The Epistemological Foundations of Music Piracy in the Digital Marketplace

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Abstract

This paper examines the fundamental epistemological gap between the consumers and producers of digitally based products. Using the music industry and the significance of digital products in this arena as a case study of evolving relationships between buyers and sellers, we evaluate the nature of 'piracy' from multiple perspectives: creators, intermediaries, distributors, and end consumers. Our study centres on the epistemological boundaries of these agents and actors, using existing evidence and qualitative research to examine the nature and limits of the epistemological reach of agents and actors in this digital marketplace. Our theoretical model is an adapted and applied version of *Domain-Generality and Domain-Specificity in Personal Epistemology*. We find a series of epistemological dissonances, driven by differing levels of understanding about (and access to) the underlying technological, legal, and social structures of an evolving marketplace. As a result of instability, these structures inevitably create various epistemological boundaries. Using the analytical framework developed, the case study of music piracy illustrates how identifying epistemological dissonance helps sellers develop strategies that could minimize the impact of piracy on their revenue streams.

Keywords: music piracy; digital marketplace; personal epistemology; domain-generality; domain-specificity; epistemological gap; congruous beliefs; incongruous beliefs

This paper argues that those interested in marketplace changes should direct their attention to evidence of where participants in a marketplace begin to display specific behaviours, which are incongruous, or at odds with their overall beliefs. The example chosen to illustrate this is the phenomenon of 'piracy' in the music industry, an activity that has been greatly facilitated by the advent of technological innovation and accidents in infrastructure development. This has been examined from number of perspectives - moral [*Al-Rafee, Cronan*, 2006], ethical [*Yoon*, 2011], legal [*Houle,* 1991] and economic [*Ku,* 2002]. These perspectives are of value to actors and agents in the digital music marketplace as illustrated by the chief executive of the

International Federation of the Phonographic Industry (IFPI) Frances Moore in 2011: 'As we enter 2011, digital piracy, and the lack of adequate legal tools to fight it, remains the biggest threat to the future of creative industries.' [IFPI, 2011]

Using the specific analytical tools of law, psychology, sociology, economics and business, we can generate insights on the causes and consequences of piracy [*Wolfe, Higgins*, 2009]. However, in order to determine the root cause of piratical behaviour in the digital medium it is necessary to consider the belief systems that determine the behaviour of individuals. Accordingly, this examination uses the perspective of epistemology by using a theoretical model to deconstruct testimony and identify epistemological boundaries. It concludes that attempting to understand incongruous behaviour through an epistemological lens may be more productive than more subject discipline specific approaches.

Context

The music industry has evolved almost alongside changes wrought by the introduction of new computer-mediated technologies [*Alexander*, 1994]. From the development of digital recording technologies to the transmission and sharing of digital files the music industry has colonized the digital space. Often commercial organizations within this marketplace have embraced innovation without seeming to consider the ultimate consequence of their actions. The advent of cheap tape recording technology created a major crisis of copyright control; vinyl records and pre-recorded tapes could now be duplicated easily and quickly with no credible prospect of statutory censure for the copyright thief. Some hardware manufacturers, such as Amstrad [*Hayhurst,* 1985], recognized that this activity was prevalent in the music market and deliberately produced equipment to facilitate this process. With the advent of Compact Discs (CDs), the response from hardware manufacturers was further supplemented by innovative software engineering that enabled even more rapid reproduction of material on CDs using Personal Computers (PCs). Music consumers became more conscious of the fact that a discrete material object whether it be a vinyl disc, a magnetic tape, or plastic CD was no longer necessary. What made this latter stage of evolution even more critical to the revenue streams of incumbent music industry businesses was the development of a new infrastructure technology – the Internet. The Internet was independent of, yet critical to, the dissemination of digital material. Whilst incumbent purveyors of pre-recorded music could not have anticipated the scale of illegal copying and distribution by their customer base, the behaviour of consumers was fundamentally the same. As mentioned above, the scale of the illegal copying of recorded music accelerated when recording technology that did not require either specialist skills or

expensive equipment became widely available to the consuming public. The notable dip in record sales in the late 1970s was attributed to such taping, and inspired the (in)famous 'Home Taping is Killing' music campaign by the British Phonographic Industry, representing the collective interests of UK recording companies [*Yar*, 2007, p. 96].

