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# Exploring the Investor Experience in the World of Cryptocurrencies: Customer Journey of Initial Coin Offerings

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<p>Initial coin offerings are a novel form of early-stage funding, enabled by blockchain technology and crypto tokens. It is becoming a significant disruptor of contemporary fundraising conventions. Current forms of initial coin offerings have emerged without regulation and no standard process of investing in one exists. The phenomenon has barely been studied previously in academia. How well existing theories of crowdfunding apply in the context of initial coin offerings is still unknown.</p> <p>This thesis provides knowledge on initial coin offerings from the perspective of the investor. The objective of the study was to utilize service design methodology into understanding how the investing process realizes from the investor's perspective. Furthermore, the aim was to understand the factors affecting the investor experience during the process. The study was conducted as qualitative interviews with eight investors. Through inductive content analysis, a model of a generic investor journey with related customer experiences was created.</p> <p>The results indicate that from service perspective initial coin offerings are unstandardized, fragmented and lack direct touchpoints between the investor and the campaign founder, implying inadequacy of service design in the campaigns. Regarding investor behavior, initial coin offerings can be categorized as a hybrid form of funding closely related to equity crowdfunding and angel investing. Bad reputation and lack of trust are driving forces affecting investor behavior and experiences throughout the investment process. Decentralized systems bring along novel challenges regarding the customer experience and investing requires a high level of IT skills, which limits the adoption of initial coin offerings as a form of funding. Poor customer experience currently limits the disruption potential of initial coin offerings.</p>		
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<p>Polettiantti on uusi lohkoketjuteknologian ja kryptopolettien mahdollistama alkuvaiheen rahoituksen muoto. Sillä on potentiaalisesti häiritsevä vaikutus nykyisiin rahoitusmekanismeihin. Nykyinen polettiantien muoto on kehittynyt ilman regulointia, eikä standardia sijoitusprosessia ole olemassa. Ilmiötä ei ole akateemisessa maailmassa juurikaan tutkittu aikaisemmin. Kuinka hyvin joukkorahoituksen teorit soveltuvat polettiantien kontekstiin, on toistaiseksi tutkimatonta.</p> <p>Tämä diplomityö tarjoaa tietoa polettianneista sijoittajan näkökulmasta. Tutkimuksen tavoitteena oli hyödyntää palvelumuotoilun metodeja sijoitusprosessin ymmärtämiseksi sijoittajan näkökulmasta. Tämän lisäksi tavoitteena oli ymmärtää sijoittajan asiakaskokemukseen vaikuttavia tekijöitä prosessin aikana. Tutkimus toteutettiin kvalitatiivisena haastattelututkimuksena, johon osallistui kahdeksan sijoittajaa, joilla on kokemusta polettiannissa sijoittamisesta. Induktiivisen sisällönanalyysin keinoin tutkimuksessa tuotettiin yleisluontoinen sijoittajan asiakaspolku yhdessä sijoittamiseen liittyvien asiakaskokemusten kanssa.</p> <p>Tutkimuksen tulokset osoittavat, että palvelunäkökulmasta polettiannit ovat standardisoimattomia, sirpaleisia ja suorat kontaktipisteet sijoittajan ja varainkerääjän välillä ovat vähäisiä, mikä viittaa palvelumuotoilun puutteellisuuteen polettiantien suunnittelussa. Sijoittajien käytöksen näkökulmasta polettiannit voidaan luokitella hybridimallin rahoitukseksi, jolla on yhteistä pääomitusperusteisen joukkorahoituksen ja enkelisijoittamisen kanssa. Huono maine ja luottamuspula ovat ajavia voimia, jotka vaikuttavat sijoittajan käytökseen ja kokemuksiin koko sijoitusprosessin ajan. Hajautetut järjestelmät tuovat mukanaan uusia haasteita asiakaskokemukseen ja sijoittaminen vaatii korkeaa tietoteknistä osaamista sijoittajalta, mikä rajoittaa polettiantien omaksumista rahoituksen muotona. Heikko asiakaskokemus rajoittaa nykyisellään polettiantien disruptiopotentiaalia.</p>			
<b>Asiasanat:</b>	rahakeanti, polettiantti, kryptovaluutta, rahake, poletti, joukkorahoitus, asiakaspolku, palvelumuotoilu, asiakaskokemus, käyttäjälähtöinen suunnittelu		
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# Chapter 1

## Introduction

### 1.1 Background

Throughout 2017 the crypto-community witnessed unprecedented hype and increase in number and value of various cryptocurrencies. One significant phenomenon that took over the domain was a novel form of fundraising called *Initial Coin Offerings* (ICO), and it has been stated that 2017 was “the year of the ICO”; companies and organizations raised over \$5bn in a wide variety of ICO campaigns (CoinDesk, n.d.; Thomas, 2017). Thus ICOs are causing a disrupting effect in the field of traditional crowdfunding and venture capital. With the presented sums at stake, ICOs and crypto-world, in general, are creating a substantial economic impact that has raised the attention of mass media and governments (e.g., Clayton, 2017; FCA, 2017; Reuters, 2017; Roberts, 2017; Zhao, 2017). Being an emergent phenomenon without any predefined standards or regulation, ICOs have caught the attention of regulators in countries worldwide. As a reaction to the events of 2017, authorities have taken the initiative and regulation forming around ICOs is an ongoing process (ACCA, 2018).

Even though the ICO phenomenon has been widely covered in media, it has yet barely been studied in academia (table 1.1). Definitions, frameworks and general understanding of the phenomenon thus remain shallow and should be further studied. In other words, studying ICO from almost any aspect creates further knowledge about the phenomenon and helps both investors and service providers in the context. The current typical structure of ICOs has been formed inherently without any standardization. Thus there is no scientifically proven set of ‘ICO best practices’ which makes designing ICOs an ambiguous task.

The typical structure of ICOs that leans on emergent conventions has

Table 1.1: Search result numbers of ICO related keywords in Google search, Google Scholar and Scopus (searched on 29th December 2017)

Keyword	Google search results	Google Scholar search results	Scopus search results (title, abstract, keywords)
Blockchain	50 200 000	19 600	752
Cryptocurrency	34 600 000	6070	239
Crowdfunding	12 200 000	40 400	923
Initial coin offering	1 010 000	155	3

not been much studied from the investor's perspective<sup>1</sup>. How investors navigate, evaluate investing targets and make investment decisions in the scene that suffers from a vast number of scammers and lack of authoritative actors should be further studied. The differences between investor behavior in traditional crowdfunding and investing in ICOs is still mostly unexplored; the provided/needed information on investment property, means of distributing the information, motivations, needs and investor actions leading to the investment decision might differ significantly. ICO as a form of funding has disruptive potential, and it is still unknown what are the ultimate implications the phenomenon shall have in the financial markets and conventions. Both ICOs and crowdfunding enable any individual to become an investor. The dynamic change in which unaccredited individuals become early-stage investors is a novel phenomenon, which makes it imperative to understand the investor behavior and experiences as key drivers in the context of investing. Furthermore, cryptocurrencies (and ICOs) have so far been targeted mainly for specific audiences, and the user experience (UX) of ICOs has been argued to be fundamentally problematic (Indiegogo, 2017; Svinkin, 2016). This makes studying the ICOs from investor perspective a relevant and a needed task.

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<sup>1</sup>By the time of finalizing this thesis in May 2018, Google Scholar resulted in 275 articles in English language with the keyword 'Initial coin offering'. Among these 275 articles, only six had investor perspective, success factors or investor decision making criteria of ICOs in focus. Important notion is that one of the results (Varnaite, 2018) is a freshly published master's thesis and the rest (Adhami et al., 2018; Amsden and Schweizer, 2018; Fisch, 2018; Hargrave et al., 2018; Yadav, 2017) are unpublished articles from SSRN eLibrary. The article by Adhami and others (2018) is forthcoming in Journal of Economics and Business, otherwise no peer-reviewed research addressing investor perspective in ICOs was found amongst the 275 articles.

## 1.2 Objectives of the research

This thesis aims to provide knowledge on the initial coin offering (ICO) phenomenon from the perspective of the investor. The intention is to utilize principles of design thinking and the methodology associated with service design in producing the knowledge. The goal is to form a general understanding of the process of ICO from the investor perspective (customer journey) and create knowledge about how investors experience the different stages of the process. The focus of the study is thus twofold: to understand how the ICO as a process realizes from the investor perspective and to understand the factors affecting the investor experience throughout the process. Hence the following research questions are formed:

1. **How is a generic ICO process structured from the investor's perspective?**
  - (a) What is the customer journey like?
  - (b) What are the main differences in investor behavior between traditional crowdfunding and ICO investing?
2. **How investors experience the investing process?**
  - (a) What are the challenges/benefits investors experience during the process?

With a novel area of research that has not been studied much previously, it is easy to choose too broad a topic. At this stage, it is essential to focus on creating understanding on the basic functionalities within the phenomenon. With the crypto-domain already struggling with problematic user experience (Indiegogo, 2017; Svinkin, 2016), it is natural to narrow down the research questions to focus on investor experience and take the initiative to shed light on this specific topic for the needs of the community designing and developing ICOs. As a byproduct, the thesis explores the feasibility of taking design thinking approach as a mean of academically exploring funding processes and systems. Economic, regulatory or technical implications of ICOs will not be in the focus of this thesis, and the phenomenon is observed from the investor perspective instead.

## 1.3 Methodology and material

This study is built on two sources of data: literature review and empirical user research. In the literature review, the central themes related to the research

(i.e., ICO, crowdfunding, service design, customer experience and customer journey mapping) are defined, and the existing research regarding them is introduced. The literature review introduces a base of knowledge about the area of research and provides curated definition on the phenomenon of ICO. Due to the lack of previous research on investor perspective of ICOs, the literature review and definition of ICO lean partly on non-academic news articles, authoritative reports and announcements, open source reports and blog posts.

The empirical user research provides the primary source of data for answering the presented research questions. It is conducted as qualitative semi-structured in-depth interviews, taking an inductive approach to understanding the phenomenon. A combination of sequential incident technique (Stauss and Weinlich, 1997) and lightweight journey mapping (Dove et al., 2016) is used as the customer journey mapping method to create an understanding of the generic ICO process and the customer journey. Lightweight journey mapping is a user-driven tool that combines elements from critical incident technique (Flanagan, 1954) and customer journey mapping to create a blueprint of the most influential touchpoints of the customer journey linked to the user's experience at each point of interaction. Sequential incident technique broadens the viewpoint from solely focusing on critical incidents and takes ordinary incidents into account also. Customer journey mapping is only one part of the interview and thus acts as a complementary method within the rest of the interview. The interview data is eventually analyzed using systematic qualitative content analysis method (Elo and Kyngäs, 2008).

The subjects of the study are people who have taken part in ICO(s). By interviewing these people, the aim is to create understanding about the customer journey and the experiences related to the touchpoints in it. The interviewees reflect and recollect their experiences investing in an ICO, and thus these interviews represent episodic or cumulative user experience (Roto et al., 2010).

## 1.4 Thesis structure

The thesis consists of five separate chapters: 1) introduction, 2) conceptual background, 3) methodology, 4) results and 5) discussion and conclusions.

The first chapter presents the premise of the research, research problem, research questions and the overall approach and structure of the thesis.

The second chapter explores the conceptual background of the study. It consists of two main sections and a third combining section that focuses on

the intersection between the two main sections. First, the world of ICOs is explored, and a general understanding of the characteristics of the phenomenon is formed. The phenomenon is viewed in comparison to existing literature on closely similar financial phenomena. The second part of chapter two introduces the world of service design. It goes through the theoretical background of design thinking approach and customer journey mapping as a tool for studying customer experiences. This section provides the underlying definitions and reasoning for the research approach. The third section combines the two worlds, worlds of service design and ICOs, and presents how and why it is relevant to view ICOs as services and how service design can benefit the domain of ICOs.

The third chapter introduces the methodology used for the empirical part of this study. It provides reasoning for the selected research design and presents the customized journey mapping method utilized in the data collection. This chapter discusses means for data collection and data analysis methodology in more detail.

The fourth chapter presents the findings from the empirical part of the study. The chapter begins by outlining findings on general characteristics, attitudes, and motivations of the investors and continues after that by presenting the findings according to the chronological order of stages in the customer journey of ICOs. Results related to the second research question are embedded in the sub-chapters discussing the different stages of the customer journey. Eventually, the results are summarized in a separate sub-chapter for reader convenience.

Finally, the last chapter discusses the results of this study. In the 'discussion and conclusions' chapter the research questions are explicitly answered and discussed. Based on the results of the study, possible practical and theoretical implications are briefly assessed before suggesting possibilities for further research and discussing the limitations of the study.

## Chapter 2

# Conceptual background

## 2.1 Initial Coin Offering (ICO)

### 2.1.1 Understanding the phenomenon

Initial Coin Offering (ICO) is a novel instrument for raising capital in an organization (Kaal and Dell’Erba, 2018; Kastelein, 2017). Especially for start-ups, the ICO as a fundraising model is disrupting the traditional venture capital model (Mougayar, 2016). In an ICO, the issuing organization offers investors digital crypto-tokens in exchange for established cryptocurrencies such as Bitcoin (BTC) or Ether (ETH) or some traditional currency (e.g. USD or Euro) (AMF, 2017; LHoFT & SDF, 2017; Popper, 2017). ICOs are mostly used to fund the development of new digital platforms or other related projects based on public blockchain or distributed ledger technology (DLT) (CSA, 2017; MAS & CAD, 2017; SEC, 2017*a*; SFC, 2017). Furthermore, ICOs are used to gain a critical mass of users to the ecosystem under creation. What makes ICOs a desirable instrument for companies to collect funding is their simplicity and speed (ACCA, 2018). Simultaneously, investors are drawn to the unprecedentedly high potential profits in early-stage funding. Similarly to crowdfunding, ICOs share the same underlying principles where financing is collected as micropayments in the form of an open call directly to general public utilizing digital means of communication. Thus ICOs can be considered as an alternative form of crowdfunding (Barsan, 2017; Popper, 2017; The Economist, 2017*a,b*).

ICOs most often make use of *smart contracts* as the underlying mechanism for the token distribution in the token sale (Fenu et al., 2018). Instead of having a crowdfunding platform or some other centralized trusted party to mediate the fund collecting, the self-executing and self-enforcing smart contracts that reside on distributed blockchain networks handle the accounting

of the tokens in an ICO (Lauslahti et al., 2018). Lauslahti and others (2018) present that by definition smart contracts:

1. are written in computer code and formulated using programming languages,
2. are stored, executed and enforced by a distributed blockchain network,
3. can receive, store, and transfer digital assets of value, and
4. can execute with varying outcomes according to their specified internal logic.

In the context of ICOs, investor sends funds to a smart contract that automatically executes and issues tokens to the investor according to the rules that have been programmed into the contract. Based on the pre-defined conditions, the smart contract determines whether the campaign has been successful and automatically takes action accordingly (e.g., refund to the investors in case of not reaching the funding target). The smart contract thus generates the crypto-tokens and issues them according to the programmed rules without the need for trusted centralized intermediaries, which is a significant differentiating factor between ICOs and other traditional forms of funding. (Lauslahti et al., 2018)

The crypto-tokens in an ICO are digital assets or utilities that are offered to investors in return for their investment. Instead of solely representing value, tokens come in a wide variety of embedded functionalities meaning that on a more abstract level they are a representation of the token holder's rights on the issuer's platform (LHoFT & SDF, 2017; MAS & CAD, 2017; SEC, 2017*a*). These rights can concern for example a right to access or use an application, right to vote in a community or receive shares of future earnings. As tokens come in a vast number of different characteristics depending mostly on the features of the platform or system they are used in, ICOs are inconvenient to categorize from regulatory, economic or societal perspective. It is imperative to understand the varying characteristics of the trading product in ICOs, to understand the perspective of customer-investor taking part in the ICO.

