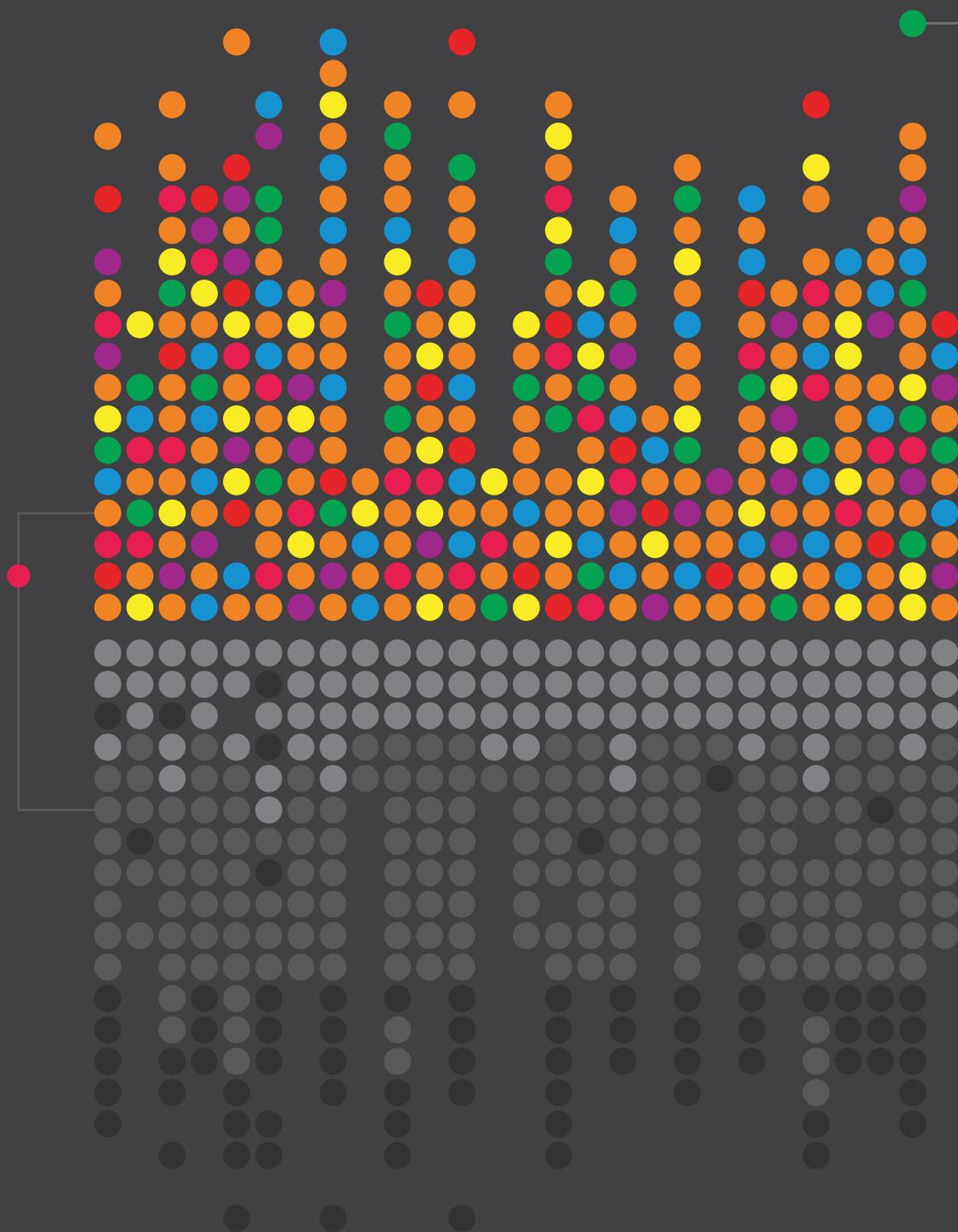


Croatia Digital Music Report

2013





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ABOUT HDU

Croatian Phonographic Association (HDU) is a voluntary, non-partisan, non-profit, non-governmental organization which, in accordance with the law, promotes the interests of record labels - phonogram producers, as well as the interests of the Croatian record industry in general.

Croatian Phonographic Association was established on 14 June 1995 and was originally founded as an association of individuals dealing with discography and related activities, since at that time this was the only form of association possible under the Law on Associations.

Work and affirmation of HDU has manifested mainly in active participation in the implementation of Porin Awards, as well as in various other actions. The HDU is also active with its department for combating piracy that de-lists links from Google, removes pirated content from Web sites and participates in regional initiatives to close the portals that illegally distribute pirated content.

Thanks to the successful work, HDU has become an official member of the International Federation of the Phonographic Industry (IFPI) at the beginning of 2007.

Foreword

Želimir Babogredac, President HDU



The digital era is omnipresent. The work related to the digitization of music experienced a significant upswing, and offer of legal music streaming services and services worldwide increases daily.

Although Croatia is lagging behind in those global trends, I believe in a significant change in this area.

As a first step in this process we should highlight the arrival of the music streaming service Deezer on the Croatian market. That way music lovers have fast, easy and legal access to their favorite music while on the other hand, the authors, artists and record labels are rewarded for their work. Moreover, in case of a successful sale there is the possibility of entering the most eminent charts in other countries.