Even by the late 1970s, producers and distributors were fully aware through historical precedent that new accessible technologies facilitated piratical behaviour; they developed Digital Rights Management in an attempt to protect copyrighted material [*Subramanya*, *Yi*, 2006]. However, this approach could not have anticipated that the boundaries of technological innovation and creativity were going to outrun and out-innovate a value chain predicated on historical structures [*Sudler*, 2013].

Analysis

A historical deconstruction of the relationship between purveyors and consumers of music shows that customers will copy and disseminate music if they realize they can do so with ease and without censure. 'Although special coding, fingerprinting, and other methods and techniques can protect software programs, no technological protection system yet devised is completely effective. In addition, despite the clear specification of property rights, piracy still can exist due to the high cost of policing consumer behaviour and enforcing the law. As such, it is likely that software piracy will remain a prevalent and a serious problem into the foreseeable future' [*Shin et al.*, 2004, p. 103].

Yet there are limitations, and this simple transactional view cannot fully account for the changing technological, social, and economic contexts in which the music industry and its value chain exist [*Rayport, Sviokla*, 1995]. In any marketplace, whose processes of value creation and exchange have radically altered [*Parry et al.*, 2011] there may be no meaningful way in which the behaviours and actions pertinent to one context may be equated with those of another. Consider the act of copying music. In the digital environment, it can be a simple process of acquiring and engaging the correct software, which can automatically copy the music and save it to a desired destination ready for use within seconds. In contrast, the act of copying taped material required the acquisition of suitable media, another tape, a physical copy of the source material, and hardware capable of transferring material from one source to another. In addition, source material had to be purchased at some point or otherwise acquired from a willing donor. If borrowed, both parties became complicit in an act of theft and this involved a social consensus, which in turn evaluated risk to the participating parties as well as considered the transaction against the general moral opprobrium that the act might attract. With

this older technology, there were arguably far more barriers creating opportunity for physical pause and consideration of the financial, moral, and ethical choices being made at each phase of the act. Digital copying in contrast has removed much of this social vector by re-socialising the process at the point at which the copy is made. Sean Ebare succinctly summarises this significant difference: 'While building trust between online communicators may take longer online than in F2F [Face to Face] environments [due to reduced cues], online communication environments are in many ways a safe refuge for the expression of identity and self–concept, even when that identity is viewed as taboo in the offline world' [*Ebare*, 2005].

The illegal acquisition of copyrighted music has a radically different social and interpersonal context in the digital age. Conversely, the process of illegally sharing music digitally has lost the immediate and physical communality of purpose that added legitimacy to the act of copyright theft.

Conceptual Framework

Individuals who are self-confessed music pirates often hold contradictory views on the nature, motivation, and assumed consequences of their actions [*Bernstein*, 1999; *Hill*, 2000; *Janssens et al.*, 2009]. What is less clear is the conceptual process by which behaviours that contradict a wider ethical and moral consideration of societal responsibility are manifest and consistently executed. Why do normally law-abiding members of society who would find theft in the physical domain repugnant, find it acceptable in the digital domain to commit theft illegally downloading copyrighted music? A detailed analysis of intent led to the construction of a decision-making matrix that details and gives weight to such factors as economic considerations and legal and ethical frameworks [*Coyle et al.,* 2009]. Their discussion concluded that only one attitudinal factor was significant in predicting whether someone had pirated in the past *and* whether someone intended to do so in the future. The basic and general consideration of whether pirating is ethical and/or criminal, captured in the legal/ethical factor, predicted past behaviour and future intentions. Clearly, the young people in the sample judged the ethical and legal aspects of music piracy to be essential considerations when pondering this issue [*Coyle et al.*, 2009, p. 12].