Swiss Financial Market Supervisory Authority (FINMA) clarifies the various types of tokens in their guidelines on ICO regulation (2018) and presents the following categorization:

1. Payment tokens

- Cryptocurrencies, like BTC. Tokens that are intended to be used as means of payment for acquiring goods or services or as means of money or value transfer.

## 2. Utility tokens

- Provide access digitally to an application or service utilizing a blockchain-based infrastructure. Can be compared to API keys that grant access to a service.

## 3. Asset tokens

- Tokens are representing assets such as debt or equity on the issuer. They may be used to hold votes on crucial business decisions, or even technical changes to the platform.

This categorization provides a very reduced but yet quite comprehensive starting point of token definition for people new to crypto-tokens. Consistently, Malta Financial Services Authority (MFSA) categorizes digital currencies into utility tokens, securitized tokens, coins and e-money with the distinction of leaving coins outside of the category of tokens and defining them as ‘virtual currency’ (MFSA, 2017). Building on this high-level categorization, some more detailed types of tokens can be identified based on their characteristics: For example ‘community tokens’ facilitate monetary policy on a social service platform and ‘work tokens’ allow people to contribute to the performance of the digital platform against a reward (LHoFT & SDF, 2017). No established definition of terminology used with token categorization exists, and thus, e.g., asset and securitized tokens or usage and utility tokens refer to the same characteristics.

Supporting the high-level token categorization presented by FINMA (2018) and MFSA (2017), Conley (2017) proposes four fundamental properties that most crypto-tokens in ICOs implement one way or another:

1. Transactional currency
2. Profit sharing
3. Voting control
4. Proof of Stake

The ‘transactional currency’ property of token presented by Conley relates to ‘coins’ or ‘payment tokens’ presented by FINMA (2018) and MFSA



(2017) and Conley argues that most tokens serve at least in part as transactional currencies. This is partly due to the fact that tokens may be tradable against other cryptocurrencies in an external token exchange or they can be used in exchange for some commodities in the platform provided by the issuer (ESMA, 2017). The token classifications are not mutually exclusive, which means that one token may have multiple properties (FINMA, 2018). Statistically, the majority of ICO tokens represent utility features as access rights to platform services, roughly 20% have currency features, 25% provide profit rights and 25% give investors right to make governance decisions (Adhami et al., 2018). When it comes to ‘profit sharing’ and ‘voting control’, they represent the asset tokens, which resemble traditional shares closely. ‘Proof of Stake’ is a property with various forms. In short, proof of stake means power on the platform, and often it includes some form of incentivizing against token holder’s functional duties on the platform (i.e., ‘work tokens’) (Conley, 2017; LHoFT & SDF, 2017). Tokens with utility properties presented by FINMA (2018) do not fit directly in the token properties presented by Conley. Utility nature of tokens is however noted by Conley indirectly (2017, p.1).

What is essential to understand about tokens is that their characteristics change the nature of the ICO also. Depending on the intrinsic functionalities of the tokens, the ICOs should be categorized accordingly. ICO of tokens that function similarly to shares of stock is analogous to equity crowdfunding while for example ICO of tokens offering utility rights in the issuer’s ecosystem can be seen more like selling software products (CSA, 2017; LHoFT & SDF, 2017; SEC, 2017a). In the case of utility tokens, the ICO is deviated from being merely an investment instrument, and the issuer utilizes ICO partly to establish the foundation for a functional service ecosystem within the platform under development. Supporting this view, it is argued that some buyers invest in ICOs primarily for the tokens’ utility while others invest purely out of potential prospects (LHoFT & SDF, 2017). In other words, the motivations of an investor to participate in an ICO are tightly entangled with the underlying properties of the offered token. Thus the features of the token distributed in the ICO are a central driver of investor behavior also.

Stemming from the diversity of token characteristics, the correct terminology regarding ICOs is a topic under debate and it is argued that it is often misused: for example the CEO of SingularDTV has claimed that ICOs and token launches are two different things and argues that ICO is a term to describe especially new coins that only act as a store of value whereas tokens in a crowdsale are multi-functional and provide utility to the native service ecosystem that the issuer is developing (LeBeau, 2017). This is a practical example where the difficulty of putting ICO in a single category

presents itself. The correct interpretation and terminology use are critical as the contents of the ICO may change the way the funding is interpreted from the regulatory perspective. Whether the tokens distributed in the ICO constitute an investment contract or not, is the disputing factor from the legal perspective. If the token is used merely to raise funds, it is a security, but it is argued that if the issuer can prove that the token has intrinsic functionality or utility in the project, it should be treated differently (AMF, 2017; The Economist, 2017b). This has led to the situation where it is encouraged to avoid marketing the ICO as an investment and avoid even using the term ICO itself (Giudici and Martinazzi, 2017, p.30). Due to the absence of consensus about the correct terminology, terms such as ‘token sale’, ‘token launch’, ‘crowd sale’, ‘pre-sale’, ‘token generation event’ or ‘token sale offering’ are used in practice synonymously with ICO (Bramanathan, 2017).

### 2.1.2 The generic ICO process

An ICO begins with the organization publishing “a whitepaper which states what the project is about, what need(s) the project will fulfill upon completion, how much money is needed to undertake the venture, how much of the virtual tokens the pioneers of the project will keep for themselves, what type of money is accepted, and how long the ICO campaign will run for” (Investopedia, n.d.). In short, the whitepaper describes the business model and technical details in the project and the detailed description about the arrangements of the ICO. The project whitepaper is the primary source of detailed information for the investors during the process of due diligence.

Regarding the tokens, the whitepaper describes the plan about the functions that the issued tokens in the ICO will perform and how the process of token creation and issuance goes (Conley, 2017). According to Conley (2017) “The simplest way is to commit to pre-mining a fixed number tokens and then never issuing tokens again, but more complicated approaches are common as well.” In this regard, the terms of *capped* and *uncapped* sales are introduced (Kaal and Dell’Erba, 2018). In a capped token sale the amount of money to be raised is limited (i.e., capped), and in uncapped, there is no limit to how much money will be raised. The price at which tokens are sold can be fixed, or they can be sold as an auction. Also, the number of tokens to be sold may differ based on the issuance strategy; some ICOs use a fixed number of tokens and some increase dynamically the number of available tokens. ICOs can have a predefined soft cap that determines the minimum level of funds raised for the project to continue. The ICO token sale structures are not limited to only these, and other alternatives (e.g., regarding participation limitations) are possible. The categorization presented here only outlines the

basic mechanics of most common ICOs.

In some cases after the whitepaper publication, the organization behind the ICO runs an ‘ICO pre-sale’ or ‘pre-ICO’ before the actual ICO. ICO pre-sale is a token sale that aims at funding the expenses of the actual ICO that include for example advertising and meet-up costs that try to promote investor interest in the ICO (Adhami et al., 2018; ICO Watchlist, n.d.; LHoFT & SDF, 2017). The sales process is usually built around discount systems in which the earlier the investor invests, the higher the discount for the tokens is. Such mechanisms are intended to lure in early investors and to arouse the interest in the funders. According to Adhami and others (2018), approximately one third of ICO campaigns run a pre-sale and they argue that running a token pre-sale has a positive effect on the success of the ICO campaign. Following the possible pre-sale, the organization behind the ICO runs their marketing/PR campaign to generate traction amongst investors before the actual token sale.

During the token sale, the actual fundraising takes place. Depending on the predefined protocols in the smart contract, the success of the ICO is monitored, and whether the token sale reaches its goals or not, the tokens are eventually distributed to the investors, or if defined so, the investors are refunded in case of ICO failure. What is important to note here, is that the issuer completely defines the mechanics of the ICO (i.e., what are the limits of success and failure and what are the actions taken based on it). Thus the responsibility of checking out the details (and hence the risk) lies entirely on the investor. After the token sale is finished, the development of the project begins. Figure 2.1 presents a generic visualization of an ICO process. In more detail, an ICO process often includes additionally, for example, getting legal consultation and other supportive activities.

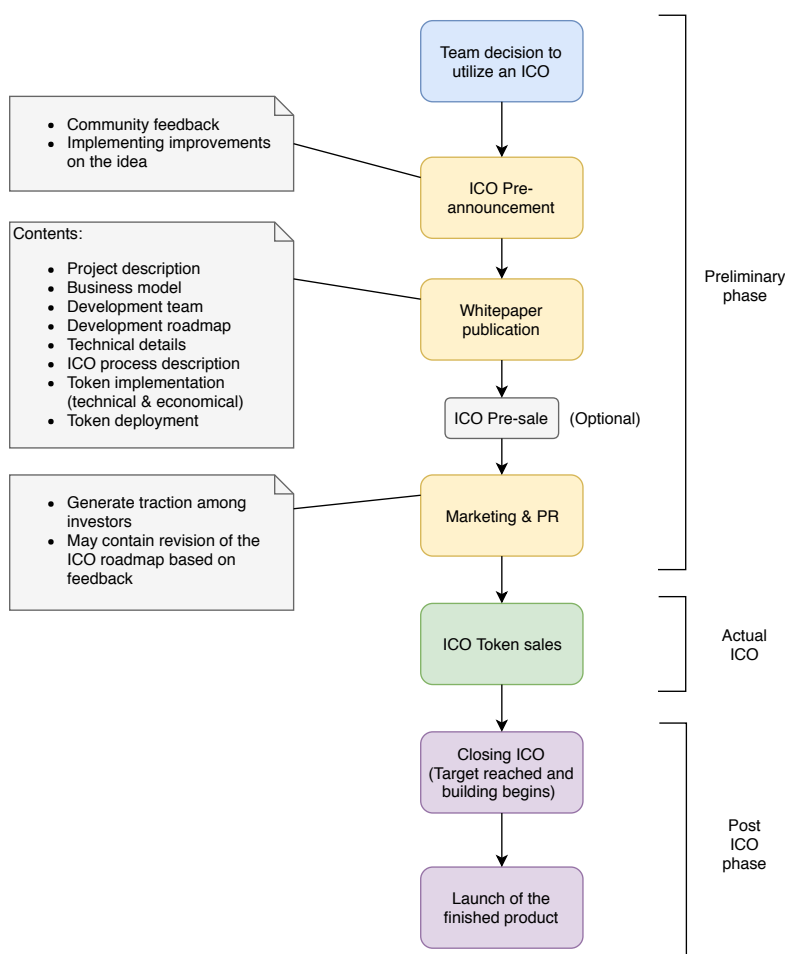


Figure 2.1: Visualization of a generic ICO based on a combination of descriptions in Kaal and Dell’Erba (2018) and LHoFT & SDF (2017)

### 2.1.3 ICOs and crowdfunding

As the academic literature on ICOs is scarce, the phenomenon should be viewed comparatively with the closely related form of investing, crowdfunding, where existing academic literature is broader than in ICOs. By definition, crowdfunding is a fundraising method for ventures where the funds are raised directly from individual supporters without the need of support from banks or venture capitalists (Gerber and Hui, 2013; Mollick, 2014). It is facilitated by crowdfunding platforms online (e.g., Kickstarter or Indiegogo) where entrepreneurial individuals and groups publish a fundraising campaign in which a large number of individuals contribute relatively small amounts of money to the venture (Mollick, 2014). The overlapping between the phe-

nomena of ICOs and crowdfunding is so comprehensive that ICOs have been called crowdfunding projects in academia (Bracamonte and Okada, 2017). The basic principles in ICOs and crowdfunding are the same, but instead of taking place on a centralized platform as in crowdfunding, ICOs utilize decentralized ledger technology applications as the mediator of the investment, which means that they are conducted without any traditional financial intermediaries (AMF, 2017). The ICO founders most often issue the tokens on public blockchains such as Ethereum making use of smart contracts, but the issuer is responsible for developing the smart contracts and protocols that take care of the transactions and token distribution. Similar platforms as in the context of traditional crowdfunding for hosting ICOs have however emerged (e.g., Indiegogo ICOs, KickICO, BlockStarter) but more conventionally services providing reviews, lists and specifications about upcoming and ongoing ICOs (e.g., ICO daily, ICO Watch List, ICO alert) have been used as marketplaces for ICOs. The ICO review services do not facilitate the investments in any way (as is the case of crowdfunding platforms) and the users are directed to issuer's website to continue to investing instead. Whereas crowdfunding platforms rely on traditional external web-based payment systems such as Amazon Payments (Gerber and Hui, 2013), ICOs make use of cryptocurrencies utilizing DLTs. In other words, in ICOs the middlemen have been cut off from the investing activities, and transactions happen directly between the founder and investor.

Belleflamme and others (2014) describe having a crowd of unsophisticated investors instead of professional ones as a distinguishing factor when comparing crowdfunding to traditional means of financing. This is where ICOs and crowdfunding have the most in common; similarly, ICOs are not constrained to any exclusive group of professional investors, but every individual willing to invest is welcome to participate. This element of openness and unprofessionalism can be seen as a connective element between crowdfunding and ICOs and simultaneously as a driving force separating the two from more traditional forms of funding. Crowdfunding and ICOs enable individual consumers with limited resources to take part in seed funding stage of investing. Ordanini and others (2011) introduced this novel role of consumer as an investor by studying the phenomenon of crowdfunding. They argue that in the context of crowdfunding the consumer becomes the key player of the entire service system, as without their input as financiers and promoters, no value is created in the initiative (Ordanini et al., 2011). This view emphasizes the imperative of understanding the customer perspective in contexts of crowdfunding and ICOs both.

### 2.1.4 Investor behavior in crowdfunding and ICOs

Investor perspective has previously been studied in the context of crowdfunding. It is argued that crowdfunding is simply a two-phase process from that perspective: pre- and post-investment (Macht and Weatherston, 2015). The pre-investment process starts with the funder's intrinsic motivation to put in money and continues to process of due diligence leading eventually to the investment decision. It is argued that it is unlikely that the funders conduct detailed due diligence and the funders do not even want to deal with the amount of information needed to do the due diligence in a detailed manner (Macht and Weatherston, 2015). Funders replace this exhaustive process by basing their decisions on social information (i.e., endorsements of earlier investors and observational learning) or short pitch narratives in the campaigns instead. The investment decision thus relies heavily on trust that earlier investors have done the due diligence and the impression delivered through campaign material. Agrawal and others (2014) argue that the lack of proper due diligence is also affected by the fact that the investments are small on an individual level which leads to lack of motivation to conduct careful due diligence.

