Studienævn for Industri og Global Forretningsudvikling
Fibigerstræde 16
DK - 9220 Aalborg Øst
Tlf. 99 40 93 09
lft@m-tech.aau.dk
www.ses.aau.dk

AALBORG UNIVERSITET
STUDENTERRAPPORT

Title:	**[Blockchain Technology within the Music Industry**
Semester:	**[Spring/summer]**
Semester theme:	**[Master's Thesis]**
Project period:	**[January – June 2019]**
ECTS:	**[30]**
Supervisor:	**[Reza Ali Tadayoni]**
Project group:	**[Pernille and Aleksandra]**

Aleksandra Anna Krajewska

_____

Pernille Sommer

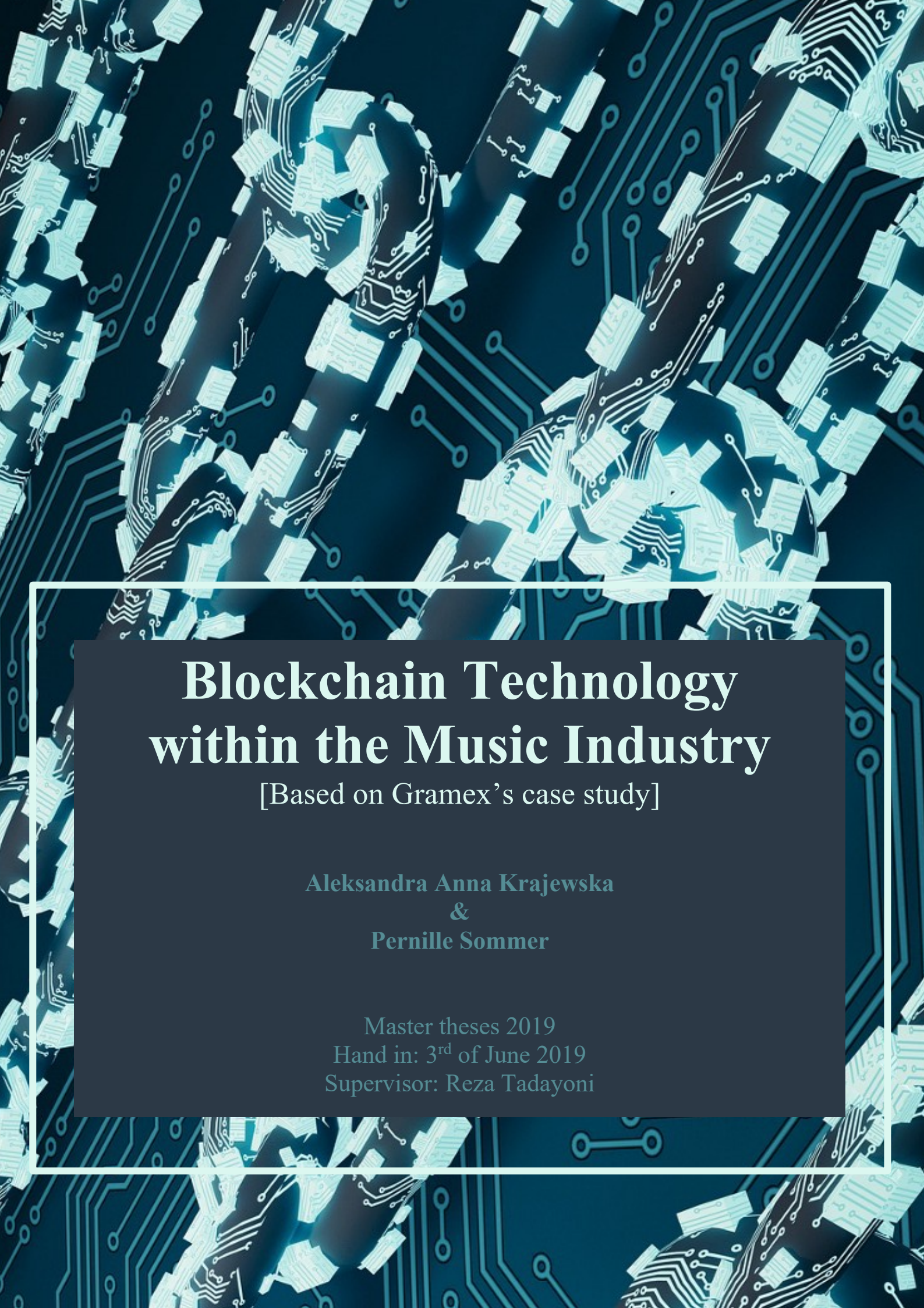
_____

SYNOPSIS:

This Master's Project aims to analyze the impacts of the evolvement of Block Chain (BC) technology on the media industry, where all transactions involve authors (of the content), users (receivers) and middle-men (multi-sided online platforms), who establish terms of these transactions. We chose this complex industry as a field of our research in order to analyze how media companies, that face ongoing, radical innovations, react on new, emerging technologies. Including how the media companies have to look at their existing business models and be able to adjust or change them rapidly to keep up with the disruptions that influence the market, with a major focus of the project will be on the management of Intellectual Property Right (IPR). We are going to analyze current situation and possible next steps of the radical innovation enabled by BC and its impact on business models and value chains within media industry.

Pages: [102]
Appendix: [125]

By signing this document each member of the group confirms participation on equal terms in the process of writing the project. Thus, each member of the group is responsible for the all contents in the project.



Blockchain Technology within the Music Industry

[Based on Gramex's case study]

Aleksandra Anna Krajewska
&
Pernille Sommer

Master theses 2019
Hand in: 3rd of June 2019
Supervisor: Reza Tadayoni

Abstract

The most significant revolution, that has changed the modern world forever, came along with the digitalization. The process of switching from analog to digital form of any piece of work, disrupted all different markets. One of the most influenced areas is the music industry. Despite of many advantages, e.g. easier access to the content, market growth, lowered barriers to entry the market and decreasing customer prices, there is also a dark side. Digitalization altered the way, how the data is distributed and how the users pay for it. The main problem is tightly related to the digital content's core nature, as it's easy to download, copy and share illegally.

The newest response to these stated problems might be a blockchain technology, that gave a rise to Bitcoin, which *"at its most fundamental level, is a core breakthrough in computer science"* (Swan, 2015). In general, inventors of the blockchain and cryptocurrencies followed an idea to eliminate extra costs that emerge while proceeding online transactions by removing 'middle-man' institutions. Hence blockchain technology provides tools to establish mutual trust and secure information exchange between entities. Following research examines Gramex that manages the digital rights of Danish artists and record labels on their behalf. The question is, if implementation of the blockchain technology would be a proper solution in order to ease the data exchange between Gramex and their customers. To analyze the problem, we have based our research on the general knowledge regarding blockchain, the theories of transaction costs, innovation, and the concept business models'.

The whole process of providing this following project, allows us to conclude that the issues related to this particular subject are still in the initial phase of the development and recognition, so there is a lot of uncertainty. Nevertheless, this feature in fact made the whole work much more interesting and engaging, as our case study is embedded in the real life-setting. Hence we were also interested both in the music industry in general, relations between institutions and in entities within this business. Obtained outcomes might have a real impact on the further researches as they provide new solutions and possible ways of embracing and implementing blockchain technology within the music industry. We believe that any kind of technology, but only wisely recognized and implemented, might add extra value to the business.

Table of content

1. Introduction

There are no doubts, that the emergence of the Internet, which is a worldwide connection network of computers, occurred to be one of the biggest breakthroughs in the modern world. Along with its development, the Internet has been changing almost all aspects of social life. Especially, it has had enormous influence on all kinds of businesses that either has been established on a network basis, used Internet in particularly chosen areas to create and deliver value, or just employed in an essential manner. The enormous and endless capabilities of the Internet have an ongoing impact on the way companies establish their weaknesses and strengths, giving opportunity to evaluate and describe their values, and at the same time providing tools to achieve it in the best manner. Nowadays firms get the opportunities to both affect people, build communities around social media, and use streaming and online platforms to engage consumers. To be able to take advantage of all these channels, it is required to collect the users' personal data and copyrights, which has been questioned recently.

One of the businesses that directly suffers from unsettled standards in terms of digital rights management is the music industry. As a consequence, there is a huge visible decrease in profits, especially for the artists. The problem occurred due to the development of the technology and digitalization that eases the process of illegal downloading and sharing products online (O'Dair, 2019). In fact, there has been no fully secure and transparent way to track all the transactions of the digital content, but the newest development within blockchain technology may reveal solutions useful not only for financial institutions.

Blockchain technology in its core, was created and then introduced to the wider audience in order to provide an effective way to lower the costs of online transactions. Since 2008, when Satoshi Nakamoto published the whitepaper "Bitcoin: A Peer-to-Peer Electronic Cash System", blockchain technology has been mostly identified with cryptocurrency called 'Bitcoin'. The idea behind the concept of creating "*a purely peer-to-peer version of electronic cash that would allow online payments to be sent directly from one party to another, without going through a financial institution*." (Nakamoto, 2008), gives basis for creating other platforms running on the same technology, that could be implemented in variety of different industries. Furthermore, it's been said that "*Bitcoin and blockchain technology, Bitcoin, at its most fundamental level, is a core breakthrough in computer science"* (Swan, 2015).

Development of the blockchain technology is an ongoing process that still entails in-depth discussion about limitations, different applications, implications and possibilities that may arise in the future. One of the most significant developments that emerged from increasing need for more efficient security for different digital properties, are smart contracts. This possibility might provide higher level of quality and complexity due to digital rights management. Finally, there is a real mechanism that enables registration, confirmation and transfer of digital value directly between peers, who are connected to the same network. Moreover, smart contracts consist of settled conditions of the transaction, but may also include regulations about content itself and its ownership like copyrights, trademarks or patent, etc.

The interesting and significant fact in terms of blockchain is that it has been built upon well-established IT technologies, but used in a novel and different way. In this sense, blockchain technology is an innovative concept, that may also be perceived as a disruptive technology, that might be influencing or even changing existing ecosystems, markets and universal rules of doing business these days. When new technologies emerge it is always a challenge for companies and markets. Nevertheless, the wise and efficient embracement of the tools and opportunities that new technologies create, generate fresh ideas, capabilities, important internal and external changes within companies. Blockchain, as a disruptive technology has been developing enormously for over 10 years now, and that makes it very important for all business models to be prepared and acknowledge the real impact that it can have on the reality and the future. Even though, it is developing so fast and arouses prevalent enthusiasm, many researchers have doubts about its advantages, some even neglect these benefits. The truth is, that blockchain development is still on the initial phase and issues related to ensuring trust are, among the others, most controversial. Furthermore, there is a matter of already existing companies that function as the third-parties, also known as 'the middle-man', ensuring trust and transparency of executed transactions. This arises a question regarding the nearest future of these institutions. Does it mean that the blockchain technology will cause slow or even rapid decline of them? Will they be replaced by other companies? How should managers react on the new reality? Is there any way to embrace it and make a use of blockchain in order to reshape business models by implementing new solutions?

1.1 Motivation

Our interest in the blockchain technology arose along with ongoing exploration of the progressive revolution within the internet and its potential usage in different business areas. The emergence of a blockchain as an innovative solution in the financial institutions, changed the way of perceiving transactions between parties. Furthermore, the blockchain technology is perceived by a lot of researchers, as the same breakthrough, as the creation of the internet itself. This gave us a firm basis to explore this surprising 'fact' or 'phenomenon', that interrupts and influences the market and causes changes within different fields of businesses. This in general leads to transformation of electronic transactions and exchanging digital goods. Vivid interest in the blockchain technology and its possible abilities, directed our attention to this topic and pushed us to a further exploration. We noticed all the hype that appeared in almost every publication about digital technologies, and the meaningful impact, that blockchain might have been changing the digital world. Thus, we asked ourselves the question: Can it be used in the Media Industry as well?

The first attempts to understand blockchain and the technology that constitutes its existence, were limited due to our knowledge, so we were not entirely sure if this was a proper direction to take. We were convinced that this technology only has connection to cryptocurrencies, but in-depth research allowed us to follow our idea. Skimming through available literature – both academic and popular science – we became aware of the fact that there is a broad area to explore, especially regarding to the usage of blockchain technology within the Media Industry.

The blockchain technology and all the issues related to this particular subject are still in the initial phase of development and recognition, so there is a lot of unknown quantitates, which also makes it interesting to examine this technology at this point. The relevant question for our research is not what blockchain technology is, but what you can do with it in a business context. Blockchain technology can be used and implemented in many varieties of uses, and this is what we want to look further into in regards to the technology.

1.2 Objectives

To be able to operationalize and measure our research question and aims, we have focused our study on 5 objectives:

- *To analyze how new technology can shape modern companies*
- *To determine possible usage of blockchain in the music industry*
- *To find out how to implement blockchain in a business model*
- *To identify changes, the company need to be focused on in order to use the technology of blockchain*

1.3 Research question

The research question refers to the blockchain technology and its possible usage in different industries – not solely related to the financial sector. The stated problem concerns the future of companies, that ensure trust and transparency of online transactions, including an exchange of sensitive digital data. This paper examines the possibility of implementing blockchain technology as a solution for Gramex, which is *"an independent organization approved by the Danish Ministry for Cultural Affairs for administration of the financial rights of performing artists and record companies under Article 68 of the Danish Copyright Act."* [1]

Based on the initial research and gained knowledge, following research question has been established.

The main research question is: *How can Blockchain Technology help Gramex within their business model, to lower transaction costs and make their business more efficient?*

In order to answer the main research question and maintain consistency of the following project, four research aims are determined. These questions are:

- *Where in the business model should blockchain be implemented?*
- *What kind of blockchain is needed to make their business more efficient?*
- *To what extent should Gramex open their business model to implement new technologies?*
- *Which transaction costs are lowered in the matter of using blockchain?*

[1] http://gramex.dk/english/

1.4 Structure of the report

The structure of the report helps to give an overview and an understanding of the way the report is built, to make it easier for the reader to navigate.

Literature review

In the first part we provide a literature review, to give the reader a better understanding of the current knowledge of the content, that the report is built upon. This is regarding the music industry, blockchain, business model and digital rights management, which is established by secondary sources.

Methodology

Further, we explain our methodology and provide knowledge about our actions in order to investigate the stated problem, foundations for procedures', applications and techniques used to identify the desirable data. With this section it allows the reader to critically assess our studies validity and reliability.

Technology & Business model

Further, knowledge about the investigated technology and business models is provided to present the knowledge of blockchain, the music industry and digital rights. Additionally, the concept of the business models is explained to give a supportive view and the possible changes, that might appear in the matter of implementing new technologies.

Theory

In the same attempt to provide knowledge to the research, the theory part is presented. This part is built on accepted facts that attempts to provide acceptable or rational explanations to the findings. Argued theories help us to understand the challenges in the business models and also give us the understanding of the possible changes.

Findings and discussion

Next, we present the findings composed through primary and secondary data collection. Afterwards, the data is being discussed in the matter of answering our research question.

Conclusion

In the end, we describe the conclusion of our findings and provide topics for further questions.

2. Literature Review on Blockchain Technology

In the following literature review issues regarding blockchain technology, its development and possible ways of implementation within the music industry will be presented. The provided articles give strong basis within the defined area and deliver knowledge that allows to discuss the topic from different point of views. Authors, who explore blockchain technology and its possible impact on diverse industries, connect it to the innovation field in relation to business models and its transformations. For the purpose of this research, articles that are focused on music industry, and possible usage of blockchain within it, were chosen. Additionally, smart contract and digital right management will be discussed.

2.1 Implementation and importance for the future

The *"**Blockchain adoption: A value driver perspective**"* (Angelis & Ribeiro da Silva, 2018) paper investigates the relationship between blockchain technology and fundamental factors that increase value of a product or service, when this emerging technology is implemented. The authors J. Angelis and E. Ribeiro de Silva (2018) present and discuss four stages of blockchain technology development that are covering "*the evolutionary technology types focused on transactions, smart contracts, decentralized applications, and the introduction of artificial intelligence supporting decentralized decision making*" (Angelis & Ribeiro da Silva, 2018). Further, the article provides some guidelines on how to adopt blockchain technology in the most efficient manner, using "*a blockchain value driver-focused framework, that gives decision makers actionable questions and recommendations*." (Angelis & Ribeiro da Silva, 2018). The authors start with an introduction about blockchain technology and its first, broadly known application that was only oriented towards cryptocurrencies - like Bitcoin and digital transactions. They also mention that blockchain technology and the emerging hype might be a new phenomenon, but underlying technologies are nothing new – just combined and used in a different, novel ways. The presentation of four stages of development mentioned above is preceded by short presentation of advantages that make blockchain technology a new and disruptive player in the digital world.

"*A distributed ledger has the potential to be highly transparent, secure, immutable, and decentralized. These features are useful for dealing with operational and business issues besides financial transactions, and the technology has already been used for interorganizational cooperation beyond the cryptocurrency aspect.*" (Angelis & Ribeiro da Silva, 2018). Premises in order to implement blockchain (BC) technology in different industries are promising but there is a belief that regardless of new opportunities emerging from this technology development, business rules and fundamentals remain the same. Opposite to this assumption, the authors state, that *"maturing technology typically enables new types of product or service offerings and involves changes in the pursued and derived benefits."* (Angelis & Ribeiro da Silva, 2018). Looking for acknowledgment for this claim, the authors investigate what are the key values that drive usage of blockchain technology. They start by shortly describing four stages of the BC's development as each one is a little bit further in its complexity and added functionalities. Firstly, Blockchain 1.0 is presented as the base technology that emerged from the need to ensure secure, simple and fast digital transaction between users without engagement of the third-party that establish the trust. Also, it is identified with Bitcoin as the well-known decentralized cryptocurrency. Then, Blockchain 2.0 emerged from the need of adding more features to the first version, as an extension of the first ledger. "*It encompasses privacy, smart contracts, and the emergence of non-native asset blockchain tokens and capabilities"* (Schuster, 2018 cited in (Angelis & Ribeiro da Silva, 2018)). A well-known example is Ethereum, but there are currently plenty of different ones, that compete in providing best solutions for diverse industries. The third version, Blockchain 3.0, is associated with decentralized applications running on a peer-to-peer network and ability to connect their users and providers directly. The authors also elaborate briefly on the latest version, Blockchain 4.0, as it is "*the most recent, and just now emerging, blockchain iteration*", that "*offers significant value opportunities*" (Angelis & Ribeiro da Silva, 2018), by combining blockchain technology and artificial intelligence (AI). Although these two technologies are opposite to each other, as the "*AI is based on probabilistic theory to express uncertainty*" and "*it is constantly changing, and the algorithms are projected to guess - or make assumptions of - reality*" and "*blockchain uses a determinist hashing algorithm, which produces the same results when the inputs remain unchanged*" then "*the results are permanent, and the algorithms and cryptography are projected to record reality"* (Angelis & Ribeiro da Silva, 2018).

There are ongoing attempts to merge these two technologies and use them as a next step towards blockchain expansion. In the next subsection the authors provide an overview of created values that emerge from implementing BC's technology on every stage of its development.

First version in its core is associated with decreasing a transaction cost and, in the broader sense, it leads to the situation when there is a possibility to ensure the trust and secure transaction between two parties without the presence of the third player – the middleman. "*Blockchain 2.0 takes a further step forward by enabling the development and use of smart contracts. From these smart contracts, it is possible to operate knowing the rules of the game, and parties that are not well known can trust each other without the need for middlemen acting as guarantors*." (Angelis & Ribeiro da Silva, 2018). It means that as a result of technology improvement, there are no more constraints in order to apply blockchain technology to different fields, that are not necessarily financially related. The paper states that "*beside enabling the elimination of many middlemen, the transparent and autonomous nature of smart contracts mitigates risks of manipulation and error.*" (Angelis & Ribeiro da Silva, 2018). Next step encompasses decentralized applications and computing, which means there is a broader scope of parties engaged in the process of creating a new value. Beside changes regarding to improvement of transaction's types, in general it requires governance modifications, that in long term would profit in an *"(..) increased learning and access to new capabilities or technologies. The change of organizational boundaries allows for different constellations tailored to generate value in a preferred way. For instance, it may enhance the service innovativeness or speed to market of new products*." (Angelis & Ribeiro da Silva, 2018). The authors elaborate on Blockchain 4.0 as it is a technology that combines AI and BC technology and as the result of combining them, what allows "*systems to make decisions and act on them without the need for direct human interference*" (Angelis & Ribeiro da Silva, 2018), but this technology is still on initial phase of development. Important statement concerns implementation of this technology, as there is no need to follow the order and implement all of the stages. If recognized premises and identified values appeals to follow second edition of the ledger, company doesn't have to start from the first one. Usefulness of this technology emerges from underlying values – "*each stage of blockchain technology provides certain enablers that are capable of generating value but for each specific case, the value generated at*

the various stages may differ. And (…) *for every new functionality implemented, there is an increased possibility to deliver added value while maintaining the intrinsic benefits of using blockchain. This is observable in comparisons between the four blockchain stages.*" (Angelis & Ribeiro da Silva, 2018).

The authors also pay attention to the fact that choosing and implementing the highest stage doesn't entail gaining the highest value. Premises and priorities established in order to define proper strategy should be aligned with chosen stage, that blockchain technology could generate added value. Angelis and Ribeiro da Silva in the last section provide "*a structured framework for managers to evaluate the blockchain options for adoption and deployment*" and "*discuss four key questions that help identify the appropriate blockchain technologies*." (2018). The provided piece of work (2018) finishes with conclusion that despite unquestionable potential of blockchain technology there is enormous field still being developed. Also, after the phase of gaining knowledge about this technology itself, now it is time to explore and start the discussion about managerial implications around blockchains and their usage. The authors suggest taking into consideration all risks that can emerge during the adoption process and start it with small steps.

The paper *"Beyond Bitcoin: What blockchain and distributed ledger technologies mean for firms"* (Hughes, Park, Kietzmann i Archer-Brown, 2018) investigates, how the growth of bitcoin, where blockchain technology is the fuel to cryptocurrencies, can have potential to grow in other business relations. The first focus that the authors come around in this paper, is the way that blockchain drives innovation and can increase efficiencies in new domains. They describe the benefits and utility of cryptocurrency in the financial service industry and analyze the benefits of blockchain into other business operations. With the promises of increasing process efficiency, lowering costs and the changing importance of intermediaries, this paper looks at the significant potential of blockchain to disrupt all sorts of industries. Furthermore, this paper also elaborates on the relatively early stage of blockchain applications, which is much more difficult to analyze or predict, which as a result, makes it difficult for the managers to understand blockchain and decide if blockchain is a competitive advantage.

Looking further into the benefits of blockchain in this paper, they are initially looking at the shared problem of distributed databases, which in many years have suffered from lost data and

inconsistent reads or writes due to power failure, data races or network disruptions. Based on this, they conclude that writing to a blockchain is much more time and resource intensive than the process of writing to a traditional database, but it is compensating by the advantages in write consistency and uptime. Another benefit in the paper is found in the decentralized ledger, which makes it possible for people to take part in a transaction without knowing the other parties' identities. They argue that this is possible because of the private keys which is only available for the one person. Furthermore, is it also stated that this transaction is written in the correct order and will never be lost or corrupted. Based on this peer-to-peer system, they explain that it is not only the ease of the transaction, but also the greater trust and reduce in transaction time and cost, which mainly is described as the reduce in working with middle-men.