The advantage of digitization is reflected in availability of music anywhere in the world, 24 hours a day seven days a week. From the record label's point of view, new technologies allow quick promotion of records, as well as quick reaction of listeners to a good song. According to research, the number of music service subscribers increased by 65% last year, and according to IFPI estimates this sums up to 13.4 million subscribers worldwide.

As opposed to positive trends and a serious obstacle to sustainable development, online piracy represents a critical point of record label digital strategies development. Globally, one in four regular Internet users are accessing illegal services, while in Croatia that number is much higher. Therefore I believe that special attention should be paid to education and increasing of public awareness about the importance of respecting intellectual property rights. Croatian Phonographic Association recognized it and in collaboration with colleagues from IFPI carried out a number of activities to combat illegal use of recordings.

In conclusion, let me point out that there great challenges lie ahead of the recording industry in achieving good results in this area. Given the openness of the digital market and enthusiasm of discographers I have no doubt that we will achieve significant success.

Foreword

Branko Komljenović, Vice President HDU



Why the first edition of Digital report only now when it is well known that the global digital revolution is in full swing in most world discography markets?

Well a bit because Croatia is rather lagging behind the developed world in digital musical development due to the fact that most world-renowned digital services are not yet available to us.

Maybe one really should not be too sentimental at the beginning of the introduction and get carried away with the idea that Croatia will just join the most advanced digital markets. But after the last few months, I think that we can look at the potential announced arrival of some the world's largest services with moderate optimism as the largest digital download store iTunes could be coming to Croatia or alongside existing Deezer and the most widely used streaming service Spotify may also be making its move. What has the last year shown that we can look to the future with moderate optimism? It showed us that with a superb streaming service that offers, alongside the entire Croatian repertoire, as many as 30 million foreign songs and excellent campaign by Hrvatski Telekom which constantly promotes the service, our users react and subscribe to the service.

We are certainly pleased with Deezer as a premium on demand streaming service and with increased monetization of by far the most popular streaming service, ubiquitous YouTube, which is the first and most important promotional tool for the majority of Croatian performers. But apart from being an essential promotional platform for performers, it is also the most visited website for viewing videos and streaming songs and mainly because of this record labels and through them also the performers can earn some money.

So, digitization is inevitable and it is happening today. New digital models that are being developed have apparently drawn the attention of millions of users worldwide and are a unique example of how digital consumption of music can literally save ailing industries. Last year was the best since 1998 for the entire international music industry which is probably a staggering fact for many who have seen discography as a drowning man without hope.

Next steps

Fabian Stilke, Marketing Director, Universal Music d.o.o.



Digital music services continue to see steadily growing revenues and are developing globally.

Download sales and revenues generated from subscription models like audio- and video streaming services see double digit increases across the globe. An impressive number of countries have seen digital revenues surpassing physical revenues. More over the digital growth absorbing the physical sales decline in some countries, especially in the Nordics, where the music industry grew last year, thanks to digital services.

The Western Balkan region will also see a massive growth in digital revenues by the end of 2013, with a huge share being generated through streaming services like Deezer. The latter has reached thousands of new customers through their bundle deals with mobile operators in Croatia and Serbia. Whereas the digital growth in the region and therefore Croatia is truly welcome and important for the industry, it is vital to understand that the markets are far from a sustainable development of a digital landscape, not only but especially in music. It is of major importance to ensure a

diversity of services to open their business and doors to the customers in the region. If we do not manage to build a healthy, growing and sustainable digital music landscape in which labels could again break new artists and young talents can pay their living being an artist, we will not manage to guide the business back to growth.

It is our responsibility as an industry to urgently implement the framework needed to support legal services and new business models and thus pave the way for a sustainable digital growth and ensure being an artist becomes a desirable career aspiration again. We are confident that we will be able as an industry to set the course for the future business in Western Balkans and as Universal Music we are prepared to contribute and spearhead in this development.

• Understanding online piracy

Development of the digital market brings its good and not so good sides. One reality that the music industry faces in its daily struggles is online piracy, which is often incomprehensible and too easily available to the average user. According to research by the Office for Harmonization in the Internal Market (OHIM) as many as 96% of Europeans believe that intellectual property is important because it supports innovation and creativity, rewarding inventors, authors and artists for their work, while 42% of respondents believe that the downloading of pirated material from the Internet is justified for personal use¹. This goes to show that the average European citizen does not understand the link between helping creators of copyrighted works and theft thereof.

Last research in three key regions - North America, Europe and Asia-Pacific has shown that the exchange of illegally downloaded content increased by as much as 160% from 2010 to 2012.⁴

Well there are personal and economic motives. Personal motives can be very different. Some pirates do it because of resentment towards entertainment and software industry giants. Others “protect” the freedom of speech by enabling free use of intellectual property. Some are pirates because they want to belong to a community where they can earn respect of others by uploading pirated content.

