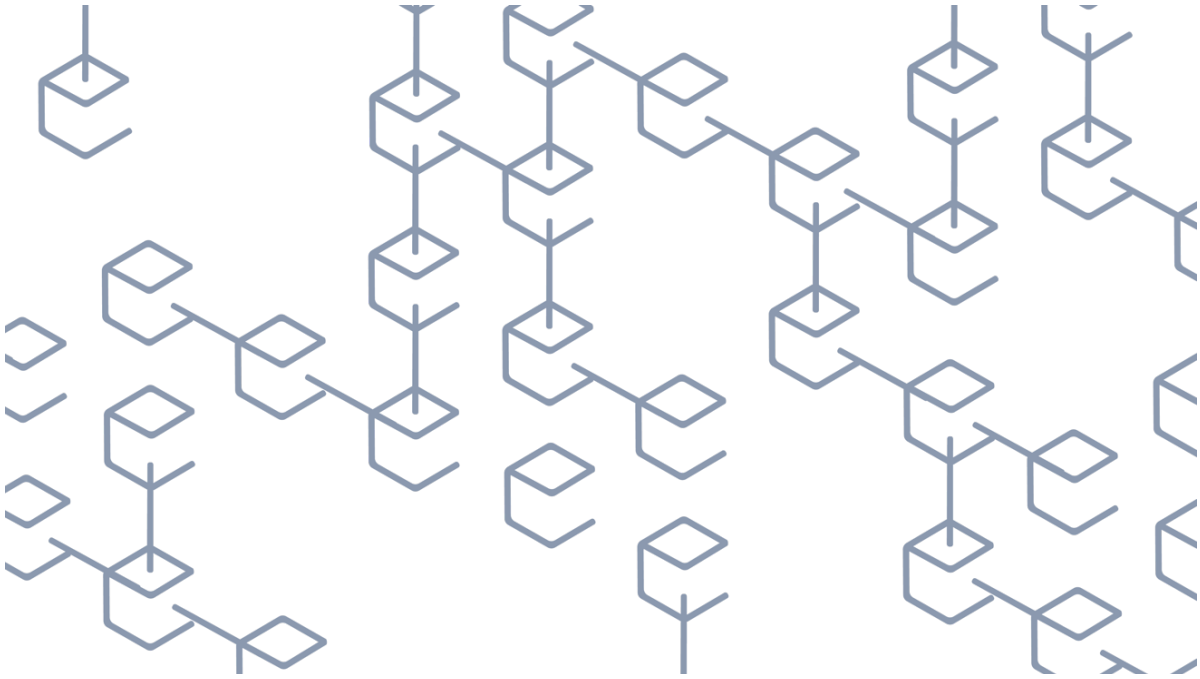
Beyond the hype:
embracing blockchain for social change

An analysis of how blockchain is fostering social innovation



Izabella Naessa Souza Cunha

Master's Thesis (CBUSO2000E)
Master of Science (MSc) in Business Administration and E-Business
Copenhagen Business School
March 2019

Supervisor: Helle Zinner Henriksen

Total number pages: 76

Title: *Beyond the hype: embracing blockchain for social change. An analysis of how blockchain is fostering social innovation.*

Master's Thesis written by

Izabella Naessa Souza Cunha

Student ID: 113145

Thesis supervisor: Helle Zinner Henriksen

Hand in date: 15th March 2019

Size: 76 pages; 159.897 characters

MSc in Business Administration and E-business

Copenhagen Business School

2019

Acknowledgments

I dedicate this research to the people living under the most social pressing conditions, people who do not have economic opportunities and are still submitted to unsafe working circumstances, people all around the worlds living in extreme poverty with no access to proper sanitation, healthcare, or education. I hope this thesis will help, even if indirectly, bring light into the problem while presenting solutions and inspiration for enterprises and governments to help scale the existing movements for positive change and incentivizing the rise of more social enterprises worldwide.

I would like to thank my supervisor Helle Z. Henriksen who patiently guided me through the research process giving me insightful advice. Also, I would like to thank the social enterprises that were part of the research: *Alice*, *BanQu*, *Plastic Bank*, and *Provenance*.

A very special thank you goes to my husband and my mother. I would not have written this thesis without their support, patience, and encouragement.

Abstract

Although recent discussions and researches have focused on Bitcoin and the emergence of cryptocurrencies, this paper examines the blockchain technology beyond the hype and beyond the discussions of the technology potential to disrupt peer-to-peer money transferring and financial markets. This study, therefore, focusses on how blockchain is uptake by social enterprises in order to tackle social problems and foster social innovation. By using an affordances conceptual model, this research places blockchain as the IT artefact underlying social enterprises which, in turn, are understood as the actors/organizations of the affordance process.

In order to identify and analyze the blockchain and social enterprises affordances, the case study method was used with a combination of two theoretical frameworks whilst merging quantitative data from an extensive literature review with the empirical data gathered from four different social enterprises. The analysis led to findings related to affordances perception, actualizations, effects, as well as enabling and inhibiting factors that contribute to the affordance's actualizations.

The discussion of findings confirms the previous assumptions that the blockchain technology is an innovation that goes beyond the hype and has been embraced by governments, companies, and social enterprises in order to address social problems and foster social innovation. Although the majority of the perceptions are positive, and a list of many enabling factors was found, the research also identified a list of inhibiting factors that are still preventing the blockchain widespread adoption among social enterprises.

Table of Contents

List of Illustrations

Chapter 1: Introduction

"(…) One of the most exciting potentials of the blockchain relates to creating new business models, whether in public or in private settings. In most of these cases, the new models don't care for incumbents because they are mostly on a disruption quest." (Mougayar, n.d.)

The words from William Mougayar express the disruptive potential the blockchain has presented in recent discussions around technology and in the most diverse type of businesses. It means that regardless of the nature of the organization, blockchain might represent a disruptive change that would not be possible to achieve otherwise. Due to the Bitcoin – the blockchain first and well-known use case - the majority of these discussions are related to the inherent capacity that blockchain possesses to revolutionize banks and financial markets. Much has been speculated about how blockchain is speeding up and simplifying cross-border payments as well as its potential disruption for share trading (Boersma, n.d.). However, another hot topic is emerging with the technology hype: the blockchain potential to address pressuring social issues. According to the United Nations, 783 million people live below the international poverty line while more than 40 million people are subject to a modern form of slavery, being over 70% of them women and girls (United Nations, 2018). At the same time, up to 12.7 million tonnes of plastic enters the oceans every year, causing the death of many species every day. In fact, in the Canadian Arctic, 87% of birds have ingested a kind of plastic (Bullock, 2018). Respectively, philanthropy and NGOs have tried tackling these issues but have fallen short. Over the last few decades, a new type of entrepreneurs has emerged. They started organizations with the value proposition of creating social change addressing the problems the world is facing today. The rise of social enterprises might mean a new way to tackle social problems. For these organizations involved in doing good, especially in underdeveloped countries, the concepts of blockchain, Smart Contracts and consensus governance are even more alluring (Dichter, 2019). Although there is an increasing interest in the blockchain technology and its business applications, from an academic perspective, there is still little focus on the blockchain role as an instrument of social change. Hence, it is worth exploring the benefits as well as the potential disadvantages of the blockchain technology when adopted by social enterprises.

In this paper, I question the blockchain technology beyond the hype and beyond its initial discussions around Bitcoin and Altcoins. I place blockchain as an underlying technology for social enterprises and as a driving force for social innovation. In this regard, I aim to answer the following research questions:

- *How has the blockchain technology been adopted by social enterprises in order to address social problems?*
    - *What are the potential benefits for social enterprises to adopt blockchain?*
    - *What are the potential constraints for social enterprises to adopt blockchain?*

Although the word "adoption" can carry many different meanings, for the purpose of this research, the employment of the term and its variants will refer to the affordance process that social enterprises join with the blockchain technology. To help answer these questions, I rely on an extensive literature review, interview, other primary sources (e.g., whitepapers), and secondary data sources (e.g., official reports). Also, I use a combined framework for affordances (Pozzi, Pigni, & Vitari, 2014) (El-Gazzar, Henriksen, & Wahid, 2017) to better analyze the affordances steps.

1.1 – Structure

Chapter 1 presents the topic of blockchain as the phenomenon the be analyzed in the research as well as the social enterprises playing an *acting* role towards the blockchain adoption for social change. This chapter also presents the research questions that will guide the research findings.

Chapter 2 begins with the literature review which concentrates mostly academic contributions around the blockchain technology. Here I present previous works related to this research as well as the basics concept of blockchain, Smart Contracts, Initial Coin Offering (ICOs), and Hyperledger. This chapter also considers the literature regarding social entrepreneurship, Corporate Social Responsibility (CSR), and previous works regarding blockchain for good.

Chapter 3 introduces the four cases I used for empirical data. These cases were chosen based on their characteristics as social enterprises, within different geographic locations, using blockchain as their underlying technology for change. For each case, I present an overview including history, value proposition, and global expansion; the social problem these companies are trying to solve; how their solutions are addressing the problem; and a use case.

Chapter 4 entails the theoretical framework in which affordances is contemplated. Through the abstraction of the theory, the affordances concepts and framework are explained in order to guide the understanding of the interactions of social enterprises and blockchain that will be found in the analysis chapter.

Chapter 5 presents the methodology used in this research. It includes the research methods and the data collection based on previous academic literatures; the choice of empirical data, in which the used criteria for the selection of the cases is explained; the evaluation that shows the trustworthiness of the process and of the data presented in this research; and the research design, where the process of the research is explained and illustrated.

Chapter 6 begins with the analyzes of the findings, combining information gathered through the research and their interpretation according to the affordance's theoretical framework. Here, I analyze the affordance existence, affordance perception, affordance actualization, affordance effects, as well as enabling and inhibiting factors for the actualization.

Chapter 7 entails the discussions where I take an in-depth analysis of the findings to better answer the research question. This chapter also includes other discoveries revealed during the research process but not necessarily contribute to the analyzes nor to the answer of the research question but are relevant for considerations of future researches.

Chapter 8 sums up the central findings and proceed with the conclusion of the thesis. The chapter answers the research question and presents reflections on the findings, theoretical and real-world implications of the thesis, and future avenues of research.

Chapter 2: Literature Review

This section of the paper will focus on previous writing related to the research question in order to present a review of existing outcomes. The goal is to be able to contribute to the academic discussion and create additional insights while placing this thesis among the important body of researches that already exists. In order to maximize the understanding of the research flow, this literature review is driven in two different directions. First, a research aiming attention to the technical terms where existing literature, media sources, and documentaries on the terms of blockchain, Smart Contracts, Initial Coin Offering (ICO), and Hyperledger was explored. Second, a research considering organizational concepts focusing on academic literature and articles related to Social Entrepreneurship, Social Innovation, and Corporate Social Responsibility (CSR).

In regard to the blockchain literature, for the purpose of this research, only recent researches and literature released after 2015 was investigated in order to guarantee that the latest developments and experiments around the technology were included in this paper.

As this thesis is an exploratory study, this section of the paper is focused on guiding the reader through the context of the researched topics. As a great amount of the results found has no meaningful contribution to this paper, after a qualitative screening, only a handful number of literature was found relevant and considered to the review. Therefore, other media sources and recent documentaries on the themes also contributed to the fundamentals of this research and this section of the paper, summing up a total of 56 reviewed sources.

Table 1 is a matrix that shows the key reviewed sources that contributed the most in view of the variables of interest of this paper.

Key Reviewed Sources	Concepts						
	Technological				Organizational		
	Blockchain	Smart Contracts	Initial Coin Offering (ICO)	Hyperledger	Social Entrepreneurship	Social Innovation	Corporate Social Responsibility (CSR)
Acheson, (What is an ICO?, 2018).			x				
Bacq, S., & Janssen, F. (2011).					x		
Bauerle, N. (n.d.).	x						
Bennett, K. (2018, June 27).	x	x		x			
Bentley, J. (n.d.).				x			
Bieler, D., & Bennett, M. (2016, September).		x					
Caramela, S. (2018, June 08).					x		x
Curtis, L. (2018, March 22).							x
Dahlsrud, A. (2006, November 09).							x
Fisch, C. (2018, September).			x				
Guegan, D. (2017).	x						
Heinecke, A., & Mayer, J. (2012).					x		
Holotescu, C. (2018).	x						
Howaldt, J., & Schwarz , M. (2016, April 30).						x	
Ibba, S., et al. (2018, September 18).			x				
Macrinici, D., et al. (2018, October).		x					
Mair, J., & Noboa, E. (2006).					x		
Morabito, V. (2017).	x						
Mulgan, G., et al. (2007).						x	
Nascimento, L. (2018, March 6).	x	x		x			
Nicholls, A., & Murdock, A. (2012).						x	
O'Leary, D. E. (2017).	x						
Phillips, W., et al. (2014).					x	x	
Westley, F., & Antadze, N. (2010).						x	

Table 1: Concept matrix with key reviewed sources

2.1 - The Blockchain Technology

According to Nascimento (2018), blockchain is allowing industries to re-imagine most fundamentals business relations, which opens new avenues and possible digital interactions in all levels being businesses, consumers, governments, and society, especially because the potential of the blockchain technology goes far beyond financial transactions and the rise of cryptocurrencies. Strengthening Nascimento's argument, Iansiti & R. Lakhani (2017) states that considering the digital transformation wave and the digital world that new technologies are helping to shape, the blockchain might be the answer for the most pressing problems in business and society related to trust and accountability. Additionally, blockchain could have a significant impact in terms of reducing the cost of transactions by decentralizing operations and when considering adoption in a large scale, even reshape the global economy (Iansiti & R. Lakhani, 2017). However, because of its novelty, most information available around blockchain is still theoretical and, consequently, there is a lack of proof when it comes to turning all this information into a real success with tangible results, particularly from a strategic viewpoint (Holotescu, 2018). Furthermore, in order to explore the full potential of

the blockchain technology and make it the foundation of global systems, many barriers including regulatory, organizational, and even societal need to fall (Iansiti & R. Lakhani, 2017).

Blockchain basic concepts

Blockchain can be described as a "secured business network where participants transfer/exchange assets within a decentralized ledger and each participant will have a copy of its content, in constant sync with other participants" (Nascimento, 2018). In other words, blockchain is not a new technology per se but a combination of three proven existing technologies: Peer-to-Peer network, cryptographic keys, and an incentivization protocol - orchestrated in an innovative way which eliminates the need for a trusted party in an information registration process (Bauerle). The Blockchain Hub (n.d.) also reinforces Bauerle statement and defines the three technologies composing blockchain as being: Peer-to-Peer network where every node of the network acts as a client and a server at the same time and holds identical copies of the ledger, Cryptography which combines public key with a cryptographic hash function creating a secured and unique digital identity for the nodes guaranteeing transparency and privacy, and Game Theory that is the governance, the behavioral rulesets of actions to be performed by the network when validating transactions.

Therefore, when a transaction is started, the information is stored in a chain of *blocks* where each block is validated by the users (Blockchain, n.d.). According to Morabito (2017), this means that blockchain technology can be considered trustless, since there is no need to trust an intermediate organization in performing an action, such as a bank handling a transaction. However, Nofer, et al. (2017) describes it as a shift in the trust, from needing to trust a third party to trust to the system itself where a certain number of nodes must validate a given transaction.

According to Nascimento (2018), the absence of the middle man – or third party – is one of the main benefits of a blockchain since it allows people who have no particular confidence in each other to trade and collaborate directly creating, therefore, a *machine of trust*. In fact, the trust is only possible because the ledger is controlled by no single individual but a distributed network that is committed to authenticate identities and authorize transactions reducing the risk of centralized corruption failure (Bauerle).

In centralized processes, there is no common practice or template shared among the network. Hence, each and every part will record their ledger in a different way, using different formats and based on their own view of facts which opens a significant window for data consistency issues, rework, bribery and fraudulent transactions (Nascimento, 2018). In a peer-to-peer distributed database, though, every transaction and its associated value are shared and visible to anyone with access to the network while the identity of the users - or nodes – are kept anonymous (Iansiti & R. Lakhani, 2017). However, Kobielus (2018) is categoric when saying that it is still too early to rely on such technology without proper testing considering different scenarios, levels of entrance, applications and other contexts. As reported by Kobielus (2018), the more stored wealth and commercial exchange value is riding on blockchain, the more its security vulnerabilities start to increase.

At the same time, Nascimento (2018) defends that not only the non-centralization contributes to the machine of trust but also the uniqueness and immutability of the transactions in a blockchain. The irreversibility of records is probably one of the most refreshing aspects of the blockchain technology (Iansiti & R. Lakhani, 2017). Because of the authorization – using private and public cryptographic keys – and authentication that happens through proof-of-work mathematical verification, every transaction happening in a blockchain is broadcasted to all nodes in the network creating a real-time sync system of records that only adds new information, never transforms or deletes (Bauerle).

In order to incentivize the network to validate new transactions and record them on the ledger, Cosset (2018) explains that a rewarding process starts every time a block of validated transactions – a structure containing a digital signature, timestamp, and relevant information – needs to be included in the blockchain. This process is called mining (Cosset, 2018). Acheson (2018) informs that for a node to add a new block in the blockchain, a complex mathematical puzzle based on a cryptographic hash algorithm that is part of the blockchain protocol needs to be solved. The process of solving the puzzle is done in the form of a race and consumes a great amount of energy and storage space (Cosset, 2018). The first node to reach out to the right hash result is rewarded with a new crypto coin (Acheson, How Bitcoin Mining Works , 2018).

As Iansiti & R. Lakhani (2017) asserts, the Bitcoin was the first concept of a crypto coin and the worldwide famous blockchain application. Bennett (2018) states that although Bitcoin is the first entry point for many people into blockchain, there is a misconception that blockchain is just another word for Bitcoin. Bennett (2018) also explains the difference between the two concepts by saying that Bitcoin is for blockchain that same as the e-mail is for the Internet, "a first consumer-grade application deployed at scale on a new platform" (Bennett, 2018). Holotescu (2018) also affirms that Bitcoin is the first and best-know blockchain platform that orients cryptocurrency transactions by using consensus protocol through a hash-based proof-of-work (PoW) distributed algorithm.

Since the Bitcoin protocol is an open source, anyone can take the protocol, modify the code and start a new version of blockchain for Peer-to-Peer money transfer or even business applications beyond cryptocurrencies which makes the usability of the technology more democratic and diverse (Blockchain Hub). Although Bitcoin plays an important role on the discussions around blockchain and cryptocurrencies, there are many blockchain platforms based on different protocols and consensus algorithms (Body, 2018). These different kinds of blockchain can be separated into coin-oriented blockchains such as Bitcoin, Litecoin, Ripple and others, and Smart Contract Platforms being Ethereum the most famous one (Body, 2018).