Based on the benefits, it is also important to stress that even with a decentralization, the data in blockchain is still not immune to network attracts and network corruption. This is based on how many people who participates in the blockchain and how many people that gives the `right´ information. This can result in network majority, forcing mutated data upon the rest of the created data, which in worst scenario brings all the loosing parties' private information in hands of the hackers.

Secondly, the discussion in this paper goes around the most compelling blockchain applications. Here the paper looks in to the field of entrepreneurship, governments, supply chain management, healthcare, energy sector, mass production and digital rights. The shared benefits of this analysis on the different industries are the peer-to-peer system, that provides many of the industries with a direct contact to the consumer, which decreases both time and costs in the matter of data and product exchange. The paper is furthermore looking at the challenges in these industries, which is designed differently and work different from the financial sector. They are discussing the need for smart contracts, which up till now is not that developed. Regulation and organizational acceptance will need to open up dramatically, before it can be used and the whole ecosystem can benefit from it. Likewise, they stress the big concern from the society that does not understand either blockchain or how they can benefit from it. Though, if the technology arouses interest, then it is stated in the paper that there is a lot of work within simplifying and demystify these concepts and usage, for consumers, critics and colleagues. Eventually the paper rounds off with the managerial aspect of the decision-

making process, in which they conclude that managers in every industry have to look at the benefit of blockchain in; trust, high uptime requirements, immutability and transaction speed. By discussing the blockchain opportunity, the managers are promoting innovation and finding operational efficiencies.

With this paper we can conclude that the blockchain technology is still in development and many of the promises still lies within speculation. For other sectors than the financial, there is still a long way for blockchain to become an essential social product, even though there are some implementation options.

2.2 Possible usage within the Music Industry

Paper *"**Reinventing the Music Industry: Will Blockchain Technology Cause a Revolution**?*" (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015) provides complex analysis of the music industry and states the question if blockchain technology could be a solution for achieving the equilibrium phase, that in consequence would revolutionize the whole industry. The authors enumerate main factors that are involved in the crisis within the music industry, like complicated intellectual property management, decreasing revenues and a high number of third parties, later also called middlemen. The final conclusion leaves an open gate for the further investigation, as the researchers prove "*why the blockchain technology currently cannot lead the music industry to the phase of equilibrium but could be considered as a solution in reshaping the music industry in the future."* (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015).

Authors, following the current situation of the music industry, applied "The Adaptive Cycle of Resilience" model, introduced by Abcouwer and B.G. Parson in 2011. "*It explains that organizations or industries can move within four different phases symbolizing a complete never-ending life-cycle*" (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015) and these phases are:

- Equilibrium

"The 'stable' phase in which organizations are 'feeding' themselves on their current business model. Meaning that they have a stable position on the marketplace and their model/product line is able to sustain their existence. This phase precedes an inevitable disruption."

- Crisis

"This phase defines the organization's need of new innovative solutions in order to cope with existing issues caused by insufficient techniques that are no longer working in favor of the organization."

- New Combinations

"(…) the phase in which new business models, technologies, or product ideas are being gathered and investigated."

- Entrepreneurship

"During this phase, the combination is being implemented and put into 'production'. In case the chosen combinations do not meet the expectations, the company has no other choice but to move back to the previous phase and search for something new and valuable. In case of success, the company can proceed to the Equilibrium, which allows it to 'embrace' the fruits of their work and end the disruption. "

The music industry has been facing different phases, that were influenced and driven by disruptions like for example the latest one – the emerge of streaming services like Spotify. The authors (2015) quote Marius Carboni who stated that "*the music industry became a mixed economy of diverse consumer channels and revenue streams*" (Carboni, 2014). The music industry struggles with decreasing revenues, licensing and delays in royalty payments. All factors brought together lead to the question on how to overcome the crisis and if there is any technology that can help with that. This arises direct question about blockchain technology and its capability to lead music industry to the equilibrium phase. Firstly, this paper presents a broad spectrum of issues that the establishing of blockchain technology would be in order to solve problems with direct connection between consumers and artists, and consequently it would have an impact on royalty payments and transparency. Also, what is mentioned after,

blockchain technology could be a solution for providing a trustworthy and shared database with information about copyrights. "*Numerous databases that contain redundant and often inaccurate information could be replaced by a constantly updated database. This type of database is necessary to revolutionize the music industry, this way helping to ease, speed-up and track the communication between the artist and the license requester."* (O'Dair et al., 2016; Willaert, 2017 cited in (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015)). There are also interesting issues pointed out by researchers, as they consider using blockchain technology to eliminate third parties and leave transactions to artists and consumers. The authors leave open question for the future research as "*in order to implement blockchain technology in the music industry, there is a need of a strong proof that the consumers are eager to play the role of the promoters as well, instead of being only passive listeners using streaming platforms."* (Raine, 2017 cited in (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015)). Others concentrate on the issue of blockchain technology in the music industry, starting with its short history and pointing out few events that have changed the market. The first major crisis came with the emergence of a file sharing platform Napster and later iTunes in 2001. Then music streaming technology gave rise to platforms like Spotify. Now, the industry is facing a crisis again and, in spite of increasing revenues, the distribution is inefficient and costly, which influence the situation of the labels and artists directly. This is the gap that could be overcome by applying blockchain technology, because it "*has the ability to allow labels directly distribute to consumers. This would reduce overheads and allow labels to receive 100% of the revenues."* (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015)

Before a final discussion, the authors provide advantages and disadvantages in relation to usage of blockchain technology within the music industry. The first aspect that supports this idea is based on its capability to benefit multiply stakeholders engaged in the production process. As it was mentioned before, blockchains ensure secure registration of all kind of transactions, their transparency, verification and visibility for all entities involved. The authors state that these bunch of attributes would be "*extremely useful in the area of intellectual property rights. (…) Instead of having a multitude of separate unsynchronized copyright databases, a number of publishers could decide to use a shared blockchain ledger, which is dynamic and self-updating. Every transfer of copyrights property would be instantly processed creating a transparency the music industry has never experienced before*." (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp,

2015). Next advantage is related to royalty payments, as implementation of blockchain technology would provide absolute clarity of the ownership. Also, the problem of long-lasting money transfers, that emerge because of unstable and unclear situation regarding to the ownership, would be solved. The authors provide arguments to support an idea to eliminate complicated and costly commitments for both sides – artist and record companies – and that would probably affect "*the dependence of artists and writers on publishers, labels and other third parties. Additionally, the combination of blockchain technology with smart contracting and cryptocurrency technology even provides an artist with the option to self-distribute musical compositions or recordings directly to his consumers."* (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015). There are two opposite groups of researchers, who provide some predictions/ideas about the future of intermediaries or third parties – one believes that there will be less parties involved because of making transactions simpler. The other group expects that new entities will emerge, based on their relations to blockchain technology and specific knowledge. Furthermore, the authors ask the question if the blockchain technology is mature enough to lead music industry to the equilibrium phase. There is a lot of open questions about its security, including vulnerability, private keys, smart contracts (as a running codes), scalability (as blockchains get bigger and bigger). Human factor also plays an important role as there are always issues among users with implementing new technologies, what might be related with lack of trust or/and knowledge.

The proposed conclusion is based on a statement that *"blockchain technology is one of many possible combinations to be considered in order to move the music industry towards the equilibrium"* (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015). Although, taking all pros and cons provided through this research into consideration it allows to follow the concept that it is too early for implementing this technology, since the technology is not that advanced. Still, there are promising premises that blockchain technology would be a useful solution to influence and reshape at least some parts of the industry, "*therefore the exploration of implementation of blockchain is highly encouraged, since this approach might become beneficial on a long-term basis. (…) Regarding future work, it is recommended to continue this research in depth by analyzing the actual blockchain implementation in similar industries*." (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015).

The article "*The networked record industry: How blockchain technology could transform the record industry"* written by Marcus O'Dair and Zuleika Beaven (2017) enables us to take a closer look on an impact that blockchain technology could have in the future on the music industry, especially focusing on the recorded music. The authors start their work referring to the file-sharing networks like Napster or BitTorrent, that emerged years ago and changed the industry, providing 'technological shock'. But even the following swap – from music 'piracy' to legal downloads and streaming services haven't changed the situation as incomes are still declining. Then, the article provides data taken from the 'Digital Music Report' provided by International Federation of the Phonographic Industry IFPI (2016), which is a Digital Music report, that showed "*an increase in overall recorded music revenue of 3.2%, following two decades of almost uninterrupted decline, the report also highlights a `value gap´: payments to artists are `miniscule´ compared with the massive consumption of music on platforms such as YouTube).*" (O'Dair & Beaven, 2017). The authors criticize all-embracing enthusiasm that blockchain technology could be the solution for all of the music industry issues, but at the same time they suggest that there are three areas that may find this emerging technology as a useful tool to overcome challenges. These are: "*accuracy and accessibility of copyright data; speed of royalty payments; and transparency of the value chain*."(ibid.). The authors also provide knowledge about "*barriers to, and even potential disadvantages of, adoption, and outlines implications for practice, including the sustainability of the recording industry and creative control of musicians' career."* (ibid.). The article focuses mostly on the example of recorded music as the authors suggest that this area might be most affected by this technology. An interesting thing, that gives some fresh ideas about a blockchain technology and its influence, is that the authors refers to the term 'disruptive innovation' as a background for this technology implementation and a usage.

The article provides new perspective on the music industry – a new approach states that `digital revolution' has not changed the structure of the market in a way it was expected. In fact, there is a suggestion that `digital revolution' has allowed major labels to `strengthen´ their control over music production and consumption; writing of record labels more broadly. The IFPI (2016) claim that "*the digital world has made labels more, not less, important in generating value for artists.*"(ibid.). What is true, that these days it's much easier to enter the market for new, upcoming artist as the entry barriers got much lower since there is so many open online

platforms. At the same time this might be a reason of increasing importance of record labels, as the competition is colossal. Here arises question for further research if a new platform, based on blockchain technology that would be focused on gathering new, niche artists, could be a solution to make them "visible" on the market.

As it was mentioned before, the authors put emphasis on the IFPI report from 2016 that highlighted "*a ´value gap´ that sees artists receiving ´miniscule´ payments even for massive consumption on platforms such as YouTube. And some artists have complained about royalty income via other streaming platforms, such as Spotify*" (ibid.). There are three main issues to solve. There is a need to create one, common database that would contain ownership documents of all songs, records and copyrights. Secondly, processing payments is too slow - "*Any piece of recorded music contains at least two copyrights: one for the sound recording itself, relating to the performer, and one for the underlying words and music, relating to the songwriter or composer. (…) for international uses, royalties can take years to reach the bank accounts of rights holders—by which point more than one more performance rights organization may have deducted administrative fees (Rethink Music, 2015), so there is an issue with "friction" too. Given that tracks can be downloaded or streamed anywhere in the world at the click of a mouse, such a model seems archaic*." (O'Dair & Beaven, 2017). Last issue refers to mistakes with payments that happen because of unclear and unsettled regulations within the value chains. "*The specific details of many streaming deals are currently hidden behind non-disclosure agreements, so that artists and songwriters may not know the terms under which copyrights are being used. This makes it difficult for them to audit royalties and to assess whether labels, publishers, or collective management organizations (CMOs) are processing payments efficiently."* (Cooke, 2015 cited in (O'Dair & Beaven, 2017)).

Because of a significant lack of proper, in depth and comprehensive research, and what comes next – literature that treats blockchain technology and its possible usage within music industry, there is still a lot of open questions and possibilities to conduct complex academic researches. The authors follow other researchers, who perceive blockchain technology as a revolution that enables to keep track of rights and at the same time is a database and a network. Articles provides examples of platforms that take advantage of this technology and try to make it "*easier to locate the owners of a piece of recorded music, and to obtain a license to use it."* (O'Dair & Beaven, 2017). Another proposition refers to an idea of surrounding "*each piece of*

music with data relating to lyrics and photographs, for instance, as well as full credits; the `ecosystem of data´ around each song will make it easier to locate the owners of a song to obtain a legal license to use it (Bartlett, 2015). Copyright information—as well as lyrics, video, and artist biography—could be embedded as metadata in digital recordings." (O'Dair & Beaven, 2017). The authors also mention an idea to use blockchain technology as a tool to create, provide a common, single and universal database of music copyright. It is tightly related to smart contracts, that "*could allow music royalties to be administered instantaneously, with distributions provided to both composers and performers in real time. Rather than passing through intermediaries, revenue from a stream or download could be distributed automatically between rights holders, according to agreed ´splits´, almost at the moment a track is downloaded or streamed.*" (O'Dair & Beaven, 2017). The authors provide a statement from 2015 made by other researchers that micropayments might be "*fundamental to the appeal of blockchain technology for the creative industries. What makes them feasible is the low transaction costs of digital currencies*" and basically this is the core for an online ecosystem as "*transaction costs are everything*." (O'Dair & Beaven, 2017). At the end O'Dair and Beaven (2017) provide a list of limitations that may emerge when deploying blockchain technology. They emphasize users' contribution to payment system, in a way the platforms that dictate specific digital currency force users to be familiar with this new payment option by using it. Moreover, there is also another challenge for consumers, as implementing blockchain technology entails a shift from monthly/annually subscriptions to the payment – even micropayment – for each 'use of' particular piece of work.

Another challenge arises with royalty payments as, in general artists are typically paid in advance. The authors state that from this point of view "*the speed of accounting is irrelevant, as artists simply will not receive the royalties. That said, a change would certainly benefit artists who do not receive large advances, or any advances at all, or those lucky enough to be given a non-recoupable advance.*" (O'Dair & Beaven, 2017). The authors also ask questions about information exchange and its value within blockchain. Then there is still open discussion about unsettled law regarding blockchains and its application, which needs regulations.

In the article "The Impact of Blockchain on the Music Industry" the authors Camila Sitonio and Alberto Nucciarelli (2018) investigate usage of blockchain technology within the industry with

special focus on changes in relation to royalty payments for artists. They notice, that "*on-demand streaming platforms (e.g. Spotify and Apple Music) have allowed consumers to easily access music products but have introduced a level of intermediation between artists and customers leading to inefficiency of the royalty payments systems."* (Sitonio & Nucciarelli, 2018).

Blockchain technology propose solutions that artists perceive as efficient enough to establish fair rules due to bring power back to musicians. It means that there is an increasing need to create common environment that would give free access to information about payments, content sharing history and tools for artist to be paid more effectively. The authors introduce an idea that new channels created a broad array of opportunities for innovative business models, both for artists and market stakeholders. It doesn't mean that upcoming changes will start revolution and eliminate different parties – these intermediaries in value chains that adds value for business will remain, but in different sense and set up. Here is the main point that leads to significant impact that blockchain may have on companies like record labels or publishers – it influences the way of shaping the whole business. The authors try to answer the question to what extent blockchain technology have had an impact on music industry and what the future of it looks like. The article provide definitions of business models, following Teece (2010), where "*business enterprise responds to and delivers value to customers, entices customers to pay for value, and converts those payments to profits [...]*" (Sitonio & Nucciarelli, 2018). Moreover, business models can be two-sided, when the relation is established only between two parties and multi-sided, when transactions take place among multiple parties, "*where an intermediary creates the conditions for buyers and sellers to encounter and transact. In this very case, the intermediary also acts as a guarantee for both parties. It doesn't just facilitate the transaction by reducing distances and transaction costs, but it also validates their identities and build mutual trust.*" (Sitonio & Nucciarelli, 2018).

The authors put emphasis on the customer's role in business models and ongoing changes as there is an inseparable connection between the business and the created value for its customers, as "*value for customers (..) can in fact be created by designing new governance mechanism for social and economic interactions, especially*" (Sitonio & Nucciarelli, 2018), but there is still a massive work due to technological innovations that influence ecosystems including demand and supply sides.

In the following chapters, the authors mention the most demanding problems that the industry faces to, work with contracts and payment systems. Also, they acquaint readers with the history of the music industry and turning points that had a significant impact on its structure. It starts with record labels which captured most of the value in the chain and smoothly moves on to the popularization of the internet. Along with this even most important breakthrough, that changed everything - the launch of the iTunes Store, that revised the way we, as a society, consume music. "*Songs were no longer a physical good, consumers would be able to purchase digital media through all their Apple devices, no extra restraints*." (Sitonio & Nucciarelli, 2018). In spite of technological evolution, the division of work within the music industry remains the same – "*artists create music, fans consume it, and the intermediaries, such as the record labels and distributors, act as the powerful middlemen (Graham, et al. 2004).*" (Sitonio & Nucciarelli, 2018). The authors present ideas that stands behind intermediaries, using the timeline that presents how the music industry has change through time and how the emergence of new technologies influenced the market. They analyzed processes of change within ecosystems and supply chains that had changed because of novel solutions and increasing popularity and the meaning of the internet. Even with all of these changes, when Record Labels were losing their monopoly of distribution power and their reduction of all transaction costs by shifting from physical to digital goods, there were still issues regarding to value captured by the artist (Sitonio & Nucciarelli, 2018). The authors noted that a new business model that is based on online streaming activities made the online music publishing easier for new authors, but still without fair payments and at the same time decreased payments and its flow for major artist. Blockchain technology would be the next step towards solving the mentioned issues, as lowering the transaction costs, faster and direct cash flow between parties without engaging intermediaries, would be giving the power back to the artists. The main problem that now stands against this ideal scenario is that "*most mainstream artists are under contract with one of the Majors, which prevents them to go straight from creation to the blockchain networks*." (Sitonio & Nucciarelli, 2018). Here arises an idea not to eliminate the "third-parties" but to change their role within the supply chain. For example, "*instead of acting as a revenue collector and representative of the musicians' intellectual property (IP), Record Labels would act as collectors of usage information, as well as continue to provide technical, production and marketing assistance according to the scope of each individual agreement. The responsibility regarding royalty payments, including the intermediates share, and the assurance of*

information transparency, would still be granted by the Blockchain Networks." (Sitonio & Nucciarelli, 2018). The authors quotes the Hype Cycle report from 2017 that suggest that in in 5 to 10 years we will finally face mainstream adoption of this blockchain technology. "*The report expects that during this time, some focus will be given to create convergence in architectural styles (private and public) resulting in all distributed ledgers having similar functional characteristics. (…) However, even with the technology in its initial stages of development, for the purposes of disintermediation in the music industry, it shows great immediate potential."* (Sitonio & Nucciarelli, 2018). Following author's assumptions, there are two main issues regarding to the extent of how blockchain technology would improve the music industry. These include "*lack of access to transactional information and the inefficiencies associated to royalty payments*"; moreover "*blockchain technology can solve both of these issues, while maintaining transparency throughout the entire chain."* (Sitonio & Nucciarelli, 2018). The authors provided an example of a new music file format *'bc'* that works as MP3 and WAV, but is designed to change the way of digital rights management within media in general. The new format is created in a way that the file includes all data within the information about the owner and payment rights, etc. This solution is based on the idea of smart contracts that are tightly related to the blockchain technology and its transformation. The authors also refer to cryptocurrency and challenges related to initial phase of acknowledgement and popularity of this technology among the users. The article provides promising information about emerging institutions that conduct active research within this area and invest in "*platforms, and open-source technologies that will allow blockchain to properly function in the industry (…). The Open Music Initiative (OMI), for example, is a non-profit organization, supported by a variety of stakeholders (e.g. artists, labels, producers, organizations, publishers) on the music industry, that is creating an open-source protocol for the uniform identification of music rights holders and creators. The idea is not to build a database or a specific product, but to develop an application programming interface (API) with specifications to support other stakeholders in the develop of their own systems."* (Open Music Initiative 2018 cited in (Sitonio & Nucciarelli, 2018)).

2.3 Smart Contracts and Digital Rights Management

"Impact of Technological Blockchain Paradigm on the Movement of Intellectual Property in the Digital Space" (Shatkovskaya, Shumilina, Nebratenko, Isakova, & Sapozhnikova, 2018) is a paper that investigates *"(..) the problem of influence of cutting-edge digital technology on the virtual and real legal relations, related to the movement and the turnover of intellectual property."* (Shatkovskaya, Shumilina, Nebratenko, Isakova, & Sapozhnikova, 2018). It is stated that the legal relations within the industrial revolution and development of money exchange has been in a longer process, but with Smith´s (1935) idea about quitting the centralized government regulation in the 20th century, it got accepted and has since been developed. This introduction leads to the result of lack in the technology and a huge focus on transaction costs, which results in the discussion of blockchain as a new system. Further, blockchain that is based on the third generation of IT, is listed in the paper (Shatkovskaya, Shumilina, Nebratenko, Isakova, & Sapozhnikova, 2018) as:

> *"- All the participants have information access; however, no one has control over the information;*
>
> *- The system doesn't have a hierarchy, amongst the many blockchain nodes, there is no dominant node;*
>
> *- System of transactions is transparent and pure, each operation is available to everyone, who has access to the system;*
>
> *- Trust for the system is defined by the number of users."*

After investigating the technology, they conclude that the full range of capabilities of applications of blockchain cannot be forecasted today and therefore the paper focusses on current projects. The projects are all in one focusing on the technical part and the digital ecosystem. They advocate the copyright object use of blockchain and dive into the different platforms that allow the right holders to control the transfer of intellectual property. Further, the paper highlights that "*The most important principles of blockchain functioning are "if you don't pay – you will not get it" and high "hacking resistance" attract attention of the market participants."* (Shatkovskaya, Shumilina, Nebratenko, Isakova, & Sapozhnikova, 2018). An example with the singer Imogen Heap who joint a project with Ujo, has now made a song on a

blockchain platform, which automatically made sure of the downloads, transfers, remix and synchronization via smart contracts. This shows that the blockchain can help you with the legal prospect, that in many years have been a threat for the music industry. The paper stresses positive use of blockchain and smart contracts, and how the creators can form and benefit from theses platforms. Even though all of this sound promising, the paper also discusses the difficulty of smart contracts, where one thing is central for the usage of smart contracts. For now, the smart contracts are representing the ready-made solutions, which firstly makes it very difficult for the parties to agree on the rules and regulations, but secondly, when the contracts are made it is very difficult to change. This makes it very difficult to use in many industries, where contracts are changing all the time e.g. the business industry. On the other hand, within laws and regulations, it makes sense to use the technology that the decisions should not be changed.

The article "Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0" (Finck i Moscon, 2018) examines the limitations and potentials of blockchain technology and smart contracts in relation to copyrights. The article explains the history and the architecture of DRM. In this section, they explain the difficulties of the rights administration in the digital world, that this is a new and much more exposed community than the physical market. Further, they state the many DMR systems and how they positively can help organizations. What is the problem within the rise of DMR systems? They discuss it as the lack of interoperability "*which is a consequence of either one company's decision not to license its technology or, more generally, of the lack of standardization. Indeed, interoperability and compatibility among different DRM systems depends on license agreements between IT companies and standardization processes of DRM components."* (Finck i Moscon, 2018). With this comment they point out the necessity to establish shared standards in the DRM domain, which they conclude is very difficult, due to two reasons. Firstly, companies prefer to handle their own technology due to market strategies and competitors. And secondly; to protect diversity of the digital content to be protected. Even though this is argued to be the solution, some still states that DRM interoperability is not always suitable as it may expand the content control and further it might increase copyright owners´ control at the expense of other legitimate and flexible uses. Therefore, they conclude; *"(…) increasing interoperability between digital goods and devices should be balanced with measures allowing users to access and use*

digital content and flexibility." (Finck i Moscon, 2018). Next DRM between public and private ordering is being discussed. The shift from public to the private copyright ordering has developed the possibility of computer coding that gives the right holders the control to influence market dynamics. They state that "*code can represent a strategic barrier to entry in addition to a contract and the rules protecting the technology that facilitate its use, to erect strategic barriers even in secondary markets*." (Finck i Moscon, 2018). This is based on the DRM embedded in computer platforms (video games or operating systems). Therefore, this is seen as a number of possible limitations. Based on this discussion, the article concludes that the raise of blockchain smart contracts can be a new form of code to discuss as a potential alternative to existing systems.

