

Social Computing and Collaboration (SCC)

TITLE	INSIGHTS FROM THE UNDERGROUND: USING ANT TO UNDERSTAND PRACTICES AND MOTIVATIONS FOR FILE SHARING IN ONLINE COMMUNITIES
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Abstract

Underground music file sharing communities are online social spaces that facilitate the sharing of mostly unauthorised digital content. This paper proposes underground file sharing communities as subcultures, and explores the Roswell community from theoretical perspectives of group formation and translation from Actor-network theory (ANT) to gain a better understanding of the motivations for file sharing. Through observations and supporting interviews, a detailed discussion of underground file sharing communities is presented. The discussion reveals interesting insights about the 'black box' of file sharing, and the ideologies of those involved. Scarcity and quality are strong motivators for engaging in underground file sharing communities, with access to high quality music files and scarce music files being a reward for actively participating. The quality of content is maintained through strict rules for converting and uploading new music. Because underground communities are quite sophisticated, it is argued that it is possible to learn from them and use this knowledge in the development of future online music systems and communities.

Keywords: Ethnography, Actor-network theory, File sharing, Online communities, Subcultures

1 Introduction

Underground music file sharing communities are online social spaces where individuals collaborate, share, and communicate. Often accessed through a website, these 'meeting places' are central to the daily norms of members. These communities facilitate the sharing of mostly unauthorised¹ digital content such as music, as well as communications between members and these often number in the tens of thousands. This paper explores one such community; 'Roswell' (pseudonym) is a private and secretive Australian online community of more than 1200 members who use BitTorrent peer-to-peer technology to share music.

Research in this area supports the notion of piracy (file sharing) as a distinctive subculture (Cooper and Harrison 2001; Downing 2010; Rehn 2004; Thomas 1993) and research into the topic of file sharing can benefit from perspectives critical of the social and economic systems within which technology and cultural activities are embedded (Stahl and Brooke 2008). Investigation of subculture is best served by an ethnographic approach which examines the of daily activities in order to consider how the current situation came into being, and the social arrangements that have formed as a result of the 'problem situation' (Thomas 1993). These arrangements are based on routines and rituals of everyday life, and are part of the daily practice of organising to stabilise the actor-network (Callon 1986; Latour 1987).

To further illuminate the collective production and sharing of digital goods in an online / virtual community, this paper uses actor network theory (ANT); through the ANT concepts of group formation and translation, (Callon 1986; Latour 1993a) it is possible to gain rich insights into the relatively unexplored field of Underground music file sharing communities.

This paper is structured as follows. Firstly the literature on information systems and file sharing, access to online music, and online communities is reviewed. We argue that there is a lack of systematic research and detailed understanding of file sharing activities, their collaborative nature, and the motivations for engaging in underground communities for file sharing. The research methodology is presented, followed by a discussion of group formation and translation; concepts from actor-network theory that help guide the analysis of the observations and interview data. The discussion reveals interesting insights about this under-researched aspect of file sharing, and the ideologies of those involved. This paper contributes to the research literature by providing a systematic study on the practices and motivations for file sharing in online, secret communities.

2 Literature Review

File sharing, often called piracy, may be usefully viewed as a cultural activity and the focus of many discussions about the Internet. However it has received little attention in the Information Systems literature, with discussions mainly based on quantitative analysis (Chidambaram and Tung 2005; Smith and Telang 2009), or focused on a resource view of technology (Caldeira and Ward 2003; Wasko and Faraj 2005). Often the discussion is related to managing or determining the costs of piracy (Bagchi, Kirs and Cerveny 2006; Sandararajan 2004). Detailed qualitative accounts are rare.

There are common perceptions of what file sharing is, however there is no clear definition and no systematic research on this topic in the information systems literature. A well-cited critical perspective proposes that piracy represents a socially constructed phenomenon resulting from evolving social, legal, and industry ideas and pressures (Yar 2005). In order to understand this cultural phenomenon, there is a need to investigate who participates, how they participate, and why they participate.