Taking privacy and security concerns into consideration and analyzing what makes blockchain theoretically tamperproof: cryptographic fingerprint and consensus protocol, several ways of hacking the ledger are already being evaluated (Orcutt, 2018). The steal of cryptographic keys to make non-authorized transactions is only one of the examples of potential security vulnerabilities on a blockchain (Kobielus, 2018). Another concern can be the network itself that works in accordance with the consensus protocol (Ibid.). Orcutt (2018) presents a recent work by *Emin Gun Sirer and colleagues* in which is demonstrated that neither Bitcoin nor Ethereum is as decentralized as they look since the research found that "the top four bitcoin-mining operations had more than 53% of the system's average mining capacity" and in the same way, three Ethereum miners accounted for 61% of the overall network.

Blockchain Networks

There are many ways to divide and classify blockchain networks (Nascimento, 2018). Bennett (2018), declares that blockchain platforms should be considered into three main categories depending on the kind of actions the users or nodes are supposed to perform: *public vs. private, open vs. closed,* and *permissionless vs. permissioned*. The public vs. private would be related to the possibility of the node to *write* data into a blockchain. The open vs. closed is the setup that allows the nodes to *read* data from the blockchain. Finally, the permissionless vs. permissioned is about defining if the users in a blockchain are *equal* in terms of sharing the same access or not inside the network. Nonetheless, according to Bauerle (n.d.), these concepts are not absolute and need to be considered as a "mix-and-match situation" depending on the business model and the strategy of the organization that is building a blockchain platform since developers might decide to make the system available for everyone to read (open) but they may not allow everyone to add data (private) on their blockchain (See Figure 1).

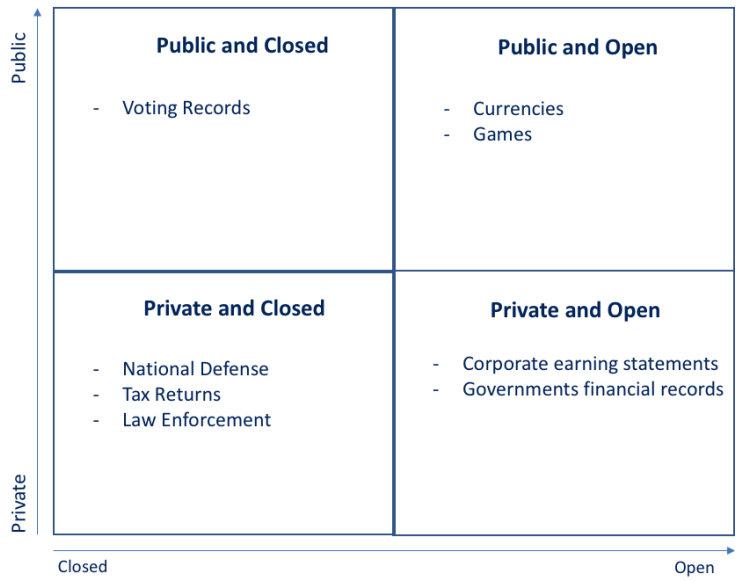


Figure 1: Public vs. Private and Open vs. Closed matrix (Bennett, 2018)

The Blockchain Hub (n.d.), does not differentiate between private and closed blockchains but considers them as interrelated concepts. The permissioned blockchain though can be classified as a private or federated blockchain (Blockchain Hub). On private blockchains,

writing permissions are kept centralized to one single organization and reading permissions might be public or restricted depending on business decisions (ChainDocs, n.d.). Private blockchains were first adopted by institutions that hold sensitive information as a way to leverage the blockchain technology by setting up a limited number of players that were authorized to verify transactions internally (Guegan, 2017). Although private blockchains might represent more control over the data, it can be classified as a high-level risk of tampering and security breach since the network will not count on a consensus mechanism and, therefore, will act just like a centralized system (Blockchain Hub). However, the Blockchain Hub (n.d.) also defends that private blockchains may have their use cases, especially when it comes to scalability and regulatory issues.

According to the Blockchain Hub (n.d.), federated blockchains and Consortiums can be considered analogous and they operate under the leadership of a group. Federated blockchain or Consortium can be defined as a blockchain system created and accessed by a group of organizations designed to solve a particular problem which provides many benefits affiliated with the private blockchain – such as higher scalability and transaction privacy – with less vulnerability since it does not concentrate the power in only one company (O'Leary, 2017). Once the consortium is formed, the federated consensus protocol will authorize blocks to enter the chain once they have been signed by a specified quorum of signers - the program will check an "M-of-N multisignature" rule where N is the number of signers and M is the number of required signatures to approve a block (ChainDocs, n.d.). The value of these parameters needs to be defined by the members according to the business requirements (Ibid.). Federated blockchains are most used in the banking and energy sector and some examples are R3[1] and EWF[2] (Blockchain Hub).

As reported by Body (2018), another way to classify blockchain networks is to divide them into *coin-oriented platforms* that are systems based on generation and quick transfer of cryptocurrencies anywhere in the world through a decentralized system and *smart contract platforms* that are created to execute a specific script while interacting and storing data in the blockchain (Body, 2018). Smart contract platforms also make it possible to build

[1] https://www.r3.com/
[2] https://energyweb.org/

'decentralized apps' (Dapps)'[3] that can interact with the contracts offering features or services to users specially related to asset management and resource planning (BlockGeeks, 2017).

2.2 - Understanding Smart Contracts

As describes by Macrinici, Cartofeanu, & Gao (2018), Smart Contracts can be explained as groups of code stored on a blockchain that emulate the real-world contractual agreements which represent binding arrangement between two or more parties and every single entity must fulfill their obligations stated in the agreement. When the defined rules are met, the agreement is enforced without the need of a third-party (Macrinici, Cartofeanu, & Gao, 2018). However, when taking the Blockchain Hub definition of Smart Contracts into consideration, the authors say that the term Smart Contract should not be confused with a legal contract accepted by courts or law enforcement as regulations around the topic are still being developed and the technology itself needs to be more mature, widespread and prepared for legal standards (Blockchian Hub, n.d.). Likewise, Hertig (n.d.) states that while standard contract outlines the relationship terms that are going to be enforced by law, a Smart Contract enforces this relationship based on a cryptographic code. In other words, a Smart Contract can be considered as a mechanism that involves digital assets that are going to be cryptographically deposited and redistributed among the involved parties in accordance with the pre-defined rulesets (Blockchian Hub, n.d.).

Another way to look at Smart Contracts is thinking about how vending machines work as oriented by Nick Szabo in 1993 (Hertig, n.d.). The ruleset is programmed into the machine and one selects a product following the introduction of the money. The machine performs as a Smart Contract checking if the money introduced is enough to release the product. If yes, the machine will release the product and the extra change if it is the case. Otherwise, the machine will eject the insufficient money and not release the selected product (Blockchian Hub, n.d.). Beyond the understanding of how Smart Contracts work, the Blockchain Hub also highlights the importance of identifying the impact these mechanisms bring to processes and

[3] See https://www.coindesk.com/information/what-is-a-decentralized-application-dapp

society. In the case of vending machines for example, not only human vendors might become obsolete, but the service now can be expanded by offering 24/7 availability (Blockchian Hub, n.d.). Therefore, many benefits can be identified from the maturity of Smart Contracts being the reduction of transaction costs by an auto enforceable code and security the most substantial ones (Hertig, n.d.).

Even though the concept of Smart Contract is not new, authors agree that blockchain seems to be the catalyst for Smart Contract exploration and implementation. Furthermore, the blockchain opens new avenues for Smart Contract to disrupt many industries including banking, insurance, energy, supply chain and others (Nascimento, 2018). Because of its versatility, Smart Contracts can vary from simple technological use cases such as digital value exchange, smart right and obligation, to more complex structures like 'decentralized autonomous organizations' (DAO)[4], government and society (Blockchain Hub).

From a legal point of view, although many scholars agree that Smart Contracts will revolutionize the way firms transact and will transform legal institutions, Sklaroff (2018) defends that even if the technology is robust enough to enable such change, the effects on firms and legal institutions interactions will be subtle and, in some instances, it will make transactions even more expensive than the traditional legal contracts it aims to replace. Additionally, Smart Contracts might sacrifice flexibility which is a critical part of transactional relationships (Sklaroff, 2018).

The Ethereum Network

The Bitcoin blockchain was designed to attend one single type of transaction: the movement of bitcoins from one owner to the other, process in which can be considered as a weak version of Smart Contracts (Ray, 2018). However, after people started exploring the potential of the platform and embedding metadata in transactions to serve other purposes, its usage started growing exponentially as well as the advance of other platforms such as Ripple and Stellar which are considered the second generation of public blockchains composed of different set

[4] See https://blockchainhub.net/dao-decentralized-autonomous-organization/

of rules and features (Greenspan, 2015; Greenspan, 2015). As reported by Greenspan (2015), the Ethereum platform was born as a way to concentrate all these application-specific blockchains in one single blockchain where developers have the freedom and the necessary infrastructure to program infinity blockchain-based applications as well as a token protocol and an embedded cryptocurrency called 'ether'.

Ethereum was built to be an alternative protocol for the creation of decentralized applications allowing anyone to write Smart Contracts according to their own arbitrary rules for ownership, transaction formats and state transition functions with vastly more power than that offered by the Bitcoin blockchain (Ray, 2018). According to Bennett (2018), Ethereum allows programmers to automate different processes where blockchain is the source of record through the Ethereum Virtual Machine (EVM) which behaves and feels like a typical client-server experience. Bennett (2018) also states that Ethereum has a consumer focus and is mainly used for business-to-consumer (B2C) applications[5].

As reported by Body (2018), Ethereum is the blockchain platform offering the most complete and advanced Smart Contracts at the moment and these Smart Contracts must necessarily be written in one of the Ethereum languages being Solidity and Serpent the most famous ones. Because of an HTTP API that communicates with the blockchain, it is believed that Ethereum can also form the building blocks for 'decentralized applications' (Dapps) that can be coded in any language (Hertig, n.d.).

Ray (2018), summarizes the five principles that the design behind Ethereum is intended to follow as: a) simplicity: the Ethereum protocol should be followed and implemented even by an average programmer and no complexity should be included in the protocol unless the benefit outcome its easiness, b) universality: Ethereum provides an internal Turing-complete scripting language which allows a programmer to build any application or Smart Contract, c)modularity: the Ethereum protocol is designed in a modular way and as separate as possible, d) agility: the protocol is not immutable but only high-level modifications that can improve scalability and/or security can be done, e) non-censorship: Ethereum does not limit

[5] See https://etherscan.io/

or restrict any category of usage giving to its programmers the freedom to build any desirable application. However, according to Greenspan (2015), even though Ethereum is a very positive platform that counts on many bright sides, there is a contentious part which is the unnecessary fact that every node executes every program for every message. Because computation is deterministic, it makes no difference whether a program is executed by one node, every node, or some external process.

Smart Contracts and IoT

Many scholars argue about the benefits blockchain can bring to Internet of Things (IoT) and the processing of data since Smart Contracts can offer a standardized method of accelerating data exchange and enabling processes between IoT devices without a server that acts as middleman working among IoT devices on a network (Mearian, 2018). Additionally, according to Bieler & Bennett (2016), Smart Contracts can also be a way to the blockchain technology improve not only compliance within the IoT but also IoT features and cost-efficiency. Bieler & Bennett (2016) presents an example in which complex trade lanes logistics using Smart Contracts can follow through blockchain all the steps and the interactions of the individual items and packages guaranteeing trust, cost savings, and accelerating transactions.

Nascimento (2018), on the other hand, suggests that IoT and blockchain complement each other since the blockchain can also benefit out of the IoT features and outcomes. Smart Contracts running on a blockchain technology can be used in any case that a transaction needs to be proceeded with the governance and reliability that no other technology can support yet (Ibid.). However, the blockchain accountability starts only once the data is inputted by a user with no guarantee that the data previously processed and inputted is accurate (Ibid.). In order to address this matter, Nascimento (2018) presents examples where IoT might be the solution to more accurate and trustworthy data input on a blockchain such as a smart scale with sensors when a product needs to be weighted or drones that can fly over a warehouse counting products removing the risk of someone entering the wrong data.

Although the IoT and blockchain correlation seems to be very promising, Bieler & Bennett (2016) also show issues that need to be addressed before a mainstream adoption like

operational challenges and costs involving the full ecosystem of players in a supply chain as well as regulation and legal aspects regarding privacy and security.

2.3 - Initial Coin Offering (ICO)

According to Fish (2018), the definitions around Initial Coin Offering (ICO) is not widely accepted yet. For him, ICOs are mechanisms used by new ventures to raise capital through the selling of tokens to investors, which implies that ICOs take advantage of some of the crowdfunding approaches (Fisch, 2018). In that way, ICOs can allow startups working on blockchains to be financed on a global scale with no third party involved or without giving up equity (Ibba, Pinna, Lunesu, Marchesi, & Tonelli, 2018). In the same fashion, CoinStaker (n.d.) considers ICOs as unregulated means of crowdfunding that is mainly conducted via cryptocurrency blockchains where crypto tokens are provided to all or the majority of investors in exchange for funding. Fish (2018) explains how the funding process through ICOs works saying that many ventures create their own crypto coin by issuing tokens that act as a currency in the venture's ecosystem. These tokens can be sold in exchange for other cryptocurrencies such as Bitcoin and Ether which, in turn, may be traded for regular currencies that are used to fund the venture.

Even though there is no legal-biding classification of token, a token could be described as a unit of value issued by a venture in order to cover a wide range of applications, for example, exchange of utility (Fisch, 2018). Acheson (*What is an ICO?*, 2018), however, explains that although many of the investors could be interested in acquiring ICOs with inheriting benefits granting the holder access to a service or a share in the earning of the new venture, investors might also be interested in investing in a new crypto that presents chances of pushing up the market price of the token through increasing demand. Usually, holders can sell tokens on an exchange at any time or realize more purchases of tokens in the market (Acheson, What is an ICO?, 2018).

It might also be the case, however, that a large portion of the token supply will be locked in for a period of time as a way to increase the chances of early adopters being able to receive

a proper return of their support and investment (CoinStaker, n.d.). However, it does not mean that an ICO will always be profitable upon release (Ibid.). In fact, Pulev (2018) states that a research realized by *GreySpark partners*[6] shows that nearly 50% of all Initial Coin Offering from 2017 and 2018 failed to collect any funding. Simultaneously, the same research shows that 40% of the ICOs in the same period were able to raise more than $1 Million each (Ibid.).

Most of the ICOs run on Ethereum blockchain and are developed through mathematical Smart Contracts algorithms (Ibba, Pinna, Lunesu, Marchesi, & Tonelli, 2018). Therefore, ICOs are most likely to be a good fit only to high-tech ventures using a blockchain (Fisch, 2018). Fish (2018), also defends that due to its technicalities, it may be worthwhile for investors to familiarize themselves with Distributed Ledger Technologies (DLTs) and blockchain technology to be able to understand more accurately the technical information provided by ventures (Fisch, 2018). Ibba, Pinna et al. (2018), additionally, affirms that the ICO market can be very volatile and, therefore, investors should be careful with the speed of changes and the technological risks that characterize this kind of complexity.

CoinStaker (n.d.) affirms that because of blockchain technologies, a highly transparent ecosystem has been created which shift the creation of new ventures through ICO. Furthermore, this represents a unique moment for the FinTech industry since ICOs eliminates many bureaucratic barriers when starting a new business such as government intervention, middlemen arbitration and others (CoinStaker, n.d.). However, along with the increased attention, concerns about the legality of token sales has been debated as unlike Initial Public Offering (IPO), the acquisition of tokens does not count on regulatory protection yet and there is not enough transparency on the token holding structure (Acheson, What is an ICO?, 2018).

The security challenges and the DAO bailout

Blockchains are supposed to be immutable, tamperproof, and, therefore, the ultimate layer of security a system can count on (Nascimento, 2018). However, as reported by Stubbs (2018), projects raising funds through ICOs are attacked one hundred times on a monthly basis by

[6] See https://greyspark.com/charting-the-growth-of-cryptocurrencies/

cyber criminals. Furthermore, after analyzing more than 372 ICOs, Ernst & Young reported that roughly $400 million of the $3.7 billion total funds raised through ICOs had been stolen (Irrera, 2018). According to the report, however, not all failure cases are due to hacking or cyberattacks but to the lack of deep analysis of the invested project caused mostly by the "FOMO" phenomenon *(Fear Of Missing Out)* which has led investors to pour money into ICOs at record speeds (Irrera, 2018). In some cases, however, hackers can attack the ICO project website and change the information flow so when investors send their money, it goes to different digital wallets that are going to store the stolen cryptocurrencies (Stubbs, 2018).

One of the biggest sales of ICOs of all time is 'The DAO', an investment fund created to foster the development of Ethereum ecosystem which guaranteed to its investors a participation on specific projects (Acheson, What is an ICO?, 2018). No longer after the sale raised over $150 million, a hacker transferred around $60 million worth of *ether* to unauthorized wallets which led to the project failure (Ibid.). Nonetheless, in order to compensate for the failure, a *hard fork* was implemented by the Ethereum blockchain team (Castillo, 2016). According to Castillo (2016), a hard fork is capable of altering a blockchain history and it was settled to return the stolen amount of ether to the right account. The hard fork, as stated by Cryptohustle (2016), is a natural procedure for protocol repair and updates. The main issue with the DAO hard fork, however, is that since it was not done to fix the protocol, "it changed the immutability of the public ledger in order to compensate for the failures of a third-party application" which questioned the immutability power of Ethereum (Cryptohustle, 2016). The DAO bailout, therefore, violated Ethereum's main value proposition and set a dangerous precedent of being able to change the ledger arbitrarily (Ibid.)

2.4 - Hyperledger: the Blockchain community

While Ethereum is an initiative that works in public chains for Smart Contracts and decentralized applications, and Bitcoin works in cryptocurrencies and payment protocols, Hyperledger is an open-source created to advance cross-industry blockchain technologies, therefore, works in the B2B platform (Nascimento, 2018). Hyperledger is a global collaboration that includes leaders in different segments such as finance, banking, Internet of

Things, supply chain, manufacturing and Technology (Hyperledger, n.d.). According to Hyperledger (n.d.), this collaborative software development approach contributes to the transparency, longevity, interoperability and support required to bring the blockchain technology into the mainstream commercial adoption.

