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The impact of a radical innovation on business models: Incremental adjustments or big bang?

Marc BOURREAU^a, Michel GENSOLLEN^a and François MOREAU^b

^a Telecom ParisTech,
Department of Economics and Social Sciences, France.

^b University Bretagne Occidentale, ICI, France.

Abstract. In this paper we study the impact of a radical technological innovation on business models. Do firms react by adjusting their business models incrementally, through iterative steps? Or do such innovations lead, instead, to a big bang of new innovative business models that are all adopted and experimented by the industry? To answer these questions, we analyze the impact of digitization—a radical innovation—on business models in the recorded music industry. Using an economic analysis of the effects of digitization, we begin by building five potential digital business models for the music industry. Then, using data from a survey on a sample of French record companies, we map these record labels on our digital business models. Our analysis suggests that digitization has led to a big bang of business models in the music industry, rather than to incremental adjustments of the existing business model.

JEL codes: L2; L86; Z1.

Keywords: business models; innovation; digitization; recorded music industry.

1. Introduction

Technological innovations shape the evolution of markets and industries. Whereas firms can adapt smoothly to an “incremental” or “sustaining” innovation, an industry can be turned upside down by a “radical” or “disruptive” innovation. As Andry Grove, former CEO of Intel, puts it, “*disruptive technologies is a misnomer. What it is, is trivial technology that screws up your business*” (cited by Christensen, 1997).

When faced with a radical innovation, firms may be forced to make extensive changes to their traditional business models. How do they proceed? Do they adjust their business models progressively, incrementally, moving along a well-defined experimentation path of potential models? Or is there a sudden big bang of radically different business models, with highly uncertain potential? In other words, does a radical technological innovation lead to incremental innovations in business models or to a disruption of the existing business models?

To answer this question, we adopt a deductive approach. Drawing on the literature on business models, we posit that a radical innovation can lead to a big bang of business models. We then use data from a specific industry, the recorded music industry, to test this hypothesis.

Many authors have stressed that the music industry provides an ideal case to study the impact of a radical innovation on business models (see, for example, Chesbrough, 2010; Teece, 2010).¹ This industry is undergoing profound transformation, the so-called “digital revolution” (see, for instance, Peitz and Waelbroeck, 2005). Up to now, the economic literature on the digitization of the music industry has focused mainly on the relationship between piracy and the decline in sales,² and on the efficiency of policy measures aimed at discouraging piracy, such as lawsuits and the implementation of Digital Rights Management (DRM) systems (Bhattacharjee et al., 2006; Maffioletti and Ramello, 2004; Liebowitz and Watt, 2006). Very few papers have taken a broader view, to analyze the effects of digitization on business models. In this paper, we aim to fill this gap.

Following Casadesus-Masanell and Ricart (2010)’s definition of a business model, we argue that a digital business model for the recorded music industry has two main components: a strategy of value capture (through the protection and sale of content or the sale of complementary goods or services) and a strategy of value creation via the meta-informational structure (both for the ex-ante selection of talents and for the promotion of new music ex-post). By combining these two dimensions, we define five emerging digital business models for the music industry, and provide an illustrative case study for each of them.

¹ Teece (2010) argues that, due to digitization, the music industry “*is being challenged to completely re-think its business models*”.

² Since 2000, the number of music files shared and downloaded on peer-to-peer networks has been negatively correlated with music sales in the world’s main music markets. Some authors have argued that there is actually a causal effect (see, in particular, Liebowitz (2006) and (2008)), while others have exonerated piracy of all responsibility in the music sales crisis (Oberholzer-Gee and Strumpf, 2007), but many authors draw more cautious conclusions (see, for instance, Peitz and Waelbroeck (2004), Rob and Waldfogel (2006), and Zentner (2006)).

Finally, we use a survey of 157 French record companies that we conducted in 2006 to test for either incremental adjustments of the existing business model or else a big bang of new business models. To that end, we map the record companies in our sample on our list of potential digital business models. We find that the mapping gives more support to the big bang hypothesis.

The rest of the paper is organized as follows. Section 2 provides a review of the literature on the impact of technological innovations on business models. In Section 3 we identify the main components of business models in the recorded music industry and, taking into account the effect of digitization on each component, we build five emerging digital business models. We also provide an illustrative case study for each model that we have identified. In Section 4 we use survey data on the recorded music industry in France to analyze how labels have adapted their business model in response to digitization. In Section 5 we briefly discuss our results and conclude.

2. Literature review

As Chesbrough and Rosenbloom (2002) and Eisenmann (2002) show, the development of the Internet has led to a surge of interest in the “business model” concept, which has been widely adopted by practitioners. At this stage, however, it is not yet as popular in the academic field. For example, Teece (2010) emphasizes that the economic literature typically ignores that firms have to find a relevant business model.

According to the literature (e.g., see Amit and Zott, 2001; Demil et al. 2004; Magretta, 2002), a business model incorporates different components: (i) the ways in which value is created, (ii) the resources and competencies required to generate value, and (iii) the ways in which transactions between participants are organized. In line with this general definition, Teece (2010: 172) states that *“the essence of a business model is in defining the manner by which the enterprise delivers value to customers, entices customers to pay for value, and converts those payments to profit.”* In a nutshell, a business model is the *“logic of value creation and value capture,”* as Casadesus-Masanell and Ricart (2010) put it.

Demil and Lecocq (2010) argue that the research on business models has followed two different routes. First, in what they call the “static approach,” a business model is viewed as a way of creating value in a business. Research that corresponds to the static approach aims, for example, at characterizing business models within an industry. One example is the seminal paper by Amit and Zott (2001), who analyze the sources of value creation in e-business. Second, in what Demil and Lecocq call the “transformational approach,” a business model is a tool for the firm which has to adapt to an innovation. However, as Demil and Lecoq (2010) emphasize, *“a sustainable BM is rarely found immediately, but requires progressive refinements to create internal consistency and/or to adapt to its environment”*.