Sampling and substitution are discussed in the literature to account for reasons people file share. To sample is to 'try before you buy', and to substitute is to download instead of purchasing (Andersen and Frenz 2007; Quiring, von Walter and Atterer 2008). Both are acknowledged to be hurting the music recording industry, however it is argued in the literature that sampling can actually increase sales (Gran and Molde 2009), and substitution may not harm the

¹ Without the permission of the copyright owner.

industry as much as reported (Lessig 2004), because those that substitute, may not have purchased the full album anyway. Lessig (2004: 37) argues that people use file sharing networks for four primary reasons:

- As substitutes for purchasing content: users who download instead of purchasing (A).
- To sample music before purchasing it: sharing could increase the quantity of music purchased (B).
- To get access to copyrighted content that is no longer sold or that they would not have purchased because the transaction costs off the Net are too high (C)
- To get access to content that is not copyrighted or that the copyright owner wants to give away (D).

From the perspective of the law, Lessig argues that only (D) sharing is clearly legal. From an economic perspective, only (A) sharing is clearly harmful. (B) sharing is illegal but plainly beneficial, and (C) sharing is illegal, yet good for society (since more exposure to music is good) and harmless to the artist (since the work is not otherwise available). While this paper does not advocate the illegal theft of music, it does propose a reconceptualisation of the concept of 'piracy' to consider filesharing activities as daily activities involving household technology conducted by a significant group of users. It is argued that it is not productive to ignore an important group of users involved in a widespread activity that will not go away if we simply ignore it, or prosecute those involved. Therefore this research is significant as it fills a gap in the information systems literature on file sharing systems, and more generally online communities and collaboration.

2.1 Information Systems for Music Distribution

The online music market has grown exponentially in the past decade and Internet technologies have brought new challenges for the music recording industry. Consumers now have a variety of choices about where to get their music. Online stores such as iTunes provide high quality digital music for a fee; alternatively there are a plethora of unauthorised (often illegal) systems available for accessing music. However there is little research to document this change in practices and the role that systems now play in music access and use.

Four main music distribution channels are depicted in Figure 1; this figure illustrates a categorisation developed for this study based on the research literature which helps to situate this paper and the research site among the available options for accessing and using music online. Online music information systems can be categorised into two main areas based on the cost and authorisation of the available content; *authorised* and *unauthorised*, and then further defined as *paid* or *free* as the following figure shows. Music distributed on the Internet is situated within this dichotomy.

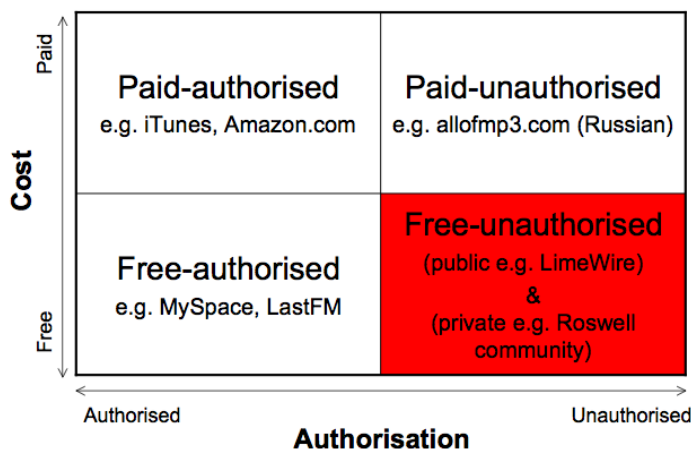


Figure 1: Classification of Music Distribution Channels

The well-known *paid-authorized* distribution channel of Apple's successful iTunes Music Store (and other online stores) is used as a reference point to discuss activities in the not so well known *free-unauthorized* music distribution channel, which is where Roswell – the underground music file sharing community observed in this paper, sits. Many of the research subjects interviewed for this study find themselves situated within the *free unauthorised* channel

(highlighted in Figure 1); they identify themselves as having alliances with underground communities similar in nature to Roswell, and/or using more public file sharing communities like LimeWire, and/or public torrent communities like very popular thepiratebay.com.