Bennett (2018), explains that Hyperledger is a private and permissioned blockchain that does not count on anonymity since the users are named in orders to apply permissions and role-based access. Unlike Ethereum and Bitcoin, Hyperledger has no native coin or token architecture model (Bennett, 2018). This can be explained by the fact that Hyperledger is a non-currency environment in which communities of software developers and companies meet and coordinate to build industrial blockchain applications avoiding the political challenges of having to maintain a global currency (BlockGeeks, n.d.).

According to BlockGeeks (n.d.), the Hyperledger's ultimate goal is to incubate and promote a diversity of blockchain technologies for enterprises creating frameworks, interfaces, and applications. By the time of this research, Hyperledger is the host of the following projects:

- Hyperledger Sawtooth: a blockchain developed by Intel using an innovative consensus algorithm called 'Proof of Elapsed Time' (PoeT) (Ibid.);
- Hyperledger Iroha: developed by Japanese companies in order to facilitate the incorporation of a framework into a blockchain (Ibid.);
- Hyperledger Fabric (IBM): it is a *plug-and-play* implementation of blockchain created to develop high-scaling blockchain applications with a flexible degree of permissions (Bentley);
- Hyperledger Explorer: a blockchain module designed to create a user-friendly Web application that can view, invoke and deploy any relevant information stored in the ledger (BlockGeeks, n.d.);
- Hyperledger Burrow: it is a project that creates a permissible smart contract machine that complies with Ethereum specifications (Ibid.);
- Hyperledger Indy: a collection of tools, library, and other components for digital identity on blockchains (Ibid.);
- Hyperledger Cello: a *blockchain-as-a-Service* (BaaS) model (BlockGeeks, n.d.);

- Hyperledger Composer: allows developers to create blockchain business application through simple models and reusable POCs (Hyperledger Composer, n.d.);
- Hyperledger Caliper: allows users to measure the performance of a specific blockchain implementation through reports containing a number of performance indicators (Hyperledger, n.d.);
- Hyperledger Quilt: offers integration between ledger systems through the Interledger Protocol (ILP) which is a type of payment protocol that transfer value across distributed ledgers and non-distributed ledgers (Ibid.);
- Hyperledger Ursa: a shared cryptographic library that avoids the duplication of cryptographic work while increasing security in the process (Ibid.).

Bennett (2018) believes that Hyperledger is not an Ethereum competitor but a complement and the usage of both, depending on the case, can result in disruptive solutions and applications. Furthermore, Hyperledger demonstrates a strong potential to be the backbone of non-currency and high-scaling enterprise application of the blockchain technology (BlockGeeks, n.d.).

Hyperledger Fabric (Hyperledger IBM)

Bentley (n.d.), affirms that the Hyperledger Fabric has become one of the most used Hyperledger frameworks for enterprises. According to Bennet (2018), the Hyperledger Fabric is an easy blockchain framework with only a few components including a) Participants: the people and entities that will join in a transaction according to their accesses and roles, b) Assets: which are the subjects of people's interaction along with their attributes and lifecycle, and c) Transactions: that are the situations/conditions in which the participants will interact with the assets. Bentley (n.d.) also defends that the Hyperledger Fabric has the ability to implement different Consensus models for managing the blockchain and it supports the creation of channels that allow a blockchain network to exchange information over more private means among organizations.

Rather than a single blockchain, the Hyperledger Fabric is a base for the development of blockchain-based solutions with a modular architecture (BlockGeeks, n.d.). Furthermore, Hyperledger Fabric model (See Figure 2), is created to provide a *plug-and-play* framework in which companies put together their own blockchain network capable of scaling to more than 1,000 transactions per second (Ibid.).

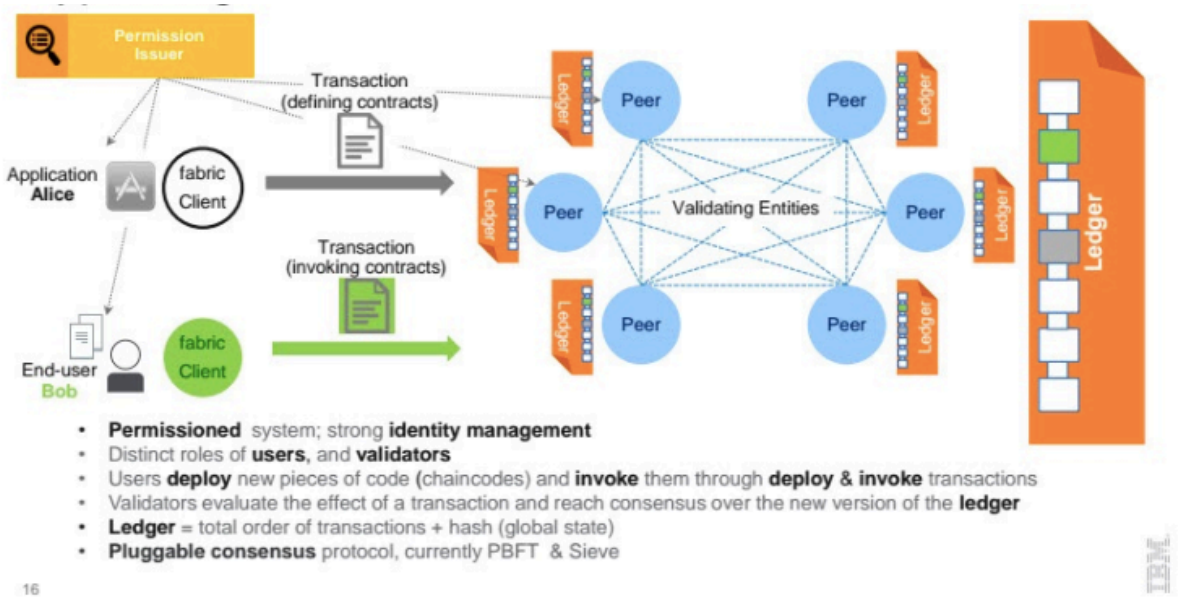


Figure 2: The Hyperledger Fabric model (BlockGeeks, n.d.)

Although many use cases and benefits can be seen on the Hyperledger Fabric, the Hyperledger Fabric has some challenges in its fundamental architecture (Bentley, n.d.). Different from public blockchains, the Hyperledger Fabric allows participants to build separate channels for their assets and hence segregate transactions (BlockGeeks, n.d.). The challenge, according to Bentley (n.d), however, is that this 'channel' method only shares the ledger/contract between two or more related parties and in a case where one organization's node goes down for any reason, "the other organization nodes can modify the chain data and the organization that is down has to accept the chain updates from the other organizations". Therefore, it might reduce the reliability of the Hyperledger Fabric model (Bentley).

2.5 - Social Entrepreneurship

According to Mair & Noboa (2006), Social Entrepreneurship (SE) can be associated to innovative approaches to address pressing social challenges in the areas of education, environment, fair trade, health, and human rights. Furthermore, SE is widely regarded as an important vertical of the sustainable development of countries (Mair & Noboa, 2006). Although many schools have researched around the area of social entrepreneurship and many articles regarding the same topic have been published, Heinecke & Mayer (2012) believe that there is not a common definition yet about the theme, but they describe social Entrepreneurs as individuals who are seeking to solve a social problem with an entrepreneurial approach. In fact, Bacq & Janssen (2011) also state that the lack of a unifying concept in the field has led to a proliferation of definitions.

Although the definitions around social entrepreneurship can be subject of discussion, Bacq & Janssen (2011) defend that it is possible to identify at least two reasons why there is such interest in this particular field. First, the innovation in treating social problems that are becoming proportionally more complex (Bacq & Janssen, 2011). Second, the inventive entrepreneurial approach that is capable of blurring the traditional boundaries between private and public sector which gives birth to hybrid enterprises guided by social and economic value propositions (Ibid.).

Mair & Noboa (2006), however, argue that social entrepreneurship is not only a combination of existing concepts, but might be a distinct field of investigation since it differs from traditional business entrepreneurship in several aspects from the reasons that move the entrepreneurial journey to the outcomes social entrepreneurs aim for. In that sense, Phillips, Lee, James, Ghobadian et al. (2014) also report that unlike traditional business entrepreneurship that is guided by market, profitability, and consumer needs, social entrepreneurship has a cultural focus aspiring to address human and social needs.

Bacq & Janssen (2011) affirms that many of the existing researches have tried to understand the boundaries of social entrepreneurship creating and exploring scenarios when an organization devotes part of its income or resource to a social cause or when a non-profit

organization adopts managerial practices. Mair & Noboa (2006) summarize the issue reporting that there are three groups of researches addressing the topic with different perspectives. The first group considers SE as non-profit initiatives seeking alternative funding strategies to create social value. The second group defends SE as the socially responsible practice of profitable businesses engaged in cross-sector partnerships. Finally, the third group considers SE as the means to alleviate social problems and foster social transformation (Mair & Noboa, 2006).

Mair & Noboa (2006), therefore, come to a conclusion where social entrepreneurship is defined as "a set of interlocking opportunity-based activities by competent and purposeful individuals who – through their actions – can make a difference in society and are bounded by context". Furthermore, it is a process that is composed of individuals (social entrepreneurs), behavior (social entrepreneurial approach), and tangible outcomes (social ventures or enterprises) to pursue opportunities aiming at the creation of practices that create and sustain social benefits (Mair & Noboa, 2006). Consequently, even though there is no unified definition around social entrepreneurship, there might be a point of common agreement which is the nature of identifying a problem-solving opportunity to meet a social need related to pursuing a social mission and an opportunity recognition (Phillips, Lee, James, Ghobadian, & O'Regan, 2014).

For the purpose of this research, a social enterprise will be defined as a combination of previous definitions that include: a) an organization in which "for-purpose" is its core value, (Phillips, Lee, James, Ghobadian, & O'Regan, 2014) b) an independent organization that counts on an entrepreneurial approach – different from CSR initiatives (Mair & Noboa, 2006), and c) an organization that can be both profitable or has a *non-profit* model (Ibid.).

Social Innovation

Mulgan et al. (2007, p.8) explains that Social Innovation (SI) can refer to the new ideas that work in meeting social goals. However, this concept is rather considered broad and capable to embrace situations far from what it is intended (Mulgan, Tucker, Ali, & Sanders, 2007). Therefore, Mulgan et al. (2007, p.8) suggest a pragmatic approach on understanding SI as

"innovative activities and services that are motivated by the goal of meeting a social need and that are predominantly developed and diffused through organizations whose primary purposes are social" (Ibid.). Westley & Antadze (2010), on the other hand, suggest a systemic approach in which social innovation can be considered as a "complex process of introducing new products, processes or programs that profoundly change the basic routines, resource and authority flows, or beliefs of the social system in which the innovation occurs" having durability and broad impact (Westley & Antadze, 2010).

For the Graduate School of Stanford Business (n.d.), social innovation happens when there is a combination of efforts and resources coming from different spheres such as governments, businesses, and the non-profit world. Consequently, SI could also be described as a force that cuts across all sector of society – private, public, and civil sectors – in order to promote inventive processes to create better social outcomes (Nicholls & Murdock, 2012). Although there is no unified concept among academics describing social innovation, the Graduate School of Stanford Business (n.d.) presents a definition that embraces the main scholars' outlines construing SI as the means to create effective solutions to solve pressing and systemic social and environmental issues to support social progress.

The concept of social innovation also differs from social entrepreneurship being the former the process through which ideas and solutions are created to generate social value and the latter is one possible channel this innovation come from – others can be individuals, corporations and non-profit. (Stanford Graduate School of Business, n.d.). Accordingly, Westley & Antadze (2010, p. 4) presents a clear separation among the concepts of social innovation, social enterprise, and social entrepreneurship as can be seen in Figure 3.

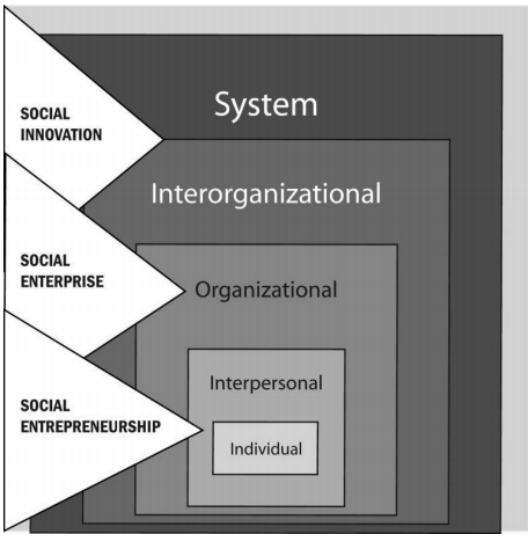


Figure 3: A systemic view of innovation (Westley & Antadze, 2010).

Finally, Nicholls & Murdock (2012) defends that although economic factors played a role in the past being the protagonists driving the waves of innovation, social innovation represents a macro-level change suggesting that it has the potential to be as disruptive and influential as the waves that went before.

2.6 - Corporate Social Responsibility (CSR)

According to the United Nations Industrial Development Organization (n.d.), Corporate Social Responsibility (CSR) can be explained as the concept where companies incorporate social and environmental concerns into their business operations while addressing the expectations of stakeholders. In the same fashion, Caramela (2018) defends that CSR programs are opportunities for companies to demonstrate their good corporate citizenship.

Therefore, CSR can be seen as a recognition that a business, as a producer of economic wealth, does not only have economic impacts (Dahlsrud, 2006). At the same time, it is important to understand that CSR as a strategic business management concept goes beyond the definitions of charity, sponsorships or philanthropy even though they can all contribute to poverty reduction (United Nations Industrial Development Organization, n.d.).

A well-implemented CSR strategy, considering the combination of different CSR issues as showed at Figure 4, can bring along a variety of competitive advantages to the company such as efficient human resource base, risk management processes, access to capital and markets, among others (Ibid.).

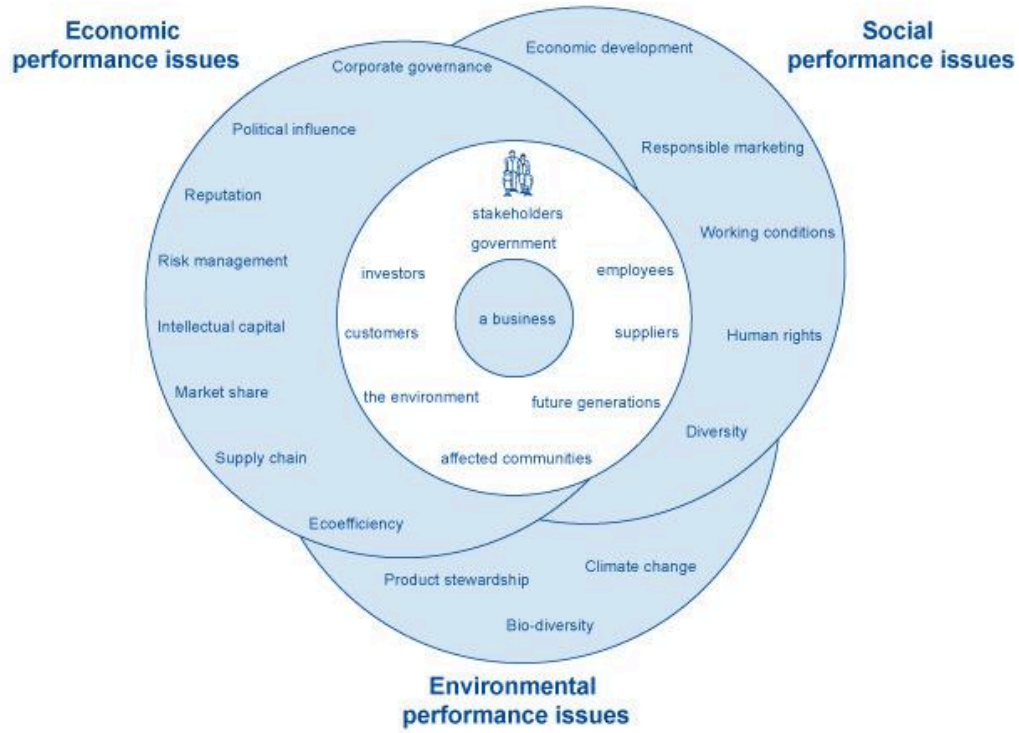


Figure 4: Economic, Social, and Environmental performance issues (UNIDO, n.d.).

The *Cone Communications CSR* study issued in 2017[7] reports a shift in the CSR concept and shows that "although CSR will always be grounded in business operations – from water conservation to supply chain transparency – recently, the stakes have gotten a lot higher. Companies must now share not only what they stand for, but what they stand *up* for" (CONE, 2017). For Caramela (2018), this change is due to an increase in the consumers' awareness in regard to a company behavior when it comes to giving back to society. Furthermore, the fact that CSR strategies are now important factors for a candidate to evaluate when choosing a company to work for (Caramela, 2018). The Cone Communications report also shows that 63% of Americans expect that businesses will take the lead to drive social and environmental change in the absence of government action or regulation. Also, 87% of the interviewees

[7] See http://www.conecomm.com/research-blog/2017-csr-study

declared the decision to buy a product because the company advocate for a cause they care about while 76% would refuse to purchase a product from a company that supports causes contrary their beliefs (CONE, 2017).

Curtis (2018) considers that businesses are now more powerful than governments - as out of the 100 largest economic entities in the world, 69 of them are corporations – and, therefore, society needs businesses to step in. However, many corporations are still skeptical and do not believe that CSR is in their best interest to benefit employees, customers and communities alongside shareholders (Curtis, 2018). Nonetheless, when big companies are looking for innovative change, often they look to startups to show them the way (Ibid.).

On the other hand, McPherson (2019) says that socially responsible investing is gradually becoming the new normal as investors are prioritizing social impact. Therefore, new ways to make strategy and public goals more transparent are gaining space while companies that invest in how to better measure impact, both environmental and social, will help make ethical fund investing mainstream (McPherson, 2019). McPherson (2019) also believes that new technologies will play an important role in order to make radical transparency possible through digitization of the supply chain.