*Pirate derives from Latin word *pirata*, from Greek *peiratēs*, from *peirein* ‘to attempt, attack’.²*

Interestingly enough pirates actually create quite a lot of their own intellectual property. Web sites, “cracking” programs, file converting methods, their own “pirate” nicknames and avatars, etc. Most of the torrent files include the pirate’s “author signature”. Unsurprisingly they share the emotional connection with their intellectual property as most recent blog posts from recently shut down IsoHunt site’s owner Gary Fung⁵ confirm. He uses words as “It’s sad to see my baby go”, „to all unsung heroes“, etc. Bear in mind that Gary Fung is the guy who was actively enabling distribution of stolen intellectual property from others and now he is emotional because his was taken away. This just goes to show that we all care about our intellectual property and we don’t like when someone else comes and takes it away from us.

Pirates in the old days would need a ship with a crew, serious weapons and a buck load of courage while today all they need is an internet connection, a computer and a buck load of coffee. Broadband internet access has moved piracy from streets to the internet with the easiest and fastest data sharing to date. Unimaginable quantities of data are being transferred over the internet every minute (according to Intel³ 639.800 GB of global IP data is transferred, 204 million Emails are sent and approximately 30 hours of video is uploaded to YouTube).

Pirates would once sail away with a ship, some gold and supplies. But what do they get today? Pirated content is available online for free. Where is the motivation?

1 - http://oami.europa.eu/ows/rw/pages/OBS/perception_awareness_behavior.en.do

2 - <http://www.oxforddictionaries.com/definition/english/pirate?q=pirate>

3 - <http://www.intel.com/content/www/us/en/communications/internet-minute-infographic.html>

4 - <http://www.netnames.com/digital-piracy-sizing-piracy-universe>

5 - <http://garyfung.ca/>

All the personal motives cannot dismiss a simple fact – piracy is stealing. The whole point of intellectual property system is that the creators can get remunerated for their creative output and thus be motivated to continue creating. Piracy disturbs this delicate balance.

The most popular torrent site would earn at least 48.000\$ per month.⁷

Even some pirates are paying in order to maintain a library of “verified” pirated content.⁶

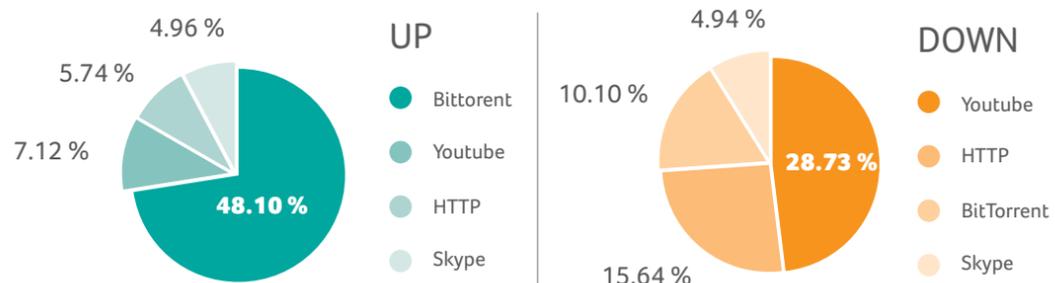
Pirates steal intellectual property and make money on the account of its creators. Illegal activity presents an advantage over competition. Being able to own, replicate, distribute and make content available to public without a valid license and obligation to pay royalties is a big deal. Every other content provider has to pay royalties for license agreements to the copyright holder. Pirates don't. Since you don't pay royalties you can offer stolen content for free. No subscription necessary, no processing payments, customer service, marketing costs. No inscription, safety protocols, limits to your service.

The money is made by selling advertising space on your web site or trying to get donations from your faithful members. Selling ad space is a popularity contest – popular sites make more money. Sites that offered pirated content had nearly 14 million views in January 2013. Though torrent sites have some fixed costs (servers, bandwidth, etc.), there is still a fair amount of money for all that participate in this organized criminal activity.

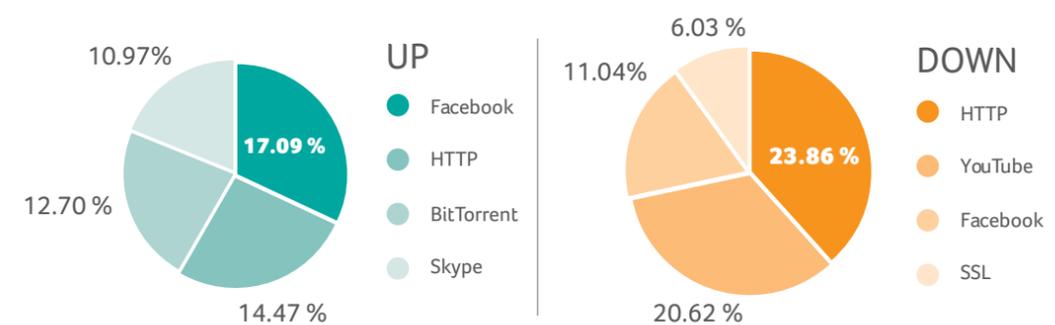
Next time you visit a torrent site, keep in mind that you are not only stealing from creators but also helping pirates to make money. Although piracy is popular (320 million users downloaded illegal content in January 2013) that doesn't make it legal or legitimate.