Whilst this is useful, it does not explain why the root cause of this consideration of legal and ethical factors should frame this decision-making process. One approach for further analysing the basis of this behaviour is the psychological approach which has as many perspectives as there are sub-disciplines within the field, such as social cognitive and motivational theories

[*Denegri-Knott,* 2004; *Gopal et al.,* 2004; *d'Astous et al.,* 2005; *LaRose, Kim,* 2006; *Wingrove et al.*, 2011]. Whilst these are insights that provide potential models for examining and, perhaps influencing behaviour, these too have limitations in that they do not fully examine the foundations of the belief systems that underpin the psychological superstructure [*Goldman*, 1985]. The manner in which belief and knowledge is structured fundamentally determines behaviours in more specific societal contexts such as the legal and ethical [*Feldman, Lynch*, 1988]. In order to further examine this, a theoretical approach which attempts to describe how epistemic beliefs are layered and subject to contextual factors could have the potential to explain how such contradictory behaviours give rise to the observed discontinuity. There are several similar approaches, in particular those of [*Chiou et al.,* 2005] and [*Shang et al.,* 2008], which seek to apply theoretical frameworks to explain this behaviour, contributing significantly to the development of the debate. Accordingly, the core conceptual approach of this paper draws from and adapts Theory of Integrated Domains in Epistemology (TIDE) framework, developed by Krista Muis and her colleagues [*Muis et al*, 2006]. The TIDE framework examining differences and communalities across academic disciplines is also used to understand how dominant epistemic modes influence the nature of pedagogy. It addresses how individuals' epistemic beliefs operate in various contexts: the larger socio-cultural, academic, and instructional contexts [*Ibid.,* p. 2].

In adapting this model, beliefs in the academic domain are substituted for beliefs derived from the digital domain. In the original model, we make it clear that it is important to determine clearly, 'what is meant by academic domain knowledge?' [*Ibid.*, p. 10]. We use Patricia Alexander's work on domain knowledge (1992) and further adapt this by specifically defining the application of domain knowledge in an academic context. Academic domain knowledge is defined as '…a body of knowledge that individuals possess about a specific field of study. This body of knowledge is comprised of conditional knowledge (knowing where and when), procedural knowledge (knowing how) and declarative (knowing that) knowledge' [*Alexander*, 1992, p. 10].

This notion of a 'body of knowledge' Muis et al. apply to that which is derived from and is constructed by the wider instructional/societal context of an individual. The normative strictures and guidance determined by the educational, social, and cultural socialization process in itself form a domain of knowledge. This is useful as it provides a basic framework within which further domains of knowledge can be subdivided in order to meet the analytical demands. So for the purposes of this study, the original model can be redrawn to examine how

an individual conceives the 'music industry'. This will help determine the boundaries between this specific knowledge and its relationship to wider epistemic fields . For example, if an individual, in their wider socio-cultural epistemic understanding, is of the belief that theft of property is wrong this can be seen to be at variance with their epistemic grasp of what constitutes theft in the digital domain. A belief in existence of theft may not cross the boundary from the socio-cultural epistemic domain to the epistemic domain that governs belief about and action in the digital domain.

The following overview of the TIDE framework will help to contextualize its use and adaptation. Muis et al. begin by defining the outer boundaries of individual epistemic knowledge in the socio-cultural domain, a product of 'enculturation' in which 'individual's beliefs may be shaped by their surrounding culture and are by-products of given social contexts' [*Ibid.*, p. 32]. There are several social and cultural influences that contribute to this enculturation, such as the influence of parents, peer groups and educational environments. These 'general epistemic beliefs form an all-encompassing background, within which more context specific epistemic beliefs are situated. In the chronological development of an individual's epistemological awareness this is the first domain to emerge within which "children begin to develop naïve theories of knowledge"' [*Ibid.*, p. 34].

