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A taxonomy of digital music services

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ABSTRACT (REQUIRED)

This paper investigates the current status of what we call Digital Music Services (DMS). Our research objective is gaining a better understanding of the properties of current DMS and investigating the relationship between service functionality and business model. In a longitudinal research project multiple researchers have contributed to making a taxonomy of current DMS. By recurrent induction and systematic comparison we derive four archetypes of DMS; Extended Radio Broadcasting (EBR), Personalized Internet Radio (PIR), Music Exchange Community (MEC) and Online Music retailers (OMR). A meta-analysis shows that the business model, service functionality and recommendation mechanism are the identifying characteristics of current DMS. We observe a tendency of DMS to start “drifting” between the archetypes and adopting properties from other archetypes. This is not without risk, as users have a rather fixed perspective of the relationship between the offered functionality and business model of the respective archetype

Keywords (Required)

Taxonomy, music, online, download, service functionality, business model.

1 INTRODUCTION

In our current society the Internet offers an extensive functionality for consumers and businesses. There are various applications available that for example enable chatting, finding information or playing online. Besides, today’s networked society also offers different possibilities to buy or listen to music and people increasingly like to listen their own personalized mix of music (Lam & Tan, 2001, Haupt, 2009). This implies music retailers are not longer their single source to obtain music and the Internet is playing an important role as supply channel (Premkumar, 2003). New forms of Internet based music services are emerging; from “traditional” streaming radio, via peer-to-peer networks to community based music recommender services (Leonhard, 2008).

The trend of developing digital music services can be seen in the last decade and the research community is following this trend with an also increase in attention (Celma, 2008). Nevertheless it is sometimes difficult to see the differences between these music services. Questions like : “what are the characteristics for an online music retailer, like iTunes?” or “how to identify a digital music service as a *regular* Internet radio station?”, are both relevant for the music industry as well as the research community (Landes and Lichtman 2003). This paper zooms in on that research topic and investigates the current status on what we call Digital Music Services (DMS). Premkumar (2003) in explained the consumption of music can be distinguished in two formats:

- The consumer either owns the specific product (either in tangible form, like CD or vinyl; or in a digital intangible file format like MP3 or AAC file).
- The consumer enjoys music trough a service like a “radio station”.

This definition in our opinion still holds, but the functionality has been extending ever since. Lately music itself is predicted to become a utility or a ubiquitous service rather than a product by various authors (Kusek and Leonhard, 2008). Current developments in ubiquitous computing and wireless devices enhance the possibilities of enjoying music, but in our opinion the core functionality of DMS still will remain: offering music to consumers. Continuing the line of reasoning of Premkumar (2003) and Lam & Tan (2001) we define a digital music service (DMS) as:

An Internet enabled service that principally offers music in an audible format to its consumers.

This can be in various formats like songs, albums and concert registrations, not necessarily accompanied from snippets or audio fragments. In various cases this service can go accompanied from extra functionalities like providing extra material like clips, interviews, background information, song texts or even music scores. But for our research objective we take the specific focus that a DMS its core functionality is the predominant *supply* of music in an audible format to its consumers.

This implies that current music recognition services like Shazam or midomi.com are not taken into account for this taxonomy. An extension of their service model in the future may result in an adjustment of the taxonomy, but we will show taxonomical research is dynamic process research.

Our research objective is to gain a better understanding on the properties of current DMS in service functionality and business model. To realize this objective we started a longitudinal research project 3 years ago in which different researchers have contributed to create a taxonomy of digital music services. In the next sections we present, the research approach (§2). The foundations behind the taxonomy (§3), and the taxonomy itself (§4) including an overall analysis of the current state of DMS (in §5). Our paper concludes with the results and discusses its contributions.

2 RESEARCH APPROACH

Taxonomies, in contrast to typologies, are derived empirically and are the result of inductive research (Sokal et al. 1963). Unlike typologies whereby the categories (types) are derived conceptually “a taxonomy begins empirically, rather than conceptually, with the goal of classifying cases according to their measured similarity on observed variables” (Bailey, 1994). This paper is embedded in a longitudinal research project of observation and sense making relating to DMS over the last three years. The research set-up is based upon the way of working described in Rowley & Slack (2007). It includes the detailed investigation of a number of DMS combined with a wider Internet based search for DMS applications. This is used as the basis for an analysis founded by the principles of both grounded theory and classification theory that leads to the development of the DMS taxonomy. We created our taxonomy by four different researchers in a recursive approach in which three main activities alternate:

1. Initial literature review. Based on our objective to characterize digital music services from the end user perspective we first conduct a literature study (Webster & Watson, 2002) in the scientific domain (that is conference papers, working papers, refereed book chapters and journal publications) for contributions in both the IS as well as the music domain. This initial investigation results in a small but relevant set of publications, that helps us to define characteristics of the DMS and the creation of taxonomies in related domains. In this search we focused around the following individual and combinations of keywords: download music, digital music, streaming content, internet radio, internet music, sharing music, web radio, net radio, streaming radio, e-radio, online streaming music radio, music download sites, MP3 music downloads, buy MP3 music online, digital music downloads.
2. Data collection towards the creation of a stable and structured set of DMS. Based on the results from our initial literature study and the researchers’ own “internet knowledge” we derived a first set of digital music services. We continued our investigation by researching individual blog entries, music related paper based consumer or professional journals, digital newspaper sites, renowned technology websites, television and radio broadcasting mediums, some artist websites in both the popular, classical and jazz domain, websites of music download services, and finally record companies both the large as well as European and US based independent labels.
3. Development of the categories for the taxonomy. Based on grounded theory (Strauss & Corbin, 1997) we used an inductive strategy for this part of the research. In the beginning individual cases are selected, compared to the existing literature and systematically developed into conceptual frameworks to synthesize data and identify patterns and relationships. At the end of each cycle it is checked that the taxonomy accommodates each case. The elements derived in this stage specify for example: service functionality of the DMS, background of the DMS supplier, applied business model and interaction with the user. The final categories are explained in the next section; Foundations behind the taxonomy.

We investigated DMS in the following countries: The Netherlands, Germany, UK, Sweden and the USA. Based on our first search results we created a list of 97 prospective candidates. This list was analyzed in different inductive rounds that include checking and cross checking against the evolving taxonomy characteristics of these candidates and also by inspection of developments in the respective DMS themselves, and interviews with users in the longitudinal research project. After four investigative rounds we kept a dataset of 51 digital music services. This dataset is not necessarily comprehensive, but our research approach and the recurrent findings suggest this set is representative for the current DMS. Developments in the music industry sometimes hampered our task as DMS disappeared, merged or altered their service model significantly. (e.g. the take over of Lala by Apple, Anywhere.fm merged with Imeem.com or Pandora.com limited its service to the USA).

3 FOUNDATIONS BEHIND THE TAXONOMY

Based on similar taxonomy research in the domain of ecommerce (Rowley & Slack, 2007), web based or mobile applications (Leem et al. 2004) and iterative clustering and deduction of the attributes from the several inspected DMS we derive 4 top level categories that determine our taxonomy. These 4 top-level attributes can be deduced back to earlier research contributions and include:

1. Business model. Specifies the value exchange that is deployed by the DMS (Derzsi & Gordijn, 2006; van der Raadt et al. 2005),
2. Service functionality. Specifies the properties of the delivered service and its product(s) (Leem et al. 2004; Francis & White, 2004),
3. DMS identity. Specifies the DMS suppliers background and position in the music industry, i.e. his location, background and/or partners (Rowley & Slack, 2007)
4. Technology and distribution Specifies the logistic principles and technological platforms for the service delivery (Burnes et al, 2004; Pachet, 2003),

As explained in the prior research method section, during the first stage of this research this list of determinants was gradually and systematically constructed and developed towards a sound set of parameters that was able to characterize the various DMS. This was an inductive process of case investigation and adjustments of the parameters. The dataset, and therefore the taxonomy is dynamic and under a process of gradual adaptation and development. These dynamics are inherently coupled to the meaning of taxonomical research as process research (Simpson, 1961). Table 1 underneath depicts the current stable set of classifying determinants for the DMS taxonomy.

