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Downloading culture: community building in a decentralized file-sharing collective

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ABSTRACT

File-sharing collectives have significantly disrupted models of digital media distribution since their emergence and widespread popularization in the late 1990s. This study investigates how semianonymous and decentralized collectives construct their communities of practice. Conducting a case study of a private torrenting community, data were gathered via participant observation, interviews, and online postings (i.e., blogs and forums). Findings challenged dominant notions of opportunism, selfishness and task-oriented individualism advanced by Human-Computer Interaction scholars. Three key constructs were identified in private torrent community building: boundary construction, membership maintenance, and a sense of belonging and solidarity. Findings illustrate how a file-sharing community cultivates the formation of prosocial digital peers, fosters an affective approach to peer-to-peer collectives, and ultimately forges a downloading virtuoso community. This sisyphean, goaloriented community seeks to create a comprehensive archive of media artifacts independent of and in opposition to dominant corporate platforms. The community demonstrates a downloading culture inspired by technological design, yet driven by trust and solidarity.

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Virtual ethnography; torrenting; peer-to-peer; deviant communities; digital downloads; online culture

Introduction

The proliferation of downloading culture has reverberated through social, moral, and economic domains. Free public access to copyright-protected music, movies, and other media has spurred controversy about the peer-to-peer technologies dedicated to facilitating these exchanges. Peer-to-peer technology enables users to simultaneously download segments of the same file directly from multiple 'peers' to increase transfer speeds, eliminating the need to download data from a single 'central' server. In this context, since the late 1990s, peer-to-peer communities (e.g., Napster, Kazaa, and The Pirate Bay) have achieved immense popularity. These communities frequently obscure participant identity and facilitate decentralized media sharing and distribution.

Torrenting, the predominant peer-to-peer technology, accounts for a significant amount of all Internet traffic. Reportedly, in the USA, torrenting accounted for 6.3% of

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all Internet traffic (Sandvine, 2015). Within the overall peer-to-peer landscape, specialized, exclusive groups have emerged that utilize torrenting technology and target distinct and computer-savvy populations. Their existence raises the question: Do semi-anonymous and decentralized collectives construct sustainable virtual file-sharing communities, and if so, how do they do it?

While past ethnographic studies discussed community formation in various digital environments such as offline communities that collaborate online, digital fora, multiplayer gamers, and the like (Baym, 2000; Boellstorff, 2008; Rheingold, 1993), this study investigates a secretive and decentralized group. More specifically, the research seeks to identify the communal constructs that track, control, motivate, and bind members, resulting in a diverse yet cohesive membership construction. These emergent constructs fortify participatory culture rather than suppressing it as previous literature on torrent users suggests, thus expanding our understanding of contemporary forms of participatory culture in digital environments.

The investigated community, MusicTorrents (pseudonym), is a private file-sharing community that uses peer-to-peer technology to archive and distribute files, primarily music. MusicTorrents attracts experienced, knowledgeable users to bond on its platforms, thereby sustaining a fervent and expressive membership. Findings suggested that three key constructs are present in its community building: boundary construction and fortification, membership maintenance, and a sense of belonging and solidarity.

To investigate this social and technological formation, Human–Computer Interaction (HCI) scholarship is reviewed as it pertains to torrenting, supplemented by a brief discussion of digital ethnographies. After explaining the study's research design, a detailed analysis of data that characterize communal constructs is presented and implications are discussed.

The emergence of BitTorrent and private torrent trackers

In 2001, inspired by libertarian ideology, Bram Cohen pioneered a technology that he named BitTorrent (Cohen, 2003). This technology, capable of efficient peer-to-peer distribution, allowed a user to download different segments ('bits') of the same file simultaneously from 'peers,' achieving optimal download speeds and eliminating the need to pass data through a central server. When compared with conventional (centralized) downloading methods, BitTorrent file distribution is far faster and requires vastly fewer resources to accomplish a similar high-volume distribution. However, implementation of this technology poses challenges for users and administrators, most notably on account of its inherent complexity and its lack of built-in centralized content governance in terms of organization, legality, and quality controls (Chen, Xiaowei, Xiaowen, & Zongpeng, 2011).

A torrent 'tracker' is a search engine that indexes available media and is maintained by a community of experts. Trackers enable users to download torrent files containing links to content files (Cohen, 2003; Dejean, Sylvain, Thierry, & Raphaël, 2010; Meulpolder, D'Acunto, Capota, et al., 2010). When read by a 'torrent client' program (i.e., uTorrent and Vuze), the links embedded in torrent files identify peers who are sharing ('seeding') a particular file, and download a copy of it. Most torrent trackers can be classified as either public or private. Public trackers are open to all users, require no registration, and are very

loosely moderated. Private trackers are exclusive and demand compliance with the community's highly codified and rigid governance, rules, and quality standards (Chen et al., 2011; Kash, Lai, Haoqi, & Aviv, 2012; Meulpolder, D'Acunto, Capota, et al., 2010). In addition, private trackers traditionally specialize in a particular subset of media (i.e., only music, television shows, or movies) on their heavily moderated torrent databases.