In the model 'Academic epistemic beliefs', there are those that emerge when 'individuals enter an educational system' [*Ibid.*, p. 35]. Whilst these beliefs are derived from the general socio-cultural context over time through the individual's acquisition of experience specific to the educational environment, education creates a distinct domain of knowledge, and is derived from and located within this class of experience. As an epistemic domain, academic beliefs become more pronounced and distinct as the individual progresses through higher levels within the educational system until, at the level of specialization, 'more developed individuals are primarily influenced by the predominant epistemic patterns of their domain of study' [*Ibid.*, p. 36]. However, Muis et al. recognise that in the context of academic knowledge, 'student's domain of specific epistemic beliefs are not entirely reflective of the dominant epistemologies of those domains' [*Ibid.*, p. 36]. Situated within this academic context is an instructional context, which derives from the individuals' personal and unique experience of the classroom and other elements of the educational process. In the context of education, Muis et al. note improved congruence between instructional beliefs and the wider academic structure of belief as students progress though successively higher educational stages, until the point at which graduates in a specific discipline hold personal domain specific beliefs that are almost fully congruent and aligned with the academic discipline or context within which they study or work.

Furthermore, the more congruent these views are, the more likely that the epistemic beliefs derived from the instructional and academic domains will inform and influence epistemic beliefs in the wider socio-cultural domains.

The TIDE framework recognizes that these beliefs evolve and mutate over time, and that in particular the individual's instructional context is subject to developmental progression and moreover, in this multi-dimensional model, there is an endless interaction between these domains. Nevertheless, the theoretical conception of distinct elements of epistemological belief does provide a structure and process that can be used to explain how and why individuals hold seemingly contradictory epistemic beliefs. Congruence and incongruence co-exist [*Bendixen, Rule*, 2004]; within the instructional domain, the individual's knowledge is not fully in accordance with the wider academic context of the field or discipline within which they have been en-cultured. It is this particular feature of the TIDE framework which is of particular use in explaining dissonances between epistemic beliefs and action.

Figure 1 presents a representation of TIDE framework. The temporal dimension has been omitted in order to clearly illustrate the relationship between the nested epistemic domains.

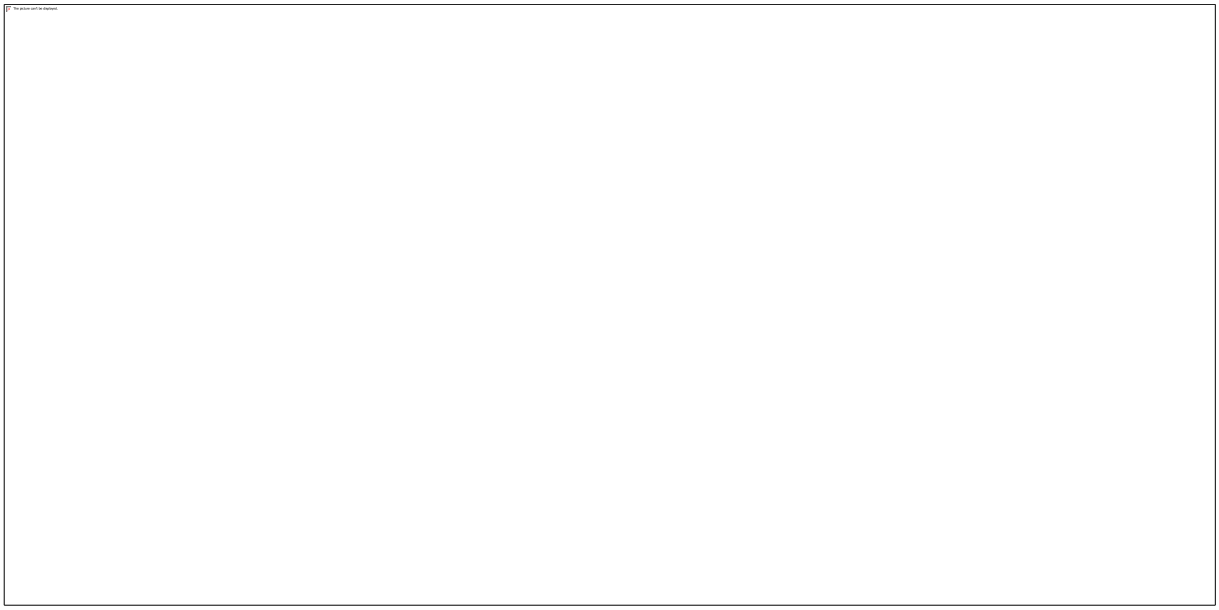
Fig. 1. The TIDE Framework

Source: [*Muis et al.,* 2006].