The post-investment phase includes investor activities after the investment transaction until the moment of exit. These activities may include value-adding involvement similar to how angel investors add value to a venture, but investor role in the post-investment phase is however mostly passive (Lukkarinen et al., 2016). Angel investors can be categorized more evenly to active and passive types based on their role in the post-investment phase (Prowse, 1998). Macht and Weatherston (2015) argue that the often-used deal-making phase in venture capital funding is omitted due to diminished possibilities of conducting any negotiation in crowdfunding process. In the scope of this study the investment phase is considered however relevant, and thus the two-phase model cannot be applied as such for ICOs in this study. Regarding the customer journey and customer experience, the actual investment phase is a critical defining factor in the case of ICOs where different means of money transfer in the form of cryptocurrencies is taking place, and the founder has more responsibility in providing the means of transactions. The two-phase model, however, is utilized to outline the base process of investor journey in ICOs in this study.

A few studies in the context of crowdfunding address the investor motivations and deterrents. The driving motivations identified by Gerber and Hui (2013) were rewards, philanthropy, being a part of a community and supporting a cause. Along same lines, Haas and others (2014) categorize the crowd motivations to invest in a crowdfunding campaign in three: altru-

ism, hedonism, and profit-orientation. This categorization can be seen as a more abstract but yet comprehensive approach to understanding the driving forces behind investing in crowdfunding or ICOs. In case of ICOs, it is highly probable that the supporters are mostly after financial gains and the domain has been stigmatized to be full of overly optimistic, maniac gambler-investors who are making investments in the hope of quick and easy profits (The Economist, 2017b). Simply the way ICOs are structured and promoted implies this: the majority of token sales are providing 'early bird' bonuses to investors (Adhami et al., 2018). Venegas (2017) however identified two distinct motivations behind ICO investing: for-profit and idealist purpose. The first refers to speculation in new asset classes and the second to promoting advancements in decentralized organizations technology (Venegas, 2017). The case study by Schwienbacher and Larralde (2012) interestingly argue that investors in crowdfunding do not have financial motivations and what motivates them is sheer participating in innovative projects instead. This view correlates with the 'idealist' motivation presented by Venegas. Other studies, however, identify crowdfunders with mainly financial incentives and equity crowdfunding can be seen as the embodiment of this type of investor motivation (Haas and Blohm, 2017; Ordanini et al., 2011; Vulkan et al., 2016). These investors do not share the interest to the initiative or the motivation of merely being involved in something innovative. In a sense, possible focus on financial motivation by ICO investors could be seen as a defining factor regarding the majority of ICO investors. In this light, ICOs can be interpreted as a form of profit-oriented crowdfunding.

Equity crowdfunding is the form of crowdfunding where the founder gives equity of their company or bond-like shares in exchange for the crowd investments (Ahlers et al., 2015). ICO campaigns resemble equity crowdfunding due to the tokens' property of transactional currency in the secondary markets. In other words, even if the token does not explicitly represent equity of the company behind the ICO, it has trading value, which is proportional to the success of the digital platform and its service ecosystem. Crowdfunding campaigns offering commodities as rewards to the investors lack this kind of trading features, as the rewards often do not have any aftermarket where investors would be seeking profit. The theoretical framework of signaling that entrepreneurs use to persuade investors in equity crowdfunding (Belleflamme et al., 2014) could be applied to ICOs as well: the base structure where entrepreneurs make an open call for funding and individual investors make their investment decision based on the information provided by the issuer is identical after all. According to Ahlers and others (2015), the human capital of the founder (e.g., qualified board members) and detailed information on risks associated with investing play important roles in attracting

investors in equity crowdfunding. Regarding drivers for investment decision in reward-based crowdfunding, Bi and others (2017) propose that signals for project quality and electronic word-of-mouth (i.e., like count and number of online reviews) have equal effect on funder investment decision. This implies that not only signaling provided by the founders but also indirect signals are significant factors driving investor behavior. In the context of ICOs the project quality is signaled as sets of codes available for investors and it is argued that these sets of codes work as a tangible proof-of-concept that is appreciated by investors (Adhami et al., 2018).

In equity crowdfunding investors are affected by the level of uncertainty and governance material provided by the founder (Ahlers et al., 2015). Uncertainty is generated through information asymmetries between the investor and the project founder. These information asymmetries concern not only idea feasibility and founder's abilities to deliver the product but also the founder's abilities to generate value through building a company (Agrawal et al., 2014). Social capital plays a salient role in reducing this uncertainty in crowdfunding projects. Founder's social capital stimulates attracting early backers and raising capital in the early stages of the campaign, which in turn has a crucial role on the success of the project through observational learning, word-of-mouth, and feedback gained from the backers (Colombo et al., n.d.). The social capital can be categorized into external and internal: external social capital refers to the founder's social contacts outside the crowdfunding platform (attracting effect in the friend-funding phase (Ordanini et al., 2011)) and internal social capital refers to the social contacts created within the crowdfunding platform (Colombo et al., n.d.). In the context of ICOs, as there is no strictly defined platform on which the campaign takes place, the founder's reputation within the general crypto-community can be seen as the internal social capital. This means that based on prior research in crowdfunding, founder's social capital within the crypto-community has critical implications for the success of the fundraising. The problem of uncertainty presented in the context of crowdfunding is most likely present in the space of ICOs as well. This research aims at creating understanding on how investors conduct their due diligence and make their investment decision and eventually overcome these issues when participating in ICOs.

Both equity crowdfunding and ICOs resemble traditional venture capital (VC) and angel investing in principle: the mere difference is that equity crowdfunding and ICOs have opened the pre-seed and seed stage investing for crowds and thus have atomized investor base. Somewhat surprisingly, the criteria by which investors make investment decisions in equity crowdfunding are argued to be different from traditional angel and VC investing (Lukkarinen et al., 2016). Lukkarinen and others (2016) studied the success



criteria of equity crowdfunding campaigns and argue that equity crowdfunders' decisions depend rather on features of the crowdfunding campaign, network utilization and understandability of the investment target's products. VC and angel investors tend to emphasize assessing the entrepreneur and the team behind the campaign, business plan, revenue potential, market growth potential, return on investment and opportunities for exit (Prowse, 1998; Sudek, 2006). Macht and Weatherston (2015) present that investors in crowdfunding are more likely make interpretations based on campaign videos and pitch narratives presented on the crowdfunding platform. Lukkarinen et al. (2016) conclude that one possible explanation for the differences in due diligence is the lack of required training, expertise or will to assess the opportunities of unaccredited investors in equity crowdfunding. Instead, investors in equity crowdfunding are argued to make investment decisions more likely based on emotional and social criteria rather than financials (Lukkarinen et al., 2016). These social criteria refer to social information, i.e., what other investors have decided before and authoritative recommendations (Colombo et al., n.d.; Macht and Weatherston, 2015). The empirical part of this study aims at providing understanding on where ICOs stand in relation to investor behavior in equity crowdfunding and traditional VC/angel investing.

### 2.1.5 Risks, reputation, and regulation

In the context of crowdfunding, Agrawal and others (2014) present three disincentives for the funders that all are tightly connected to information asymmetry: creator incompetence, fraud and project risk. Lacking knowledge on founder abilities, weak due diligence and overly optimistic approach by investors has created a problem in which projects with no capability of holding their promises have gained substantial amounts of funding and then failed at delivering (Agrawal et al., 2014). This type of negligent behavior has led to malicious opportunities and emergence of fraudulent projects. To reduce the risks caused by information asymmetry Agrawal and others (2014) propose three means: reputation signaling, rules and regulation and crowd due diligence. Brand reputation, human capital (as presented by Ahlers and others (2015)), rating systems and trustworthy intermediaries all work as signals of reputation towards investors, diminishing the risks caused by information asymmetry. Rules and regulations on governmental and platform level aim at building protection for investors against fraudulent or otherwise detrimental initiatives while crowd due diligence can provide support for investors lacking abilities or interest in thorough due diligence (Agrawal et al., 2014). Along the same lines, in the decentralized context of ICOs, possible regulating actions presented in prior research include regulatory pressure

on miners, ICO organizers, and exchanges and utilizing the influence of the crypto community (Bracamonte and Okada, 2017).

The same disincentives as in crowdfunding concern ICOs also and the investing instrument has gained some questionable reputation because of its frenzied and irrational nature (The Economist, 2017*b*). ICOs are often launched by inexperienced companies or project teams without trading records, which makes them a highly risky and speculative investment class with the tendency of creating bubbles (ACCA, 2018). Unregulated space, inexperienced founders, unsophisticated investors, overly optimistic expectations, and the complexity of cryptocurrencies and underlying blockchain technology is an alerting combination that leaves investors in a vulnerable state (ACCA, 2018). Many authorities have taken the initiative of warning investors about the underlying risks in ICO investing (e.g., AMF, 2017; ESMA, 2017; MAS & CAD, 2017; SEC, 2017*a*). For example, the European Securities and Markets Authority (ESMA) has warned about following risks investors expose themselves to:

1. Unregulated space, vulnerable to fraud or illicit activities
2. High risk of losing all of the invested capital
3. Lack of exit options and extreme price volatility
4. Inadequate information
5. Flaws in the technology (ESMA, 2017)

Referring to the first point, ICOs have been promoted as a way of fundraising that circumvents the hurdles of regulation related to securities and traditional means of raising capital, but lately, regulators have taken the initiative and begun regulating ICOs (ACCA, 2018). For example, in China and South Korea ICOs have been completely banned and in U.S. SEC has taken a firm stand strongly tilting towards an interpretation, which states that majority of ICOs are considered as securities (O’Leary, 2017; PBC, 2017; SEC, 2017*b*; Zhao, 2017). From the regulative perspective, ICOs are difficult to regulate due to the diverse nature of ICOs and the varying characteristics of tokens. It is not clear under which regulation the tokens fall into which leads to the need of examining ICOs case-by-case (AMF, 2017).

In her (2017) article “Legal Challenges of Initial Coin Offerings (ICO)” Barsan categorizes tokens into two from the legal perspective: 1) currency like tokens and 2) security like tokens. How regulation affects the ICO, depends on which category the token falls into; e.g., money, commodities,

and securities all go under own regulations and the interpretation of tokens' nature vary significantly (Conley, 2017). Barsan argues that ICOs are prone to a lot of diverging regulation depending on the country. Both currency-like and security-like tokens will most likely be regulated, and especially ICOs with share-like characteristics should fall within the boundaries of securities regulation regardless of country (Barsan, 2017). Due to the distributed global nature of ICOs, it is, however, difficult to state which country's regulation should be addressed to an ICO and thus the domain is full of conflicts in the jurisdiction. As the rules might be contradictory, it may be impossible for an ICO to fully comply with all the regulation. Uniform regulation regarding ICOs is yet to be created, causing uncertainty and risks for investors and founders in the domain.

### Case "The DAO"

The U.S. SEC has expressed its view on ICO regulation through its investigation of The DAO (Decentralized Autonomous Organization) ICO. In the investigation they concluded that the token offering in The DAO ICO was, according to the 'Howey test', an investment contract and thus it should have abided the U.S. securities laws. In other terms, all the tokens offered and sold in the U.S. should've been registered with the SEC or they should've been qualified for an exemption from the registration requirements (SEC, 2017b). The DAO case could be seen as a precedent for future ICOs operating in the United States. SEC advices in the investigation report "those who would use a Decentralized Autonomous Organization ("DAO Entity"), or other distributed ledger or blockchain-enabled means for capital raising, to take appropriate steps to ensure compliance with the U.S. federal securities laws" and states that "the U.S. federal securities law may apply to various activities, including distributed ledger technology, depending on the particular facts and circumstances, without regard to the form of the organization or technology used to effectuate a particular offer or sale" (SEC, 2017b).

What makes the DAO case peculiar is that DAO was a stateless decentralized entity and in the end nothing more than a piece of code, meaning that it was not a governed organization per se. Thus it was not a straightforward task to determine whom would be the people held liable for the violations. In its investigation, SEC concluded that not only the developers and marketers of the ICO but everyone taking part in it should be considered liable for violating the Securities Act (SEC, 2017b). Following these events, some ICOs specifically forbid investors from the United States taking part in the event to prevent possible conflicts with the SEC. Furthermore, the U.S. SEC has taken steps forward in the regulation and sent subpoenas to dozens of compa-

nies behind ICOs during spring 2018 (Popper, 2018). The regulative actions have started discussions about the future of ICOs, and some have speculated that the type of ICO that has just become a major phenomenon is about to deprecate and ‘ICO 2.0’ that is appropriately regulated will emerge with even stronger force (Marks, 2018).

## 2.2 The world of service design

### 2.2.1 The principles of design thinking

Businesses are going through a necessary change of becoming more service-oriented and are required to compete on the most compelling customer experience (Brown, 2009; Kimbell, 2011). Design thinking provides the guiding principles through this cultural change. In essence, design thinking refers to the way professional designers think and work in practice (Kimbell, 2011). Kimbell (2011) proposes three distinctive ways to describe design thinking: as a cognitive style, a general theory of design and as an organizational resource. Based on the perspective viewed from, the purpose of design can be defined as solving problems, taming wicked problems or building innovation. As an approach for organizations to build innovation, design thinking works by understanding and modeling complex constructs by putting the focus on understanding the customers’ needs, motivations, emotions, and experiences. It can be seen as a set of principles that are applicable to practice by any organization regardless of their discipline or field of activity (Brown, 2009). In addition to empathy with users, design thinking embraces the principles of abductive reasoning, quick prototyping and failure tolerance in the innovation process (Kimbell, 2011; Kolko, 2015). As Kimbell (2011) puts it, design process in obedience to design thinking is an iterative process that moves between generating insights about end users, idea generation, testing, and implementation. Instead of focusing on for example technological research and improvements as the basis of innovation, design thinking focuses on understanding customer processes and actual customer behavior in the context of innovation. It has been argued that by putting the focus of design and development on the user or customer, also the commercial success of products tends to increase while the costs of supporting activities decrease (SFS-EN ISO 9241-210, 2010).

Service design is a new, evolving approach to creating services and the field has been struggling with finding a single definition for it (Stickdorn and Schneider, 2011, p.29). As no standard definition of service design exists, Stickdorn and Schneider (2011, p.34) approach the topic by defining five

core principles of service design thinking to help understand the concept: it is user-centered, co-creative, sequencing, evidencing and holistic way of thinking through the process of designing products and services. Service design thus puts the principles of design thinking into practice. User-centeredness means that the services should be viewed from the user perspective, as the inherent purpose of a service is to meet the customer's needs. Even though the first and foremost focus in service design thinking is the user, the co-creative principle means that the service design process should consider all stakeholders. This principle somewhat overlaps with the holistic principle: holistic principle emphasizes taking the entire environment of service into consideration in the design process. Other authors have also recognized and emphasized the holistic nature of service design (e.g., Mager, 2009; Teixeira et al., 2012). The service that constitutes of interactions between the stakeholders is viewed as a sequence of actions forming a service timeline. In other words, service design “deconstructs service processes into single touchpoints and interactions” that create service moments (Stickdorn and Schneider, 2011, p.40).

Miettinen (2016) also presents core principles of service design consistently. In addition to the principles proposed by Stickdorn and Schneider, the iterative nature of service design process where trying and failing early-on is encouraged, is emphasized as a core principle (Miettinen, 2016, p.4). Accordingly, Rytilahti and others (2015) crystallize that service design “is a process that entails an iterative cycle of design, testing, measuring and re-design.” This definition connects directly with the principles of design thinking. Miettinen (Miettinen, 2016, p.4) defines the aim of service design as follows: “The aim of service design is to create customer- or human-centered solutions that make the service experience feel logical, desired, competitive and unique for the user.” Similarly, it is emphasized that user needs are the starting point of design thinking and experience is considered the denominator of value (Brown, 2009; Kolko, 2015; Wetter Edman, 2009). Design thinking applies methods that aim at understanding the user experience by studying how, why and what trigger the experiences and what are the user's wants, needs, attitudes and desires (Wetter Edman, 2009). Teixeira and others (2012) define service design as a field that orchestrates service elements and service delivery process to help customers co-create their desired experiences, hence also emphasizing the profound role of customer experience in the service design approach.