In regard to those situated in the *free-unauthorised* quadrant of Figure 1, in addition to sampling and substitution, this paper contributes a third motivation for file sharing, that of scarcity which refers to the unavailability, or inability to access content for purchase either online or in physical stores. This is a particularly strong motivator in Australia. Scarcity, as a motivator, has not previously been discussed in detail in the research literature related to file sharing (Beekhuyzen and von Hellens 2009).

2.2 Underground Community Subcultures

In 1993, Thomas described the computer underground as “a broad and somewhat invisible community comprising people who systematically interact electronically ... in order to engage in a variety of shared activities” (1993). Today, underground file sharing communities still operate under the radar of law enforcement by employing methods that encrypt all traded digital content and communications so they are not detectable by those tracking illegal file sharing activities, unlike content traded in public websites and systems. This paper proposes these communities as subcultures in a similar way to Thomas (1993) – a group that is deviant from mainstream ideologies about file sharing since they use computer technologies to subvert in some way, dominant social norms about the function and purpose of technology (Bell 2001).

Rheingold (1993; 2001) depicts communities as having shared social codes and reciprocity as social cement to bind online communities, in addition to longevity, critical mass and ‘sufficient human feeling’. Social interaction is at the heart of a subculture of piracy (Downing 2010), and it is at the heart of sustainability in online communities. Through ethnography, Rehn (2004) proposes that a piracy subculture represents an economic structure where gift giving and “play” are more important than economic profit. He argues that the importance of sharing as a means of achieving status and social standing are important factors that help shape subcultures of piracy. Communities can be designed to encourage sharing, and to reward active participation through ratios and perceived status (Beekhuyzen, von Hellens and Nielsen 2011)

If the computer underground reflects a “highly complex mosaic of interest, motives, and skills and it possesses a language and a set of values, information-processing techniques, and norms that shape its cultural identity” (Thomas 1993) then underground file sharing communities and systems are an interesting phenomena to study. They have existed much longer than paid-authorised systems (Biddle, England, Peinado and Willman 2002) like iTunes (see Figure 1). Before the availability of public (free-unauthorised) file sharing systems such as Napster, and commercial paid-authorised systems such as iTunes, underground communities existed to share digital files (Thomas 1993). Such systems were originally built *for users by users*. Rather than using a system designed by others where most systems often have limited input by users (Mao and Zhang 2008), these systems used were designed and built by those directly using the system.

The investigation of the underground has led the first author of this paper to the following characterisation of file sharing communities, which are considered *underground* based on three key characteristics:

- The community is private with invitation-only membership as opposed to public file sharing systems like Limewire and public websites for file sharing like thepiratebay.com.
- The community (website) and its access are also hidden from public view and members are advised not to discuss the community in public places (such as forums).
- Members in the community trade in mostly unauthorised digital content, which is considered illegal in most Western countries.

3 Research Methodology

In the ground-breaking macroethnographies of the past, research sites generally included a long stay at an exotic far away place studying the indigenous population. In the contemporary urban settings, the Internet is now a popular place to conduct ethnographies (Hine 2005). Virtual ethnographies can show how cultures are manifested not through physical practices, but through digital practices.

This paper is part of a wider doctoral study (Beekhuyzen 2009). Observations were the primary data collection method, and interviews were useful to confirm and question the first author's observation data however there were a number of ethical challenges in gaining access to interviewees due to the topic (illegal behaviour – discussed below).

3.1 The Ethnography

Roswell is a secret and private Australian online community of 1200+ members using BitTorrent peer-to-peer technology to share music. The distributed network enables the sharing of digital rights management free digital content to community members for no monetary cost. In the underground community, members use a screen name to identify themselves; thus there was no access to the 'real' identity of the participants.

Regardless of where they are conducted, a key feature of ethnography is spending extended time in the 'field' so observations of the Roswell community were recorded over 120 consecutive days and conducted in two phases. Phase one (the first 30 days) was useful to document background information about the community, in getting familiar with its processes, and also in exploring the community with a view to collecting data, i.e. what, when, how to collect the data. The 'lessons learnt' were used to guide the data collection in Phase Two. The further 90 days (phase 2) were spent documenting the traffic of digital files, the sources of those files, the frequency of use, the language used and other relevant aspects of the community environment that helped to illustrate the importance and value of content for members.