Initially, public trackers (e.g., The Pirate Bay, Demonoid, and Isohunt) served as downloading hubs and as portals that allowed users to access indexed and curated lists of links to media (i.e., music, movies, and books) available for download via the BitTorrent protocol. These lists enabled users to quickly download their content of choice using a simple keyword search. The websites drew significant traffic and eventually became significant sources of media information and platforms for media exchange (Asvanund, Clay, Krishnan, & Smith, 2004). Their social facets gradually expanded, eventually forming online communities. Eventually, a subset of private groups of highly selective and technologically savvy users was formed (Meulpolder, D'Acunto, Capota, et al., 2010).

Perhaps due to their technical proficiency requirements, controversial morality, dubious legality, and covert visibility, private file-sharing communities are understudied in general, and are hardly mentioned in ethnographically oriented studies. It is contended that private torrent communities are virtual communities of practice (cf. Dubé, Bourhis, & Jacob, 2005) in that they implement highly codified, formal economic and social capital systems. Instead of emphasizing the dissident and delinquent aspects of downloading activities, it is contended that this exploration can elucidate users' own conceptions of participatory culture (cf. Jenkins, Ford, & Green, 2013; Lehdonvirta, 2013, pp. 17–18). Accordingly, following Fuch's (2011) critical observations of contemporary media, we suggest that MusicTorrents users' praxis demonstrates the existence of a popular subculture that offers a vital collective experience that contrasts with and that may even subvert corporate and state domination of the digital collective experience.

To uncover the communal and participatory nature of these semi-anonymous and decentralized collectives, we turn to a discussion of the ethnographic and HCI legacies that address virtual communities, with particular attention to the study of torrenting communities.

Understanding virtual communities: two theoretical traditions

Since the 1990s, the Internet has awakened scholarly interest in the fluid, ephemeral, transient, and open characteristics of virtual communities. As aforementioned, this interest is examined from the perspectives of two distinct research legacies: ethnographies of online communities and HCI studies of torrent trackers. Both legacies have addressed fundamental concepts of online community, deviance, exchange, and sharing.

The legacy of digital anthropology

The online ethnographic tradition can be chronologically framed in two waves (Coleman, 2010). The first wave explored the initial fascination with the introduction of the Internet and its rapid popularization, extending roughly to the end of the 1990s. Scholars identified shared norms, including practices, terms, and genres, that created '... a social context akin to community' (Baym, 2010) that preceded the formation of virtual communities (Baym,

2010; Kolko & Reid, 1998; Rheingold, 1993). The initial fascination and excitement surrounding the advent and mass availability of the Internet began to subside around 2000 as the dot-com bubble burst. Second wave scholarship consisted of ethnographies that acknowledged the *a priori* existence of online communities, and shifted the focus to highlight interrelationships between online and offline cultural constructs (e.g., gender, sexuality, identity, and religion) (Coleman, 2012).

It should be noted that studies of both waves have identified two types of online communities. The first type consists of online communities that function as extensions of offline counterparts, that is, transnational communities (Dekker & Engbersen, 2014; Miller & Slater, 2000; Oiarzabal, 2012), religious communities (Golan, 2012), and others. The second type, more relevant to this study, consists of 'purely' online collectives that manifest only in the digital arena (Baym, 2000; Boellstorff, 2008; Danet, 2001). Many recent ethnographic studies explore online communities that are open, readily accessible, and embody mainstream online practices (such as interactions on Facebook, Twitter, and 4chan). These communities can be accessed without specialized knowledge or ability. They are most thoroughly described in studies of Social Networking Services (SNS)-based communities (Dekker & Engbersen, 2014; Oiarzabal, 2012). These studies do not explore lower profile virtual communities that use less familiar platforms.

To conclude, in spite of the substantial legacy of online ethnographic research, decentralized torrent communities on low-profile platforms have been largely understudied by digital ethnographers. On the other hand, torrent trackers and their communities have been objects of inquiry for HCI scholars.

HCI on peer-to-peer communities

As part of their overall mission to explore and design user behavior in digital environments, HCI scholars researched and developed torrent communities. In its early stage, roughly 2002–2005, scholars sought to characterize torrent communities by relying primarily on measurements of size, users, and bandwidth. Scholars' consistently recurring objective was to obtain valid knowledge and measurement standards that could be employed to understand and predict the emergence of peer-to-peer communities and their members' behaviors. Researchers emphasized what they deemed 'selfish motivations' in user behavior, which can be also viewed as a rational quest for achieving (digital) rewards (Asvanund et al., 2004; Golle, Leyton-Brown, Mironov, & Lillibridge, 2001; Saroiui, Gummadi, & Gribble, 2002). Accordingly, scholars suggested mechanisms to incentivize 'good' user behaviors, including network pricing, micropayment systems, reputation systems, autonomous club formation, and admission control systems (Asvanund et al., 2004, p. 161). These mechanisms were asserted to result in the formation of a technologically sustainable community (Golle et al., 2001, pp. 79–80).

Between 2008 and 2012, researchers created theoretical models of optimized data economies that were intended to discourage users' negative sharing behaviors (i.e., selfish or opportunistic) and to stimulate a collective aspiration to enlarge their bases of shared data. As a result of this work, scholars attempted to predict users' needs, motivations, and actions in highly elaborate data economies designed to optimize productivity (Dejean et al., 2010). The premise underlying this discourse emphasized that users were primarily motivated by opportunism, and that their decision-making was influenced by individualism.