The combination of terms service design and design thinking into service design thinking may seem confusing at first, but as the concepts share the same approach and are practically inseparable, it becomes quite natural to combine the two: service design is the embodiment of design thinking in the

field of service creation. Hence the term service design thinking refers to the way design thinking principles are applied in the context of service creation.

It can be argued that the human-centered design process (SFS-EN ISO 9241-210, 2010) with its primary focus on the user experience is tightly entangled with the concept of service design thinking. Miettinen also recognizes the connection between human-centered and service design processes and argues that conceptual and iterative design approaches are essential in the service design process (in Stickdorn and Schneider, 2011, p.57). The iterative activities within human-centered design process consist of understanding and specifying the context of use, specifying the user requirements, producing design solutions and evaluating the design against the requirements (SFS-EN ISO 9241-210, 2010). The steps are analogous to the process described by Kimbell (2011), where the design process consists of gathering insights from end users, ideating, testing and implementing. The process of design thinking is taught along same lines in Hasso Plattner Institute of Design at Stanford (Stanford d.school, n.d.), where the process of design thinking is categorized in the following phases: empathize, define, ideate, prototype, and test. Similarly in the non-academic context, e.g., Design Council's (2007) double diamond illustrates the stages of design as discover, define, develop and deliver. This research focuses on the discovering part of the design process (or insight gathering depending on what terminology is preferred) thus aiming at providing knowledge about the customer journey and customer (or user) experience within that journey. Future ICO creators are then able to utilize this information and proceed more readily to the developing and delivering phases of their design processes.

### 2.2.2 User experience

It is essential to establish an understanding of what is meant by user (or customer) experience in the context of service design thinking, to produce knowledge on the experiences of investors in ICOs.

Defining user experience (UX) is not unambiguous and finding consensus on the matter has been a difficult task for UX professionals and academia due to its multidisciplinary nature (Law et al., 2009; Roto et al., 2010). Depending on the approach, the given definitions vary considerably making it difficult to find a definition that would suit all perspectives. As presented by Roto and others (2010), the term is "often used as a synonym for usability, user interface, interaction experience, interaction design, customer experience, website appeal, 'wow effect', general experience, or as an umbrella term incorporating all or many of these concepts." Despite the problems regarding the consensus of UX definition, an attempt to create a standardized

definition for user experience (SFS-EN ISO 9241-210, 2010) has been made. In this definition user experience is defined as “person’s perceptions and responses resulting from the use and/or anticipated use of a product, system or service.” Furthermore, the following notes are attached to the definition:

- “User experience includes all the users’ emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and accomplishments that occur before, during and after use.
- User experience is a consequence of brand image, presentation, functionality, system performance, interactive behavior and assistive capabilities of the interactive system, the user’s internal and physical state resulting from prior experiences, attitudes, skills and personality, and the context of use.
- Usability, when interpreted from the perspective of the users’ personal goals, can include the kind of perceptual and emotional aspects typically associated with user experience. Usability criteria can be used to assess aspects of user experience.” (SFS-EN ISO 9241-210, 2010)

What makes this definition problematic is that with the notes attached, the definition becomes essentially an all-inclusive umbrella term that doesn’t solve the problem of finding consensus. Mirnig and others (2015) studied the standardized definition formally and argued that while the definition fails at providing a bulletproof definition of user experience and it contains minor inconsistencies, it still is a viable way of defining UX. The standardized definition thus acts as a good base foundation for UX definition and needed specifications can be made case-by-case.

The perspective from which UX is viewed still changes the way the term is used in different situations. As Roto and others (2010) present, UX can be viewed from three fundamental perspectives: as a phenomenon, as a field of study or as a practice. The standardized definition provides the common elements of user experience that must not be neglected when UX is viewed as a practice. When viewed from the perspective of a field of study, different aspects of UX may be in the focus case by case. UX as a phenomenon focuses on describing what UX essentially is and tries to identify and rationalize the different types of it. In a way, these perspectives are three separate levels of abstraction. In more general terms Roto and others (2010) describe UX as a field that “deals with studying, designing for and evaluating the experiences that people have through the use of (or encounter with) a system.” For this research, the user experience is viewed as a practice as the focus is in studying the past experiences that investors have had with ICOs.

### 2.2.3 From user experience to customer experience

As presented above in the principles of service design thinking, the driving force of service design is the experience. Customer experience (CX) is a holistic, multidimensional construct that is formed as a subjective response to any kind of direct or indirect contact with a company offering a service (Lemon and Verhoef, 2016; Meyer and Schwager, 2007; Teixeira et al., 2012). The broad definition means that customer experience is not constrained to only contacts that are generated by the service provider. Indirect contacts that take the form of word-to-mouth, recommendations or criticisms, advertising, news reports, reviews, etc. are also included as factors constituting customer experience (Meyer and Schwager, 2007). In other words, customer experience encompasses every aspect of company's offering, and it focuses on customer's cognitive, emotional, behavioral, sensorial and social responses to the offering (Lemon and Verhoef, 2016).

By definition, user experience and customer experience may seem similar constructs, and they are often used synonymously, as stated by Roto and others (2010). Customer experience is, however, a broader concept and shouldn't be confused with UX (Roto et al., 2010). Even though it could be argued otherwise because of the ambiguous definition of UX, a general understanding is that user experience is mainly a result of usability, visual design, and interaction design and occurs specifically through use or anticipated use of a system. Customer experience instead includes all of the customer's experiences with the service provider as a whole. In other words, user experience is included in the overall experience of interacting with the service provider, which is defined as customer experience (figure 2.2).

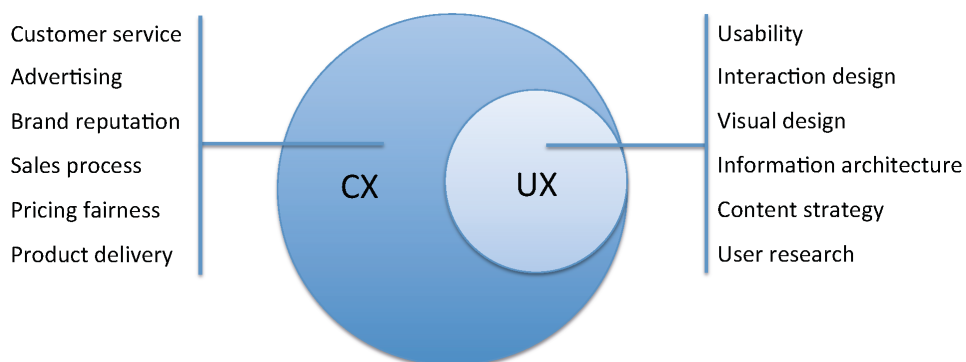


Figure 2.2: Relation of user experience and customer experience (UXPin, n.d.)



Referring to the standardized definition of user experience, this categorization could be however questioned due to the all-inclusive nature of UX definition. Roto and others (2010) outline the differentiating factor so that “the noun ‘user experience’ refers to an encounter with a system that has a beginning and an end. It refers to an overall designation of how people have experienced (verb) a period of encountering a system”. The point is, user experience focuses on a specific period of activities and it emerges from the use or anticipated use of a system. Customer experience encompasses also the indirect encounters as a factor, which can be seen as an essential differentiating factor between UX and CX. However, the terms are tightly interconnected, and methods used in collecting experience data in both fields overlap as they are applied in the process of service design (Teixeira et al., 2012). Table 2.1 compares key features of UX and CX.

Table 2.1: Comparison between UX and CX (based on Lemon and Verhoef, 2016; SFS-EN ISO 9241-210, 2010)

	<b>User experience (UX)</b>	<b>Customer experience (CX)</b>
<b>What is it?</b>	User’s subjective response	Customer’s subjective response
<b>Focus</b>	Emotions, beliefs, preferences, perceptions, physical and psychological responses, behaviors and accomplishments	Cognitive, emotional, behavioral, sensorial and social responses
<b>Is a result of</b>	Use or anticipated use of a product, system or a service	Direct or indirect encounter between customer and service throughout the customer journey
<b>Causing/affecting factors</b>	Brand image, presentation, functionality, system performance, interactive behavior and assistive capabilities of the interactive system, the user’s internal and physical state resulting from prior experiences, attitudes, skills and personality, and the context of use	The quality of customer care, advertising, packaging, brand, product and service features, user experience, ease of use, external environment, previous experiences, customer engagement, and reliability

It is understandable that the terms easily get mixed in practice and due to the ambiguous consensus, defining the terms case-by-case is encouraged. In

the scope of this research, investor experience is viewed more closely according to the definition of customer experience. Firstly, the process of investing is not constrained to only one system, and investor behavior outside the platform where the exchange takes place is within the scope of the study. Indirect contacts with the service provider in the form of, e.g., word-of-mouth are of interest in understanding the ICO process from the investor perspective. Secondly, user experience (interpreted as a response to interaction-, visual- or usability design) is not the primary focus of the study, but the overall journey, customer needs, factors and stress points that produce the experiences affecting the investing decision are essential points of interest instead. In this sense, the definition of customer experience fits better with the objectives of this study.

#### 2.2.4 Customer journey

Customer journey is the base construct when studying customer experience. It is the process customer goes through during the service, and by analyzing the customer journey, the customer (or user) experience can be understood (Følstad et al., 2013; Følstad and Kvale, 2018; Lemon and Verhoef, 2016; Mangiaracina et al., 2009). As presented by Lemon and Verhoef (2016) “we conceptualize customer experience as a customer’s ‘journey’ with a firm over time during the purchase cycle across multiple touch points. We also conceptualize the total customer experience as a dynamic process”. Analyzing the customer journey provides insight about the customer experience from the customer’s point of view, and in short, customer experience is a result of all elements of the customer journey (Følstad et al., 2013; Voss and Zomerdiijk, 2007).

Customer journey consists of so-called touchpoints between the customer and the service provider or the brand (Voss and Zomerdiijk, 2007). Every interaction or encounter a customer has with the service provider can be considered as a touchpoint. Brugnoli (2009) defines that “a touchpoint is any physical or digital element of the system with which the user comes into contact during the experience”. By connecting these touchpoints into a path of encounters or moments, a customer journey is formed (Voss and Zomerdiijk, 2007). The touchpoints are often categorized into main stages of the service (e.g., pre-purchase, purchase and post-purchase (Lemon and Verhoef, 2016)). The stages consist of one or more touchpoints, and the customer experience (and hence customer behavior) is affected as the customer is exposed to the multiple touchpoints during the journey. According to Lemon and Verhoef (2016) “This process may function as a guide to empirically examining customer experiences over time during the customer journey, as well as to

empirically modeling the effects of different touch points on the customer's experience." Important notion regarding touchpoints is that not all of them are controllable by the service provider and these should be taken into consideration nevertheless. Følstad and others (2013) separate these points from touchpoints in the customer journey and calls them actions instead. Actions are "customer's activities which may or may not involve an interaction with a service provider" (Følstad et al., 2013). Categorizing actions separately from touchpoints contradicts the view of Lemon and Verhoef (2016) who include such actions as touchpoints outside of firm's control. These can be interpreted as indirect contacts affecting the customer experience however and thus are addressed in the scope of this research. Regarding this study, these indirect actions are of interest as there is no previous knowledge of how many direct touchpoints exist in comparison to indirect ones during the ICO investing process.

In the context of service design, customer journey is a framework used to gain understanding on customer behavior, feeling, motivations and attitudes throughout their journey of interaction with the service provider (Brown T. in Zomerdijk and Voss, 2010). In other words, customer journey forms the basis of design thinking; design thinking approach takes understanding customer experience as the starting point of design activities, and customer journey provides the basis for understanding the customer experience. According to Følstad and others (2013), customer journeys are used to "support design in three different ways: to structure and communicate the user research at the beginning of the service design process, to support collaborative or co-creative processes, and to serve as visualizations of the produced service design." These functions link customer journey tightly to the objectives of this study. From the service design perspective, this study focuses on the 'discover' stage of the design process. The produced customer journey acts primarily as an intermediary in understanding and communicating the investor perspective to the process of ICO through which analysis of customer experience can be conducted. Eventually, this provides means of answering to both research questions and supports future design of ICOs.

### **2.2.5 Mapping the customer journey**

Customer journey map is a tool that is used to analyze and communicate the customer journey. It is a representation about the different stages along the customer journey and includes touchpoints, actions, channels, steps and customer experiences throughout the journey (Mangiaracina et al., 2009; Marquez et al., 2015; Stickdorn and Schneider, 2011). Følstad and others (2013) however argue in their systematic review that the contents of a cus-

customer journey map may differ based on the objective of the use case. In other words, depending on the needs, customer journey map may include all elements presented before, but for some processes, all the measurements may not be relevant (Følstad et al., 2013). For example, in some cases, customer journey map is used to illustrate only the most critical steps along the customer journey (e.g., Dove et al., 2016) or in some cases, the map focuses merely on describing the sequence of touchpoints without addressing the customer experience (e.g. generic customer journey maps). Customer journey map helps designers to understand and communicate how the entire service works from the customer perspective (Følstad et al., 2013; Marquez et al., 2015).

Most often customer journey mapping is used as a way of identifying the customer journey in a situation where no customer journey has been predefined or only top-level stages are defined prior to the mapping (Følstad et al., 2013). This study utilizes customer journey mapping similarly with this approach: using customer journey mapping to form an understanding of the customer journey of ICO investors without a predefined customer journey.

Customer journeys can be divided into generic and actual customer journeys (Halvorsrud and Kvale (2009) in Følstad et al., 2013). This division means that there should be made a distinction in customer journey maps depending on whether the customer journey is mapped based on an intended customer journey (e.g., a collaborative effort by internal resources) or based on actual customer data and experiences. Følstad and others (2013) argue that interviews and observations are the most common methods in customer data collection, but state of the art for mapping of actual journeys is fragmented. This means that there is lack of systematic research and specification on customer journey mapping methodology. This study aims at producing a generic customer journey based on actual customer journeys, i.e., in this study, a customer journey is formed for each interviewee representing the actual customer journeys, and by combining and analyzing these, the generic map of ICO investor's customer journey is formed. This approach where data is gathered on individual level and then analyzed on a generic level is typical convention in customer journey mapping (Følstad and Kvale, 2018).

Lemon and Verhoef (2016) emphasize the importance of identifying critical touchpoints or so-called "moments of truth" within the customer journey. These critical touchpoints are the points of customer journey that have the most influence on customer outcomes (i.e. customer behavior and purchasing decisions) and by affecting these touchpoints, companies can make a fundamental difference in customer behavior to their favor (Lemon and Verhoef, 2016). This viewpoint resembles critical incident technique (CIT) (Flanagan, 1954) that is an approach to identifying the most critical events causing pos-

itive or negative experience and CIT has been used as such in the studying customer or user experience (e.g., Serenko and Stach, 2009). Dove and others (2016) introduce lightweight journey mapping as a method to study user experience. Lightweight journey mapping combines elements from CIT and traditional customer journey mapping to create a customer-driven blueprint of the most influential touchpoints of customer journey that connects with user's experience at each point of interaction.