2.4 Impact on Business Models

The paper "***How blockchain technologies impact your business model***" written by Morkunas, Paschen i Boon (2019) starts with a general overwiev of the blockchain technology and the beginning of its usage within digital money transactions. The authors admit, as previous researchers, that the discussion about blockchain technology is narrowed down basically to financial services and at the same time ignore most of the other sectors, that could gain profit by applying it. The truth is, that application of new technologies and solutions should entail broad discussions, changes within organization and active process of reshaping business model, in order to redefine creation and delivery of the value.

This article explains main assumptions regarding blockchain technology and how "*different types of blockchain impact business models*." (Morkunas, Paschen i Boon, 2019). The authors based their research and analysis on Canvas Business Model framework illustrated by Osterwalder and Pigneur, who described it as a concept of "*how an organization creates, delivers, and captures value*" which consists of 9 blocks, that "*taken together and properly aligned (…) create and deliver value*." (Morkunas, Paschen i Boon, 2019). Following the idea, they were trying to point out, how the blockchain technology affects each element of this business model. After a short introduction about blockchain technology, the authors provide a more specific concept that concerns private and public ledgers. The first one "*offers more transaction privacy, which is critical for transactions involving sensitive data (…). Closed*

blockchains are easier to scale up, cut down costs, and feature greater transactional through-put. Additional advantages include added security, lower costs, added reliability, and a higher level of trust, as only pre-verified parties are able to initiate a new node in the blockchain." (Coburn, 2018 cited in (Morkunas, Paschen i Boon, 2019)). Contrary to this, public or open ledger allow anyone to interact in order to establish any kind of transaction. All exchanges and actions are anonymous (or pseudo anonymous) and there is no privacy as all transactions are visible for all users.

The main part of this article provides knowledge, how blockchain technology influences business model, as it may lead to emergence of entirely new business or threatening existing ones. Especially, it concerns companies that position themselves as intermediaries that provide services for two opposite parties, who are interested in performing a transaction. These companies should ask questions, if and how this new, rapidly emerging technology can affect their business operations, actions and at the end – position on the market, and how changing a business model could reverse a situation.

By collecting data from startups in Europe, North America and South Africa (websites, articles, press releases, etc.) authors (Morkunas, Paschen i Boon, 2019) answers the question on how these 9 elements/ blocks, the Canvas Business Model, could be affected by applying blockchain technology:

- Customer segment

"Facilitating an access to a target market, that was previously not reachable (Larios-Hernandez, 2017) and therefore creates new customer segments for a business."

- Value preposition – creating value for customers

"Blockchain technology can influence customer value by providing access to products or services that were previously not available or could only be garnered by expensing a large amount of time or money" and "Blockchain technology can also provide faster or less expensive transactions than those completed in traditional settings."

- Channels – communicating with and reaching customers to deliver value proposition

"The simplification of doing business. Middle parties may become disintermediated. (…) New types of channels may also be introduced within an organization."

- Customers relationships

„These relationships may be driven by a motivation to acquire customers, to retain customers, or to boost sales. Examples of categories of relationships include personal assistance, dedicated personal assistance, self-service, automated services, the creation of communities, or the co-creation of new content." And "Creating greater confidence and transparency."

- Revenue streams – cash generated from each customer segment

"Technology companies that provide blockchain-related professional services derive revenues from transaction fees for activity on a network, service level agreements for enterprise clients or platform fees for software-as-a-service (SaaS) contracts."

- Key resources & activities - Key resources create value proposition, reach markets, maintain relationships with customer segments, and earn revenues.

"The opportunity to make resources more fluid, allowing firms to move away from the traditional ownership and to access resources only when required." and "Furthermore, both applications of public and private/federated blockchains enable firms to automate processes that were previously manual, enabling human resources to focus on other, more value-added activities." Last "Blockchain technologies facilitate the peer-to-peer exchange of these resources."

- Key partnerships – network of suppliers and partners

"The disintermediation of traditional intermediaries or transform financial institutions. The use of blockchain can also enable the addition of new partners such as technology companies that develop application programming interfaces (APIs) and software development kids (SDKs) and maintain the transactional algorithms."

- Cost structure

"Blockchain implementations can reduce transaction costs such as negotiation costs and search costs and eliminate the costs of intermediaries."

In the discussion part, the authors present "*several obstacles continue to limit the mainstream adoption of blockchain technology*" (Morkunas, Paschen i Boon, 2019). Even providing that advanced technology, ongoing transactions are still too slow. There are also doubts regarding to security, lack of standardization, unsettled law regulations (smart contracts), costs. Also, the challenging part for the companies that are willing to implement blockchain technology within its structures, entails choosing between private or public ledger. These two options differ from each other in a way that private blockchain "*can save an organization time and cut costs, whereas a public blockchain has the potential to disrupt an industry, either through disintermediation.*" (Morkunas, Paschen i Boon, 2019). The authors also refer to the concept of incremental and radical innovations as a subject, that has a potential to be examined. They observed that "*consortia-led blockchain projects have the potential to lead to architectural innovations, whereas public blockchain projects can engender radical innovations. Architectural innovations reconfigure established systems to link existing components in a novel way. (…) Radical innovation, by contrast, is based on different principles and leads to new applications and markets (…). It also enables the successful entry of new firms or the creation of a new industry."* (Henderson & Clark, 1990 cited in (Morkunas, Paschen i Boon, 2019)).

Article leaves some open questions by pointing out limitations that the authors faced during the research. The first problem refers to the initial phase of the whole discussion due to the blockchain technology and its implementation, what also has its confirmation with small sample of cases to examine. As it's been written "*it will be interesting to explore which industries will create architectural innovations or generate radical innovations and to confirm whether these will be supported by private or public blockchains*." (Morkunas, Paschen i Boon, 2019). Then, researchers suggest that for further research it would be interesting to investigate, what kind of blockchain – private or public – has greater impact on business model and which one enables gaining more benefits from its usage.

Finally, implementation of blockchain technology may lead to "*the reduction of operational costs, shorter settlement time, reduction of risk, new revenue opportunities, and a reduction in the costs of capital.*", what means that "*blockchain has an opportunity to create benefits beyond digital currencies and influence all sectors of the economy*." (Morkunas, Paschen i Boon, 2019)

2.5 Summary of literature review

Provided literature review gives a vast amount of insights and knowledge about the main subject, even though blockchain technology and its usage in different industries not related to cryptocurrencies, is still at the relatively initial phase of development. Researchers, who examine issues regarding to the BC technology agree that it's a useful solution that might be implement in various businesses, as there are no more constraints in order to apply blockchain technology to different fields. Nevertheless, there are few areas that should be explored to provide better understanding of blockchain technology capabilities and the opportunities that it brings, as the most important conclusion that underlies the examined issue, describes distributed ledger as a technology that "*has the potential to be highly transparent, secure, immutable, and decentralized. These features are useful for dealing with operational and business issues besides financial transactions, and the technology has already been used for interorganizational cooperation beyond the cryptocurrency aspect.* " (Angelis & Ribeiro da Silva, 2018). It allows to make an assumption that blockchain technology might be a future solution for different businesses, based on digital data exchange, by transforming the way information technologies are implemented and used within companies. It entails innovations that should be considered within companies' business models. Thus, now it's time to consider managerial implications around blockchains and their usage.

Referring to the music industry solely, the cited authors agree that the adjusted application of blockchain technology would solve problems with royalty payments for artists, money transfers for content producers and access to information about ownership among the others, ensuring transparency and security of all transactions. As it was mentioned before, there is an increasing need to create a common platform that would provide an unrestricted access to payments' information, history of content exchanges, copyrights and tools for artists to be paid more effectively. Nevertheless, there are opinions that its quite too early for this technology to be

implemented, but there are strong premises that it will be useful as a solution to influence and reshape at least some parts of the industry.

In "*Blockchain adoption: A value driver perspective*" (Angelis & Ribeiro da Silva, 2018) the authors present and discuss four stages of blockchain technology development also reminding that underlying technologies have already been existing for years, but now they are used in another, novel way. From this point of view, business rules and fundamentals should remain untouched, but in contrary technology development causes emergence of new concepts, solutions, services and products. Literature provides reasonable premises that present a blockchain technology as a new and disruptive player in the digital world.

The most significant advantage relates to transaction cost and `third-party institution', the `middle-man', that constitutes trust and security of any transaction. Blockchain technology will presumably not eliminate intermediaries but will modify approach, how businesses are acting and responding to other players' operations on the markets – it's innovative tool that forces companies to consider novel ways of doing business and at the same time enables to introduce an active process of reshaping business models in order to redefine creation and delivery of the value. As it was stated before, implementation of blockchain technology may lead to "*the reduction of operational costs, shorter settlement time, reduction of risk, new revenue opportunities, and a reduction in the costs of capital.*", what means that "*blockchain has an opportunity to create benefits beyond digital currencies and influence all sectors of the economy*." (Morkunas, Paschen i Boon, 2019).

Some of the authors agree that blockchain technology has a potential to "*reduced role for one of the most important regulatory actors in our society: 'the middle-man' "* (O'Dair & Beaven, 2017), but at the same time removal of intermediaries would generate new and unexpected challenges that should be always taken into consideration while discussing this issue. There is also a statement, that institution of 'middle-man' will remain, but the concept and a way of shaping transactions should be adjusted to the new technological environment. Thus, general tendency states that *"in terms of music, blockchain technology does offer at least the potential of a truly networked record industry"* and *"the 'technological shock' of blockchain technology does at least bring with it the potential of economic sustainability—for artists and, it seems likely, for industry intermediaries too."* (O'Dair & Beaven, 2017). What has to be considered referring to third-parties is that a new, upcoming development probably won't start a

revolution and eliminate intermediaries from a value chain. Tendency shows that implementation of new technologies should be a trigger to rethink and reshape business model in order to adjust it to a new reality. Thus, blockchain technology and its implementation within music industry would be a game changer. Nevertheless, this technology is still on initial phase and needs more research and improvements in this field, even though benefits theoretically, are clearly defined. There are some limitations and issues that need to be solved, as insufficient knowledge and usage of cryptocurrencies. Same situation relates to revenue streams. It is still unclear how to reach future consumers, as the society have a limited knowledge about blockchains and how they could benefit from its active usage. There is a lot to be researched within the music industry as *"not only literature is limited, but also the perception of the effectiveness of the technology to this industry in particular."* (Sitonio & Nucciarelli, 2018).

In many publications an emergence of smart contracts is presented as a tool that might have a significant impact on problems that music industry is struggling these days. Smart contracts could ensure data security and trust among engaged entities, as they consist of information about the ownership, payment right etc. Because of that, they could "*allow music royalties to be administered instantaneously, with distributions provided to both composers and performers in real time."* (O'Dair & Beaven, 2017). However smart contracts are still under development and need more technical, organizational and legal regulations before they will be implemented in the whole ecosystem. Moreover, smart contracts are made in the way that they can't be modified or changed at all, so there is still a need for improvement. The music industry is characterized by a frequent change in contracts between artist, record labels, producers etc. There are opinions that ubiquitous enthusiasm, that blockchain technology might be a magical solution for all music industry problems can be premature. Nevertheless, there are three areas that might benefit from this tool: *"accuracy and accessibility of copyright data; speed of royalty payments; and transparency of the value chain."* (O'Dair & Beaven, 2017).

Few researchers also refer to the issue of establish control over intellectual property's transfers, noticing that "*the most important principles of blockchain functioning are "if you don't pay – you will not get it" and high "hacking resistance" attract attention of the market participants.* (Shatkovskaya, Shumilina, Nebratenko, Isakova, & Sapozhnikova, 2018). A matter of intellectual property rights is included in digital rights management and, regarding to

blockchain technology, lack of unsettled rules, law and standardization. Researchers agree, that establishing standards in the DRM domain is an increasing necessity, because of the companies that prefer to handle their own technology and the diversity of the digital content. Since the blockchain technology is still at the initial phase of improvement and there is a lot to explore, researchers highlight the increasing significance of its development in the future and possible outcomes that may emerge from constant studies within this field.

3. Methodology

In this chapter we clarify how this study is carefully developed throughout a rational qualitative research which is based on an exploratory study. First, we address the research philosophy that further allow us to explain the approach to theory, the main steps of understanding the methodological choice, research design and the research strategy. Afterwards we describe the process of how we have collected and processed our empirical data to retain and present a reliable and serious research.

3.1 Research philosophy

The main purpose of our research should embrace development of a new knowledge in particular field as "*the term research philosophy refers to a system of beliefs and assumptions about the development of knowledge*." (Saunders, 2016). Following the theory, researchers, in order to provide coherent project at every stage of the process, makes a number of types of assumptions. In our research we are focusing on the knowledge of the new technology of blockchain, which is based on earlier studies and combinations of interviews from different experts. This data is considered valid and legitim and a way of communication knowledge to others, which in our belief follows the research assumption of the epistemology. Another concern to approach the research is looking at the paradigms of organizational analysis. We have been approaching the research with a view of achieving fundamental change, which is formed from the knowledge and understanding of Gramex's work structure and how they are doing business. We have been put into the understanding of the problems that Gramex are struggling with, in a way to find a radical solution. Here it has been important for us to have an objective mind, to understand and learn without input from earlier work or knowledge. Getting to the result of this research we have therefore based our research on the combination of objectivism and radical change, which is the approach of the radical structuralist paradigm.

Our set of believes and knowledge predictably influence how we understand questions, methods we use and how we interpret findings. It means that, "*a well-thought-out and consistent set of assumptions will constitute a credible research philosophy, which will underpin methodological choice, research strategy and data collection techniques and analysis*

procedures. This will allow to design a coherent research project, in which all elements of research fit together." (Saunders, 2016).

We do believe, that each philosophy has something to propose and can adjust value but we are more prone towards interpretative philosophy because, as mentioned our research started with an observation of existing phenomenon, that is embedded in real-life context. In this particular case we chose to predicate our study on qualitative method of data collection, as this procedure enables in the most viable way, gathering needed features. The Qualitative method provides capabilities to investigate a described issue in a deep manner and rapidly react on changes and new knowledge that emerge in the process of conducting a research. This is associated with interpretative philosophy, because "*researchers need to make sense of the subjective and socially constructed meanings expressed about the phenomenon being studied. Such research is sometimes referred to as naturalistic since researchers need to operate within a natural setting, or research context, in order to establish trust, participation, access to meanings and in-depth understanding*." (Saunders, 2016).

The process of conducting proper research is based on choosing the consistent approach to theory development.

3.2 Approach to theory development

To be able to answer our research question, it is important for us to focus on the approach to the theory. Our research has raised from an observation of real-life phenomena and we experience that the blockchain technology issue, is a topic that nowadays emerges in almost every industry. This technology is still in an initial phase and yet, there is a lot to discuss.
We are going to explore the possibilities of usage of blockchain technology within the music industry, moving back and forth from the inductive and deductive approach in order to combine them. The combination of these approaches is called the abductive approach and "*begins with the observation of a 'surprising fact'; and then works out a plausible theory of how this could have occurred."* (Saunders, 2016). We use data collection and the concept of business models to explore the theory behind transaction costs and innovation in order to answer the question, how the blockchain technology can help Gramex within their business model to lower transaction costs and make their business model more efficient. Next, in the deductive

approach it is possible for us to test the theory in practice, which makes our research more reliable. This makes it possible for us to build a bridge between field and theory, which is necessary in order to examine the use of a new technology.

3.3 Methodological choice

The abductive approach to theory is regularly used in qualitative studies because of its way of working with the theory development as explained above. Apart from that, our research also takes part in a new field of knowledge, which depends on knowledgeable participants for interviews. Therefore, based on the abductive approach and the participants perspective and knowledge, the qualitative methodology is chosen for this research. Working with the qualitative study has been based on semi structured interviews with participants within the knowledge of blockchain, employees at Gramex and different participant connected to the music industry, who will be presented in the following sections. Collecting data based on the verity of the participants helps us with theoretical contribution and make us able to understand and apply the collected data. These collected data lead to a multi-method qualitative study that works within a non-standardized framework, which means that the research process can be changed throughout the research if any questions or procedure emerges. (Saunders, 2016)

3.4 The purpose of the research design

Based on our descriptive research question which typically is built from the `how´ or `what´, it relates to an exploratory research design. This exploratory research design is particularly relevant for our research, that we aim to study the relevance of blockchain implementation within Gramex's business model. In the nature of the exploratory research it gives us the opportunities to conduct information, which include search of literature and interviewing experts. The important part for our study is that the interviews is allowed to be semi- or unstructured, which we have been using when conducting data. Our data collection therefore has a large focus on the quality of the contributions from the participants, because this topic relies on experts. What has also been important for our research is the flexibility, that gives room for changes, as we have worked within a field of a new technology.

3.5 Research strategy

In our research we are following the strategy of a case study in order to investigate in-depth, how the usage of blockchain technology can influence the structure of Gramex within the music industry. Our research is developed from the insight knowledge of the structure and workflow of Gramex, where we are looking at the benefit of blockchain due to restructuring workflows. Furthermore, is the understanding about Gramex dynamics also very important, which also refers to a case study. *"The interaction between a phenomenon and its context is best understood through in-depth case study"* (Dubois and Gadde cited in (Saunders, 2016)). We are looking at the real-life setting within Gramex, which also indicate that this distinguished the exploratory case study from other strategies. Furthermore, a view on the strategies are divided within to dimensions. In our case, we are looking at a single case, which is the case of Gramex and its way of structuring and performing their job. Therefore, the strategy that we are using is the single case embedded case study. It would be possible to discuss the choice of using the single case strategy, that it is possible to replicate this study into other companies like Gramex, to make them more efficient, but Gramex is the monopoly which is the choice for the strategy.

3.6 Case selection

3.6.1 Gramex

Gramex is a nonprofit members organization with around 30 employees, it is founded in 1963 by IFPI Denmark and the common council of executive artists. IFPI Denmark is the record companies' organization where the common council of executive artists is based on the many unions and federals concerning Danish music. One of the main reasons why the foundation of Gramex was built was the Danish singer Aksel Schiøtz who is famous for his interpretations of Danish songs during the occupation. When he was not able to sing live after his sickness, the radio stations started to play his music without payments. Many found this disturbing and this was one of the reasons that musicians got their legal rights written into the copyright Act in 1963.

Gramex is a company that collect payments on behalf of performing artists and record companies when their recorded music is played publicly in Denmark. Therefore, as a costumer

at Gramex they make sure that no one have to figure out how to pay the legal rights. This is done by making agreements of payments with radio- and tv-stations, cafes, stores, fitness clubs and everyone else who plays public music.

3.6.2 Gramex ecosystem

As explained above, Gramex is the central player in the matter of obtaining the payments of digital rights. They are collaborating with all the Danish singers and record labels in Denmark,

which means that they have monopoly. This is possible because Gramex is approved by the Ministry of Culture as the only organization in Denmark taking care of all legal rights connected with music[2]. The collaborations between artists and record companies are handled equally and are handled both technically and manually. An artist is registering online with all the details, where the song or album has to be manually listened to, for the security of piracy and also to prevent misunderstandings in the use of the songs. Both artist, songs and labels are then registered by a coded number that allow Gramex to specify the songs and people involved. As stated, the earned money from the digital tights are split 50/50 between artist and the record label, which raised the question of how Gramex is payed? Gramex and their employees has fix costs and in the end of the year, when everyone is payed their share, Gramex starts by taking their part to cover the expenses. Another important aspect in this monopoly is the equal management of all the artists. Even if an artist can live from his earnings or if the artist only creates one song, both artists are getting the same managerial hours to secure and select the earnings. Looking at the threats or competitions, Gramex is experiencing a new threat which comes from the development of online shopping. Many stores are closing and putting their products online. This is a huge threat, because the payments from the stores are disappearing. Based on this, a new competitor has threatened Gramex, which is called ´royalty free music´. The people behind this is making a business, based on a cheaper music platform, that many of the public places prefer because of the low costs.

[2] http://gramex.dk/om-gramex/

3.6.3 Stated problem

The problem stated by John (CEO of Gramex) is based on the structural difficulties, that too many resources are used on gathering information about the digital rights of the played music. Almost half of the employees are hired to solve this administration. It is too time consuming for the employees to keep an eye on, who and where the rights of the songs are connected to everyday. Danish songs are connected with Danish record labels which is the easy part in this situation. Because looking at international songs played in Danish radio or public events, they have to manage how many minutes the song has been played and pay the right owners. Listed above is also the issues about putting the same effort in songs no matter how much they earn. This is placed as a problem because if Gramex wasn't the only one allowed to handle the digital rights, they would have had the opportunity to distinguish the songs that was not profitable. A process like this has a lot of transaction cost linked to it, which is found in time and expenses. Furthermore, the problem based on the new competition on the market, it is challenging their business model, which also made them interested in the blockchain technology based on a solution with costumer segmentation and access to different music catalogues.

3.7 Methods of data collection

This subsection elaborates on the selective process of gathering primary and secondary data. Our primary data is conducted through semi structured interviews and is then supported by our secondary data which is based on relevant literature, publications and online articles. This section is very important for defining the scope of the research. Thus, we are also elaborating on the advantages and disadvantages for the data collection and why we have chosen to do the data collection this way.

3.7.1 Primary empiricism

This section describes how we have collected our primary data and who we have been interviewing to get the best knowledge for this research.

3.7.2 Semi Structured interview

In the process of collecting primary data we have chosen to use the semi structured interview. This type of interview is an essential way for us to collect data, that the questionnaires are used as a guideline throughout the interviews. This means that we have prepared the questions within different topics which guides the interview, but at the same time vary the order of the questions and makes the opportunity to add new questions to the interview (Saunders, 2016). Our semi structured interview is built around `open questions´ which makes it possible for the participants to describe and define specific situations or facts as they wish. This type of interview fits our research that many of our interviews are collected from specialist and CEOs. They have more knowledge of our topic and therefore it benefits us when they supplement the interview with their knowledge. Furthermore, is it possible with the semi structured interview to use *probing questions* which makes it possible for us as interviewees to explore the responses that are at interest for our research question further.

3.7.3 Preparing the interviews

Before conducting the interviews, it is important to be prepared to get the best possible outcome. This preparation was first based on the literature review, that gave us the basic knowledge within the blockchain technology and made it possible to ask the right questions. Next in the process of preparing the interviews we have been focusing on the five p's: *Prior, Planning, Prevent, Poor and Performance* (Saunders, 2016). Initially, we have been focusing on the *priority*, which is to get all the fundamental knowledge of the company before contacting them. This gave us a better chance of reaching Gramex and the right participants for our interviews. To get the right person for the interviews also increases the credibility of the interview, which is very important for a good research. Next is the importance of *planning* the unstructured interviews, which requires a lot of consideration. This takes focus in an interview guide which has been redefined throughout the process. This will be further described in the following. By putting effort in to priority and planning, we have a good chance of *preventing* lost time and data. It is very important that we work within a limitation on time. Furthermore, a good prosses is also a way to prevent a *poor* interview and ensure quality in the data. Finally, to get the best performance we provided the interviewees with the interview guide before the interview, for them to be prepared with the best possible responses. Furthermore, both of us

had a given role before conducting the interviews, that one was the main interviewer and the other one was taken notes. This was to eliminate confusion and to help with overview of the questionnaire.