Illegal behaviour is difficult to study in any discipline, and it is almost completely absent from studies of technology. To gain approval for the observations in this study, it was necessary to agree to conduct covert, rather than overt, observations. Human research ethical approval was received from the host university. Covert observations were most appropriate because if members of the community were aware their actions were being documented by someone other than 'one of their own' they would have revoked my (the first authors) membership to the community. Therefore members of Roswell did not give informed consent to being part of this study, however care was taken not to harm the community or its members. To treat the online observation data sensitively in this research, only data about traffic, rules and roles of users were recorded about Roswell. Individual online forum posts are not collected. In line with Sanders' approach where "no information can be personally identified" (2005), using online observation data for research without direct permission in this study meets Marx's (1998) criteria of protecting individuals from harm.

Because of the covert nature of the observations, no members of Roswell could be interviewed. Therefore, general file sharers were sought. However the study revealed that many underground file sharing communities use the same open source software for their 'meeting place'. One interviewee logged onto the community he is a member of and showed his profile during the interview. The first striking issue was the similar look and feel of the community to Roswell, which I had been observing. The interviewee explained that many of the underground file sharing communities use similar open source software. The community he was part of hosted 45000+ members which is much larger than the 1200+ member Roswell. Therefore it is argued that because of the overwhelmingly similar characteristics of Roswell and other communities, the findings discussed here have wider applicability than just one, now closed community.

3.2 The Interviews

Thirty semi-structured interviews were conducted with sixteen tertiary students, six musicians and eight music recording industry stakeholders. All interviews lasted between 60-90 minutes, were transcribed verbatim, and Nvivo aided the data analysis. The eight key informants from the music recording industry commented on mainstream

Australian music culture and how the emergence of digital distribution has changed the way music reaches consumers. The six musicians provided insights on how they are using Internet technologies to distribute their music. These interviews are not the focus of this paper, however they were useful to situate file sharing activities and underground communities within a wider music culture. By referencing the wider culture of the mainstream music industry we can begin to understand the subculture of underground music file sharing communities.

There have been a number of studies that focus on the downloading behaviour of tertiary students (Remington 2006; Rob and Waldfogel 2006). Undergraduate students were the focus of the majority of the interviews in this study for a number of reasons; they are uniquely immersed in the World Wide Web and in computer technologies in general as a part of their educational experiences; they regularly participate in newsgroups and use Instant Messaging and email to communicate; the conflict over the effects of music downloading primarily involved the popular music that is marketed to, and consumed by, young people; legal actions and educational campaigns have been focused on students (Kinnally, Lacayo, McClung and Sapolsky 2008).

4 The Filesharing Actor-network

Detailed accounts of how different researchers apply actor-network theory to empirical data are rare, therefore the ANT approach to analysis and interpretation in this paper is in line with the approach outlined in the collection of articles in *Actor-network theory and organising* (Czarniawska and Hernes 2005: 9; Hernes 2005: 117). Firstly, actants (those which act and are acted upon) are identified, and then the actants are followed through a trajectory of programs and anti-programs until they become actors (acquiring a distinct and relatively stable character). Those with successful programs (e.g. iTunes), or successful anti-programs (e.g. Roswell who has strength in opposition and resistance) become actors. Their success is due to association: the formation and stabilisation of networks of actants, who can then present themselves as actor-networks (Czarniawska and Hernes 2005: 9). The following discussion uses concepts from ANT to explore filesharing, and the motivations for participating in underground communities. The discussion is based primarily on observation data, however excerpts from interviews with underground file sharers are used to support the discussion (direct quotes are in italics). Pseudonyms are used for all participants.

4.1 Group Formation

Klecur (2004) reflects that within the IS field there is concern that researchers often neglect the technology itself, treating it as a black box, with more focus on the organisational, social and political issues. The underground file sharing community can be considered a black box in ANT terms; a topic taken for granted, containing issues often not given any explanation. As a starting point for the analysis, actants in the network were identified. This was not an easy task due to the many new players continually entering the industry, and the regularly changing alliances between those in the network. However the associations between each of the actants at a point in time were identified and documented. An example of an association between music consumers and musicians is that consumers may feel that musicians get a low monetary return from online music sales because the record label and distributor receive most of it, so they choose not to pay.