2.7 - Blockchain for good

After the rise of cryptocurrencies and the better understanding around the Bitcoin underlying technology, a surge in new projects, organizations, and platforms based on the use of blockchain started in 2013 and has grown at an accelerating pace especially in Governments and non-profit organizations (Galen, et al., 2017). In fact, organizations with a social focus such as the United Nations (UN) are dedicating time and efforts to explore blockchain's ability to support the achievement of the Sustainable Development Goals (SGDs) (Kewell, Adams, & Parry, 2017). A report from the Stanford Graduate School of Business in partnership with Ripple Works showed that many blockchain initiatives dedicated toward social impact are on the rise being 34% of these initiatives started in 2017 and 55% of social-good blockchain initiatives are estimated to impact their beneficiaries by early 2019 (Galen, et al., 2017).

On the other hand, a report written by Accenture Labs in 2017 showed that although there are lots of ideas around creating social innovation though blockchain, the applications are still in their pilot stages because social innovation organizations lack sufficient visibility into how a pilot scheme can be scaled up (Accenture Labs, 2017).

Even though the non-profit usage of the blockchain is growing, 61% of the social initiatives presented in the report from the Stanford Graduate School of Business are for-profit, especially in the sectors with most commercial opportunities such as Energy, Health, and Financial Inclusion (Galen, et al., 2017).

Accenture Labs (2017) explains that social innovation organizations face four critical challenges in delivering their missions and scaling their impact. These challenges are: 1) affordability: as services need to be affordable, these organizations have to reduce transaction cost and leakages; 2) accountability: due to the level of scrutiny of how they generate and use funds, transparency and accountable operations are critical for their survival; 3) reliability: because of the challenges in keeping the flow of funds continuous, these organizations often need to cross-subsidize their operations; and 4) marketability: from finding the right talent to the communication strategy of the company (Accenture Labs, 2017). When identifying these challenges, it is possible to understand why blockchain is been adopted by social innovation organizations as it takes a strategic shift in technology, with a focus on enhancing transparency and promoting sustainability to achieving scalability (Accenture Labs, 2017).

Some companies are also changing the way they do Corporate Social Responsibility (CSR) by incentivizing startups and social entrepreneurs to create innovative ways to approach social problems. Consensys, a leading blockchain technology company that leverages the Ethereum blockchain, created the *Blockchain For Social Impact Coalition (BSIC)*[8] which is a CSR arm of the company. According to their website, the Coalition "incubates, develops, and implements confederated blockchain products and solutions that can address social and environmental challenges across the United Nation's Sustainable Development Goals." The team believes

[8] See at https://blockchainforsocialimpact.com/about/

that blockchain is capable of creating an economic prosperity for individuals and communities and, therefore, the projects are focused on financial inclusion, supply chain, identity & vulnerable population, and energy & environment (Blockchain for Social Impact, n.d.).

Although companies and initiatives like Hyperledger are trying to bring blockchain into the mainstream, Enchev (2018) listed a series of challenges the blockchain still represents for governments, for-profit and non-profit organizations that want to adopt the technology to their daily operations. Technical complexity is the first one since blockchain is still considered a new technology that demands a high-end technical knowledge and, consequently, there is a lack of blockchain professionals and crypto specialists (Enchev, 2018). Governance is another challenge for blockchain consensus-based decision making, especially after the Ethereum 2016 episode with the usage of the hard-fork (Ibid.).

Chapter 3: Cases

3.1 – Alice: Blockchain solution in Philanthropy and Aid

Overview

Alice is a company founded in 2016 by Raphaël Mazet, a social entrepreneur specialized in running online campaigns for charities. Alice is built to be a platform that incentivizes social organizations to run projects transparently by creating a series of incentives for social organizations to report on their impact reliably and in a transparent way while donor can track their donations, and the performance of each project, restoring trust in charities and making it easier to identify and help scale projects that are most effective (through donations, grants or investments).

The problem Alice is helping to solve

According to Mazet (2016), in November 2015 public trust in charities hit its lower point in almost a decade. Consequently, NGOs and social enterprises were facing a tough moment for funding since they have traditionally relied on philanthropy or public finance to fund their activities. Mazet also explains that this situation is mainly because social enterprises fail when it comes to have full control and transparency about their operations and impact data which lead to a questionable attitude that resonates in lower trust, visibility, and funding. As a result, it can be said that the social funding model as we know is at risk and this is due to three main reasons: 1) wasted money, as millions of dollars are wasted every year in ineffective social projects, 2) lack of trust, since social enterprises are not transparent enough regarding their data impact making social funding stagnant, and 3) loss of potential, as small but effective projects do not scale or failure to succeed due to lack of visibility (Alice, n.d.).

Subsequently, Alice came to be a solution addressing these problems by requiring that all social projects specify the goals they are trying to achieve and oblige that the achievement of these goals has to be independently verified and validated. This way, transparency is enforced

since the funding will be conditional to the impact and social organizations will only receive funds if their impact is proved (Mazet & Wojciechowski, Alice whitepaper, 2017).

How it works?

Alice is built on the Ethereum blockchain and uses Smart Contracts and tokenization to power its core functionalities. All information about the projects and their impact goals are stored on the blockchain making it immutable and tamperproof. This information, as well as the projects, track records, are publicly available but works as a permissioned platform as Alice takes advantage of Smart Contract features to secure selective disclosure rules. Meantime, a combination of both humans and machines act as "validators" verifying that the organization has achieved its goals.

Alice created different protocols to accommodate all sort of fund – donation, grant, investment, and others - a social organization can receive. The donation protocol runs with Smart escrow contracts that temporarily block the donated funds which are released by portion after each milestone is completed by the social organization and verified by the validators. Similarly, the impact investment protocol allows the social enterprise to receive an initial capital to start their projects and then they are automatically transferred under the donation protocol where they are repaid from escrowed donations once the social project achieve its goal. The governance protocol, on the other hand, allows social enterprises to make adjustments on their previous goals, ask to change validator, and is also responsible for managing any dispute between the actors (beneficiaries, validators, funders, etc.). Finally, as a way to incentivize the network, all the fees are paid in Alice native tokens and the grants are managed collectively by Alice token holders via a decentralized autonomous fund (Mazet & Wojciechowski, Alice whitepaper, 2017).

Alice use case: St Mungo's appeal

Alice's pilot project was a partnership with St Mungo's, a charity that works to prevent homelessness and support people in their recovery from homelessness. Through the 2017

appeal called *Street Impact: 15 Lives*, the goal was to start a fundraising in order to help lift 15 people out of long-term rough sleeping by delivering intense personalized support. On its page at Alice's website, St. Mungo's had to list a number of specific goals it needed to achieve to unlock the donations. Although the appeal didn't reach the total intended fund which was £50.000, Alice could manage to unlock £13.627 sending the appeal to only 200 of St. Mungo's warmest donors. While the donors could track and check the donations, the money was used to find a temporary home for three homeless people and a permanent home to one of them (Lake, 2017).

3.2 – BanQu: Blockchain for digital and economic identity

Overview

BanQu was founded in 2015 by a group of economic development professionals. The founders describe the company as a "for-profit/for-purpose blockchain-as-a-service software company". When building BanQu, their goal was to solve one of the toughest global problem - extreme poverty - by providing the poor an "economic identity." BanQu believes a verifiable identity will give the poor greater access to the economy and global supply chain, which will bring them greater opportunities and, consequently, improve their lives (Reynoso, 2017).

According to BanQu CEO Ashisg Gadnis, "If you are trying to make the world a better place, financial inclusion is the key answer. (…) it's more (about) connecting them [the poor] to the supply chain by empowering them with data." (BanQu, n.d.)

The problem BanQu is helping to solve

According to BanQu (n.d.), nearly 2,7 billion people around the globe do not have access to credit and services by banks or other formal financial support due to lack of economic identity. Being economic identity understood as the "digital or electronic credentials that define a person's history of economic interactions in the world's economy" (BanQu, n.d.), the lack of a credit history or verifiable economic identity makes the underbanked people – who are in

most cases refugees and the world's poorest – even more excluded from the global economy. Therefore, although billions of dollars keep flowing in form of aid and donation every year, the root of the problem, which is the lack of economic identity, is not being solved or addressed by governments or institutions (BanQu, n.d.).

As a result, BanQu developed a blockchain application solution in order to provide benefits to all the businesses, organizations, and governments that interact with the world's poorest on a daily basis where every interaction is documented on the blockchain while building the economic identity necessary to connect the unbanked to the global economy (Ibid.).

How it works?

BanQu blockchain technology provides an immutable platform where refugees and the world's poorest can maintain a free, secure online profile that enables them to start tracking all their commercial transactions. Over time, they build a recognizable, vetted economic identity while maintaining ownership and control of their own data. Since 60% of the 2.7 billion unbanked people own mobile phones, these devices were the BanQu focus when developing the platform that help them to connect to the global economy (BanQu, n.d.). BanQu platform works in two fronts. First, empowering the unbanked with economic identity so they can joy in global trade. Second, with *Blockchain Supply Chain Management* to help institutions to save costs, enhance transparency, and create long-term success.

The solution created by BanQu allows the unbanked to set up a personal digital identification profile while connecting to their banked network. As they start accumulating transactions on the BanQu blockchain, they develop a trackable financial and personal history. Through the BanQu blockchain, a variety of transactions can be stored for history purposes such as cash disbursements, property records, health records, education records, among others. This economic identity provides the baseline for the unbanked to join in the global supply chain (Ibid.). Meanwhile, BanQu offers benefits to the businesses, organizations, and governments that interact with the world's poorest on a daily basis being through the verification of aid destiny or management of records on the platform which translates into trust, traceability, and transparency. Also, by providing the institutions with the user's global financial identity

components in the blockchain, practices like anti-money laundering and suspicious activity reporting become more effective (BanQu, n.d.).

BanQu use cases

Creating Economic Identities: BanQu created digital identities for several hundred refugees and individuals in extreme poverty zones in Kenya, with the goal to create sustainable and secure economic profiles that can be used to access financial and government services (BanQu, n.d.).

Managing Supply Chain[9]: BanQu is improving the delivery of essential medications to poor communities and providing end-to-end transparency from manufacturer to farmer. Through a partnership with Anheuser-Busch InBev, BanQu focused on creating transparency and traceability in the cassava crop value chain in Zambia. In June 2018, the partnership connected 2,000 Zambian farmers to the mobile platform as they harvest and sell a projected 2,000 tonnes of cassava, producing a high-quality starch used in beer, which provided economic empowerment to the region's small-scale farmers (Ibid.).

Mapping Land: BanQu is testing a farmer land mapping for women farmers in Latin America, where access to finance is hard due to lack of land rights and outdated property registries (Ibid.).

3.3 - The Plastic Bank: Blockchain for social and environmental impact

Overview

Founded in March 2013 in Vancouver, Canada, the Plastic Bank is a social enterprise that aims to use recycling to reduce ocean plastic and global poverty. By enabling the exchange of plastic for money, items or blockchain secured digital tokens, the Plastic Bank transforms

[9] See more at https://banqu.co/case-study/

waste into economic opportunity empowering local communities worldwide through recycling. At the same time, the Plastic Bank is supporting people living in poverty to build better futures. Its first big operation was in Haiti 2015, expanding later in Europe, the Philippines, Peru, and Colombia (Plastic Bank, n.d.).

The problem Plastic Bank is helping to solve

Every minute, the equivalent of one garbage truck of plastic waste enters the oceans which represents a total of 8 million metric tons a year. This plastic waste litters the seafloor and floats on the surface poisoning seabirds and other marine life. By the year 2050, one report suggests there will be more plastic than fish in the world's oceans (IBM). According to the Plastic Bank founder and CEO David Katz, "We are experiencing the fastest rate of extinction ever (because of encountering plastic) and yet, plastic is still in the food chain. The very last thing we need to do is to clean the ocean." Furthermore, much of the plastic originates in underdeveloped countries with minimal waste management infrastructure, where citizens often survive on less than a dollar a day, where people are always concerned about food, shelter or security, and where the concept of recycling is nearly inexistent.

To solve both environmental and social problems, the Plastic Bank was created providing an above-market rate for plastic waste, thus incentivizing its collection. Plastic Bank also provides the ability for local entrepreneurs to set up and operate a convenience store for the poor, in which plastic waste is the currency while they grind the plastic into pellets and sell this back to manufacturers to re-use as an ethically-sourced raw material (Plastic Bank, n.d.).

How it works?

When the Plastic Bank started, the first operations between the Plastic Bank and the citizens carrying plastic to recycle were manually recorded on paper. To scale its operations and become a global platform for change, a reliable, high-performance enterprise system was needed. Therefore, in 2017 the Plastic Bank partnered with IBM Hyperledger to launch a baking application that runs through blockchain (Field, 2017).

Blockchain is used to track the entire cycle of recycled plastic from collection, credit, and compensation through delivery to companies for re-use. Since it runs one on a private cloud, servers offer instantaneous scalability thanks to a low-latency architecture that enables rapid transaction processing and high-speed virtual networking capable of supporting millions of users (IBM). All this technology is also important for people who don't qualify for bank accounts as the stores that sell stuff for collectors to accept payments from Plastic Bank accounts. Since about 50% of people in Haiti have smartphones that can run the app, collectors can use plastic credits to power their devices through solar power stations at stores, pay for healthcare, education fees among others (Field, 2017).

Plastic Bank use case: Haiti

According to Plastic Bank[10], Haiti ranks 168th on the UNDP Human Poverty Index scale and is widely known as one of the poorest countries in the western hemisphere. Around 65% of the population live under the national poverty line. Because of its geographical location, hurricanes and earthquakes have devastated the already poor local infrastructure. Because of enterprises partnerships like Shell and Henkel, the Plastic Bank was able to open 32 branches in five different regions of Haiti while giving economic opportunity to over 2.000 collectors and their families and recycling more than 3 million kg of plastic since 2014[11].

The Plastic Bank continue to expand its operations in Haiti partnering with other companies, schools and community organizations. Besides, other programs are currently running in the Philippines, Indonesia, Brazil and more locations are to come (Plastic Bank, n.d.).

3.4 – Provenance: Blockchain for transparency in Supply Chain

Overview

[10] See more at: https://www.plasticbank.com/plastic-bank-in-haiti/#.XEso6M8zY_U
[11] Last access: 25/01/2019

“Provenance began out of a personal frustration for how little we know about the things we buy.” (Provenance, n.d.)That is how the provenance founder Jessi Baker describes her idea behind her social entrepreneurship in 2014. Based in London, Provenance is leveraging the blockchain technology to transform global supply chain and change the relationship between products and consumers by creating more transparency, awareness, and fairness in every every-day purchased product.

The problem Provenance is helping to solve

Before reaching the end consumer, goods can travel through a vast network of manufacturers, distributors, transporters, storage facilities, and other suppliers that have different responsibilities in designing, producing, delivering, and selling the product. However, in most of the cases consumers do not have knowledge nor visibility around the product journey and condition (Provenance, 2015).

Provenance (2015) also explains that the creation, sales, and use of material things without transparency might have many negative consequences: environmental damage, exploitative extraction, unsafe work conditions, forgery, and the amount of valuable material wasted at the end of a product life. In fact, very often we see in the news that slavery is still present in many factories in around Latin America, Asia, and other locations, conflict diamonds that are mined irregularly bring the death of many people in African countries every year. In May 2013, an article from Reuters exposed that over 1.000 workers died in an irregular factory in Bangladesh (Paul & Quadir, 2013).

To address this issue, Provenance was created delivering meaningful change to every purchase through an open and transparent platform empowered by blockchain technology where products and the entire supply chain can be assessed and verified by every consumer before a buying decision is made. Therefore, providers are forced to comply and keep fairness throughout the product value chain minimizing environmental impact, unregulated extractions, and unsafe work conditions.

How it works?

Provenance leverages the blockchain technology to provides transparency for public-interest information such as the supply chains of consumer products. For that, Provenance utilized an open source protocol and permissioned blockchain where users have different accesses and the possibility to keep identities anonymously as some participants might prefer to protect their identities while sharing certificates and authentication.

The design of Provenance consists of six participants from producers to end consumers. The solution also counts of different architectures that combine modular programs deployed on the blockchain. Although these programs are independently controlled, they are able to interact with one another without friction since they share the same blockchain system. The main architectures can be explained as:

- Registration Program: it will implement the registration of named participants like producers, manufacturers, auditors, certifiers, etc. The registration requires also a digital identity which will be a combination of public and private cryptographic keys;
- Standard Programs: after registration, the standard program will count on a proper recognition of a standard like “no animal testing” for example, providing the related compliance. After the materials are successfully approved by an auditor or certifier, the next step is the deployment of a producer or manufacturing program;
- Production Programs: this program will specify and implement the parameters for production following the inspection and guidelines from auditors or certifiers;
- Manufacturing Programs: here the raw materials will be transformed into final products and the input goods must be “used” for any output to be created. For example, “the registration of a certain amount of organic cotton fabric requires as input the appropriate amount of raw organic cotton, and after this usage, the raw organic cotton should no longer be usable” (Provenance, 2015).

After these processes, a “tagging” stage will take place to make physical all the digital safeguards and to facilitate the user-facing applications. Provenance (2015) also explains that

although this process of becoming more transparent can increase products price by 20%, it does not affect the willingness to purchase (Provenance, 2015).

Provenance use case: Co-op

The food industry has seen a rise in forgery and false claims which left consumers afraid, confused and, therefore, impacting the reliability of supply chains. Co-op is one of the largest consumer co-operatives in the world, based in Manchester, UK. Because of its partnership with Provenance, today it is possible to track their fresh produce from origin to the supermarkets increasing trade fairness, reducing environmental impact, and empowering consumers. Provenance is working with the Co-op food and digital teams to track the entire journey of fresh produce from source to shelf in real-time. At every point in the journey, the Provenance solution collects data about supplier and their locations, as well as the environmental and social impact of each business. The process builds a digital history of the products that can be accessed by anyone. Through this partnership, Co-op increased efficiency in its operations while growing customer trust (Provenance).

Chapter 4: Theoretical Framework

Affordances

Affordances are preconditions in which an interaction between an actor and its environment is likely to happen, being actors the organisms that are perceiving and behaving in an environment (Gibson, 1986). Furthermore, the affordance existence is regardless of the actor's ability to perceive this likelihood (Pozzi, Pigni, & Vitari, 2014). Consequently, an affordance is about the existence of a condition to the interaction process which does not imply that a specific interaction will happen (Greeno, 1994).

