Topic:

Asset-based community development: A concept for developing a project with limited resources based on a digital currency (Blockchain)

Bachelor´s thesis

Business Engineering

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Contents

List of abbreviations and acronyms

ABCD	Asset-Based Community Development
Coin	Digital Currency, Cryptocurrency
BTC	Bitcoin
PoW	Proof of Work
PoS	Proof of Stake
MN	Masternode
Stake	Proof-of-Stake block reward
Token	Cryptocurrency dependent of another Blockchain Project
NFT	nonfungible token
USDT	Tether
Community	Virtual Community
dPOS	delegated Proof of Stake
dAPP	decentralized Application (running on a Blockchain)
Premine	Creation and distribution of a currency by a single entity

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1 Introduction

The Asset-Based Community Development (ABCD) describes an approach about empowering community-members by focusing on their skills and capacities to find solutions based on what is already available within the community. The key principle in this concept is that communities can handle most of the development processes by identifying and activating existing but often unrecognized assets (see. Kretzmann/McKnight (1993)). These unrecognized assets do not consist only of skills or knowledge, but also include relationships among the community members and their connections outside the community (see. Mumtaz et al, (2015)). Recognizing and activating these "social assets" offer opportunities which are not limited to monetary resources only. Dating back to 1970 the Asset-Based Community Development approach became popular due to significant changes of industrial jobs. The economy shifted to highly professionalized or low-paying service jobs, limiting the poor and uneducated from well-paid jobs. To address the growing issues of poverty, public health, human services, education and criminal justice, a new approach was needed to provide new opportunities to the citizens in need (see. Kretzmann/McKnight (1993); Walker (2006)). In opposite to focusing on the needs and deficits of the communities, McKnight and Kretzmann from the Institute for Policy Research introduced a positive approach with the "glass half full" mentality. By talking directly with the individuals of a community and developing models to recognize existing "social assets" they aimed to strengthen the available resources, skills and relationships of the community members instead of focusing on what is missing (see. McKnight/Kretzmann (1993); Mathie/Cunningham (2003)). Essential part of the ABCD approach is not only to discover, but also to activate the "social assets" which includes time, skills, gifts, and relationships of the community members (see. Saegert et al, (2005)).

1.1 Motivation and Objective

New projects and start-ups face several problems when introducing new ideas or products to the public. A study by CBInsights (see. CBINSIGHTS (2019)) shows, that there are a few main reasons of why most start-ups fail. The top 3 are “no market need”, “ran out of cash” and “not the right team”. Judging by these results, even the best startups can fail, if there is no demand for the product, no funding / proper budget management or the wrong team available. With the introduction of Blockchain and digital currencies, monetary and economic aspects are decided and agreed upon by all participating individuals. While it comes with risks like price manipulation and money laundering, it also offers unprecedented opportunities for projects seeking to develop ideas without being limited by monetary regulations and funding. Thanks to the open source (see. opensource initiative (1990)) nature of the blockchain, it´s possible for any developer with decent programming skills to copy an existing digital currency and release it with his own financial rules. New blockchain projects like Ethereum (see. Ethereum (2015)) enabled even less programming proficient individuals to develop their own currencies by using a tutorial. A digital currency could solve the funding dilemma of new projects and start-ups, as for example salaries could be paid this way. Also, developing a community provides indicators for the success of an idea or product. With many people showing interest, providing feedback and suggestions, the community can be seen as the first target audience, which is not only the consumer of the product, but may also evolve to the developer and manager of the product, which could further benefit deficit teams.

This thesis aims to combine the benefits of the asset-based community development (ABCD) approach with the creation of a cryptocurrency in order to develop a new concept, which can reduce or even resolve issues arising in start-ups and new product releases. This concept should be adaptable on as many scenarios as possible as the term “community” is broad and may be applied on various groups or organizations for any purpose and size. By providing a first practical test of ABCD based on a digital currency, the potentials of a digital currency in the context of a community-oriented development with limited resources will be examined.

1.2 Approach

Asset-based community development in combination with a digital currency offers an approach, which could solve many issues of start-ups and problems, which new products are facing at the early stages as well as enforce their development and success. In order to test and evaluate this theory several strategies will be utilized to get deeper insights into this interdisciplinary topic. After providing the theoretical background regarding blockchain, cryptocurrency and community development, important elements for developing the new concept are extracted by a transfer of the asset-based community development approach onto a virtual community environment. Throughout this study, new terms and theories are introduced, in order to close the theoretical gaps caused by the focus of ABCD solely on local and problematic communities. By providing a brief introduction into possible areas of applications for digital currencies as well as potentials and risks of utilizing a digital currency, a practical approach is performed in order to explore and evaluate the relevance of integrating a digital currency into asset-based community development. Since this thesis aims to create a concept applicable on any group or scenario in order to support existing processes as well, the focus is not merely on defining the requirements for applying this concept. Rather, the benefits of utilizing the introduced cryptocurrency-based community development approach are highlighted, providing practical guidelines and tools for start-ups, innovating projects or big organizations seeking to benefit from the integration of a community into their development processes.

1.2.1 Practical approach

A cryptocurrency called Domocoin (DOMO) has been created and presented as an experiment without initial funding or a roadmap. To focus on the benefits of a cryptocurrency, the goal is a completely community-oriented development with a defined goal, which can´t be achieved with currently available resources. After creating the cryptocurrency, it was presented on several social networks in order to generate awareness and develop a community. Currently, the main driving factor of the community is the author of this thesis. Based on what is currently offered, he decides how and what is developed. During this thesis a platform will be developed, which is restricted to the community only. By verifying the ownership of at least 1 Domocoin the individual will be eligible to register and login on the platform. A user profile will be provided, where each individual can provide his skills and resources to enable the discovery of hidden skills and knowledge. Due to the unexpected interdisciplinary nature of this assessment, requiring much deeper research into areas like cyberpsychology, communications, politics and socioeconomics a statistically relevant evaluation on the success and importance of the newly developed concept was not possible at this point. Interested scientists should be encouraged to carry out further investigations by applying the concept in other scenarios. However, by outlining milestones achieved during the practical approach and presenting collected statistical data verified by the blockchain, first recommendations can be extrapolated, providing a basis for further investigation and evaluation.

1.2.2 Conceptualization

After discovering all necessary elements in the theoretical integration and evaluating the practical test, a new concept will be proposed. Aspects from areas like psychology (motivation), politics (participation), economy (cryptocurrency) and informatics (social platform) are included and highlight again the need for further scientific research to grasp the potentials this new concept can offer to start-ups and big corporations. The developed DOMO Network remains active beyond the presentation of this thesis, to enable future research on the various interesting topics surrounding a virtual Community.

2 Theoretical Background

Preface

Since the primary goal of this thesis is to utilize the asset-based community development in a virtual, product development environment, while also integrating a digital currency in this context, a theoretical basis needs to be established. The first part of this chapter provides the necessary basic knowledge about blockchain and cryptocurrencies. Especially the introduction of the most popular forms of cryptocurrencies is required in order to understand aspects utilized in the practical test. The next part focuses on the definition of the interdisciplinary term "virtual community" and which characteristics scientists from various areas of expertise use to define the term. Finally, a short introduction to the origins of community development is provided.

2.1 Blockchain

A brief History

On the 30th October 2008, Satoshi Nakamoto (pseudonym) published an e-mail under the title "Bitcoin P2P e-cash paper" and with the words "I've been working on a new electronic cash system that's fully peer-to-peer, with no trusted third party" (Nakamoto (2008)) , just one month later he released his whitepaper "Bitcoin - A Peer-to-Peer Electronic Cash System" (Bitcoin Whitepaper (2008)). The release of the Bitcoin Whitepaper marks the date of the invention of the blockchain. While the identity of Satoshi Nakamoto is unknown up to date, his release of the bitcoin code (source code) to the public makes him the most famous person in the blockchain sector.

2.1.1 Definition

"A blockchain is a distributed data store that maintains a continuously growing list of data records that are hardened against tampering and revision, even by operators of the data store's nodes. The most widely known application of a blockchain is the public ledger of transactions for cryptocurrencies, such as bitcoin. This record is enforced cryptographically and hosted on machines running the software." (Fanning/Centers (2016))

This definition is one of many attempts to explain the underlying technology in just a few sentences. While a definition in three sentences looks visually appealing in a public presentation, knowledge about the underlying principles is necessary to understand how a blockchain works. The definition formulated by the author of this thesis therefore only offers an introduction which is further elaborated afterwards:

Basically, the blockchain is a database that is copied and updated by all its participants. Care is taken to ensure that all participants have the same copy of the blockchain transactions. Participants who behave incorrectly can be excluded in a majority decision (consensus). The blockchain consists of so-called blocks that are "appended" to the blockchain at random but regular intervals and allow it to grow steadily (currently about 265+ Gigabyte (Blockchain.com, n.d.)). The attached blocks contain (among other) information about past transactions that (among other functions) enable the sending of property in the form of digital information (e.g. a money transfer).

2.1.2 The proof-of-work consensus

How is a distributed consensus decision in a peer-to-peer network possible when extending the blockchain data structure?

The idea is to collectively select a transaction history for block extensions. To do this, the nodes must send their newly created blocks to all partner nodes in the network for examination and acceptance. If there are several competing block versions, the node with its block proposal that made the greatest computing effort wins. The creation of a new block candidate requires little computing effort without artificial complication. This would result in block candidates being created faster than consensus building in peer-to-peer networks. For this reason, the creation of a block with artificial computational effort is slowed down (difficulty adjustment). Each node that wants to create a block must solve a cryptographic task, also called proof-of-work (PoW). In order to reach a consensus in the peer-to-peer network, the new block candidate must contain some important elements (among others):

- The “protocol version” specifies which set of rules is used when creating a block
- The “reference” is the reference to the previous block
- The “timestamp” indicates the time at which the block was created

- A “level of difficulty (threshold)” is required to determine the number of bits that are identical to 0 at the beginning of the sequence of numbers in the nonce
- The “Nonce (Number used once)” is a preliminary sequence of numbers that is generated once for a specific purpose (Proof-of-Work)
- The “hash tree” refers to the transaction data

If new transaction data is generated or transaction data is modified, the nodes (often referred to as miners) must solve the cryptographic task in a competitive environment. The bit sequence (Nonce) is searched for, which has only zeros in the first places. The number of places is defined by the current difficulty level. Such a proof of work is computationally expensive, especially when competing with a lot of miners and thus having a higher level of difficulty. If a solution of the cryptographic task is found, the miner node distributes the solution to the peer-to-peer network to verify it. The verification itself is simple: The block content (challenge string) and the solution found (proof response string) are fed to the hashing algorithm. If the nonce starts with the required 0-bits, this block can be verified. If all nodes in the peer-to-peer network agree with the miner's PoW solution, this block is appended to the blockchain. In addition, the miner receives a reward (e.g. in Bitcoins) for his effort including the transaction fees of all transactions, which have been picked from the transaction queue. (see. Andolfatto (2018) pp. 87-95; Fill/Meier (2019))

2.1.3 Asymmetric Cryptography

With the development of the digital economy, the security of electronic transactions is becoming increasingly important. Since a business transaction in the electronic environment takes place across distances and without personal contact, special security measures must be taken to build trust. It must be ensured that electronic documents (messages, letters, contracts, etc.) originate from the intended sender. Sensitive data such as electronic contracts must also not be altered. It is also required that the receipt of electronic messages is correctly acknowledged by the recipient. The purpose of cryptography is to protect the data against access by unauthorized persons. In asymmetrical cryptography, the original file is encrypted with a key K1 and decrypted at the recipient's end with the key K2 to get the original file back. The two keys K1 and K2 are not identical: therefore it´s called asymmetrical encryption. In asymmetric cryptography, a key pair (K1, K2) is required. Every participant in the network usually must register with a certification authority in order to obtain a key pair. The subscriber “Max” gets the key pair (Kpriv, Kpub). Kpriv must be kept secret by

Max and Kpub is published and made available to the public. In the case of asymmetrical cryptographic procedures, Max encrypts his original document or his contract with the public key of the recipient “Tim” before transmitting the document to him. This document remains unreadable for everyone, except for Tim who has the necessary private key. On the receiving side, the document is therefore deciphered using the private key of Tim. Tim can thus read and understand the document. The asymmetrical encryption method is not only used for encrypting and decrypting documents, but also for sealing documents with digital signatures. The digital signature is an electronic signature that can be used to sign electronic messages, documents or contracts with legal validity. Obviously, the electronic signature can be regarded as a seal which is “stamped” on the electronic document before it is sent. The recipient of the document can recognize the correctness of the seal and is thus guaranteed that the document has been transmitted undamaged and unaltered. In addition, he gets the certainty that the message comes from the person with whom he wants to communicate. With regards to blockchain technology, the transaction data is usually not encrypted. In other words, the original document is signed, and the recipient performs the test for equality. To do this, he decrypts the seal with the sender's public key and compares the received hash value with the hash value that he can generate directly from the original document. If the two hash values are identical, he can recognize the sender thanks to the seal and knows that nobody has changed the transaction data. Thus, asymmetric cryptography is also used to confirm the ownership of documents and data. With the public key being publicly visible and related to the ownership of specific data (on the blockchain), the owner can use his private key to sign a message and verify the ownership of the questioned public key and it´s assigned data. (see. Fill/Meier (2019); Sciencedirect (2004))

2.2 Cryptocurrency

Preface

Before examining the definition, basic functions and manifestations of digital currencies, the definition and functions of currency will be introduced to provide a better understanding of how economic literature defines the term “currency”.

2.2.1 What is a currency?

Economic theory combines the definition of the term "currency" with the so-called monetary functions. Thus, something is a currency if the following functions are fulfilled: (see. Durlauf & Blume (2010); Mussel (2011))

Exchange and cash function:

- Money is a means of exchange, in order to simplify the trade in goods
- trade/exchange can be split into two sub-acts:
    - The sale of a commodity for money
    - The purchase of commodity with the money previously acquired

Value retention function:

- Money offers the advantage that goods do not have when exchanged directly, buying and selling can take place at different times
- A certain value can be stored in money in order to exchange it later
- This monetary function is particularly evident in saving, as value is stored in the form of money to form a reserve

Function of the calculation unit:

- Money can be used to express the value of goods and assets in a general reference value, making comparisons easier

Liquidity function:

- Money should be compact so that it can be easily carried
- The compactness facilitates the exchange between two persons and the transport costs remain low

In addition to the monetary functions, the following properties are related with the term "currency":

Central monetary properties:

- Homogeneity
- Divisibility
- Durability
- Scarcity

Homogeneity

- All monetary units must be of the same nature and therefore fully exchangeable
- Homogeneity is closely related to the exchange medium function

Divisibility

- Necessary, in order to be able to enable exchange, payment and calculation functions
- Money must be divisible into smaller units without loss of value

Durability

- Medium must not suffer any loss of substance over time, i.e. the purchasing power must not decrease due to the medium (reflected in the function of storing value)

Scarcity

- Necessary in order to assign a high purchasing power to a relatively small weight unit

2.2.2 What is a cryptocurrency?

A cryptocurrency, also called digital currency or virtual currency, is a currency whose operation and security are based on cryptography ("crypto-") and is completely digital.