For the purposes of this analysis of epistemic beliefs in the digital domain, the original TIDE model is transposed into a depiction of the relationship between the wider socio-cultural context and new core 'domain specific' beliefs applicable to the digital environment. Accordingly, 'Instructional context' is replaced with the 'Interface context' in order to specifically identify actions that take place at the point at which the user interfaces with the hardware and software required to access digital artefacts. Moving outwards into more general domains, the academic domain is redefined as the 'digital domain', or the entire class of hardware and software products and processes constituting the wider ecology of the digital industry. The latter comprises the multiplicity of delivery systems (hardware, networks), the processes used to construct digital product (software), and the promulgation of this class of product (marketing, advertising, promotion). The socio-cultural context remains essentially the same. This is the critical advantage of adopting the TIDE framework; it provides a conceptual map, which can be adapted to examine a wide range of specific belief systems within the context of wider societal beliefs. Here we are specifically examining the epistemic beliefs that derive from engagement with digital technology through the lens of actions and attitudes to digital music piracy. The base structure could however also be used to examine video piracy and other forms of misappropriation of digital artefacts. This adaptation and development of

the TIDE framework schematically identifies where the boundaries between domains reveal either congruous or incongruous beliefs (Figure 2, Table 1).

Fig. 2. The adapted TIDE Framework



Source: compiled by the authors.

Table 1. Key terms of the adapted TIDE Framework

Term	Description
(i) General Beliefs	These are beliefs that are derived from the wider socio cultural context, which includes general beliefs about the digital context, 'such as the home environment, in interaction with peers, in work related environments' [*Muis et al.*, 2006, p. 33].
(ii) Digital Beliefs	These are the beliefs that an individual acquires through interaction with, and immersion in the digital environment. This domain includes modes of passive consumption of digital media such as the viewing of television programmes and listening to radio programmes. Added to this are more interactive modes of consumption, activities that are now integral to accessing digital media such as web browsing, the use of Smartphone technology, and the use of public access facilities. From these passive and interactive modes, the user acquires knowledge of the skills and techniques required to access the utility of digital media.
(iii) Interface Beliefs	This refers to the beliefs derived from the specific set of skills and knowledge required to access a particular class of products. This is distinguished from Digital Beliefs by the peculiar understanding required to actively engage with an interface designed to enable access to and/or acquisition of a particular class of digital products, such as sound or video files.
(iv) Congruous Beliefs	These are the beliefs from each of the domains that are in congruity with one another. For example, a belief that theft is morally reprehensible is reflected in the actions (or inactions) an individual takes in both the digital and interface domains.
(v) Congruous Boundaries	These are the specific points at which the epistemic domains are congruous. Here any recognition that content must be paid for from the General Domain meets the point at which the individual pays for music consumption in the Digital Domain and also in the Interface Domain where the individual

	recognizes that content available for download without payment from a web resource may be illegal.
(vi) Incongruous Beliefs/Dissonance	These are beliefs derived from a domain which are incongruent with other domains. Counter to the example of congruity above, a belief that theft is morally reprehensible in the General Domain may not be reflected in actions within the other domains.
(vii) Incongruous Boundaries	These are the specific points at which the epistemic domains are incongruous. Recognition that music must be paid for when physical copies are taken from a store, in the General Domain, is incongruous at the point at which the individual illegally downloads content for consumption in the Digital Domain without making the appropriate payment. In the Interface Domain, an individual, through a lack of technical understanding or ignorance of the relevant legal strictures may not have the appropriate epistemic reach which allows them to discern whether or not the interface they are using enables the illegal download of content. This also creates an incongruous boundary.