Percentage of application Internet traffic use in Europe, 2013¹⁰

Fixed Internet access



Mobile Internet access



6 - <http://www.torlock.com/>

7 - Considering a revenue of only 0.001 \$ per visitor (revenues can be much higher, depending on negotiated contract terms)

8 - <http://www.netnames.com/digital-piracy-sizing-piracy-universe>

9 - <http://www.netnames.com/digital-piracy-sizing-piracy-universe>

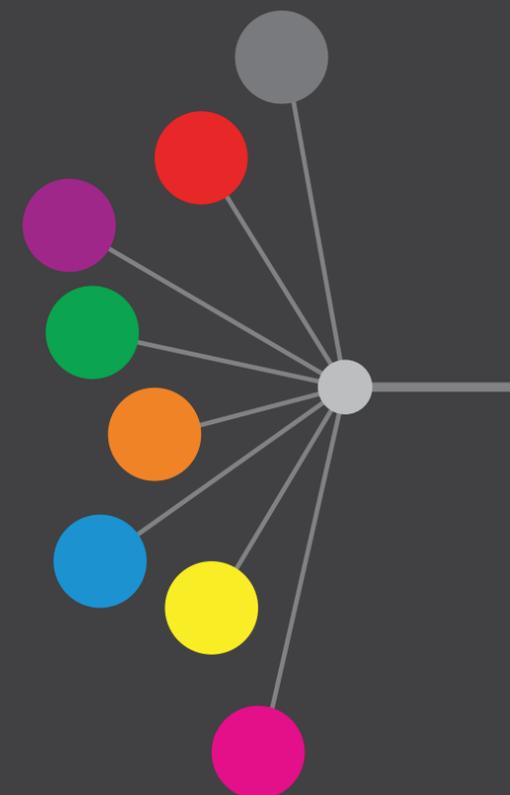
10 - www.sandvine.com, Global Internet PhenomenaReport: 2H 2013

Record labels in the digital world

It is indisputable that the record companies have adapted to market requirements of the digital era. In a market without borders, especially in wake of recent Croatian accession to the European family, the rules of the game are changing. The music industry was risky and competitive business for notorious reasons even before digital world. Clearly, it is now easier to create so-called “instant” stars, but if we are talking about musicians with a large number of hits, the story returns to its roots. Good music is always the one that sooner or later open all doors and attracts a large number of fans and thus consumers. Business risk remained the same. Despite the remarkable multi-year drop in the number of sales of audio and video albums, record labels costs remain the same. Specifically, every song still requires identical recording time in the studio or production. Massive amounts of time and financial resources are continually invested in quality of PR and marketing campaigns.

*The role of record labels in the digital world continues to be **indispensable**. There is no proven case that a musical group can work completely independently using only digital channels.*

At one point the artist must move into the “real world” and present himself at concerts, festivals, on TV, radio, with music releases. On the other hand, digital distribution allows everyone to publish their music tracks, of which only a small number is truly representative. In sporting terms, the Internet has given us the ability to watch all the sports games, but not all matches belong in the first league. Record label gives certain credibility to the performer, making him noticeable in the vast sea of content – placing him in the “first league”. This credibility is especially important to new artists, because most digital services do not want to cooperate with the performers themselves, but directly with the record labels that represents them and thus shows a certain degree of seriousness.





Croatia Records as the leading and largest record company in the region early recognized the importance of digital technology as a platform for the distribution and promotion of music content. It thus formed digital division that deals with the preparation and administration of audio, video, text and photo materials as well as collaborating with the world's leading digital services for music content distribution. In short the strategy of Croatia Records is the creation and promotion of orderly, creative and modern system of distribution and promotion in direct collaboration with authors and performers on the one hand and with the world's leading platforms for digital distribution on the other.

Croatia Records has developed its own CMS (content management system) based on cloud technology which communicates directly with the major platforms such as iTunes, Amazon, YouTube and Deezer thus putting it in a unique position in the territory of the former Yugoslavia. Direct cooperation gives them a huge advantage in speedy response, updating content and reporting.



Good practice example in digital marketing

Cooperation with **Marko Perković Thompson** on his latest album, Ora et labora resulted in a uniform record in digital and "analog" sales. The album has achieved unprecedented sales on iTunes, entered the top 10 list of the world's sales. Digital technologies are fast and accurate and knowing how to follow this fast pace is essential in coordinating promotional and sales platforms: Facebook, Twitter, Soundcloud, websites, iTunes, YouTube, etc.



Another example is the Split hip hop trio **Dječaci** with the album Istina, where a cooperation of new and old technologies took place as well. Boys are great in handling new technologies; they are creative and fresh, but on the other hand overlooked by the mainstream media, TV and radio stations at the time of publication of their album. Then a record manager stepped in to the role of promoter with the help of new and old technologies. In a short time the boys broke out with their originality and freshness, and became one of the most recognizable young performers.

Menart acted as a visionary when it founded the digital department before anyone could possibly guess which direction the changes in the discography will take. A blurred vision at first soon turned into a commercial business. Thanks to the results achieved Menart got the trust and catalogs of other record companies including Aquarius Records, Cantus, Campus, Best Music, Orpheus and many others. They successfully sell and distribute music content in Croatia and the rest of the world, and their work opens the door to innovation, promotion of their performers and performers of partner on websites, mobile services, and social networks.