Affordance is, therefore, relational as it might count on dynamic interactions from and for an actor and an artefact, and it is relative to the actor capability to act creating possible reflections on the artefact itself (Pozzi, Pigni, & Vitari, 2014). According to Hammond (2009), "the affordance is there, it has always been there, but it needs to be perceived to be realized" and the conditions that enable this interaction include the properties of the actor and of the environment, actors capabilities, the artefact's characteristics, and external information (Gibson 1986) (Pozzi, Pigni, & Vitari, 2014) (El-Gazzar, Henriksen, & Wahid, 2017). In the same fashion, Pozzi et al. (2014) in their literature review of affordances shows that affordances are *potential-for-action* conditions that need to be triggered or actualized by a goal-oriented actor in order to achieve an outcome which can, in turn, be an affordance effects or empirical results.

Gaver (1991), on the other hand, explains consequential affordances and introduces the concepts of *sequential affordances* that refers to situations in which the action on a perceived affordance can result on new information that might lead to a new affordance over time, and *nested affordances* that happen within the same time and space since they perform as both an end in itself and as a means towards realizing a new affordance.

For the purpose of this research, I decided to use Pozzi et al. (2014) affordances theoretical framework that shows the four steps of the affordance process: *existence*, *perception*,

actualization, and *effect*, combined with the El-Gazzar et al. (2017) affordances framework that places *enabling factors* and *inhibiting factors* as part of the actualization step.

Although affordance perceptions can be used to analyze different interactions in a variety of contexts, in this paper, I examine the *IT artefact-Organization* relationship and this research will focus its analysis on the actualization and effect in the context of blockchain technology adoption to support social entrepreneurship.

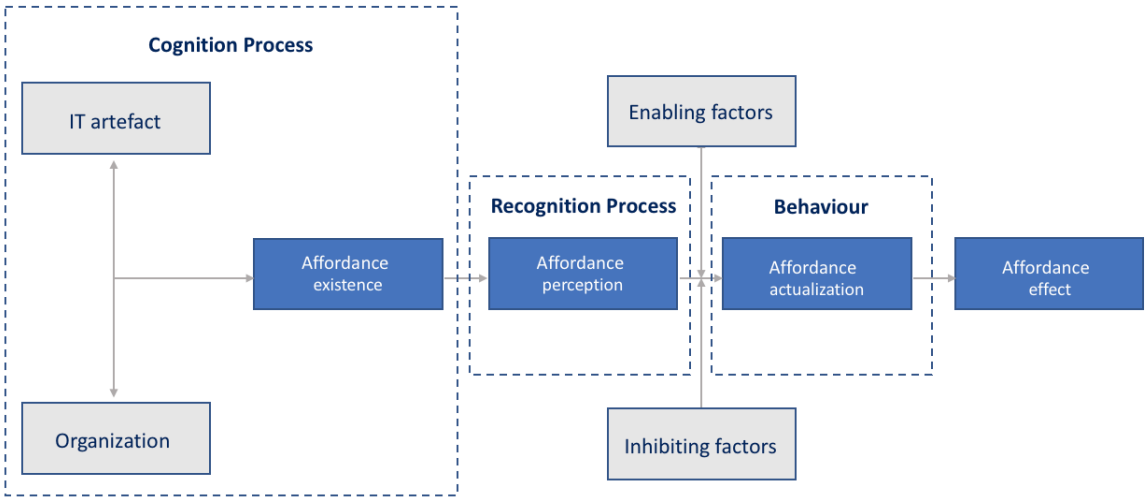


Figure 5: Combination of two analytical lens: (El-Gazzar et al., 2017; Pozzi et al. 2014)

The affordance perception in regard to Information and Communications Technology (ICT) has been used by many scholars. However, because of its novelty, only a few studies have examined the blockchain phenomenon utilizing affordance perception. Risius (2017) exploited affordances to examine blockchain not only from a technological point of view but its business application including the creation of value and governance. Another study examined the blockchain with affordances lens to explore the perception around Distributed Ledger Technologies (DLTs) as a means to achieve the UN's Sustainable Development Goals (SDGs) (Kewell, Adams, & Parry, 2017). When it comes to social entrepreneurship and affordances of blockchain, the topic has not received much attention from the research community yet. Therefore, it is part of the objectives of this research try to address this gap by exploring blockchain affordances with social entrepreneurship to foster social innovation.

Chapter 5: Methodology

5.1 - Research Method and Data collection

This study is motivated by recognizing the lack of academic researches on the applications of the blockchain technology for positive social change. The research method of this study relies on case study and Robson (2002) describes case study as the means to analyze empirical investigation of a particular contemporary phenomenon within its real-life context. According to Saunders et al. (2009), case studies are interesting especially for those who wish to gain a rich understanding of the context of the research and the process being a strategy often used for exploratory research that can use different combinations of data collection. Saunders et al. (2009) also defend that the case study method might be a very worthwhile way to explore existing theories that can also provide a valuable source for new research questions. Furthermore, the data collection technique employed for case study is likely to be used in combination (Saunders, Lewis, & Thornhill, 2009) which is the situation of this research.

Since the goal of this research is to analyze and understand the affordance process of blockchain technology and social enterprises, this research adopted a qualitative data technique that uses and generates non-numerical data (Saunders, Lewis, & Thornhill, 2009). In order to increase the level of detail e accuracy regarding the analyzed subject and the cases, a combination of primary and secondary data was used during the development of this research. Because of the lack of availability from the representatives of the social enterprises here analyzed, I could conduct only one interview (with *Alice*) on the 18th of February 2019 that took place through a video conferencing platform for the interviewee's convenience. For the other social enterprises, I used documentary analysis that includes companies' reports, whitepapers, and previous publications and interviews.

The interview with *Alice* followed the constructivism approach which focuses on the interaction between interviewee and interviewer, and on the meanings that are created through this interaction (Eriksson & Kovalainen, 2008). The interview was semi-structured

and although it counted on prepared questions, it left flexibility according to the interviewee's opinion, context, and background (Saunders, Lewis, & Thornhill, 2009). The interview was transcribed and coded as shown in the Appendices 1 and 2.

5.2 - Choice of empirical data

With the research design in place, the next step is to identify the appropriate cases that can help understand the phenomenon and build the pertinent analysis to answer the research question. As the research question does not limit the analysis by geographic location, my first strategy was to seek social enterprises that have a global impact, or their actions are not limited to a specific local community. Second, I tried to diversify the sectors on which these social enterprises work in order to have more data regarding the cross-sector potential of the blockchain. Next, I narrowed the cases based on the fulfillment of the following criteria:

- It fits the definition of a social enterprise, as shown in the literature review;
- The social enterprise must be a trustworthy organization which means:
    - has its own website with contact information and address;
    - shows its founders, investors or advisory board members;
    - has reports, whitepapers or other publications available online;
    - it has been featured in a well-known newspaper or magazine.
- It is not just a piloting idea, but it already has real use cases with results that can be found in their official websites;
- The blockchain technology is a crucial part of delivering their value proposition.

Finally, the following cases were chosen: a philanthropy and aid company based in England: *Alice*, an organization providing digital and economic identity in the United States: *BanQu*, a company addressing environmental impact located in the Haiti, Philippines, and Indonesia with its Headquarters in Canada: *Plastic Bank*, and a supply chain organization based in the United Kingdom: *Provenance*.

5.3 – Evaluation

Elo, Kääriäinen et al. (2014) states that qualitative content analysis can be utilized in either an inductive or deductive research and the most widely used criteria for evaluating qualitative content are those built by Lincoln and Guba (1985) under the term *trustworthiness*. Elo, Kääriäinen et al. (2014) also adopts the five alternatives for assessing the trustworthiness of qualitative research proposed by Lincoln and Guba (1985) which are credibility, dependability, conformability, transferability and authenticity, being the last one incorporated in 1994 (Elo, Kääriäinen, Kanste, & Pöl, 2014).

Credibility is explained by Elo, Kääriäinen et al. (2014) as the aspect in which researchers must ensure all the participants of the research are identified and described. Eriksson and Kovalainen (2008) also add to it stating that other aspects such as the researcher's familiarity with the topic and the rational and linear relation between categories and findings also need to be considered. Therefore, credibility was addressed in this research by embracing the in-depth qualitative analysis of a few case studies within the research philosophy of interpretivism. Moreover, credibility can also be assessed throughout the reading of the paper especially in the data collection, analysis, and discussions sections. Regarding the researcher background, I have spent over two years in continuous research of the topics here examined and written other academic papers with reference to blockchain and its business applications. Additionally, I current work within social enterprises and have in-depth involvement in social projects and social innovation.

For dependability and conformability, Eriksson and Kovalainen (2008) say dependability is about the documentation and logical flow of the information while Elo, Kääriäinen et al. (2014) explain conformability as being the potential for congruence between two or more people about its accuracy, relevance, or meaning. To solve dependability, all the authors mentioned or quoted in this research were addressed at the list of references found at the end of this paper as well as all additional data and other information can be found documented at the appendices section. Furthermore, this paper follows a standard academic flow proposed for a Master thesis. When it comes to conformability, the interpretivism research philosophy based on ontology and deductive approaches consider the researcher's

subjectivity as part of the study (Saunders, Lewis, & Thornhill, 2009) which is, in fact, reflected in this research. Notwithstanding, to create some level of conformability, this thesis counts on a supervisor responsible for reviewing the material here presented.

When it comes to transferability, Eriksson and Kovalainen (2008) explain it as being the connection of this research to the results of other researches. Consequently, in the chapter of the *Literature Review*, 54 sources around the topics of blockchain and social innovation, were analyzed, confronted, and incorporated in this research contributing to the overall discussion and results.

Finally, regarding authenticity, which refers to the extent in which researchers, fairly and faithfully, show a range of realities (Elo, Kääriäinen, Kanste, & Pöl, 2014), it can also be assessed on the literature review section as well as on the case studies that represent presents empirical data from different geographic locations and backgrounds.

5.4 - Research Design

This study follows the research design displayed in Figure 6. The research process started with the literature review of the blockchain, its concepts and other important definitions that were developed after the technology. This process includes reviewing books, articles, academic literature, conference proceedings, and others in order to create the foundations for the understanding of the phenomenon and other related studies. The literature review also counts on a brief review of social entrepreneurship, social innovation, Corporate Social Responsibility, and *Blockchain for good*. The research continues with the data collection which comprehends the empirical data based on the fours analyzed cases. According to Sauders et al. (2009), qualitative in-depth analysis of few cases helps the researcher using the interpretivism philosophy.

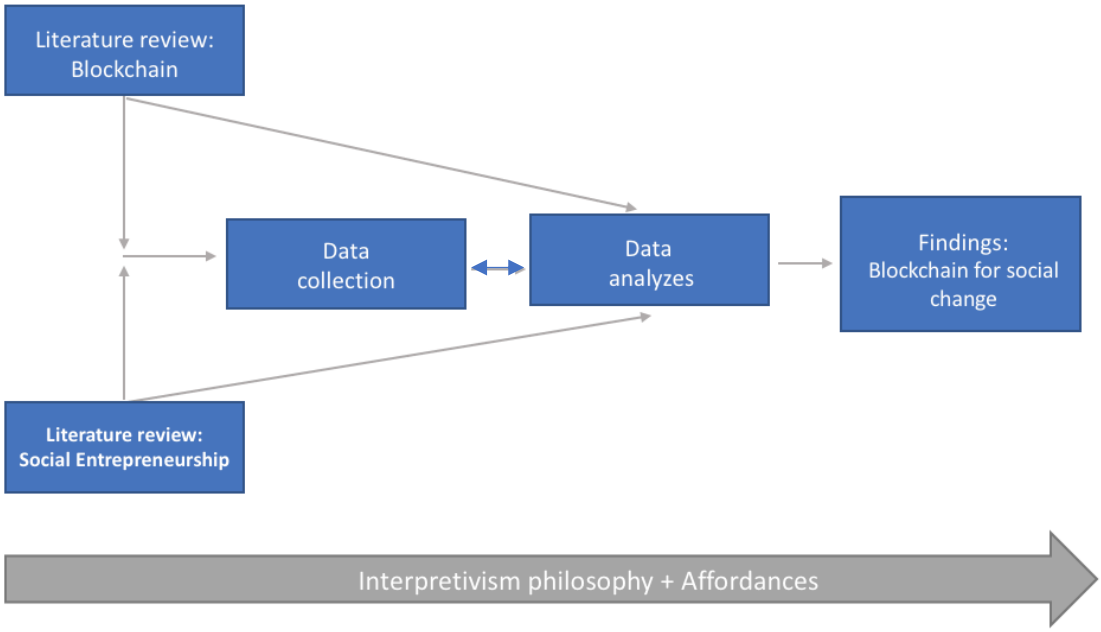


Figure 6: Research design

The data analyzes, therefore, merges the previous information in order to create a coherent analysis around the blockchain technology and social entrepreneurship within the affordance's lens. Moreover, the process of data collection and data analyzes affects one another as new insights come up within the analysis, hence, new amendments need to be done in order to support the new discoveries. Finally, the findings are placed aiming to answer the research question.

Corbin & Strauss (2008) defend that the continuous and bilateral process of data collection and analysis that leads to more data collection and analysis insights is a process that brings more potential to the research. Furthermore, the entire research was conducted following the interpretivism philosophy and using the affordances lens.

Chapter 6: Analysis

This chapter presents an analysis and interpretation of the literature review and the empirical data found during the research process. This analysis will contribute to answering the following questions:

- *How has the blockchain technology been adopted by social enterprises in order to address social problems?*
- *What are the potential benefits for social enterprises to adopt blockchain?*
- *What are the potential constraints for social enterprises to adopt blockchain?*

After analyzing the data and for a better understanding of the key findings, this chapter is divided into six parts in accordance to the affordance framework: 1) affordance existence 2) affordance perception, 3) affordance actualization, 4) affordance effects, 5) enabling factors, and 6) inhibiting factors.

6.1 - Affordance existence

As reported by Pozzi et al. (2014), affordances are preconditions for an activity and they exist whether the actor cares about them or not. The theoretical framework proposed by Pozzi et al. (2014) shows the presence of an organization (actor) and an IT artefact (artefact) in order to qualify an affordance to exist. For the purpose of this research, the **IT artefact is translated into the blockchain technology whilst the organization/actor is the social enterprise**.

The Social Entrepreneurship aspect

Although the four analyzed cases presented different characteristics, business models, and value propositions, when it comes to understanding and defining social entrepreneurship, the analysis shows common patterns that will help to answer the research questions.

All organizations represented in the cases are described as social enterprises with exception of *BanQu* that describes itself as a "for-purpose" organization. This is due to the fact that all four founders represented in the cases have as mission the creation of positive social impact by solving or minimizing an existing social problem. *BanQu*'s moto is "dignity through identity" and all its communication is about addressing extreme poverty. *The Plastic Bank* explains clearly what they do by stating that the initiative "stops ocean plastic while reducing poverty". *Provenance*, on the other hand, states that "empowering brands to take steps towards greater transparency" is their mission while for *Alice*, the ultimate goal is to "rebuild the trust in the social sector" (Livia Enomoto interview, 2019). Therefore, all cases have social innovation as their value proposition using a creative approach to address social problems or approaching social problems in different ways which are also in accordance with Heinecke & Mayer (2012) social entrepreneurship definition.

Another common pattern found after analyzing the empirical data is that all four cases were created after the perception of an opportunity by an entrepreneur. None of the cases is a result of a Corporate Social Responsibility (CSR) department of an established organization or corporation. On the contrary, all four "startups" are relatively new – the oldest one is *The Plastic Bank* that was founded in 2013 – and started developing their ideas, building their teams and use cases from scratch.

Regarding profitability, the cases differ in the sense that *Alice*, *BanQu*, and *Provenance* are considered "for-profit" companies while *The Plastic Bank* apparently do not have a source of revenue. However, it is also important to highlight that *BanQu*, and *Provenance* have their profits as a result of their *business-to-business* solutions which means that they do not make profits out of the end users that benefit from their *business-to-consumer* services. This shows that profitability is not a critical feature when identifying and analyzing a social enterprise.

6.2 - Affordance perception

As stated by Greeno (1994), the affordance perception happens through a recognition process in which the actor identifies the affordance existence. The recognition process can be

influenced by 1) the features of the object, 2) the actor's capabilities, 3) the actor's goals, and 4) external information. Therefore, I found that besides the blockchain characteristics that might present technological solutions for problems that could not be addressed otherwise – like trust, for example - an important understanding of the external environment is necessary for the affordance perception process. In this case, especially the understanding of social problems.

Understanding Social Problems

When analyzing the four cases, it is possible to identify that social problems come from different sectors of society, for a variety of reasons and regardless of the geographic location. The main social problems addressed in the cases were identified as global poverty, environmental impact, and slavery. Besides the social problems, *Alice* also exposes the lack of trust in the social sector (being charity, philanthropy, aid, and others). Although this analysis does not focus on understanding the origin of social problems, Figure 6 shows the cause-consequence relationship that the analyzed cases are trying to address.

As shown in the literature review, the causes related to global poverty can be associated with many other social, cultural, and historical arguments. However, global poverty is perceived by *BanQu* as a cause and as a consequence of the lack of economic identity by the world's poorest since without a validated history of trade, one can be excluded from the global economy. For *The Plastic Bank*, on the other hand, global poverty is more associated to the inexistence of a source of income by the majority of the population in underdeveloped countries due to low educational rates and rare opportunities to find sustainable jobs. Global poverty can also be associated to slavery as shown by *Provenance* as unsafe and unregulated work conditions very often happen in underdeveloped countries where the rates of poverty are high, and the legal inspections by the authorities are rare or inexistent.