3.7.4 Selection of interviewees

TrustWorks

Henrik Hvid Jensen is educated MsC, Computer Science and Personal Certificated Scrum Master. He has worked within the interest of corporate blockchain in bigger companies as Maersk Line and TrustWorks. He is passionate about understanding digital business potential and combines his passion and professional live, when helping businesses to understand, how technologies will shape business models and processes. Currently his passion is facilitating global trade through a commercially, politically and competitively neutral decentralized platform, based on blockchain (Jensen, 2019).

Based on the knowledge of blockchain, we have chosen to interview Henrik to get the best understanding of this technology for our case study.

Media at hand

Allan Hammershøj, Chief Operating Officer at Media at Hand.

He has an M.Sc. degree in electronics and many years of experience in major international research projects within telecommunications. Allan knows a lot about video streaming standards, and he keeps an eye on the development of smartphones, broadcast standards, encoding technologies, and much more[3].

With a long background within IT and systems, Allan is interviewed to give us a better understanding of the possibilities within IT systems and also to give us a broader knowledge about the digital right management and how it has developed.

Gramex

John Robert Kristensen has the last 20 years been working with strategy, management and sale. He has been working within a long list of senior positions in international companies, among other things he has a past as CEO at Nokia, Nordic marketing manager in Blaupunkt, marketing manager in Canal Digital and senior advisor in Dansk Industri. He is educated cand.merc.

[3] https://www.mediathand.com/#_about-us

(Management of Technology) and is now working as the CEO at Gramex, where he manages rights for executive artists and record labels (Kristensen, CEO at Gramex, 2019).

Being the CEO at Gramex, an interview with John would be needed, to ask about and understand the interest for blockchain, which also would give us the understanding of the stated problem in the company.

Kikki T. Mortensen and Lars Riis Korsholm are both employees at Gramex. They work with the collection of the different rights regarding artists and record labels. The interview with Kikki and Lars was to support our knowledge about the ongoing tasks and how they are done.

3.7.5 Interview guide

As noted above we collected our primary data through semi structured interviews. To be able to keep a structure throughout an interview and to be sure to collect the correct data, it is important to make an interview guide. The interview guide is built around the research question, which makes it possible to divide the questions into priori topics or themes. By doing this, we are ensuring to get around the relevant theory for the project. Furthermore, this also gives us a better change to ensure that we go through all the questions that we need to be answered. As mentioned earlier, the semi structured interview can vary from the questions asked and with a manageable interview guide this makes it possible without ruining the interview. In order to operationalize the theory, we have been focused on omitting the theoretical terms (Saunders, 2016). The interview guides can be found in the appendix 10.1.

3.7.6 Secondary empiricism

To be able to use and support our empirical data, our secondary data such as reports, point of view papers, academic journals, books and additional information found on the internet, has been used as well to give the foundation of the section - findings and discussion.

3.7.7 Becoming familiar with the data

At this time in the research we became familiar with the conducted data by making transcripts of the interviews. By doing this we have been able to look for continuous themes and data from the interviewees, to help us understand the blockchain technology and how it can help Gramex

with their internal issues. This has therefore been important for us in our data analysis (Saunders, 2016).

3.7.8 Coding

When working with an exploratory study and to be able to analyze qualitative data, it is necessary to code the interviews that have been conducted. Therefore, based on our approach to the theory, we have coded the interviews in 3 stages. The first stage of coding was pre-coding the interview guide, which as mentioned, is divided into priori topics. These topics are created based on the theory and is therefore a first step of the *priori coding*. After conducting and transcribing the interviews, we used NVivo, which is a technical program that makes it easy to navigate and to code the many interviews and quotes. The second stage of coding was to *priori code* the qualitative interviews derived from the existing theory, where we afterwards made a more data driven coding where *in vivo coding* was used to code the terms used by the participants. To be sure to work within the relevant topics for our report, our defined research question helped us to select which data to code with the purpose to be able to answer the research question.

Throughout the stages of *in vivo* and *priori coding*, we have been aware of the danger of becoming lost in the multiple terms, which was one of the reasons why we *priori coded* the interview guide for a start. Our coding and transcription can be found in appendix 10.2 & 10.3.

3.7.9 Reliability and Validity

Taken into consideration that our research is based on a technology that is in its development, it is very important for the reliability of our research that the methods are correctly defined. Reliability is the base of credibility and consistency. We are maintaining this through the whole research and therefore it has a high reliability, which means that our qualitative study would be able to produce the same answers, even though new settings or people where asking the given interviewees. Reliability is also important in the context of the interviews, reflecting on the findings. Therefore, to avoid interviewee bias, it has been important for us to be aware if the participants attempt to hide data, if they affect other interviewees to change their views or if they attempt to have more knowledge than they actually do. Furthermore, it has also been important for us to focus on the interviewer bias, where we have been aware of not to ask

leading questions to form the interview. Another important aspect that has been paramount for the case study, has been the focus on participant bias. For us to get the right information and knowledge about this new technology, we had to be sure to get in contact with participants who had enough knowledge about this topic. Further, all of our interviews have been face-to-face, which also makes it easier to understand and read the faces of the participants. We experienced in one of our interviews, a lot of background noise and people walking around, where we had to ask for a new setting of the interview. Because the setting of the interviews is important during the gathering of data, that this topic is very technical and complex, to be able to focus and not be interrupted. We have managed to get a good representative of interviewees within this topic, who have expert knowledge about blockchain, digital rights, technology, innovation and the structure of Gramex.

The reliability of the search of secondary data also is an important role of getting the right material. In this case the authors of the written material must be acknowledge within the field of blockchain or any of our theory-based topics. If any of the collected data is of poor quality, it will damage the reliability of our research.

The validity of this research examines if we are going to find out what we are stating in our research question. By focusing on the correctness and the validity of the chosen methods throughout the research, a high validity has been achieved. Our focus on gaining knowledge about the different views on the theory and the blockchain technology, has given our research the best possible argument for the assumption of this research. The first meetings with Henrik established our knowledge within the theory of blockchain, which raised the validity of our findings. After conducting the analysis, it was possible to test the validity of the theoretical discussion and its correctness. In order to do this, we arranged an extra meeting with Henrik from *TrustWorks* and two employees from Gramex, Lars and Kiki. The knowledge we got from them forced us to conduct an even broader, in-depth analysis. As a result of this process, we revised the previous idea and created a new vison of a possible solutions for the company. With this validity we ensure that our findings are applicable in real life context.

3.7.10 Sub-conclusion

To sum up the methodology in this research, our belief follows the research assumption of the epistemology. Where another approach looks at the organizational paradigm, where we are following the radical structuralist paradigm. This is based on the way we are gathering the information and how our attitude towards new knowledge is. This is associated with interpretative philosophy because, "*researchers need to make sense of the subjective and socially constructed meanings expressed about the phenomenon being studied. Such research is sometimes referred to as naturalistic since researchers need to operate within a natural setting, or research context, in order to establish trust, participation, access to meanings and in-depth understanding*." (Saunders, 2016). Our approach to theory is based on the abductive method, as we are working both within the inductive and deductive approach, to gather information and test this theory afterwards.

Our methodological choice is based on the multi-method qualitative study, that we are gathering all our primary data from a variety of participants and have the opportunity to change the direction of the research if needed. Our research is based on a new technology that has not been discussed much yet, which have made it necessary for us to have an exploratory research design, with the use of semi structured interviews. Further, our research is looking at one particular business, where we in-depth are understanding and learning about this company, which base this strategy on a case study.

4. Technology

4.1 Blockchain

"Blockchain is believed to be the component that completes the Internet puzzle and makes it more open, more accessible, and more reliable" (Drescher, 2017) .

The new disruptive technology that has benefitted areas like politic, economic, humanitarian and legal system with the currency of bitcoin and blockchain, makes it clear that this could have the *"capacity for reconfiguring all aspects of society and its operation."* (Swan, 2015). Blockchain has been broken down into, for now, four types, for the organization and the convenience that each type is profitable in different ways. Blockchain 1.0 is the "*development of cryptocurrencies in applications related to cash – currency"*. This is based on currency transfer, digital payment and remittance. Blockchain 2.0 is based on *contracts,* that handles "the entire slate of economic, market, and financial applications that are more extensive than simple cash transactions ." (Swan, 2015). This is based on bonds, stocks, loans, futures, mortgages, smart property, titles and smart contracts. Blockchain 3.0 is *applications,* which means that applications that run on peer-to-peer ledgers are being developed. Last, blockchain 4.0 which is functioning on algorithmic management (AM).

Further, "*When people get into blockchain, there's a natural discussion about what type of blockchain, because blockchain comes in many different types."* (Massessi, 2018). The different types normally discussed are the public vs. private blockchains. The different between them is seen in the way of who is able to put data in to the system.

There are many types of blockchain, Ethereum and Bitcoin is one of those, that are used in public platforms. Where the private blockchains uses platforms like, Hyperledger, Corda, Hashgraph, etc. talking about these two types of solutions*, "we see the public blockchains tend to focus more on Business to Consumer scenarios, whereas private blockchain are really well structured to Business to Business scenarios, supply chain, value chain relationships or creating any kind of shared infrastructure between enterprises."* (ibid.)

But what is often left out, is the idea of open vs. closed blockchains, which brings into reflection, who can read the data from this blockchain. Should it be readable for everyone or just for some collected parties?

To know what solution is going to be best for each content, it is important to consider whether it is public vs. private or open vs. closed.

4.1.1 Blockchain 1.0 – Currency

Blockchain technology has made its public debut in 2008, when Satoshi Nakamoto released the whitepaper "Bitcoin: A Peer-to-Peer Electronic Cash System". That was the first introduction of a new cryptocurrency named Bitcoin, which was described as "*a purely peer-to-peer version of electronic cash that would allow online payments to be sent directly from one party to another, without going through a financial institution*." (Nakamoto, 2008). The peer-to-peer system a explained as a "*distributed software systems that consist of nodes (individual computers), which make their computational resources (e.g., processing power, storage capacity, or information distribution) directly available to another"* (Drescher, 2017). The user's computers turn into nodes of the system, when they are joining the peer-to-peer system, these are equal concerning the users' roles and rights. Although some will respect the resources, they contribute more than others, everyone in the system have the same responsibility and functional capability (ibid.).

In order to elaborate on the idea behind blockchain, there is no other way than to start with a short introduction to the cryptocurrency called Bitcoin that was tightly intertwined with blockchain technology from its beginning. This cryptocurrency was proposed to the wider `audience´ - future users - in 2009. Creating Bitcoin was only possible because of the blockchain technology emergence and development.

In its core, blockchain is an open, decentralized and public ledger that can storage digital data – information. From a technical side, blockchain consists of connected nodes that saves, and records all proceeded transactions – when information about transaction, that happens online, is once added to the database in a shared network, it cannot be changed (Figure 1). Mentioned database "*is shared by all network nodes, updated by miners, monitored by everyone, and owned and controlled by no one. It is like a giant interactive spreadsheet that everyone has access to and updates and confirms that the digital transactions transferring funds are unique."* (Swan, 2015)

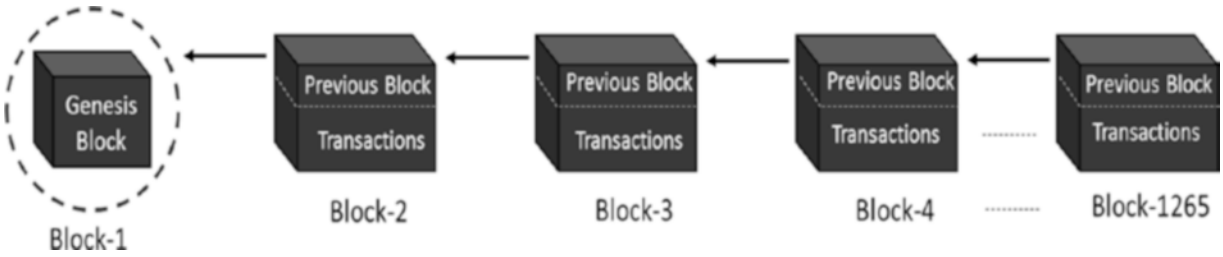


Figure 1 – The blockchain data structure (book beginning blockchain) (Swan, 2015)

It enables to proceed transactions between two parties without a third-party authentication, also called a `middle-man´, who ensures the trust. Usage of this new technology enables to reduce the cost of transaction, that blockchain "*provided the answer to digital trust because it records important information in a public space and doesn't allow anyone to remove it. It's transparent, time- stamped and decentralized*" (Marr, 2018). The most important part in the way of secure blockchain is the hash function. This function transforms any kind of data into a unique number, transformed by small computer programs, which is so complex that it is hard to hack. Compared to the length of the hash value, there are many different kinds of hash functions, an important one is the "cryptographic *hash functions, which create digital fingerprints for any kind of data."* (Drescher, 2017).

It's been said that "*Bitcoin and blockchain technology, Bitcoin, at its most fundamental level, is a core breakthrough in computer science"* (Swan, 2015). In fact, it is solving one of the biggest and long-lasting issues related to digital cash, described as the double-spend problem. It means that before blockchain cryptography, there was no reliable way to guarantee that the digital cash used in particular transaction wasn't copied before and spend in a previous transaction. This limitation required existence of an institution that would be able to confirm the payment, its legality and to guarantee the trust. These third-parties among others are banks and for example online payment services like PayPal. Swan puts emphasis on blockchain's trustless "*in the sense that a user does not need to trust the other party in the transaction, or a central intermediary, but does need to trust the system: the blockchain protocol software system.*" (Swan, 2015). The starting point for this project was related to blockchain's attributes that "*any transaction can be sourced and completed directly between two individuals over the internet*" (Swan, 2015) and its usage for any online action that requires secure, recorded transactions. Evolution of blockchain allows to implement its technology and solutions in many different

fields as supply chains, transportation, healthcare or media – areas not only related directly to finances and money transfers.

There is still an ongoing discussion regarding intellectual property rights – verifying and tracking ownership. How will blockchain technology change the rules of it? How do we use new technologies and emerging opportunities to ensure fair rewards for digital content? To show the content of a ledger, it can be seen as a concrete mapping of the property between owners as shown in figure 2. The top layers are more general, where the those in the lower layers contain more general information (Drescher, 2017).

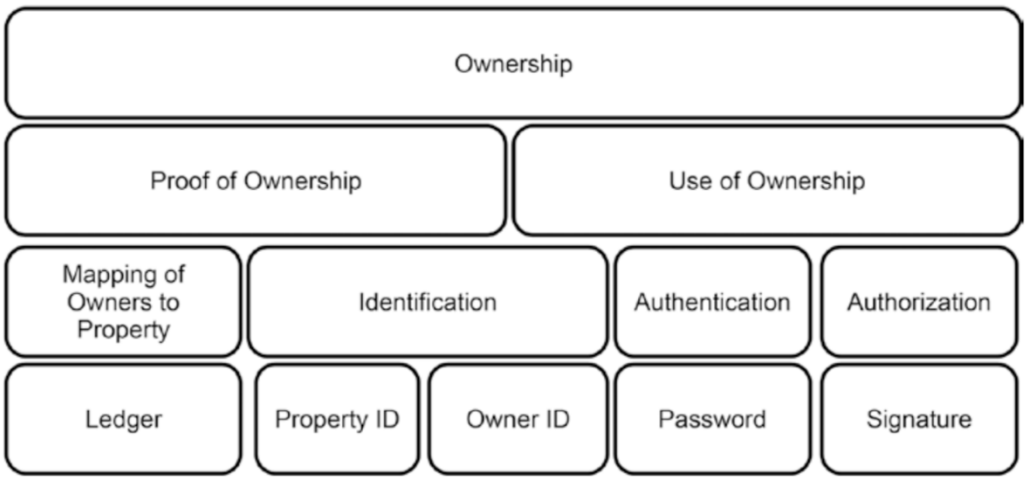


Figure 2 - Concepts of ownership (Drescher, 2017).

4.1.2 Blockchain 2.0 – Contracts

Next step taken in the blockchain technology development emerged from explicit demand to provide more complexed solutions for different property and businesses, without limited focus on cryptocurrencies and its exchange. Therefore, blockchain 1.0 is developed for the decentralization of money and payments, where the key idea of blockchain 2.0 is further developed to exchange value in a peer-to-peer and decentralized manner. The higher level of improvement also contains possibility to register, confirm and transfer a `value´ that runs on smart contracts. These smart contracts go beyond the simple sell and buy cash transaction, as they have more imbedded instructions and information in them. It means, that each file, data, information that would be exchanged between peers, would involve a digital form of contract that settles conditions of the transaction. These contracts could be financial transactions

including private equity, crowdfunding instruments, pension, bonds and all manner of derivatives. Smart contracts also include public records as land and property titles, business licensing, death certificate, marriage certificate and vehicle registration. Furthermore, they are also exploring the physical asset key, which are encoded as digital assets in blockchain and used for controlled access to cars, homes or hotels. Smart contracts also elaborate on the intangible assets, applying technology that runs on smart contracts would solve problems with establishing clear legal regulations about provided digital content and its ownership, which include copyrights, trademarks, patent, domain names and reservations, that also can be protected by blockchain. This is a big step in the way of protecting intellectual property (IP), which is done by different registrations of specific daytime stamps for future proof. These hard and intangible assets registry is all part of the smart property (Swan, 2015).

What differs smart contracts from a normal contract is the trust issue. Usually you have to make a contract to trust someone in their act, but a smart contract "(…) *is both defined by the code and executed (or enforced) by the code, automatically without discretion.*" (Swan, 2015). What makes a smart contract distinct is based on three elements:

Autonomy, which means that, after it is developed and up running, a further contact has to be established between the contract and its instructing agent. Where smart contracts also might be *Self-sufficient* in their ability to arrange resources – which lays in the ability to raising funds by `issuing equity´ or `providing services´ and using them on resources that are needed (processing power or storage). The last element in smart contracts puts value in the fact that they are *decentralized,* that they do not work on a `single centralized server´, they are `self-executing and distributed´ across network nodes (Swan, 2015).

What is important to know about blockchain is that: "*Contracts do not make anything possible that was previously impossible; rather, they allow common problems to be solved in a way that minimizes the need for trust."*. By minimalizing the trust, things often get more convenient by removing human judgement in the equation and then allows complete automation (Swan, 2015).

4.1.3 The Future: Blockchain 3.0 and 4.0

Next version of Blockchain technology, also called Blockchain 3.0 expands the *"focus further to incorporate decentralized applications (dApp)."* (Angelis & Ribeiro da Silva, 2018). It means that applications that run on peer-to-peer ledgers are being developed. They are designed in the same manner as blockchain itself in its core, so it will be transparent, safe, resilient and with clear structure. The newest update concerns inclusion of artificial intelligence (AI), that *"is based on probabilistic theory to express uncertainty. It is constantly changing, and the algorithms are projected to guess — or make assumptions of – reality*." (Angelis & Ribeiro da Silva, 2018). On the other hand, blockchain technology is characterized by its accuracy, reliability and safety, as it works on well-established technology that uses algorithms. This complexed solution, that emerges from combining two distinct applied mechanisms, will probably be used to fix complicated and engaging problems. As Angelis & Ribeiro da Silva (2018) explains *"AI allows computers to learn from accessible data, while blockchain provides data accuracy, which is useful for feeding data into the AI system and for recording its outputs*.". Referring to Blockchain 4.0 edition there is also a matter of algorithmic management (AM), that is an automated decision-making process. The core of this system is founded in the function of AM, that enables to gain efficiency, when *"the optimizing algorithms analyze large data sets to better control processes and maximize predefined outputs such as costs or revenues."* (Angelis & Ribeiro da Silva, 2018). Because of applied technology and systems that are based on algorithms characteristics, algorithmic management can be implemented only in well-structured settings, where predictions are easy to establish. Nevertheless, evolution of the blockchain technology allows us to assume that in the future it is going to exceed those limitations. What's important is that blockchain technology used with artificial intelligence *"is useful in environments in which traceability and immutability are highly valued. In other circumstances, the AI function may instead be directly linked with the decision making without the reliance on and use of a decentralized database."* (Angelis & Ribeiro da Silva, 2018).

4.2 Technology development in the music industry

Music has been present in humans' lives throughout ages, but in fact only in the last three decades it faced significant breakthroughs, that have changed the whole industry and the way

the music as a medium is perceived. Following Patrik Wikström (2014): *"The overall music industry is based on the creation and exploitation of music-based intellectual properties. Composers and songwriters create songs, lyrics, and arrangements that are performed live on stage; recorded and distributed to consumers; or licensed for some other kind of use, for instance sheet music or as background music for other media (advertising, television, etc.)"* (Sitonio & Nucciarelli, 2018). Till the beginning of the Internet era and the rapid increase of its importance, which has changed the whole landscape, the music industry had been pretty stable. The rules were simple, based on the record labels' control over the artists and market, and the whole sale was physically handled as tapes and CD's, which was sold in a retail music shop. The control over the entire supply chain was on the side of these record labels, including all the data from the transactions. "*This suggests that any possibility for data managing with innovation objectives would not be available for artists*." (Sitonio & Nucciarelli, 2018). The first turning point came with the digital revolution that caused decreasing importance of physical distribution. The exchange of music has never been easier, as an access to the files started being provided through the internet, which means that all the rules have changed.

4.5 Digital Rights Management

The creation of human intellect was first mentioned as Intellectual property (IP). This protection was handling legally rights that was a part of the creative and innovational work of physical products, work of the mind, land and other tangible resources. IP is built from to categories which is handling "*Industrial Property- (Patent, industrial design and trademark)" and "Artistic and Literary Property- (copyright)".* The organizational or individual rights awarded by the society is intellectual property rights (IPR) which manage the rights of inventions, symbols, image, names, literary and artistic work. The IPR secures that no one else makes unauthorized use of the creator's property. As stated above the advent of the information technology and the internet, managing IPR has been very difficult, especially copyright.

Based on the evolution of technology, the situation for right holders has become critical. The combination of powerful computers, large media storage and file sharing has become a possibility. The internet has now made it vulnerable to copying and distributing all content. What started with CDs and physical books and movies, is now products that can be digitalized,

which faces a decline in their revenues due to the widespread of the content. The publishing and information industries have the foundation of copyright but based on the new internet-based technology a supplement to this is Digital Right Management (DRM). (Chaudhuri, 2007)

4.5.1 What is DRM?

DRM is a technology which is managing certain permission and restrictions. It is based on techniques which makes it possible to use information about the *"(..) rights and the rights holders to manage copyright material and the terms and conditions on which it is made available to users."* (Chaudhuri, 2007). These permissions and restrictions are not the same as copyrights, which means that copyright is not implemented in the DRM and therefore cannot replace the traditional framework of IP law. That's why it is a supplement to the IP. DRM can be understood in two ways: *"Management of digital rights: The responsibility of expressing and managing the rights to content in electronic or digital form, as a corollary to content in print."* or *"Digital management of rights: The ability to physically manage intellectual property and proprietary rights in content by way of an electronic system or process associated with copyright management systems."* (ibid.).