Source: compiled by the authors.

To test this model, three statements from individuals, who are self-confessed music pirates and whose confessions are available in the public domain, have been deconstructed. The sources are: *The Confessions of a Teenage Music Pirate* [YPulse, 2011], *Confessions of a Music Pirate* [*Hurewitz*, 2002], and *Confessions of a convicted RIAA victim Joel Tenenbaum* [*van der Sar,* 2010]. To apply this model, it is advantageous analytically to focus on one political jurisdiction in order to establish some epistemic boundaries with a degree of cultural homogeneity, in particular to limit cross-contamination of underlying societal general beliefs. However, as this is a speculative application and adaptation of an analytical model, this is best left for a more developed iteration of the technique.

Application of the Model

The model can be illustrated as a single axis, which enables text to be deconstructed and classified along this axis, detailed in Table 2.

Table 2. An Analytical Axis

Congruent Socio- Cultural Beliefs	Congruent Digital Beliefs	Domain Specific Beliefs	In-congruent Digital Beliefs	In -congruent Socio- Cultural Beliefs

Source: compiled by the authors.

A table is created under which statements, either congruous or incongruous at these epistemic boundaries, are listed. The first analysis takes the form of a simple count of congruous and incongruous beliefs, located at the boundaries of these overlapping epistemological domains, generated from a reading of the narrative accounts. The three narrative accounts of self-confessed digital music pirates were read and statements that were congruous at the identified boundaries were given a score of one and added to the appropriate

column; statements that were incongruous were similarly scored and are tallied. Neutral or general statements, which are indicative of beliefs derived from the wider socio-cultural context and which are not directly relevant to the crossover between the epistemic boundaries did not attract a score.

To more fully illustrate this process, we quote below three statements from Narrative A, *The Confessions of a Teenage Music Pirate*, and the resulting analytical interpretation.

> Many of my friends who download music from YouTube think it's perfectly acceptable since it was already online, and listening from your iPod isn't much different from listening online [YPulse, 2011] (*Incongruous between the digital and interface domain – Score 1*).

This statement expresses an epistemic belief that sits on the boundary of the 'knowing what' which constitutes part of the individual's understanding of the digital domain. Yet it also refers to the manifestation of behaviours that are specifically generated from (mistaken) beliefs of the true nature about how the interface with digitally delivered music works. This knowledge is erroneous, and within its own frame of reference, incongruous with the individuals' wider epistemic knowledge of the digital domain, as they can clearly discern the difference between the use of 'YouTube' as a facilitator of digital consumption and an 'iPod' as an alternate mode of digital delivery. Indeed, if they could not do so, then it would be unlikely that they could access digital products as they would not have the skills or knowledge to use either. This then becomes a count of one in the table under the incongruous beliefs that sit between the music interface domain and the wider digital domain.

The following statement gives a quite different result:

> It's almost impossible for record companies to keep music off YouTube (*Congruous between the socio cultural and digital domain – Score 1*), even with new protections that recognize licensed tracks, because a small pitch change makes a song unrecognizable to the computer. I've listened to many leaked albums on YouTube, and when they're taken down, someone else usually uploads them again [YPulse, 2011] (*Congruous between the digital and interface domain – Score 1*).

This is both congruous within its own frame of epistemic reference and within the wider socio-cultural context because this is simply a statement that can be readily verified empirically by repeated observation. This then becomes a score of one in the congruous boundary (v) between the narrators' understanding of the wider socio-cultural context domain (i) and the digital domain (ii).

The classification of the third example is a little more problematic as it includes statements of speculative opinion that are difficult to validate objectively. It may very well be that this is a statement expressing an accurate set of observations. However, without knowledge of the discrete nature of the population discussed, and without a triangulation using qualitative methods, the statement must be discarded due to its unverifiable and anecdotal nature, no matter how credible it may seem. This is an example of neutral or general statements, which are indicative of beliefs derived from the wider socio-cultural context and not scored for the purposes of the analysis.