Like Demil and Lecoq, Teece (2010) contends that technological innovations often require new business models if they are to succeed in the market place. Therefore, *“new business models can*

themselves represent a form of innovation" (Teece, 2010: 176). This implies that innovating firms should excel not only at developing new innovative products or technologies, but also at finding out the appropriate business model for their innovation. In other words, as Chesbrough (2010) argues, technological innovation and innovation in business model are complementary in the success of a new product or service.

The innovation literature traditionally makes a distinction between incremental innovations (which alter the market structure only marginally) and radical innovations (which lead to profound changes in the market structure). An important question is how business models evolve when a radical technological innovation occurs. Teece (2010) argues that it is likely that a radical innovation leads to extensive changes to the existing business models. How do these changes occur? Christensen (1997) and Amit and Zott (2001) consider that firms can foresee the right post-innovation business model, but that the transition from the old to the new business model is full of hurdles. In contrast, Chesbrough (2010) claims that firms are uncertain about which business model is the right one, and have to go through an experimentation phase. Demil and Lecoq (2010) add that experimentation implies incremental adjustments of the traditional business model as an adaptation to the new environment. McGrath (2010) therefore suggests that firms should invest in experimentation on new potential business models.

Do firms follow the same "path" of business model experimentation or different paths? McGrath seems to suggest that, while the right business model is still uncertain, the experimentation path is relatively certain and common knowledge, because "business evolution is highly path-dependent". Winter and Szulanski (2001)'s view of business model evolution also suggests an implicit path of adjustments: *"The formula or business model, far from being a quantum of information that is revealed in a flash, is typically a complex set of interdependent routines that is discovered, adjusted, and fine-tuned by doing"*. We refer to this view of the impact of a radical innovation on business models as the "incremental adjustments" hypothesis. Following a radical innovation, firms in the industry gradually adjust their business model, in a more or less coordinated way, through experimentation, until they find the right business model.

An alternative view would be that, because of the radicality of the technological innovation, firms are highly uncertain about which business model could be the right one. In this case, experimentation is itself also uncertain, and many alternative business models could flourish and be adopted by firms more or less randomly, without any clear experimentation path. We will refer to this alternative view as the "big bang" hypothesis.

Our research question is therefore: after a radical innovation, do we witness "incremental adjustments" or a "big bang" of business models?

To test which hypothesis seems the most relevant, we study the evolution of business models in the music industry. The music industry is indeed facing a radical innovation—digitization—and the traditional business model is clearly not operational anymore. As Chesbrough (2010) states, *"CD unit sales are down substantially from just a few years ago, while alternative formats for music*

distribution like iTunes have grown more important. It is in times like these - when it is clear that the 'old' business model is no longer working - that business model experimentation becomes so important, but it is not at all clear what the eventual 'new' business model will turn out to be. Only experimentation can help identify it and create the data needed to justify it." We analyze how experimentation with new business models occurs at the industry level. Do record labels coordinate on some promising business models, or do they more or less randomly adopt potential digital business models? To answer this question, in the next section, we start by identifying potential digital business models for the music industry.

3. The emergence of digital business models in the music industry

In this section we use the economics literature on the effects of digitization in content industries to characterize the potential digital business models for the music industry. We then provide an illustration of each digital business model.

3.1. Business models in the digital era

As Peitz and Waelbroeck (2005), Bourreau and Gensollen (2006) and Curien and Moreau (2006) highlight, digitization transforms the way music is created, produced, distributed and consumed. Therefore, new business models are likely to emerge as a response to digitization. To identify the business model components that are likely to evolve, we adopt Casadesus-Masanell and Ricart (2010)'s definition of a business model as the "*logic of value creation and value capture.*"³ We argue that digitization can transform the business models in the music industry by affecting the two pillars of a business model: (i) how value is captured, and (ii) how value is created.

3.1.1 Value capture and value creation in the recorded music industry

Value capture. In the recorded music industry, value has traditionally been captured by selling physical products (CDs, vinyl records, etc.). With digitization, however, music has been reduced to digital files that can be reproduced at almost zero marginal cost (e.g., see Peitz and Waelbroeck, 2005), and this is challenging the traditional method of value capture.

We argue that record companies can employ two generic strategies to capture value in a digital environment: (i) by protecting content, in which case the record companies continue to capture value by selling content; or (ii) by transferring value, in which case value is captured through the consumption of ancillary products or services.

³ As we have shown with the literature review, some authors have proposed more extensive definitions of business models. However, our objective here is to define a manageable list of digital business models. This is why we adopt Casadesus-Masanell and Ricart's simple definition.

The strategy of content protection could consist in the introduction of DRM (Digital Rights Management) protections, which restore the rivalry of cultural goods. Record companies can then charge a per-unit price for music titles or a subscription fee, and rely on copyright enforcement to fight against piracy. The strategy of value transfer can take different forms (for an extensive discussion of value transfer in a world without copyright, see Varian, 2005; Liebowitz and Watt, 2006; Slater et al., 2005). First, firms can capture value through the sale of ancillary products or services (e.g., presentation texts, lottery tickets, free T-shirts, etc.). Second, record companies can derive revenue from advertising; value is then extracted from a different group of agents, advertisers, which value the audiences of record companies. Third, firms can transfer value onto “meta-information.”⁴ The objective is to exploit the fact that music is an experience good⁵ and that, even if the content is now technically non-rival, the associated meta-information can be addressed to one particular consumer—in the case, for example, of personalized recommendations from an online shopping site.