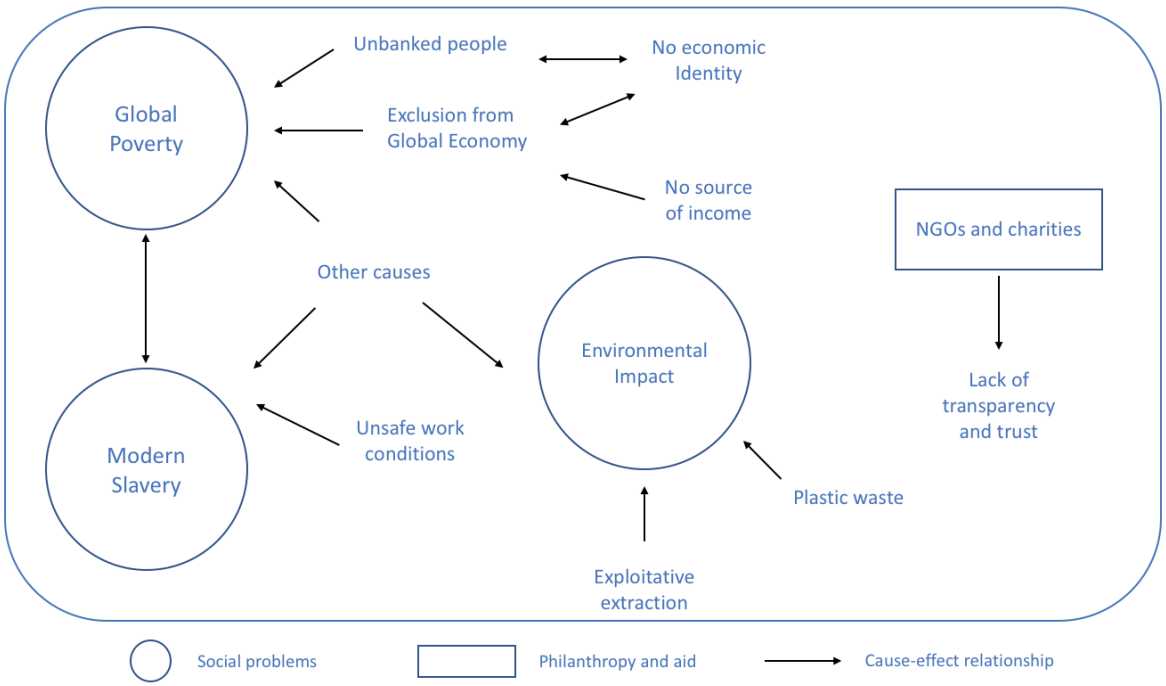


Figure 7: Cause-effect association of social problems according to the analyzed cases

According to *The Plastic Bank*, global poverty has also an association to environment impact since most of the waste comes from underdeveloped countries where there are no recycling activities and where the living conditions often do not count on improved sanitation. Furthermore, because of the absence of proper regulation prohibiting the exploitative extraction of natural resources in underdeveloped communities, the environmental impact is increased with global repercussion.

In order to minimize and avoid social problems such as global poverty, environmental impact, slavery, among others, social enterprises, appeals, and NGOs are created worldwide (Heinecke & Mayer, 2012). However, even these initiatives face their own challenges (Alice, n.d.). The majority of social projects are from non-profitable organizations that often rely on philanthropy, charity, and impact investing to exist and scale their impact as demonstrated by *Alice.* Due to the lack of transparency in these organizations' activities, public trust in charities and social impact initiatives are decreasing rapidly impacting even more negatively in already severe social problems.

Blockchain affordance

Back to the Pozzi et al. (2014) research, it is the goal-oriented actor/organization with his own characteristics that perceives the affordance as an opportunity to perform an action. In this regard, after considering the external information such as the existence of social problems and perceiving the presence of the blockchain technology as an IT artefact, I found that social entrepreneurs have a positive perception about the social potential of blockchain when it comes to using the technology to create innovative ways to approach social problems.

As shown by Kewell et al. (2017), the **blockchain perception has been shifted toward the social and environmental use cases that aim to tackle global challenges.** In fact, as demonstrated in the literature review, **social initiatives involving blockchain are on the rise** and 34% of them started in 2017 (Galen, et al., 2017). Nonetheless, **key organizations as the UN are trusting in the capabilities of the blockchain to achieve some of the Sustainable Development Goals (SDGs)** (Kewell, Adams, & Parry, 2017).

6.3 - Affordance actualization

As demonstrated by Pozzi et al. (2014) in their literature review, the actualization step is a behavioural process in which the goal-oriented actor will make use of the IT artefact to achieve the organizational goals. Thus, I identify that the social enterprises here considered enjoying many actualized affordances from adopting the blockchain technology.

Figure 7 shows the social causes that the analyzed social enterprises are addressing through the actualized affordances with the blockchain technology. After understanding some of the causes of global poverty, *BanQu* created a two-way solution to approach the social problem through blockchain. First, creating a digital, economic identity to solve the unbanked people situation, especially among refugees. Second, **empowering the entire supply chain** that interacts with these people with the data they need in order to make the interaction and transaction possible.

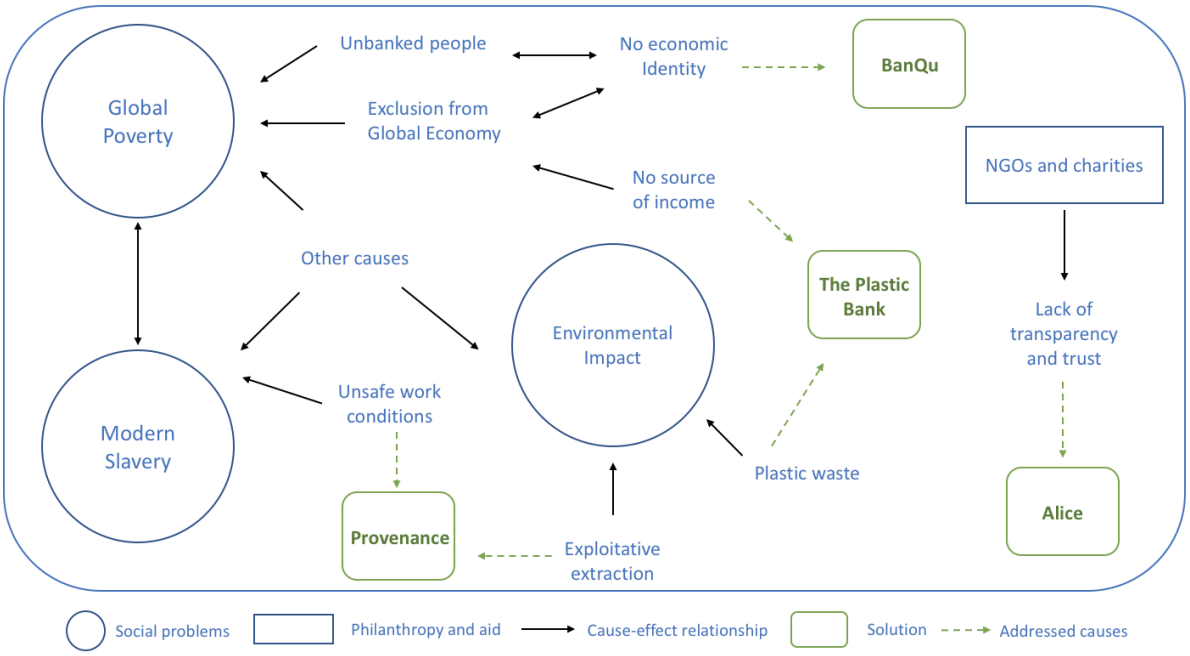


Figure 8: Social causes addressed by each analyzed case

Addressing both global poverty and environmental impact, *The Plastic Bank* perceive blockchain beyond its peer-to-peer money transfer capabilities and enjoy actualized affordances by creating a solution-focused not only on businesses but on the regular citizens from underdeveloped countries since they are mostly unemployed and willing to start an activity that could bring economic opportunity for them and their families (Plastic Bank, n.d.). Instead of using manual operations, *The Plastic Bank* solution counts on the blockchain technology **to scale their operations supporting instantly millions of users globally** and **to track the entire cycle of recycled plastic** while creating a positive social and environmental impact with global proportions.

The founder of *Provenance* acknowledged that a great portion of consumers are becoming more aware of the origin of products as they want to have more detailed information about the fabrication process before buying an item (Provenance, 2015). Therefore, through an actualized affordance using blockchain, *Provenance* solution is **taking social problems related to supply chain such as unsafe and unregulated work conditions, and exploitative extractions into an opportunity for companies to be compliant and more transparent about their processes.**

Alice, on the other hand, observed an increase in impact investing at the same time that charities and philanthropy are facing a tough moment for funding. The founder, therefore, identified the problem and through an actualized affordance with blockchain is **transforming the lack of trust in the social sector into incentives for social organizations to run projects transparently by reporting their impact in a reliable and tamperproof platform.**

6.4 - Affordance effects

After the process of affordance actualization and after analyzing the empirical data, I found affordances effects that are both enabling conditions for additional affordances and enabling organizational changes (Pozzi, Pigni, & Vitari, 2014). Moreover, I found affordances effects into two categories: indirect affordance effect (resulting in social impact) and direct affordance effect (directly impacting the social enterprise).

For BanQu, the indirect affordance effect, as can be seen in their case in Kenya involving hundreds of benefited refugees, is the creation of people's digital identities and inclusion on society while unbanked people that before were excluded from the global economy are now **(re)included on the global trade**. Because of blockchain, BanQu also benefits from the **reduction of transaction costs** to manage its database of identities and to enable other transactions - between providers and the (re)included consumers – to happen seamlessly.

For *The Plastic Bank*, the effects are both direct and indirect. First, the actualization process brings the direct results in global scale resulting in **broadened reach** and, therefore, more awareness and engagement. Second, the indirect effect is the **certification of the recycled plastic** empowering buyers (companies) with transparent information about the plastic origins and incentivizing its sales at the best price.

For *Provenance*, the effects of a more transparent supply chain can also be found in different ways. First, the possibility to verify activities in each step of a supply chain causes indirect effects such as **better and more compliant work conditions** while the **natural resources extractions and usage are done in sustainable and regulated** ways. Second, by being

transparent about their product journey, companies are gaining more public trust. At the same time, because of the affordance actualization, *Provenance* as a for-profit social enterprise also counts on **different business models** relating to business-to-business and business-to-consumer applications.

When it comes to *Alice*, the affordance effect can be identified as direct as grantmaker and investors can count on **automatized operations** through Smart Contracts releasing funds based on delivery. At the same time, it means more opportunities for social initiatives and NGOs to receive funds as the affordance actualization incentivizes **more transparency and trust in the social sector**.

6.5 - Enabling factors

After combining the literature review outcomes with the empirical data, I identified several enabling factors that might contribute to the affordance of the blockchain technology by social enterprises. These include a) the bitcoin open source protocol, b) diversity of blockchain networks, c) Smart Contracts (as a means for disintermediation), d) Ethereum principles, e) Initial Coin Offering (ICO) (as a means for fundraising), f) cross-industry Hyperledger collaboration, and g) need for transparent social impact.

As shown in the literature review, the Bitcoin was the entry-point for many people into blockchain, thus, the first famous blockchain application (Iansiti & R. Lakhani, 2017; Bennett, 2018). Since it relies on **an open-source protocol**, any developer can have access to this protocol, make the necessary code modifications and start a new blockchain-based solution. This open source enables the fast adoption of the blockchain since it does not require a developer to start a blockchain protocol from scratch. The open source also enables social enterprises to create solutions that go beyond the peer-to-peer money transfer with no limits to its applications for social impact as can be seen in the cases here analyzed.

The **diversity of the blockchain networks** may also be considered as another enabler factor to the blockchain adoption as it democratizes the blockchain usability. Because of the

different networks, blockchain is a solution that affords from open, public, and permissionless platforms, to closed, private, and permissioned ones depending on the strategy of the social enterprise and the data sensibility level. For example, a supply chain solution might choose an open (everyone can read) and private (not everyone can write) platform whilst a currency-based solution might opt for an open and public (everyone can read and write) one.

Smart Contracts can also. be considered as an enabler factor *per se* when analyzed as a means for disintermediation. The absence of a middle-man to enforce a contractual agreement between two or more parties involving digital assets is a mechanism that considerably reduces bureaucracy by creating an *auto enforceable* process while facilitating its management. This process reduces transaction costs and incentivizes (social) entrepreneurs to create transaction-based solutions.

Taking the **Ethereum principles** into consideration - especially *simplicity*, *universality*, and *non-censorship*, it is possible to identify the reasons why it can be examined as an enabler factor of the blockchain adoption by social enterprises. First, the simplicity of the Ethereum protocol enables any average programmer to be able to implement it. Second, Ethereum provides all the scripting language and facilities necessary for a programmer to build any blockchain application. By choosing Ethereum, social entrepreneurs and programmers have the freedom to develop any application from business solution to social innovation. In fact, out of the four analyzed cases, three (*Alice*, *BanQu*, and *Provenance*) use Ethereum.

As shown in the literature review, **Initial Coin Offering (ICO)** is one of the most famous trends for funding (Fisch, 2018). This is due to the fact that by working with ICOs, startups might get the necessary funding to develop further their plans without giving up on equity. Moreover, ICOs might eliminate bureaucratic barrier when starting a business such as government intervention and middleman arbitration. However, to be able to join the benefits of ICOs, the startups need to run on a blockchain-based platform which incentivizes more (social) enterprises to create blockchain solutions and take advantage of the ICOs.

Hyperledger, on the other hand, is a non-currency environment that acts as an enabler or a hub and its ultimate goal is to bring blockchain mainstream by incentivizing entrepreneurs to

develop creative blockchain solutions in a collaborative space. By leveraging a community of software developers, companies, and infrastructure, Hyperledger motivates the creation of industrial blockchain applications regardless of the sector with a high-scaling capacity. An example is *The Plastic Bank* that runs its application on the IBM Hyperledger solution.

The **need for transparent social impact** might also be one enabler of the blockchain technology. As shown in the literature review, companies are investing in ways to better measure both social and environmental impact (McPherson, 2019). The *Alice* case also demonstrated that NGOs and social enterprises are facing a tough moment for funding due to the lack of clear activity and transparent impact. Considering transparency and trust the immediate benefits of a blockchain – due to its tamperproof abilities – social entrepreneurs may be seeing blockchain as the ultimate solution to address the need for transparency and to rebuild the trust in the social sector (Livia Enomoto interview, 2019).

6.6 - Inhibiting factors

After analyzing the literature review with the outcomes from the empirical data, I also identified four inhibiting factors that might constrain the affordance actualization. These include a) no clear regulation, b) high consumption of energy and storage space, c) operationalization of the entire supply chain, and d) lack of blockchain experts.

No clear regulation around blockchain can be described in two different levels. First, in relation to Smart Contracts, in the best of my knowledge, it was not found any legal acceptance of a Smart Contracts by the courts yet, therefore, the concept and applications of a Smart Contract still need to be more mature and prepared for legal standards. Second, although ICOs take advantage of some characteristics of crowdfunding, Initial Coin Offering and the acquisition of tokens do not count on regulatory protection yet as IPOs nor transparency on the token holding structure, as could be noticed with *The DAO* example.

In public blockchains that count on a high engagement and a consensus protocol such as the Bitcoin, the *mining* process is responsible for a **high consumption of energy and storage**

space which can make the adoption of the blockchain by social enterprises as well as NGOs financially and structurally unfeasible.

When it comes to supply chain solutions such as *BanQu* and *Provenance*, an inhibiting factor that may constrain the affordance actualization is the **operationalization of the entire supply chain**. This means that in order to have its ideal outcomes, all the participants within a supply chain need to be technologically prepared to play their parts along the process. However, this operationalization might represent great costs inhibiting the adoption of the blockchain.

Finally, as blockchain is still in its infancy, the **lack of professionals capable of developing applications on a blockchain** platform can also be represented as an inhibiting factor of the affordance actualization. As stated by *Alice*, "when we had to hire our first developer, it took many months (…). To be able to find and hire a blockchain developer who knows how to code Smart Contracts it is super difficult." (Livia Enomoto interview, 2019).

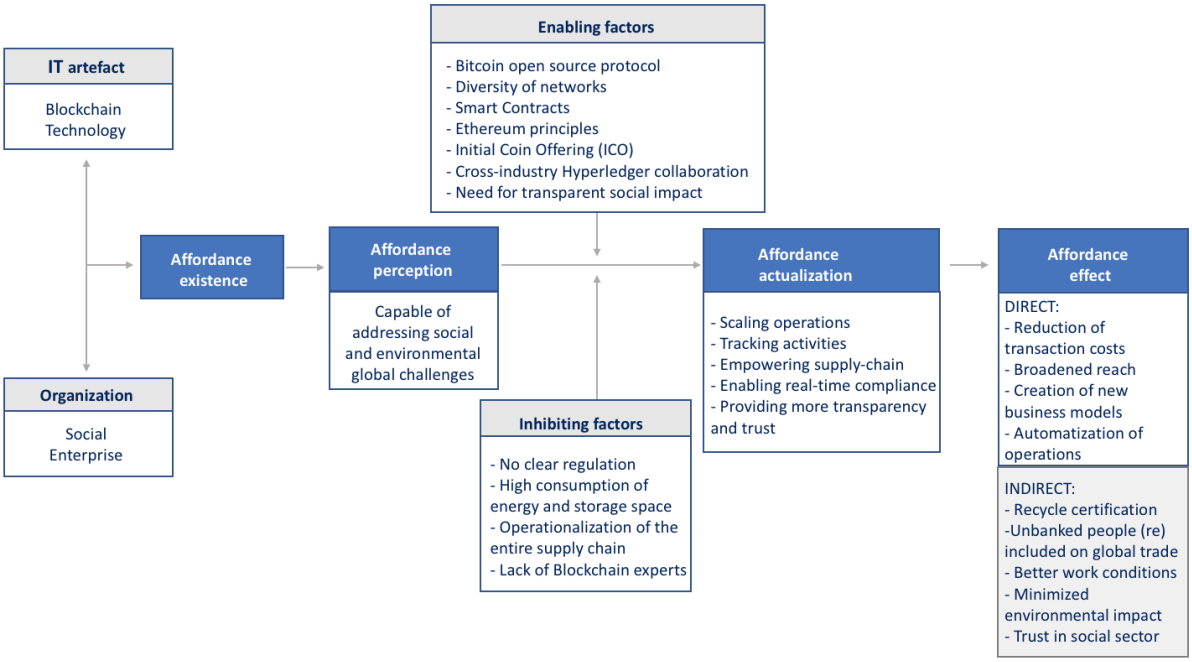


Figure 9: Summary of the findings.

Chapter 7: Discussion

This chapter presents the implications and meanings of the research findings. The discussion gives a broader perspective of the adoption of the blockchain technology by social enterprises and, therefore, will answer the questions of this research. The main research question is: *"How has the blockchain technology been adopted by social enterprises in order to address social problems?"*. Therefore, I outline in this chapter the main findings which contribute to the building of the answers.