The cryptocurrency fulfils the essential functions of a currency: Cryptocurrencies act as a store of value. If I own a Bitcoin, I have something valuable that I can easily sell or exchange. In addition, crypto currencies are a unit of account for economic calculation or accounting. You can already buy some products and services using cryptocurrencies, especially with Bitcoins. In addition, cryptocurrencies are a means of payment and can be transferred within a few seconds. They are always connected to a payment system to allow exchanges, which currently take place mainly for speculative purposes and in certain marketplaces. The first cryptocurrency (Bitcoin) was conceptualized in 2008 and with it the technology of blockchain was born. Bitcoin is both the best known and the most important cryptocurrency we know. (Almost) All cryptocurrencies are based on the blockchain technology and differ from each other mainly in their value, the inflation rate, the features of their blockchain and their business ideas. The value is relatively volatile and is determined by supply and demand. Every cryptocurrency runs on a computer network. Like stocks, they are identified by a symbol called a ticker, which usually consists of three letters (e.g. BTC for Bitcoin). A cryptocurrency is always connected to a payment system that enables transactions to be carried out. These transactions take place between two entities without the need for an intermediary (for example a bank). Cryptocurrencies are subject to a protocol that defines the rhythm and rules for creating new blocks and distributing monetary rewards. (see. Frankenfield (2019); Bussac (2019))

2.2.3 Forms of cryptocurrencies

(Following, the term “coin” will be used as synonym for the term “cryptocurrency” for simplicity reasons)

Preface

After the introduction of Bitcoin and it´s Proof-of-Work Algorithm in 2009, many other projects have been founded with similar functionalities and purposes. Thanks to the open source nature of the Blockchain, the underlying code (source code) is publicly available. Basically, anyone with decent programming skills can create his own digital currency clone and modify it as needed. With multiple thousands of different cryptocurrencies and new ones being released every day, it is nearly impossible to list all of them, especially since most of them are pretty much exact duplicates with different names. Instead, a small introduction of the algorithms, functionalities and terms with regards of their popularity will be provided.

2.2.3.1 Proof-of-work (PoW)

As already explained, the creation of a new block without artificial complication requires little computational effort. This would result in block candidates being created faster than consensus building in peer-to-peer networks. For this reason, the creation of a block is slowed down with artificial computational effort. Each node that wants to create a block must solve a cryptographic task, also called a proof of work. Proof-of-work is the first and probably most known consensus algorithm, as it is the basis of the famous cryptocurrency Bitcoin. Since a reward is paid out with each block (if accepted by the network), a real race has developed fueled by the growing value of Bitcoin. Since "finding" a block is becoming more and more difficult due to increasing competition, it is only possible to compete for a block reward with highly specialized computing units developed for this purpose only (also called “ASIC miner”) and extremely low electricity costs. While this may only apply for Bitcoin, other cryptocurrencies utilizing the same algorithm are also vulnerable to a high difficulty due to ASIC miners. This is one of the reasons for many projects to develop ASIC resistant algorithms in order to enable “regular” computing devices to be able to compete for block rewards again.

2.2.3.2 Proof-of-Stake (PoS)

The principle of Proof-of-Stake (PoS) is simple: The more coins you have, the more important you are in the network and the higher are your chances to find blocks, append them to the blockchain and thus receive new coins as a reward. The advantages of this algorithm are that it requires significantly less processing power comparing to the PoW approach. Furthermore, it is easy to calculate your "weight" in the network because it depends on the number of coins you want to "stake" in relation to the total number of coins currently in circulation. A simple calculation of 500 coins owned and 800000 coins in circulation gives a result of 0.0625%, which is the expected share on the amount of coins issued within a specific timeframe. The PoS principle promotes the saving of coins, which can also be criticized as a negative aspect. By favoring the biggest shareholders, the rich become even richer, which in turn can lead to a centralization around the biggest shareholders, who can ultimately determine the consensus among themselves. Nevertheless, the proof-of-stake algorithm is one of the most popular consensus algorithms, as especially smaller projects benefit from the significantly lower requirements to participate in the network.

2.2.3.3 Masternodes

Like PoS, the idea of “Masternodes” is based on the ownership of coins. The term “Masternode” refers to a network node that signals the network the interest of receiving a share of the emitted coins by “locking” a defined amount of coins in the masternode. By "locking" a predefined quantity of coins, they are removed from circulating supply. The masternode has the right to receive a share of the emitted coins only if these coins remain untouched. In contrast to the proof-of-stake principle, a dedicated server is usually required, which can take over significantly more tasks within the network and therefore requires a certain amount of computing power. Since the masternode principle is already more cost-intensive (computing power must be provided) comparing to the proof-of-stake approach and the “locked” coins are not allowed to be moved under any circumstances, this principle offers many advantages, especially from the network´s point of view. The high computing power can contribute to the scalability of the network, since it offers much more computing power than it requires in contrast to normal participators. Installing a network node contributes to the security and decentralization of the network (the more nodes, the more difficult it is to attack the network). From an economic point of view, the creation of the Masternode and “locking” the coins means that fewer coins are in circulation, resulting in a lower supply. If demand remains the same, this would lead to a rising price (without considering other aspects

like speculation). Nevertheless, large shareholders are favored because, like the problems of the PoS approach, a lot of coins are required, and small shareholders are completely excluded from getting shares of emitted coins. In addition, in most cases a server for running the masternode must be rented, which results in additional costs and an even bigger barrier to participate. The masternode functionality is combined with the PoS algorithm in many, if not most cryptocurrencies.

2.2.3.4 Smart Contracts

Smart Contracts are a technology that gained popularity with the development of the cryptocurrency Ethereum. Although, smart contracts do not contribute to the security or scalability of a blockchain (they are built on top of it), they are becoming inseparable from the term blockchain. As the name implies, they are contracts that can automate many business processes by means of the immutability of the blockchain. Broken down to the essentials, they are program code agreed upon by two or more parties, usually in context of a business transaction. By fulfilling predefined conditions, processes can take place fully automatically and with the blockchain as the underlying technology, central monitoring authorities are not required to guarantee the execution. Once started, a Smart Contract can only be stopped or changed with the agreement of all parties and according to predefined rules. Unfortunately, in most cases the creation of a Smart Contract requires knowledge of the utilized programming language, since "loopholes" can be built into the code and could lead to abuse. Furthermore, Smart Contracts are only as secure and functional as its underlying blockchain.

2.2.3.5 Tokens and NFTs (nonfungible tokens)

With the development of Ethereum, another popular blockchain based technology emerged. With the help of so-called tokens, a special kind of cryptocurrency can be developed based on an already existing blockchain. Compared to the development of an own blockchain with functionalities such as Masternodes or smart contracts, the development of a token based on an existing blockchain requires significantly less effort. Furthermore, all the features of the underlying blockchain can be utilized and do not need to be developed first. In the course of time, many blockchain developers have made sure that the creation of a token is as fast and intuitive as possible. Therefore, even less technically experienced people can create their own currency based on an existing blockchain. Like smart contracts, the security and functionality of a token is limited to its underlying blockchain and in most cases, utilizing those features

or doing transactions require transaction fees, which are paid in the underlying blockchain´s currency.

Tokens, unlike a currency, can also be unique and a called non-fungible tokens (NFTs). The fungible character of an asset is an important characteristic in financial markets and means that a unit of this asset class is strictly identical to another unit of this class. It is the standard property of assets in a market, from equities to commodities. A non-fungible token is a token form represented by (among others) the ERC-721 protocol as the standard for non-fungible tokens on Ethereum, in which each token is unique in value and property. Therefore, an NFT is unique and cannot be replicated, shared or destroyed. NFTs are currently used as unique objects in virtual art or computer games, such as individual cats called “cryptokitties” or virtual goods in blockchain based video games.

2.2.3.6 Stablecoins

A stable coin is a currency that reflects the value of a financial asset, such as a fiat currency (e.g. euro or dollar). In a sense, it is a safe haven for investors who want to protect themselves against the volatility of the cryptocurrency market without leaving this market by selling their coins against fiat currencies. Tether (USDT) is a token that reflects the value of the US dollar and is issued by a company. Tether has been the subject of many discussions in the past, as it is a digital currency that is very similar to the dollar but is issued by a private company. Tether is a great example for how a traditional currency can become a cryptocurrency, even without initial support by its underlying government.

(see. Team (2019); Bussac (2019), Source: Own)

2.3 Virtual Communities

Preface

Since the utilization of a digital currency already implies the possession of software and information technology, researching the term "community" while excluding information technology, would be out of the reach and relevance of this thesis. Generally, all the following statements may also apply to the original term "community", if excluding information technology aspects. For the sake of relevance, the term "virtual community" will therefore be examined in detail and used as a synonym for the term "community" throughout this thesis

2.3.1 Definition

The term “virtual community” is used with several synonymous terms, such as digital community, online community, or network community (see. Mark, Gloria. (2001)). Depending on the utilized literature, the term is considered from various scientific perspectives. The term “virtual community” was first used in 1993 by Howard Rheingold in reference to the network "The WELL" (abbreviation for Whole Earth Lectronic Link., it is one of the oldest communities on the Internet). Rheingold compares participation in a community with a regular pub and defines it from a sociological point of view as a group of people who meet each other on a social platform and communicate with each other in a close culture (see. Rheingold, H. (1993)). However, this definition does not go far enough for this research, because it is argued exclusively from a sociological perspective. There is no consideration of technical aspects or cooperative aspects.

Further definitions of virtual communities are numerous and follow very different approaches. According to Hagel and Armstrong (see. Hagel/Armstrong (1999)), there are five characteristics of online communities: first, a specific focus of interest; second, the ability to integrate content and communication; third, the use of information provided by members; fourth, access to competing providers; and finally, commercial use. The fourth and fifth points are more suitable for commercially oriented virtual communities. The first three can, however, be used to define a virtual community in general.

The following overview with definitions from different perspectives is used to highlight the interdisciplinary character of virtual communities:

2.3.2 Multidisciplinary overview

Table 2.1: Definitions of virtual Communities from different Perspectives

Representative **(Perspective)** **[Characteristics]**	**Definition**
Rheingold (1993) (Sociological) [Not commercial, socially motivated]	„Virtual communities are social aggregations that emerge from the Net when enough people carry on those public discussion long enough, with sufficient human feeling to form webs of personal relationships in cyber-space."
Hagel & Armstrong (1999) (Commercial) [Product oriented]	„Virtual communities are groups of people with common interests and needs who come together online. Most are drawn by the opportunity to share a sense of community with like-minded strangers, regardless of where they live. But virtual communities are more than just a social phenomenon. What starts off as a group drawn together by common interests ends up as a group with a critical mass of purchasing power, partly thanks to the fact that communities allow members to exchange information on such things as a product's price and quality."
Döring (2001) (socio-psychological) [Mutual virtual gathering place, technical platform]	A virtual community is an association of people with common interests who exchange information and establish contacts with each other with a certain regularity and commitment by computer mediated means.
Cassiopeia AG (2001) (Technologically) [Communication, Exchange of information, Cooperation, Generating and sharing knowledge]	Virtual communities are communities in defined networks (intranet, extranet, internet), which are based on the interests and individual needs of a community. Users can communicate with each other within the community via web browser and other end devices, coordinate joint projects and thus increase the efficiency of their cooperation.
Preece (2000) (multidisciplinary) [Interacting Individuals, Basic rules for interactions, Mutual purpose, Technical platform]	"An online community consists of: People, who interact socially as they strive to satisfy their own needs or perform special roles, such as leading or moderating. They have a shared purpose, such as an interest, need, information exchange, or service that provides a reason for the community. Policies exist in the form of tacit assumptions, rituals, protocols, rules, and laws that guide people's interactions. Computer systems support and mediate social interaction and facilitate a sense of togetherness"

Source: (Leimeister J.M. (2004) p.48; see. Ebner (2002); partly own translations)

2.3.3 12 Principles of Virtual Communities

Referring to Typaldos (Typaldos (2000)), Miia Äkkinen (Akkinen (2008)) has developed principles, which are related to each other in a hierarchical structure (the underlying principle requires the principle above). In combination with the overview of definitions from different perspectives, the theoretical knowledge of virtual communities is enough to finish this chapter.

Table 2.2: 12 Principles of virtual communities

Principle	Explanation
Purpose	Community exists because the members share a common purpose which can only accomplished jointly.
Identity	Members can identify each other and build relationships.
Reputation	Members build a reputation based on the expressed opinions of others.
Governance	The facilitators and members of the community assign management duties to each other, allowing the community to grow.
Communication	Members must be able to interact with each other.
Groups	Community members group themselves according to specific interests or task
Environment	A synergistic environment enables community members to achieve their purpose
Boundaries	The community knows why it exists and what or who is outside and inside
Trust	Building trust between members and with community facilitators increases group efficiency and enables conflict resolution.
Exchange	The community recognizes forms of exchange values, such as knowledge, experience, support, barter or money.
Expression	The community itself has a "soul" or "personality"; members are aware of what other community members are doing.
History	The community must keep track of past events and must react and change in response to it.

Source: (Akkinen (2008)), see. Typaldos (2000))

2.4 The History of Community Development

According to Midgley and Livermore (Midgley/Livermore (2005)) the roots of community development can be dated back to as far as the 1920s, where the British empire tried to educate African colonies to improve their local living standards (Smyth (2004)) The idea was to design small rural development programmes by combining government resources with local labor. Midgley et al. state that improving the incomes of the poor through various local activities was the primary goal of Community development. Examples for these activities are the deployment of infrastructure facilities, supporting the development of small industries like crafts or building schools and clinics. The usual approach for handling problematic communities was to develop a "top-down" strategy based on identified needs and deficits. These needs-based perspectives, which the government used as reference for the developed plan and enforced its execution "from above", caused many communities to become dependent on the external services and aid they were being supplied. In Europe the community development approach was adopted as a part of post war reconstruction as available resources of the governments were depleted, which enforced a shift from focusing on identifying problems over to identifying available skills and resources within the community (International Association for Community Development (1953)). In 1960 the approach finally evolved into a movement supported by various governments and development agencies. Since the foundation of the International Association for Community Development (IACD) in 1953 in the USA many more associations emerged, like the "Association of Community Workers in the UK" or the "Australian Community Workers Association". Strengthening the underprivileged and at-risk communities in their neighborhoods by focusing on their opinions and suggestions in social and economic development as well as integrating them into the development processes of the institutions and agencies. The shift away from the top-down approach was even more enforced by recognizing the value of the problematic community members and finally applying human rights, social inclusion, equality and respect for diversity. In summary, the Community development approach seeks to take its own initiatives by means of development from the bottom-up. The participation of the population in the design of policies to improve living conditions (self- as well as neighborhood) is crucial. A focus is set on enforcing the motivation and skills of the poor population in the Third World, which is more important than financial aid, which could quickly lead to monetary dependence.

3 Theoretical Integration

After providing the required theoretical background, we can now proceed and attempt a first theoretical integration of the asset-based community development in the context of virtual communities and product development.

With the famous book "Building communities from the inside out" (Kretzmann/McKnight (1993)), John P. Kretzmann and John L. McKnight introduce the ABCD approach and provide detailed information about its structure and the procedure required for applying it on a community. Since the asset-based community development approach is intended to be utilized on rebuilding physical communities, a transfer is required in order to make it applicable on virtual communities with a focus on product development. By analyzing the contents and procedures mentioned by Kretzmann et al. and integrating comparable terms and concepts related to virtual communities and product development, essential components for developing a new concept can be identified.

The book starts with criticizing the frequently used needs-based approach, which focuses on the needs and deficiencies of a community. Deficiency-oriented policies and programs, often supported by university research data, are intended to "teach people the nature and extent of their problems, and the value of services as the answer to their problems"(p.2). As a result, involved people are led to the believe, that their well-being depends upon being a client of the service as they have "special needs that can only be met by outsiders"(p.2). Kretzmann et al. (1993) moves on and argues that, with no incentive of being producers, "consumers of services focus vast amounts of creativity and intelligence on the survival-motivated challenge of outwitting the system or on finding ways, in the informal or even illegal economy, to bypass the system entirely"(p.2). While this argumentation is focused on the lower income class of problematic local communities, it outlines the problems resulting from focusing only on the deficits and needs, which follows a generally pessimistic bias. Introducing the asset-based approach, emphasis is given to the available knowledge and abilities of the community, which could solve problems by enabling its community members to contribute to the development. In the context of product development, the term “open innovation” provides a comparable approach, focusing on integrating customers into business processes.