To define potential digital business models for the music industry, we focus on these two generic strategies for value capture: content protection (the traditional method of value capture), and transfer of value. We refer to strategies of protection as “P.v”, as they imply (relatively) high prices (P) and low sales volumes (v), and to strategies of value transfer as “p.V”, since these strategies rely on the sale of music at a very low (or even zero) price ($p \ll P$), which leads to a high volume of music consumption ($V \gg v$)—the value being extracted indirectly.

Value creation and meta-informational structure. In the recorded music industry, value is created by attracting the attention of consumers to a limited set of music products that fit with their preferences. The recommendation system, which we refer to as the “meta-informational structure,” is therefore crucial as it selects certain music from a large supply, which is likely to have value for certain consumers. The meta-informational structure is characterized by two main dimensions:

- *The ex ante selection of works.* This takes place before the production phase. It may, or may not, involve professionals, who usually belong to the A&R (Artists and Repertoire) department of a label, and select the works which are worth producing.
- *The ex post promotion of works.* Ex post promotion (i.e., once an album has been produced) is either centralized (promotion by the mass media, such as radio and television), or decentralized (promotion by word-of-mouth (WOM),⁶ directly or through the internet). Even though the mass media, and especially radio, are still the dominant promotion tool in the music industry (Peitz and Waelbroeck, 2005), the development of online WOM could challenge this pre-eminence (e.g., see Chevalier and Mayzlin, 2006).

⁴ We define “meta-information” as the information consumers need about the available content and its quality.

⁵ An experience good is a product or service whose characteristics, such as quality and price, cannot easily be determined in advance, that is, before consumption (Nelson, 1970).

⁶ Word-of-mouth has long been recognized as an efficient communication channel to influence purchase decisions. See Godes and Mayzlin (2004) for a general survey on WOM and its impact on sales.

Four meta-informational structures emerge from the coexistence of two modes of selection of talent (by professionals or not) and two modes of promotion (centralized or decentralized). The four structures are shown in Table 1 below.⁷

Table 1 – The four meta-informational structures

	Selection by professionals	No selection
Centralized promotion	Star System	Push
Decentralized promotion	Structured Pull	Free Pull

The *Star System* model combines centralized promotion by the mass media with professional selection by the A&R department of major companies or by independent labels. Coupled with a strategy of protection, this corresponds more or less to the current business model of the recorded music industry. The *Push* model combines an absence of selection with centralized promotion. This model, which can be associated with TV programs such as “American Idol”, is suited to fashion goods, the utility of which does not depend on their intrinsic quality and for which no selection is really necessary. The *Structured Pull* model, which is similar to the current model of independent labels, is characterized by decentralized promotion and the provision of personalized advice (e.g., via online WOM on web sites like Amazon that sell cultural products). The *Free Pull* model is based on the possibility for artists to enter into direct contact with their public, without either professional selection or centralized promotion (via blogs, websites like MySpace, FaceBook, etc.). Even if the Internet is itself a medium that operates a certain selection, this selection could be different to that of the mass media: from a static viewpoint, it could allow for greater diversity, and from a dynamic viewpoint, it could allow production to be recomposed according to the reactions of demand.

3.1.2 Emerging digital business models in the recorded music industry

The two components of our potential digital business models are the way value is captured (either by protection or by transfer), and the way it is created, via the meta-informational structure (see Table 1). By combining the two modes of value creation and the three new meta-informational structures, we obtain five emerging digital business models (see Table 2). The sixth possible emerging business model has been left out, because it seems highly unlikely that the protection of musical content could ever be compatible with the “Free Pull” system in which artists are generally not selected by professionals of the music industry.⁸

These five emerging digital business models represent a real change from the present dominant business model of the recorded music industry. Of course, we cannot exclude the persistence of the present business model, which is based on the Star System meta-informational structure and a

⁷ The transition from the traditional meta-informational structure (the "star system") to a new meta-informational structure can be explained by the fact that the latter is more efficient for a given (and potentially new) business model. For example, decentralized promotion can be viewed as more efficient if the record companies aim at selling music from the "long tail".

⁸ In such a scenario, that we could call “Amateurs”, artists would try to sell their recorded music outside any professional channels.

strategy of content protection. Another alternative would involve an incremental change, where the Star System remained as the meta-informational structure and value was captured via the transfer strategy. We will refer to these two business models as the “status quo” models.

Table 2: Five digital business models for the recorded music industry

	Method of value extraction	
<i>Evolution of the meta-informational structure</i>	Protection (P.v)	Transfer (p.V)
(Star System towards) Push	<i>Hit and Run</i>	<i>Jingle</i>
(Star System towards) Structured Pull	<i>Happy Few</i>	<i>NetLabel</i>
(Star System towards) Free Pull		<i>Consumartist</i>

The five emerging digital business models have in common the fact that consumers become increasingly involved in the production of music. The transition from value capture by protection to value capture by transfer leads to the free provision of content, and affords consumers more flexibility for using the music content, particularly in terms of interoperability, copies and exchange. In addition, the transition from Push to Structured Pull enables consumers to be producers of meta-information, while the transition to Free Pull gives them a certain degree of responsibility over the production of content.

3.2 Illustrative case studies

For each of the five digital business models presented in Table 2, we now provide a short case study of an existing music service that fits the model.

3.2.1 The “Hit and Run” business model

With this business model, the players maintain some features of the traditional business model. Value is still extracted from physical goods (like CDs) or from digital files. As highlighted by Hamaide and Wauthy (2004), the goal of the “hit and run” business model is to generate revenue from content, especially through massive promotion campaigns, before it becomes a fully public good due to piracy. The “hit and run” model prolongs the existing situation, without really taking into account the new opportunities offered by digitization.