> Contrary to what many adults may think, most young people who don't pirate music, movies, or games don't do it because they think they'll be caught or because think it's wrong. They stay away because they think they'll get viruses. This is a valid fear. I've gotten plenty of viruses from downloading P2P files, but they're usually poorly placed and very easy to get rid of. Still many people I know are *very* scared that their computers will break down, so they don't download anything illegally [YPulse, 2011].

By systematically deconstructing the three sample narratives – varying in length from 1000-3000 words – a pattern of scores is built, which yields an overall pattern of epistemic congruity and incongruity (Table 3). By collating the analysis in this manner, patterns in common epistemic congruities and incongruities can be discerned, which could indicate remedial strategies.

Table 3. Deconstruction of Narratives by Congruous and Incongruous Beliefs

	Congruous Digital Beliefs	Incongruous Digital Beliefs	Congruous Interface Beliefs	Incongruous Interface Beliefs
Narrative A	4	1	3	2
Narrative B	6	2	3	2
Narrative C	3	1	5	3

Source: compiled by the authors.

From this demonstration of the analytical tool, we derived a high degree of epistemic congruity amongst the narratives, and most of the incongruous statements in all the narratives, from misunderstandings of the technical nature of how processes actually worked.; For example, the assumption that iPod and YouTube were using identical or similar technology. These and the other incongruous epistemic beliefs are described as dissonances, beliefs that are contradictory within the individuals' own epistemic domains. Dissonance describes a statement

which encompasses two contradictory views. Returning to the examples above as illustrations, when narrator A describes how friends think that '*listening from your iPod isn't much different from listening online'*, this phrase is both an acknowledgement that iPods are a different medium for recorded music and an assertion that they are not 'much' different at the point of use. This form of justification, separating function from form, is inherently dissonant and is unsupportable when subject to even the simplest narrative deconstruction. The identification of such dissonant epistemic beliefs is important, but it does not necessarily mean that these epistemic foundations manifest or give rise to illegal or 'piratical behaviour'. It may be that in some individuals more verifiable epistemic domains that have less dissonance may give rise to a confidence to perform illegal activities; dissonance may arise from a secure knowledge of their own technical skill or an outright refusal to recognize the normative moral and ethical strictures of the wider socio-economic context. It is perhaps appropriate that individuals who have such congruent epistemic beliefs remain subject to the formal censure of legal and political jurisdictions. Returning to those whose behaviour may be founded on incomplete or dissonant knowledge, it may be that a correction of these dissonances may lead to a reduction of behaviour founded on incongruent beliefs and the dissonances that arise in the overlap between epistemic domains. This may indicate that organizations involved in the value chains, which extract income from the sale and distribution of digital music, may be able to reduce their exposure to revenue loss through piracy by reducing instances of epistemic dissonance.

Discussion

Access to knowledge and comprehension of the key foundations that constitute true knowledge in the specialized epistemic domain of the interface with digital music is a key factor related to piracy. We have adapted and applied an epistemic model in order to analyse the root cause of a phenomenon that has major commercial consequences [*Peitz, Waelbroeck*, 2004]. The new model will not, and perhaps cannot, conform to the detailed constructs of pure theoretical epistemological thought. The application of this adapted model and the use of epistemic domains per se are open to detailed theoretical deconstruction and criticism [*Hofer*, 2006]. However encouraging, this discourse will lead either to the development of a more accurate and any case will remain: this is the root cause of much piracy in the digital domain, namely not by the wilful and knowing resistance to the dominant mores of the wider socio-cultural context, but by the persistence of epistemic dissonances that are the foundations of behaviours manifested by individuals, even though they are contradictory to their wider epistemic domain. Here exists a clear link to the recent work of de Bruin (2013) on epistemic

virtues in business, which applies the concept of epistemic virtues in business to the development of business ethics. Whilst this paper is written from the perspective of the practice of business, if digital music pirates are considered as actors in the music business, then the 'belief perseverance' (as de Bruin states) has a particular relevance if considered as an explanatory factor of incongruent epistemic beliefs in the digital domain. Belief perseverance means that individuals cling to beliefs too closely in the face of counterevidence [*de Bruin*, 2013, p. 591].