Menart achieved cooperation with one of the most important digital distributors worldwide The Orchard thereby standing shoulder to shoulder to the biggest independent publishers. This proved to be the right path because cooperation with renowned distributor greatly speeds up the work with big services. Small publishers who work independently usually have a longer path to reach a specific target. In conjunction with the distributor they were able to offer the single on iTunes in a day or two, which is practically impossible under the rules, because the process takes four to six weeks.

Good practice example in digital marketing

Dubioza kolektiv enabled a free download of their new album from the band's page. Although this action was known to the public the album has achieved great sales results (as has the previous one). In most cases their fans have downloaded the free album and also supported the band with buying their CD.

Music of Croatia on Amazon. In 2009 Amazon has initiated "World Music" project with the purpose of promoting the genre. Menart was called upon to present Croatia. All the songs were put on Amazon for free at first but the project was so successful that they've decided to put this compilation up for sale and it reached excellent results.



Dancing Bear has realized the importance of the presence on the Internet in time and established one of the first virtual CD shops in Croatia as early as 1996. Since then it monitors developments and trends and successfully adapts to rapid changes that technology brings and as a result their songs are available to a worldwide audience through all relevant music services. Dancing Bear's digital strategy is based on the positive experiences of the global music and technology leaders and on the new and ever growing opportunities. Looking forward to the fact that technology enables faster, better and more efficient penetration in markets where they participated only symbolically, and their aim is to provide a more competitive content to the widest audience possible.

Dancing Bear greeted the digital era ready and with understanding and accepted new models of content distribution towards end users. In this they were helped by colleagues who participated in the pioneering efforts of establishing the kind of service as we know today and their experience of cooperation with digital partners has remained very positive. Each day they witness with excitement new attempts to return music as entertainment, hobby or passion to its rightful place.



Good practice example in digital marketing

Our global bestsellers are **The Bambi Molesters**. We can say that their act parallel in the real and virtual world. The originality of their vision of surf music impressed many around the world and they achieved very significant collaborations with renowned world musicians. Their music is known in Brazil, where the song Malagueña opened the popular soap opera BangBang!, recently their song Chaotica was included in the beginning of the 12. Episode of the final season of mega hit series Breaking Bad. Their album As The Dark Wave Swells has risen to 12 place of sales in the category of Rock 'n' Roll music on Amazon in summer 2010. With the start of commercial digital distribution of songs The Bambi Molesters convincingly became one of the most listened bands from this area. We will continue the story and hopefully achieve even better results.

Aquarius Records label was founded in Zagreb in 1995. It has grown in the Club Aquarius as a result of a group of enthusiasts and music lovers, who have encouraged a whole new music scene in Croatia with numerous concerts and festivals, and quickly established the label as one of the leading publishing houses in the Croatian music and recording activities.

...●●● **cedeterija.com** The internet music shop Cedeterija was created under the auspices of Aquarius Records. It is primarily focused on sales of physical and digital music titles but has a respectable number of film, merchandise products and related accessories in its additional offer. They offer approximately 700,000 different titles and products, and that number is increasing daily.

Cedeterija was established in 2005 as one of the first internet shops in Croatia with a large number of titles in its offer and was reincarnated in 2013 through improved and redesigned system and a new global domain cedeterija.com. By upgrading to a new system they launched Cedeterija Internet radio that broadcasts 24 hours a day, seven days a week and is a great refreshment of the local radio scene. Their motto is: music, music and only music.

They plan to expand regionally in the near future and take advantage of the potential that it brings with it, while at the same time of course working hard primarily for Croatian and regional artists to be heard and enable worldwide purchases of their titles. As digital sales are growing year after year, they hope that the coming year will follow the same trend, but as they say, for now the CD is still the invincible ruler of music formats.

Good practice example in digital marketing

Aquarius Records took their visual reach on the Internet very seriously and **videos of their whole catalog** can be found on the official YouTube channel. In mid-November in 2013 we are proud to have the more than 1.000 songs, 79.473 followers and 94 million hits on all our tracks.





Dallas Records, one of the leading record labels in the region, was established in 1987. Alongside Gibbonni our rich catalog contains eminent performers such as Severina, Plavi orkestar, Jinx, Neno Belan, TBF, Danijela Martinović, Doris Dragović, ENI, Let 3, Tereza Kesovija and many others.



Dallas records launched a web store called Dallas Music Shop www.dallasmusicshop.com at the beginning of 2011 and was one of the first to offer songs in digital format, not only from local but also foreign catalogs. In addition, this site offers the option of purchasing albums in digital and physical form from their and other Croatian and foreign record companies, books, concert tickets for Croatia and merchandise (T-shirts, hats, badges, etc.) all of which accounts for more than hundreds of thousands of items. In addition to shopping their site is updated daily with the latest current events from local and international musical scene, concert announcements, links to recent videos, etc.

The Dallas records database contains more than 100,000 individual songs in digital format, with more than 8,000 digitalized albums. Their priorities are streaming services such as Deezer, iTunes and YouTube (video streaming). Their experiences are very positive and their goal is to eventually digitalize the entire catalog and offer it to as many online services as possible.