Domain	Determinant	Attributes
<i>1. Business model</i>	Revenue model	Free, indirect (advertisements and/or linking), pay per use (purchase), pay for subscription (flat fee)
	Access to service	Open (No registration required), registration required, registration required with extra options
<i>2. Main Service Functionality</i>	Main Goal of user	Discover, listen, acquire, exchange, socialize
	Main Content delivered	Album, song, snippet, podcast, music video
	User input Mechanism	From push towards pull
<i>3. Service Supplier Identification</i>	Original background of the service supplier in the music industry	Retailer, record company, distributor, artist, new contender, Radio or television broadcaster, fan club, music magazine, music wholesaler, user's social network
	Location	Country specific, worldwide unspecified
<i>4. Technology and distribution</i>	Content Distribution model	Fileserver, Peer-to-peer, Streaming
	Technology Platform	Web based conform W3C standard, web based proprietary plug-in required (Java, Flash, Silverlight, Quicktime, Windows media), installation of specific application required, installation of specific application enables more functionality
	Technology device	PC, Console, MMP, Mobile phone
Table 1. Set of determinants specifying the digital music service taxonomy		

4 PRESENTATION AND ANALYSIS OF THE TAXONOMY

From our investigations we derive four DMS archetypes. We first will present and explain each type respectively. Secondly we will explain results and observations of the overall analysis over the entire population of DMS. Table 2 shows the four types and each unique pattern of identifying attributes.

I Extended Radio Broadcasting (EBR)

The first category continues the traditional radio broadcaster with what we call an extended service portfolio over traditional radio broadcasting. This type includes especially existing traditional radio stations and to a lower degree former radio pirates or enthusiast individuals. Either a free or advertized revenue model characterizes this service, depending on the background of the radio station itself (public or commercial). This service offers a palette of extended functionality over traditional radio with low to moderate user influence and user interaction via email, short messaging services, chat boxes, polls, playlist, etc. Therefore the supply mechanism is push towards the user. The value proposition of this type is to generate one type of generic content for a large audience.

II Personalized Internet Radio (PIR)

The second type continues the prior type, but is significantly different because of the user influence and the personalized value proposition by these services. The value proposition of this DMS focuses on generating specified music for each individual user. The substantial amount of these services originally is initiated with this value proposition and uses some kind of an automated recommendation mechanism. This service is mostly financed via the indirect advertising model, but also monthly subscription models are observed. The supply mechanism still is push towards the user, but the user interaction is significantly greater compared to EBR. The PIR service uses an intelligent recommendation engine for the personalized music supply based on attributes like musicological profiles, taste, mood, playlist characteristics or musical preferences. The user continuously is able to interact with this engine and react upon the proposed music.

III Music Exchanging Community (MEC)

The third type especially focuses on sharing music combined with a socializing character to virtually meet, discuss and chat with kindred spirits. In some occasions the investigated service is a variant of a generic P2P service, but especially focused around sharing music (E.g. Soulseek). In a lot of cases this type is used by the artists themselves or their record companies as new marketing/communication intermediary between fan and artist (E.g. MySpace). The majority of these services is a web based platform in which users share more than just their music files, but add own contributions like information tags on the artist, the users personal musical taste, similar artists and/or styles, etc. This type differs substantially from PIR. Firstly, as MEC types mostly focus on finding individual songs or music by specific artists, with no intelligent/automated recommendation engine that supplies the user with continuous personalized music. User interaction is necessary for each song played, whereas PIR services play music automatically using an engine based on individual profiles. Secondly this MEC type mediates between push and pull as in most cases the content is generated by both the end users as well as artists. The PIR type however merely offers legal content to the user supplied by record companies and/or individual artists.

IV Online Music Retailer (OMR)

The last type stems from a different original archetype and node in the music supply chain compared to the prior three types. This type is what we call the so-called online music retailers. They enhance or in some cases replace retailers and wholesalers in the traditional music supply chain. The value proposition for the end user is to obtain music in an official legal transaction with a high ease of use and a relevant set of music and artists available (Anderson, 2006). The transfer mechanism is pull as users deliberately order music from a catalogue. The functionalities for this service type focus on a comprehensive product portfolio that is also easy to browse, with secure and straightforward payment mechanisms. This is the only type that supplies music with a direct payment business model. Music can be previewed in audio snippets and recommendations are deployed based on customer related behavior.

Table 2 shows the taxonomy that features four archetypes of digital music service categories each with its distinguishing set of service characteristics.