The adoption of the blockchain technology has been shifted considerably from just a peer-to-peer money transferring solution to include much broader applications along with its embracement to mobilize good causes towards social innovation and positive social impact (Kewell, Adams, & Parry, 2017). This shift on the technology application and adoption can be placed as a new angle of perception of the blockchain affordances by social enterprises. Despite the fact that there is no unique classification in regard to what makes an organization a social enterprise, the literature as well as the empirical data reviewed some points of agreement which are a) the value proposition of a social enterprise is focused on positive social change, and b) the social enterprise was started by an entrepreneur with the aim of social innovation – different from Corporate Social Responsibility (CSR) initiatives. As a result, the profitability factor may not be meaningful when classifying social enterprises. Once the social enterprise definition is delineated, the research shows that social enterprises have adopted the blockchain technology in different ways, in diverse sectors of society, and with different goals. However, the common point found among all the analyzed cases is that all the social enterprises are leveraging the blockchain technology to improve processes or enable solutions that were not possible otherwise.

The insights from this research suggest that the blockchain technology provides many affordance actualizations for social enterprises. These include the global scale of operations, the secured tracking of activities, creation of new business models, the supply-chain automation, as well as the provision of transparency and trust. The findings also show that the affordance can happen regardless of the geographic location of the enterprises and their

consumers, and in different sectors of society being the analyzed cases divided among financial inclusion, environmental impact, transparency in supply chain, and philanthropy and aid. Another important factor identified when adopting the blockchain technology is the possibility to count on the support of different blockchain networks such as Ethereum and Hyperledger. The former offers even an average programmer the suit of tools he/she needs to build any application or Smart Contracts within a blockchain. The latter, on the other hand, counts on an open source community where professionals can collaborate and contribute together in order to create new solutions for businesses. Altogether, social enterprises are leveraging platforms like Ethereum and Hyperledger to give birth to their own ideas without the need of starting a blockchain application from scratch.

This research found more enabling factors for the affordance actualization than inhibiting factors. However, this paper also identified some elements that might contribute to a more careful adoption of the blockchain technology. These are the lack of clear regulation of Smart Contracts and ICOs – which can represent a risk to the social enterprise and its investors - the high consumption of energy and storage space by public/open blockchain platforms, the operational challenges of empowering all the players within a supply-chain with blockchain, which requires considerable efforts, great investments, and stakeholder's engagement, and the lack of blockchain experts.

When it comes to the benefits of the blockchain technology for social enterprises, the research mapped three main components. The first and immediate is the ultimate level of accountability that a blockchain technology offers. As shown in the literature review, many companies are investing in innovative ways to make radical transparency possible – especially about their social impact - and due to the blockchain characteristics – especially the immutable source of data, blockchain might be the answer these companies are looking for. Beyond transparency and trust, another important component is *decentralization*. This means that the blockchain technology eliminates the need for a third-party – or the middle man – which helps social enterprises to deploy their solutions faster and cheaper counting on less bureaucracy and sometimes no government intervention. Finally, the blockchain technology enables new business models to come to life as shown by the case study, being business-to-business and/or business-to-consumer solutions.

However, as pointed in the literature review, the blockchain technology has not been tested in every possible scenario yet and it might be too early to affirm that the technology is, in fact, immutable (Orcutt, 2018). Another counterpoint expressed in the literature is in regard to private blockchains. Although they represent a solution for companies that are not interested in sharing their sensitive information – especially when it comes to banks – for not counting on a public consensus mechanism, private blockchains can extend the same risks as centralized systems, being susceptible to corruption and failure. On the other hand, the research also points to the possibility of social enterprises to create federated blockchains or consortiums in which the risks of a private blockchain might be addressed.

Contrasting the enabling factors, inhibiting factors, affordance actualization, and affordance results, this research comes to a conclusion that although it may be too early to affirm how prolific the adoption of the blockchain technology by social enterprises will be, it represents more benefits than constraints with some use cases already in place as presented by the empirical data showing that the blockchain contribution for social innovation goes, in fact, beyond the hype. For the social enterprises, these benefits include the reduction of transaction costs which is an important factor for *for-profit* enterprises but especially for *non-profit* organizations since they do not count on a regular source of revenue, transparency, broadened reach, and increase in funding for social impact initiatives and social organizations. When it comes to social impact, the empirical data showed the rise of new social innovative solutions created through blockchain by social enterprises that are already bringing positive change in: the (re)inclusion of unbanked people on global trade, better work conditions for employees living in underdeveloped countries, more sustainable extraction of natural resources, and minimized environmental impact by producers.

While this paper focused on the data analysis across four sectors of society (financial inclusion, environmental impact, transparency in supply chain, and philanthropy and aid), it is valid to state that the social initiatives around blockchain are not limited to just these sectors. Other areas of society are also being addressed through the potential of the blockchain technology for social innovation. During the research, I also identified cases in the healthcare sector, energy, agriculture, education, among others.

During the research process, it was also identified that social enterprises are not only adopting blockchain because of its benefits but also because various cryptocurrencies companies and blockchain platforms are creating their own foundations or blockchain associations incentivizing the rise of new organizations and new blockchain-based solutions. Most of these foundations have mainly a social innovation goal that incentivizes other companies and entrepreneurs to use their platforms to create applications that include positive social impact. One example is the *Blockchain For Social Impact* created by Consensys where the goal is to leverage the Ethereum blockchain technology for social impact. Two out of the four case here analyzed - *Alice* and *Provenance* - are part of this coalition.

Chapter 8: Conclusion

The aim of this research is to explore blockchain as a phenomenon beyond the hype and beyond its *peer-to-peer* money transferring applications already addressed in previous researches. Throughout the process of the research and by using an affordances lens, I was able to map and analyze the findings, as well as identify several affordances actualizations. The findings confirm that social enterprises are indeed adopting blockchain as the means to tackle social problems and to enable social solutions that were not possible before the emergence of the technology. The context of the affordances can vary from social enterprise, but this thesis found different ways to adopt blockchain to foster social innovation. First, using the decentralization nature of blockchain and Smart Contracts to rebuild trust in the social sector by bringing transparency into donation activities while incentivizing NGOs and social initiatives to have a more goal-oriented approach. Second, adopting blockchain for financial inclusion where unbanked people can count on secure and immutable digital economic identities that allow them to be (re)inserted into global trade. Third, leveraging blockchain to create economic opportunity for people living under extreme poverty by incentivizing them to join in traceable recycling activities that are rewarded with salaries, access to healthcare and education, and other social benefits. Finally, bringing transparency and awareness to supply chains where all players count on high-level accountability in each process which, in turn, facilitates compliance.

Beyond the different approaches, this research found many benefits for the affordance actualization. These are the global scale of social enterprises operations, the decentralization, the immutable tracking record of activities which can be translated into security and trust, the possibility to make supply chain operations and communications more efficient and accessible, while empowering all their customers, employees, and stakeholders with more transparency. Furthermore, considering the current scenario of blockchain, I identify more enabling factors to the adoption of the technology than inhibiting ones. These enabling factors may contribute to the creation of innovative ways to tackle social problems since social initiatives involving blockchain are on the rise. On the other hand, a few constraints for the affordance actualization were also outlined in this paper. Therefore, those who are interested in bringing the blockchain technology into the mainstream might want to start

formulating strategies to resolve these factors. These are the inflexibility and/or the inexistence of regulations around Distributed Ledger Technologies (DLTs) and Initial Coin Offering (ICOs), and the high costs associated to blockchain platforms, especially running under Ethereum.

For practice, this thesis contributes first to the ratification of the previous assumption that blockchain is an innovation that goes beyond the hype and has been embraced by governments, companies, and social enterprises in order to address social problems and foster social innovation. Therefore, it forwards the lack in the existing academic literature. Second, it identifies a list of inhibiting factors that are still preventing the blockchain widespread adoption among social enterprises. Third, the combination of frameworks suggested by Pozzi et al. (2014) and El-Gazzar et al. (2017) used in this research validates the concept of affordances for understanding the blockchain uptake by social enterprises.

Further research

Because of its novelty, most data available around blockchain lack academic angle and, as a result, are perceived as assumptions based on empirical data rather than on theories (Holotescu, 2018). Consequently, there are various opportunities for further academic studies around blockchain and its relation to social enterprises and social innovation.

Although this research focusses the analyzes on the affordances process in which blockchain technology and social enterprises are IT artefact and organization, respectively, the concepts of sequential and nested affordances raised by Gaver (1991), were not explored which opens a new avenue for future research.

The notion of blockchain as a driving force for positive social change also raises questions regarding the opposite analyses which is *"Blockchain as a driving force for negative social change"*. In this regard, there is an extensive body of literature about the unfavorable impacts of blockchain for society that might contribute for other studies.

References

Accenture Labs. (2017). Blockchain for Good - 4 guidelines for Transforming Social Innovation Organizations. AccentureLabs.

Acheson, N. (2018, January 29). How Bitcoin Mining Works . *Coindesk*.

Acheson, N. (2018, March 16). *What is an ICO?* Retrieved from CoinDesk.com: https://www.coindesk.com/information/what-is-an-ico

Alice. (n.d.). *Why Alice*. Retrieved from Alice.si: https://alice.si/#Why-Alice

Bacq, S., & Janssen, F. (2011). The multiple faces of social entrepreneurship:A review of definitional issues based on geographical and thematic criteria, Entrepreneurship &Regional Development. *Entrepreneurship & Regional Development*, pp. 373–403.

BanQu. (n.d.). *Press Release*. Retrieved from Banqu.co: https://banqu.co/wp-content/uploads/2018/10/BANQU-BRAND-EPK.pdf

BanQu. (n.d.). *Problem - The Unbanked* . Retrieved from BanQu.co: https://banqu.co/our-purpose/#!/about

Bauerle, N. (n.d.). What is Blockchain Technology? . *Coindesk*.

Bennett, K. (2018, June 27). Public Blockchain vs Private Blockchain for the Enterprise. *Public Blockchain vs Private Blockchain for the Enterprise*. Blockchain Training Alliance .

Bentley, J. (n.d.). *Hyperledger Fabric – The Good, The Bad, and The Opportunity.* Retrieved from 10xts.com: https://10xts.com/hyperledger-fabric-the-good-the-bad-and-the-opportunity/

Bieler, D., & Bennett, M. (2016, September). *IoT and blockchain challenges to solve.* Retrieved from i-Scoop.eu: https://www.i-scoop.eu/blockchain-distributed-ledger-technology/blockchain-iot/

Blockchain. (n.d.). *Bitcoin for Beginners*. Retrieved from Blockchain.com: https://www.blockchain.com/learning-portal/bitcoin-faq

Blockchain for Social Impact. (n.d.). *About*. Retrieved from BlockchainForSocialImpact.com: https://blockchainforsocialimpact.com/about/

Blockchain Hub. (n.d.). Blockchains & Distributed Ledger Technologies. *BlockchainHub.net*.

Blockchian Hub. (n.d.). *Smart Contracts* . Retrieved from BlockchainHub.net: https://blockchainhub.net/smart-contracts/

BlockGeeks. (2017). *What Are Dapps? The New Decentralized Future* . Retrieved from Blockgeeks.com: https://blockgeeks.com/guides/dapps

BlockGeeks. (n.d.). *What Is Hyperledger?* . Retrieved from BlockGeeks.com: https://blockgeeks.com/guides/hyperledger/

Body, A. (2018, February). *Blockchain : how to choose the right tech for your business*. Retrieved from Medium: https://medium.com/@abody/blockchain-how-to-choose-the-right-tech-for-your-business-aa4597d7ee7c

Boersma, J. (n.d.). *5 blockchain technology use cases in financial services - Powering innovation in the industry.* Retrieved from Deloitte.com: https://www2.deloitte.com/nl/nl/pages/financial-services/articles/blockchain-technology-use-cases-in-financial-services.html

Brest, P., & Born, K. (2013). When Can Impact Investing Create Real Impact? *Stanford Social Innovation Review*.

Bullock, S. (2018, June 08). *Key Facts About Plastic Pollution.* Retrieved from greenpeace.org: https://www.greenpeace.org/usa/key-facts-about-plastic-pollution/

Callon, M. (2001). Actor Network Theory. In N. J. Smelser, & P. B. Baltes, *International Encyclopedia of the Social & Behavioral Sciences* (pp. 62-66). Palo Alto and Berlin: Elsevier Science Ltd.

Caramela, S. (2018, June 08). *What is Corporate Social Responsibility?* . Retrieved from Business News Daily: https://www.businessnewsdaily.com/4679-corporate-social-responsibility.html

Castillo, M. d. (2016). *Ethereum Executes Blockchain Hard Fork to Return DAO Funds.* Retrieved from CoinDesk.com: https://www.coindesk.com/ethereum-executes-blockchain-hard-fork-return-dao-investor-funds

ChainDocs. (n.d.). *Chain Protocol Whitepaper* . Retrieved from Chain.com: https://chain.com/docs/1.2/protocol/papers/whitepaper

Coindesk. (n.d.). *What is Blockchain Technology?* . Retrieved from coindesk.com: https://www.coindesk.com/information/what-is-blockchain-technology

CoinStaker. (n.d.). *What is an ICO*. Retrieved from CoinStaker.com: https://www.coinstaker.com/what-is-an-ico/

CONE. (2017). *2017 Cone Communications CSR Study.* Cone Communications LLC.

Cosset, D. (2018, January 4). Blockchain: What is Mining? . *Dev*, p. 5.

Cryptohustle. (2016, October). Retrieved from Cryptohustle.com: https://cryptohustle.com/immutability-doesnt-mean-being-against-hard-forks

Curtis, L. (2018, March 22). Why Pushing For Social Responsibility Is Smart Business. *Forbes*.

Dahlsrud, A. (2006, November 09). How Corporate Social Responsibility is Defined: an Analysis of 37 Definitions. *Corporate Social Responsibility and Environmental Management*.

Dichter, T. (2019). Blockchain For Social Impact? Be Careful What You Wish For. *Fourbes*.

El-Gazzar, R., Henriksen, H. Z., & Wahid, F. (2017). IT INNOVATIONS AND ENTREPRENEURSHIP IN EMERGING ECONOMIES-IS CLOUD COMPUTING A MAGIC INGREDIENT FOR EGYPTIAN ENTREPRENEURS? *In Proceedings of the 25th European Conference on Information Systems (ECIS)* (pp. 1044-1061). Guimarães, Portugal: ResearchGate.

Elo, S., Kääriäinen, M., Kanste, O., & Pöl, T. (2014, SAGE Journals). Qualitative Content Analysis: A Focus on Trustworthiness.

Enchev, S. (2018, December 04). *The Dark Side of Blockchain*. Retrieved from Hackernoon.com: https://hackernoon.com/the-dark-side-of-blockchain-46666adb8061

Eriksson, P., & Kovalainen, A. (2008). Qualitative methods in business research. *SAGE* .

Esterberg, K. G. (2002). What is Social Research? Some Practical and Theoretical Concerns. In K. G. Esterberg, *Qualitative Methods in Social Research* (pp. 1-22). Boston: McGraw-Hill.

Field, A. (2017). *The Plastic Bank: Using Plastic Refuse To Create A Global Currency For The Poor.* Retrieved from Forbes: https://www.forbes.com/sites/annefield/2017/11/29/the-plastic-bank-using-plastic-to-create-a-global-currency-for-the-poor/#c79a7bf74332

Fisch, C. (2018, September). *Initial coin offerings (ICOs) to finance new ventures.* Retrieved from Elsevier: https://www-sciencedirect-com.esc-web.lib.cbs.dk:8443/science/article/pii/S0883902618301721

Galen, D., Brand, N., Boucherle, L., Davis, R., Do, N., El-Baz, B., . . . Lee, J. (2017). *Blockchain for Social Impact.* Stanford Graduate School of Business.

Gaver, W. W. (1991). Technology affordances. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 79-84). ACM New York.

Gibson, J. J. (1986). The Ecological Approach to Visual Perception. *Lawrence Erlbaum Associates*.

Greeno, J. G. (1994). Gibson's affordances. *Psychological Review, 101(2)*, pp. 336-342.

Greenspan, G. (2015, November 02). *Smart contracts: The good, the bad and the lazy.* Retrieved from MultiChain: https://www.multichain.com/blog/2015/11/smart-contracts-good-bad-lazy/

Guegan, D. (2017). Public Blockchain versus Private blockhain. Paris, France: Archive ouverte en Sciences de l'Homme et de la Société.

Hammond, M. (2009, August 26). What is an affordance and can it help us understand the use of ICT in education? *Springer US*, pp. 205-2017.

Heinecke, A., & Mayer, J. (2012). Strategies for Scaling in Social Entrepreneurship. In C. Volkmann, K. Tokarski, & K. Ernst, *Social Entrepreneurship and Social Business* (pp. 191-209). Gabler Verlag.

Hertig, A. (n.d.). *How Do Ethereum Smart Contracts Work?* . Retrieved from Coindesk.com: https://www.coindesk.com/information/ethereum-smart-contracts-work

Holotescu, C. (2018). UNDERSTANDING BLOCKCHAIN TECHNOLOGY AND HOW TO GET INVOLVED. *The 14th International Scientific Conference eLearning and Software for Education Bucharest* (p. 9). Bucharest: University of Timisoara.

Howaldt, J., & Schwarz , M. (2016, April 30). SOCIAL INNOVATION AND ITS RELATIONSHIP TO SOCIAL CHANGE.

Hyperledger. (n.d.). *About Hyperledger*. Retrieved from Hyperledger.org: https://www.hyperledger.org/about

Hyperledger Composer. (n.d.). *Build Blockchain applications and business networks your way*. Retrieved from Hyperledger.github: https://hyperledger.github.io/composer/latest/

Hyperledger. (n.d.). *Hyperledger Caliper*. Retrieved from Hyperledger.org: https://www.hyperledger.org/projects/caliper

Iansiti, M., & R. Lakhani, K. (2017, January-February). The Truth About Blockchain. *Harvard Business Review*, p. 11.

Ibba, S., Pinna, A., Lunesu, M. I., Marchesi, M., & Tonelli, R. (2018, September 18). *Initial Coin Offerings and Agile Practices* . Retrieved from MDPI.com: https://www.mdpi.com/1999-5903/10/11/103/htm

IBM. (n.d.). *The Plastic Bank - Business challenge story.* Retrieved from IBM.com: https://www.ibm.com/case-studies/plastic-bank

Irrera, A. (2018). *More than 10 percent of $3.7 billion raised in ICOs has been stolen: Ernst & Young.* Reuters.

Kewell, B., Adams, R., & Parry, G. (2017). Blockchain for good? *Wiley Online Library*.

Kobielus, J. (2018, June 21). Sorry, but blockchain databases are just not that secure. *InfoWorld*.