The term 'rights' it is to be understood, that it is the content of the work that is in digital form, not the managing of the content. Looking further into the functional aspect of DRM, it can be divided into two areas. The first part is located in the identification and description of the IP, regarding rights and parties involved in the creation. The second aspect is the technical implementation of usage restrictions. DRM may therefore be explained as; *"The technologies and/or processes that are applied to digital content to describe and identify it and /or to define, apply and enforce usage rules in a secure manner."(ibid.).*

DRM has three perspectives: Legal, social and technical. The technical perspective on DRM is located in the rights specification language, trust infrastructure and the electronic package controls. This involves elements that in combination are used to protect and secure the content, where the mathematics of cryptography is used the most. These elements are (Chaudhuri, 2007):

Encryption	Digital certificates	Access control	Trust infrastructure
Public/private keys	Watermarks	Authentication	
Rights specification language	Secure communication controls	Secure content storage	

And the legal perspective involves:

Legislation	Compliance	Investigation	Enforcement

Even though a lot of elements are possible to implement to the content, DRM cannot completely secure it. As well as the technology is evolving, so are the motivated hackers, with sufficient time they can hack most of the encryption systems. Even with the social perspective, that involves education, ethics and expectations, people can still copy copyright content. This can be based on low knowledge about the issue or that they choose to ignore it (ibid.).

5. Business model

The history and the concepts of business models are examined in this section in order to explain internal and external changes within the company, to make a use of new technology.

According to Ghaziani and Ventresca (2005) it was in the early 1970s that the public started talking about "business models", which later grown in to importance in the halfway 1990s together with the appearance of the digital economy (Fielt, 2014). In the late 1990s the academic exploration on business models appeared with early work from Timmers (1998), Weill and Vitale (2001) and Afuah and Tucci (2001), although some also mention Drucker´s "theory of business" that appeared earlier (Drucker, 1994). Every company has a business model and have been replied for enterprise performance and an important point for innovation (Lambert & Davidson, 2013 cited in (Fielt, 2014)). As Hamel beautifully describes the important role of the business model concept in innovation as it *" also encompasses the business model used to commercialize the product. Without a successful business model, there is no innovation, just invention"* (Hamel 2000; cited by (Schoen, 2005.)).

Even though many academics stress the importance of business modelling, it is still difficult to place it within one model, that there is still not a general accepted definition (Al-Debei & Avison, 2010; Morris et al., 2005; Shafer, Smith, & Linder, 2005 cited in (Fielt, 2014)). A quick overview of the different definitions on the concept of business models are showed in appendix 10.4. The different definition is an attempt to understand and clarify what the purpose of a business model is. Timmers' first definition of the business model; *"(…) an architecture for the product, service and information flows, including a description of the various business actors and their roles; and (b) a description of the potential benefits for the various business actors; and (c) a description of the sources of revenues."* This is built around the architecture and address the business network where the different actors' roles, interaction and relationships are in focus (Fielt, 2014). Further, some of the authors also put the importance on the strategic and organizational aspects when they are looking at business modelling, even though most of the authors stress that a complete strategy cannot be found in a business model (e.g., Chesbrough & Rosenbloom, 2002 cited in (Fielt, 2014)). Using business models in different definitions, purposes and contexts, that is seen in established companies, start-ups, importance of

technology, types of innovation and profit oriented, also explains why there is no agreed definition.

The definition of business models, also the compositional elements are a way to describe what the business model is made of. These compositions are designed in different ways and are seen as different frameworks, which also defines the different relationships and hierarchal structure between the elements (e.g., Gordijn et al., 2005 cited in (Fielt, 2014)). The different elements are shown in appendix 10.5. The diverse elements also make it difficult to agree on the one specific framework, but Ghaziani and Ventresca (2005) concluded that the discussion about business models is mainly framed around value creation. Even though the meaning of value creation is discussed differently, is still comes from the same indication: *"The question of how to create value in the face of a changing business environment"* (Fielt, 2014).

5.1 Business Model Canvas

Business Model Canvas (figure 7) is the most well-known framework, which is built around a shared language for visualizing, describing and changing business models (Osterwalder & Pigneur, 2010). The focus within this framework is based on design and innovation, where the visual thinking helps to understand the storytelling and holistic approach. The elements of the business model canvas are within 9 building blocks which are grouped in four columns; *"customer interface (segments, relationships and channels), product (value proposition), infrastructure management (activities, resources, and partners) and financial aspects (revenues and costs)"* (ibid.).

The building block about customer interface is focusing on the customers of your business. Who are you targeting (age, income, area, interests etc.), how are you providing service to your costumers (e-mail system, 24 hour phone service, communities ect.) and most of all how are you reaching them (Online platforms, physical stores, tv commercials etc.).

The next building block is based on the product, which helps the companies to target their main values delivered to their customers within the product or service, that they are providing (low price, fast solutions, easy access, unique resources etc.)

Further, Osterwalder & Pigneur talks about the infrastructure management, by looking at the different partners, that the companies are working with, in the matter of producing or delivering the end product to the costumers. In this building block it is also paramount that the companies locate their key resources, that can be embedded in unique knowledge, machines, systems or even financial. This also goes together with the key activities in your company, that differ depending on the business type, but is what makes it possible for the company to create and offer the value proposition (software development, training, supply chain management etc.).

Finally, there is the financial aspect that includes the money stream in the company. Which and how much money is used in order to produce the product and the knowledge behind it. Marketing and rent could be some of the costs, where the revenues are based on the price setting for each costumer segment. Are they willing to pay for the product and how? There are two types of revenue streams: "*1. Transaction revenues resulting from one-time customer payments 2. Recurring revenues resulting from ongoing payments to either deliver a Value Proposition to customers or provide post-purchase customer support" (ibid.)*

<table>
<tr>
<td rowspan="2">Key partners

Who are your most important partners?

Which key resources do you acquire from partners?

Which key activities do your partners perform?</td>
<td>Key activities

What are the activities you perform every day to create & deliver your value proposition?</td>
<td rowspan="2">Value propositions

What is the value you deliver to your customer?

Which of your customer's problems are you helping to solve?

What is the customer need that your value proposition addresses?

What is your promise to your customers?

What are the products and services you create for you customers?</td>
<td>Customer relationships

What relationship does each customer segment expect you to establish and maintain?</td>
<td rowspan="2">Customer segments

For whom are you creating value?

What are the customer segments that either pay, receive or decide on your value proposition?</td>
</tr>
<tr>
<td>Key resources

What are the resources you need to create & deliver your value proposition?</td>
<td>Channels

How does your value proposition reach your customer?

Where can your customer buy or use your products or services?</td>
</tr>
<tr>
<td colspan="3">Cost structure

What are the important costs you make to create & deliver your value proposition?</td>
<td colspan="2">Revenue streams

How do customers reward you for the value you provide to them?

What are the different revenue models?</td>
</tr>
</table>

Figure 7: Business Model Canvas (Osterwalder & Pigneur, 2010)

5.2 The Business Model Mediates Between the Technical and Economic Domains

Another framework is discussed by Chesbrough and Rosenbloom (2002) and this puts business models in relation to technological innovation. This business model is defined as a model where previous perspectives on business design is incorporated into a coherent framework which includes the characteristics of technology and potential inputs (figure 8). Thus, the focus of this model is based on the focusing device that constitutes a connection between "*technology development and economic value creation"* (Chesbrough & Rosenbloom, The Role of the Business Model in Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spinoff Companies, 2002). The elements of this framework are quite similar to Business Model Canvas as they openly mention value network as one of the main elements, which involve suppliers, complementors, customers and competitors.

"The business model provides a coherent framework that takes technological characteristics and potentials as inputs and converts them through customers and markets into economic inputs"- Chesbrough and Rosenbloom.

This business model is therefore both focusing on the internal and the external sources to create and capture a piece of the value. Because of the use of both internal and external sources, this model is described as an open business model. By focusing on an open business model, Chesbrough stress that companies are more competitive and harder to imitate than they would be if they were using a better strategy. Further, the understanding of the cognitive role in the business model is dominant for the firms, in order to commercialize technology which allows firms to capture value from the investment of the technology (Nielsen & Lund, 2012).

By focusing on the external sources, which contains the competitive strategy as an element in the business model, Chesbrough and Rosenbloom differentiate their framework from the Business Model Canvas. However, as stated above, they stress that it is not covering the full strategy. Chesbrough and Rosenbloom explains that the differences between strategy and business model is the fact that strategy highlights the value capturing and business modelling is focusing on value creation (Chesbrough & Rosenbloom, The Role of the Business Model in

Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spinoff Companies, 2002).

Looking at Chesbrough and Rosenbloom (2002) framework, there are six elements that combine the business model.

1. Identify the value propositions, which is the value created for the costumers based on the offered technology.
2. Locate a market segment, which is the costumers that are going to use the technology.
3. The value chain must be defined to create and distribute the products or services.
4. Estimate cost and profit for producing the product or service, based on the value chain and value propositions chosen.
5. Look at the value network connecting the customers and suppliers and the identification of potential competitors and complementors, to find the position of the firm.
6. To gain and maintain advantages over rivals, the innovating firm has to describe the competitive strategy (Nielsen & Lund, 2012).

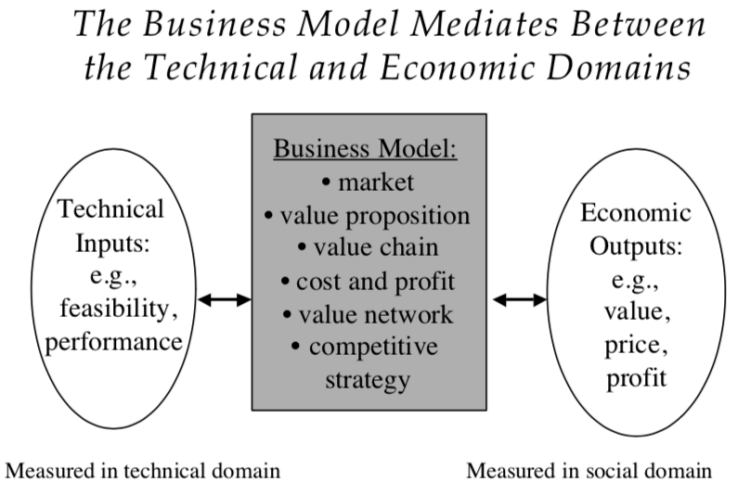


Figure 8: The Business Model Mediates Between the Technical and Economic Domains (Chesbrough & Rosenbloom, 2002)

5.3 Open business model

Since the book with the topic of '*open business model*' written by Chesbrough (2006a), the term has been frequently used. However, like the above definition of (closed) business models, the open business model is neither provided with a clear definition. Trying to understand the term, "business model": *"(…) descries the logic of value creation and value capturing of a firm.".* Where "open" makes the difference in *"referring to a firm's boundaries and its collaboration with the outside world across these boundaries – be it with other firms, communities, or customer."* (Weiblen, 2014). Further, Chesbrough opinion is that open business model is closely similar to the open innovation concept (Chesbrough, 2006a cited in (Weiblen, 2014)). The definition of open innovation is "the use of purposive inflows and outflows of knowledge to accelerate internal innovation and to expand the markets for external use of innovation, respectively" (Chesbrough, 2006b cited in (Weiblen, 2014)). This captures latest occurrences such as user and costumer integration, IP commercialization and collaborative research and development (R&D) processes. With a definition that cannot be comparable, Chesbrough argues that *"(..) companies must develop open business models if they are to make the most of the opportunities offered by open innovation (…). To get the most out of this new system of innovation, companies must open their business models by actively searching for and exploiting outside ideas (…)"* (Chesbrough 2007 cited in (Weiblen, 2014)).

Based on the focus of innovation, technology and ideas, the directness of firms R&D activities are clearly tied together with the open business model that Chesbrough argues for. With this view on the concept, the open business model is always attended by the term of open innovation implemented in a company's R&D (ibid.).

To sum up, *'open business model'* viewed as a broad theme can be studied from two different, but still related, perspectives. The first one refers to *open innovation* and its meaning for focal firm's research and development activities. This approach put emphasis on knowledge, ideas and intellectual property, that are used and exchanged in novel ways. Second approach focuses on *business model view*, that *"considers openness in all value creation and value capturing activities."* (Weiblen, 2014). This one relies on 'resources' that company poses and is able to exchange and share them within its ecosystem. Based on Weiblen's work (2014), notion of 'resources' in general includes production outcomes but also human skills, services and brand,

which means that this view on open business model is broader than open innovation. The following framework (figure 9) proposed by Weiblen (2014) shows the relations between business model and open innovation in relation to open business model concept.

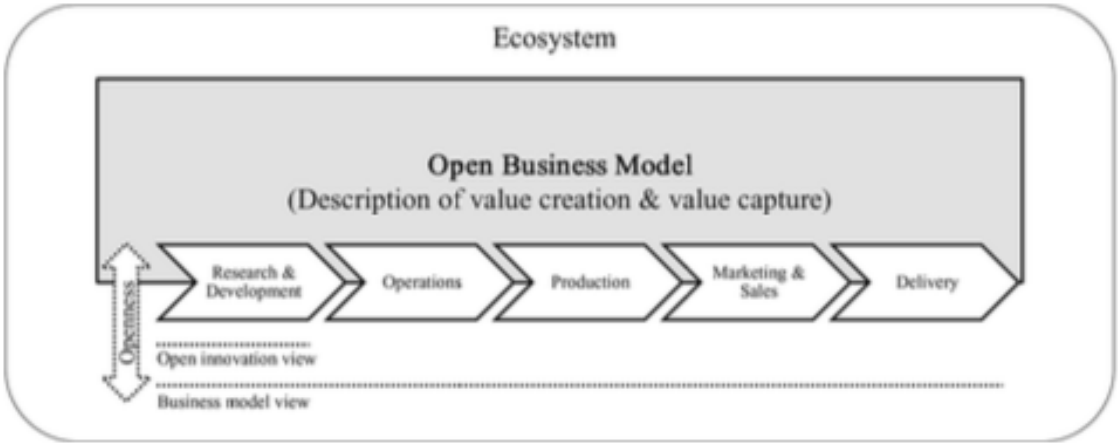


Figure 9: Openness with regard to value creation activities in the open innovation and business model views of the open business model. (Weiblen, 2014)

"Open Business Model is seen as an ecosystem-aware way of value creation and capturing. Focal firms collaborate with the ecosystem by building up value- or partner networks, platforms, or alliances and innovate their business model to make use of the emerging opportunities." (Weiblen, 2014)

5.4 Old and New Music Economy

Patrik Wikström, author of "The Music Industry: Music in the Cloud, 2nd edition" distinguishes between two music economies – the old and new approach, providing examples on how the market and customers have changed because of the internet emergence and online sharing platforms like Napster. He presents three dimensions that he perceives as main features, that differentiate these two economies. He focuses on `connectivity vs. control´, `service vs. product´ and `amateur vs. professional´ (Wikström, 2013). Firstly, the author put emphasis on the matter of network, referring to the network theory. Before the usage of digital files being a main way of having access to the online music, control of the music was handled by music firms and record labels – their priority was "*to maximize the revenues from each individual piece*

of intellectual property and to minimize unauthorized use." (Wikström, 2013). Nowadays it is basically impossible to regulate this use, nevertheless it is still important to know mechanisms that leads customers and awareness on how intellectual property is used by the audience. To bring a closer and more in-depth investigation of this issue, Wikström (2013) uses a network theory that is based on connectivity, which "*is a measure of how well the members of a network are connected.".* The high level of this networking means that there is a lot of connections between members of the same network and the information, data, money etc. flow goes easily.

The old music business was characterized by limited connectivity, especially regarding the audience, as the whole network was in charge of the music companies, who were providing content directly to the individual consumers as drawn in firgure 3.

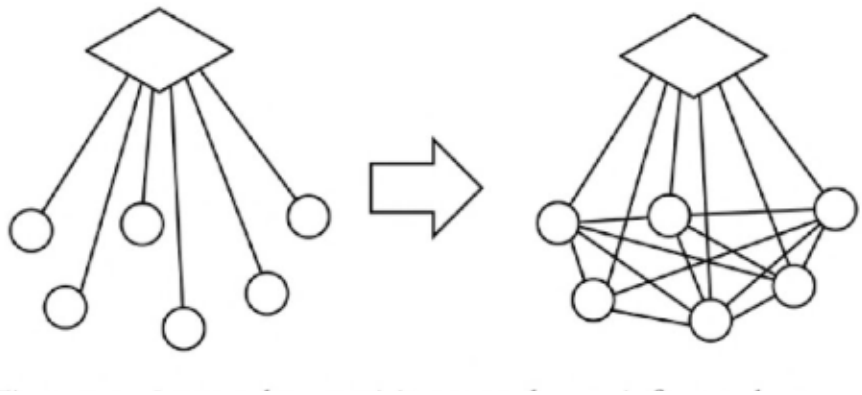


Figure 3: *Increased connectivity causes the music firms to lose their ability to control the flow of information* p.6 (Wikström, 2013)

Transformation that emerged from unlimited access to the internet changed the relations between content providers and receivers. Now, the connectivity between individual members of the audience has increased enormously and the importance of physical music distribution has been radically reduced. The landscape of a present media industry evolved from hierarchical to more decentralized structure, where all members of it are connected and music companies lost their capability to deal with the stream of any information. "*The technologies lower the barriers, which had previously restricted the capability to distribute information to the network (…). Now, the capability to upload is theoretically accessible to everyone connected to the network.*" (Wikström, 2013).

A second dimension that may be used to describe changes within music industry refers to service vs. product. Nowadays, each piece of information is uploaded to the `cloud´ where every member connected to this cloud has limitless access to it. Following Wikström (2013) "*in such a 'friction-free network', the economic value of providing access to an individual track is infinitesimally close to zero."* Nevertheless, there is still a solution, sort of a way to get money out of content that is accessible online for a broader audience. One of the concepts that was established to provide a service, that would ease an approach to wanted content is Spotify. Members of a `cloud´ are able to use a platform that consists of millions of tracks, but the platform is built in a manner that selects, chooses, proposes and just provides handy tools to look through all the available content and to pick up interesting, tailored position.

The third-dimension treats notion of 'amateur' in contrary to 'professional'. For many years there were global artists, who built the whole music industry ecosystem and were perceived as 'brands' itself. The new music economy has changed dynamics between artists, their art and the audience. "*The increased connectivity of the audience network combined with various kinds of music production tools enable 'non-professionals' to create, remix and publish content online*." (Wikström, 2013).

Basically, new music economy consists of three elements that differentiated it from the old one. It's "*characterized by high connectivity and little control; music provided as a service; and increased amateur creativity*." (Wikström, 2013). The basis of all changes is embedded in digital information and the communication technologies development, that enabled to upload and share content in the internet. Also, usage of cyberspace as a `shared platform´ allowed to move basically every part of the music business, even like promotion, concerts, events, talent development, "*into the realm of digital technology*." (Wikström, 2013)

4.4 Change of structure within the music industry

As it was mentioned before, the music industry has experienced an enormous transformation along with proceeding development of digital technologies. The first, meaningful breakthrough came with Napster that allowed exchanging compressed files in peer-to-peer manner. Then Apple presented their own platform "*iTunes Music Store service to complement the high*

successful iPod music player and bring digital downloads to mainstream." (Hosoi, Kim, Stainken, & Caro, 2015). Progressive transformation of the market led to establishing on-demand digital streaming platforms like Spotify, enabling access to the content on different devices, anytime and anywhere. As a consequence, relations and dynamics between members of the network that constitutes music industry existence, and that consist of content providers, producers, artist, record labels, listeners etc. have changed.

Before the Internet era and its dominance, Record Labels/music companies had the control over the entire supply chain, which was "*vertically integrated, with interdependent activities, transforming the music created into a physical good"* (Graham, et al. 2004), as shown in figure 4. They were adding great amount of the value as, they "*would finance and supply the artists access to equipment, operational support to produce, record, package and promote their music, and provide access to distribution and sales channels.*" (Sitonio & Nucciarelli, 2018). As a consequence of this unequal distribution of the power, the whole network that embraced artists, intermediates and receivers would suffer from lack of proper, uneven access to information.

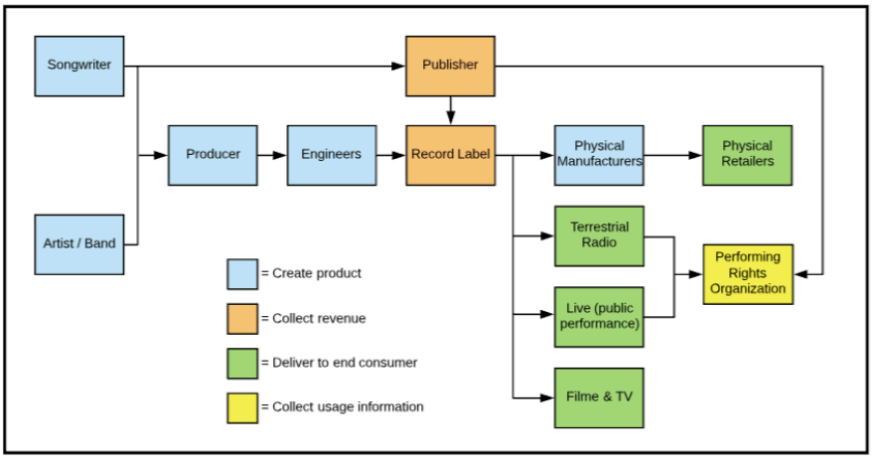


Figure 4: *Recorded music supply chain before digital media – adapted from (Hosoi, et al. 2015).* (Sitonio & Nucciarelli, 2018)

Emergence of the internet and development of digital technologies caused weight shift towards artists who have now more influence over content production process and (self-) promotion. Referring to the model proposed by Hosoi, Kim, Stainken, & Caro (2015), the supply chain has changed because of the emergence of a new `actor´ in the chain – Aggregator. According to Sitonio & Nucciarelli (2018) selling music at this point has stopped being a process of managing

the physical good. Artist got an additional possibility of approaching consumers in the form of digital supply chain as a separated and at the same time complementary way to traditional supply chain.

Digital transformation provided tools that make the process of producing the content easier and cheaper – using computers and broad network, that allows to produce the music even at home and reach consumers using only internet technology and information channels. It means that at the same time, it allows to remove intermediaries out of the supply chain. It brings power back to the producers/artists and lower the costs. It refers to the promotion too, because nowadays it can be managed just by an artist. The significant change that influenced the dynamics within the chain and relations between the actors, refers to easier access to the market for new and smaller artists. Now they are "*able to record their music in independent facilities, or even at home, making it available online through the Aggregators directly. These artists would no longer depend on being signed by a Record Label to get published.*" (Sitonio & Nucciarelli, 2018). Global access to the internet causes feasible approach towards broader audience in the whole world. Nevertheless, following Sitonio & Nucciarelli (2018), it is not that obvious that record labels lost their "*monopolistic distributional power*" and because of decreasing transaction costs, artists now would poses greater incomes form their work – they stated that "*the Aggregators only reinforced the existent information asymmetry in the industry"* (De Leon and Gupta 2017). The authors of the paper "*The Impact of Blockchain on the Music Industry*" from 2018, refer to Hosoi et al. (2015), who quotes findings which show, that "*record labels still claim the largest piece at over 50% of the share, despite their changing value to the supply chain*.". He seeks the reasons and premises of this state in "*existing contracts with the artists and the licensing/royalty business model that involve the record label as the performance rights holder for the recording.*" (Sitonio & Nucciarelli, 2018).

As it is depicted in figures 5 and 6, the difference between major artist and smaller (or the new) artist, is visible. For the first group the new business model, that includes the aggregators and refers to revenue streams, causes decrease of "*the total and flow of payment. For small and independent ones, even though created the possibility for publishing music online, royalties are commonly unpaid"* (De Leon and Gupta 2017, Gartner Inc. 2017 cited in (Sitonio & Nucciarelli, 2018)).