MyMajorCompany (MMC) is an independent label founded in December 2007, whose business model is representative of the “hit and run” model. MMC advertises unsigned artists on its web site, and lets consumers decide which artists should record a CD. More precisely, MMC asks consumers to invest a small amount in the production of a candidate album. Once €70,000 have been collected, MMC signs up the artist and produces his or her album. As one of its founders, Michael Goldman, acknowledged, MMC's ambition is not to abandon the traditional system of promotion used by the majors, which he still considers to be the most effective. Once an artist's album has been produced, a classic marketing plan is developed, a video is sent to TV networks and the single is sent to radios to

get airplay. In addition, in April 2008, MMC signed a distribution deal with Warner Music, one of the four major companies in the music industry.

Hence, MMC has a dual business model. On the one hand, it relies on the Internet to ensure that consumers themselves not only select the artists to be produced (which reduces the risk of failure), but also finance production (which lowers the magnitude of any failure). On the other hand, it relies on traditional methods to promote and capture value. Promotion remains centralized and value is still extracted from physical or digital content. MyMajorCompany is therefore an emblematic example of the “hit and run” business model.

The success of the French artist Grégoire illustrates the dual nature of this business model. Grégoire appeared on mymajorcompany.com in early 2008, and was signed up two months later by MMC after convincing 347 consumers to bet an average of €200 on his success. Once the album was available, MMC started a €200,000 marketing campaign and Grégoire received attention from radios and TV programs, in particular when the album was released in September 2008. That same week, Grégoire was ranked 5th in the chart of the most broadcast artist on radio, and 8th on TV, according to Yacast. By the end of 2008, Grégoire had sold about 250,000 albums.

3.3.2 The “jingle” business model

In this business model, as in the previous one, promotion is centralized and there is no selection of artists by professionals. The players do not attempt to collect value through the sale of protected content. Rather, they consider that it is not desirable to fight against piracy, and that the negative effects of DRM systems on the development of the market are greater than the potential benefits of increased protection. Recorded music is therefore distributed almost free-of-charge and revenues are generated from other markets, the growth of which is boosted by the fall in the price of music.

Within the context of an economy of attention,⁹ music acquires most of its value from promotion in the mass media. Value can be extracted either from spin-offs, such as mobile phone ringtones, or from advertising. The key players are the mass media, which could even create their own labels, and the major record labels. In a business model where the consumption of recorded music is dictated by the mass media, the biggest players have a strong advantage, because they are the only ones to have access to effective promotion. They are also in a position to negotiate advantageous contracts with partners in the spin-off markets.

Star Academy is a TV reality show produced by Endemol, a world leader in entertainment programs. It was first broadcast in France in October 2001. This reality show is emblematic of the “jingle” business model, as it relies on centralized promotion (on TV) and on the lack of selection of artists by labels. For four months, 18 candidates voluntarily confined to a boarding school are taught to sing, dance, and so on. This process of producing a “star” is watched by TV viewers who vote, each week,

⁹ An economy of attention is one in which goods and services acquire value because the public’s attention has been drawn to them (Simon, 1971). They partly render this value by, in turn, drawing the public’s attention towards spin-off goods and services.

to eliminate the weakest candidate. *Star Academy* also relies on a form of value extraction mainly achieved through a shift towards the advertising market.

To generate revenue, a massive demand is created for ephemeral artists. The basic principle of this reality show is to find ordinary, unknown individuals with whom TV viewers can identify, and to transform them into “Stars” thanks to the massive advertising support that the TV program galvanizes. In 2003, revenue from TV ads amounted to €170 million, while the 100 hours of programs cost only €16 million. CD sales (the winner records a CD with Universal Music) reached the 1 million mark for albums and another million for singles, but accounted for only 5% of the total revenues generated by *Star Academy* that year. Moreover, more often than not, the wannabe artists achieve fame and sales far beyond what their intrinsic talent would normally have allowed. Most of the winners of *Star Academy*, especially in recent years, have not succeeded as professional artists.

3.2.3 The “happy few” business model

In this business model the meta-informational structure is the Structured Pull, and as in the “hit and run” business model, the value of music lies in its content. But in the present case the extraction of value is more inventive; it may still derive from the sale of protected files, but most often the producers and distributors resort to diverse commercial strategies: (i) *bundling or streaming offers*, in a way that amounts to the free provision of works that are not yet appreciated; (ii) *personal addressing*, using statistical systems of recommendation based on past consumption or on community-based recommendations; (iii) *temporal addressing* (DRM of expiration), for example by free supply of new works during a trial period.

Launched in 2003, the iTunes Music Store (iTMS) is the musical content distribution service created by Apple. Because of its content-based value extraction and the numerous decentralized promotion tools that it offers, iTMS can be considered emblematic of the “happy few” business model. The catalog of the iTunes Music Store contains more than 10 million songs (from the four major labels and thousands of independent labels, as well as from self-produced artists distributed by CD Baby, for example) and iTMS now has more than 50 million customers worldwide. In 2009, iTMS accounted for about 70% of world sales of digital music and iTunes was the biggest music retailer in the United States.

Being distributed through iTMS seems a good deal for the majors as well as for the largest independent labels, since Apple transfers 70% of the sales to them. Though this figure is lower for smaller independent labels, thousands of them are present on iTMS because the unlimited shelf space that the digital store provides allows them to be on an equal footing with majors as far as distribution and availability is concerned. Furthermore, iTunes offers decentralized promotion tools that can favor small labels unable to secure large advertising budgets and airplay. iTunes allows users to access hundreds of Web radios. Well-known artists are invited to publish playlists of their favorite songs. Users can create “iMixes” and share their music (at least 30 seconds of each song) and publish them on the Internet. They can also share their library on iTunes with their friends for playback. A new feature, My iTunes, enables users to embed little widgets on their blog, Myspace page or

website, with which they can share their top reviews, favorite artists, etc. from the iTunes Store with anyone who visits their site. These decentralized promotion tools could favor a sort of Long Tail on iTunes.