Scholars suggested that a peer-to-peer system seeking efficiency and longevity must implement economically oriented mechanisms to account and control users' selfish characteristics. Consequently, individual incentives for users who exhibited altruistic behaviors were stressed as essential to an ideal data economy (Kash et al., 2012). Scholars suggested that torrent communities must implement an enforced minimum sharing ratio¹ policy to maintain a trusted system that supports accountability by tracking and incentivizing 'good behavior.' To enforce these minimum requirements on their users, numerous torrent communities limited public access to their platforms and implemented exclusive access policies.

These private communities where '... new users must be invited by a member of this community' chose to promote exclusivity to increase the efficiency of the exchanges occurring within their boundaries. These communities employed an '... enforced sharing ratio ... ' and specialized in a particular '... nature of content exchanged' (Dejean et al., 2010, pp. 12–13) (i.e., focus only on music, movies). According to these HCI studies, the utilization of filtering mechanisms such as invitation systems and minimum ratios by private communities fostered prosocial tendencies among members such as cooperative behavior and reciprocity (Dejean et al., 2010, pp. 12–13; Meulpolder, D'Acunto, Capota, et al., 2010, p. 5).

Private trackers were shown to be faster, better organized, and ultimately more reliable than their public tracker counterparts (Chen et al., 2011). These faster speeds and betterbehaved user bases demonstrated the quality that could be attained by an efficiently designed private community (Meulpolder, D'Acunto, Capota, et al., 2010).

To conclude, scholars initially portrayed torrent communities as cybernetic marketplaces for individuals to exchange digital goods. However, their focus on the technological and mechanical facets of these collectives does not emphasize their potential for establishing intimate and reciprocal connections while fostering a sense of community. HCI research analyzing torrent communities developed three community-enhancing constructs: (1) a modified model of a nonmaterial economy used by a private tracker (Kash et al., 2012), (2) social enforcement mechanisms using numerical measures (Dejean et al., 2010), and (3) means of incorporating human decisions into algorithmic models (Chen et al., 2011).

HCI stresses rationality in its approach. In spite of its overall agenda to converge human and technological aspects, it consistently emphasizes the technological facets of torrent communities. The HCI legacy seeks to address tensions that arise when creating a more efficient community that engineers both its software and users to fit an elaborate system. The primary objective of any private peer-to-peer community is to provide members with access to collective digital goods. Perhaps, to more efficiently achieve this objective, communities may engineer their rules and expectations of user behavior to catalyze the growth of trust among users and to foster a sense of community and reciprocity, as will be further discussed below.

While it is beyond the scope of this paper to discuss the sociology of the scientific enterprise of HCI research, a numerical computer science-oriented analysis has obvious merit. The case study at hand is framed using a synthesis of the aforementioned HCI insights, virtual ethnographic methods, and the social theories discussed above.

Methodology

Torrent communities exist as closed and secretive environments that offer pirated materials; as such, they may receive unwelcome attention by corporate interests and government authorities. Therefore, engaging members and relaying their worldviews posed substantial challenges. Following the anthropological legacy of ethnographic study of virtual and covert communities (such as delinquent and deviant groups, see Ferrell & Hamm, 1998), an ethnographic approach for studying torrent communities was developed.

To unveil the cultural structures that propel a torrent community, an exclusive community called MusicTorrents (pseudonym) was selected. To investigate the construction of the MusicTorrents community, the ethnographers conducted participant observation by actively participating in the forums between 2013 and 2015, and eventually acquired cultural insider status. This status facilitated the acquisition of trusted cultural insider status that enabled the researchers to conduct semi-structured interviews. The researchers did not identify themselves publicly in the forums; however, while privately contacting prospective interviewees (resulting in 12 key informants), the researchers disclosed their identities, guaranteed anonymity, and provided a general overview of the research. Data were organized and categorized using *Nvivo*, a mixed-method data analysis software.

Site selection and description

According to its operators, over the course of its (unusually long) multi-year lifespan, MusicTorrents administrators, in collaboration with the site's 145,000 users, have compiled and curated nearly 1,000,000 unique releases by approximately 700,000 artists, amounting to a database containing over 2 million indexed torrent files. These accomplishments are unusual for private torrent trackers, whose lifespans tend to be limited by external challenges (i.e., lawsuits, distributed denial of service/hacker attacks, resource constraints, and police operations). Hence, MusicTorrents can be viewed as an extreme (or deviant) case study that allows the identification of the proclivities that enable the construction of a thriving semi-anonymous, decentralized, and closed online community.

Upon joining the MusicTorrents community, new users select a username, upload an image (avatar), and add other information at their discretion for inclusion in their public profile available for viewing by the community. Members are assigned a user class based on three criteria:

- (1) Ratio The user's relative contribution of digital goods to the community, measured by the proportion of uploaded data divided by downloaded data.
- (2) Uploads Introduction of new media files to the community's database.
- (3) Community contributions Non-data participation in the community, focusing on social behaviors (i.e., forum posting, discussions, and coding/suggesting new features).