Even though CIT and lightweight journey mapping provide effective means of identifying the most critical points in the customer journey, they reach only experiences or incidents that count as critical in the eyes of the customer. They do not recognize the regular incidents along the customer journey and thus fail at providing insight on the process of customer journey or customer experience as a whole. To tackle this problem, Weinlich and Stauss (1997) introduce a modified method from CIT called sequential incident technique (SIT) where the customer journey and the experiences associated with it are studied in two phases: 1) a customer path (a typical customer journey in the context, i.e., stages of customer journey) is created and 2) the customer experience and incidents within this path are assessed through interviewing customers. Customer journey mapping in this study is conducted by combining elements of both SIT and lightweight journey mapping. The framework of lightweight journey mapping where the interviewee is responsible for identifying incidents within the journey and assessing their experience related to each incident is used. However, instead of focusing merely on the most critical points of the customer journey, the number of these 'milestones' is not limited to only a few most critical ones (as proposed by Dove et al., 2016). The user is thus able to add and evaluate also normal incidents, that they feel relevant, to the journey map. This approach enables creating a better overall understanding of the customer journey that is needed for the sake of the first research question.

## 2.3 ICO from the viewpoint of service design

### 2.3.1 Service modules of crowdfunding services and ICOs

Crowdfunding takes place on designated crowdfunding platforms. These platforms, or so-called crowdfunding services, provide not only a marketplace for the crowdfunding campaigns but also various types of services for both the funders and founders hosting their crowdfunding campaign and it has been argued that designing these service systems is a complex task (Haas and

Blohm, 2017). Haas and Blohm (2017) introduce a crowdfunding service configuration framework for systematic design that comprises of ten service modules with 24 module parameters. This modularization gives a comprehensive viewpoint onto what different services both funders and founders need in the scene of crowdfunding and provides an applicable blueprint on top of which new crowdfunding services can be built on.

By inspecting ICOs against the crowdfunding service modules (see table 2.2), it is evident that in ICOs the founder is largely responsible for arranging every service aspect of the fundraising or leaving some services out of the ICO campaign. They are the actor who provides the services towards investors; customer support, payment systems, IT functionalities, investor relations, authentication and contracting are all investor-facing services provided solely by the founder. Furthermore, founders utilize and combine multiple external services in their campaigns such as external wallets, blockchains and communication channels. In other words, the founder of ICOs is designing and managing a complex service system instead of merely focusing on collecting funds and developing the funded product. Thus it is encouraged that founders take service design approach in their ICO design to ensure the funding success and hence the success of the project itself. From another perspective, table 2.2 provides sound reasoning behind the emerging business of ICO services as it shows the burden and complexity of arranging the campaign. There is thus a reason why crowdfunding campaigns are hosted on platforms providing supportive services, and combined with the pressure to regulate ICOs, it is possible that also the scene of ICOs will undergo a shift towards that in the future.

Table 2.2: Service modules of crowdfunding services (Haas and Blohm, 2017) in relation to ICOs

Service Module	Description	In Initial Coin Offerings
Market Differentiation	Market differentiation based on crowd motivation, market specialization of the service system and type of compensation	No specific marketplaces for different types of ICOs. Knowing the motivations of the crowd and suitable compensations are based on founder's own assumptions.
Matchmaking	Two-sided marketplace where information is provided and funding decisions are registered	ICO review services. These platforms provide information and rating about on-going and up-coming ICOs where links to the founders' websites are provided in order to proceed with investing
Crowd Activation	Attraction, activation and balancing the right crowd. Advertising both online and offline targeting funders to ensure funding success and founders to ensure thick markets	PR & marketing towards investors done by founder
Customer Support	Comprehensive support for both funders and founders to overcome initial barriers and clarify issues	Provided to investors by founder
Investor Relations	Providing communication channels between funders and founders. Also, performance monitoring service	Communication channels decided, established and maintained by founder
Risk Assessment	Due diligence and feasibility assessment to reduce information asymmetries	Conducted by investors themselves. ICO reviews provide some assistance
IT Functionality & Operations	Technical development and hosting of the platform	Implemented by the founder. A combination of multiple services (i.e. external blockchains and wallet services)
Payment	Form of the payment system (credit card, PayPal, cash in-payment), time of the payment (e.g. pre-paid), form of payment processing (directly between the founder and giver or via a financial intermediary)	Cryptocurrencies on smart contracts. Direct transactions between investors and founders. Smart contracts implemented by founder and hosted on external blockchains.
Authentication	Know Your Customer (KYC) service to ensure meeting legal regulations, preventing frauds and reducing risks for both founders and givers	KYC of investors done in some cases. Not necessary.
Contracting	Terms and conditions, privacy policy and legal relationship after funding success. Either peer-to-peer or via legal intermediation	Smart contracts directly between investor and founder. Separate terms of use and privacy policy created by founder

### 2.3.2 ICOs in the frameworks of service-dominant logic and design thinking

From ICO founder's perspective, the investor is the customer or consumer of their services. Relating the ICO phenomenon to the theoretical background of crowdfunding, it is essential to understand the changing role of the consumer in the service process where the consumer engages with the service delivery. It is argued that unaccredited investor behavior in equity crowdfunding differs from traditional, more professional VC and angel investors (Lukkarinen et al., 2016). The motivations of consumer collaboration are extended in the field of crowdfunding to include a desire for investment, patronage and social participation (Ordanini et al., 2011). The Service-Dominant Logic (SDL) paradigm, stemming from the field of marketing, takes the approach that every economy is a service economy and in service-centered view, the goal is to customize offerings according to consumers' needs (Vargo and Lusch, 2004). According to SDL, value is co-created as a combined effort of all stakeholders, but the beneficiary (i.e., consumer/user/customer) always defines it (Vargo and Lusch, 2016; Wetter Edman, 2009). Reflecting the phenomenon of crowdfunding to SDL, consumers become central actors as resource integrators and value co-creators in the service economy. Ordanini et al., (2011) argue that consumers take an essential role in activating the process and influencing the outcomes of the process in the context of crowdfunding. Similarly, in the context of ICOs, consumers take the leading role in value co-creation.

The fundamental principles behind SDL and design thinking are very similar despite having different backgrounds: SDL in marketing and design thinking in designer practices (Wetter Edman, 2009). For the slight differences between the two frameworks, Wetter Edman (2009) argues that while SDL focuses on emphasizing the service nature of every economy and understanding how value is co-created in these economies, design thinking takes the focus to understand perceived customer experience as the denominated of value. Either way, both frameworks acknowledge phenomenology as the determining factor of the value of services. This premise puts customer experience in the focal point of designing and developing ICOs also. The customers of ICOs are the individual consumers who go through the process of investing in the ICO, similarly as in the context of crowdfunding. It is thus argued that ICOs (as well as crowdfunding campaigns) should be considered as services in which investors act as customers. Building on the principles of design thinking, understanding how, why and what trigger investor experiences throughout the customer journey is the fundamental basis of creating successful and valuable ICO campaigns. Based on these theories, taking



design thinking approach to studying the ICO phenomenon is justified.

## 2.4 Summary of the conceptual background

Initial coin offerings are a novel fundraising instrument for companies and projects, which can be categorized as a new form of crowdfunding. The main difference in investing in an ICO and crowdfunding is the compensation for the investment and the workflow through the investment: in ICOs investors get crypto tokens in return for their funds, these tokens have often immediately liquid secondary market similar to stocks and the investing happens using cryptocurrencies on decentralized systems and smart contracts instead of conventional payment methods on crowdfunding service platforms. Tokens may have various functionalities and characteristics embedded in them and on a high level they can be categorized as 1) payment tokens, 2) utility tokens or 3) asset tokens. Categorizing a specific token is not a straightforward task as one token may have multiple functionalities. The difficulty of categorizing tokens makes also defining and categorizing ICOs a hard task from regulative perspective. The difficulty of regulating ICOs has resulted in authorities warning and even banning ICOs and ICOs enjoy a questionable reputation due to the lack of regulation and a vast amount of illicit activity in the domain.

Due to the novelty of the ICO phenomenon, there is a lack of existing literature about it. The phenomenon is thus viewed in this study reflecting on the prior studies on crowdfunding. By definition crowdfunding and ICOs share mostly same characteristics: the base structure where entrepreneurs make an open call for funding and individual investors make their investment decision based on the information provided by the issuer is identical. This setting is studied to have specific features as both crowdfunding and ICOs enable individual consumers with limited resources to take part in seed funding stage of investing. This leads to unique investor behavior where making detailed due diligence is neglected, and investors are more likely to rely on social information when making investment decisions. In crowdfunding, the investment process consists of pre-investment and post-investment phases. When applying the model to ICOs as the basis for the customer journey, also deal-making phase is included, even though it is neglected in the literature of crowdfunding, because of the unconventional means for investing in ICOs.

Investor motivations in crowdfunding are categorized in altruism, hedonism and profit orientation, depending strongly on the type of investment target. While crowdfunding literature emphasizes that there often are no fi-

financial motivations for participating in crowdfunding, investors in ICOs are mostly profit-oriented. This can be seen as a defining characteristic of ICO investors compared to traditional crowdfunders, and it draws ICOs by definition close to the subcategory of equity crowdfunding. In equity crowdfunding investors are highly affected by uncertainty and information asymmetries when making their investment decision. To tackle these issues, investors rely on brand reputation, human capital, rating systems and trustworthy intermediaries. Investors in ICOs are likely to follow similar patterns in dealing with the uncertainties and risks in ICOs. When comparing investor behavior in equity crowdfunding to angel investing, prior studies argue that there are notable differences between the two. Prior research indicates that unaccredited investors in crowdfunding lack the required expertise and will to perform exhaustive due diligence processes similar to angel investors and they are more likely to base their investment decisions on emotional and social criteria. Where ICOs stand between these two forms of early-stage investing, is left to be answered by the empirical part of this study.

This thesis takes service design approach to creating knowledge about the ICO phenomenon. The principles behind this approach are also known as principles of design thinking. Design thinking works by understanding and modeling complex constructs by putting the focus on understanding the customers' needs, motivations, emotions, and experiences. It is user-centered, co-creative, sequencing, evidencing and holistic way of thinking through the process of designing products and services. The process of design thinking consists of emphasizing, defining, ideating, prototyping and testing. Along the same lines, the process of design can be illustrated as a double diamond consisting of four stages known as 'discover', 'define', 'develop' and 'deliver'. This study focuses on the 'discover' part of the design process, thus aiming at providing knowledge about the customer journey and CX/UX within that journey.

Defining UX or CX is not an unambiguous task, and they have become ambiguous all-inclusive umbrella terms in practice. In short, UX refers to person's perceptions and responses resulting from the use and/or anticipated use of a product, system or service. CX, in turn, is a more holistic construct that refers to subjective responses to any form of direct or indirect contact with a company offering a service. By definition, the two seem quite identical, and they are often used synonymously in practice. A general understanding, however, is that user experience is mainly a result of usability, visual design, and interaction design whereas customer experience includes all of the customer's experiences with the service provider as a whole. UX focuses on a specific period of activities, and it emerges from the use or anticipated use of a system. Customer experience also encompasses the indirect encounters

as a factor, which can be seen as an essential differentiating factor between UX and CX. In the scope of this research, investor experience is viewed more closely according to the definition of customer experience because the investing process is not constrained to only one system and indirect contacts with the service provider are as well in the interest of this study. Also, UX (interpreted as a response to interaction-, visual- or usability design) is not the primary focus of the study, but the overall journey is the primary interest instead.

Customer journey is the base construct when studying CX. It is the process customer goes through during the service, and by analyzing the customer journey, the customer (or user) experience can be understood. It consists of direct and indirect touchpoints between the customer and the service provider. Regarding this study, both direct and indirect touchpoints are of interest. By connecting these touchpoints, a customer journey is formed. In the context of service design, customer journey is a framework used to gain an understanding of customer behavior, feeling, motivations and attitudes throughout their journey of interaction with the service provider. Thus, customer journey is strongly linked to the objectives of this study, as the customer journey acts primarily as an intermediary in understanding and communicating the investor perspective to the process of ICO.

Customer journey mapping refers to means for analyzing and communicating the customer journey. It is a representation of the different stages of the customer journey and includes touchpoints, actions, channels, steps and customer experiences throughout the journey. The methods for mapping customer journeys are fragmented, and it is optional how many of the elements above and how they are presented on the journey map. There is lack of systematic research and specification on the methodology for mapping customer journeys. Customer journey mapping is often used as a way of identifying the customer journey in a situation where no customer journey has been predefined. Depending on the way the journey map is pieced together, different maps are divided into generic and actual customer journeys. The distinction is that the first refers to intended customer journey and the latter refers to customer journeys formed based on actual customer data gathered via interviews and observation. The aim of this study is to produce a generic customer journey map of ICOs based on multiple actual customer journeys. This study combines the techniques of SIT and lightweight journey mapping to accomplish this objective.

From a service perspective, ICOs differ from crowdfunding in the sense that crowdfunding campaigns and investing take place on designated crowdfunding platforms while ICOs are rarely hosted on similar services. These crowdfunding platforms provide services for both funders and founders while

in the context of ICOs the founder is largely responsible for doing most of the work and providing every service aspect of the fundraising themselves. Viewing ICOs in relation to the crowdfunding platforms shows that the founder of an ICO is orchestrating an elaborate service system instead of merely focusing on collecting funds and developing the funded product. Thus it is argued that crowdfunding platforms are more developed in comparison to fragmented conventions in ICOs and there may be a potential shift towards platform-based markets in ICOs also.

It is essential to understand the changing role of the investor when it comes to crowdfunding and ICOs: in these contexts, investors are consumers and customers. The motivations of consumer collaboration are extended to things like altruism and social participation. SDL takes the stance that every economy is a service economy, and the goal is to customize offerings according to consumers needs. In ICOs, consumers take the leading role in value co-creation as (according to SDL) the consumer always defines value. Similarly, design thinking takes the focus to understand perceived customer experience as the denominate of value. It is concluded that ICOs should be considered as services in which investors are customers and based on this, taking design thinking approach to studying ICOs is justified.

## Chapter 3

# Methods & Data

### 3.1 Research methodology

#### 3.1.1 Qualitative research

This thesis takes qualitative research approach to solving the research problem, which is reflected in the style and structuring of the research questions. The reasoning behind this decision has both practical and theoretical foundation. In the research setting, design thinking approach was selected, and thus the methodology adopted in user-centered design practices was utilized in this study. In the practical context of UX, there has been a shift from quantitative methods towards qualitative methods and qualitative studies have already reached more traditional quantitative methods in the frequency of use (Bargas-avila and Hornbæk, 2011). Qualitative methods are argued to be superior in providing rich and detailed enough data for studying user experience, and it has been reported that studies concerning generic UX are mostly conducted qualitatively (Bargas-avila and Hornbæk, 2011). Data collection methods in customer journeys are also most often qualitative with qualitative interviews as the most frequently used data collection method (Følstad et al., 2013). With this tradition of using the qualitative methodology in studying customer journeys and user experience, it was a natural decision to choose qualitative research approach for this study.

