has been involved in a binary distinction between 'good' and 'bad', ethical and deviant, the complex reality of hackers is that the two blend together and that often deviance and criminality are the result of outwardly imposed distinctions (Sterling, B 1992; Meikle G 2002). There has been an anarchic streak running through the 'hacker ethic' from the early MIT hackers which is also apparent in those I have observed. Many narratives among this group seem to involve taking pleasure in the idea of 'getting one over' on authority while demonstrating their superior technological skill. This ranges from the use of 'legitimate' SQL injection, talk of how to bypass MAC address based internet access on the university campus to narratives of climbing fences in campus in order to take measurements for scientific experiments. Conversations frequently also turned to the work of GCHQ[5], the ethics of government and private sector data collection, the feasibility of hacking into university printing services and how one might hack PayPal. All theoretical, of course, and mainly the result of technological inquisitiveness but, I would contend, indicative of an antiauthoritarian trait which is important to the 'hacker ethic'.

Narratives Regarding the History of Technology

A final narrative theme which seems to form the basis for a number of conversations relates to the history of science and technology. While attempting to code data into the correct geographical and temporal format, for example, discussions turned to the history of Greenwich Mean Time, the invention mechanical timekeeping and navigational tools. I also recorded a narrative about a joiner who passed down his craft over hundreds of years which had been perfected over time and remains to this day. There was talk about the historical 'punch cards', the origins of modern computing, a story about secretaries typing out lines of code by hand and about the geometric circuit design drawn onto the window of the university campus.

These kinds of narratives about the history of technology represent a shared language, a common point of reference which ties the participants of the RHoK event together despite some apparent differences in terms of occupation, age and so on. It also appears as the expression of an acknowledgment among them that they are part of something bigger, a longer line of technologists and inventors. This feels in some ways similar to the desire to recognise a wider global community at these kinds of events.

Hacker narratives of these types appear to be present in other studies (Coleman, G 2010; 48) and are perhaps indicative of the ideals which underpin this technological activity. I would argue that

narratives of openness and sharing, exploration, antiauthoritarianism and exploration are evidence of a set of plural and fluid hacker 'Hacker *Ethics*' running through the RHoK group. These are concepts which provide shared interests among the members and the acting out of them through conversations and storytelling act to cement and reinforce their values.

The Ethic of the Code: Discussion and Conclusions

In this paper I have addressed the nature of one particular group and event, just a handful of individuals in one room over one weekend, trying to instigate positive changes through technological innovation. I have shown some of the ways in which they find themselves connected to a much wider global network of likeminded people and similar events.

Previous theoretical framing devices of hacker communities provide us with some understanding of the motivations which lie behind these connections, the ties which hold them together. These may include a scepticism towards authority, liberal ideas regarding informational freedom or simply a passion for technology; the 'geek' within. So from these motivations, we might quite safely refer to this as a 'community of interest'. Specifically, however, these interests are constructed upon important elements of what previous researchers have termed the 'Hacker Ethic' (Levy, S 1984; Himanen, P 2001; Kelty, C 2008), a loose collection of shifting values which we might be better to think of as a more plural term – 'hacker ethics'. Among this group, the telling of stories seemed to play an important role in the expression of these shared interests whether through narrating the history of technology or stories of college pranks and rule-breaking. But I was left with the impression that such narratives also have a *performative* quality, reinforcing beliefs and cementing ties among the group.

Although some of these framings of hackers do hold up, others are found to be rather flimsy when tested in such settings. In this pristine room, far from the dystopian, binary, deviant, North Atlantic, males of hacker folklore (Cooper, J 2000), we find ourselves instead presented with a 'social geek'. One who is connected, and for whom connectivity is essential - a less ethnocentric, more heterogeneous and perhaps more realistic imagining of the hacker. The importance of social media to these groups is one clear example of this sociability. This can be most clearly seen, however, through the metaphor of the power cable. The importance of being connected, to the internet, to the grid, is symbolic of a society in which informational networks are central. The ability to manipulate such networks, thus circumventing physical and symbolic power structures is why hackers occupy such a significant position within the 'Network Society', and potentially a threatening one in the eyes of authority.

Hackers also, however, represent a cultural group which formed around an activity which not only challenges access to physical informational networks but is also acutely aware of the relationship between these physical networks and the social implications of them. Thus, this may go some way to explaining why hackers assign this connectivity such a central position within their ethics. The 'Digital Divide' may be an outdated term, however, there is clearly an extent to which inequality of access to technology and informational networks are related to economic and social exclusion, both globally and locally. The Information Communication Technology for Development (ICT4D) movement which emerged during the early 90s sought to address this divide by, first, providing technology to under developed communities and then later through end-user innovation and appropriate solutions.

More recently, we have witnessed the emergence of groups such as RHoK and *Geeks without Bounds* which seek to apply hacking skills to solving humanitarian problems. Although these groups are connected to previous ICT4D projects such as *Ushahidi* and *FrontlineSMS* and are often sponsored by traditional development agencies including The World Bank, I would argue they are also indicative of a new 'generation' of 'Humanitarian Hackers' who see themselves as grounded in democratic social and technological movements such as open-data, open-gov, crowd sourcing,

social media and are often heavily involved in movements such as Arab Spring, Anonymous and Occupy. This 'generation' are also influenced by, and in turn are shaping, Web 2.0 technologies such as apps, smart phones, wireless devices, social media – the 'hacker con', this informal style of real world gathering remains an essential element of this 'generation'.