The 'user class' classification is an explicit hierarchical manifestation of social capital as determined by the community's rules; the user class ranks vary from a new and untested 'User' up to the expert and successful 'Elite.' When users ascend in class, they accumulate additional community privileges (i.e., ability to edit databases, and access to additional

forums). This approach relies on measures of data and behavior that implement a rational and meticulously administered system of meritocratic self-advancement. Accordingly, the system measures and broadcasts the worth of individuals within this virtual economy of data.

The MusicTorrents website includes a community wiki that clearly and simply presents all relevant site information, ranging from rules and how-to guides to FAQs and other relevant information. To ensure their technical and bureaucratic fluency, new users are encouraged to at least read the entries that outline membership basics. All users undergo constant automated reviews of their technical behavior (ratio, torrent client, and seeding) in order to ensure ongoing compliance with the rules. When users fail a review, they are either warned or banned from the community, depending on the severity of their transgression.

MusicTorrents was founded after a massive international government operation shut down an earlier comparable private tracker. This deviant community challenges established institutions, norms, and laws, while protecting its users by obscuring their offline identities and assigning them permanent alternate online identities, thus facilitating ongoing social interactions that in turn promote community construction.

Data gathering and analysis

Data were gathered in an exploratory manner, relying on participant observation and semi-structured interviews that ranged from 45 to 90 min. Communications regarding the interviews occurred primarily via online media (Skype, MusicTorrent's 'private messages,' or by telephone) and in person. The investigators sought to conduct interviews in settings where the subjects would feel comfortable discussing the particulars of their membership. As discussed above, a semi-structured protocol was designed to guide the interviews (see Appendix 1). The interviews included questions about user's background, online profile, online practices/conduct within the community, and overall opinions regarding the torrent community.

The participant observation activities included interacting with the community's web interface, creating a profile, sending messages, reading and posting on the forums and wiki, and joining Internet Relay Chat (IRC) discussions in the community's chat room.

The data analysis approach utilized methods derived from principles set forth by Grounded Theory (Glaser & Strauss, 1967; Shkedi, 2005). The interviews were first transcribed, and a coding scheme with an initial list of themes was developed. Next, *Nvivo* was used to code the transcripts and the resulting data were used to '... organize this material thematically, highlight key phrases and statements, and link it to other forms of data' (Boellstorff, Nardi, Pearce, & Taylor, 2012, p. 173). When the resulting analysis of the gathered data was compared to the reviewed literature, it indicated the presence of three major constructs employed in community building, as discussed below.

Findings

Ethnographic observations and interview analysis point to three major community-building constructs employed by MusicTorrents and identified in this case study. These constructs are as follows:

- (1) *Boundary construction* Seeking to create an exclusive community of technological virtuosos, the community vets new members and broadcasts every member's personal quantitative measures of social capital.
- (2) *Membership maintenance* Agreed-upon rules are made explicit and visible. Tracking and enforcement mechanisms enforce the rules; they punish selfish conduct and reward prosocial behavior in the context of the meritocratic system.
- (3) *Belonging and communal solidarity* By promoting a collective sensibility, community activists have created an environment that recognizes users for their contributions and rewards them with prestige.

(1) Boundary construction: engaging and entering the private torrent community

To construct and maintain social boundaries, MusicTorrents formulated and implemented an elaborate vetting process that serves as a mandatory rite of passage for individuals seeking membership. The boundary construct filters out non-contributing or potentially harmful candidates.² The filtering is accomplished by testing for the technological virtuosity and musical passion necessary to be a productive denizen of this community.

Through this vetting process, MusicTorrents implicitly criticizes public trackers such as Pirate Bay and Demonoid, thus positioning itself as an exclusive, elite domain in contrast to the popular public arena. It is therefore comparable to other creeds that criticize lay behavior, such as the religious virtuoso (cf. Silber, 1995). The vetting process effectively excludes unwanted candidates, while attracting users who will likely positively impact the community and its collective digital commodities, thus firmly reinforcing MusicTorrents' virtual and social boundaries.

Candidates who wish to join the community may attempt to do so in one of two ways. The first method of acceptance is a snowballed social networking approach in which highranking members vouch for a candidate by issuing a direct invitation. In this scenario, the sponsor is held accountable for any potential misdeeds of the invitee. The second method is available to any candidate in an approved geographic location³ who has no high-ranking members willing to vouch for them. Such a candidate can use an IRC client to be interviewed in a private chat-room environment. This interview tests the speed of a potential user's Internet connection, his or her musical passion, and his or her technical proficiency with the private torrenting protocol.

When inviting a candidate to join the MusicTorrents community, a member is in effect attesting to the candidate's technological and moral competence, thus asserting the candidate will be a productive and prosocial member. When members were asked to describe the qualities of an ideal new member, they provided impassioned answers. For example, User F said:

A love for music, an appreciation of technology as a whole and a respect for the internet as a threshold you have to cross to understand. What the site does ... talk to my grandparents about it; they don't want or need it ... You need to appreciate technology enough to be willing to break the law. That will set a lot of people apart. A lot of people are not willing to break the law, so that's a large factor. Love of internet, love of technology ... appreciation of music. (User F Interview)

User F emphasized the technological underpinnings of the community and its significance as a provider of a file-sharing system. This user indicated that an individual's affinity for technology must be stronger than his or her obedience to the law. These characteristics are accentuated by a generational digital gap metaphor (Talk to my grandparents).