3.1 Open Innovation

Mostly used in market and business environments, Chesbrough and Bogers introduce and describe open innovation as "a process based on purposively managed knowledge flows across organizational boundaries" (see. Chesbrough/Bogers (2014)). Initiated by companies, customers or potential customers are integrated into innovation processes in order to develop better products or gain a bigger market share. The primary focus is not on questioning the customers directly about their opinion and needs, but rather collect data regarding the customer`s ideas and suggestions, which contribute to the solution of their own problems or supports the discovery of unfulfilled demand and development of completely new products (Shipton, et al (2006)). Participatory integration may range from questionnaires up to direct contributions of the customer to the resolution of problems, tasks or decisions. However, for a customer to be able to execute more specific tasks and directly contribute to the product development in more complex business processes, a certain level of knowledge and skills may be required. Customers can be integrated in many business processes like the testing of prototypes, customer to customer support or even completely customer developed products, like reviews or customized t-shirts. Customers providing feedback or supporting other customers can reduce operating expenses and provide feedback for further market research and new product discoveries. Business models of companies like TripAdvisor go a step further and focus on the customers also becoming their producers (reviews). Open Innovation is used as an encompassing or synonymous term and subordinates' terms like "co-creation" and "crowdsourcing" (Innolytics Innovation, n.d.). Open Innovation is already integrated by several big companies opening their innovation processes to the public. A study by The Garwood Center for Corporate Innovation and the Fraunhofer-Institute (Nawroth (2013)) surveyed 125 executives of the largest companies in Europe and the United States and discovered that 78% of the companies have applied open innovation and none has abandoned it yet. In context of the ABCD approach, a shift away from classical need-based market research towards integrating the customer in development processes by utilizing his abilities and knowledge highlights an existing trend, which is already being actively integrated in existing product development processes.

3.2 Capacity focused development - Community Assets Map

After criticizing the needs-based approach an alternative is suggested, the capacity-focused development. Considering the expectations of finding a solution by external support (investments or services) as being futile, the focus is on utilizing an internally focused approach in order to try to find a solution using existing capacities. Since the fundamental assumption is that “every single person has capacities, abilities, and gifts” (Kretzmann/McKnight, (1993) p.13), the development of a "Community Assets Map" is proposed to discover the "assets" of a community. Since this "Assets Map" is used for physical Communities, the exact elements are not relevant for this thesis, however the overall structure of developing a "Community Assets Map" can be used to develop a similar model adapted virtual communities. The Assets Map consists of different blocks that are related to each other in a hierarchical order. The first and fundamental element describes “individuals”, which contribute gifts and abilities to the community. Gifts can be further divided into “gifts of the head” (e.g. knowledge), “gifts of the heart” (e.g. generosity) and “gifts of the hand” (e.g. workforce), while the abilities are those learned at schools or the workplace. The next element contains “associations”. In local communities’ possible associations are for example cultural or religious groups. Trying to apply this model on virtual communities, one possible argumentation is that most individuals are usually part of multiple different communities or chats, which sometimes even connect with each other in a partnership. These association can be of relevance as next to the potential of discovering more likeminded people which may be interested in joining the community, they "can in fact be stretched beyond their original purposes and intentions to become full contributors to the development process" (Kretzmann/McKnight (1993) p. 6). Another block examines “institutions” located in the community. A geographically based community usually includes institutions like schools, hospitals and businesses. Extrapolating on virtual communities, services from community members or external services offered from within the community maintain a relationship with the virtual community and thus, could be assigned in the institutions block. The fourth block deals with the physical space, where the community exists, this could be directly translated into virtual space (communication channels) where the virtual community operates in. The fifth and final block includes connections based on economy and interactive exchanges in the community, this block finally includes financial and economic aspects. (Server) Hosting providers, cryptocurrency exchanges and an underlying cryptocurrency, could be possible economical aspects within this block. The introduction of the “community assets map” put additional emphasis on a relationship-driven development. However, relationships among individuals within a virtual community are significantly different when

comparing them to local communities. Anonymity and lack of physical presence might counteract prejudice of the appearance or environment a person lives in. However, the invisibility of body language, non-verbal emotional reactions or eye-contact can result in a negative online disinhibition (Suler, J. (2004)), which describes a behavior of reduced self-inhibition as a result of interacting within a digital environment. Shah et al. (2018) concludes in a psychological attempt of integrating ABCD in a virtual environment (eABCD) that "deficit views, coupled with toxic online disinhibition, can exacerbate online miscommunications and lead to harmful digital dynamics between […] community partners" (Shah et al. (2018)). Focusing on behavior and communication, the summary of "language moves" categorized in the essential parts of ABCD (asset-based, internally focused, relationship driven) provide a set of communication guidelines, which will be revisited and displayed in chapter 6.3 – Community Management.

3.3 Individual capacity inventory

Utilizing the Community Assets Map, we can now develop a better overview of all participating forces and their relationships within the virtual community. However, even a good model runs the risk of substituting details in exchange for simplicity and readability. In this case, the Community Assets Map simplifies the "individuals" and does not consider the different abilities of each individual and does not provide any approach of discovering those skills as well. In order to solve these issues, the "Capacity Inventory" (p. 14) is introduced and is designed to identify the abilities of individuals within a community. Relevant skills are already formulated in a list and each individual simply must put a mark on the skill he is familiar with. There is no predefined set of skills, which can be used on any community, as the relevance of each skill differs greatly depending on the designated community and its purpose. It is therefore the responsibility of the founder (or community manager) of the community to choose an appropriate format. Generally, the Capacity Inventory is divided into 4 parts:

1. **Skills Information**

All skills, which the individual has learned at home, in the community, school or at work are listed here. It doesn´t matter how the individual has acquired these skills, as even skillsets acquired from hobbies or out of curiosity can be valuable for the community. The first part ends with asking the individual to list his priority skills, which he feels most comfortable with. This is usually considered the most important information, as an individual is considered best at assessing his own skills. Furthermore, this gives the individual the chance to name skills, which may have not been listed by the creator of the capacity inventory.

2. **Community Skills**

In this section the individual can list his experience and work in other communities. This information is very relevant as experiences, good or bad, can contribute to not doing the same mistakes, also organizational and managing skills can further optimize the communication and motivation within the community. At the conclusion the individual is asked what kind of work he would be willing to do in the future.

3. **Enterprising Interests and Experience**

The third part is about questioning the individual about his entrepreneurial activities. First, the individual is asked, if he ever considered starting a business, what motivated him and what led to the failure or success of the business. Second, the person is asked in what kind of business he/she is currently involved to generate an income. This information can be especially interesting for locating potential business partners for the community on the one hand and discovering leadership potentials on the other hand. Provided experiences from the individuals could also have a positive influence on the business model and purpose of the virtual community.

4. Personal Information

The last part deals with basic information about each individual. The main purpose is the ability to contact the individual and (in a virtual community context) to discover language or time zone barriers.

Note: The results rely on the intentions of the individuals. Depending on the circumstances, some information may be falsified, if a benefit by doing so could be achieved, especially since the real identity of individuals is usually not given in virtual communities.

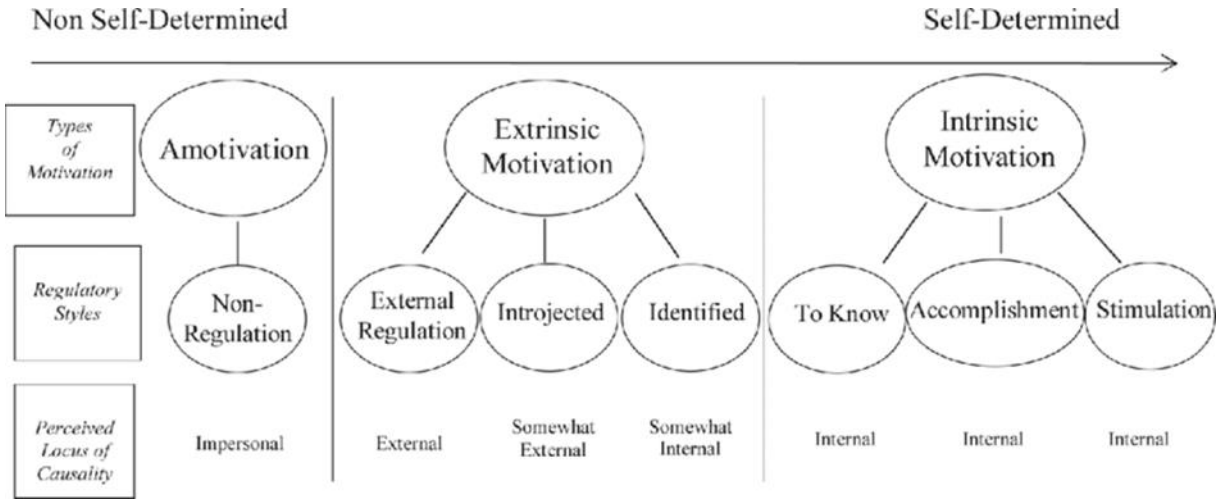
3.4 Community contribution

Using historical experience, Kretzmann/McKnight (1993) argue that "significant community development takes place only when local community people are committed to investing themselves and their resources in the effort". They further point out, that a capacity focused development cannot overcome all problems arising from community development and thus replace additional external resources completely. Rather, he brings forward that "outside resources will be much more effectively used if the local community is itself fully mobilized and invested, and if it can define the agendas for which additional resources must be obtained" (p. 8). Local Communities as stated by Kretzmann/McKnight (1993) consist of people living in the same geographical area and thus have a personal reason for participating in community development, as the individuals and families benefit directly from local changes. Even if individuals decide to not participate in community development activities, they are still considered being a part of the community due to the geographical classification of the local community. This is usually not the case in virtual communities. As stated in the first chapter, there is always an underlying reason for an individual to join a virtual community, which does not necessarily imply a contribution or commitment either. In local community environments a mediator is used to connect skills, organize activities and motivate individuals to participate in community endeavors. Issues like a theoretically unlimited community growth, time and language barriers as well as the lack of physical presence and resulting online disinhibition (Suler, J. (2004)) are not considered in a local community environment. Thus, the literature about asset-based community development is not enough to develop a concept, which is applicable on virtual communities within a product development environment. A research towards motivation is conducted to provide a basic understanding of these psychologic elements as well as develop important elements for the new concept.

3.4.1 Motivation

Before introducing scientific research and theories, a theoretical understanding of the most relevant aspects of "motivation" is provided. The following foundational knowledge is based on the scientific paper by Nadia Ayub “Effect of Intrinsic and Extrinsic Motivation on Academic Performance” (Ayub, N (2010)):

Research (Deci/Ryan (1985)) shows that curiosity, persistence, learning and performance are a direct result from motivation. Furthermore, three types of motivation were defined: extrinsic motivation, intrinsic motivation, and amotivation.



Source: (Goodboy (2015))

Figure 3.1: Continuum of Motivation

An extrinsically motivated person can be motivated by rewards (external regulation), by feeling pride or shame (introjected), by being aware of the value of the activity caused by external incentives (identified) or by an identified value being of personal benefit (integrated). Generally, extrinsic motivation is caused by external influences/incentives. In the context of this elaboration, monetary incentivization (cryptocurrency) is considered the most important extrinsic motivation.

Deci (1975) describes intrinsic motivation as an activity in favor and pleasure of the satisfaction derived from participation. She concludes that “intrinsic motivation stems from

the innate psychological needs of competence and self-determination." (Deci (1975) p. 2). Based on her findings three types of intrinsic motivation are defined: to know, to experience stimulation, and to accomplish things. " Intrinsic motivation to know" encompasses explorative and curiosity motivations as well as educational and learning motives. (Gottfried, (1985)). Depending on researched scientific papers the term "mastery motivation" is used to describe the intrinsic motivation towards accomplishments (Harter, (1981)). The author explains that experience can be an intrinsic motivation by participating in activities, "in order to experience stimulating sensations derived from one's engagement in the activity". The final type is the amotivation. In a state of neither being intrinsically nor extrinsically motivated the individuals experience "feelings of incompetence and expectancies of uncontrollability they perceive their behavior as caused by forces out of their own control (Harter, (1981) p. 3). Finally, the author points out that in this state the participation may stop imminently.

Extrapolating practical guidelines for motivation and participation comes with a risk, as developed theories, discoveries and interpretations are as different as the scenarios they could be applied on. Therefore, the following findings should be critically reviewed as examples and not solely relied on.

In a thorough research Catherine M. Ridings (2004) has analyzed several communities and extrapolated technical recommendations for the medium the community is based on. With regards to information exchange as being the reason to join a community, several technical suggestions regarding the presentation of information are provided:
Utilizing search functionalities, providing links for further research on community topics, separating topics with appropriate titles and descriptions as well as integrating "experts" for specific areas to develop an important place of information for the community can strengthen the binding of an individual with the community and motivate more information exchange. Highlighting social aspects, features like displaying replies including the id of the user, the ability to search for all answers of a user and public user profiles can support friendship building, which is considered an important factor for active participation in a community. From a sociocultural perspective, "the Zone of Proximal Development (Vygotsky (1978))" underlines the theory of assigning experts for several topics within a community. The interaction with a more experienced individual enables the solution of more complex tasks and learning or discovering significantly more than without any support. This concept underlines the intrinsic motivation to know, concluding that individuals will join and participate in community activities as they expect to broaden their own abilities by learning

from more skilled individuals. Another study by Kimberly Ling, et al. (2005) concluded that "People will contribute more to online communities when they believe that their contributions will be unique", other partially supported theories are "Members who are assigned challenging specific numeric goals will rate more than members assigned non-specific do-your-best goals" and "members assigned exceedingly difficult specific goals will rate less than members assigned difficult goals". These results are based on a scientific research on the online community of a movie rating platform (https://movielens.org/) and could be criticized regarding the size of the community and relevance of the results outside this scenario. What seems to become clear when reviewing this research is (allowing myself to add a personal and unverified opinion at this point) that messaging individuals directly (in this case via e-mail) seems to play a relevant role in motivation for contributions. Concluding that writing a personal message to an individual and asking him for help will at least raise the possibilities of a reply, other than broadcasting the task to the public. The same scientific study also highlights problems of participation in online communities and lists some studies revealing that the mayor share of contributions is provided by a minority of specific community members. The term "social-loafing" (a phenomenon probably any student is familiar with) describes a reduced effort of individuals working in a group towards a collective goal. The reason for this behavior is the perceived lack of importance of the own performance within the group. This phenomenon offers a good transition to the next topic: lead-users.