The documented associations are traced to identify the actants connections with the programs (*paid-authorised* systems) and anti-programs (*free-unauthorised* systems) available. These programs/music distribution channels become actors in the music actor network. In doing so, details of how the groups/actors form and stabilise is explored; for example, details of how the underground community came to exist, and the use of the concept of *translation* to gain knowledge of Roswell's cultural practices, technology and artifacts (Czarniawska and Hernes 2005: 9). Through this analysis, Roswell and other underground communities are seen as a "super actor that seems to be much larger than any individuals that constitute it, and yet it is an association – a network – of these individuals, equipped with a 'voice'" (Czarniawska and Hernes 2005: 7). The super actor is akin to the Leviathan identified by Callon and Latour (1981); as Jason (an underground file sharer) explained, "*there is kind of another view that the public thinks they are looking at that. So going online where everyone can access torrents, you think you are looking at that level (the top level of file sharing), but you are really looking at a small part of that*".

4.1.1 Actors and the Role of Communities

Power is legitimised through culture as the structures and roles provide the means for people to have control and thus exert power over others. Actor-network theory is concerned with studying the mechanics of power as it occurs through the construction and maintenance of networks made up of both human and non-human actors. In Jasperson et al's (2002) classification, language and symbols are manipulated to define the IT artifact and thereby exercise power and construct reality about appropriate decisions, structures and goals. Certain actors (such as the moderators of the community) have the ability to control and shape the dominant interpretation of organisational events.

To understand power relations using ANT, emphasis needs to be given to examining *controversies* to see how particular struggles or problems become resolved and/or appear as black boxes, i.e., taken for granted - not needing any explanation. Within ANT research, it is argued that it is only when particular controversies are examined that the black boxes begin to open to show the complex chains of actor-networks, which are normally concealed by the black box effect (Latour 1993b). An illustrative example is that to the casual observer, file sharing communities are ad hoc and probably unorganized, when the exact opposite appears to be true. This research reveals that underground communities are highly sophisticated and orderly.

An actor is: "any technological apparatus that bends space around itself, makes other elements dependent on itself, and translates other language into a will of its own" (Slack and Wise 2007: 118). Technology is always a part of a larger spectrum; it is not solitary as it requires other people, culture and other actors (Slack and Wise 2007). An actant is any participant in an endeavor, whether human or nonhuman. An actant is defined by what it does, in essence, what function it performs within a discipline. It emerges through trials (experiments, tradition, practical application), and once its fellows (usually human actants in the discipline) deem that it performs adequately (through a regularized process, such as peer review or commodification), it is admitted to an institution (Jablonski 2001).

The underground file sharing community is the actant, and the supporting system (or artifact) is the actor, and together they support ritualistic practices, "*everyday I wake up and I go to this FTP first thing in the morning it's like my lifeline...and I check what's just been released through the scene²...*" (Rusty).

To enable successful group formation, members must be proficient in the local language, and participate according to the rules. The elite few who have privileges to contribute new content to the community (only 5% of users in Roswell, this restriction helps to maintain quality) need to follow these rules explicitly if they want to remain part of the community, "*it is really, really strict, so that is how they've been able to survive for a long time...and there is no centralised tracker like with public torrents, it is just peer to peer which also makes it very difficult to destroy, especially when you have moderators based all around the world, you can't really take down one moderator and the whole thing falls over, it doesn't work like that*" (Gates).

Once individuals are accepted as members of the underground community (it is invitation only), they pass over the Obligatory Passage Point which results in a set of activities which are highly ritualised (evidenced above) and members enact expected codes of behaviour. This community engagement and collaboration is missing in many of the paid-authorized options for music. MySpace (free-authorized) was possibly the most successful attempt at online community engagement thus far in music, with Last.fm providing a more contemporary (also free-authorized) collaborative listening experience. Although iTunes provides its' customers with an account, there is little evidence of attempts to create any kind of collaborative community (uses push rather than push/pull technology) (Cannatella and Geoghegan 2009).