3.2.4 The “netlabel” business model

In the “netlabel” business model, the value of recorded music lies in the meta-information required for its consumption. Due to the effectiveness of decentralized promotion on the internet, discovery of new talent now lies at the heart of music production. Centralized promotion by the media is replaced by promotion by experts (not self-proclaimed, but recognized by other users), who achieve a better match between music production and demand.

Within the “netlabel” business model, various models can develop for bringing artists, independent labels, music-lovers and consumers together. However, the organization of music-oriented social networks of recommendation seems to be the most relevant model. Here, instead of or in addition to the sale of music files on the Internet, each artist is financed by shares in the receipts from concerts and by merchandizing. Hence, a large number of small, more or less independent labels are likely to coexist. Entry barriers decrease significantly, because of the reduction in the costs of promotion and physical distribution, and the search for new talent becomes crucial, due to increased supply.

Myspace is a social network founded in 2003, with an interactive, user-submitted network of friends, personal profiles, blogs, groups, photos, music, and videos. It is emblematic of the “netlabel” business model for three reasons: the sale of content is not seen as the main value extraction model (though it is still possible); decentralized promotion is at the heart of the social network; and selection does matter, since labels use Myspace to search for new bands or to assess the potential of new songs by bands who have already signed a contract with a record label.

Myspace's main source of revenue is advertising. In 2008 its revenues attained \$750 million. In the same year, about 120 million users and 5 million musicians had a page on Myspace. Usually, an artist's page offers songs for downloading or streaming, photos, videos, a biography, tour dates, as well as the list of the artists' friends. Myspace Music is a specific service on Myspace, which was created in 2008. It allows musicians to sell their music as mp3 files, but also to offer free downloads, in which case the artists receive a share of advertising revenues.

For small indie bands, Myspace is a springboard. It offers a free promotion tool, and the artists' popularity among Internet users can potentially convince a label to offer them a contract. As an example, Myspace is generally recognized as having been instrumental in the success of the Arctic Monkeys, who reached the top of the charts without any promotion through the mass media. Furthermore, the number of friends an artist has, or the number of “plays” on the audio player, can be used by radio playlist panels to measure the intensity of the buzz the artist creates. The popularity on Myspace is then used as an indicator as to whether the station should playlist them or not.

Likewise, negotiations with local concert promoters are much easier when the artist can boast of many “friends” on Myspace who live in the region.

3.2.5 The “consumartist” business model

In the “consumartist” business model, the frontiers between professionals, occasional producers and amateurs become very blurred; at the extreme, the consumer becomes the artist. Even more so than in other business models, the gains in welfare cannot be reduced simply to the profits and surpluses of the players, as the way music is produced and consumed is substantially transformed. The openness¹⁰ of works enables everyone to modify and partially re-use them. Not all consumers are enlightened amateurs, and not all enlightened amateurs are artists, of course, but they are all potential contributors.

Within the “consumartist” model, there is a corresponding co-evolution of supply and demand, to the extent that the concepts of consumption and production tend to get mixed up. This would lead, in the domain of musical creation, to the development of algorithms of consumption and the transformation of algorithms of production similar to the general trend of disintermediation that exists in other economic sectors. Just as in the domain of travel, where consumers can compose their trips by assembling raw services (trips, hotels, etc.) and so by-pass travel agencies, in the “consumartist” business model, consumers compose works by re-using raw productions. Value can thus be extracted from re-used works.

In such a business model, authorship, and more generally intellectual property, gradually lose their meaning. From a certain point of view, this evolution could inspire great enthusiasm, but it also runs the risk of provoking insolvable conflicts of interest and prohibitive transaction costs if the definition of intellectual property rights does not evolve significantly.

MXP4 is a new digital format for music, introduced by Musinaut, a start-up company created in 2006. This new format broadens the appeal and adaptability of music by allowing listeners to select from many versions (or “skins”) of a single song to fit their mood, moment or mindset. It also allows musicians and bands to surprise and engage the listener with many variations and unconventional versions of their musical scores, songs and albums. The software created by Musinaut is called the MXP4 Creator and costs \$400. The creator drags and drops segments of music into the software, picks the possible transition points, and then assigns a sequence and sets a probability that dictate which section gets played next. A song can also be set up so that the user selects which section plays. As an MXP4 file may contain dozens of tracks recording the various instruments and several possible interpretations of the music, the listener can choose to listen to a song in an acoustic or electronic version, change the tempo, or listen to it in another language. But the changes can also be subtler. The listener can also make only simple changes at the level of a specific part of the drums or piano, for instance. The MXP4 format can furthermore generate some randomness. For example, artists can

¹⁰ Here, by openness, we mean not only the absence of DRM, but also the possibility of re-using a work in a new, original creation (that is, openness in the sense of the “open source” software).

play on the accents they want to give to their song. This may be the same most of the time, but with a change and surprise for one listening out of ten, for example. This is called unpredictability, and it is what renders MXP4 recording close to the surprise the user might experience during a live performance. For instance, a song may last two minutes or ten! Thus, the process involved in MXP4 involves the two main players in the music value chain: the artist and the listener.

The MXP4 example fits the consumartist business model because it is characterized by a lack of selection (all enlightened amateurs are artists), reliance on decentralized promotion (works made by reworking existing music are posted on personal websites or social networks) and the fact that consumartists do not expect to extract value from the content they produce.