3.4.2 Lead-Users

The term „lead-user" is a special category of individuals within a group of individuals. Usually approached from a marketing perspective, the needs of lead users are considered as being representative for a specific market. Consumers identified as lead-users also have a higher commitment to the purchase of future products. Furthermore, it describes an approach on identifying most valuable individuals and integrating them into development processes of innovative products (Kirchgeorg, (2018)). Depending on the environment and objective, the classification of lead-users can vary greatly. The MIT-Professor Eric von (von Hippel (2016)) has developed the concept and provides resources for defining and identifying lead-users i.e. based on their activity and the quality of the contributions. He defines lead-users as: (1) they face needs that will be general in a marketplace, but they face them months or years before the bulk of that marketplace encounters them and (2) they are positioned to benefit significantly by obtaining a solution to those needs. The previously introduced "capacity inventory" by Kretzmann (et al.) could provide necessary data for identifying lead-users

based on their experience and skills. Definitions of the previously introduced “open innovation” concept, the focus on the value generated by individuals as well as proposing valuable users as a possible foundation for market research, are elements of this thesis and have been recognized in the work of Eric von Hippel as well. Over the years the concept was topic of several scientific researches (Schreier (2007)) which confirm the effectiveness of integrating lead-users into development processes prognosing up to eight times higher revenue by doing so (Gary L. Lilien (2002)).

3.4.3 Shared Mental Model

When integrating as many individuals as possible in discussions, voting’s or product development processes, a certain amount of experience may be required to participate. Logically, complex issues also require more experience within the subject in order to be able to provide a solution or informed opinion. In the absence of a basic understanding of the specific topic, individuals could still participate in surveys and discussions, but the results may be less relevant than the sole inclusion of few qualified individuals. Essentially, the introduced lead user concept relies on the identification (and separation) of relevant individuals based on characteristics like experience and skills. A study on the performance of teams within organizations (Mathieu, (2000)) concludes that a shared understanding of the performed task and involved work improve the performance of a team. Usually applied when introducing new employees in a team environment, shared mental models are “knowledge structures held by members of a team that enable them to form accurate explanations and expectations for the task, and, in turn, coordinate their actions and adapt their behavior to demands of the task and other team members (Cannon-Bowers, 1993). The knowledge and ability of proper decision-making of individuals can vary greatly depending on the topic and should not be ignored. The “shared mental model” provides a beneficial approach to the lead-user concept by “creating” new lead-users through education. After all, the diversity of a community and the different perspectives of its members should be treated as potentials and not subjectively excluded. Theoretical literature categorizes shared mental models in “taskwork” and “teamwork” (Cannon-Bowers). “task work mental models” describe utilized tools and the performed task, providing a fundamental overview about the business processes and operating manuals for utilized tools. The “teamwork mental model” introduces every individual of the team, including their responsibilities, communication flow among each other as well as skills and other personal preferences and characterizations.

3.4.4 E-democracy

The term “e-democracy” is derived from the participation in political decisions by computer-aided technology which is relevant for community-based development as decisions and opinions are essential part of a community focused development. While it`s already possible in some countries and especially in virtual communities to electronically participate in voting’s and elections (eVoting, eElection), there is much more behind the term e-democracy. Thanks to the internet and the possibility of staying anonymous, it`s easier than ever to express opinions and criticism, propose alternative ideas and get uncensored information about for example misbehaving individuals or organizations. Thanks to new information and communication technology political self-determination does not require physical presence anymore. In this political context an introduction of the famous “Spiral of Silence” theory (Noelle-Neumann, (1974)) will be provided as it describes a risk, which can negatively impact communication within a community. Developed by E. Noelle-Neumann the “Spiral of Silence” describes a dynamic process where the opinion of a minority opposing the dominant opinion of a famous individual or majority disappear from the public. Due to the fear of being isolated, rejected or publicly denounced individuals perceiving themselves as minorities keep their opposing opinion private. Although the virtual anonymity may benefit minorities in expressing their opinions, it can also be used to massively suppress opinions or even turn the spiral upside down by spoofing a false majority. Without going too deep into politics and other related topics like the recent “fake news” discussions, open source projects and the invention of blockchain marks another milestone in the field of e-democracy. Innovations like open source software (= code being publicly visible for review) being developed by a collective of independent developers, blockchains utilizing the consensus algorithm as underlying technology and new features integrating users into financial decisions by building on top of the blockchain technology have introduced a new generation of democracy. For example, the “delegated-proof-of-stake algorithm” (dPOS) relies on the voting power given to shareholders of a cryptocurrency to vote on “Witnesses” which compete for the ability to be get paid a fixed salary by the network. In the case of “masternode voting” a group of significantly big shareholders vote on investment proposals from individuals in order to fund the development of specific ideas, some projects are already speaking of “governance” in this context (Dash Cryptocurrency, n.d.). Thanks to the anonymity of the internet and the innovating power of digital currencies, the identity or political and sociocultural environments are not relevant for the voting process anymore. Decisions, which are usually restricted to the responsibility of the CEO, can be completely outsourced to the crowd, displaying existing laws and regulations as outdated. Shareholders

are being enabled to (publicly) vote on decisions, which can fundamentally influence the progress of a project without the need of being physically present or fulfilling any other regulatory requirements. In this context the term “DAO (decentralized autonomous organization)” has emerged and describes a business form, which is completely run by a collective of individuals utilizing various features of the blockchain technology. Delegating the full responsibility of a project in the hands of its community offers exciting new possibilities that have yet to be discovered.

3.5 Summary

Kretzmann (et al.) has developed a concept which motivates community development by utilizing an asset-based, inside-focused, relationship driven approach and discovering individual skills and capacities. Most aspects of the asset-based community development (ABCD) approach could be transferred in a virtual environment. The “Community Assets Map” provides a layout, which can summarize important forces and relationships of individuals, associations and institutions within a virtual community. The “capacity inventory” enables the analysis of everyone within the community and discover skills and potentials which could be valuable for the community development. Terms like "open innovation" and "lead-users" portray several similarities with the ABCD approach and confirm that users are already being actively integrated into product development processes of organizations becoming consumers, producers and developers of innovative products. A relevant study has confirmed that discovering and integrating valuable customers (lead-users) into product development processes can yield up to eight times higher revenues. Thanks to new blockchain technologies, the community can be enabled to vote on financial decisions and thus have a minor influence on the achievement and progress of specific goals of the projects. Keeping the interdisciplinary character, a theoretical understanding of the term “motivation” as well as theories resulting from scientific research have been provided. “Motivation” and “Participation” are rooted in behavioral psychology, especially in a rather new area of expertise called “cyberpsychology”, which goes beyond the focus and capacities of this thesis. Therefore, only a short introduction to provide a basic understanding of this topic was provided. Scientists are encouraged to research this very interesting field regarding motivation and participation of virtual communities, especially in the context of cryptocurrencies and new democracy features based on the blockchain.

After assembling all theoretical elements for the creation of a new concept, a closer look at cryptocurrencies and how they fit in the context of this thesis is facilitated

3.6 The scope of Cryptocurrencies

Preface

Since blockchain and cryptocurrencies are still a very new and scientifically undisclosed topic, the significance of self-proclaimed “blockchain professionals” is highly questionable. With new projects being released everyday it is simply not possible for a single individual to always stay up to date with the most recent innovations or reliably forecast any trends. Also, there is always the risk of the source being motivated by money, losing its neutral credibility. Instead of relying on a questionable source the author of this thesis decided to utilize his own experience in order to research cryptocurrencies. By observing the sector since 2014 and being involved since 2016, my expertise, complemented by the experience of publishing a cryptocurrency, should be an adequate reference for the following research of cryptographic currencies

3.6.1 Introduction

In the recent years, especially since the surge of Bitcoin reaching almost 20.000$ in value, Blockchain and Cryptocurrencies became a hot topic among many sectors like finance, healthcare or the entertainment industry. With bitcoin being barely older than 20 years and most active altcoins (=generalizing term for any cryptocurrency other than Bitcoin) being not older than 5 years, available statistical data exists mostly in shapes of financial estimations, development activities or blockchain based statistics like transactions per day or average account balance. Ongoing discussions about the purpose of specific altcoins and fraud cases stealing millions of dollars by making false promises have resulted in many people questioning the need of cryptocurrencies other than Bitcoin (sometimes called “Bitcoin Maximalists”). Considering solely the Blockchain technology, big companies like IBM (IBM Blockchain) have already discovered the potentials of the new technology and are actively integrating it into their processes.

3.6.2 The purpose of cryptocurrencies

A deeper research on existing cryptocurrencies highlights that the exchange function of a currency is widely used to justify its purpose (observations based on top 50 projects: (Coinmarketcap)). Other advertised features like transparency, decentralization and censorship resistance are default functions of a (usual) blockchain too, which indeed raise questions regarding the purpose of some cryptocurrencies. Although there are several cryptocurrencies, which are actually presenting themselves as an alternative to fiat currency (euro, dollar, etc.) and bitcoin (for example (Dash Cryptocurrency, n.d.) or (Monero Cryptocurrency, n.d.) a significant amount of projects is focusing on utilizing its underlying cryptocurrency as a means of exchange for a very specific service or good. Many bigger projects (=at least 100.000.000$ market capitalization) use their cryptocurrency for paying transactional fees for services deployed directly on the designated blockchain. Probably the most famous example is (Ethereum, 2015) enabling the deployment of decentralized Apps (dApps) and tokens. Games on the Ethereum Blockchain like (Cryptokitties, n.d.)offer NFTs (non-fungible tokens) which can be collected and traded, but every action requires paying a transaction fee. Bitcoin do offer a similar feature to the degree that instructions (Opcodes) can be executed on the blockchain, but the development would require significantly more effort as less developer manuals are provided for this special case. The creation of tokens is another service on a blockchain, which usually requires a predefined amount of its underlying cryptocurrency to be "burned" in order to create a cryptocurrency (token) on top of another blockchain. Other cryptocurrencies like (Dogecoin, n.d.) started as a joke and thanks to its growing community (calling themselves "Shibes", a reference to a dog breed and the mascot "Shiba Inu") the cryptocurrency developed a very impressive value with a market capitalization of more than 250 million dollars at the time of writing. It´s a great example to justify that a cryptocurrency does not necessarily need a reasonably good purpose for its creation and how a strong community can drive its development and value. The release of Tether a so called "Stablecoin" (https://tether.to/), which mirrors the value of one dollar, has caused a hot debate about trust and how a private company is able to "print" dollars by pegging or tethering a cryptocurrency to the value of one dollar. Tether is ranked as the 5th biggest cryptocurrency in market capitalization (over 4.5 billion dollars) at the time of writing and is probably the most valuable example for a cryptocurrency representing the value of another medium, in this case the dollar. With new cryptocurrencies being released every day, new reasonable use cases are constantly being introduced.

3.6.3 Potentials and Risks of cryptocurrencies

Examples like Dogecoin are a funny evidence that the sky is the limit for the creativity of finding a reason for releasing a cryptocurrency. “Classical” scenarios for cryptocurrencies (tokens) are initial coin offerings (ICOs), which represents a new form of crowdfunding. Organizations usually issue tokens in exchange for fiat money (dollar, euro, yen) in order to raise capital which is required to develop a specific project. The purpose of the cryptocurrency itself in this scenario depends on the promises and credibility of the issuing organization. It may be exchangeable in the product or service, which will be developed with the raised capital or provide specific voting rights. Due to several fraudulent projects in the past, this approach got discredited among many investors. Tether representing the dollar, a highly regulated currency usually issued only by the federal reserve, proves that there seem to be no barriers on what could be represented by a cryptocurrency or token. This example also outlines the requirements of rules and regulations of cryptocurrencies. Huge amounts of money entering the cryptocurrency markets have forced regulators to react and find ways for regulating cryptocurrencies or digital assets. The Howey Test (Howey Test, n.d.) is one of those approaches applied by the American Securities and Exchange Commission (SEC). Its purpose is to evaluate whether a cryptocurrency is considered being a security and thus requires law enforcement. The European parliament has also published an extensive paper regarding cryptocurrencies, law enforcement and illegal activities (Cryptocurrencies, n.d.). Generally, selling a cryptocurrency to collect funds for any purpose should be carefully examined and discussed with a specialist before doing so. Integrating the community/investors into the financial and entrepreneurial decision-making of the raised capital and into the development of the product is a very important aspect, which helps avoid concerns regarding law enforcement of securities.

In conclusion, this topic has highlighted that creativity and conviction are the only limitations for creating and integrating a cryptocurrency in existing structures. Basically, anything can be represented by a cryptocurrency and examples like “Dogecoin” highlight that there is no simple answer to the question “why should my organization/startup release its own currency?”. Possible scenarios like motivating action through rewards, paying for services and contributions as well as utilizing the power of exclusivity and limitation will be further examined in the practical test.

4 First practical test: Domocoin

4.1 Introduction

Presented as an experiment without initial funding or a roadmap, the focus of the cryptocurrency is a completely community-oriented development with an open end. With a limited budget and a defined goal, which can´t be achieved with available resources, this experiment can be used as a first practical realization of the asset-based community development based on a cryptocurrency. The codebase for the blockchain has been replicated and modified from an existing cryptocurrency in order to minimize the initial effort of developing a blockchain. In this scenario a fully independent blockchain has been created, which requires coding skills in C++. The test was implemented by two people, a full stack developer with broad programming skills as well as the author of this thesis. After evaluating various cryptocurrencies and considering relevant functionalities in terms of usability and maintainability, the codebase is based on the source code of the cryptocurrency called “PivX” (https://pivx.org/) at the time of writing.

4.2 Preparation

A basic landing page (https://domoproject.me) was prepared to describe the project and provide all links and tutorials required for participation. Precompiled wallets for Windows, Mac and Linux as well as a Paperwallet-Generator are available in order to minimize the effort of individuals joining the project. The specifications of the cryptocurrency have changed several times since its creation and (after several iterations and updates) the cryptocurrency exists with the following specifications at the time of writing:

4.2.1 Coin-Specifications

Name: Domocoin

Short: DOM or DOMO

Circulating supply: ~ 900000 DOMO

Block rewards: Staking: 0.075 DOMO; Masternode: 0.875 DOMO; Reserve: 0.05 DOMO

Block time: 60 seconds

Inflation based on above numbers: 1 DOMO per minute

Masternode collateral: 1000 DOMO

Algorithm features: Proof of Stake (POS) + Masternodes

The fixed inflation rate of 1 DOMO per minute is relatively low compared to other cryptocurrencies, thus making the currency scarce. The reasoning behind this decision is that (in theory) scarcity leads to a higher purchasing power and thus a higher value per coin. Scarcity could create demand as it strengthens the “fear of missing out”. The individual wants to get the coin as soon as possible, because the price per coin could grow faster than similar coins with a higher supply and inflation rate.

After several trial and errors, discussions with the community and evaluations of rewarding structures, newly created coins are distributed as follows:

0.875 Domocoins (87,5%) are distributed to Masternodes. Masternode operators are individuals, which have “locked” 1000 Domocoins and provide/rent servers in order to decentralize, secure and scale the network. With more Domocoins being “locked” the circulating supply will shrink, making remaining coins even scarcer. Since Masternode operators contribute more effort into the network, they are considered more valuable and thus receive the biggest share of newly distributed coins.

0.075 Domocoins (7,5%) are distributed to “staking”. Any individual running the wallet software on any compatible device is eligible for the staking reward, as long any Domocoins are already owned. Although staking is very important for the security of the network, there is no additional effort required to participate except running a wallet. Compared to Masternodes the effort and costs to participate are considerably low, which is the main argument for Masternodes receiving the biggest share.

0.05 Domocoins (5%) are distributed to the “development fund”. Its purpose is to reward developers and contributors outside of the community. The founder of the cryptocurrency has complete ownership of the development funds at the time of writing. However, the idea is to develop a voting platform for community members in order to enable collective investment decisions in the future.