4.2 Translation

Central to ANT is the concept of translation. During translation, actors agree that the network is worth building, worth participating in, and worth defending (Callon 1986). According to ANT, stability and social order are continually negotiated as a social process of aligning interests during the process of translation, "which generates

² The place where digital content in underground communities comes from – analogous to a food chain where the scene would be higher than underground communities and content filters down. It then filters down from underground communities to public websites and systems.

ordering effects such as devices, agents, institutions, or organizations” (Law 1992: 366). Underground file sharing communities are a ‘place’ to align such interests, and this is done through what appears to have become a fairly formal and organized organization.

Sidorova and Sarker (2000) believe that it is useful to focus on a single actor (or micro actor) “from whose vantage point we wish to see the process of translation”. During a translation, the creator works out a scenario for how the system will be used. This scenario is inscribed into the system. This strategy of interestment of Roswell inscription defines activities for actors to engage in, and defines the actors various roles and member classes in the community (Monteiro, 2000). In negotiating their terms of involvement, the actors must agree to the underlying unlawful ideology of the community. In Roswell, the focal actor, *CaptTron* (the creator or Roswell), assigned administrator privileges to a number of other members, who passed over the obligatory passage point. But it is assumed he kept himself in a strong position to still remove any of the newly appointed administrators if needed. *CaptTron*, possibly with *Zer0* (the second documented member), defined the roles for the community at this point.

Interestment is associated with getting actors interested in the community and negotiating the terms of their involvement and participation. In order for actors to accept their new identities during problematization, the focal actor uses various strategies and devices of interestment (Callon 1986). The notion of inscription refers to the way technical artifacts embody patterns of use (Akrich 1992). When developing information systems, designers inscribe certain characteristics in their design for actors with specific tastes, competencies, motives, aspirations, and political prejudices (Akrich and Latour 1992). Upon creating Roswell, the focal actor’s primary role was to inscribe other actors through sharing his ideologies about unauthorised file sharing, and the purpose the community would play in supporting his/her goals of sharing digital content. In the process of enrolling actors in the community, expected behaviour is inscribed within the system architecture through the rules of participation (Beekhuyzen et al. 2011).

In creating Roswell, *CaptTron* enacted a multiplicity of identities within in Roswell, including being the system operator, the administrator, the moderator, the seed etc. Power was legitimised through these roles which he then delegated and disciplined (Star, 1991:28). He delegated these roles to allies - other members in the community who were willing to take on an active role in administration in the community. Those delegated to, joined forces with the actor (the newly appointed system operators, moderators, administrators, etc), and in doing so agreed to adopt a disciplined approach to conforming to patterns of action and representation (Star, 1991:28).

5 Discussion: Motivated by Quality and Scarcity

ANT enables a move from the experience of building the actor-network to a consideration that *it might have been otherwise*” (Star 1991: 38). Star uses this phrase to highlight that there is nothing necessary or inevitable about any technology, “all constructions are historically contingent, not matter how stabilized” (Star 1991: 38). This is a useful way to consider the creation and evolution of underground file sharing communities. They are historically situated within a technical, political, economic and social milieu that strongly influences the way the community works. They are situated within a wider music culture and by their very nature and ideologies, they challenge mainstream political, economic and social perspectives by embracing technologies that challenge the stability of mainstream music networks.

Accounts of using actor-network theory often do not explain *why* a network takes the form that it does. They appear much more interested in exploring *how* actor-networks get formed, hold themselves together, or fall apart, however the *why* is also important to consider. The previous section provides an analysis of the formation of underground file sharing communities, and translation of the members into the secret community. From this, an important question arises: what motivates members to return regularly and actively participate? An analysis of the interview data sourced from underground file sharers points to two key reasons: scarcity and quality. Excerpts from the interviews of underground file sharers are used as illustrative examples.