Lake, H. (2017, May 04). *Blockchain startup offers transparency tool to track donations to charity.* Retrieved from UK Fundraising:

https://fundraising.co.uk/2017/05/04/blockchain-startup-offers-transparency-tool-to-track-donations-to-charity/#.XErBUM8zY_U

Latour, B. (2005). Reassembling the Social: An Introduction to Actor-Network-Theory. Oxford: Oxford UP.

Law, J. (2007). *Actor Network Theory and Material Semiotics1*. Lancaster.

Macrinici, D., Cartofeanu, C., & Gao, S. (2018, October). Smart contract applications within blockchain technology: A systematic mapping study. *Telematics and Informatics volume 35, Issue 8*.

Mair, J., & Noboa, E. (2006). Social Entrepreneurship: How Intentions to Create a Social Venture are Formed. In J. Mair , J. Robinson, & K. Hockerts, *Social Entrepreneurship* (pp. 121-135). London: Palgrave Macmillan.

Mazet, R. (2016, June 01). *How blockchain philanthropy can restore trust in charities.* Retrieved from Medium.com: https://medium.com/alice-si/how-blockchain-philanthropy-can-restore-trust-in-charities-7614b14431d9

Mazet, R., & Wojciechowski, J. (2017). *Alice whitepaper.* Retrieved from GitHub: https://github.com/alice-si/whitepaper/blob/master/Alice%20white%20paper%20-%20FV%200.9.pdf

McPherson, S. (2019, January 14). Corporate Responsibility: What To Expect In 2019. *Forbes*.

Mearian, L. (2018, June 25). *IoT could be the killer app for blockchain* . Retrieved from ComputerWorld: https://www.computerworld.com/article/3284024/blockchain/iot-could-be-the-killer-app-for-blockchain.html

Morabito, V. (2017). *Business Innovation Through Blockchain: The B3 Perspective.* Milan, Italy: Springer.

Mulgan, G., Tucker, S., Ali, R., & Sanders, B. (2007). *Social Innovation, What It Is, Why It Matters, and How it Can Be Accelerated.* The Young Foundation.

Nakamoto, S. (2008, October). *Bitcoin: a peer-to-peer electronic cash system.* Retrieved from Bitcoin.org: https://bitcoin.org/bitcoin.pdf

Nascimento, L. (2018, March 6). Blockchain in a nutshell . *SAP Blog*, p. 47.

Nicholls, A., & Murdock, A. (2012). The Nature of Social Innovation. In A. Nicholls, & A. Murdock, *Social Innovation* (pp. 1-30). London: Palgrave Macmillan.

O'Leary, D. E. (2017). *Configuring blockchain architectures for transaction information in blockchain consortiums: The case of accounting and supply chain systems.* California: University of Southern California, Los Angeles, CA, USA.

Orcutt, M. (2018, April 25). How secure is blockchain really? *MIT Technology Review*.

Pandit, V., & Tamhane, T. (2018, February). A closer look at impact investing. *McKinsey Quarterly*.

Paul, R., & Quadir, S. (2013, 05 13). *Bangladesh rescue operation near end; collapse death toll at 1,127.* Retrieved from Reuters.com: https://www.reuters.com/article/us-bangladesh-building/bangladesh-rescue-operation-near-end-collapse-death-toll-at-1127-idUSBRE94C0BL20130513

Phillips, W., Lee, H., James, P., Ghobadian, A., & O'Regan, N. (2014). Social Innovation and Social Entrepreneurship: A Systematic Review. pp. 428-461.

Plastic Bank. (n.d.). *What we do*. Retrieved from PlasticBank.com: https://www.plasticbank.com/what-we-do/#.XEsZws8zY_U

Pozzi, G., Pigni, F., & Vitari, C. (2014). Affordance Theory in the IS Discipline: a Review and Synthesis of the Literature. *Twentieth Americas Conference on Information Systems.* ResearchGate.

Provenance. (2015, November 21). *Blockchain: the solution for transparency in product supply chains.* Retrieved from Provenance.org: https://www.provenance.org/whitepaper

Provenance. (n.d.). *About - Mission*. Retrieved from Provenance.org: https://www.provenance.org/about#mission

Provenance. (n.d.). *Pioneering a new standard for trust in food retail.* Retrieved from Provenance.org: https://www.provenance.org/case-studies/co-op

Purlev, P. (2018, September 13). *More than 50% of all Initial Coin Offerings (ICOs) fail to raise money.* Retrieved from CoinStaker: https://www.coinstaker.com/initial-coin-offerings-fail/

Ray, J. (2018, August 22). *A Next-Generation Smart Contract and Decentralized Application Platform.* Retrieved from GitHub.com: https://github.com/ethereum/wiki/wiki/White-Paper

Reynoso, R. (2017, November 17). *BanQu Uses Blockchain to Fight Poverty.* Retrieved from Medium.com: https://medium.com/coinforward/banqu-uses-blockchain-to-fight-poverty-6b6fa8263fc9

Risius, M. (2017). A Blockchain Research Framework: What We (don't) Know, Where We Go from Here, and How We Will Get There. *Business & Information Systems Engineering*, pp. 385-409.

Saunders, M., Lewis, P., & Thornhill, A. (2009). Using secondary data. In M. Saunders, P. Lewis, & A. Thornhill, *Research methods for business students* (pp. 258-259). Pearson.

Sklaroff, J. M. (2018). Smart Contracts and the cost of inflexibility. University of Pennsylvania Law Review.

Stanford Graduate School of Business. (n.d.). *Defining Social Innovation*. Retrieved from gsb.stanford.edu: https://www.gsb.stanford.edu/faculty-research/centers-initiatives/csi/defining-social-innovation

Stubbs, J. (2018). *ICO funded projects hit by 100 cyber attacks a month: report.* Reuters.

United Nations. (2018, October 26). *With 40 Million Forced into Modern Slavery, Third Committee Expert Urges States to Protect Rights of Women, Girls, Companies Must Remedy Violations.* Retrieved from un.org: https://www.un.org/press/en/2018/gashc4244.doc.htm

United Nations Industrial Development Organization. (n.d.). *What is CSR?* . Retrieved from Unido.org: https://www.unido.org/our-focus/advancing-economic-competitiveness/competitive-trade-capacities-and-corporate-responsibility/corporate-social-responsibility-market-integration/what-csr

Westley, F., & Antadze, N. (2010). Making a Difference: Strategies for Scaling Social Innovation for Greater Impact. *The Innovation Journal: The Public Sector Innovation Journal*.

Appendices

Appendix 1: Interview with *Alice*

Researcher: Could we start with you explaining your role at Alice, how long have you been working there?

Livia Enomoto: After working for different companies and having acquired a lot of experience from Corporate Social Responsibility, Raphael invited me to join the Alice team. Eight months ago, I started and I'm currently the project director for Alice (…).

Researcher: How Alice was created? What problem the company is trying to address?

Livia E.: When Raphael [Raphael Mazet, CEO at Alice] started his first social enterprise with his partner Areti, he realized that one of the major problems within the social sector was the lack of transparency and trust. People are not financially contributing to social initiatives and charities anymore because they are unsure about how the donations are spent. And was with this idea in mind that Raphael started creating Alice's first concept as a way to rebuild the trust in the social sector. People understand the social cause and its importance, however, when it comes to donation, there is something holding donators back and Raphael identified the problem. After having the knowledge about blockchain and its potential, the founding team grew even more and started counting also on a CTO [Jakub] who is a blockchain specialist.

Researcher: A while ago the term "social enterprise" was coined and many people started using it to describe different kinds of organization. How would *you* describe a social enterprise?

Livia E.: I believe [social enterprise] is the best combination of the actual model [regular business] with a social purpose. For example, it's very hard for an NGO that depend on donations and volunteering to keep their work going on. If you have a social enterprise, at least you have an independent source of revenue. Before, I've worked for an NGO in Brazil, but it was always very difficult to do the job because the organization is constantly struggling to keep its activities alive. The social enterprise is not like this, it can combine what is the system today with a social impact.

Researcher: In other words, you are saying that social enterprises are different from corporate social responsibility and NGOs for example. Is it right?

Livia E.: Yes, and regarding non-profit, sometimes is really difficult to run it. Even for the big and well-known NGOs relying on donations is a struggle because you don't know about tomorrow. Let's say that your NGOs has a long-time donor, using Brazil as an example we can say that Petrobras is an important donor to the TAMAR Project. Once Petrobras was accused to be involved in corruption schemes, the project stopped receiving any contribution from

Petrobras. In this way, if you are always depending on donations and contributions like this, it is really difficult to plan your company activities. Another point that we always discuss at Alice is that we need to look at the workforce of a social project as real employees like the employees from any other company. We want the best people to solve the social problems that are out there, then we need to give them proper salaries, incentives, and a career plan and stop relying on just volunteering work.

Researcher: That's a very good point.

Livia E.: Sure. Everybody needs to pay their bills in the end of the month. And people are not going to do their best if they are not incentivized. Today we see the NGOs are desperate trying to find people and it is really difficult to work with this situation all the time.

Researcher: Summing up your point of view about social enterprises, it is the combination of the regular business model with the "for purpose" idea no matter if the company is non-profit or for-profit, is it right?

Livia E.: Yes!

Researcher: And since Alice is a "for profit", what is the business model?

Livia E.: We think about Alice as an ecosystem and today we have only one part up and running which is the donation platform. In this platform, the NGOs or social initiatives enroll their projects, we proceed with the due diligence, the donations happen and 4% of the funds raised goes to Alice. But the way Alice works, the payment is only released after proven results. For example, a person donates an amount of money to a social initiative. The money won't go to the NGO straight away. First, the NGO has to deliver the promised results, only then the donation is released. Only after the donation moved to the NGO account that Alice will take the 4%. And this is the business model of today. In the medium/long-term, we want to finish the other parts of this ecosystem and create different forms of revenue. For example, an important part that is coming in the near future, is about impact investing. Impact investing is when investors put their money on a company or project expecting financial and social returns. In this case, we want to charge the investors instead of the NGOs or the social companies. With the same logic in mind, we can also think about grant makers since they can have access to data that tells them what kind of initiatives brings more social and financial results.

Researcher: Great. Another question is if the release of funds is done by milestones, how does it work for companies that first need the money in order to start their operations? It would be the other way around. Does Alice have a solution for that?

Livia E.: There is an option that we offer today. Depending on the donator and the nature of the project, 50% of the total fund can be released upfront upon the donator's approval. This option exists because we understand that some companies don't have the necessary cashflow to start operations first and then cover their costs later. However, our focus is to create the maximum transparency and that's why we link the release of the funds to the result, as a way to guarantee to the donor that his donation was used with that specific purpose. But as soon

as we have the impact investing part ready, it will help these companies that need the upfront payment while the investors take or not the risks. Today we are still piloting many ideas and testing operations. But to be honest, from what we have seen, the challenge NGOs face the most is not even the need for an upfront payment but creating these milestones with deliverables attached and putting a price for each milestone in an effective way. This goal-oriented approach is new for them, a complete change of culture from an NGO perspective!

Researcher: And is this a service that Alice also offer to these NGOs? A kind of consultancy?

Livia E.: Yes, today we do this way. Together with our advisors we help the NGOs to map these milestones. But in a long-term viewpoint we want this to be done in a different format. For example, having a kind of curatorship service that analyzes the project before it goes live in the platform. But this part is not ready yet (…). Another way we are designing our solution is to work with grants, which would be the other way around: they would come with the money and we will provide the means to track the allocation of the grant and results.

(…)

Researcher: Nice. Let's change a little bit the focus now to tech. How would you describe the importance of technology to make it possible to social enterprises like Alice to address social problems?

Livia E.: We don't see another way to do what we do, especially regarding transparency, if not using a public blockchain platform and that's why we use Ethereum today. But we also acknowledge that within this space, sometimes people are so focused on the hype of the technology that the purpose of why using it sometimes is lost. That's why we have a group for "Blockchain for good" where we often discuss this.

Researcher: The Blockchain for Social Impact Coalition? Created by Consensys?

Livia E.: That's one. And there are other events like the conference in New York in the middle of the year. But we have created another informal group with other companies that are using blockchain for good using Ethereum and we are planning another conference where we always discuss this matter. We believe in the power of decentralization but it's not only about the technology. It is about the social impact first. We always insist with the projects we start working with that they need to understand their real social impact by asking to the beneficiaries if they are truly being benefited. We do the same with the technology: first, we question if there is a reason to use it and then we understand the associated benefits. If we find out that this is not the best technology for us to use, then we will find something else.

Researcher: And when you decided to leverage blockchain to support Alice, what were the main features and benefits you identified as been the most important ones that made you adopt the technology?

Livia E.: The things that all the founders agree on are the decentralization and transparency factors. Having everything accessible to all the parties instead of one single person or institution. Another one is related to the Ethereum Smart Contracts. We are not so interested

in cryptocurrencies. Today, for example, we don't even have a special token for Alice. And the plan is not to think about it now. We started thinking about it a while ago, but we decided to have a solid company first. But the Smart Contract for us is very important because of the way we wanted to link donation to results. Using Smart Contracts, we can get the donations, freeze them until the NGOs report and prove results and only then the donation is released. I'm not the blockchain specialist but I don't see other technology making it possible for us to work this way.

Researcher: So, do you believe that if blockchain didn't exist, would it be possible for Alice to exist as a company offering what you offer today as a service?

Livia E.: Well, with 100% of transparency and trust like we offer today, it would not be possible without blockchain. There are other companies that do grant management but not with the same efficiency we promise. In fact, another thing that we want to do and blockchain will help is shortening the due diligence process. So, in an overall, I believe this is only possible because of blockchain.

Researcher: Ok. And what about the disadvantages of blockchain? Especially factor that might inhibit social enterprises to adopt the technology.

Livia E.: Sure. It's not so simple to have a company running in a blockchain platform. It's not cheap, thus, it's inaccessible to many people. The technology is super interesting, but it is not mainstream yet and it is not like internet today that almost everyone has access to it. We believe that this day [where blockchain will be accessible to everyone] will arrive and that's why we are investing on it. I like to say we see blockchain as the dial-up internet that we used to have before to the Wi-Fi. Blockchain today is the dial-up internet, it's expensive, not everyone can access, and it has its own limitations.

Researcher: You mentioned before that Alice counts on a CTO who is a blockchain expert. Do you think it is difficult to find and hire blockchain specialists?

Livia E.: It's super difficult. We were lucky because our CTO is also a professor, so he has a very nice network of people and students. Because of him, we could hire our developers. But in general, it is hard. When we had to hire our first developer, it took many months so to be able to find and hire a blockchain developer who knows how to code the Smart Contracts it is super difficult. At the same time, adding another layer to the challenge, we don't want to hire people whose only interest is in the technology. We want to hire developers that share the same values as the company. We look for people who care about the social impact that we are helping to create.

Researcher: In that sense, do you believe that people today are more aware of this "social causes" that a company supports while they are looking for jobs?

Livia E.: Personally, yes! That's always what I'm looking for. For me it made the whole difference. I've moved from lobby experience to social projects. I remember my previous experience where I used to work with lobby. Every time that I had to asked for help from the other departments, people always said: "oh no… you are the one who is always talking to that

politicians!". After I changed the department and started working with CSR, people were always much more open and available to contribute and help. So, I could see that the willingness to social causes exists. And as I said before, personally, that's what I was looking for, a way to have a career but also doing a positive impact. And I can also see that this is something that my friends also care about. Unfortunately, it is not all jobs that give you this opportunity.

Researcher: You said that the blockchain is not mainstream yet. How do you see social enterprises in ten years now? Do you think that the democratization of the blockchain will happen? If yes, it will help social enterprises? How do you see this evolution?

Livia E.: I believe the companies will change the direction to be more social-focused. I also see from the *Blockchain for good* group that we have, companies are rising and improving their operations. A company that we see also doing an amazing job is *Provenance* and they do all the tracking of a product from the very beginning. It's impressive to see how they are growing fast and starting partnerships. There is another one, a *The Bounties Network* and they do awards for people to do good actions. We also see them growing fast. They started an activity to clean a beach in the Philippines and it was impressive the amount of people that showed up. I see this as a thermometer to point what is working and what is not working. Like the revolution that happened with the internet. We didn't have an idea about how many things we could do in a global scale. And that is the pattern today.

Researcher: Do you believe that groups like the *Blockchain for good* are a sign of change?

Livia E.: Sure. And it is a very strong group. We were surprised to see how many companies believe in positive social change. First time we were expecting around 50 people and 250 showed up discussing topics exactly like "we are here discussing solutions for people who cannot be here". We need to start engaging the end beneficiaries to the conversation as well and this per se is already a change in the way we do and see business. The group is very nice, and the discussed topics are relevant to everyone. Let's see what is going to happen in the next one. We are discussing about how we can empower regular citizens to leave their comfort zones and start being agents of change as well. But the group is very active and concerned about the future of society beyond just profit.

Researcher: You also mentioned before some of the projects you have in Alice's pipeline but tell me more about the future plans for Alice.

Livia E.: We already have the donation platform and we want to onboard even more project in the platform. The next step would be this program for grants and funds, so they can have access to accurate data and reports. Later, we want to have a hub for curatorship and validation of the projects. We also have the plan to create a market for impact investment. The last one needs more licensing and other authorizations to be up and running. It is a little bit more complex but is something that we are already working on. In a nutshell, that's our pipeline of projects and next steps.

Researcher: This was a very nice conversation, Livia. Glad to learn more about Alice. Thank you for your time!

Appendix 2: Code and categories

Categories	Code	Alice
		N. of Mentions
Organizational	Social Enterprise definition	1
	Social Enterprise compared to NGO	2
	Social Enterprise compared to CSR	1
	Social Enterprise and profitability	3
	Social Enterprise employees (workforce)	2

Categories	Code	Alice
		N. of Mentions
Organizational	Identifiying the social problem	2
	Lack of transparency and trust	4

Categories	Code	Alice
		N. of Mentions
Organizational	Rebuild the trust in the social sector	1
	Alice value proposition	2
	Alice business model	3
	Alice future projects	3

Categories	Code	Alice
		N. of Mentions
Technological	Blockchain importance	1
	Blockchain as the only solution	3
	Addressing transparency	3
	Decentralzation	3

Categories	Code	Alice
		N. of Mentions
Technological	Smart Contract	2
	Ethereum solution	4
	Cryptocurrencies and token	1

Categories	Code	Alice
		N. of Mentions
Technological	Blockchain for good	5
	High cost to run a Blockchain	1
	Lack of specialists	2
	Future of Blockchain	1