4.2.2 First steps

After developing the cryptocurrency and running it successfully in a testing environment, the public release was scheduled within 2 weeks. The proof-of-stake algorithm requires the initial ownership of coins for participating in the network which is a problem as the result is that 100% of all Domocoins must be created and distributed by a single entity (Premine). Even if the entity does not have any evil or egoistic intentions, there remains a probability of an unfair distribution, because the first individuals receiving the coins benefit from the comparably low competition for receiving block rewards. Also, a Premine represents a risk for centralization and price manipulation by the dominating entity, which is regularly abused by scammers and may dramatically reduce the trust regarding our intentions. To avoid individuals questioning the integrity of the project and criticize our intentions, we decided to utilize the PoW algorithm for 2 months and announce the project in advance to enable a fair start for everyone. Due to the limited budget, professional advertising and marketing was not considerable. By researching comparable cryptocurrencies and platforms used for communication among the community members of these projects, several websites and social networks could be located to create initial awareness:

Bitcointalk.com is the first and probably biggest forum for any blockchain and cryptocurrency related topics. The forum was originally created by Satoshi Nakamoto, the pseudonymous inventor of Bitcoin on Nov 22, 2009. With many new cryptocurrencies being announced daily, this forum is the go-to place to find interesting projects, discuss blockchain related topics and connect with likeminded people in the blockchain and cryptocurrency sector.

Twitter is mostly known as a microblogging social network. Most cryptocurrency based projects also operate a twitter account, as there seems to be a significant amount of cryptocurrency interested users on the platform (sometimes being referred to as “crypto twitter”). Like other social networks, connecting with people or advertising in “trending” discussions or topics is less complicated comparing to a regular forum without a mobile app.

Telegram is an instant messenger with additional anonymity features. Since Bitcointalk or twitter do not offer real-time communication for groups, managing a community can be difficult without instant messaging and group management features. There are many providers to choose from, we decided to pick telegram due to its popularity among most cryptocurrency projects and it´s privacy features. However, separating topics and limiting spam can be difficult as there is usually only one chat, where all group members are communicating at the same time.

Discord initially gained popularity by gamer communities, which looked for a better way to organize the communication of larger amounts of people. With text, image, video and audio communication between users in separated channels, communication can be divided into several topics and purposes. The advanced permission system enables the creation of customized roles and limited access to specific areas. In opposite to many popular social networks, discord only requires an e-mail address for registration (which can also be optional in some servers). The discord server for Domocoin was created after several requests by community members.

4.3 Milestones

This topic deals with important milestones, which have been rated as relevant by the author and founder of the digital currency. The relevance is highly subjective and may be criticized as irrelevant for large-scale applications. The presented milestones shall therefore solely act as possible examples for achievements in a small-scale environment. These achievements contain significant amounts of effort of all involved individuals. The following milestones are observations by the founder and are therefore formulated in an according format.

Milestone 1:

After facing several severe problems with the proof-of-work based currency, mostly as a result of poorly configured external mining pools, which individuals used to concentrate more processing power for participating in the proof-of-work consensus, we finalized the decision of utilizing a proof-of-stake based currency 1 month earlier than expected. Since this cryptocurrency operates on a completely new blockchain, all community members need to exchange their old coins for the new coins. I am going to do it manually and looking forward to talk with every individual to get an overview of the people behind the anonymous shareholders, the amount of coins they own and why they joined my experiment in the first place. In addition to the proof-of-stake features, we keep the Masternode features as requested by a lot of community members. The next steps include preparing tutorials for the new masternode setup, update the homepage, make announcements on all social networks, do general support for community members with issues and prepare a workflow for a more efficient handling of the swap of the old coins.

Milestone 2:

The community is growing steadily. Initially, most community members joined from discovering the announcement on Bitcointalk, the second biggest source of new members is the follower base of my private twitter account. I was able to discover this because I use different invite links for different platforms. Judging by the number of users, discord seems to be the most favored choice for the DOMO community. What started with a request of several community members quickly became the prior communication platform of the project. Several individuals volunteered to help me structure the discord server and answer frequently asked questions. Since more and more people approach me, introducing their skills and asking on how they can help, I decided to develop “jobs”. The first job is the “moderator”, he keeps an eye on the communications when I am unavailable and makes sure no one spams or misbehaves in the chats. Although I am relaxed with rude language as long no one is

personally insulted, I still decided to setup some very basic rules for behavior as a reference for the moderators to avoid any future conflicts, making clear that only heavy harassment or spam should be permanently banned. “Marketing manager” is the next new job and with a non-existing budget for advertisements, his job is basically joining other communities to raise awareness of the DOMO project and negotiate possible partnerships. Other Jobs are “Designer” for smaller design tasks, “Translators” managing the translations and chatrooms for languages like Russian or Japanese and “Members” which I created solely to distinguish community members, which contributed enough for me noticing it but don´t fit in any other category. Every job got a reward between 1000-2000 Domocoins as a “loan”. Furthermore, I created chatrooms, which are only visible by the specific roles, to keep confidential communication out of the public channels. As a bonus, I announced, that in-progress tasks or upcoming news will be first displayed in the restricted chats before going public. In order to enable other community members to also see these “early bird” news, I offered them to pay any symbolic amount of Domocoins (back) to me in exchange for the permission to enter the chat.

Milestone 3

A marketing manager (we just call us “team-members”, separation in roles is only used in this protocol for simplicity reasons) suggested me to partner up with some other discord and telegram communities to facilitate giveaways and airdrops. By providing several links he showed me communities, which are specialized on discovering and promoting new projects on their servers. As expected, there were several community leaders who charged ridiculously high fees for a bit of advertising, but after several negotiations and declines I finally found some community managers willing to host airdrops and getting paid in Domocoins. “Airdrop” is a term describing a gift that is dropped without any special requirements. So interested people just needed to download the Domocoin wallet, join the discord server and post an address to receive a small amount of Domocoins. After executing a few airdrops, a lot of people joined our servers and for the very first time I got contacted by other community managers about potential partnerships.

Milestone 4

Discovering how fast the community was growing after giving away Domocoins, I started to optimize the process and developed some requirements for potential partnerships like a certain minimal amount of people needs to be within that community and how much Domocoins I am willing to give away or pay to the community leaders. Furthermore, a community leader decided to join Domocoin and introduced me to a lot of new ideas for advertising and managing the community on discord. We optimized the permissions and roles on discord, configured chat bots which can forward messages across multiple platforms and enable games, which are more entertaining than I expected. He also showed me even bigger communities for potential partnerships.

Milestone 5

I keep on being asked about listing Domocoin on a cryptocurrency exchange. I have refused to participate in the discussions due to concerns of price manipulation especially regarding people buying Domocoin on that exchange and loosing huge amounts of money. Having a representative price would put pressure on me to sustain a growing value, as I don´t want anyone to lose money and become angry. After long lasting discussions with the team I had to realize that I can´t refuse the requests of the community, some community members already started submitting registration forms without my knowledge, so my agreement was purely formal at this point. Finding an exchange, which would accept Domocoins as payment for the listing fee, however, turned out being extremely difficult as the most famous exchanges also charge the most ridiculous listing fees of up to 20.000$. Ironically, it seems that the less popular exchanges with lower listing fees are requesting more details about the currency, its purpose and the founder than the popular exchanges with high fees. After several declines, the DOMO community finally found a small exchange called Cratex (Cratex, 2018) willing to accept 2000 Domocoins as listing fee to pair Domocoin with Bitcoin. The founder and developer of the exchange is also a student, so we quickly reached a common sense. We planned an airdrop for all registered and new users on his exchange and I started to broadcast the great news across all channels.

Milestone 6

After Domocoin was listed on the first exchange several events occurred rapidly afterwards. With Domocoin being paired with Bitcoin, there is now a real value attached to the currency. The Supply is very high in the orderbook and since there are just a few buy orders available, the price is not stable at all and could change dramatically when buying or selling higher amounts. Now that Domocoin has a value comparable to Bitcoin and thus also comparable to Dollar or Euro, partnerships and listing negotiations started being converted from a dollar price into Domocoins. Since the value is quite low, some individuals and organizations have charged extremely high amounts of for example 100.000 Domocoins or 1000$, which make up almost 50% of the total circulating (at the time). Selling such a huge amount would not be possible either, because there are not enough buy orders available to cover such a huge sell. Although not representative, the highest observed price reached approximately 1 dollar per Domocoin.

Multiplied by the circulating supply it would result in a theoretical market capitalization of almost 200.000$ (for current total supply see: https://explorer.domoproject.org/#/coin).

Due to the highly volatile price and my shrinking shares, I decided to limit payments for partnerships, contributions and listings to the collateral of 1-2 Masternodes, which is 1000-2000 DOMO. One of the biggest shareholders also funded an exchange listing (paid in dollar). Thanks to the displayed value in Bitcoin, listing on various free “coin statistics” websites was possible and raised the reach for new community members even more. More and more services included Domocoin and the community members constantly provided more potential services to partner with. Next to new exchange listings, Domocoin got listed on the famous portfolio tracking app “blockfolio”, thanks to connections of a community member with the CEO of the app. Hosting services listed Domocoins and reduced the initial setup effort and hosting fees of running a Masternode. With the logo being relatively ugly in my opinion, I initiated a competition for a new Domocoin logo. The community would discuss and vote on submissions and the winner would receive 2000 Domocoins as a reward. To motivate initial contributions of designs, a reward of 150 Domocoins was paid for every submission.

Milestone 7

While facilitating more partnerships with other communities and listing Domocoin on more "coin statistics" websites, I got referred to a discord server of a cryptocurrency called "Heptacoin". The creator of the currency announced, that he will abandon the project and is looking for a successor. Seeking to "rescue" the Heptacoin community and somehow integrating it into the Domocoin Community. Discussing ideas in the team chat, we came up with the idea of doing a "crypto mergers & acquisitions" of the community by raising Domocoins from our Community and offering an exchange rate for Hepta to DOMO. In order to calculate an exchange rate, we asked all interested Heptacoin shareholders to register the amount of Heptacoins they are willing to exchange and divided that amount by the amount of raised Domocoins. Some Hepta shareholders refused to participate, but the overwhelming majority of more than 80% of the circulating supply of Heptacoin participated in the exchange. Our "Community mergers" attracted the attention of a journalist, who explained us that we are the very first of doing a "crypto-to-crypto merger". After having an interview, he released an article about our approach: (Domocoin Mergers, n.d.)

Developers, who discovered Domocoin mostly by word of mouth by other community members, started joining the community. It turned out that the participation of this kind of individuals is highly valuable, because their contributions require a lot of effort and knowledge. For example, one individual developed "tipping bots", which enabled any individual on the same communication platform (for example: telegram or twitter) to send and receive Domocoins, by using the bot as a central wallet. While this is considered insecure, because the owner of the bot also controls all coins, it is a perfect solution for individuals, which don´t want to download the wallet software. This way we can raise awareness by randomly tipping Domocoins to strangers and facilitate competitions and airdrops more effectively. Other developers, which run their own cryptocurrency or related services, also started actively contributing to issues which they have faced and resolved in their own projects. Surprisingly, many of these highly valuable and active individuals didn´t even ask for a reward. Just like the amount and quality of contributions differs greatly for regular community members, their initial motivation seems to differ, too. To show my deep gratitude to these individuals, I rewarded Domocoins generously, promoted them to the highest possible rank "developer" with myself being in the same category and praised their contributions publicly to the rest of the community. Although I sometimes catch myself not being able to answer their qualitative questions in detail, I am constantly trying to "give back" by forwarding possibly valuable information to them.

Milestone 8

With a shrinking share of my own Domocoin holdings, I reduced the amount of new partnerships and airdrops. As a result, the influx of new community members into the communication platforms dropped significantly. Over time, we released new versions of the blockchain and wallets, rendering some of the most outdated version as not compatible with the network anymore. Although we broadcasted the new updates weeks in advance and weeks after, there are still several outdated Masternodes interfering with the network. After resolving many support cases from new community members being unable to properly synchronize with the network, we decided to start with a new blockchain and again facilitate a manual swap. Within a timeframe of 3 months, community members have the chance to exchange their old Domocoins for new Domocoins, until I start spending not exchanged Domocoins for new partnerships and contributions and thus reduce the exchange rate for latecomers. The swap provides valuable insights into the activity of certain individuals and the size of their Domocoin shares. All exchanges and other services needed to be notified in advance to update their information and their nodes. Few weeks before writing this thesis, I facilitated another swap while simultaneously reducing the inflation rate, fixing critical bugs and releasing a new wallet design. However, the main reason for the recent swap was my significantly lower activity on the communication platforms due to various personal reasons in the recent past. My theory, that many Domocoin shareholders have abandoned the community due to inactivity, rendering their Domocoin shares as “lost” was not correct. Instead, leaving individuals tried to sell their Domocoins on the exchange, resulting in a lower price, which motivated the remaining individuals to get some cheap Domocoins and grow their shares. Swapping all the coins manually, I was able to collect statistical data about all shareholders, which is permanently visible in form of transactions on the blockchain. Barely any small shareholders, which participated for example in airdrops, did not swap their coins at all. A full overview of (anonymized) shareholders and more statistics will be presented in the evaluation.

4.4 The DOMO Network

In accordance to the “capacity inventory” elaborated in the asset-based community development literature, a minimalistic platform based on Laravel (a PHP based web-framework) was developed to demonstrate an exemplary practical implementation using a cryptocurrency. This approach aligns with the problem of discovering hidden skills in a community without the need of a direct interview, which would not be viable considering a growing number of community members. In order to be able to register and login on the platform, every community member needs to sign a mnemonic phrase using the “signmessage” function in the Domocoin wallet. In order to log in, a minimal amount of 1 DOMO is required. By signing the mnemonic phrase with the private key of the specific address, ownership of the address and the containing balance can be verified. After verification, the submitted Domocoin address is linked with the account and grants access to the platform if it contains at least 1 Domocoin. On the first login, an empty profile is displayed (see image), each input field is entitled and contains a transparent description inside the field to guide the user with further information.