Good practice example in digital marketing

On the occasion of the Mars festival in 2011 where 30 Seconds to Mars led by frontman Jared Leto performed, we organized a winning game where you could win a meet & greet with the band. In just a few days during the campaign the number of fans of our official Facebook page increased by more than ten thousand. The campaign has exceeded our expectations and achieved an excellent result and even more than that considering that it wasn't advertised elsewhere.



Due to daily changes in marketing communications, exponential expansion of the Internet, as well as opening unlimited possibilities of communicating with consumers Hit Records has adapted to a new role in the digital world as well. Monitoring of market developments and ways of communication of music consumers and the current international trends, the primary channel of communication with their users became Facebook, YouTube, iTunes and recently Deezer. At the same time their largest markets still remain Croatia and countries of the region (Bosnia and Herzegovina, Slovenia, Macedonia, Serbia and Montenegro) and their goal is to position themselves among the leading publishing houses in the region using modern technology in the digital world.

Creativity has always been prized trait and coexistence in the digital world has brought some new rules to the "game without borders". While some argue that the Internet consumes creativity, Hit Records believes that the digital world encourages creativity. Full and unrestricted access of young, unestablished artists and authors in the world music flows allows new combinations and musical expressions. Still, they say, it's hard to avoid the impression that many young musicians, as well as their older counterparts are increasingly resorting to clichéd forms devoid of creativity that bring immediate and short-lived celebrity status and earnings.

Good practice example in digital marketing

Hit Records is extremely pleased with the cooperation with its performers on social networks. We are pleased to say that Hit Records **invests mainly in digital marketing** on interactive media. At the same time we aren't neglecting the "traditional" advertising channels such as radio, television and print. Given that digital advertising provides more features in comparison to those of the traditional media - from better targeting of the target groups through the intensity of the campaign, we believe that in the future the odds will surely change in favor of digital marketing.



Scardona has always managed to anticipate future developments in the music market and had prepared in time for the new changes brought about by the digital era. Two years ago they've launched Scardona World Music in the U.S., with the idea of spreading Croatian indigenous music to the world market which resulted in excellent cooperation with American producers and musicians thus accomplishing the sale of its titles over important digital content aggregator The Orchard. They've organized two successful tours of their leading performers that have triggered new interest in Croatian indigenous music on even the most demanding U.S. market.

Alongside Scardona web shop, their albums have been previously available on the popular iTunes and Amazon.com. They also launched a successful free Internet radio www.soundofdalmatia.com. On it you can exclusively listen to albums with authentic Dalmatian music through the application that allows you to see the title of the song and the album enabling listeners to purchase songs or albums through the service. In Scardona believe that the digital era finally came to life in our market as well and that we will soon have a completely new situation in the music industry which will connect publishing, concert activity and digital sales into a whole.



Good practice example in digital marketing

Concert activity of our performers, especially of groups like **Intrade**, which occur around the world where our media doesn't have an important impact, we turned towards digital marketing. This was proved to be very crucial on successful tours in the U.S. and Australia. They we made TV commercials that were put on YouTube and were available to everyone in the simplest of ways.

Deezer is a music streaming service established in 2006 in France under the name Blogmusik and is present in Croatia since March 2012. This is the first such service in our country which has, in collaboration with the leading provider of telecommunications services Hrvatski Telekom, managed to secure its position in the country. Hrvatski Telekom provided Deezer with an opportunity to provide its music services to many new customers through its new distribution channels. It is this successful cooperation, and the cooperation with record companies and associations such as the Croatian Phonographic Association, that was the key to successful Deezer strategy and communication on the market.

Deezer wants to give the music lovers a captivating experience that will return the value of music and the impressive figures of 12 million monthly active users across more than 180 countries speak of the popularity of the service. With the help of international partnership with Facebook and various strategic partnerships with telecoms, Deezer is committed to bringing music to new audiences around the world.

Current Deezer users prefer to listen to local performers such as Severina, Dubioza Kolektiv, Jelena Rozga, Oliver Dragojević and Hladno pivo, while the most popular foreign performers are currently Avicii, Eminem, Lady Gaga, Lorde and Katy Perry.

Deezer top 10, November 2013.