Describing 'belief perseverance' as a 'deeply rooted' aspect of individual psychology, de Bruin goes on to confirm that 'an explicit discussion of this bias decreases its effect by making individuals aware of this phenomenon' [*Ibid.*, p. 591]. This analysis has an important consequence for policy and legislation seeking to curb digital piracy. This view indicates that the most effective curb on digital piracy may not be the threat of punitive legal action, but rather the identification of the incongruous epistemic belief and a re-educational process that highlights these incongruities. A fuller exposition of their technical processes and the attendant costs borne by the distributors and creators of digital music and related products may do far more to adjust epistemic beliefs than the threat of a legal sanction. By adjusting epistemic beliefs, behaviour can be modified. Furthermore, this form of intervention may prove far more cost effective for those involved in the digital music value chain, as the epistemic relationship becomes one of direct education rather than indirect sanction through a political and legal jurisdiction. Businesses can avoid paying legal fees by promulgating the transparency of their business processes. In this context, the application of an epistemic analysis based on an adapted TIDE framework contributes to the management of the epistemic ecology of the digital music value chain.

The major methodological issue is consistency of interpretation: whether a statement should be classified as either congruous or incongruous, or simply ignored as being unclassifiable. The prime challenge here lies in selecting the criteria used to make this judgment. If, however, the epistemic domains are reasonably well-defined and specific. This means that in most cases triangulation of stated opinion against settled expert knowledge is possible. In the case of the epistemic domain covering access to digital music, there are some technical specifications (file formats, enabling Internet protocols) that determine the physical reality of engagement in this domain. Narrated opinion can be measured against more certain knowledge, whilst this analytical approach does not in itself guarantee that all such interpretations will be valid; accuracy and validity will improve by following a simple rule – the higher the number of observations and interpretations made, the lower the error rate will be

[*Kotrlik et al.*, 2001]. Moreover, to further reduce bias and individual subjectivity, the same data set of narrated witness could be analysed by more than one individual. Again, the greater the number of individuals who deconstruct the narrative, the lower the aggregate difference of subjective interpretation [*Miles, Huberman*, 1984]. Another way to improve the accuracy of interpretation would be to situate the assembled narratives in a homogenous socio-cultural epistemic domain, as this will provide common frames of cultural and linguistic references against which the epistemic domains nested within can be analysed. In brief, there are three strands of development that are needed to fully test this analytical approach: a more detailed critique of the theoretical foundation, a large-scale study with a multiplicity of interpreters, and applications of the technique within a homogenous socio-cultural context.

Conclusion

This paper set out to argue that those interested in marketplace dynamics in the digital environment should direct their attention to evidence of where participants in this marketplace begin to display specific behaviours, which are incongruous or at odds with their overall beliefs. Furthermore, it has been demonstrated how an epistemic approach could yield valuable indicators for remedial action that lies beyond the remit of political and legal jurisdiction. This demonstration of an analytical tool has implications for the control of music piracy. The analysis enables those organizations involved in combatting the loss of revenue to music piracy to develop a new class of preventative techniques that would not be dependent on legal instruments or overtly coercive measures to deter music piracy. The approach is independent of this solution, and participants in the value chain could seek to reduce music piracy without the overt cooperation of the statutory authorities. Where political jurisdictions are openly hostile to commercial influence on the framing of statutory instruments, this may be a valuable adjunct to framing a commercial strategy. The micro study, intended only to demonstrate the application of the model, also revealed that epistemic dissonances are centred on technical misunderstandings of the mode of digital music delivery. These incongruities may be the foundation of some piratical behaviour in this domain. In turn, this indicates that some form of educational process to make existing and new users of digital music more fully informed of the technical architecture underpinning this activity would help to reduce piracy. If further studies were to show that this approach had an empirically measurable effect, then the cost effectiveness of this technique should be judged against alternative approaches such as the use of legal enforcement and redress.

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