Figure 4.1.: The DOMO Network (Profile)

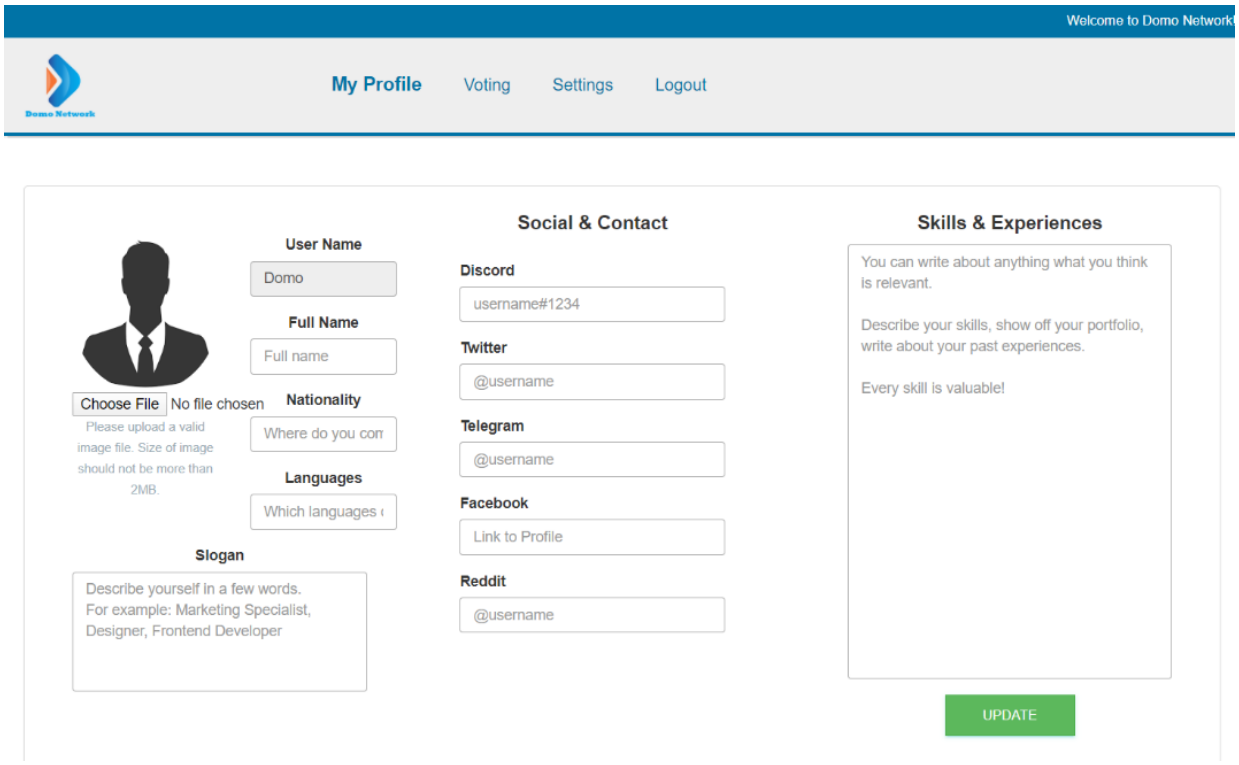
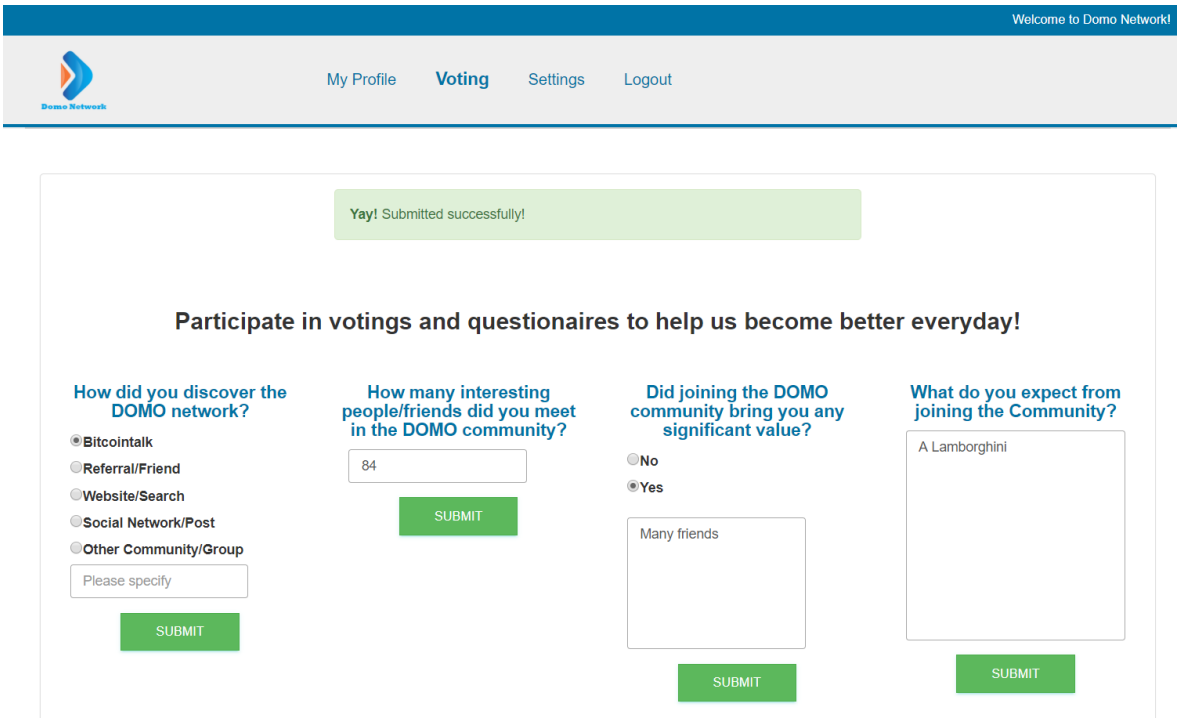


Figure 4.2.: DOMO Network (Voting's)



Every user can upload his own picture (avatar) and write down his name. Nationality and languages serve to reveal time or language barriers. The slogan offers the user the possibility to describe himself in a few words. This allows a quick identification of the profession and/or skills of the user. Social & Contact is mainly used to maintain at least one communication channel but may also be used for quicker identification within other social networks. Skills & Experiences offers the user the possibility to provide an unrestricted quantity of relevant information regarding his Skills & Experiences.

Using the top menu, the user can navigate to the voting page. Questions regarding the community and development can be provided here. Since only Domocoin Shareholders can login on the platform, these questionnaires are exclusive to the DOMO Community.

The Settings page displays a unique ID to be able to uniquely identify the user, the registration date of the account as well as the mandatory "change password" function. Pressing "Logout" in the top menu will log the user out of his account.

4.5 Conclusion

Summarizing the whole experiment, benefits and drawbacks are highlighted based on the personal emotions and interpretations of the founder:

Looking back at the beginning of the cryptocurrency and the DOMO community, new friendships, partnerships with services and other communities as well as a better understanding about the motivations and needs of individuals within virtual communities are just a few examples for personal value, which made the effort of creating and managing a cryptocurrency and community worth it. Already at the beginning, the strategy for evaluating relevant cryptocurrencies for the project comprised mistakes, which could have been avoided retrospectively. Thanks to the unbelievably diverse skills of my friend and cofounder, we had practically free choice regarding the cryptocurrency (source code) we could use for our project. Although I constantly coordinated with my cofounder and tried to keep long-term maintenance efforts as low as possible, both of us considered mostly the biggest and most successful cryptocurrencies to build our own blockchain from. Although, for example a token based on Ethereum is extremely fast developed and requires practically no maintenance (Ethereum developers take care of that), we would have had to pay a fee for each transaction, which was a long-term exclusion criterion considering our low budget. Also, we assumed that with a large development team, the source code would contain fewer bugs and new exploits would be fixed faster. Unfortunately, because of these reasons, we completely abandoned the idea of a currency (token) on an existing blockchain and did not consider other, less popular projects. In retrospect, more patience and an unbiased consideration of all options would have saved a lot of work, grief and frustration for both us and the community. To name just a few of the problems with the blockchain, we were (fortunately) pointed out by community members to critical vulnerabilities that had already caused huge financial damage in other projects. However, by disabling some features and updating the source code, these vulnerabilities could be closed after several sleepless nights. The resulting release of a new version led to another unexpected problem. While in most cases old nodes were still compatible with the updated blockchain, some minor changes to the source code strictly required an update. Since some of the network nodes had not performed the update due to (presumably) inactivity, two conflicting networks emerged. The result were connection problems, which did not lead to serious damage, but caused general dissatisfaction. We finally decided to facilitate a "restart" or "swap" which turned out being very convenient for me in the context of this thesis. All community members had to swap their old Domocoins with me for the newest ones. From a founder's point of view this provides a very good overview of the activity and number of existing owners. Furthermore, this is also the only

way to get back all "lost" or "inactive" coins. As a common result of discussions, a lot of members were not very enthusiastic and especially people who showed up after 1-2 months were noticeable confused. Although many cryptocurrency projects see “swaps” as a sort of a very last option to correct a serious mistake and are therefore generally considered to be negative, it forces the owners of the coin to act and simultaneously provides a way to collect statistical data. If the risk of upsetting the community is to be avoided, my observations have shown that important changes, which are welcomed by the majority, can create a positive post-swap attitude which justifies the additional effort as a necessity to join the "next-generation". It turns out that a cryptocurrency is suitable for various marketing purposes, may be used as an alternative means of payment or funding (especially for projects with limited resources) or to collect information about its underlying community. Although most negotiations concerning the payment for a service or partnership in Domocoins failed, there were still many service providers and individuals who contributed to the community in exchange for a masternode (1000 Domocoins). Motivated by successful partnerships and service deals, individual members started to take part in researching and applying for new potential partners regardless of what the founder says or does. Of course, to a certain extent, speculation on future profit plays a certain role. Already since the first days of creation, almost no day went by without being asked for a marketplace to trade Domocoin on. Since I didn´t want to comment on this topic, the community decided to find a marketplace by themselves and even pay a reasonable fee for the listing. My worries turned out to be partly justified, because through my "Contribute to earn Domocoins" policy most members had received Domocoins as a reward from solving a task or representing a "job" (e.g. “moderator”). After Domocoin was finally listed on the marketplace, what had to happen happened. The supply was much higher than the demand and thus resulted in a relatively low and dropping price. Although not representative, the market capitalization (price x total amount) increased to up to 200000$. While this suddenly resulted in almost any negotiation being able to be conducted by paying in Domocoins, the dollar value of Domocoin was so precisely converted that some business proposals demanded almost 50% of all existing Domocoins in circulation. Eventually I became more consequent in negotiations and moved on to offering Masternodes (1000 Domocoins) as payment for partnerships, services and contributions. Thanks to all the “cointracker” websites, which also provide calculations for future profits from staking and Masternodes, “realistic” negotiations were possible again, inspired by speculation of course. With the DOMO network I am now able to collect even more detailed information about everyone in the community. Unfortunately, due to the tight schedule and the development of the platform during this elaboration a detailed study of the results was not possible at the time of writing

5 Evaluation

Preface

This chapter is divided into two parts. The first part points out the general difficulties of data collection in virtual environments and presents collected data from the practical experiment. In the second part concrete guidelines are derived from the practical experiment, which can be used as a point of reference for utilizing a cryptocurrency in a virtual community.

5.1 Collecting data from virtual communities

Performing a relevant research in a virtual environment has proven to be extremely difficult for several reasons. A study (Cosentino, 2016) summarizing existing scientific research on the open source development platform GitHub has identified 4 minor issues when working with datasets of open source projects and their communities: (1) the inferences based on the empirical method employed, (2) the data collection process, (3) the generalization of the results and (4) the dataset and use of third-party services. (1) The study discovered, that most of the works reported issues with the utilized empirical methods, which did not consider potential errors and bias from the author or utilized tools. (2) More than 60% of the works have used private datasets or did not provide a link to the dataset, furthermore (API) request quotas restrict the amount of data that can be requested, reducing the sizes of the datasets dramatically. Most social networks like twitter, require membership fees to request datasets, limiting the acquisition of huge and relevant datasets to organizations with huge budgets. (3) By utilizing sampling techniques, which do not include probability methodology, conclusions from small samples are incorrectly elevated into general assumptions. (4) Third party services hosting datasets usually have the problem of being unstructured or simply being outdated as the services are usually just mirrors containing old data from existing sites. Considering the features of a virtual environment, there are even more problems a scientific researcher must face. One of the greatest benefits and biggest problem is anonymity. In contrast to a local survey, individuals with different user accounts could theoretically participate in the same survey indefinitely. Even the collection of personal data from social networks can contain data that a person has falsified for anonymity reasons. While huge datasets and filters for detecting falsified information could minimize the problem, they do not entirely prevent it either. Furthermore, a huge budget is needed to acquire up-to-date datasets from social networks. If individuals are incentivized to participate in questionnaires for attractive (monetary) rewards, there may be a risk of abuse, for example through

automated programs (Bots). The previously used citation from Kretzmann et al. fits in this example quite well "consumers of services focus vast amounts of creativity and intelligence on the survival-motivated challenge of outwitting the system or on finding ways, in the informal or even illegal economy, to bypass the system entirely". With the monetary incentives exceeding a personal limit, bypassing the system becomes a more lucrative endeavor than following the rules. The probability of abuse depends on the scenario and involves effort and expenses. Bots may falsify the analysis of trends or activities of data collected online. A great example is a study researching trending topics about e-cigarettes on twitter, highlighting the need of distinguishing “social bots” from humans in order to not discover falsified data (Allem JP, 2017). Publicly accessible markets (see: ebay.com) have already emerged, selling fake web traffic like clicks, follows, likes, views and so on. Thus, with enough financial resources or technical know-how, every online collected dataset can theoretically be completely manipulated and in exchange requires even more money or effort to get an even bigger dataset to be able to filter out fake data. In the context of digital currencies, concrete motives exist for using multiple accounts on the communication platforms of the community. For example, criticism can be voiced without causing permanent displeasure in the community, advertising (spam), attempts to receive double rewards, gain more decision-making power in the community or other forms of abusive behavior is enabled by using multiple accounts.

In the practical experiment the blockchain is presented as a possible source for the collection of relevant data. Although information such as "highest account balance" or "transactions per day" are not relevant because they could easily be falsified (e.g. creation of different addresses), by changing the underlying blockchain resulting in an obligatory “coin-swap”, statistical data can be collected and verifiably preserved on the blockchain. Based on the total supply of the legacy blockchain 700000 Domocoins were generated for the swap. After deducting the founder's shares, ~660000 Domocoins were available for swapping. A swap represents two transactions, firstly the community member must contact the founder directly and send him the old coins. Secondly, after verifying the transaction and re-installing the new wallet, new Domocoins are distributed in a 1:1 ratio. The only exception to this procedure is the most utilized marketplace (https://cratex.io), where the founder exchanged Domocoins for 32 users (according to the marketplace manager) in one transaction. All transactions after 01.02.20 were not considered in the following statistics. The masternode growth and the price development of Domocoin are exported from external service providers.