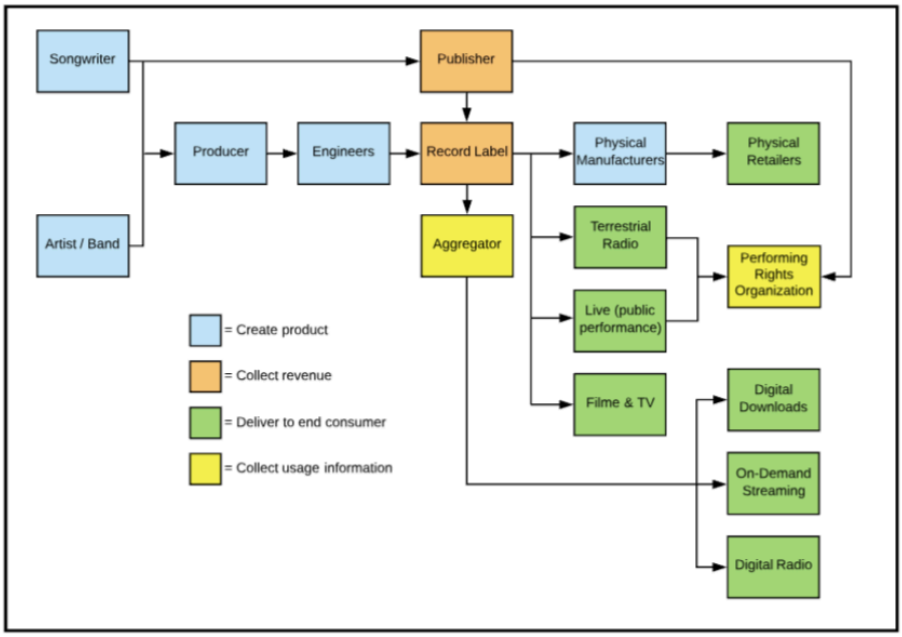


Figure 5: *Recorded music supply chain after digital media for major artists – adapted from (Hosoi, et al. 2015).* (Sitonio & Nucciarelli, 2018)

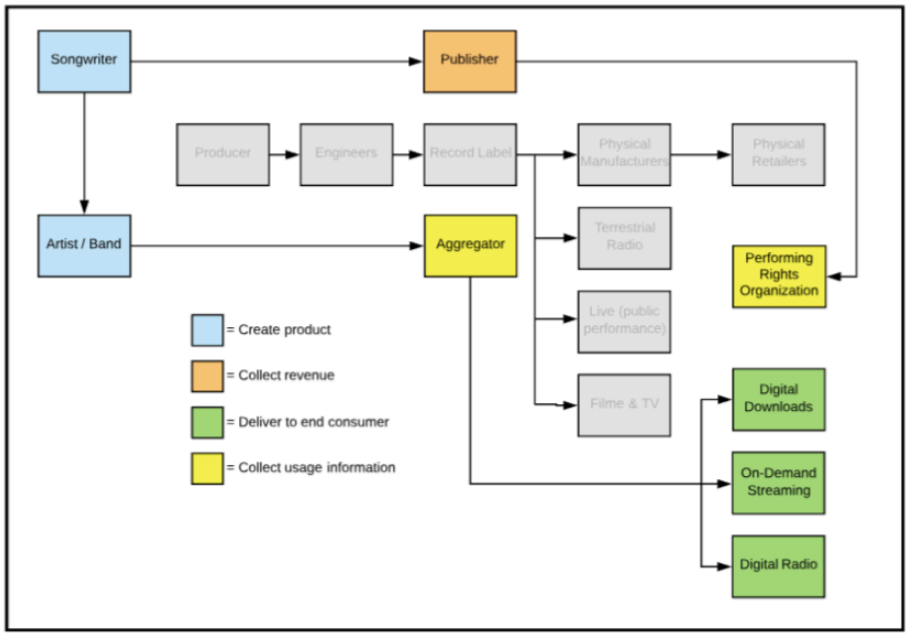


Figure 6: *Recorded music supply chain after digital media for small artists. – adapted from (Hosoi, et al. 2015).* (Sitonio & Nucciarelli, 2018)

6. Theory

In this section we present and explain the theoretical part used to examining the stated problem. Provided theories where selected in order to understand how features of blockchain technology can have an impact, on the way of doing business. The two selected theories are Transaction Costs and Innovation. It starts with a definition of transaction costs and its implications on business models and innovation. Next, the definition of innovation is examined in order to understand how companies should embrace new technologies and handle innovation processes, in order to maintain ambidexterity.

6.1 Transaction Costs

No matter of the industry, the main question regarding to the market and firms' existence remained the same through many years. It discusses the issues of the reasons, why companies are being established. The question is, why we chose to gather around entities that become firms instead of relying our economy on individual producers. There are many explanations for this, like theory of economies of scale and scope, control and dominance over the market, or costs of external and internal transactions.

The roots of an idea that treats transaction as a basic unit of economic analysis comes from John R. Commons, who in 1934 recognized "*that there were a variety of governance structures with which to mediate the exchange of goods or services between technologically separable entities.*" Center of the studies regarding to institutional economics lied in the process of "*assessing the capacities of different structures to harmonize relations between parties and recognizing that new structures arose in the service of these harmonizing purposes (…).*" (Williamson O. E., 1981). Then, in 1937, the next step towards expanding the theory was made by R.H. Coase in his article "The Nature of the Firm", here he tried to analyze the reasons and drives for firm's existence. Back then, his concept was neglected for many years, as he wasn't able to provide an operational framework for a provided concept. Coase argued that "*the costs of transacting, particularly those of determining prices, are the direct explanation of the firm.*" (Klaes, 2000). He focused on analyzing the internal and external conditions that influence integration within the firm and the relations with entities that exist and act in its environment.

In this sense Coase was the first researcher that brought the concept of internal and external relations among institutions that play roles on the market. It relates to the processes of running the company and building an enterprise on common ground that assembles units and then establishing relationships between them in order to settle the conditions for cooperation. Moreover, there is a matter of exchanging regulations between firms and institutions embedded in its surroundings.

Coase put emphasis on boundaries of the company, but for many years his idea had been questioned due to the lack of sharp definitions treating firms' boundaries. Coase observed, "*that the production of final goods and services involved a succession of early stage processing and assembly activities. But whereas others took the boundary of the firm as a parameter and examined the efficacy with which markets mediated exchange in intermediate and final goods markets, Coase held that the boundary of the firm was a decision variable for which an economic assessment was needed*." Here the question arises "*What is it that determines when a firm decides to integrate and when instead it relies on the market?"* (Williamson O. E., 1981). In 1945 economist and philosopher, Friedrich Hayek stated that studying economic problems becomes intriguing, when "*events are changing and sequential adaptations to these changes are needed."* (Williamson O. E., 1981). He believed that what characterize a high-performance economy is its power and capability to deal with change; embracing it and adapting to uncertainty in the most effective way. Subsequent researchers treated this issue in relation to the postwar period, trying to examine general conditions of the markets and common conclusions led to transaction cost origins (Williamson O. E., 1981). Author of "*The Economics of Organization: The Transaction Cost Approach*", Williamson dished up a concept that "*hierarchical organization and associated controls are traced to the limited capacities of human actors to cope with the complexity and uncertainty with which they are confronted. The organization is essentially viewed as a "problem-facing and problem-solving" entity (Thompson 1967, p. 9). But organizational efforts are often myopic and demands for control can and often do give rise to dysfunctional outcomes*." Coase initiated transaction cost theory as he had been analyzing, why some transactions are being removed from the price system and then are putting into the organizations – firms. He believed that turning back from a decentralized price system must be related to cost of using price mechanism. In this sense, the idea of transaction cost stands "*separate from and in addition to ordinary production costs*." (Langlois, 1995). So,

in this sense the transaction cost theory came directly from the price theory, explaining the institutional overlay of production. "*Production costs determine technical (substitution) choices, but transaction costs determine which stages of the productive process are assigned to the institution of the price system and which to the institution of the firm.*" (Langlois, 1995).

In general, there are three main areas that are defined by different kinds of costs due to companies and its structures. These are production costs, transportation costs and transaction costs. For the matter of the following project, last mentioned area would be examined. Following Oscar E. Williamson (1981) definition, *"transaction occurs when a good or service is transferred across a technologically separable interface. One stage of activity terminates, and another begins. With a well-working interface, as with a well-working machine, these transfers occur smoothly. In mechanical systems we look for frictions (…). The economic counterpart of friction is transaction cost (…)*". Moreover, *"transaction cost analysis supplants the usual preoccupation with technology and steady-state production (or distribution) expenses with an examination of the comparative costs of planning, adapting, and monitoring task completion under alternative governance structures"* (Williamson O. E., 1981).

6.1.1 Types of Transaction cost

In general, there are two types of transaction costs: internal and external as shown in figure 10. The internal transaction cost (a) are discribed by all the fixed costs inside the company. The second line (b) describes all of the external costs. Coase argued, that the firm aims to do all the work internally, to lower these external costs, so it means that line (a) is below line (b).

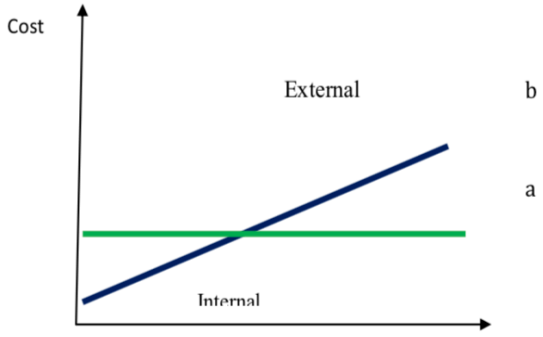


Figure 10: Internal and external transaction costs. (Yousuf, 2017).

Thus, if the "*external transaction costs are higher, than the internal transaction costs, this will push the company to grow, whereas when, the internal transaction costs are higher than the external transaction costs, the company will be downsized by outsourcing"* (Yousuf, 2017)

Rationally, every company would choose to expand, if the internal transaction costs were lower. In general, "*transaction costs arise, when a product or service is transferred from stage to stage, and when new sets of technological capabilities are needed to produce a product or service."* (Yousuf, 2017) Several authors argue that the three main types of transaction costs, which are: "*search and information costs, bargaining cost, and policing and enforcement cost."* (Yousuf, 2017).

6.1.2 Transaction Cost Economic with the Property Rights Approach

Due to the following research, another theory about transaction cost was explored. This concept was developed by Oliver William (1971), one of the biggest supporters of transaction costs and the first researcher, who recognized and explored the `role of sunk costs´ in the contracting issues and motivations for vertically integration. The theory called the "New Institutional Economics" is a concept and a framework of a "*(…) governance structure as a distribution of property rights providing appropriate incentives to govern a relationship, is intended to apply within and outside firms*" (Allen, 1999). Even though, the relationship between the property rights and transaction cost is explained, he argues the difference as "*the property rights approach deals with grand private environmental rules, while the transaction cost approach deals with private incomplete contracts*". Demsetz (1988) also explores, that the broad definition of transaction costs makes it harder to understand markets and firms. Constantly, Coase put importance on the `formal relations´ within a firm (for example, employer vs. employee) in the way of reducing transaction costs. On the other hand, Alchian and Demsetz (1972), restrain the role of authority inside the firm.

Several transaction costs issues within property rights are argued by Demsetz (1995), without using the term of transaction costs: "*shirking, the uncertainty in being able to measure or count, reduction of coordination costs and the agency problems from opportunism*" (ibid.). These costs mentioned by Demsetz are included in the definition of the property rights of transaction costs, "*where a broad transaction cost definition is necessary in order to make clear, that the Coase*

theorem does not apply." (ibid.). He also states that *"The property rights definition of transaction costs respects no boundaries between firms, markets, households, or any other theoretical constructs. When property rights are protected and maintained in any context, transaction costs exist."* (Allen, 1999).

Even though transaction costs have a narrower definition and is treated differently, the neoclassical approach still has similar transaction cost standards as the property rights approach. Niehans states that parties must *"find each other, they have to communicate and to exchange information…. goods must be described, inspected, weighed and measured. Contracts are drawn up, lawyers may be consulted, title is transferred, and records have to be kept."* (Allen, 1999)

Williamson (1998) mentions that transaction costs economically requires broader, far-sighted perspective, that comes from the ability of gathering a reliable, clear and in-depth overview about a current situation and a capacity to predict actions within and outside the organization in the future. This approach relies on establishing clear strengths and weaknesses of the company, which allows to describe core competencies and disabilities of the firm.

6.2 (*Open*) Innovation

Innovation can be examined from two perspectives – closed and open. The difference between them lies in a way the innovation process is created and handled by the company. Companies that rely on closed approach, develop innovations in-house using internal R&D departments. In this chapter second approach – open innovation – will be explained.

In general, a quite simple definition of 'innovation' can be found in paper 'Closed versus Open Innovation: Evolution or Combination?' (Marques, 2014), where it is described as *'on-going processes of learning, searching and exploring, which result in new products, new techniques, new forms of organization and new markets'* Lundvall (1992).

As Chesbrough and Rosenbloom (2002) linked business model in relation to technological innovation, they proposed a concept that focuses both on external and internal resources that also uses technology development to create and capture the value. In fact, this idea of

managing the business is described as an open business model, that "*filled a gap in management research by linking the open innovation phenomenon* (Chesbrough, 2003) *to the increasingly popular business model concept* (Zott, Amit, & Massa, 2011)." (Weiblen, 2014)). As the definition of open innovation has been mentioned before, this chapter would provide a wider overview regarding to the core of the innovation and its openness. Furthermore, as the blockchain technology is perceived as a disruptive innovation, next section would give an analysis of its meaning and importance.

Innovation itself could be described as "*the process by which existing knowledge and inputs are creatively end efficiently recombined to create new and valuable outputs*." (Felin & Zenger). Following (Chesbrough, 2011) open innovation is a concept that "*falls directly in that gap between business and academe. Conceptually, it is a more distributed, more participatory, more decentralized approach to innovation, based on the observed fact that useful knowledge today is widely distributed*." This approach allows to transcend boundaries in order to possess new sources of knowledge and technology that comes from external suppliers. These days, there is an increased need for companies to interact with external partners, as "*the environmental uncertainty and the complexities of innovation and knowledge recombination have led to the increased permeability of organizational boundaries.*" (Felin & Zenger). The concept of open innovation includes all external participants like users, suppliers, customers but also competitors and universities that nowadays align with companies in order to exchange knowledge and technologies. Findings indicate that more linkages and external sources of knowledge, especially in ambiguous environment, lead to increased improvement regarding to innovation outcomes and performance (Felin & Zenger). Thus, *"innovation is a key factor in the success of an industrial economy, in competitiveness, in corporate survival, and it is even an essential tool in entrepreneurship (Drucker, 1989)*." (Marques, 2014)

Following Chesbrough (2011), companies should actively transform their business models by opening boundaries, which among the others, results in lowering costs, gaining wider diversification on the market, and creating new revenue streams for firms. Chesbrough, who is an author of the book "Open Innovation" from 2003, proposes the definition, that describes *open innovation* as, "*the use of purposive inflows and outflows of knowledge to accelerate internal innovation, and expand the markets for external use of innovation, respectively*."

Regarding to the description above, this concept may be perceived in contrast to "*traditional vertical integration approach, where internal R&D activities lead to internally developed products that are then distributed by the firm.*" (Chesbrough, 2011). There are also two distinct ways of approaching and implementing these changes within the companies' structures. The first, which is more common, is based on the usage of external sources or ideas and putting them in the companies' own internal innovation processes. The second one, less common, means that "*ideas and technologies in the firm are allowed to go outside to be incorporated into others' innovation processes.*" (Chesbrough, 2011). The main question regarding to this distinction is treating the dilemma, of which ideas and technologies, that fit existing business model, should be taken from outside and then implement internally. Reversely, what are the internal features, which are not suitable and might be moved to external stakeholders. Chesbrough (2011) emphasize, that because of all these premises, "*business model is another key element of the open innovation concept*."

Weiblen (2014) in his work 'The Open Business Model: Understanding an Emerging Concept', refers to Chesbrough (2006a), directly established relations between open businnes model and open innovation, when argued that "*companies must develop open business models if they are to make the most of the opportunities offered by open innovation*". It means that the only way for companies to achieve profits from innovation is to "*actively searching for and exploiting outside ideas and by allowing unused internal technologies to flow to the outside, where other firms can unlock their latent economic potential."* (Chesbrough, 2007, p. 22). This concept focuses on capabilities that are a result of firm's activity in the field of research and development (R&D).

An interesting approach also refers to innovation in relation to business model, as "*the idea that the business model itself can be subject to innovation*" but still "*the move from a closed to an open business model is seen as particularly challenging and requiring more research insights* (Storbacka et al., 2012)." (Weiblen, 2014). This notion means that innovation might be something more than just product/process/service innovation and could result in significant modifications within the existing business model, leading to open business model. But, conducted by Weiblen (2014) literature analysis provide arguments that "*open innovation only constitutes an open business model if it leads to collaboration in the firm's value creation and*

capturing activities." Moreover, "*open innovation often necessitates business model changes to reap its benefits* (Chesbrough, 2007; Smith et al., 2010), *the result is not always an open business model.*" Researchers explain this inconsistency with distinct meaning of the term 'openness' in these approaches: "*open innovation looks at the permeability of a firm's research and development for ideas, whereas open business models look at collaborative value creation and capturing.*" (Weiblen, 2014). Despite of misunderstandings, that are consequence of distinct meanings, there is a conceptual framework to illustrate these relationships between open innovation, business models and open business models as shown in figure 11.

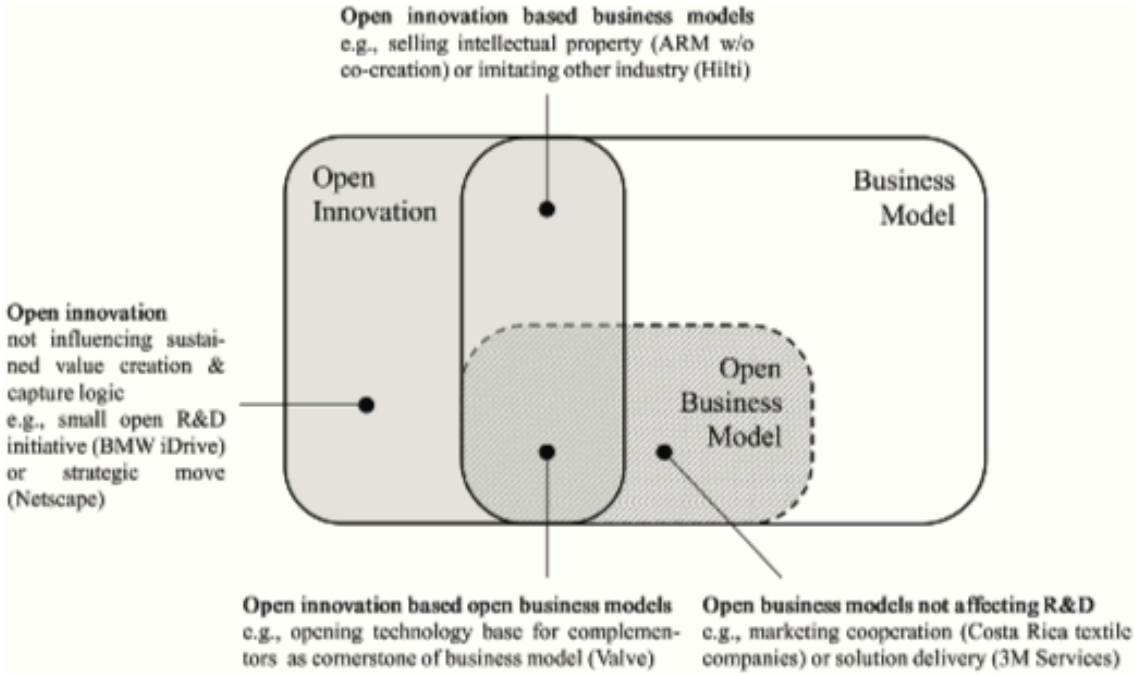


Figure 11: Conceptual framework of separation and overlap between open innovation, business model, and open business model concepts. (Weiblen, 2014)

6.3 Disruptive Innovation

A Simple definition of the term 'disruptive innovation' says, that it is a process of "*introducing a better business model into existing market.*" (Ovans, 2015). According to the authors of the article "What Is Disruptive Innovation?" there is an issue with "*conflating a disruptive innovation with any breakthrough that changes an industry's competitive patterns", because "different types of innovation require different strategic approaches.*" (2015) That means in broader sense, that misunderstanding of the situation on the market may lead to inadequate

decisions and further actions. Same authors also provide the definition of 'disruption' to begin with, as it is "*a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses.*" (Christensen, Raynor, & McDonald, 2015). This situation occurs when established companies only focus on one, well-know, well-described and devoted group of costumers, working on improving products and services dedicated to them, and at the same time ignoring needs of others. Thus, this new company, that is willing to enter the market has and open space to walk in and also to adapt it by targeting these ignored segments. At the same time, established companies with grounded position on the market tend to ignore premises and respond with less eager, as they are more focused on higher profits in more-demanding segments. Thus, new players "*move upmarket, delivering the performance that incumbents' mainstream customers require, while preserving the advantages that drove their early success. When mainstream customers start adopting the entrants' offerings in volume, disruption has occurred."* (Christensen, Raynor, & McDonald, 2015)

In theory, there are only two situations, that allow to use the term of 'disruptive innovation' in order to describe a new activity on the market that further changes it. The first refers to the *low-end footholds,* when well-established companies overlook undemanding customers, being focused on these segments, that require ever-improving products and services. Thus, there is a chance for a 'disruptor' to provide a product that is 'good enough' for these 'abandoned', low-end customers. The second possibility relates to the *new-market footholds*, which means, that disrupter just "*create a market where none existed. (…) they find a way to turn no consumers into consumer*." (Christensen, Raynor, & McDonald, 2015). So, trying to describe any significant activity, new phenomena on the market, that influence other companies and customers, as a 'disruptive innovation', one of these two concerns has to be recognized.

6.4 Limitations and discussion

6.4.1 Business model

The first limitation stated in this theory is the difficulties in finding a common definition on business models. This makes it difficult to align and agree on different aspects of its use. Even though the Business Model Canvas is the most common and widely used business model, it is

according to Kraaijenbrink (2012), missing some overall aspects to understand the value of a company (Fauvel, 2013). Firstly, he points out that the Canvas is only focusing on the financial aspect, when a huge part of business is how it is driven. Therefore, the strategic purpose – mission, vision and strategic objectives is in demand. Next, he is criticizing the model for not taking up for account the many competitors on the market, even though the model is known for its simplicity – it limits the use of the canvas. Lastly, some of the components do not fit the same level of concept, where his suggestion is to merge or introduce these components later (customer relations and channels – on the right side and key activities and key resources - on the left side.) Maurya (2010) also stresses some issues missing in Osterwalder's canvas. This is based on the problem, solution and key metrics. He argues that it is important for making a business that the real problem is found to build the right service or product to solves this problem with a perfect solution. Finally, he stresses the need for Key Performance Indicators (KPIs) that is important to reach the goal of the business (Fauvel, 2013).