I would contend that this group is strongly connected to the 'Hacker Ethics' of informational freedom, antiauthoritarianism, collaboration and creativity as described by previous authors (Levy). However, while some of these previous authors have argued that the 'Hacker Ethic' has influenced wider societal changes in the IT industry, healthcare and so on (Kelty, C 2008), I would like to propose an alternative viewpoint. Instead of viewing wider emerging movements such as open-data, peer-to-peer sharing or crowd-sourced banking as being influenced by a *technologically determined* 'Hacker Ethic', I would argue that these movements, including hacking, are indicative of a wider and pre-existing social and cultural shift towards the democratisation of information networks.

An example might be the recent emergence of the 'clean web' movement. The 'clean web' comprises a collection of different projects aimed at decreasing the cost of environmental technologies such as solar power through collaboration, crowd-sourcing and peer-to-peer information sharing. Movements such as the 'clean web' may be based upon similar ethics as and hacking and involve typical traits such as 'hackathons', but I believe that these should not be viewed as purely 'hacker' ethics as such. Instead, hacking might be seen as an early example of this kind of movement which perhaps popularised it to some extent. A real attempt to trace the historical origins of interrelated social movements and technologies such as hacking, ICT4D, open-data and crowd-sourcing has yet to be carried out, however, it is likely that this kind of exploration would provide some answers as to the wider social and cultural shifts which lie behind them.

Alongside this adoption of crowd-sourcing, 'unconferences' and other indicators of the democratisation of information in areas such as government, education and business, it is also interesting to note the extent to which there is a public interest in the important role that 'hacking' has played in wider mainstream history of technology. I would argue that examples of this can be found in the clamour to fit those who might be described as 'hackers' such as Alan Turing (helped to some extent by recent government declassification), Mark Zukerberg, Steve Jobs and Steve Wozniak into popular narratives of science and technology.

This RHoK event I attended was not immune from such 'hacker branding'. It is a common trait among most of the individuals I have interviewed for them to talk in terms of hacks and hacking, an adjective, rather than describing themselves as hackers, a label often seen as perhaps too boastful to be self-assigned. Often this term seems only useful when describing to outsiders what they are not. The labelling of one as a hacker tends to be external and those involved in this activity often self-identify much more closely than that, for example, with a particular 'flavour' of Linux.

However, the organisors of the RHoK event made conscious and overt use of 'hackerisms' in their branding of the event from its name to the format of the events themselves. I would argue that this is not uncommon in other similar events (Mozilla Summer Code). There was a sense at times that the corporate sponsors were aligning themselves with overt uses of hacker terminology in an attempt to lend themselves an air of underground legitimacy, to appear cool (Heath, J 2006). This re-appropriation of hacking terminology and, the attempts by corporate IT and government to jump on the 'hacker bandwagon', did not go unnoticed by the participants. They were certainly aware of the apparent conflict between the ideals of corporate IT and mainstream development organisations and those of the open-source hacking community.

I would contend that such corporate branding and marketing of RHoK has parallels with the wider market in which a consumerisation of technology has taken place (Miller, D 2011) which at first glance appears in stark contrast to the act of hacking are able to go beyond the 'black box' of

devices. However, if we return to the original 'Hacker Ethic', we find that this is perhaps not as it first appears. In some ways, the development of technologies such as Facebook, crowd-sourcing, open-data, even Apple have contributed to a greater democratisation of information. For better or worse, the user friendly interface of the Low Orbit Ion Cannon (LOIC) DDoS[6] tool utilised by the Anonymous hacktivist movement allowed a far greater degree of participation by members of the public in what was previously a technologically exclusive act (although it might be argued that this was not in the spirit of the 'Hacker Ethic'). Perhaps more relevant was the role of social media in the Arab Spring uprising. While it certainly was not the instigator and the population was quick to move to more traditional methods once these were cut off by the government, it did allow for a far greater spread of participation.

On the other hand, while this kind of technology may be less elitist in providing greater access to information, it should certainly not be confused with hacking. Often, those using it do not fully understand what is going on behind the 'black box', thus creating opportunities for surveillance or misuse. It may also be a factor in exaggerating existing inequalities as there will always be those who have less access to these technologies than others.

There was certainly evidence within the RHoK event for Himanen's notion that changes in working practices within the 'Network Society' are resulting in a blurring between work and leisure – the "Fridayisation of Sunday" (Himanen, P). This idea of hobbyism as a motivation for hacking has often been employed (refs) but remains relatively untested. It was an interesting exercise comparing the RHoK event to conventional paid employment. In some ways, the participants were taking part in what felt similar to work or university – they gave presentations, introduced themselves to the group, worked together with strangers, sat in front of a computer late into the night. Often, these projects were closely aligned to their own work or academic research. Many of them spent the time leading up to the event and after they left working on the projects. It is a passion, something they enjoy, their life. Many of the participants also involved their family in the RHoK activities with wives, girlfriends and children dropping in and out. An event such as RHoK, it seems, is neither work not hobby but something of both. Although unpaid, it was not quite the 'weekend only' leisure activity of the ham radio or model railway since it blurred much more into people's everyday activities.

An exploration of the processes by which the various technologies were produced during the RHoK event as well as the nature of these outcomes as cultural artefacts was also revealing. I found them to be reflective of a process which is grounded in the 'Hacker Ethics' of openness, sharing, collaboration and decentralisation, a *bazaar* through which the hacker *lifeworld* is turned into code. Here, the metaphor of a code seems perhaps most fitting – both the digital string of symbols and a set of ethics, a way to live one's life.

The final outcome was rough – just a basic prototype, a seemingly messy collection of coloured blocks on a map. But the perhaps that is not the point. After all the effort which the groups put in as they hammered out lines of code late into the night in an empty campus, the clatter of a keyboard echoing down the corridors. Then, huddled together around the blinking light of a single laptop came that moment when they realised that it actually worked. This ethic, *lifeworld*, the code, had resulted in something. They had somehow captured it and made it real - staring at them through the code.

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