4. The adoption of digital business models in the music industry: incremental adjustments or big bang?

In the previous section we identified five potential digital business models for the music industry. The question is, how do record companies react to digitization with respect to their business model? One potential response at the industry level could be to adapt the existing business model incrementally. This would be the case in particular if uncertainty on what the most appropriate business model might be were low (i.e., the experimentation path is clear for all firms). We would then expect the record companies to change their business model in a similar and coordinated way. Alternatively, if no digital business model appears unambiguously dominant for the record companies, we can expect them to test the potential digital business models more or less randomly, which would be consistent with the hypothesis that a radical innovation leads to a big bang of business models.

To summarize, if the incremental adjustments hypothesis is valid, we expect to find a concentration of record companies on a “promising” digital business model. Otherwise, if the big bang hypothesis is valid, we should find a more or less uniform distribution of labels among all potential digital business models.

4.1 Method

To test the incremental adjustments and big bang hypothesis, we used a survey of 157 French record companies. In this survey we had asked the record companies for their opinion on the evolution of the music industry. Our method was to map each record company in our sample to a digital business model –either the status quo model or any of our five potential digital business models– by using their opinion on the evolution of the industry.¹¹

The data were collected from a survey of French record companies that we conducted between July and October 2006. With 5.6% of total recorded music sales in 2009, France is the 5th largest market in

¹¹ We drew up our five emerging business models after the survey, which is why we did not ask the labels directly for their opinions on these business models. However, for each business model we can determine whether there are labels whose opinions on the evolution of the music industry are consistent with that business model.

the world. It can be seen as representative of the other main markets (like the US, the UK or Germany), where the four major companies (Universal Music, Sony-BMG, Warner and EMI) also predominate, and independent labels account for a roughly equivalent share of music sales (i.e., 24.7% in France against 23.9% worldwide).¹²

A questionnaire was mailed to an extensive list of 871 labels, compiled from professional directories, both for-profit and not-for-profit.¹³ A week later all the labels were contacted by phone to help them complete the questionnaire.¹⁴ 187 labels finally agreed to answer the questionnaire, that is, 21.5% of the total number of labels in our list. However, we had to exclude 26 questionnaires, for two main reasons: i) some labels had just stopped their label activities; ii) some questionnaires were not answered correctly. We also excluded two labels that had been created in 2006 only. Thus, we ended up with a final sample of 151 record companies. This sample contained record companies of different sizes: one major record company, a few large independent labels, and several very small labels.¹⁵ The questionnaire was composed of three main sections; a first section with general questions (name of the label, year founded, number of employees, etc.), a second section with questions pertaining to their label activities, and a third section in which we asked the labels for their opinion on the crisis faced by the music industry. In what follows, we will use variables from the opinion section to analyze which emerging business model each label is closest to, and variables from the other two sections to identify the type of label that is representative of each business model.

Table 3 below provides some summary statistics for our sample of 151 record companies. The “average”¹⁶ record company is a young and very small firm (6 employees), located in Paris or its suburbs; it produces mainly pop rock music, and sold about 200,000 CD units in 2005.

Table 3: Some summary statistics

Variable	Mean	Standard deviation	Min	Max	Number of obs.
Year founded (age)	1995.4	10.4	1938	2005	151
Firm size: Sales of CDs in 2005 (in units)	197,053	1,468,395	1.15	16.6 million	134
Firm size: Number of employees	6.3	22.4	0	200	145
Pop rock	0.54	0.50	0	1	149
Location: Paris and suburbs	0.53	0.50	0	1	146

¹² Source: IFPI (International Federation of the Phonographic Industry) and French Observatory of Music (Cité de la Musique).

¹³ This list corresponds—more or less—to the total population of French record companies (only some very small labels might be missing). In other words, the surveyed population was not a sample but (more or less) the full population of French record companies.

¹⁴ Self-reported data have well-known limits and potential biases. For example, respondents might unwittingly provide a wrong answer, or may respond in a strategic way. However, in this section we use answers to opinion questions, and there is no alternative but to let respondents self-report their opinions.

¹⁵ Unfortunately, we cannot adjust our data to make them consistent with the full population. Neither the Ministry of Culture in France nor the national statistics agency (INSEE) have data on the characteristics of the full population of record companies (such as, age, location, or size).

¹⁶ Note that there is a lot of heterogeneity in our sample.

4.2 The labels' opinions on the evolution of the music industry

In the survey we asked the labels for their opinion on different aspects of the evolution of the music industry. We then used the answers to determine which emerging digital business model each label is closest to. To do so, we began by determining the method of value capture that matched each label best, and then determined which meta-informational structure the label believed would prevail in the future. By combining the method of value capture and the meta-informational structure, we were able to assign a digital business model to each label.

4.2.1 Value capture

We asked the labels for their opinion on six possible strategies for combatting the negative effects of music piracy. One strategy was to “*find new sources of revenue (concerts, ancillary products, mobile ringtones, etc.)*.” As this corresponds to our value transfer strategy, we consider that those labels which viewed this strategy as “suitable” or “totally suitable” for fighting against the effects of piracy match with the transfer strategy.¹⁷ We also asked the labels whether they saw “*taking legal action (against pirates)*” and “*reinforcing technical anti-copy systems (DRM)*” as “suitable” or “totally suitable.”¹⁸ We consider that labels which viewed at least one of these two strategies as “suitable” or “totally suitable” match with the protection strategy. The following table shows the number and percentage of labels which match with the two generic value extraction strategies.¹⁹

Table 4: Opinion of labels on value extraction strategies

Value extraction Strategy	Match (#)	No match (#)	Match (%)
Transfer	109	34	76.2%
Protection	57	91	38.5%

Number (#) and % of labels whose opinions match with the transfer and protection strategies

A majority of labels (109) have opinions which match with the transfer strategy, whereas fewer than 40% of the labels have opinions corresponding to the protection strategy. Note that labels can view both strategies as “suitable,” which explains why the total of the first column exceeds the total number of labels.