The term ‘scarcity’ in file sharing is a new term introduced as a finding for this study and it is particularly relevant to the Australian context. Australia’s geographic isolation appears to also mean isolation in terms of access to a wide range of digital (non-Australian) content. Scarcity refers to something not easily found; the economic literature argues that scarcity determines price. Harford (Andersen and Frenz 2007), an economist, argues that scarcity power

is pricing power. An extensive search of the literature revealed little discussion of scarcity as a motivator in music file sharing.

Scarcity refers to the lack of ability to purchase desired music in either physical or digital form. Scarcity exists when it is not possible to purchase desired music, *"I actually tried to lie to Amazon and tell them that I was in the United States and of course to them I still look from I am from Australia"* (Gates). Consumers often engage in file sharing to download what they cannot access through authorised sources, *"There's a lot of stuff you can't get in Australia so I have to (download)"* (Sid).

A desire to access to high quality and platform independent digital music files shape why the network takes the form that it does, and there are strong rules in place to ensure a high standard of quality is maintained. The strong rules imposed by the moderators of the community are important to maintain the quality of the content, even if they appear to be annoying at times, *"you must include a log file and the log file tells you how the album has been ripped and they actually have a guide on how to rip albums properly and encourages people to follow that guide. They are very strict on maintaining this quality."* (Gates). The rules are in place to ensure that digital content is named correctly and easy to search through meta tags. There are penalties or disincentives for not following the rules, *"If you're not using a certain MP3 encoder and a certain CD ripping program, automatically your release is nuked...I know these things are highly sophisticated. If things aren't tagged properly – nuked! If songs aren't labelled properly – nuked!"* (Rusty).

A finding related to both scarcity and quality is the desire for music in high quality lossless digital format FLAC, a format not readily available for download in Australia *"I guess ultimately for me if there was a place where I could download music in FLAC and purchase it I would be more than happy to do it, it's just I can't get it. That's why I don't do it"* (Gates).

6 Conclusion

This paper explores the file sharing activities in underground communities, and presents a discussion of the motivations for file sharing. ANT is a useful guiding theory to help explain these practices and motivations. The analysis revealed that the desire for community engagement is strong, with file sharers in underground communities regularly communicating and collaborating with peers. Underground communities provide this community engagement, which appears to be missing from many of the paid-authorised options for accessing music.

Quality is a strong motivator for engaging in underground file sharing communities, with access to high quality music files and scarce music files being a reward for participating. The quality of content is maintained through strict rules for ripping and uploading new music. If members do not conform, reciprocate, and actively participate according to the rules, their content will be removed/replaced, and membership to the community may be discontinued.

This study extends the ethnographic work of Thomas who argues that the computer underground can be understood as a form of social rebellion, and it is not necessarily an intentional attempt to resist social norms, but instead, it reflects a socially situated tension with political and ideological overtones: *"It is political to the extent that it challenges existing forms of power and control, and ideological because it challenges beliefs and policies about computer system security, information as private property, and other established social and legal premises"* (Thomas 1993: 57). This study had similar findings to Thomas, which revealed a subculture quite different from that portrayed in the media and legislative debates. The study by Thomas informs this paper, which questions commonsense assumptions about file sharing activities.

To an outsider, such 'illegal' systems may be considered disorderly and ad hoc, however our research shows that the underground file sharing communities do not fit such a label. These online spaces for collaboration, sharing and communication enact strong rules, and members are rewarded with high quality files and access to scarce digital content. The meeting place requires those engaging to have a high level of technical skill.

This paper could be considered limited due to its detailed focus on one particular setting. There are also limitations to ethnography, due to the small sample size. However the choice of small sample sizes provides an opportunity for deep analysis in an ethnography. Due to ethical limitations, no members of Roswell could be identified/interviewed.

This paper contributes to research in the form of a highly contextualised study: to date there are no systematic studies of underground music file sharing communities that provide insight into the everyday norms of those who participate, and their motivations for participating. Underground music file sharing communities are frequented by a significant number of individuals; so it is necessary to gain a better understanding of their community culture, and the motivations for engaging in such activity. The important contribution of this paper is an understanding of the strong rules for contributing to underground file sharing communities. This strongly suggests that underground music file sharing communities are highly sophisticated, and can offer new ideas for the development of future online music systems.

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