The objective of this thesis is to understand the customer journey of ICOs and to gain an understanding of how investors perceive this process. In addition to the practical conventions in the field of user-centered design, the decision to select qualitative research approach was based on the fact that it provides better premises to answer the research questions. ICO as a phenomenon is novel and yet rather weakly understood in academia. The inductive qualitative research approach is necessary for this kind of situation

where basic knowledge of the essence of a specific phenomenon is needed (Eskola and Suoranta, 2003, p.19). The defined research questions dictate that qualitative research approach is appropriate; it would be inconvenient to try to answer them quantitatively. Inductive qualitative research approach abandons pre-defined hypotheses and instead stays open to emerging insights and tries to learn from the data (Eskola and Suoranta, 2003, p.19-20). In principle, qualitative research approach allows the researcher to discover rather than test variables, and it enables the researcher to reach the inner experience of participants, which indeed is one of the objectives of this study (Corbin and Strauss, 2008, p.12). Qualitative research is about entering the world of participants to create an understanding of their perspective and understanding not only how they experience things but also what meanings they give to those experiences (Corbin and Strauss, 2008, p.16-17; Miles et al., 2014, p.11). Thus for the purposes of this study, it is evident that inductive qualitative research was the most convenient methodological approach to take.

Qualitative research methods come in many colors. This study utilized a combination of in-depth interviews and a customized customer journey mapping method as sources of data. The collected data were then analyzed using inductive content analysis method.

### 3.1.2 Interviews

Interviews are one of the most common strategies for collecting qualitative data (DiCicco-Bloom and Crabtree, 2006). As a method, they are known for their ability to gather firsthand data on experiences, attitudes, and perceptions and thus they are widely used in the context of design (Hanington and Martin, 2012, p.102). Interviews can be used both in qualitative and quantitative research approaches. The differentiating factor is the level of pre-defined structure in the interview, and different interviews can be loosely categorized as unstructured, semi-structured and structured, where the first two categories represent the interviews in qualitative research approach (DiCicco-Bloom and Crabtree, 2006). As stated, this thesis takes an inductive qualitative methodological approach, and the study is explorative as it is trying to gain a better understanding of the investor perspective in the novel phenomenon of ICOs. In this research setting it is appropriate and even required to make use of the more loosely structured interviews and to leave the interpretation and analysis to the investigator (DiCicco-Bloom and Crabtree, 2006; Hanington and Martin, 2012, p.102). Semi-structured in-depth interviews are in fact the most frequently used interviewing method in qualitative research projects (DiCicco-Bloom and Crabtree, 2006). For

that reason, it was natural to choose semi-structured in-depth interviews as the format of interviews in this thesis.

The idea behind an individual in-depth interview is to dig deep into participant's world using open-ended questions. The predetermined questions play only a guiding role in the discussion, and the conversation is free to roam through additional questions emerging from the dialogue between interviewer and interviewee. As stated by DiCicco-Bloom and Crabtree (2006) "The in-depth interview is meant to be a personal and intimate encounter in which open, direct, verbal questions are used to elicit detailed narratives and stories." They have the advantage of making the participant feel more comfortable in the interviewing situation and thereby making the participant more prone to open up and share personal attitudes and experiences (Hangington and Martin, 2012, p.102). Thus an approach like this tends to be ideal when trying to understand and specify the context of use and participant's needs and experiences and hence it fits well with the agenda of this study.

The interview script was formulated taking inspiration from episodic and narrative interview techniques (Flick, 2000). A single interview session was divided into five stages: introduction, background/warm-up, participation in ICOs, journey mapping exercise and wrap-up. The questions were formed to gain an understanding of the participant's history, motivations, insights, attitudes and behavioral reasoning behind investing in ICOs. Some questions took a narrative approach and asked the interviewee to tell a story about some particular incident or their biographical history (e.g., Tell the story about how you ended up in the domain of cryptocurrencies?). The rhythm of the interview followed the phases of an episodic interview loosely as the interviewees were asked to remember specific events (e.g., How do you follow upcoming ICOs?) and then asked to share insights on more general topics in turn (e.g., How would you characterize, how ICO investing is different from traditional investing?). The interview questions asked during the journey mapping exercise also followed the principles of episodic interview technique, as the interviewer did not fix the situations or the events the interviewee selected to bring up and left the freedom of choice to the participant (Flick, 2000). The questions in the journey mapping exercise were formulated by applying the original SIT research design (Stauss and Weinlich, 1997). The interview script can be found in appendix E.

### 3.1.3 Journey mapping exercise

As a part of the interviews, an exercise of journey mapping was utilized as a tool to gain understanding on how the investing process of ICOs is structured from investor's perspective and how do the investors perceive the different

steps in this process. In the exercise, participants were asked to recall the latest ICO they have invested in and thereby each journey map created in the interviews represents an actual customer journey. As stated by Følstad and others (2013), methods for mapping and measuring actual journeys are fragmented. While interviews and observation are prominent means of collecting data, various types of alternative methods for data collection are used for journey mapping purposes in practice. SIT is identified by Følstad and others (2013) as relevant, but mostly disregarded method for journey mapping and they argue that it should deserve more attention in work on customer journeys than it has in the past. In this study, a custom combination of sequential incident technique and lightweight journey mapping was used as the journey mapping method.

The custom journey mapping method created for this study takes the approach of SIT, but instead of asking the participant to point out particularly negative or positive incidents during the episode and assessing only them, the interviewees were asked to attach an experience assessment to each step during the episode. This way it was possible to tap into the experiences associated with each point of action and elicit further conversation on them. For this purpose, the rating system presented by Dove and others (2016) in the lightweight journey mapping was utilized. As pointed out by Dove and others (2016), the conversations associated with these ratings are the points where great insights are gathered during the interview session, and in fact, the primary purpose of using the ratings in this study was to stimulate discussion about the experiences. Each interviewee thus attached a rating of experience based on perceived pleasantness to each step (or ‘milestone’ as used by Dove and others (2016)). The experience rating was based on a predefined scale from 1-5 making use of emotion faces, following the original lightweight journey mapping research design. Making use of faces as ratings are a convenient way to tap into both positive and negative emotions of the participant (Dove et al., 2016). The custom combination of SIT and lightweight journey mapping allowed generating understanding on the one hand about the process structure comprehensively and on the other hand on the experiences associated with each step in the process.

The journey mapping exercise began with inviting interviewee to recall the last ICO he has participated in as an investor. Then the course of the exercise was explained to the participant and the three main stages of investing (or ‘episodes’ as they are called in (Stauss and Weinlich, 1997)), derived from the crowdfunding literature, were introduced: pre-investment, actual investment, and post-investment. Clear beginning and ending of each stage were defined for the participant. The pre-investment phase begins with awareness of the ICO and ends in investing decision. The actual investment phase



starts from investing decision and ends in a confirmed transaction. Lastly, the post-investment phase begins with the confirmed transaction and ends in selling tokens, finished product or receiving a refund for an unsuccessful ICO. Notable in the post-investment phase is that none of the interviewees had reached one of the predefined ‘ends’, and the end remained open as they were simply holding on to the purchased tokens and waiting for the projects to finish. These three stages of investing constitute the typical customer path, which is defined as the first phase of SIT (Stauss and Weinlich, 1997). The typical customer path was left loose and inexact in this study for three reasons. Firstly, more strict typical customer path was unknown at the beginning of the study and would’ve required extensive additional study. Secondly, it allows more explorative approach and the customer-driven narrative approach used in lightweight journey mapping was desired in this study. Allowing the participant to lead the narrative provides a powerful way of focusing on the core experiences the participant has about the journey (Dove et al., 2016). The customer-driven narrative also relates to the principles of episodic interviewing, where the situations to remember are left for the participant to decide (Flick, 2000). Thirdly, defining more exact typical customer path would’ve been difficult for the participants as they the selection of interviewees was not restricted to a single case of ICO. The structure of the journey mapping exercise is illustrated in figure 3.1.

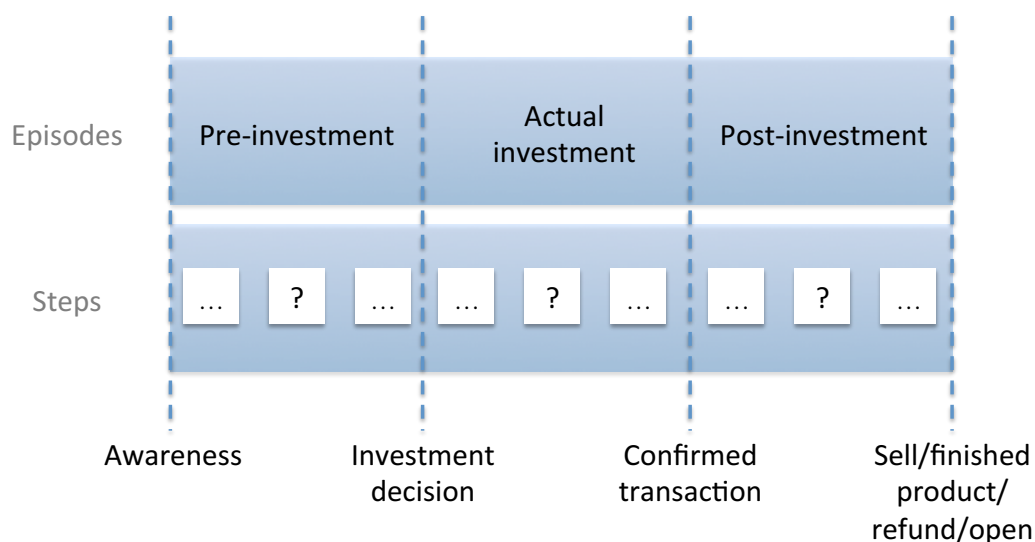


Figure 3.1: Structure of the journey mapping exercise

The three episodes of investing were processed one by one, and each participant was asked to do the following tasks:

- Describe the course of this stage.
- What single steps or actions this stage included?
  - Who was involved? Which channels did you use? What kind of information you gathered/needed? What tools did you use? Why?
- Please attach an experience assessment to each step and explain the reasons behind the assessment.

This set of questions was formulated and modified based on the original SIT research design by (Stauss and Weinlich, 1997). As the participant described the events and the course of actions, the interviewer wrote them on post-it notes using distinctive colors for actions or touchpoints, people, and channels and laid them on a process canvas. The participant then attached the rating faces on the post-its representing actions. This resulting map works as a record of customer's experience in a particular workflow, and thus the journey mapping exercise can be seen as a self-documenting process (Dove et al., 2016). For each step, additional clarifying questions may have been asked, allowed by the loosely structured principles of in-depth interviews. In this sense, the journey mapping exercise held on to the free-roaming conversational grip that had already been established in the first part of the interview session. An example of a finished journey mapping exercise is presented in figure 3.2, where yellow notes mark action points, blue notes tools, channels and services and green notes mark other people.



Figure 3.2: Example of a finished journey map from an interview (in Finnish). The three stages represent the episodes presented in figure 3.1

### 3.1.4 Inductive content analysis

While qualitative research comes in a wide variety of forms, so do different methods of analysis within the qualitative research tradition (Miles et al., 2014, p.8). On a general level qualitative data analysis consists of three main flows of activity: data condensation, data display and conclusion drawing/verification (Miles et al., 2014, p.12). Content analysis as one qualitative analysis method provides a systematic and objective way of describing a phenomenon (Tuomi and Sarajärvi, 2002, p.105). The idea is to analyze written, verbal or visual communication messages to produce condensed and broad conceptualizations or categorizations describing the phenomenon without losing any of the information the data contains (Elo and Kyngäs, 2008; Tuomi and Sarajärvi, 2002, p.110). Content analysis can be used either inductively or deductively based on the purpose of the study. This study is highly explorative, and it focuses on a novel phenomenon that has not been studied in academia before. In this type of situation where previous studies dealing with the phenomenon are fragmented or even non-existent, the inductive

content analysis is well applicable (Elo and Kyngäs, 2008). In the inductive approach, the categorizations are derived from the data, and no predefined categorizations or hypotheses exist. The inductive approach moves from specific details towards general statements by observing particular instances.

In a bigger picture, content analysis process (both inductive and deductive) can be divided into three phases: preparation, organizing and reporting (Elo and Kyngäs, 2008). The preparation phase includes defining the unit of analysis and making sense of the data. In this study, the unit of analysis was twofold based on the principal research questions: investing as a process/workflow and investor experience throughout this process. Putting much effort into making sense of the data did not make that much sense in the context of this study due to the homogenous nature of data units; in each document of data (i.e., transcribed interview), the setup was the same. The transcribing process itself and reading through the transcriptions can, however, be seen as a process of making sense of the data as the point of making sense of the data is merely getting immersed in the data (Elo and Kyngäs, 2008). The organizing phase includes the ‘bulk’ of the analysis work, and it can be directly related to the ‘data condensation’ workflow presented by Miles and others (2014). In that phase, the data is coded, grouped and categorized to provide the means to create descriptions of the studied phenomenon through abstraction (Elo and Kyngäs, 2008). In other words, the data is 1) reduced, 2) clustered and 3) abstracted (Tuomi and Sarajärvi, 2002, p.110-111). Data display activities presented by Miles and others (2014) are applicable in the organizing phase of inductive content analysis. The created general descriptions of the phenomenon under study are eventually reported as a model, conceptual system, conceptual map or set of categories. In this study, the model of a generic investor journey linked to factors affecting the investor experience works as the outcome of the analysis.

## 3.2 Data collection

The dataset of this study consists of 8 in-depth interviews with people who have had experience in participating in an ICO as an investor. The interviewees were recruited by posting recruitment announcements on Finnish crypto communities in social media (Facebook group Bitcoin ja kryptovaluutat (7000 members all over Finland) and a Finnish crypto-forum Bittiraha.fi), face-to-face in a ‘bitcoin hobbyist’ meet-up<sup>1</sup> and by utilizing author’s

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<sup>1</sup>In Helsinki capital area, different meet-ups in the crypto community take place practically weekly. The particular meet-up visited in this study has a monthly event. For more information see: <https://www.meetup.com/Helsinki-Bitcoin-Hobbyists/>

personal networks. Out of 10 scheduled interviews two were eventually canceled. The qualifying criteria were left very loose, and the only requirements for the interviewees were that 1) they have invested in at least one ICO and 2) they can participate in the study in the capital region of Helsinki. This was due to the facts that firstly, it was unclear at the beginning of the study that how common it is in Finland to have taken part in such activities, and it was a priority to reach as many investors as possible and secondly, the methodology required the interviews to take place in a face-to-face setting, which was a practical reason to the requirement of residing in the close vicinity of Aalto-university. Leaving the requirements loose, made it possible to reach a more diverse group of interviewees for the study. For the exploratory nature of the study, this was desired. Although the requirements were left loose, the goal for the recruitment, if possible, was to reach both very experienced and less experienced investors in the context of ICOs and cryptocurrencies. This spectrum was successfully reached, and the level of experience varied significantly among the participants: from being involved with cryptocurrencies for only a few months (interviewees #3 and #5) to over six years of experience (#1 and #6) and from having participated in only one ICO (#3, #4 and #5) to experience of investing in over 10 different ICOs (#2). This type of purposeful seeking for possibly contradicting cases functioned as a tactic for checking the representativeness of the findings (Miles et al., 2014, p.296). Table 3.1 presents the background information of each interviewee.