Table 5 compares the views of the labels on the transfer and protection strategies. It shows that 21 labels have opinions which are consistent with neither the transfer strategy nor the protection strategy. 13 labels are more in line with the protection strategy, while 67 are more in line with the

¹⁷ That is, we can consider that these labels view transfer strategies as suitable. Note, however, that they had not necessarily adopted such a strategy.

¹⁸ The three other strategies were to “*lower the price of recorded music,*” to “*improve the quality of the product (bonus tracks, packaging, etc.)*,” and to “*accelerate the development of legal digital platforms.*”

¹⁹ The percentage of matches is similar for both for-profit and not-for-profit record companies.

transfer strategy. Finally, 42 record companies have opinions which are consistent with both strategies.

Table 5: Transfer vs. protection

Protection	Transfer		Total
	No match	Match	
No match	21	67	88
Match	13	42	55
Total	34	109	143

Number of labels whose opinions match with the transfer and protection strategies

4.2.2 Meta-informational structure

We also asked the labels for their opinion on whether blogs, forums, and customer reviews on e-commerce websites (that is, decentralized channels of information) would supersede centralized promotion channels (such as radio) within the next few years. We consider that those which either “agree” or “strongly agree” that each of these three information channels will supersede centralized promotion channels also “agree” that decentralized promotion on the internet will supersede other forms of promotion. Table 6 below shows that there are 45 such labels in our sample (30%).

Table 6: Opinion of the labels on the evolution towards decentralized promotion

Decentralized promotion will supersede centralized promotion	Number	%
No (disagree)	106	70.2
Yes (agree)	45	29.8
Total	151	100.0

Number and percentage of labels which agree or disagree that decentralized promotion will supersede centralized promotion.

Finally, we asked the labels whether they believed that, over the next ten years, any new or little-known artists would be able to self-release their music by taking care of their own promotion and distribution on the internet. We consider that the labels which “agree” or “strongly agree” with this statement “believe” that the market is evolving towards a situation in which there will be “no selection” by professionals (such as record companies). As Table 7 shows, a majority of labels (66%) think that self-release by new artists will indeed become more frequent, and hence that selection of these new artists will become less severe.

Table 7: Opinion of the labels on the evolution towards no selection

There is a tendency towards no prior selection	Number	%
No (disagree)	48	34.3
Yes (agree)	92	65.7
Total	140	100.0

Number and percentage of labels which agree or disagree that in the future, prior selection of new artists will become less severe.

Using the analysis above, we can determine how many labels have opinions which are consistent with each of our four possible meta-informational structures (“Star System”, “Push”, “Structured Pull” and “Free Pull”). For instance, the “Push” model is characterized by centralized promotion and no prior selection. We therefore consider that labels are close to this model if they disagree that decentralized promotion is superseding centralized promotion while agreeing that selection is becoming less severe. We identify 62 such labels. With a similar method, we determine the number of labels for each meta-informational structure.

Table 8: Opinions of labels on the evolution of the meta-informational structure

	<i>Selection by professionals</i>	<i>No selection</i>
Centralized promotion	... <i>“Star System”</i>	... <i>“Push”</i>
	35 labels	62 labels
Decentralized promotion	... <i>“Structured Pull”</i>	... <i>“Free Pull”</i>
	13 labels	30 labels

We consider that a label “believes” that the market is evolving towards a given meta-informational structure if its opinions on the evolution of the industry are consistent with the mode of selection (selection by professionals or no selection) and the types of promotion (centralized or decentralized) that characterize this information structure.

Table 8 shows that the “Star System” meta-informational structure (which we identify as the baseline structure in the paper) and the “Push” information structure have the largest number of labels. Interestingly enough, the evolution towards the “Free Pull” information structure is consistent with the views of 30 labels – including 18 for-profit labels – on the evolution of the music industry.

4.2.3 Incremental changes in business models or big bang?

We can now map the record companies of our survey to the potential digital business models. For each label, we first determine whether it is in line with the protection and/or the transfer strategy; we then use its opinion on the evolution of promotion and prior selection to determine its “belief” on the evolution of the meta-informational structure. By combining these two beliefs on the value capture strategy and the evolution of the meta-informational structure, we can associate a business model to each label.²⁰ Table 9 gives the number of labels whose opinions correspond to each of our five emerging digital business models (“Hit and Run”, “Jingle”, “Happy Few”, “NetLabel”, and “Consumartist”).²¹ The table also presents the two “status quo” business models, corresponding to the “belief” that the meta-informational structure is not evolving.²² There is a “total status quo” if

²⁰ 18 labels cannot be associated with any of the business models. This is because these labels “agree” with neither of the two value extraction strategies (protection, transfer).

²¹ Note, however, that since we use the general *opinions* of labels, we cannot claim that the labels have *adopted* these business models nor that they view them as relevant to their own goals and resources. Besides, a higher number of labels associated with a given business model does not mean that this business model is more “relevant” to the music industry, as our sample is composed of a large proportion of very small labels and a small proportion of large labels.

²² The gray-shaded area in the table corresponds to a scenario which we excluded from our analysis, the “Amateur” scenario (see Footnote 7). Though 7 labels are associated with this scenario, we believe that it is not a relevant business model for the music industry. Moreover, 4 of these 7 labels are “not-for-profit.”

the method of value extraction does not change and a “partial status quo” if the method of value extraction changes.

Table 9: Number of labels “close” to each business model

Meta-informational structure	Method of value extraction	
	P.v (protection)	p.V (transfer)
Star system (status quo)	“Total status quo” 6 labels	“Partial status quo” 18 labels
Push	Hit and Run 6 labels	Jingle 49 labels
Structured Pull	Happy Few 1 label	NetLabel 12 labels
Free Pull		Consumartist 19 labels

We consider that a label is “close” to a given business model if its opinions on the value extraction and the evolution of the meta-informational structure are consistent with this business model.