Because of the critics of the business model canvas, many variations of the canvas have been made. One of them are from Osterwalder himself, that have presented the Value Proposition Designer (figure 12), which basically just zoom in on one part of the Canvas. This helps with *"(…) filling out the box of the value proposition by emphasizing the relation between the customer and the actual product or service*." (Osterwalder, 2013 cited in (Fauvel, 2013))

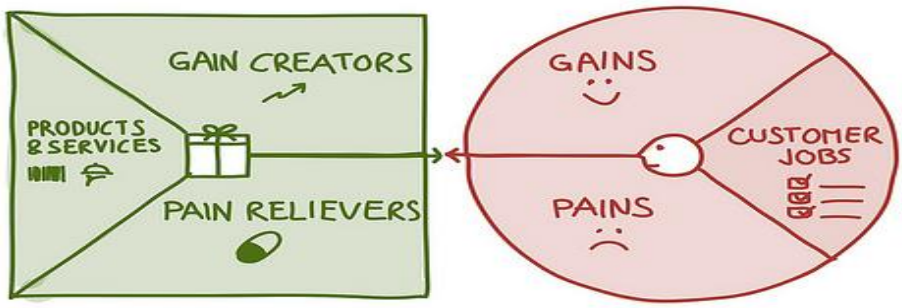


Figure 12: Osterwalder's Value Proposition Designer (Fauvel, 2013)

In general, many researchers find it difficult to agree on or propose one, complex and coherent definition, as interpretation of the 'open business model' depends on the chosen approach. Also, unclear definition is a result of similarity to open innovation and the business model itself.

6.4.2 Transaction costs

The first limitation of the theory of transaction costs, that occurs in literature, refers to dispute of its core meaning as it is difficult to observe and measure. So, following Scott Masten et al. (1991), *"analysts have had to rely on estimations of reduced-form relationships between observed characteristics and organizational forms."* (Hodgson, 2010). Other researchers indicate, from a resource-based perspective, significant meaning of human resources that should be also taking into consideration, as they constitute *"a set of firm-specific communication codes (or competences).*" (Hodgson, 2010).

The important limitation of this theory refers to the context in which the firm is embedded. In Coase's theory of transaction costs there is not enough space dedicated to the significance of relations between individuals, as he ignored *"the ways in which structured relations between individuals may affect their capabilities or dispositions."* (Hodgson, 2010). Later on, Williamson developed transaction cost theory and expanded it by *"searching for explanations of different organizational forms, including different kinds of hierarchy and the viability of cooperative versus more hierarchical firms."* (Hodgson, 2010). An important conclusion that emerges from criticism towards transaction cost economics states that the best response to all limitations would be merger of two approaches, that is TCE with competence-based explanations.

Based on the limitations from the prior transaction cost theory, we decided to expand our research with the concept, that refers to property rights. As in our case study there is no production of tangible assets, which is the basic of the first approach in the transaction cost theory.

6.4.3 (Open) Innovation

The main issue regarding subjects of 'innovation' refers to many different and very broad classifications of its meaning. The core of innovation is mostly related to technology development that occurs when a company attempts to improve already existing products or services. Despite of popularity and broad research, followed by vast literature on the 'innovation' theme, there are still areas that need deeper investigation and clarification, especially the once that refers to open innovation and its implications. The biggest problem

that occurs in relation to openness within the company, which leads to innovation process, is the flow of the knowledge. The challenge here is finding a balance when it comes to unrestricted exchange of resources, but at the same time maintaining some dose of control over this process. Moreover, there is always a risk, that insufficient management would cause leakage of *"sensitive knowledge, both commercial and technological."* (Marques, 2014), which can lead to stolen knowledge and thus increased competition.

6.5 Sub-conclusion

To sum up, the first part of our report explores the development of the technology and the invention of the blockchain. It presents four stages of blockchain's improvement - currency, contracts, applications and algorithmic management. Additionally, it gives the understanding of how a company can benefit from applying any of the improvements. The benefits appear in the decrease of transaction cost, transparency, efficiency and secure transaction options. Then, the overview of the music industry is provided in order to examine the technology development within this area. This part gives a firm knowledge about these changes, which allows us to establish basis for the following research. Moreover, the gathered information about digital right management let us to recognize the main concern questioned in the music industry. It deals with difficulties with proper security of the musicians' art.

Moreover, we followed an approach that treats business models as a key element of new and old businesses. Before entering the theory section, we discussed the business model canvas and the one that mediates between the technical and economic domains. These two both have interesting elements, with the main focus on the value creation. The models differ from each other in the way of getting new knowledge, that can be learned from internal or external resources.

Further, the two theories have been discussed. First, transaction cost theory treats issues associated with internal and external resources that companies' poses or might obtain by establishing relations within the ecosystem. Additionally, the relationship between property rights and transaction cost was discussed, as this field of study is not interconnected with production companies. Demsetz and Niehans state that transaction costs in these settings are

found in the settlement and the monitoring of property rights, what also includes all the contract exchanges between the rightsowners.

The second theory examines different approaches to the notion of innovation and the possible ways of implanting the theory in practice. The idea of open innovation is close to the understanding of the open business model, which focusses on the knowledge from outside the company, where the disrupted innovation is a new way of doing business.

7. Data collection

In order to examine the stated problem, answer the research question and provide the findings we conducted 4 semi-structured interviews. The first interview was arranged to help to narrow down ideas and depict the main subject of the further project. The knowledge that we obtained from Henrik H. Jensen, allowed us to determine areas, that we would be exploring through the project. We learnt about the blockchain itself, main assumptions, limitations and opportunities, that it can provide in our case study. Also, we got some basis knowledge of the technology that it runs on and its development.

The second interview, with Gramex's CEO John R. Kristensen allowed us to get an in-depth overview of the company's structure, main competences, areas of activities and their struggles. It helped us to understand what part of the structure, business model we should be focused on in the further research. Moreover, it provided us with a broader idea regarding the music industry and relations between the parties participating.

The third interview was arranged with Allan Hammershøj, the Chief Operating Officer at Media at Hand provided deeper understanding of digital rights management. He pointed out possible solutions, that might emerge along with implementing blockchain technology in the various of platforms. He confronted us with an idea of the way to manage rights in new technologies' context.

After the collected data, that provided us with an in-depth knowledge of the blockchain technology and how it can offer security and efficiency, we needed a second meeting at Gramex. The interview with the two employees of Gramex – Kiki and Lars, explained the workflow and presented us the difficulties, that they recognize in their everyday work. With the new added knowledge, we found it necessary to validate our thoughts, concepts and prior findings and arranged a second meeting with our specialist. It definitely enabled us to fully understand, which direction we should follow, while providing the final project.

In order to present our findings and discuss it, we transcribed all the interviews and coded each interview within the 10 themes. The coded interviews are provided in appendix 11.3 for a full view of the data. The collected data from the interviews and the knowledge from journals and books are the main data we used to present our findings, and which are used in the discussion.

8. Findings and Discussion

In this part we look at our findings of two theories, that treat the subject of transaction costs and innovation, for us to understand the changes in Gramex's business model. Then, we compare key statements from these theories with general outcomes, that we have got from academic literature. Moreover, we use the information from conducted interviews, that gave us an in-depth understanding of our case study. Thus, obtained knowledge about Gramex's underlying situation, blockchain technology and its capabilities allowed us to deliver the ultimate findings.

In the first part of analyzing the usage of blockchain in the business model of Gramex, we had to look deeper into their organization to gain knowledge and understand the main problems of Gramex. Additionally, we got an overview of the main work system. As Gramex is handling digital rights for artists and record labels. The contracts, that contain data about the right holders, are in the center of attention in the music business. Lars R. Korsholm, employee at Gramex, explains the workflow,

> red. "*Let's say the song hasn't been a hit in four years. Then they will terminate their contract and they don't want to deal with this track anymore in Denmark, because it doesn't generate any money anymore. And then it goes to a different company or something like that. Once a year we will send out a total airplay, list of air players, to every record company registered as a member of Gramex. Then every record company has to check out all songs. Yes, this is still ours, this is not ours. And get back to us. Saying this is not ours anymore. And then sign a declaration. because we don't know what's happening year by year by year, with those rights. because if they are terminated and they forget to tell us and we just pay out for those tracks then we have no possibility to get the money back from the record companies."* (Korsholm & Mortensen, 2019)

This process is very long and demands lots of hours of work. But what is most important to notice is the problem stated by Kikki T. Mortensen (2019), employee at Gramex,

> *" (..) everything is done manually (..) Because we do not have a system that can manage it. We have a big wish for our I.T. department, that we could have a system, so it would be online."*

All this internal registration causes a lot of transaction costs, since many of the labels forget to claim or reclaim the rights, because they are changing hands all the time. As we know from the interview with Lars and Kiki, the big struggle concerns contracts, which the big record companies or distributors handle. The first thing about this issue is related to the different ways of preparing these contracts – there is no template, common draft, that can be used by all parties involved. This entails extra work for the employee, who is responsible for checking all the regulations. This problem is not the biggest one, but still argues that a new innovative IT program would ease this process. Further,

> *"What's takes time is for the right holders to send us those contracts. That's the lazy part of it."* (Korsholm & Mortensen, 2019)

It means, what Gramex's is struggling with, is mostly related to collecting these contracts and following up on all the changes within the digital rights and the ownerships. This is the biggest aspect of transactions costs, which they want to lower.

From the interview with John Gjørup Kristensen, CEO of Gramex, he also explains that they are in the possession of 4000 Danish members.

> *"(…) we have around 4000 members - 4000 artists - and its only artists, who are singing or playing or whatever. And then we have around 3500 record companies. Because a lot of record companies sign the artists. And then we have different incomes where we do let's say the agreement with the customers on their behalf."* And *"Only Danish artists, but also Danish artists played abroad."* (Kristensen, CEO at Gramex, 2019)

The rights can both be changing national or internationally, which gives a perspective to this workload. And what doesn't make sense is, when the big companies do not provide evidences of the ownership rights, they lose money. Therefore, it should also be in the interest of these companies to send the contracts.

What causes this problem, is the lack of efficient communication between Gramex and the other companies around the world. K. Mortensen (2019) also compared this system to a stock market; if a song is good and someone buys it and then the same song loses its value, they can sell it to another party.

Further, for the purpose of our research, it's also important to state, that Gramex is the only company, according to the law, that is in charge of these rights:

> *"So, it says in the law, that it can only be one company handling this. So, we have in fact the monopoly. But for instance, in Iceland, there can be more than one. But in our law system, would be one. In Spain, they have four, but then it's more complicated."* (Kristensen, CEO at Gramex, 2019)

This agreement is also based on the fact that all radio stations, shops, restaurants, schools and theaters in Denmark, need to have an agreement with Gramex:

> *"(red.) they have to come and have an agreement with us. If they play them on the radio, then they actually are using our product and they have to pay for that"* (Kristensen, CEO at Gramex, 2019)

Regarding to international agreements, Gramex has 46 bilateral agreements for 46 international collecting societies. In Denmark the process of signing up to Gramex starts, when the Producer sign up the artists on their behalf. The exception from this is the situation, when the danish artist participates in a foreign project. Then the artist has to come directly to the company and provide evidence for this collaboration. This should be done in order to establish a proper representation of the rights (Korsholm & Mortensen, 2019)

The conducted interviews gave us a possibility to get an in-depth overview of the Gramex' structure and its connections with other participants of all transactions. Settled relations and broad connections also include also the distributors, who are in charge of digital rights management of foreign members and the Danish artists played abroad. This showed us how big this network is, in order to manage all digital rights and payments.

> *"(…) we have a lot of distribution agreements in Denmark, of course, controlled by distributors in Denmark like Playground (Music Label)."* (Korsholm & Mortensen, 2019)

The problem occurs when the distributors do not inform Gramex about the changes with the ownership:

> *"(red.) that's a problem. You have to check it three times a year or you're doing this constantly. (…) And we have to have a documentation."* (Korsholm & Mortensen, 2019)

Gramex is also responsible for providing lists of recordings to the producers and this takes place once a year.

> *"And at the same time, we also have… each producer right gets a list every year of their recordings that have been played. So, if there's some of them amongst, that they don't have rights for any longer, then they have to let us know 'this is not ours anymore'."* (Korsholm & Mortensen, 2019)

Gramex wants to find the solutions to these managerial problems in the technology of blockchain,

> red. *"(..) it's very difficult to handle a lot of that information we have in the files, territories. We have some ideas, but sometimes they require that the other organizations have the same language as us in the IT part of it, (..)but if we think the blockchain ... then they have to report to the blockchain every time they buy or sell rights and every time, they sell shares*." (Korsholm & Mortensen, 2019)

With this solution the representatives hope to lower the transaction cost, which in theory is "*when property rights are protected and maintained in any context, transaction costs exist."* (Allen, 1999). With this in mind, blockchain has the ability to secure and follow the rightsowners, which would lower the transactions costs, when this part of registration and tracing the content would be digitalized.

The position of Gramex and gathered literature confirm that the music industry is facing a crisis, that emerged along with streaming services and the digital right management. For example, the authors of the article that refers directly to the blockchain technology *"Reinventing the Music Industry: Will Blockchain Technology Cause a Revolution*?" state, that *"The music industry has been facing different phases, that were influenced and driven by disruptions like for example the latest one – emergence of streaming services like Spotify. (…) The music industry struggles with decreasing revenues, licensing and delays in royalty payments."* (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015). It raises the question how it is possible to overcome this crisis and if there is a technology that could be implemented in order to change this situation. This issue with streaming services, however, has no influence on Gramex directly.

> *"For Gramex it's not a big problem, because all the negotiation regarding downloads, all the negotiation with Spotify and YouTube, Facebook etc. record companies they do by themselves."* (Kristensen, CEO at Gramex, 2019)

Nevertheless, the overall situation and tendencies show which direction the companies within the music industry should follow. Based on the literature, we were able to establish the main challenges, that currently are distracting the industry. Among the others, they refer to complicated intellectual property management, decreasing revenues and a high number of third parties (middlemen). Thus, all factors brought together lead to the question, how it is possible to overcome the crisis and, if there is any technology, that can help with it. Leaders of Gramex are interested in blockchain technology and its capabilities. As they are aware of the difficulties and the emerging need of an internal IT-based system, that would ease managing all the transactions, they are handling in Denmark and internationally.

> *"Blockchain would be a fantastic international product for all our businesses, because rights are shifting so quickly, and we don't have technology to follow that.*" (Kristensen, CEO at Gramex, 2019)

Blockchain technology emerged from the simple and direct idea, that there is a need of removing these institutions, also called 'third parties' – in order to reduce related costs of all transactions executing over the Internet and ensure security. The best example, that illustrates this mechanism, would be a bank that works on the principles of the 'middleman', while proceeding money transfer from one entity to another. Of course, the engagement in any bank in any transaction generates extra costs (commission), that involved entities need to handle and this is regulated by contracts. In our report the music industry has been investigated, as we found out that there is a broad field in relation to digital rights management and file exchange, that the study of the blockchain technology might bring new solutions to.

We made an attempt to understand, how this emerging technology might be used in other industries, as "*a distributed ledger has the potential to be highly transparent, secure, immutable, and decentralized. These features are useful for dealing with operational and business issues besides financial transactions, and the technology has already been used for interorganizational cooperation beyond the cryptocurrency aspect.*" (Angelis & Ribeiro da Silva, 2018).

Nevertheless, the important premises state that in terms of the market (even diverse industries), business rules and fundamentals will remain the same. In our understanding, it means, that companies functioning on the principles of being a 'middle-man' in the value chain, has to embrace new technologies and innovative solutions in order to implement them and reshape their business models. The idea of removing 'third-parties' doesn't have to result in the process of vanishing these entities. Literature states; *"maturing technology typically enables new types of product or service offerings and involves changes in the pursued and derived benefits."* (Angelis & Ribeiro da Silva, 2018).

Nevertheless, the difficulty that emerges from a proper usage of the blockchain within businesses, is related to the creation of a new business model. The question raised is, how companies can implement blockchain technology, provide services based on it and still earn money. If the 'middle-men' institutions would be disrupted, then the information exchange would be proceeded directly between the users engaged in the transaction. Therefore, the business model, that include a blockchain technology, as a part of the strategy, is still discussed.

> *"And that is one of blockchains big challenges. if you want to create this one here (the direct transaction). How do you then make money out of it. And I see that, it is probably the only opportunity (…), but it is that the incumbent in the industry then work together on realizing that one."* (Jensen, First meeting, 2019)

Consequently, it leads to changes within the business approaches, which at the same time influence other firms in the ecosystems. In our work, we were focused on exploring the concept of innovation, with a special emphasis on the 'open' approach. The examined case study required a broader perspective, that combined the idea of the business model with the technology development. Based on our initial research and gathered literature, we concluded, that Gramex should recognize their external and internal resources in relation to their ability to embrace and implement new technological improvements. According to Chesbrough (2003), this idea combines an open innovation phenomenon and the business model concept. Therefore, management of Gramex, in order to acquire new sources of knowledge and technology, should reshape their business boundaries.

As we know from Kiki and Lars (2019) Gramex possess an in-house IT department, that could be able to set up a new, internal system, that would handle data exchange.

"We have an I.T. department and they have a big task of developing a new system, but I don't know when they are busy." (Korsholm & Mortensen, 2019)

But, in relation to establishing an external network of companies, based on blockchain technology, the management of Gramex should involve resources, that come from other suppliers. This approach is confirmed in academic literature, as "*the environmental uncertainty and the complexities of innovation and knowledge recombination have led to the increased permeability of organizational boundaries.*" (Felin & Zenger). Moreover, especially in our case study, it was very important to follow what Chesbrough (2011) stated, that opening boundaries causes lower costs, which relates to our idea of creating a common platform.

The literature learned us that an open business model is a necessity for this to be possible. Chesbrough argues *"(..) companies must develop open business models if they are to make the most of the opportunities offered by open innovation (…). To get the most out of this new system of innovation, companies must open their business models by actively searching for and exploiting outside ideas (…)"* (Chesbrough 2007 cited in (Weiblen, 2014)).

We recognize blockchain technology as a disruptive kind of innovation, something new on the market, that emerged from ongoing modifications and created needs. Therefore, companies have to constantly recognize, react and learn, how to embrace new technologies, its capabilities, limitations, opportunities that may arise from implementing them. In order to achieve this and, in addition, create a new value, Gramex should focus on cooperation with external companies, that might provide them with diverse knowledge. In association with Gramex' internal data this should cause solutions for the future.

Implementing new technologies should entail broad discussions and changes within the company's business models, in order to establish new definition of created value and its delivery. Literature provides many premises regarding the usage of blockchain and its capabilities to influence and reshape existing businesses, in a way of disrupting the market. It is especially relevant for companies, that position themselves as a 'middleman' in established transactions. With blockchain as a new and still evolving technology, a disruptive innovation,

it is paramount to understand this new peer-to-peer system. To be able to find the solution that fits the company, open innovation is needed.

The need of new innovation is also argued from J. Kristensen in his book, *Danmark under forandring*, where he states that the growth of the company is achieved by a creative mind in adaptation to new technology. He argues, that the way we understand *disruption,* in the matter of the technological development, rather has to do with the end of the industrial society. J. Kristensen (2016) believes that the disruption is the name of the shift from one economic paradigm to another. It has been the habit of thinking in more than 100 years, that is now being disrupted with the digitalization. "*For those, who think about the future and the changes, will make a focus on the topline and new opportunities."* (ibid.). He mentions the five technological waves of Schumpeter, which describes the development in the technology and the new waves to come. This is of course not a new way of thinking, but to be able to catch up with the new changes. J. Kristensen argues, that you have to be "*either adaptive or creative".* Where being adaptive is the traditional way, where you adapt to the changes and the creative way, is to do something new (ibid.). Gramex, who is navigating in the music industry is therefore open for the way of thinking creative. The conducted interviews and research of academic literature provide a deeper understanding of the blockchain evolution.

The development of this technology moved from the first phase, where it was used only for transferring cryptocurrencies, to blockchain 2.0, which handles smart contracts. Now, applications based on decentralized ledgers are under development. Finally, the latest innovation within blockchain technology is focused on artificial intelligence, in order to achieve more complexed and automatic data transmissions by combining these two distinct tools.

This understanding of the literature makes it clear, that the second version, that deals with smart contracts, is the most needed solution for our case. "*From these smart contracts, it is possible to operate knowing the rules of the game, and parties that are not well known can trust each other without the need for middlemen acting as guarantors*." (Angelis & Ribeiro da Silva, 2018). This solution would help to establish clear, transparent and secure transfers of the data between Gramex, record labels and artists in order to ease digital rights management and cash flows. *"A general sense of blockchain-based smart contracts emerges from the smart property discussion. In the blockchain context, contracts or smart contracts mean blockchain transactions that go beyond simple buy/sell currency transactions and may have more extensive instructions embedded into them."* (Swan, 2015). Using smart contracts as a tool fulfill these

needs without having an extra institution. *"This is because a smart contract is both defined by the code and executed (or enforced) by the code, automatically without discretion. In fact, three elements of smart contracts that make them distinct are autonomy, self-sufficiency, and decentralization."* (Swan, 2015). Also, smart contracts' transparent and autonomous nature "*mitigates risks of manipulation and error.*" (Angelis & Ribeiro da Silva, 2018).

In order to expand the knowledge about the smart contracts and the safety of blockchain, Allan Hammershøj, Chief Operating Officer at Media at Hand, explained how the safety is improved in the blockchain system, due to hacking of private data. Blockchain is built on the system of ledgers which contains all the information about the given object. This is where A. Hammershøj sees the benefit.

> *"(…) what's interesting about blockchaining the keys itself, is that then there's not just one key. There are different keys. That's encrypted in older stages."* (Hammershøj, 2019)

With the development of the digitalization, it is learned that the access to digital content has been easier (O'Dair, 2019). Even though the security of the internet has been improved, hackers are also improving. A. Hammershøj explains the possibility of hacking the blockchain system.

> *"(red.) (…) of course, it's possible to decrypt it, right? To unscramble it and to make a key. You can brute force your way to a key or you can just try to guess it right. So, what's interesting here is the traceability, meaning that, if you find some content that's been decrypted and you can play it back, you can from that on go backwards to see. ´okay - what place in the blockchain of the key management did this happen?´, then you could find out where the breach is. You can see, where it came from because that's where it accessed. Also, it's kind of like in DRM technologies. It's called forensic fingerprinting"* (Hammershøj, 2019)

What is also discussed in relation to blockchain usage and security of the content, is the problem of double content (Hammershøj, 2019). In the music industry, where illegal downloads are increasing, the blockchain key can help with the reduction of these downloads and hacking. The only problem refers to the double content (ibid.). This means, that if one song is downloaded or recorded from the internet, its next version does not have any traceability code.

> "*How would you in any way find out where it was breached? And then you would have all the keys removed. Right! When it's decrypted, that's where the problem is."* (Hammershøj, 2019)

This argument from A. Hammershøj is something that is needed to be discussed in order to understand, if this solution is something that will benefit the music industry.

Further, we focused our research on finding a solution for Gramex in order to see, if they can benefit from the blockchain technology and how they can make their workflow easier and more efficient. The findings provided knowledge about the difficulties, that are related to blockchain and its direct transaction within the context of creating new business models. We realized that the hardest part is related to the way blockchain-based businesses earn money. In our case using blockchain as a tool to manage the data exchanges, it is not a desirable solution. Because if the direct transaction between the artist/record labels and users is done by blockchain, there is no need for Gramex, which makes this a bad solution for Gramex.