Table 3.1: Background information of the interviewees

Interviewee	Profession	Involvement in crypto scene (time)	ICO experience (number)
#1	Researcher (Economics)	> 6 years	2
#2	Student (Computer science)	5 years	10+
#3	Student (Logistics)	6 months	1
#4	Service manager	6 years	1
#5	Designer	4 months	1
#6	Student (Physics)/Entrepreneur	> 6 years	2
#7	Head of development	5 years	3
#8	Entrepreneur	4 years	6

Although not moderated in the recruitment process, it is notable to men-

tion that out of the eight interviewees four were involved with blockchain technology (#1 and #7) or cryptocurrency trading (#6 and #8) on a professional level. All of the interviewees had a background of higher education or were currently studying in an institution of higher education. Also, another point to be noted is that all of the interviewees were male by gender. The age of the participants ranged from 22 to 42. These demographic details do not, however, play a critical part in this study due to the qualitative and explorative nature of the study and their expectedly vague relevance to the research questions.

First two interviews were held as test interviews where the methodology (i.e., interview template and journey mapping exercise) was tested, and informal feedback was gathered from the interviewees. The changes made after the test interviews were only minor as only two interview questions were dropped due to their too general nature and redundancy. Thus the two test interviews are treated as entirely valid sources of data in this study. The rest six interviews were then held during February 2018 after the successful test interviews. When the interviewees had participated in the ICO they described varied case-by-case; for some participants (#6) the latest ICO they had attended was a couple of weeks ago, and for others (#7 and #8) it was over half a year ago. The time between investing and the interview defines that the data gathered in this study represents episodic user experience (Roto et al., 2010) and there may be implications on the credibility of the testimonials given by the interviewees as they depend on the memories of the participants. These issues are considered in more detail in chapter 5.

The interviews were held mainly in a peaceful meeting room setting in the premises of university. One interview (#8) was held in a busy cafe and two interviews (#1 and #7) in office environment provided by the interviewee. In the interviewing session, there were interviewee and interviewer present, and the interviews were recorded with an audio recorder. The interview sessions were 60-90 minutes long depending mainly on the characteristics and speaking pace of the interviewee. Finally, after data analysis and outlining the tentative results of the study, a validation session where the results were discussed with the participants was held with two participants (#1 and #2).

### 3.3 Data analysis

The data analysis was conducted by applying the principles of inductive content analysis. The process of analysis began by listening through the audiotapes of the interviews and transcribing them. This constituted the preparation phase presented by Elo and Kyngäs (2008). Next, the process

of analysis moved to qualitative analysis software Atlas.ti, where the transcribed interviews were read through and reduced by coding. According to the units of analysis, the focus was in the investor workflow and experiences associated with that workflow, but also investor motivations, attitudes, and more general views were noted. Different coding techniques were mixed in the process of coding: simultaneous coding, sub-coding, descriptive coding, process coding, in vivo coding and emotion coding were all used more or less in a mixed manner in the coding process (Miles et al., 2014, p.75-81). The reduced data (i.e., coded words and short sentences) was then processed by doing pattern finding, clustering and subsuming particulars with the network tool of Atlas.ti. These processes of coding and then finding similarities and categorizing them refer to first and second cycles of coding presented by Saldaña (in Miles et al., 2014, p.73). Tuomi and Sarajärvi (2002, p.111) refer to these steps as reducing and clustering in the process of inductive content analysis. The first cycle of coding summarizes segments of data and second cycle groups those summaries into a smaller number of categories, themes or constructs (Miles et al., 2014, p.86).

In the first cycle of coding the interview, the data was reduced to a total of 590 codes. In the second cycle, this number was reduced to 89 by forming sub-categories (Tuomi and Sarajärvi, 2002, p.111-113). At this stage analytic memos were written for most of the sub-categories to create a summarized data log about the meaning and interpretation behind them. The outlines of the central findings started to form during that process. 34 of the sub-categories were labeled concerning the three main stages of investing: pre-investment, actual investment, and post-investment. 31 of the sub-categories represented positive and negative experiences associated with the workflow. Furthermore, 11 sub-categories were labeled as “problem,” six as “motivation/interest” and seven as “miscellaneous.” This high-level categorization was used due to its apparent nature (the structure of the journey mapping exercise) and to slice the data into smaller, more easily digestible chunks.

At this stage, two matrices were created as data display measures. Firstly, a meta-matrix was created to present main characteristics, and answers to central topics in the study in relation to each interview (see appendix A). This helped to recognize patterns and relationships within the data by bringing the data into a workable format where the cases are easily comparable (Miles et al., 2014, p.136). Secondly, the activities described by the interviewees in the journey mapping exercise and the experience ratings attached to them were all brought together in the form of a conceptually clustered matrix (see appendix A). Conceptually clustered matrices are used when tentative themes have emerged from the initial analysis (Miles et al., 2014, p.174).

Through this matrix, the process workflow was categorized, and the mean values of the pleasantness of each activity throughout the investor journey were measured. Eventually, these values were used to create a directive curve of investor experience (inspired by Mangiaracina et al., 2009) throughout the investing process (see appendix B). Important notion regarding these analysis activities is that they do not represent statistically accurate data and they were not or should not be treated as such. The matrix and the produced experience curve were merely utilized as a supportive visualization to draw rough conclusions about how investors perceive different stages of investing ICOs.

Although the sub-categories already gave quite clear implications about the findings, the data was still abstracted as the final step in the process of actual analysis. In this process, the two units of analysis were separately processed: investor workflow in each stage of investing and the experiences associated with that stage. For each main stage of investing a workflow- and an experience abstraction were created. As a result, a total of 28 generic categories in 10 main categories were created: 11 generic categories for workflow in four separate main categories and 17 generic categories for experiences in six main categories. Furthermore, five generic categories for main category ‘problems’ and three generic categories for main category ‘motivations/interests’ were created. Based on these abstractions a visualization of a generic customer journey was created as a tool for reporting the results of this study (see appendix D). Table 3.2 shows an example of the abstraction process used in this study.

Table 3.2: Example of the grouping and abstraction process in the study, constituting negative experiences in the pre-investment phase

Reduced data	Sub-category	Generic category	Main category
Not able to trust who the people behind the ICO are	Lack of trust towards the project	Mistrust	Negative experiences in the pre-investment phase
Risk of getting scammed			
ICO review: mistrust towards the real motives behind the service	Lack of trust towards the information sources		
Cannot fully trust social media			
Suspicious towards the forums			
Searching for information is cumbersome	Overwhelming amount of information	Laboriousness of information management	
The amount of information causes stress			
Relevant information is lost in the vast amount of information			
Going through telegram conversations is laborious	Difficulty of comprehending the information		
Technical understanding is not sufficient			
Investment and whitepaper are too difficult to understand	Decision making under pressure		
Rapid changing of prices cause nervousness			
Psychological pressure to invest quickly			
ICO model may cause stress			

As a measure of validation, participant feedback was gathered after the process of abstraction. Prior studies argue that “good research goes back to



the subjects with the tentative results and refines them in the light of the subjects' reactions" (Silverman, 2000, p.208). Miles and others (2014) call this technique of getting feedback from participants as a tactic for testing and confirming findings. In the validation exercise of this study two participants (#1 and #2) were invited for a session where the visualizations of a generic customer journey, investor motivations, and ICO problem domain (see appendices D and C) were presented and explained to them. It is argued that by laying out the findings clearly and systematically, it is easier for the participant to access the information and understand the main factors on a higher level (Miles et al., 2014, p.310). The participants were then invited to give open feedback on the results: what are their initial comments on the results, how accurate they see the results are, what is missing and are there some clear disagreements or misconceptions that should be reconsidered. In addition to merely confirming the tentative results, the results from the session were used to evoke insights for the discussion part of this study.

## Chapter 4

# Results

### 4.1 Characteristics and motivations of investors

Identifying the typical characteristics, underlying interests, and motivations of investors for participating in ICOs is necessary to understand the investors' behavior and experiences. Based on the interviews, investor motivations can be viewed from two different perspectives: 1) investors' interest towards cryptocurrencies in general and 2) investors' interest towards ICOs particularly. These two aspects overlap greatly, but the motivations are weighed unevenly between the two. Motivations to initially become involved with cryptocurrencies are driven in part by interest and fascination towards the *ideology* at the core of blockchain technology and cryptocurrencies. This ideology embraces libertarian attitudes and decentralization of power as underlying principles and idealizes disrupting existing centralized economic systems. Investors are drawn to the ideas of freedom and independence that they see cryptocurrencies enable. Describing his first encounter with Bitcoin, for example, one investor told that *"Ideologically it interested me that there is no state in the background printing more money and stuff. There's a bit libertarianism in my way of thinking."* (#4) Ideology as a driving motivation to invest in ICOs is not however that significant or direct, and it is something that merely has drawn more experienced investors to the domain of cryptocurrencies in their early days.

Interest towards technology and *promoting technological development* play a critical role as investors' object of interest: *"Even if I didn't get rich, I would like to see that something came out of this. I would like to see this project succeeding."* (#2) This interest manifests itself as close to an altruistic motivation to find, support and follow projects that the investor believes have

potential, have disruptive effects on contemporary systems or can support the bigger ecosystem of crypto services. On one hand, investor enjoys finding and being a part of such projects and on the other hand he/she wants to support projects that may benefit the society or crypto ecosystem somehow. This type of altruism was in clear minority in the motivations amongst the investors, but yet the few strongly emphasized it. The interest in technology and ‘belief in the project’ stand somewhere between interest towards cryptocurrencies in general and ICOs explicitly: it is a driving force getting investors involved with the world of crypto, but also a clear criterion for selecting the ICOs they participate in.

The strongest single motivation to take part in an ICO was financial profit, even for the same people who recognized ideology as their underlying motivation to get involved with cryptocurrencies. As one investor put it, “*I don’t have any altruistic motivation to support the companies [in ICOs] ... I’m genuinely interested in it [crypto scene] otherwise, but investing in ICOs is nothing like doing charity or anything. I don’t have any other motivation than money.*“ (#7) The same investor behind this quote recognized decentralization as the main absorbing factor for his initial involvement with cryptocurrencies. This inconsistency implies the way investors view ICOs as part of the crypto world. *Benefit to oneself* is the heaviest motivation for participating in an ICO. High risk – high reward mentality is characteristic for investors when they get involved with ICOs. Sometimes investors go after quick profits when they see that the markets will value the tokens highly even if they did not care about the project itself that much. Still, however, most of the investors viewed the ICOs as long-term investments that have first and foremost high growth potential in a bigger picture. This finding is consistent with investor behavior in angel investing where investments have 4-6 year horizon typically. Interestingly, few investors (#3, #7, #8) brought up the long-term goal of financial freedom in life when asked about their goals regarding ICOs. Such intentions imply the strong emphasis on personal benefits in the form of profits when it comes to motivations behind investing in ICOs. These findings argue that while there exist altruistic and ideological motivations amongst the investors, ICOs are considered primarily as an instrument to get substantial profits in the world of cryptocurrencies. This is well analogous with the analysis on the existing literature on investor motivations in crowdfunding and ICOs.

As another more surprising motivation where investors seek to benefit from ICOs is the motivation of self-development and learning. Whether it is because of the novelty of the phenomenon or for some other reason can be speculated, but three investors brought up learning and sheer curiosity as one of the underlying reasons why they had invested in an ICO. One investor

described his investing experience as a necessary procedure in his efforts of comprehending the phenomenon: *“I studied them [ICOs], and it seemed that if I want to learn this stuff, I need to invest now. Just quickly get onboard in something while there is still an upswing going on.”* Strong fear of missing out fueled this learning process, but more pure motivations of self-development also emerged: *“Actually I see it [studying and following ICOs] largely as a learning experience. This everything [investing process] is about my will to develop myself so that I become better in the future with them [ICOs] and at some point, I can, for example, help other people with these matters.”* The motivation of learning in the context of ICOs may be a reaction to the lack of standards and regulation that are characteristic to ICOs, as it might drive the need for the investors to educate themselves actively. This connection is however highly speculative. A visualized model for investor motivations and interests is presented in figure 4.1.

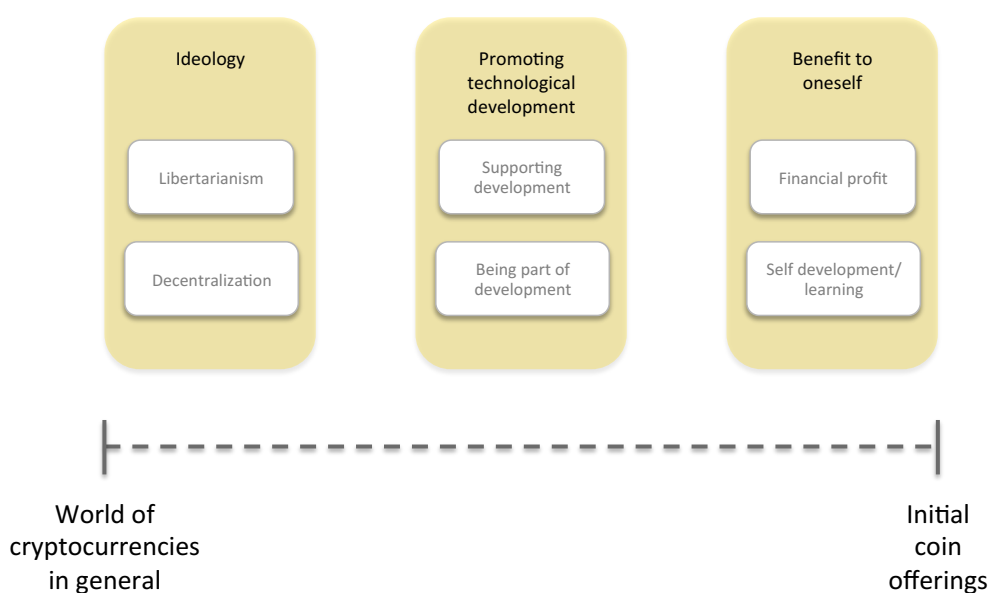


Figure 4.1: Motivations and interests for participating in ICOs

As noted in the data collection section, all of the interviewees had a background in higher education, and all of the interviewees unintentionally happened to be men. Furthermore, the interviewees had next to none experience in traditional investing. Due to the qualitative research approach, it is not possible to draw accurate conclusions from the demographic details, but it is good to acknowledge the possible implications this may have had on the findings related to investor characteristics. For example, several

investors admitted having a particular interest in technology, which could be an explanatory characteristic to explain their involvement with ICOs or cryptocurrencies in general. Investor unsophistication and irrationality as driving factors of investor behavior (presented in the literature of crowd-funding) didn't emerge strongly from the interviews. Investors themselves, on the other hand, brought up the 'irrational' and 'profit-crazed' high-risk investors that are ruining the domain by enabling the market for scams but saw themselves as investors making rational and measured decisions. This implies that there may be a sort of third-person effect in the investors' thinking. The impression all of the interviewees gave about themselves did not entirely fit the profile of an unsophisticated, irrational and quick profit-seeking individual, even though profit making was, in fact, the strongest single motivation for their participation in ICOs.