5.2 Domocoin Swap Results from 07.12.2019 - 12.01.2020

Table 5.1.: Transaction Data extracted from the DOMO Blockchain

Swap Date	Amount	Total Share		Amount desc	Total Share	Cumulated	Rank
07.12.2019	1964	**0,31%**		158261	**25,20%**	25,20%	1
07.12.2019	1838	**0,29%**	Marketplace	115817	**18,44%**	43,64%	2
07.12.2019	3254	**0,52%**		96732	**15,40%**	59,04%	3
07.12.2019	22171	**3,53%**		24811	**3,95%**	63,00%	4
07.12.2019	23236	**3,70%**		23236	**3,70%**	66,69%	5
07.12.2019	16562	**2,64%**		22171	**3,53%**	70,23%	6
07.12.2019	100	**0,02%**		19169	**3,05%**	73,28%	7
07.12.2019	1416	**0,23%**		16562	**2,64%**	75,91%	8
07.12.2019	8387	**1,34%**		16000	**2,55%**	78,46%	9
07.12.2019	1746	**0,28%**		13703	**2,18%**	80,64%	10
07.12.2019	4546	**0,72%**		13560	**2,16%**	82,80%	11
07.12.2019	24811	**3,95%**		12575	**2,00%**	84,81%	12
07.12.2019	2131	**0,34%**		8387	**1,34%**	86,14%	13
07.12.2019	5415	**0,86%**		7677	**1,22%**	87,36%	14
08.12.2019	115817	**18,44%**	Marketplace	7090	**1,13%**	88,49%	15
08.12.2019	12575	**2,00%**		6500	**1,04%**	89,53%	16
08.12.2019	20	**0,00%**		5415	**0,86%**	90,39%	17
08.12.2019	13703	**2,18%**		5188	**0,83%**	91,22%	18
08.12.2019	2627	**0,42%**		4865	**0,77%**	91,99%	19
08.12.2019	19169	**3,05%**		4600	**0,73%**	92,72%	20
08.12.2019	4134	**0,66%**		4546	**0,72%**	93,45%	21
08.12.2019	3000	**0,48%**		4205	**0,67%**	94,12%	22
08.12.2019	1001	**0,16%**		4175	**0,66%**	94,78%	23
09.12.2019	13560	**2,16%**		4134	**0,66%**	95,44%	24
09.12.2019	96732	**15,40%**		3600	**0,57%**	96,01%	25
09.12.2019	7	**0,00%**		3254	**0,52%**	96,53%	26
09.12.2019	101	**0,02%**		3000	**0,48%**	97,01%	27
09.12.2019	16	**0,00%**		2627	**0,42%**	97,43%	28
09.12.2019	4175	**0,66%**		2202	**0,35%**	97,78%	29
09.12.2019	4	**0,00%**		2131	**0,34%**	98,12%	30
09.12.2019	7090	**1,13%**		1964	**0,31%**	98,43%	31
09.12.2019	5188	**0,83%**		1838	**0,29%**	98,72%	32
10.12.2019	4865	**0,77%**		1746	**0,28%**	99,00%	33
10.12.2019	266	**0,04%**		1419	**0,23%**	99,23%	34
10.12.2019	4205	**0,67%**		1416	**0,23%**	99,45%	35
10.12.2019	3600	**0,57%**		1257	**0,20%**	99,65%	36
10.12.2019	100	**0,02%**		1001	**0,16%**	99,81%	37
10.12.2019	6500	**1,04%**		266	**0,04%**	99,85%	38
13.12.2019	158261	**25,20%**		200	**0,03%**	99,89%	39
13.12.2019	2202	**0,35%**		170	**0,03%**	99,91%	40
19.12.2019	16000	**2,55%**		151	**0,02%**	99,94%	41
19.12.2019	1257	**0,20%**		101	**0,02%**	99,95%	42
19.12.2019	4600	**0,73%**		100	**0,02%**	99,97%	43
20.12.2019	151	**0,02%**		100	**0,02%**	99,98%	44
20.12.2019	10	**0,00%**		20	**0,00%**	99,99%	45
20.12.2019	20	**0,00%**		20	**0,00%**	99,99%	46
22.12.2019	10	**0,00%**		16	**0,00%**	99,99%	47
22.12.2019	1419	**0,23%**		10	**0,00%**	100,00%	48
27.12.2019	170	**0,03%**		10	**0,00%**	100,00%	49
27.12.2019	10	**0,00%**		10	**0,00%**	100,00%	50
12.01.2020	200	**0,03%**		7	**0,00%**	100,00%	51
12.01.2020	7677	**1,22%**		4	**0,00%**	100,00%	52

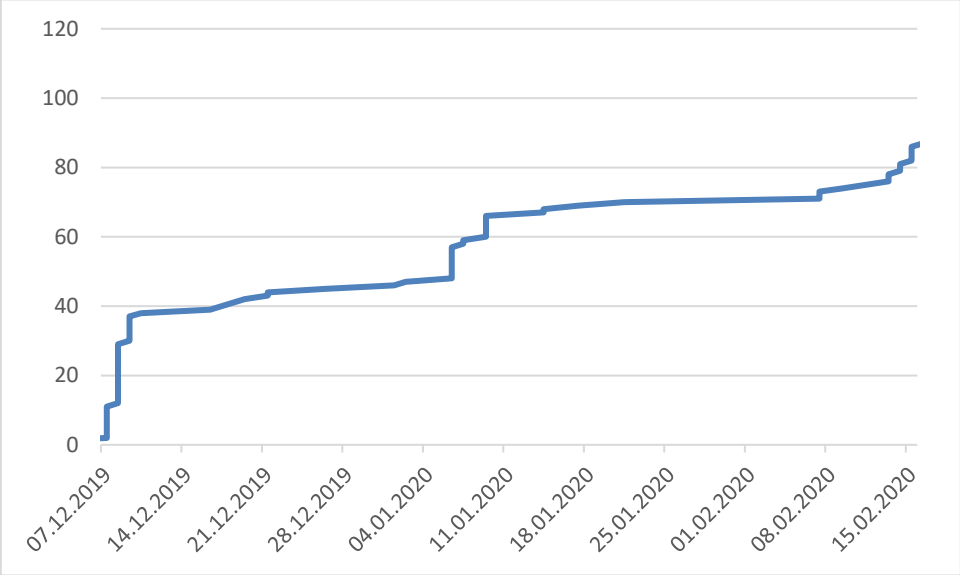
Table 5.2.: Domocoins Swapped per Day

Date	Total Amount	Total Share	Cumulated Total Amount	Cumulated Total Share
07.12.2019	117577	**18,72%**	117577	18,72%
08.12.2019	172046	**27,40%**	289623	46,12%
09.12.2019	126873	**20,20%**	416496	66,32%
10.12.2019	19536	**3,11%**	436032	69,43%
13.12.2019	160463	**25,55%**	596495	94,98%
19.12.2019	21857	**3,48%**	618352	98,46%
20.12.2019	181	**0,03%**	618533	98,49%
22.12.2019	1429	**0,23%**	619962	98,72%
27.12.2019	180	**0,03%**	620142	98,75%
12.01.2019	7877	**1,25%**	628019	100,00%
Sum	628019	100,00%		

Table 5.3.: Swap Transactions (Users) per Day

				Incl Users from Exchange	
Date	Swaps	Cumulated Total Share		Swaps	Cumulated Total Share
07.12.2019	14	**26,92%**		14	**16,67%**
08.12.2019	9	**44,23%**		41	**65,48%**
09.12.2019	9	**61,54%**		9	**76,19%**
10.12.2019	6	**73,08%**		6	**83,33%**
13.12.2019	2	**76,92%**		2	**85,71%**
19.12.2019	3	**82,69%**		3	**89,29%**
20.12.2019	3	**88,46%**		3	**92,86%**
22.12.2019	2	**92,31%**		2	**95,24%**
27.12.2019	2	**96,15%**		2	**97,62%**
12.01.2019	2	**100,00%**		2	**100,00%**
Sum	52			84	

Table 5.4.: Masternode age



Source: www.ihostmn.com

5.2.1 Interpretation

The collected data (Table 5.1) shows that 628019 Domocoins were swapped within a timeframe of 36 days. This equals to about 95% of all Domocoins available for the swap (660000). It is not clear whether this number would be different if the marketplace operator wouldn´t have managed the swap for its users. With respect to the validity of the data, the transaction with the marketplace (funds of 32 accounts) is visually highlighted as well as separated (Table 5.3). The reason lies in a potential risk of duplicate data, as there is no possibility to verify the marketplace data in regards of its authenticity. Since no personal identification measures are required by the exchange individual users are free to operate several different accounts at the same time, falsifying the dataset of swap participators. Particularly noteworthy is that 94,98% of all available Domocoins participated and 76,19% of all transactions (excluding Marketplace Users) were already conducted within the first week after the announcement. A look at the age of the Masternodes (Table 5.4), which are created for earning a share of the block rewards (requires 1000 Domocoins per Masternode) shows that 39 Masternodes (45%) of all currently active 87 Masternodes were created within the first week of the swap. By comparing the amount of transactions (Table 5.3) with the number of users on the social communication channels of the Community (Telegram, Twitter, Discord), it becomes clear that a large share of the audiences did not participate in

the swap, probably because they do not own any Domocoins and are thus considered not being part of the community. Comparing 84 transactions to 578 users on Discord, 145 users on Telegram and 430 followers on Twitter (checked 15.02.20) highlights the issues in calculating the size of a community based on the number of users within a public server or social network. It is important to note that 84 users are already a very optimistic estimation as potential duplicates and inactive users from the marketplace are included. The swap of Domocoins is forcing a participation as the remaining Domocoins may be redistributed to new community members if not redeemed. Thus, the engagement of the community members is very high in that situation. Besides developing a reference about a realistic size of the community, this engagement could also be used to collect data regarding the activity and availability of single community members. By collecting data on aspects like time passed until first reaction, time passed until finalization and average time to reply, highly active and responsive members could be discovered, even if not visible in public chats. However, this example of a possible scientific research requires extensive theoretical knowledge in areas like psychology, to be able to extrapolate relevant results. In order to avoid criticism on the validity of the concluded assumption caused by the marketplace data, an experimental redistribution of the marketplace transaction (Date: 08.12.19; Amount: 115817 Domocoins and 32 Accounts) was conducted. The exclusion of the data from the first week (07.12.19 to 14.12.19) and redistributing it evenly on future timeframes, provides the following results: 76.5% of all Domocoins were swapped and 47.6% of all community members have finalized the swap process within the first week. Based on these results, we conclude that new messages and announcements are expected to reach at least 47% of the whole Domocoin community within one week. Since 95% of all available Domocoins have already been swapped, the chosen communication channels seem to be enough to reach the majority of the Domocoin community within 36 days. Based on these results, a grace period of up to 36 days will be utilized when integrating minor features or facilitating market research in the DOMO Community to give every Member enough time to respond. Within one week, first results can be already reviewed to get relevant feedback on the outcome.

5.3 Practical Experiment

In the next step, the procedures of the practical experiment will be examined in order to derive concrete, general recommendations for practical application.

The practical experiment starts with the technical preparation of the cryptocurrency, consisting of the underlying source code, the specifications of the currency and the wallets for easy receiving and sending. Selected inflation rate, total supply, distribution and algorithm are explained by economic and technical aspects. Depending on the technical skills of the developer and the time allocated for maintenance, the development of a custom blockchain may not be the optimal solution. Projects that enable the development of a sidechain or tokens on their blockchain provide a remedy. However, it should be noted that functions such as "Block Rewards" or "Masternodes" are often not available. Furthermore, in the example of the development of a token on Ethereum, transaction fees must be paid, which therefore presuppose the ownership of Ethereum. A detailed cost/benefit analysis should therefore be made when selecting the optimal solution. A visual presentation of the information relevant to users in the form of a wallet should make it easier to get started with the currency. Paperwallets offer the possibility to generate a Document including a QR code, which can be used to receive coins, and thus offer the possibility to generate a receiving address in a very short time without the installation of software. The coins can be printed out and physically passed on as well. A landing page should summarize all important information and provide links to the wallets and social communication channels. Once the basic elements have been prepared and the functionalities of the blockchain and wallets have been successfully tested, the marketing strategy is planned. Practical experiment has shown that the combination of Bitcointalk, Twitter, Telegram and Discord are ideal for both attracting attention initially and maintaining communication with the community in the long term. A competitive analysis, as well as feedback from the initially small community, provides a very good source to identify relevant communication channels and marketing strategies. The direct addressing of influential individuals (influencers) was, in the case of the practical experiment, another great source for awareness generation. For example, influential contacts of the founder ensured a visible growth of the community through advertising on Twitter. Partnerships are a very popular form of awareness raising and the practical experiment has also shown that cooperation with other communities leads to community growth through the combination of giveaways and publication of the news on all communication channels. The extrinsic motivation to receive a reward for an activity attracts additional attention and highlights a benefit of using a digital currency. Partnerships, if consistently enforced, can be paid for exclusively in the cryptocurrency, so theoretically no additional budget for marketing

is necessary. Thanks to Discord's permission system, different roles could be visually displayed and different rights assigned in the practical experiment. In general, delegating tasks is a good idea for a steadily growing community, since assigning responsibilities brings advantages for various reasons. Many time-consuming tasks can be delegated that way and thus take over a very large part of the additional work that is generated by the creation of a community. If there are communication barriers between community members speaking different languages, moderators can be used to translate and publish messages. Marketing managers can, for example, plan partnerships and advertise in other communities, but also increase visibility by managing accounts on other social networks. Designers can contribute to the visual representation by contributing, for example, advertising banners or elements for the landing page. However, identifying and motivating competent people is a challenge. In the practical experiment "bounties" were published, which describe possible areas of responsibility within the project. By offering appropriate rewards for certain activities, incentives were created for the members to actively contribute to the project. However, care should be taken here to first observe and progressively reward performance in order to prevent abuse. The more information and examples of possible activities are presented within the project, the higher the probability that individuals will identify with some of them. The creation of a "Capacity Inventory" as exemplified by the "DOMO Network" provides an ideal insight into the skills of the community members and can be used as a source for identifying potential team members.

To ensure a lively exchange and feedback within the community, there are various methods that have been implemented in the practical experiment. One method is the principle of Gamification, where the members are motivated to interact by creating a competition. An artificial pressure for timely activity can be triggered by a limited time window and by awarding prizes. So-called "giveaway bots" are programs that automatically trigger competitions or gifts. In the practical experiment, wallet functions were also integrated, enabling receiving and sending by simply using a command in the chat, without the need for wallet software. The public sending of coins in social media also offers the possibility to make outsiders aware of the project and send them coins (even without asking).

The presented lead-user concept was also applied in the practical experiment and serves to identify the most valuable community members. In this case mainly developers were identified who have made substantial contributions to the project. Giveaway bots, shared hosting for Masternodes or the discovery of vulnerabilities were contributions that took a lot of time and generated added value for the whole community. It is difficult to establish general guidelines for identifying lead-users, as the added value generated depends on the scenario. Nevertheless, lead users are usually characterized by a high level of activity. The high level of interest in the project, active participation in discussions, and extended knowledge in specific fields were characteristics that were used in the practical experiment. The degree of innovation is also high in most cases, which allows detailed discussions and brainstorming's about future innovations and ideas, while remaining realistic.

If the community is to serve as a basis for the research in the context of a market and potential analysis, the following aspects must be considered. There is a risk that some users utilize different accounts or there may be bots in the community. Therefore, the use of a metric like the number of community members can lead to falsified results. Especially if a survey is conducted and rewards are offered for participation, there is a risk that these could be abused and falsified by individual users or bots. A "swap" carried out as part of the practical experiment, which was intended to introduce fundamental changes to the block chain, has proven to be a successful method of data collection in public virtual communities. Since community members were forced to participate in the exchange, as their coins would otherwise no longer be usable, the level of participation was very high and, due to the additional effort that was not compensated, a lower risk of falsified data can also be assumed. Limited access, such as by verifying the ownership of the coin (DOMO Network) or concentrating the analysis on a smaller group such as the lead-users, can lead to better but, due to the smaller quantity, also fewer representative results.

6 Conceptualization

Preface

In a first theoretical integration, models of the asset-based community development approach were elaborated and brought into a product development context by terms such as open innovation and lead-user. The interdisciplinary character of virtual communities was highlighted by examining aspects of communication (language moves), psychology (motivation) and politics (e-democracy). An experiment was then carried out to illustrate the integration of a cryptocurrency and to derive concrete guidelines for further action. Based on the original concept of Kretzmann (et al.), the concept at the center of this paper is now presented.

6.1 Definition

In order to differentiate the new concept and to enable a point of reference for the purpose of subsequent research in the future, the formulation of a new term seems logical. According to the primary focus and probably most significant difference in comparison to similar approaches, we are going to define the new concept as follows:

By incorporating the asset-based, internally focused and relationship-oriented values of virtual communities and combining the concept with a cryptocurrency, a new development form emerges: "**crypto-based community development**"

For the sake of clarity, we refrain from adding a subtitle at this point and leave it to the creativity of future scientists who base their research on this concept.

Crypto-based community development (CBCD) builds on top of ABCD (asset-based community development) and essentially consist of 4 additional elements:

- Community Management
- Community Assets & Capacities
- Community Participation
- And obviously, cryptocurrency based

All elements are equally important and do not necessarily depend on each other to be implemented successfully. Subject to the organizational form and scenario in which the concept is to be applied on, only individual elements may be used to reinforce existing structures. The 4 elements of CBCD should trigger synergy effects thus, the theoretically highest potential of the concept can only be reached by using all elements.

The term "community" has been used throughout this thesis as a synonym for "virtual community", therefore the term "community" is also equated with the term "virtual community" in the following formulations. Since the term "community development" represents both the starting point and the prerequisite for a successful application of the concept, the term must be defined in this new terminology first.