Therefore, we wanted to look further into the solution of creating a common platform, to see if that would be a more appropriate solution for Gramex. We learnt from the conducted interview with L. R. Korsholm and K. T. Mortensen , that there is a need for building a common online space, where all the artists, producers and record labels could register and be a part of the network, that has a direct contact with the 'users' (all public places). This solution would ease uninterrupted and straight payments for the used content. In relation to this idea, Henrik defined the first obstacle, that questioned the matter of cooperation. He stated that creating a common platform based on the blockchain technology would be extremely difficult, as:

> *"I mean there are three steps... let's take the music industry. First of all, the music industry, or the producers, the artists… or who is going to represent the artist, they need to make a decision they want to work together."* And *"That takes time."* (Jensen, First meeting, 2019).

To make this clear, the producers are not in competition with the big actors such as Spotify, they are in competition with each other.

> *"So, in order for them to work together they need to work together with their biggest competitors, which can be difficult. And there is also some legal about some sort of competition laws and those kinds of things."*

Which is why this can be a struggle. So, if they agree

> *red. "(…) 'yes we want to work together', then you need to decide, how you're going to do that. I mean how are we going to design the blockchain with the standards and processes and all these kinds of things, so it's actually matches everyone, so nobody gives some kind of competitive advantage out of those one. And then you need to build it."* (Jensen, First meeting, 2019).

In the process of analyzing gathered information, the question regarding the removal of the 'middle-men' institutions raised. Taking this possibility into consideration and using the argument that gathering all artists, producers and record labels together would threaten Gramex's existence. As the literature tells us, that blockchain is based on trust established by all engaged peers, the institution of the 'middle-men' is not needed. It means, that in general it "*has the ability to allow labels directly distribute to consumers. This would reduce overheads and allow labels to receive 100% of the revenues."* (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015).

Using blockchain in this matter could also lower the transaction costs of monitoring rights and get rid of the silos. In this following case, embedded in the music industry context e.g. it would be Spotify. Unfortunately, it does not look like a solution in the near future, says A. Hammershøj.

> *"And the problem is another thing, is that most music today is in silos, either in iTunes or Spotify or YouTube, that's the vertical. This we're talking about is a horizontal way of delivering services, but that's not the way the world's going unfortunately."* (Hammershøj, 2019)

But the question remains, if it is possible?

> *"Technically yes. Would it be done? It doesn't look like it."* (Hammershøj, 2019)

Thus, if this idea is possible to manage, why is there no other company on the market, that could create a competitive environment? The reason for this, is a stated law that puts Gramex

in charge of all the ownership rights of artists and record labels on their behalf. In this sense, Gramex has monopoly. So, even though, someone would be building this platform, they would need all the rights to handle these informations.

> *"Everything can happen, but we will probably buy this system instead of giving all our rights away."* (Kristensen, CEO at Gramex, 2019)

Of course, this is an advantage for Gramex, as no one can disrupt their business. Nevertheless, if they sold the rights, would it be a solution to benefit the artist and the users?

This solution would be possible, but a question is raised by A. Hammershøj.

> *"Be careful here. The blockchain has many things, because if you go into cryptocurrency right. (…) going to blockchain such as bitcoins and so on, also the payment here is not there yet. As you just know, it's dropped 80 percent of the value (…) but the technology of blockchain as a technology in itself, does great open source projects"* (Hammershøj, 2019)

This points out the difficulty in the payment methods, but the more complexed problem refers to usability. Here we ask the question, how the content would be accessible for the user through the blockchain technology.

> *"(…) This is a usability issue. Of course, it also has to do with stakeholders. But this is usability, because where does a service start. You say, ´if I put my start screen to Google then I'll be able to find anything.´. And that's because they made a good search engine right. But it's not very good to find music"* (Hammershøj, 2019)

Hence, a new blockchain based platform has to be developed for this purpose, to get access to the content and therefore it would replace Spotify. This would take a lot of work to gather all the artist on this specific platform. Further, the costumer experience for both parties also has to be convenient. As an argument for that, people use Spotify because of the easy way of approaching the content.

To sum up this part of the discussion, with the knowledge that we obtained, a new blockchain based platform could be a potential solution. Nevertheless, this goal can only be accomplished, if Gramex sell all of the rights or establish the new platform.

But the main problem with the presented approach is in fact the misunderstanding of the blockchain technology itself, which is a 'decentralized ledger'; in other words, *"a distributed database of records or a public ledger of all transactions or digital events that have been executed and shared among the participants. Each transaction in the public ledger is verified by a consensus of the participants in the system, allowing for traceability and, in turn, security without the need of a central authority."* (Angelis & Ribeiro da Silva, 2018).

This misunderstanding appears in the first interview with J. Kristensen, who believes that the blockchain based platform would be an advanced tool to manage their work flow.

> "*So, it's all in the system but it's a lot of work in every company because we don't have an intelligent I.T solutions that can follow rights, what blockchain could do. So that's why it was interesting for us."* (Kristensen, CEO at Gramex, 2019)

The same idea was presented by K.T. Mortensen (2019):

> *"Yeah, but if you think of the blockchain … then they have to report to the blockchain every time they buy or sell rights and every time, they sell shares."*

But, in its core, what is discussed by H. H. Jensen:

> *"so, this is normal digitalization. There's no decentralization in here"* (Jensen, Second meeting, 2019)

There is no doubt that Gramex, as a company, needs an internally managed IT system, that would ease the process of data exchange and constant updates, in order to ensure that in the end, the right person – as the rightful owner – would be paid. But in this particular investigated case study, blockchain technology is not a solution.

The in-depth analysis of the gathered data and first conclusions led us to the second meeting with our specialist, who confirmed our assumptions.

> *"So why do we want to do decentralized with blockchain.? Because I mean, as you say- this is actually to me It's... I'm surprised that they… but that's probably because they have a monopoly, that they haven't digitalized or automated it... because I mean... I can't see where a blockchain should be used here."* (Jensen, Second meeting, 2019)

The essential feature of blockchain, that constrains the possibility of using it within the internal structures of Gramex is the aspect of 'decentralization'. This means that there is no institution, or person, who should have a power over the network; all participants have the same access to distributed information; there is no hierarchy – all participants are even; all transactions proceeded over the platform are transparent and pure; trust is established by a number of users.

We therefore suggest that, as a first step, Gramex should work on developing and implementing an internal IT system, that would automatically conduct most of the processes, which now are being done manually.

Of course, there is an important matter of in-house employees, who are now responsible for proceeding these processes, as automatization always leads to a decreasing need of human work. The second doubtful aspect refers to the emerging need of a new IT department, that would handle the new system. Regarding the first issue, the case of Gramex would still demand complex human work, as the company has various kinds of contracts with their members. Creating one template for all of them would be a helpful solution, even though, K. T. Mortensen and L. R. Korsholm explain that:

> *"(red.) It's not that this takes time because we have read so many of those different contracts. (…) It is because the countries doesn't only contains neighboring rights, which is our area, it also contains a lot of other things."* (Korsholm & Mortensen, 2019)

This would be the first step to ease this process.

Earlier in the discussion, A. Hammershøj confirmed that Gramex would benefit from implementing a simple internal IT system. This argument is also supported by H. Jensen (Second meeting, 2019).

> *"And again, to me it's fairly simple what you need to do right ...because when you have digitalized those things here, everything can by automatically done."*

But since there are still binding contracts with all producers, record labels and artist, employees they still need to have control over some of the contractual terms and conditions. Thus, there are situations, that require direct contact with the opposite party. Gramex has their own in-house IT department, that is responsible for providing standardized system to ease and clarify

information exchange. Still, the question about its creation and implementation remains open. As a consequence of this situation, we suggest providing an extra source of knowledge by rethinking their business model in order to implement open innovation and through this, adjust their business to the new reality.

Further, the interview with John and the second meeting with Henrik, have changed our perspective and shifted it towards a different solution, that in our understanding is more applicable at this moment. We identified an area, where the blockchain technology would be applicable. John, who explained Garmex's position in Denmark, also gave us an overview of the worldwide connections and the whole complexed ecosystem; especially how the music industry regarding digital rights management and cash flows is created. Gramex could be the first institution, that would identify common challenges for companies like them and start the process of creating common networks of enterprises from different countries, that operate within the same business areas, as Gramex.

We believed, that adjusting the business of Gramex in order to gain a new knowledge and provide a service, that would add an extra value for all involved parties, is a right direction in the process of the development. In this sense, establishing an online platform that artists, record labels, producers, radio stations, and all representatives of public spaces would have access to, is a possible and useful solution. This means, that in our case there is no necessity and even an opportunity to use blockchain technology within company's IT structure. Thus, blockchain as a decentralized ledger, would have no application in this case, but still there is a serious need of improvements within the internal system, that would embrace new technologies in order to ease the work of Gramex's employees.

There is still a lot of doubts regarding this technology, as decentralized digital ledgers often handle confidential data. It may encompass difficulties with ensuring security, standardization and settling law regulations, also estimating costs. Referring to these issues, we also know that choosing the proper version of the blockchain is an essential decision to make, as a private blockchain "*can save an organization time and cut costs, whereas a public blockchain has the potential to disrupt an industry, either through disintermediation, as is the case in financial applications of Bitcoin and other cryptocurrencies, or by the creation of new business models.*" (Tamayo, 2017 cited in (Morkunas, Paschen i Boon, 2019)).

Based on this, we suggest Gramex to start making the first attempt towards other companies in order to create a common, decentralized, trustworthy platform. That contains information about payments, copyrights, ownership, etc., that all companies from the music industry would have access to. "*Numerous databases that contain redundant and often inaccurate information could be replaced by a constantly updated database. This type of database is necessary to revolutionize the music industry, this way helping to ease, speed-up and track the communication between the artist and the license requester."* (O'Dair et al., 2016; Willaert, 2017 cited in (Assal, Clancy, Dimitrov, Užubalyte, & Witkamp, 2015)). Thus, the platform is to be built on a private and closed Hyperledger, that a blockchain as this can only be edit and read by the peers, who are connected to this blockchain. Further, this choice of blockchain also "*offers more transaction privacy, which is critical for transactions involving sensitive data (…). Closed blockchains are easier to scale up, cut down costs, and feature greater transactional through-put. Additional advantages include added security, lower costs, added reliability, and a higher level of trust, as only pre-verified parties are able to initiate a new node in the blockchain*." (Coburn, 2018 cited in (Morkunas, Paschen i Boon, 2019)). Because of these advantages, we see it perfectly fitted for a common ledger in the music industry, and for Gramex and their difficulties.

The significant feature, that stays against the 2.0 blockchain's usage, is that the structure is not fully developed. Therefore, this can be a challenge for Gramex, as they are working in the industry where the rights are changing all the time. In general, the problem is related to the security of these contracts and the fact that they are unchangeable. On the other hand, we know from Allan, that the inability of altering the agreements is not a problem, as there is always a possibility to add new codes to the contract.

> *"No but you could do it with the key. That's the exact thing, is that you change the key. That means the player next time it wants to get to it, it still needs the key to it, right. But then the key is changed. So, the key change to do terms and it might come up saying - sorry Terms has change. (…) They are being updated."* (Hammershøj, 2019)

Further to this, he stated that there are many different kinds of contracts, which run on diverse blockchain-based platforms, that are developed for various purposes. Thus, managers should have the basic knowledge and well-defined expectations due to contracts and their features, before choosing the right one. (Hammershøj, 2019).

Another aspect to discuss in the matter of the security improvement, is the digital rights management that comes along with the blockchain technology, that has been stated in the analysis. H. H. Jensen explains the opportunity to hash the content, which have not been possible in decentralized systems before blockchain.

> *"(red.) You can hash it (the content) and do some different things to secure it. which also makes it impossible to change up here. (…) But the interesting thing about the security (in) the blockchain, that you now can do, can have the same level of security on decentralized solutions, they should have on centralized solution. You were not able to do that before."* (Jensen, Second meeting, 2019)

Even though this is a huge development, these improvements are still vulnerable; and the hackers are improving their skills as well. Nevertheless, the possibility of tracing the content and identifying direct spots where it was hacked, make it much easier to control the digital content.

> *"It's about finding out what happened, because crimes will happen. It's a matter of evidence to find out where it was, where did it come from. Right?"* (Hammershøj, 2019).

The definition of digital rights management is based on the legal regulations and the matter of securing the content. Currently many artworks, video and audio files contain watermarks to secure the ownership and the payment transaction (in favor of accessing the content).

> *"(…) a combination of both blockchaining, and a watermark on the key management to blockchain, then it's much easier to find out what was the breach and then go backwards."*

The traceability of the information, that is put into the blockchain, therefore makes it difficult for the hackers to hide in the system. A. Hammershøj (2019) explains that going backwards in the chain, from the record label to the music platform, allows to track if the leak was directly in the record label or emerged in other transactions. Allan points out, that this feature of blockchain is an opportunity to make people more thoughtful and careful, when it comes to illegal downloads or hacking the content. With this opportunity he points out that more people in the future will be more thoughtful, when they decide to download or hack content.

9. Conclusion

The purpose of this case study was to explore if the blockchain technology can help Gramex in order to lower their transaction costs and make their business more efficient. In order to examine the company's current situation and to provide achievable solutions for the future, we started gathering knowledge by an in-depth literature review and semi-structured interviews. As our research was based on case study principles, the context and general real-life setting have had a significant meaning for the whole process of providing this project. The case study of Gramex was thought-provoking because it encompassed not only internal and external associations with units existing within the ecosystem, but also an importance of the new technologies in shaping modern businesses. Moreover, the research exposed how significant it is to recognize and deeply understand capabilities of innovative technologies, same as pros and cons of implementing them. Our study showed, that managers should be very cautious when they consider changing the company's structure based on only popularity, overall hype and few premising statements, regarding novel achievements in the IT field.

In order to answer our main research question, we gathered knowledge about the transaction cost theory, innovation and business models. We identified the main problem that Gramex faces, that is related to information exchanges and constant follow-ups on changes within their ecosystem, which causes them a lot of transaction costs. Combined theories and concepts, replenished with semi-structured interviews allowed us to conclude, that there is no need of implementing a blockchain-based platform within the internal structure of the company. The most important feature of this technology is the decentralization and this in fact excludes the blockchain-based solution for Gramex. Obviously Gramex should invest in providing an IT system in order to digitalize and ease their workflow, save money and time, but this should be done by a regular IT system. Implementing this solution will also help Gramex lowering their transaction cost in the matter of new registrations and contracting within Denmark.

Nevertheless, obtained experiences let us to provide a potential solution for the future, that still includes blockchain technology, but used in a broader context. We would recommend Gramex to reach the other companies, that work on the same basis and start a new initiative in order to establish a common platform. The blockchain-based platforms are characterized by peer-to-peer systems, where every user is equal in terms of roles and rights. Moreover, has the

same responsibility and the same competencies. Hence, we consider that companies, which constitute to the music industry existence should be engaged in the process of developing the common closed and private Hyperledger, in order to ease the information exchange, obtain better security and to lower transaction costs with all foreign countries.

In addition to the literature and knowledge about blockchain improvements, Gramex and other companies would benefit from implementing this technology, that supports smart contracts and allows to add extra exchange conditions to each piece of data. The case of Gramex displays that lack of shared ledger for companies within the music industry, causes money leakage in all transactions. To implement this solution and make it succeed, all the companies in the ecosystem should recognize the area within their business models in order to open the boundaries and start innovative processes. These changes would benefit all of the companies, including Gramex, even though this proposition is not what the management of Gramex was expecting at the beginning.

An interesting feature regarding blockchain technology and its advantages refers to the problem of hacking content and illegal downloads. This is the first online system, that might ensure security of data in addition to digital rights management. As it is a decentralized system that handles all data exchanges in transparent manner, it provides tools to track all changes within the systems and attempt to make any illegal, unwanted alterations or brakes-in to the network.

During the process of providing the project, we faced limitations, that might have had an impact on the final outcomes. Firstly, we were not able to reach any other studies within this field, as usage of the blockchain technology in other industries that are not directly related to the financial sector are limited. This concept is perceived, as an innovative and meaningful tool for the future, but it still needs lots of investigations and development. In our project we follow academic findings and solutions that gave us basis to use them in a different, novel way. Nevertheless, we believe that our research and putted effort provide strong foundation for further investigation of this subject. Main assumptions might be used in different contexts, but still the real-life setting plays a substantial role in this study.

There are also other interesting aspects and topics, that might be starting points, base for the further research. At first it would be noteworthy to conduct an in-depth analysis of the whole

music industry ecosystem and how companies, record labels and artists work together, in order to get a better understanding how the blockchain-based system could be implemented and spread around the world. How to engage companies from different countries to collaborate and work together?

In addition to this, it would be beneficial for the future research to explore different legal regulations that shape the music industry in each country. This should be taken under investigation, as it might be an obstacle for establishing a common blockchain-based platform. This particular technology is so novel, that internal regulations in the companies might be limiting for the implementing of blockchain. If the agreement would be made, it would also raise the question, where and how to begin the common initiative? How to manage this possible cooperation, that potentially could turn into establishing the blockchain-based platform?

A further research should also look at exploration and the ability to share knowledge with other IT companies in Denmark in terms of new technologies as blockchain. It would give the companies an in-depth understanding where the platform should be established.

Moreover, it would be interesting to explore, how cryptocurrencies might be exploited along with the smart contracts. The question for the future is, how companies should manage payments for shared content and exchanged data. If a further development of the blockchain technology will change people's attitude towards virtual money, it would make it much more efficient to make a usage of them.

If we had a broader overview on the organizational aspects, it would also be motivating to study the theory of ambidexterity, and its influence on the companies in relation to the new technological developments. How fast is the concept of blockchain developing? And, how open for technology does a company need to be, to keep up with novel solutions?

10. References

Allen, D. W. (1999). *Transaction costs.* Simon Fraser University .

Angelis, J., & Ribeiro da Silva, E. (2018). Blockchain adoption: A value driver perspective.

Assal, Y., Clancy, K., Dimitrov, D., Užubalyte, G., & Witkamp, A. (2015). *Reinventing the Music Industry: Will Blockchain Technology Cause a Revolution?*

Chaudhuri, D. K. (2007). *Digital Rights Management - a Technological Measure for Copyright Protection and its possible impacts on libraries.* Kolkata: Basanti Devi Collage.

Chesbrough, H. (2011). *Everything You Need to Know About Open Innovation.* Retrieved from https://www.forbes.com/sites/henrychesbrough/2011/03/21/everything-you-need-to-know-about-open-innovation/ 3/3

Chesbrough, H., & Rosenbloom, R. S. (2002). *The Role of the Business Model in Capturing Value from Innovation: Evidence from Xerox Corporation's Technology Spinoff Companies.* Boston: Harvard Business School.

Christensen, C. M., Raynor, M. E., & McDonald, R. (2015). *What Is Disruptive Innovation?* Retrieved from Harvard Business Review: https://hbr.org/2015/12/what-is-disruptive-innovation

Drescher, D. (2017). *Blockchain Basics: A non-technical introduction in 25 steps.* Frankfurt: Apress.

Drucker, P. (1994). *The theory of the business.* Harvard business review.

Fauvel, C. (2013). *Criticisms, variations and experiences with business model canvas* . UK: European center for research training and development.

Felin, T., & Zenger, T. R. (n.d.). Closed or open innovation? Problem solving and the governance choice.

Fielt, E. (2014). *Conceptualising business models: definitions, frameworks and classifications.*

Finck, M., & Moscon, V. (2018). *Copyright Law on Blockchains: Between New Forms of Rights Administration and Digital Rights Management 2.0.*

Gramex. (u.d.). Hentet fra http://gramex.dk/om-gramex/

Hammershøj, A. (29. March 2019). COO at media at hand. (A. a. Pernille, Interviewer)

Hodgson, G. M. (2010). Limits of transaction cost analysis.

Hosoi, T., Kim, J., Stainken, D., & Caro, F. (2015, 08 31). *Disintermediation in the Recorded Music Supply Chain.* Retrieved from UCLA Anderson Global Supply Chain Blog: https://blogs.anderson.ucla.edu/global-supply-chain/2015/08/disintermediation-in-the-recorded-music-supply-chain.html

Hughes, A., Park, A., Kietzmann, J., & Archer-Brown, C. (2018). *Beyond Bitcoin: What blockchain and distributed ledgers technologies mean for firms.*

Jensen, H. H. (2019). Hentet fra https://www.linkedin.com/in/henrikhvid/

Jensen, H. H. (2019, April 21). First meeting. (A. a. Pernille, Interviewer)

Jensen, H. H. (01. 05 2019). Second meeting. (A. a. Pernille, Interviewer)

Klaes, M. (2000). The History od the Concept of Transaction Costs: Neglected Aspects.

Korsholm, L. R., & Mortensen, K. T. (2019, May 4). Interview with Kikki and Lars. (A. a. Pernille, Interviewer)

Kristensen, J. R. (10. April 2019). CEO at Gramex. (A. a. Pernille, Interviewer)

Kristensen, J. R., & Dyekjær, T. M. (2016). *Danmark under forandring.* Vordingborg.

Langlois, R. (September 1995). Transaction Costs, Production Costs, and the Passage of Time.

Marques, J. P. (2014). Closed versus Open Innovation: Evolution or Combination? *International Journal of Business and Management*.
Marr, B. (2018). A Very Brief History of Blockchain Technology Everyone Should Read.
Massessi, D. (2018). *Public Vs Private Blockchain In A Nutshell.* Coinmonks.
Morkunas, V. J., Paschen, J., & Boon, E. (2019). How blockchain technologies impact your business model. *Business Horizons*.
Nakamoto, S. (2008). Bitcoin: A Peer-to-Peer Electronic Cash System .
Nielsen, C., & Lund, M. (2012). *Business models; network, innovation and globalizing.* Ventus publishing ApS.
O'Dair, M. (2019). *Distributed Creativity; How Blockchain Technology will Transform the Creative Economy.* London: Palgrava macmillan.
O'Dair, M., & Beaven, Z. (2017). The networked record industry: How blockchain technology could transform the record industry.
Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: a handbook for visionaries, game changers, and challengers.* Self-published.
Ovans, A. (2015, 1 23). What Is a Business Model? *Harvard Business Review* .
Saunders, M. L. (2016). *Research Methods for Business Students.* Harlow:: Pearson Education.
Schoen, J. M. (2005.). *The innovation cycle: a new model and case study for the invention to innovation process.* Engineering Management Journal, 17(3).
Shatkovskaya, T., Shumilina, A., Nebratenko, G., Isakova, J., & Sapozhnikova, E. (2018). Impact of Technological Blockchain Paradigm on the Movement of Intellectual Property in the Digital Space. *European Research Studies Journal Volume XXI, Special Issue 1*, 397-406.
Sitonio, C., & Nucciarelli, A. (2018). The Impact of Blockchain on the Music Industry.
Swan, M. (2015). *Blockchain: Blueprint for a New Economy.*
Weiblen, T. (2014). *The Open Business Model: Understanding an Emerging Concept.* Switzerland: Univeristy of St. Gallen, Institute of Technology Management.
Wikström, P. (2013). The Music Industry: Music in the Cloud, 2nd edition.
Williamson, O. E. (1981). The Economics of Organization: The Transaction Cost Approach.
Williamson, O. E. (1998). Transaction Cost Economics: How It Works; Where It Is Headed.
Yousuf, A. (2017). *Transaction Costs: A Conceptual Framework.* Debrecen: International Journal of Engineering and Management Sciences.