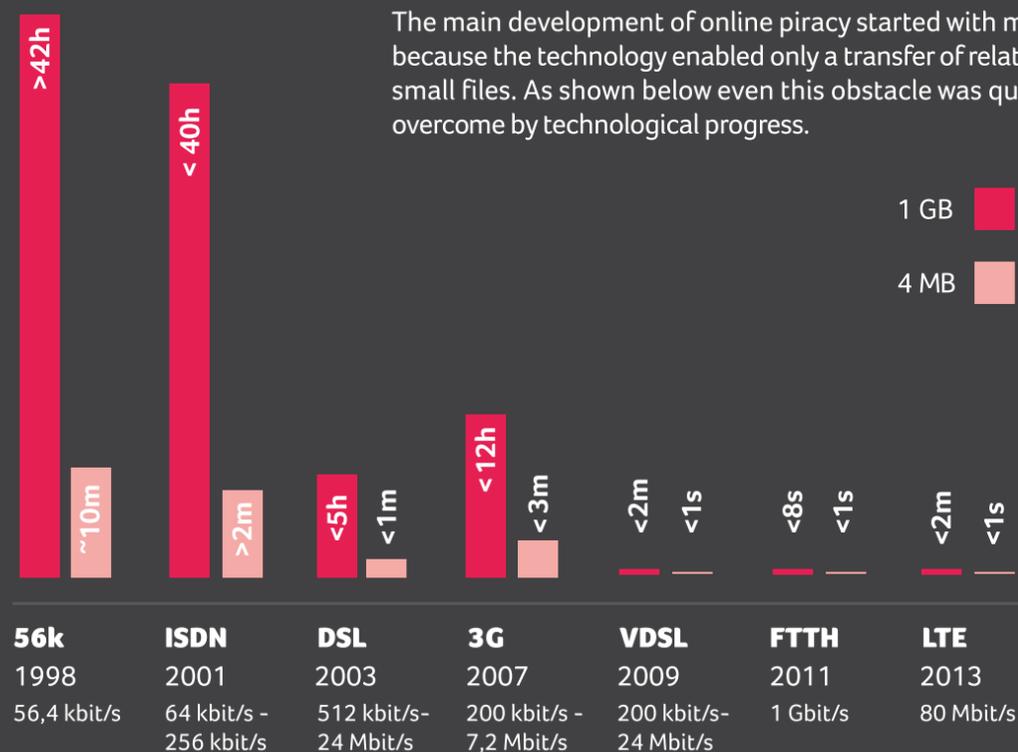
- Avicii - Wake Me Up **1**
- Naughty Boy - La La La **2**
- Robin Thicke - Blurred Lines **3**
- Daft Punk - Get Lucky **4**
- Severina - Tarapana **5**
- Pink - Just Give Me a Reason **6**
- Justin Timberlake - Mirrors **7**
- Calvin Harris - I Need Your Love **8**
- Macklemore & Ryan Lewis - Can't Hold Us **9**
- OneRepublic - Counting Stars **10**

Deezer is available in Croatia as a standalone service through individual tariff packages and offers from Hrvatski Telekom. Deezer offers its users unlimited access to a database with over 30 million songs that can be accessed through the internet connection and even when they are not online or 3G/4G network via any computer, tablet or smartphone. Users can make their own playlists, share them with friends, listen to specific radio stations and get a sneak preview of some songs or albums even before their official release date. Music lovers can enjoy in music anytime and anywhere. Deezer's mantra is music discovery and they help their users rediscover great new performers through new functions like 'Hear this' and 'Explore'.

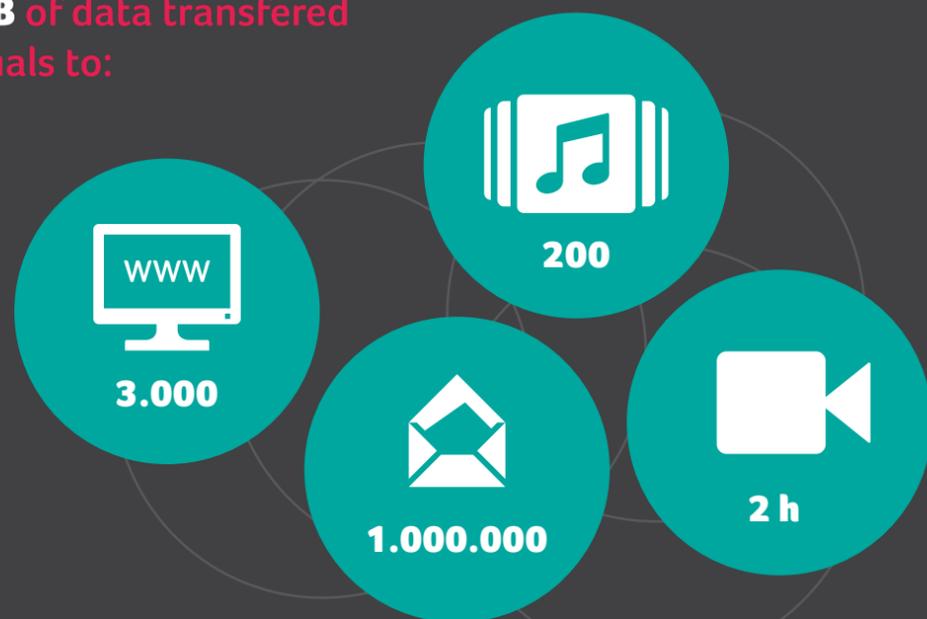
Domestic labels have accepted Deezer as another way to promote music and performers that they represent so in the coming year they plan to have more prestreaming and thus allow users to access exclusive material.