		I Extended Radio Broadcasting (ERB)	II Personalized Internet Radio (PIR)	III Music Exchanging Community (MEC)	IV Online Music Retailers (OMR)
1	<i>Revenue model</i>	Mostly free, sometimes indirect	Indirect or subscription	Free or indirect	Pay per use or subscription
	<i>Access to service</i>	Open	Mostly signup required	Mostly signup required	Signup with credit card or comparable financial statements
2	<i>Main objective of user</i>	Listening and passive discovery	Listening and active discovery	Sharing & exchanging music and socializing	Buying music
	<i>Main Content delivered</i>	Broadcasts of regular programs	Songs and snippets	Songs, albums, snippets, information	Albums, songs, snippets and music videos
	<i>Music recommendation mechanism</i>	Disc jockey	Playlist sharing, music characteristics, users mood	Social network, kindred spirits	Artist -and music characteristics based
	<i>User input Mechanism</i>	Push towards user	User Controlled Push	Both Push & Pull	Pull by the user
3	<i>Original background in the music industry</i>	Regular Radio station	New contender	New contender	Media Retailer or new contender
	<i>Location</i>	Country or city specific	Country specific	Unspecified	Country specific
4	<i>Content Distribution model</i>	Streaming or download podcast	Streaming	Various (i.e. P2P Upload/streaming/download)	Download
	<i>Technology Platform</i>	Web-based often a plug in required	Web-based often a plug in required	Web-based or specific application	Web-based or specific application
<i>Exemplary services</i>		Radio1.nl; 3fm.nl 538.nl; 1live.de ffh.de ; mixmegapol.com p3star.se bbc.co.uk/radio1 1019rxp.com 1067litefm.com wdhafm.com radiotime.com	Last.fm; Meemix Spotify Musicoverly Pandora.com Finetune.com Launchcast Live365 music.aol.com/radioguide/bb	iLike; Deezer Garageband Myspace; Hyves Simplify music Imeem ; Esnips Soulseek; Ijigg mog.com playlist.com radioblogclub.com seeqpod.com	iTunes Amazon MP3 Walmart Music Download We7
Table 1. The digital music service taxonomy					

5 ANALYSIS OF CURRENT DIGITAL MUSIC SERVICES

From the analysis across the entire set of DMS it can be concluded that:

- The business model varies across the four DMS types. ERB is either free or indirect. Most OMR download services use a pay per ownership model or flat fee subscription model. PIR services mostly use an advertising model or a flat subscription model. The MCE communities are mostly free.
- The User interface input in most DMS is limited to search and recommendation functionalities.
- The majority of digital music services include an obligatory registration model. Nevertheless a small number of services offer a limited functionality for unregistered users.
- User input mechanism shows a kind of continuum between two extremes (Push \leftrightarrow Pull, well known from logistics and marketing). The ERB type is a classical push type where the music content is pushed towards the consumer. This mechanism is altered in the PIR type where the plain push is now user controlled via, automated attributes like; musical preferences, mood, taste or social playlist combinations. Gradually the transfer mechanism changes towards a Pull mechanism in which the consumer more and more sits in the driver’s seat and pulls the specific music content he/she intends to listen to.
- Technology platform currently is not a discriminating determinant in the taxonomy. The majority of all the investigated DMS are offered in various versions, available for various technology platforms. E.g. web-based applications for various browsers and Operating Systems (OS); mobile applications for various mobile OS; as well as stand-alone applications for various OS. Format is independent on the services main/core functionality. Download, streaming and peer-to-peer offer single file formats like mp4 or mp3 in various compression settings.

Our explorative research to DMS confirms developments described by (Haupt, 2009; Kusek & Leonard, 2008; Volda et al. 2006). The supply mechanism for music is arrived at a new level (Burnes et al., 2004) and this logically impacts how society buys, shares, listens and creates music. Recently the discussion focuses on how the music industry will embrace the “music is everywhere concept” (Leonard, 2008). We also see this trend happening in the long term, but also see difficulties in finding the business model that matches this service functionality, as “ubiquitous music” requires a PIR like supply mechanism, but especially this type currently has great competition from the OMR. Figure 1, underneath, shows these attributes for further analyze of this relationship.