Table 9 shows that most record companies (64%) tend to adopt a business model which corresponds to a radical change from the traditional business model of the industry. Among them, the vast majority (80 labels) believe in the emergence of new digital business models with a radical change in both the meta-informational structure and the method of value extraction (“Jingle”, “NetLabel” or “Consumartist”), whereas only 7 labels think that a radical change will concern only the meta-informational structure, with the end of the Star System. Only one label fits with the “Happy Few” business model; it is one of the largest independent labels in France, for which this business model appears to be precisely tailored.²³

The 24 labels that have opinions consistent with a “partial” or “total” status quo are on average larger in size than the whole population; for example, they sold 869,823 CDs on average in 2005 against 197,053 CDs on average for the full sample. The major record company in our sample belongs to this subset of labels. This might reflect the fact that this major is confident that it can maintain both an efficient selection of new artists and centralized promotion of its new releases, although the transfer strategy is unavoidable.²⁴

The distribution of the record companies across the potential digital business models gives more support to the big bang hypothesis than to the incremental adjustments hypothesis. First, every potential digital business model is associated with at least one record company. Second, the concentration of record labels on specific business models tends to be low. Most labels consider that value capture will require the implementation of a transfer strategy. However, those labels are

²³ We checked that our results remain robust when we compare early and late respondents.

²⁴ For instance, Major companies advocate the development of a “new subscription model based on the concept of ‘bundling’ music with other services or devices – be it an ISP subscription, a mobile phone or a portable player. While the music comes virtually ‘free’ to consumers under this model, record companies and artists get paid out of the sale of services or devices” (Ifpi, 2008).

somehow uniformly distributed across the four business models that rely on the transfer strategy. It therefore seems that digitization –as a radical innovation—has led to a big bang of business models. In this transitory period, the firms in the industry (the record companies) seem to experiment with all potential business models, more or less randomly, without any clear knowledge of what the sustainable digital business model will eventually be.

5. Conclusion

In this paper we analyzed the impact of a radical innovation on business models. Our research question was: after a radical innovation, do we observe incremental adjustments of the existing business model or a big bang of business models? We have studied this question through the lens of the recorded music industry, where we have found more support for the big bang hypothesis. Many new innovative business models have flourished in this industry, and the record companies seem to have positioned themselves almost uniformly across those models; in other words, there is no sign of concentration around any particular model.

The literature on business models argues that either firms can foresee the appropriate post-innovation business model (e.g., see Christensen, 1997; Amit and Zott, 2001), or at least the experimentation path that would lead to an effective model (Chesbrough, 2010; Demil and Lecoq, 2010; McGrath). Our research suggests that, when a radical innovation emerges, the business model experimentation path is not necessarily the same among firms, and might be highly uncertain. At the industry level, an implication of the big bang hypothesis is that it is likely to create a wave of creative destruction. This is because the winner of the race for the effective business model is highly unpredictable; it could be an incumbent or a small entrant. Similarly, given the dynamics of the business model selection, there might be no clear first-mover advantage, as second-movers could easily leap-frog first-movers if they discover the appropriate model.

From a managerial perspective, our result implies that firms should not only invest in experimentation with business models, but should also invest in order to find the “right” experimentation path. From this point of view, fruitful strategies might be for firms to carefully observe the competitors’ results with alternative business models, to implement some kind of coordination among competitors (to capitalize on the returns from experience with innovative business models), or else for big firms to set up independent subsidiaries to experiment different potential business models.

Our analysis has some potential limitations. First, can our finding for the recorded music industry be viewed as a general result? In this industry many firms are small, and therefore may not have the ability or the financial means to “invest in experimentation”, as McGrath (2010) has suggested. In an industry with larger firms, companies might be able to invest to foresee the “right” experimentation path, in which case the incremental adjustments would prevail. Second, as we have used a deductive method to identify digital business models for the music industry, we may have overlooked

important alternative business models. Third, to map the record companies on our list of business models, we have used their opinions on the evolution of the music industry, and not the actual adoption of innovative business models.

In the paper we have focused on the recorded music industry and shown that a radical innovation is likely to give rise to a big bang of potential business models. However, this might not be true for all radical innovations. Some radical innovations (e.g., microwave ovens) have led only to smooth and incremental adaptations of the existing business models. Nonetheless, we can think of radical innovations other than digitization, which have provoked big bangs of business models, such as the World Wide Web or the electric car.

Although the first electric car was manufactured as early as 1834, it was only in the 1990s that electricity started to be considered as a real alternative to fuel for car propulsion. For the last twenty years, many resources have been devoted to developing cheaper and more efficient batteries, but the definition of a relevant business model for the electric car is probably an even greater challenge.²⁵ Should the battery be sold with the car or rented? Should the car itself be sold or rented? Should consumers be charged for the electricity they consume, or through a monthly fee and free access to public charging stations? There are as yet no clear answers to these questions, and radically different business models are currently being tested (2012) by various firms. According to the CEO of General Electric Energy Industrial Solutions, "*the experimentation around electric vehicles is needed to figure out what the new 'operating system' will be for this technology and for the industry to scale up profitably.*"²⁶

Finally, in this study we have disregarded the time dimension. One interesting area for future research would therefore be to study the factors that influence the speed and duration of the business model selection, once a big bang has occurred. Our conjecture is that, when there is a co-evolution between business models and technology, the selection process takes more time than when technology stabilizes quickly.

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²⁵ See, for example, "Five business models to boost electric cars", http://news.cnet.com/8301-11128_3-20056521-54.html.

²⁶ Another example is the pharmaceutical industry, where the traditional "blockbuster" business model is no longer operational and firms are experimenting with new and radically different business models (see Chesbrough, 2010).

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