In User A's response, the quintessential values sought by the community in its members reflect the free culture movement (Lessig, 2004):

[Users should be] Generally tech savvy, understand copyright law and the importance of a free and open internet. I think these would all be core values [of candidates and members]. (User A Interview)

Users C, D, and E also focus on the balance between the savviness and musicality required to transverse MusicTorrents' boundaries:

Users are a fairly vocal music community. They are likely to spread the word about a band they like. (User C Interview)

[Users are] nerds, computer savvy, online community savvy ... You wouldn't teach your grandma MusicTorrents. (User D Interview)

Members are information seekers, music seekers, a little bit offbeat, well rounded ... intimidating, intelligent ... [and they] know how to use torrents. (User E Interview)

These and other responses delineate the community's expectations about the values that should be espoused by current and potential members. Once a candidate has been judged to have met these criteria (by an interviewer or a high-ranking member), that candidate is issued an invitation.

After a new member creates an account, the inviting member (sponsor) is credited with a new entry (in their 'invite tree'). A large invite tree further increases social capital within the community. As has been noted above, a sponsor is held accountable for their invitee's shortcomings. Thus, if the invitee violates rules (i.e., misreporting download/upload statistics to gain a higher ratio or trading or selling invitations), both the new member and the sponsor will be sanctioned. This accountability construct thickens the community's boundaries, making users less likely to invite lay friends who are unfamiliar with the community's rules and technologies. Candidates without friends already on MusicTorrents, however, can become members only after being vetted via the chat-room admission interview.

In order to help candidates succeed, the community set up an external website dedicated to interview preparation. On this website, candidates can review all the information needed to understand the MusicTorrents interview process, technologies, community, and rules. When ready, candidates are interviewed on IRC by a senior member who verifies their bandwidth and tests their knowledge of torrenting and music. If the interviewees demonstrate acceptable levels of technological prowess and passion for music, then they are invited to join the community.

To conclude, MusicTorrent's boundaries are clearly defined and enforced with vigor in a socially controlled technological environment. This elitist community of virtuosos has carved out a digital enclave in cyberspace that appeals to like-minded, technology-oriented music collectors. The combination of technical and musical proficiency that MusicTorrents demands yields boundaries that allow only discerning, knowledgeable, and elite candidates to participate.

(2) Membership maintenance mechanisms and reciprocal social exchange practices

Governing a deviant, decentralized, and anonymous community is a challenge, as its members display individualistic tendencies (Eger & Killat, 2008) that could cause them to disengage from the community or foster chaotic behavior. To counter this risk, the community imposes minimum thresholds of measurable pro-community behaviors to maintain membership.

A key aspect of the social exchange expressed by these mechanisms is the quantitative classification of users' contributions, expressed as 'ratio.' At first glance, in line with the community's online guidelines, this data-driven measure determines a user's social standing within the bureaucratic system. However, when interview subjects were asked about social stratification, they expressed frustration with the system's inability to account for non-data contributions. Subjects highlighted the value of social contributions that they felt were not expressed in their 'user class,' although when asked explicitly about the value of community participation, they responded ambiguously. The question was asked in the following manner:

Who in your opinion contributes more?

Option A: A user with a lot of upload but no other community participation

Option B: A user with limited data but high community participation

This question attempted to investigate the different types of community participation and their meanings in this digital exchange system. Most subjects stated that community participation was the more important type of contribution.

[Option] B is providing a service to the site that can only be matched in dollars. They are giving their time to improve the site, assuming they are helping and answering questions. Companies pay for that; that's called tech support. That's something companies pay for and these people are giving up their time and doing it for free. That's an incredible thing. Uploading a ton of [data to gain] ratio is done easily if you have the hardware ... investing the effort in improving an online community ... the site would survive on ratio alone [but] there would be no content and then the site would die. (User F Interview)

If the discussions are encouraging community interaction, then this person contributes more because the dissemination of information encourages users to behave well. (User A Interview)

Forums are something that keeps the site alive in addition to content. (User A Interview)

There were a few really big albums that I really wanted to discuss with people and that's the first place that I would go. (User F Interview)

Subjects' responses indicated that the non-data contributions were highly valued. Certain interviewees even valued online social interactions and participation more than they valued 'ratio.'

Another construct was suggested by subjects who indicated that sustaining active membership in the community facilitates acquisition of 'real-life' (RL) prestige. In the course of the interviews, subjects were asked how and if membership in the virtual community affected them personally. Most responses featured two benefits of membership: the knowledge that resulted from an understanding of the rules, and instant access to an extensive high-quality catalog of music.

After joining the site, my understanding of torrents and why people use torrents increased, which has directly affected my understanding of how that traffic appears on a network. My job now has to do with networking, and torrent traffic is something that organizations want to [be able to] identify directly. It has contributed to my understanding of an open and free internet, and has helped me to seek further knowledge in that area by generating interest. (User A Interview)

Users A, E, and F reference increases in prestige and social capital, among RL friends, as members become the go-to source to acquire music.