6.2 Community Development

Community development represents a form of project development where potential customers can be actively integrated into the development processes of a company. Following the Open Innovation approach, the last step is to transform potential consumers of a product into producers and developers of a product. The potentials resulting from a successfully integrated community development are as diverse as the possible areas this approach could be applied on. However, initiating and making a community grow, motivating individuals to join and contribute as well as identifying and mobilizing hidden potentials present challenges to large corporations and start-ups alike. In order to maintain the interdisciplinary character of a virtual community, a part of Preece's Definition was selected and supplemented by the twelve principles of a virtual community by Miia Äkkinen:

"An online community consists of people who interact socially as they strive to satisfy their own needs or perform special roles, such as leading or moderating. They have a shared purpose, such as an interest, need, information exchange, or service that provides a reason for the community." Preece (2000)

The following characteristics must be fulfilled in order to be able to speak of a virtual community, which can be used as a basis for the implementation of this concept:

6.2.1 12 Principles of Virtual Communities

Principle	Explanation
Purpose	Community exists because the members share a common purpose which can only be accomplished jointly.
Identity	Members can identify each other and build relationships.
Reputation	Members build a reputation based on the expressed opinions of others.
Governance	The facilitators and members of the community assign management duties to each other, allowing the community to grow.
Communication	Members must be able to interact with each other.
Groups	Community members group themselves according to specific interests or task
Environment	A synergistic environment enables community members to achieve their purpose
Boundaries	The community knows why it exists and what or who is outside and inside
Trust	Building trust between members and with community facilitators increases group efficiency and enables conflict resolution.
Exchange	The community recognizes forms of exchange values, such as knowledge, experience, support, barter or money.
Expression	The community itself has a “soul” or “personality”; members are aware of what other community members are doing.
History	The community must keep track of past events and must react and change in response to it.

Source: Table 2.2: **12 Principles of virtual communities**

If a foundation of a community is now planned within the framework of this concept, some important aspects should be considered first. Based on the asset-based community development approach, a positive, inward-looking view should be emphasized at this point. Instead of pointing out deficiencies and problems according to the classical, problem-oriented approach, the community as small as it might me, should be consulted for feedback, opinions and solutions. The involvement of external service providers has to be avoided wherever possible. If an external service provider is regularly called in, the feeling in the community may arise that they are not qualified or trustworthy enough to take on this task and are therefore only allowed to do the "worthless" work.

Creating a community can take a lot of time and even then, there is no guarantee that many interested individuals will come together to generate added value for the company. Consistent and sustained progress, highlighting all achievements (as small as they might be), providing value for the community (not only trying to benefit from it) and seeking regular feedback from the community are essential for a healthy community growth.

6.3 Community Management

This topic deals with organizing and communicating within a virtual community in order to optimize the exchange of information and to achieve a more efficient cooperation.

The communication within a community determines how the individual participants develop and how they relate to other members. If a generally negative mood due to some disagreements prevails, this is expressed in taunts and demotivation in the community. Online disinhibition (Suler, J. (2004)) can cause people to insult and disregard other community members for no apparent reason. Jokes and sarcasm could be misunderstood without even noticing it. With a steadily growing number of community members, the risk of someone committing unfounded mischief in the chat also increases. The first step is therefore to establish guidelines (preferably before the community is founded) to provide a reference for behavior in such scenarios. The “Terms of Use” describe the rights of the individual community members. By participating in the respective communication medium, the guidelines are automatically accepted. In the worst case, they are also legally valid and protect the organization from possible liability. Another form of guidelines is the so-called "Codes of Conduct", they define behavior that is not tolerated in any way, which is especially important for moderators to point out misconduct and react accordingly.

Another possibility to improve the quality of communication is the use of "shared mental models". By providing tutorials and training material, the intrinsic motivation to learn is activated and at the same time the level of knowledge of participating community members is increased. This, in turn, enables community members to contribute on complex topics and develop a more critical opinion.

The management of responsibility plays another very important role. Delegating tasks can dramatically reduce the workload of top management, but at the same time it motivates and binds the person to the community. Delegating a community member, as opposed to a private and inaccessible team, signals to the community that, with enough willpower and skills, anyone can play an important role in the community and not just the exclusive circle of the founder.

Following, list of potential roles is displayed, please note that this is only to act as an example and there are obviously may more possible “jobs”:

Advertisement Manager	Advertising on various external platforms
Marketing Manager	Negotiates partnerships and arranges cooperation
Translator	Translates news into foreign languages
Designer	Cooperates with Managers or Developers
Moderator	Moderates certain areas, ensures that the rules are followed
Developer	Contributes to technical implementations
Social Media Manager	Manages social networks
Partner	Representative of an external community or service

In a comparable attempt of integrating ABCD in a virtual environment Shah et al (2018) has developed a summarizing guide of "language moves", which offer concrete practical examples and, if properly applied, dramatically improve the communication within the community:

6.3.1 Language Moves

Asset-Based	
Offering praise	Example: There's wonderful sensory details here. I really felt like I was in the scene, feeling the same things
Using strengths as base for growth	Example: The point is to practice. As a bow hunter, I'm sure you understand how important practice is (by the way I am still really impressed that you can do that).
Acknowledging strengths dominant society may frame as deficits	Example: I love how you incorporate Spanish into this writing! It makes it special to you and your story and gives the piece a strong feeling of how your family life is!
Internally Focused	
Responding to digital community preface statements (such as Notes)	Example: In your author's note, you asked about transitions, and I think…
Stating intention not to control	Example: In my opinion, the most important part of your writing is your voice, so I will try my very best not to steamroll your writing in any way. In the end, it is your writing.
Highlighting personal subjectivity	Example: Something that I think you should focus on in your next revision is the organization of your piece. What is that most important information that should come first? To me, I would think describing what he did in the military should come before how he felt after he left it.
Explicitly affirming community agency	Example: I loved seeing which of my comments you chose to take and which you felt you didn't need to. That is one sign of a great writer: being able to pick and choose what critiques you want to apply to your own writing.
Incorporating choice	Example: Would you rather have the whole thing in your perspective, or have the whole thing from your mother's perspective? I think there are very good reasons for either choice!
Relationship Driven	
Beginning with introduction posts	Example: "I am from" poems
Offering relevant relational comments	Example: I also got picked on when I was little. I had a hard time making friends for a really long time, I'm sorry that it happened to you as well
Blending personal connection with tasks	Example: One thing that I would like to hear more about are your emotions about leaving Ceresco. I moved a couple times when I was little too, and I always HATED moving. Was it hard moving?
Taking a posture of learning from community members	Example: I'm a terrible cook so I'd love to hear more on this! Maybe it would help improve my cooking, haha!
Remembering and referring to personal details from community members	Example: I appreciated how your essays showed your personality: your high regard for your friends, your homesickness for Colorado, and your love for playing videogames.
Using relational emoticons and salutations when appropriate	Example: :-D
Stating the relationship is valued	Example: I'm excited to get to know you, and hopefully together we can learn more about writing

Source: (Shah, et al., 2018) S.12 – 13

6.4 Community Participation

Facing empty chats and no contributions of a community can be very frustrating and demotivational for the team. With respect to the size of this thesis and the origin of this topic residing in behavioral psychology and cyberpsychology, a detailed explanation of this topic will not be conducted. However, referencing to the chapter 3.4 – Community participation, a lot of content has been provided already. Highlighting different forms of motivation and theories like assigning experts, discovering lead-users and e-democracy display the high complexity of this topic and the urge for further research. Since the specialization of the author of this thesis relies in e-commerce, going deeper into these psychological areas is outside of his competence as well.

6.5 Community Assets & Capacity

Discovering and enabling the „social assets" of a community has been highlighted several times throughout this research. As big as a community might become, discovering valuable community members and assigning them as "lead-users" requires predefined approaches. The most utilized way is by defining requirements and observing or directly researching according users. There are many ways of collecting data about a community, with many being subject to manipulation (see. 5.1 collecting data from virtual communities). Three approaches have been identified and modified to fit in the crypto-based community development concept:

Cryptocurrency Swap

As described in Chapter 4 and 5, swapping the currency of a community is a possible way to collect statistical data, which tends to be more accurate than purely relying on requested data by for example social networks. Information about activity and size of the community as well as getting more results from questionnaires due to the enforced participation are just a few results.

Community Inventory Map & Community Assets Map

On the following pages, layouts of the two approaches are displayed. Community managers may utilize these examples in order to get a better overview about all the entities, their relations to each other, as well as skills and capacities of the community members.

6.5.1 Community Inventory Capacity

(Source: (Kretzmann & McKnight, 1993) p.19)

Name:

Contact Information [E-Mail, Phone, Discord, Twitter] (please write at least two):
1. 2. 3.

Question 1: Skills Information

What are your priority skills, which you feel most comfortable with? (You can list as many skills as you feel might be relevant for the community)

Question 2: Community Skills

Have you any experience in the management of a Community?	
☑ Yes, *(please elaborate below)*	☐ No

Would you be willing to contribute to Community development?	
☐ Yes, …	☐ No

what would be your dream job in the Community?

_____

Question 3: A: Business Interest

Have you ever considered starting a business?	
☐ Yes, (write below)	☐ No

_____

Did you plan to start it alone or with other people?	
☐ Alone	☐ Others

Did you plan to operate it out of your home?	
☐ Yes	☐ No

What obstacle kept you from starting the business?

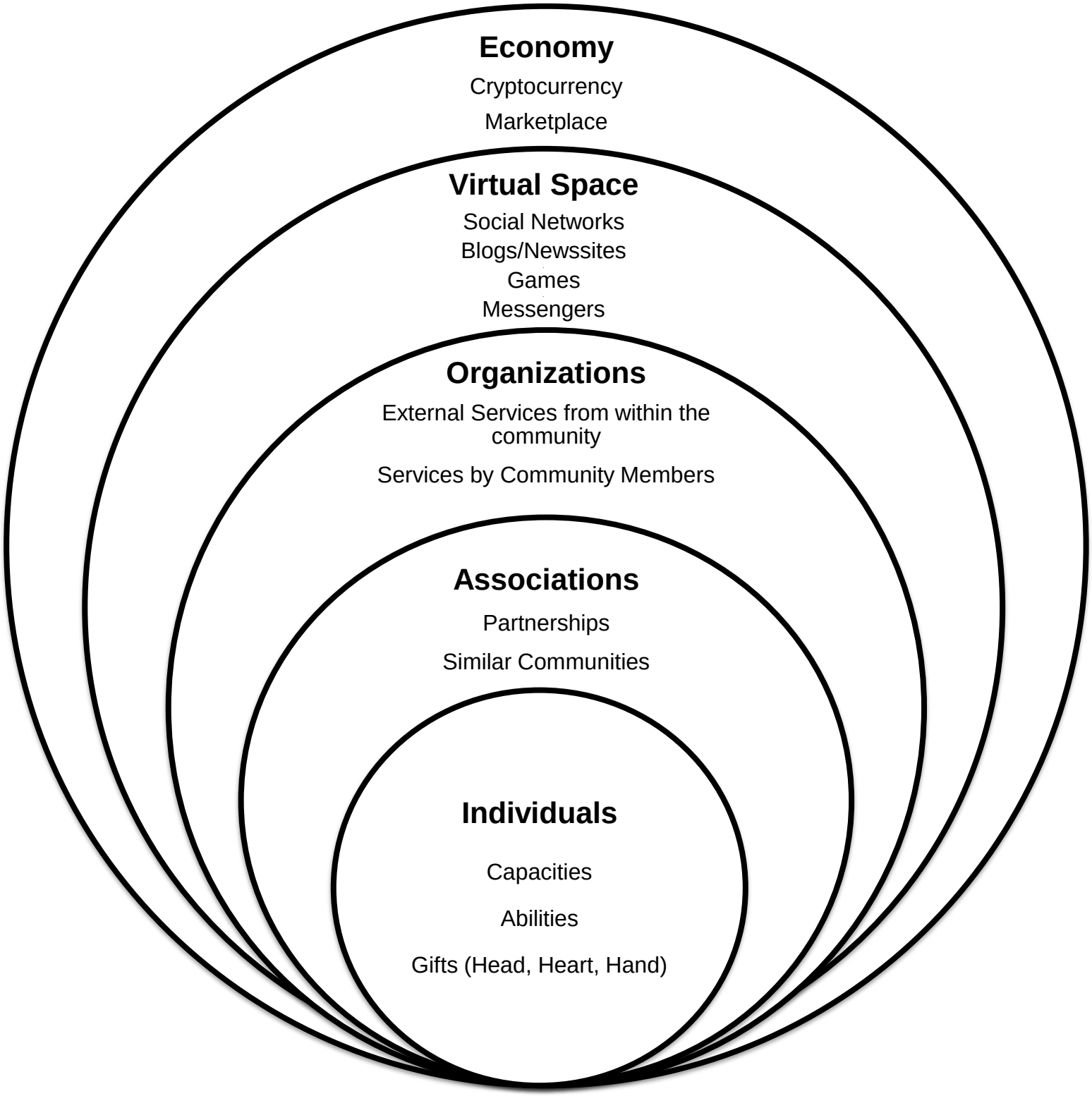
Question 3: B: Business Activity

Are you currently earning money on your own through the sale of services or products?	
☐ Yes	☐ No

If yes, what are the services or products you sell?
Whom do you sell to?
How you get your customers?
What would help you improve your business?

6.5.2 Community Assets Map

Figure 6.1 Community Assets Map



Source: (Kretzmann & McKnight, 1993) p. 7

7 Conclusion

After highlighting the purposes of utilizing a cryptocurrency in chapter 3.6 - The scope of Cryptocurrencies, the practical test in chapter 4 delivered results, which benefit community development in general. Using a cryptocurrency to pay for services, advertisements and partnerships, without having a directly comparable value, was possible and could directly benefit the community build around it. Using the currency to reward for contributions was successfully conducted as well. Furthermore, supported by "tipping bots", the cryptocurrency could be used as a direct marketing tool by giving away coins to interested people. The practical experiment supports the theory, that using a cryptocurrency to motivate individuals to contributions, pay for salaries and services as well as using the currency itself as marketing tool can benefit a business strongly. Problems like a limited budget, lack of market research for product fit or an incompetent team can be resolved by integrating a community into the business processes. While developing and maintaining a community might be a lot of effort, the potentials of an international virtual community full of people who show interest in your endeavor, sharing experience and knowledge outweighs the potential costs. When dealing with a very low budget, start-ups or small groups usually put marketing and partnerships at the end and focus on developing the product first. Utilizing a cryptocurrency, which for example offers early-bird access to the product, marketing and market research does not require enormous amount of money anymore. By doing a "swap" the size of the community can be estimated very precisely, while achieving a lot of participation in questionnaires. Discovering lead-users and rewarding with a cryptocurrency motivates contributions and can ultimately lead to discovering new team members or even new products. Sadly, cryptocurrencies are mostly used as a means of exchange, even though blockchain features go far beyond speculating on a price per coin. The purpose of Domocoin, for example, is to act as a "ticket" to be eligible to enter the community platform (DOMO Network). In my opinion, a shift away from the speculative monetary valuation of cryptocurrencies is required to fully grasp the potentials of cryptocurrencies and their underlying blockchains. In conclusion, we have introduced the asset-based community development, which have been successfully deployed on local communities and transferred the concept into a virtual environment by adding models and theories from virtual community and product development research. The practical test show how a digital currency can further strengthen the concept of community development. By taking all researched aspects into account, a new concept has been proposed. The author will conduct further research using the DOMO community and publish this paper in a community-oriented manner. Scientists are encouraged to conduct further research to explore the full magnitude of this new approach.

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