Online file sharing development

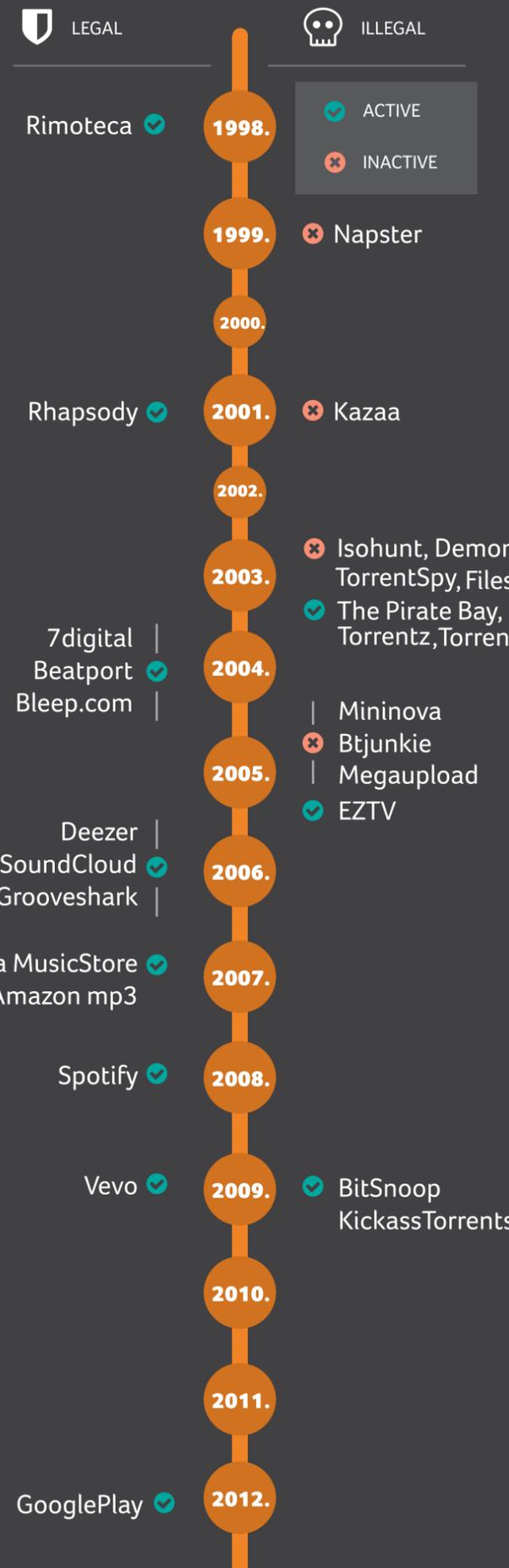
The main development of online piracy started with music because the technology enabled only a transfer of relatively small files. As shown below even this obstacle was quickly overcome by technological progress.



1GB of data transferred equals to:



Legal and illegal services development



Napster was the most successful service for illegal sharing of music files at the turn of the century, peaking at 26.4 million users. Injunction was issued on March 5, 2001 ordering Napster to prevent the trading of copyrighted music on its network. Napster settled for 20 million \$ and tried to convert to legal music service. It went bankrupt in 2002 and resurrected many times. It is currently owned by Rhapsody (from 2011) and available in 16 countries in Europe.

In 2013 UK, Ireland and Italian courts issue court orders to ISP's that must block access to the most visited torrent sites. Other countries that are currently blocking access to the most popular .torrent site The Pirate Bay include Belgium, Denmark, Finland, Germany, Greece, India, Iran, Malaysia, Netherlands, Norway, Sweden and China.

As we can see the war on copyright is far from over. Though some significant torrent sites have been shut down, there are still some that managed to survive. As entertainment and software industries continue to wage legal battles against distributors of pirated content, more and more legal services are being launched, enabling widely accessible and affordable distribution of legal content. Every new technology opens a new battlefield and illegal and legal content providers must stay on top of their game in order to secure dominance.

As they say "the future is coming". This has never been so true as today.

Did you know?

The first cd burner was invented in 1988 by a company named Taiyo Yuden Co., Ltd.¹¹ CD-R recording systems available in 1990 were similar to the washing machine-sized Meridian CD Publisher, based on the two-piece rack mount Yamaha PDS audio recorder costing \$35,000, not including the required external ECC circuitry for data encoding, SCSI hard drive subsystem, and MS-DOS control computer. By 1992, the cost of typical recorders was down to \$10–12,000, and in September 1995, Hewlett-Packard introduced its model 4020i manufactured by Philips, which, at \$995, was the first recorder to cost less than \$1000.¹²

1988.

On 7 July 1994, the Fraunhofer Society released the first software MP3 encoder called l3enc. The filename extension .mp3 was chosen by the Fraunhofer team on 14 July 1995¹³. MP3 enables music to be compressed to one tenth of the CD format size.

1994.

In 1999, the Wi-Fi Alliance formed as a trade association to hold the Wi-Fi trademark under which most products are sold.¹⁴ However it took almost a decade for the Wi-Fi to become widely used

1999.

2001.

Programmer Bram Cohen released the BitTorrent file-sharing protocol in 2001.¹⁵

OneSwarm is released in 2009. It is a privacy-preserving P2P client developed at the University of Washington that enables “safe” P2P file sharing.¹⁶

2009.

11 - http://en.wikipedia.org/wiki/Taiyo_Yuden

12 - <http://en.wikipedia.org/wiki/CD-R>

13 - <http://en.wikipedia.org/wiki/MP3>

14 - <http://www.wi-fi.org/>

15 - http://en.wikipedia.org/wiki/Bit_torrent

16 - <http://www.oneswarm.org/>