People ask me to download things for them. It is very obvious they don't have membership because then they wouldn't need help. (User A Interview)

[Membership] Gives me a sense of wealth. (User E Interview)

... [With other services, like Spotify] there is no permanence. [MusicTorrents is] like a vault that will hold music; that's why people bother dealing with the site and are so passionate about it. I'm not a very high-up user and I respect it. I would be sad to lose my tiny little account. (User F Interview)

As implied earlier, membership in MusicTorrents grants an offline symbolic elite status that defines individuals as more connected, musically knowledgeable, and digitally savvy. In addition to having access to an extensive database of available music, community members have the opportunity to 'fall in love with artists before other [nonmember] people even hear them' (User E interview). One member purchased a T-shirt with a logo of the community on it, and as a result of that shirt ' ... people would see [me wear-ing] that and get excited and talk to [me] about MusicTorrents' (User F Interview). Hence, membership can confer limited prestige and social standing in everyday social life outside the boundaries of the online community.

The community has constructed a balance in which two types of mechanisms facilitate exchanges and maintain membership. These mechanism types are driven by either a rational data-driven approach (based on members' ratio and usage statistics) or affective social reinforcement (based on peer influence). Consequently, MusicTorrents users frequently engage in 'optimal practices' (well-beyond minimum thresholds) to ensure the long-term sustainability of the site. HCI research (Chen et al., 2011; Kash et al., 2012) has already pointed out the importance of data-driven mechanisms for the long-term sustainability of torrent communities. Our research adds the socially oriented tendencies of members who strive to advance their (online and offline) social standing, reinforcing the sense of a community rather than simply a decentralized and semi-anonymous collective.

(3) Belonging and communal solidarity

Belonging is a fundamental component of membership that fosters communal solidarity (McMillan & Chavis, 1986). Contrary to HCI literature expectations, in which members

are described as being focused only on personal acquisitions and contribute the minimum to avoid punishment, members described their desire to belong, rather than fear of sanctions, as motivating their contributions.

This site isn't just a [public tracker like] pirate-bay filled with ads, it's community-based. If you're willing to be a part of a [virtual] community that tells you something ... if you're willing to explore realms online ... (User D Interview)

User D continues, highlighting a personal sense of belonging in the virtual community, stating:

You can tell there is a definitely a community behind the screen. Even though you're on the computer, there is definitely camaraderie. (User D Interview)

The collective spirit expressed by User D as 'camaraderie' is particularly notable as it exists in a community where members have no offline personal connection. In framing the community in terms of camaraderie and other collective characteristics, subjects described MusicTorrents as a successful torrent tracker. Many felt that membership in the community fostered shared values, including digital prestige and trust, as well as an appreciation of music, technology, downloading culture, and the Internet. A particularly revealing question asked subjects to characterize what all members had in common:

[MusicTorrents users are] Information seekers, Music seekers, A little bit offbeat, [and] well-rounded. As someone [who has] access to all types of music [members are generally] listening to [more than] ... one genre of music. (User E Interview)

An appreciation for the international nature of music, not everybody likes world music but everyone recognizes that music is a transnational phenomenon. In the US you always hear about billboard charts exclusively focused on the US as opposed to charts in other countries. I think being on there [MusicTorrents], and being around people from different places, helps [people to] recognize the globalization of music. (User C Interview)

Users C and E discussed individuals' abilities to appreciate music in all of its styles (e.g., classical, scream death metal, and contemporary pop) and various digital formats (i.e., MP3, WAV, and FLAC) as communal traits. However, it was not the style of music, but its conceptual appreciation, that intensified their sense of belonging. Many spent a larger portion of their interview extolling the community and technology of MusicTorrents rather than the music to which it provides access. User F mentioned the expertise that the community expects its users to master and his own expectations about the user base.

[MusicTorrents' users have] an appreciation of technology as a whole and a respect for the internet. [There is] a threshold you have to cross to understand the site. (User F Interview)

Interviewees expressed their ongoing ambition to increase their sense of belonging by contributing new data to the MusicTorrents collective, thereby gaining the ratio necessary to ascend user class in the community's social hierarchy.

... when I was downloading a lot, it was a pretty cool thing to be a part of and [I] tried to read up on the blog posts and was proud of that status. I really wanted a PU [(mid-level user class)]. (User A Interview)

Interviewees characterized membership in MusicTorrents private torrent community as exciting and meaningful, describing MusicTorrents as having both a prodigious number of high-quality users and a well-curated music archive.

I spend loads [of time and money] on the act of listening to music. I have certain expectations for that and until recently I couldn't get what I wanted without ... MusicTorrents. (User F Interview)

It obviously gives me access to this treasure trove of music, which is amazing; I never have to worry about not being able to have access [to] a particular album ... [because] no more copies are available and things like that. It is just a click away I know there is a community of enthusiasts there, who ... care about this, this isn't just about ... having free music and not paying for it, this is people who are really passionate about preserving this digital information so that it is always available for anybody who wants, at any point in time. I feel a little bit privileged to be part of that. I think that is nice. (User G Interview)

This perceived value of belonging to MusicTorrents allows the community to enact the demanding rules vetting users' active commitment to the community. The emergent elite community is, according to User A, '... a pretty cool thing to be a part of' (User A Interview).

The 'coolness' User A refers to implies a sense of admiration or pride derived from participating in the MusicTorrents community. The repeated depiction of MusicTorrents in similar, if not identical and positive, terms affirms a sense of belonging. When asked, MusicTorrents members described other members as technologically savvy, intelligent, highly informed, and having good taste in music. The subjects' descriptions of their senses of belonging were frequently expressed as a friendly set of overlapping values and selfinterest that had converted a heterogeneous collection of people into a cohesive virtual community.