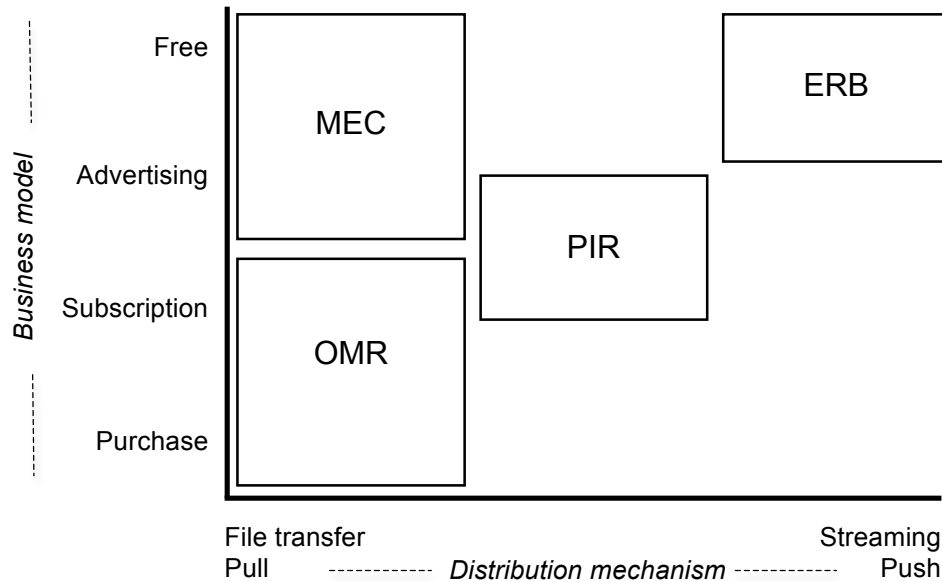


Figure 1. Business model versus distribution / recommendation model

Based on our findings we put the four types from our taxonomy in perspective of two orthogonal determinants: business model versus distribution mechanism (as main discriminating mechanism of service functionality). Our taxonomy shows there is currently a well-defined distinction in how the DMS relate their business model versus service functionality.

The OMR suppliers are currently well in business (IFPI, 2009), but the PIR suppliers offer a new service functionality that users seem to gradually adopt and adhere to (Nielsen, 2008). The PIR type also comes close to match the predicted service format of music instead of a product. This forces especially OMR suppliers to rethink their service model, but also to adjust their business model. PIR suppliers on the other hand have a good starting point to support this new way of listening and sharing music, but have currently great difficulties in becoming as profitable as the OMR suppliers.

The core question for future developments is how to develop an appropriate business model that exactly fits this intermediary type. Purchasing music, as a product, now still is the dominating paradigm and it is even rising compared to a decade ago. But ubiquitous music means dedicated listening to desired music over and over again. And this marks a grey area between possessing a piece of music or just buying the right to continuously listen. It is especially the latter service functionality that requires a different model than pay per use, but this should be a well-defined and acceptable business model (for both artists, record companies, distributors and consumers). The competitive advantage for the PIR type is currently the recommendation functionality -and algorithm knowledge. It is especially this element that these PIR types or the future ubiquitous music services should explicate extensively to their customers and include it in their business model.

6 CONCLUSIONS

Our longitudinal classification research into DMS has resulted in a taxonomy including four archetypes of DMS. It shows that the majority of current DMS adopt one focused service value towards its consumers. This focus stems from the originating business model of the music service. The majority of our investigated DMS are location based. This especially holds for the ERB type, but also PIR deploy their services location specific. In some cases the service level even differs per country. A number of DMS, individually classified as different types in our taxonomy, have initiated partnerships. In such partnerships the service model towards the customer of the service is extended towards a palette of services (e.g. Last.fm that offers direct linking towards Amazon and iTunes, and also includes allmusicguide.com as encyclopedia).

In addition to the prior described partnerships we also see that in their quest to innovate and create market share DMS have been extending their service portfolio towards “other” categories. We observe some typical examples of these overlapping initiatives: PIR type services that start to include socializing services or OMR services that include personalized recommendation engines (Last.FM including a beginning social networking functionality, Genius functionality into iTunes).

The PIR type currently has great difficulties to survive or in other words in selecting “the right business model”. This stands in great contrast to commercial and private broadcasters that use ERB as an extended channel. The ERB type of DMS can be deployed with a limited extra budget, with a continuous advertising income in the majority of the investigated cases. Compared to the PIR type the EBR type adopters already have experienced in the music domain and have enough resources available for the necessary royalties. The PIR type DMS on the other hand repeatedly adjust their business model. Several PIR type DMS in the last two years continuously have been financially challenged (Last.FM), go out of business or maintain in a kind of cliffhanging surge for survival (Pandora). On the other hand several PIR suppliers seem to have overcome their critical period (Spotify, Last.FM and Pandora) and they can become a competitor versus the OMR types. We expect a deliberate and focused business model will separate the winners from the unsuccessful DMS suppliers.

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