To conclude, in fortifying its boundaries, fostering reciprocal social exchange mechanisms, and cultivating a strong sense of belonging, MusicTorrents has created a trustworthy community with dedicated members. MusicTorrents inspires members to prosocial and altruistic tendencies that contrast sharply with the individualistic proclivities highlighted by HCI scholarship.

Conclusions

The legacy of HCI research viewed individuals' torrenting behaviors in terms of selfish motivations (Asvanund et al., 2004; Golle et al., 2001; Gummadi et al., 2003), highlighting users' self-interests while discounting communal influences. In contrast, the present study illuminates a communal affinity in private torrent trackers, and three constructs were identified as facilitating a cohesive and sustainable community. These constructs consist of boundary fortification, membership maintenance mechanisms, and a collective sense of belonging and solidarity.

In the highlighted HCI scholarship (Chen et al., 2011; Dejean et al., 2010; Meulpolder, D'Acunto, & Capota, 2010), there is an implicit assumption that technological constructs reliably determine behavior. Accordingly, programs that connect peer-to-peer users ('clients') were considered the leading influence that shapes relationships within these communities. In contrast, this study reveals that the cultural influences in a peer-to-peer collective are more powerful than previously assumed, particularly by HCI scholars.

The findings are instead more consistent with ethnographic studies that have focused primarily on the affective nature of online culture, while omitting much discussion of its technological underpinnings (Boellstorff, 2008; Kendall, 2002; Rheingold, 1993). The

present study has shed light on the importance of community and culture in the digital arena, seeking to link both streams of research. Themes of collective identity, collaboration, freedom, and exchange were presented as guiding forces of digital communities.

In accounting for both domains, the community at hand was found to have employed cultural mechanisms synced with the technological needs of the community. These mechanisms (i.e., fortified boundaries, stringently enforced measurement mechanisms, and a sense of belonging) facilitated the creation of new prosocial digital peers. Hence, the MusicTorrents community created a structure in its rules, interview process, exchange economy, and interactions that nurtured a collective affect in its membership.

In accordance with these developments, a new portrayal of digital peers emerges in which individuals confront the innate tensions between collective motivations, a deviant setting, and advancing personal goals (i.e., obtaining status and digital goods). This is to say that these *digital peers* do not act solely for their individual benefit at the cost of others. Rather, they perceive themselves as a part of a community, albeit a deviant one, in which they invest a fair amount of time, resources, and effort to become productive members.

Members in the MusicTorrents' private peer-to-peer community, and particularly those with higher ranks, define themselves as 'downloading virtuosos.' This is to say, they stand in contrast to ordinary people who either purchase digital goods or acquire them by means of public downloading exchange systems (e.g., The Pirate Bay, DC++, Napster, and Soulseek). In this sense, the social standing of these virtuosos could be compared to that of hackers. While hackers have long been acclaimed as masters of modernity and technology (Coleman, 2012; Nissen, 1998; Turgeman-Goldschmidt, 2011), their culture seems to parallel that of MusicTorrents' members in their affinity toward technology and in their concern for their freedom to exchange information and digital goods (Coleman, 2012; Lessig, 2004). However, the study's findings identify contrasts between the individualistic affect in hacker collectives as defined by the literature and that of MusicTorrents, where members demonstrate stronger group cohesion and commitment.

Past studies on fandom (Baym, 2000; Jenkins et al., 2013) presented online communities as ideal sites for expressive articulation of viewers' favored cultural artifacts (e.g., TV series and music). In private torrent communities, we find users who combine a comparable affinity to the cultural artifact with an elevated technological virtuosity. When a new album is uploaded to MusicTorrents, both its technical and cultural qualities are reviewed by members on public comment threads. In this context, future studies could adopt a discourse analysis approach to further characterize this variant of fandom.

While the act of torrenting has been often construed as an act of piracy that demarcates a social form of delinquency, some scholars have framed it in Jenkins' 1992 concept of participatory culture (Jenkins et al., 2013, p. 116; Lehdonvirta, 2013, pp. 17–18). Rather than viewing torrent users as immoral or as passive consumers of preconstructed messages, scholars portray them as active audiences who shape, share, reframe, and remix media content and meanings. While Jenkins et al. associate individual needs with the formation of participatory culture, the collective aspects are highlighted in the MusicTorrents case study.

In expanding Jenkins' concept, Christian Fuchs criticizes his disregard for the effects of strong centralized governance and uneven distribution of power facilitated by corporate platforms (e.g., Google and Apple) on the growth of participatory culture (Fuchs, 2011). In line with Fuch's reasoning, we contend that MusicTorrents' anti-establishment

stance and, ironically, its stern mechanisms of social control and exchange embody an institutional democratic freedom and equality rarely noted in previous participatory culture scholarship. The subsequent emergent communal spirit among its participants 'maximize[s] the developmental powers of humans ... ' (Fuchs, 2011, p. 278) in ways that corporate platforms do not. Thus, the MusicTorrents community may be viewed as a counterculture to corporate- and state-endorsed enterprises. Although their ideological consciousness has not been investigated, their praxis can attest to an ideological standing that is comparable to that of past hackers and libertarian advocates (cf. Coleman, 2012; Lessig, 2004).

In spite of the communal constructs that have been discussed in this study, the findings suggest that MusicTorrents participants constantly confront an inner tension. They strive for the freedom to obtain and exchange digital goods and information; yet they have created a strong institutional system of rules and regulations to which they have subjected themselves. In their efforts to cultivate a virtuoso community engaged with exclusive goods, they have created, perhaps as an unintended consequence, a quasi-bureaucracy to enforce the community's social order. MusicTorrents has constructed a media-oriented community that has distanced itself from the general population of downloading Internet users. The community has created a stratified prestige system among its members in which prestige is not determined by musical tastes, but rather by technical fluency and altruistic tendencies.

The collectability of music content is another aspect of MusicTorrents that users' perceive as a benefit. Danet and Katriel (1989) discuss collecting as an informal form of play that grants collectors a sense of status. For collectors, it is contended that collecting is an endeavor to create a 'perfect set' that provides a sense of closure, completion, or perfection. This theme may resonate with MusicTorrents' virtuoso users, who in a sisyphean manner impossibly seek to archive a 'complete set' of all music (in various versions and formats), of which an inexhaustible supply exists. The present study suggests the emergence of the novel concept of a decentralized yet bounded, peer-to-peer collective, enabled by both the technological aspects of the software (as implied by HCI scholars) and the common mission and culture of users.

When the constructs employed in creating an exclusive peer-to-peer community were investigated, the findings revealed the importance of community-oriented attitudes. Through further reflection, emergent developments arose, including the emergence of digital peers, the ability of affect to motivate prosocial behaviors, and the emergence of downloading virtuoso communities.

Rather than focusing on torrenting solely as a subcategory of online music-related activity or as a tool for users to access content, in accord with the study's findings, scholars can reframe their ontological perception of torrenting trackers as communal sites and cultural platforms. Future scholarship that develops and verifies the themes uncovered by this work and measures their prevalence within other online populations could lead to a meta-scale understanding of peer-to-peer communities. Further research could include large-scale, longitudinal or comparative studies that rely on new tools (big data, analytics, and data mining techniques) to elucidate the boundaries and inter-relations of similar communities of practice in the online (and possibly offline) digital landscape.

Notes

- 1. Sharing ratio is a decimal value assigned to each member and visible to the entire community, and is calculated by ratio = uploaded data/downloaded data.
- 2. Harmful candidates references individuals seeking to act selfishly (i.e., 'ratio cheaters' and 'leechers') or unable to contribute (i.e., limited connectivity, censored networks, and bad computer).
- 3. MusicTorrents maintains a list of disqualifying geographic locations due to high rates of unacceptable conduct (i.e., reporting false ratio statistics, and limited or censored bandwidth).

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Appendix 1: Interview protocol questions.

2

Basic descriptive statistics

- 1. What is your username?
- What is your current and past avatar? 2. Why?
- 3. What is your userclass?
- What is your ratio? How do you 4. describe that ratio?
- 5. How did you reach the community?
- 6. How long have you been on the site?
- How often do you log in to the site?
- How difficult was it at first to learn 8. how to become a good user?
- 9 How are the community rules?
 - What do you think about a. them?
 - Are they fair? b.
 - Are they well designed? C
 - d. What do you understand?
- 10. Have you invited users to the site?
 - a. How big is your invite tree?
 - i. What is the
 - userclass
 - distribution?
- 11. Do you interact regularly with particular users?

- Behavior
- 1. What benefits does you userclass on the site grant you?
 - What is your place in the sites hierarchy?
- How do you interact with the community 3 and its members
 - a. Do you post on the forums?
 - People you know in real life b.
 - c. People you only know online What do you use MusicTorrents for?
- 4. Is MusicTorrents your first stop a. in looking for music?
- How does membership in the community 5. affect you?
- The effects of userclass on interactions? 6.
 - Your userclass a.
 - b. The userclass of others you interact with
 - c.
 - Who in your opinion contributes more?
 - In real life? d.
- 7. Do you feel like you are a part of the participatory culture of the site?
- Do you visit/post the forums? 8
- Do you contribute to the site? How? 9 (donation?)
- Would you donate again? a. 10. Do you consider yourself a seeder or a
- leecher? a. How long do you retain torrents
 - for?
- 11. Do you upload content?
 - a. Is it original?

Community Characteristics

- 1. How valuable to you is your online membership? Why?
- 2. Talk to me about DRM?
- 3. To me MusicTorrents is _
- 4. How many friends do you have on MusicTorrents?
- a. How many of them do you know in real life?
- 5. I would/nt help someone I know on the site because
- 6. Do you trust the moderators?

7. Do you feel like you are listened to on the site?

- 8. Have you participate in real world meet-ups of the website?
- 9. Would you be open to this?
- 10. What characteristics do all users have in common?
- 11. Are you a member on other private trackers?
- 12. Do you think freeleech events are good? a. Do you listen to all of the music
- that you download during freeleech? 13. Describe the character of the forums, and
- the effect that the heavy moderation had on them
- 14. Legal/moral/ethical role of MusicTorrents?
- a. Does MusicTorrents hurt of help artist?
- 15. Is MusicTorrents more than just music?