## 4.2 General views and attitudes on ICOs

All of the interviewed investors (N=8) had somewhat skeptical and cautious attitudes towards ICOs. They recognized and emphasized the high-risk nature of the investment class and noted that it affects their investing behavior and their expectations for the investment: *"I play with such sums of money that it doesn't bother me to lose them."* (#3) The general attitude towards ICOs as an investment class resembles attitudes towards gambling or lottery tickets. The projects are early stage, and most often there is nothing concrete to show for the investors, only promises and visions about the future product. This vagueness leads to the problem that valuating tokens or assessing risks is practically impossible for investors; investors cannot rely on traditional metrics and tools for valuation. Interestingly, however, regardless of that, investors spend substantial amounts of time studying the projects and indicate honest belief and attachment to the projects they have invested in: *"I still strongly believe in the project, so much that I have kind of let go the token price. It's going to be what it's going to be, but I still like the project."* (#7) This contradiction between investors' uncertain attitudes towards ICOs as an investment class and their real relation to the projects they get involved with is a rather peculiar phenomenon. ICOs are simultaneously viewed as uncertain high-risk investments and considered as long-term investments with a nearly emotional level of attachment.

In addition to the high-risk nature of the early stage projects, mistrust caused by a vast number of scams and hacking incidents in the domain have infested the reputation of ICOs amongst investors. Investors are not afraid of only getting scammed, but also entirely legit projects suffer from the risk

of malicious cyber attacks that have led to investors losing their money. The risk of such attacks causes cautious behavior amongst investors. As one investor described his reaction to his first encounter with the latest ICO he had invested in *“I try to keep quite cautious and negative stance to it [ICO], like ‘everything is crap until proven otherwise’.”* (#1) Another investor described having the first-hand experience of losing money in a hack against an ICO. The general view amongst investors is that they find it hard to believe any information sources in the context of ICOs. Investors see the lack of trustworthy actors in the scene a problematic issue.

As noted by a few more experienced investors, the domain of ICOs has gone through significant changes rapidly during the year 2017. According to them, the scene has become a ‘wild west’ as the number of poor quality projects has become high. There are simply too many projects, too much information to process, too many scams and too much speculation around ICOs to make educated decisions. Thus some have even taken a step back from investing in ICOs and aim at investing only in extremely high-quality projects that come to their attention from trustworthy, private sources. In reaction to the recent changes, investors call for clearly defined rules, structures and regulation to the scene. To comply with the common ideology within the crypto community, investors hope this regulation emerges from within the community, not forcibly by governments: *“To get some kind of sensible regulation which would preferably come from within the community and not by, let’s say, Finnish government ... because obviously they probably don’t have any clue what’s happening there.”* (#8) It is thus apparent that ICOs enjoy, to say the least, questionable reputation amongst investors who are not satisfied with the current state of ICOs in the world of cryptocurrencies and they are hoping for clarification and sense to the market.

Investors acknowledge the early access nature of ICOs and tend to be forgiving towards problems emerging in the scene. They reason through the fact that ICO markets are unfinished and the systems are still undergoing a process of development in the big picture. Some investors accept for example errors in transaction processes that would without question be enough of a reason to abandon the venture in any other context of purchase. For example, one investor tried to get a transaction through in an ICO for an hour before finally succeeding to do so, but yet commented banally *“I wasn’t surprised [because of the problems]. It’s already known from Ethereum that the network gets congested when it’s used for an ICO.”* (#6) This reaction implies that investors, in fact, expect errors and problems to happen in the process of investing which again affects how they view ICOs as an investment class. Investors’ reactions towards usability challenges and error situations throughout their journey of investment manifest the forgiving attitude. Such

behavior supports the claim that investors adjust their behavior accordingly and accept the possibility that they lose all of their invested money in ICOs.

Not all of the attitudes towards ICOs are however only negative and suspicious. Investors see also benefits in ICOs, although the benefits are in a small minority comparing to the more negative attitudes. Investors recognize that ICOs enable such projects to materialize that would otherwise not realize due to the difficulties of traditional means of collecting funding. Collecting funding through ICOs is perceived as more straightforward, immediate and global. Thus, ICOs as a novel funding instrument first and foremost benefit companies in need of funding. They get instant access to global markets through ICOs and are not required to go through rigorous processes of regulation. For investors themselves, the benefit is that they get early access to companies or projects that would otherwise be accessible only by accredited investors and hence ICOs enable access to unprecedentedly high possible profits to ordinary individuals. The possibility of high profits is why investors are willing to tolerate all the problems, risks and uncertainties causing the negative attitudes towards the phenomenon.

### 4.3 Pre-investment activities – assessing the investment opportunity

Pre-investment phase is the stage of investing, where investors assess the investment opportunity and make their investment decision based on the sources of information available to them. Figure 4.2 presents a model of the pre-investment phase of investor journey in ICOs created based on the findings of this study. According to the model, investors make use of three different classes of techniques that they use for assessing three different criteria of the project. The technique classes are *personal assessment*, *community and peer-to-peer support* and *expert evaluations* and the criteria are *trustworthiness*, *potential*, and *profitability* of the project. The next four sections explain these findings in more detail.

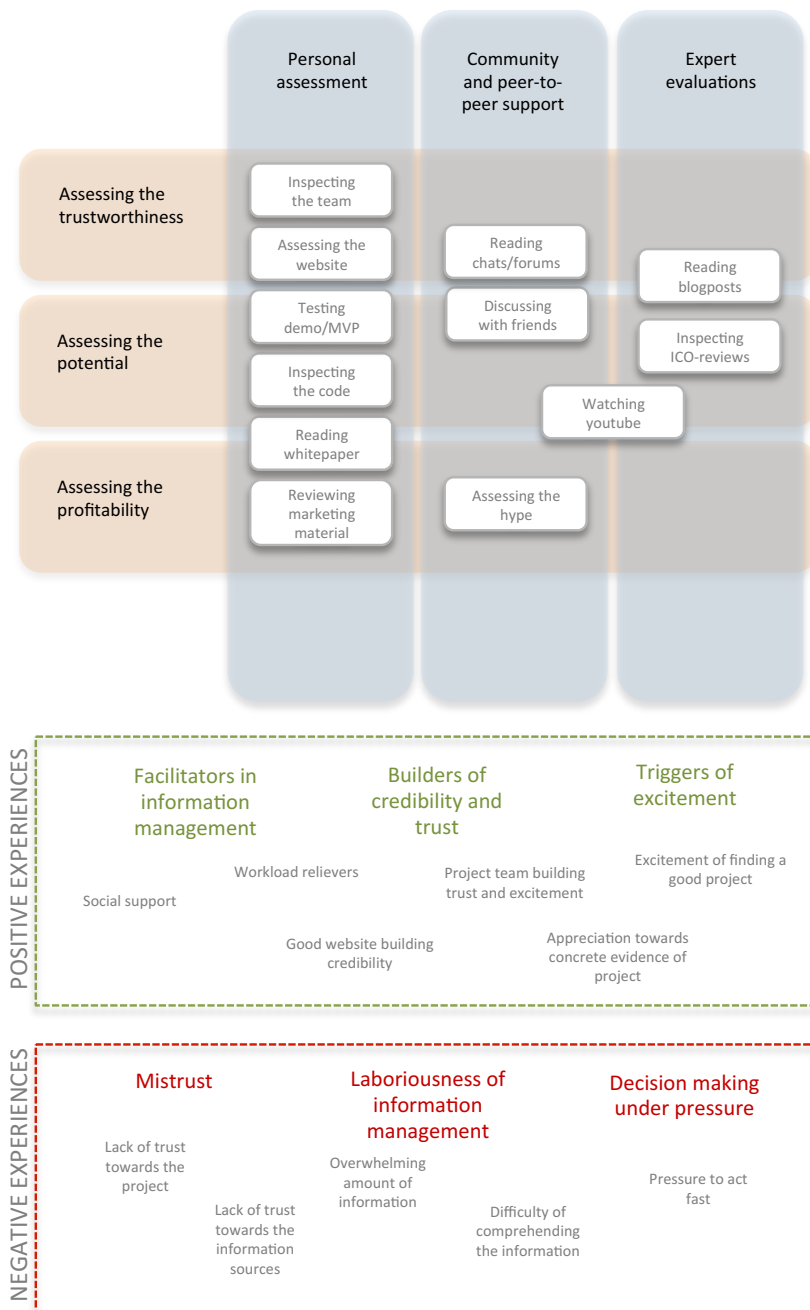


Figure 4.2: Model of the pre-investment process



### 4.3.1 Assessing the investment opportunity single-handedly

For an investor perhaps the most obvious technique for assessing ICOs in the pre-investment phase is doing the work by oneself. Especially more experienced investors assess the ICO by speculating on the possible potential of the project. They assess the project's possible disruptive effects, the project's stance and possible impact to other crypto projects, the benefits and sensibility of implementing the idea on top of blockchain technology and the growth potential of the industry the project resides in. This self-made evaluation is often based on intuition, but investors use whitepapers and other material provided by the project team as fuel for their thought. After all, it is about assessing the potential of possibly highly abstract ideas and visions.

Two primary targets of inspection for the investor are the project team and the whitepaper when doing the due diligence by oneself. Investors report that having a competent team is the most significant single factor affecting their investment decision positively. This finding is consistent with existing literature on angel investor behavior. A strong and convincing team affects ICO investors in two ways: a strong team 1) builds trust and 2) it has the effect of triggering excitement amongst the investors. The investors assess the team's competence by checking their professional background and by evaluating the team's levels of technical and economic competences. Between the two, the investors appreciate technical competence higher, and one investor even described the trend in which project teams focus too much on building a good ICO with a strong competence of marketing problematic in the scene of ICOs. For investors, this is a red flag when considering investing in a project. For the background check, investors have to go as far as investigating if the team members even exist because of high-quality scams that present fake teams with fake identities. Taking such actions is one implication of the lack of trust that is characteristic of the scene of ICOs. For some investors, it is not sufficient that the team appears only on the ICO website, but they also inspect the team's appearance in other media sources. Investors consider team members with verifiable identities making public appearances as an effective way of building trust. In this respect assessing the investment in ICOs is different from angel investing where investors most often meet the project team personally or may even know them through personal contacts. Close inspection of the team, however, is similarly emphasized in investment assessment by angel investors.

How well the team is networked and how diverse is the expertise within it are used as assessment criteria. Thus, the social capital of the project team is a similarly relevant attractor of investors as in conventional equity

crowdfunding projects. When evaluating the team, investors feel convinced by team members who have a strong background of successful crypto projects. Famous developers and influential people in the world of crypto as part of the ICO team act like magnets attracting investors to participate in the ICO.

As part of the due-diligence process, investors assess the credibility and potential of the project by reading the project whitepaper. As one investor put it, *“It [the whitepaper] might be the best and most accurate source of information, even so, that it has some technical solutions in such detail that you could implement them yourself if you wanted to.”* (#2) The whitepaper thus often provides accurate technical details about the project, but investors also complained about the trend of whitepapers having too vague contents. Vague and sloppy whitepapers cause mistrust and irritation amongst investors. However, investors often feel that whitepapers are also too technical and difficult to understand which makes them cumbersome to use as a source of information in assessing the investment opportunity. Reading a highly sophisticated whitepaper leaves investor frustrated. Investors value less technical descriptions about the project for their assessment on the project idea and find them pleasant to read but simultaneously expect the project team to produce accurate technical details about the project as a mean of building trust in investors. Investors perceive that whitepapers as technical descriptions about the project serve only a small segment of technically oriented investors. For example, less experienced investors rely on the more technical ones to make the due diligence for them. In a way, investors expect whitepapers to be the detailed information sources of the projects, and they value thoroughness in them, but they may not even read them themselves and rely on that some other investor would’ve raised concerns if there were any. Such behavior complies with the studies on investor behavior in equity crowdfunding where funders mostly outsource the due diligence to the community and investors are argued to lack the required expertise to conduct due diligence with same criteria as in VC and angel investing.

In addition to assessing the team and whitepaper, investors appreciate highly if there is some concrete evidence of the project in the form of a testable demo or a minimum viable product (MVP): *“I found it kinda cool that they had working MVP where you could test the basic functionalities, even though they were very elementary, but still they worked.”* (#7) Even if the demo was not anywhere close to a finalized product and demonstrated only the barest form of the core functionalities of the project idea, it is likely to evoke positive feelings of trust and confidence amongst the investors, and it promotes the potentiality of the project. Such demo works as a signal to the investors telling that the idea is implementable and it is an indication of the technical competence of the team: *“I think that it tells about the*

*team if they have a demo. It tells that they know how to make software.” (#7)* Similarly, as with demos, investors heuristically assess the ICO website and draw conclusions about the project’s credibility based on that. A website that has been built with latest technologies and looks like it has required professional skills to implement works as a parameter of credibility for the investors. Furthermore, it promotes the impression of profitability as investors believe that a good looking website draws other investors along: *“Even though I personally found it [the website] quite tasteless, I saw that someone had undoubtedly gone through the trouble of building it and I believed that it would make a trustworthy impression to other investors also so that I won’t be left alone there investing in the project.” (#5)*

### 4.3.2 Exploiting community and peer-to-peer support in due diligence

Social media and crypto community play important roles in the whole domain of ICOs. In fact, social media channels discussing the ICO (sometimes facilitated by the project founders but mostly not) form perhaps more essential touchpoints for the investors than any particular service provided by the project team. Social media is strongly present from the very beginning of the investment process: investors do not search for ICOs actively, but more likely browse through more general crypto channels in social media and expect prominent projects to show up to them instead. Investors feel that while there is an overflow of projects in the scene of ICOs, their social media channels function as a sort of a filter for projects worth their attention: *“I go to the open chat groups in Telegram where people discuss crypto-investing, and then I look if there is something new and wonderful, because if there is something auspicious, the news will spread here also.” (#5)*

Investors use social media as a tool for assessing the project in the pre-investment phase. They look for sentiment on what other people have thought about the project, and they look for confirmation to their own sentiment about the project. They reflect their thinking to other investors and check if there is something that they may have missed or overlooked. In a way reading through chats and forums function as a shortcut through the process of due diligence: *“The idea is that if there is critique or something obvious, it [browsing the community] speeds the process up.” (#4)* They look for clear deal breakers in the community discussions. Investors assess primarily the trustworthiness but also the profitability of the project through social media. By exploring the community discussing the ICO, they speculate what others think about it and is there thus potential profit embedded. Such speculation

indicates that investing in ICOs has characteristics of a *Keynesian beauty contest*, according which investors do not actually invest in the project they consider the best, but expectations about what other investors think, drive the investment instead. It is not enough that the project idea is good, but the project has to have an active community and ‘hype’ around it also. This way investors look for indicators of interest towards the project. Investors perceive that facilitating a community around the project is pivotal to the success of the ICO. The hype around the project is a crucial assessment criterion of profitability for the investor, and investors use the sheer size of the community around the ICO as a direct metric for ICO valuation. Investors see that the amount of hype is proportional to the token price in the after-market of the ICO. Assessing the hype as a metric is an implication of the inapplicability of traditional investment valuation metrics in the context of ICOs.

While investors perceive that they get the most recent ICO information from their social media channels, they suffer from the lack of trust towards these information sources nevertheless: *“I followed the conversation and googled the same things. I was checking the facts because you cannot trust absolutely any source of information in this [ICO investing].”* (#5) After all, investors acknowledge that in social media anyone can be claiming anything. To tackle these issues investors check the facts from other sources, look for reoccurring patterns in opinions in the conversations and pinpoint single people they have deemed intelligent and trustworthy and focus on their arguments. Especially on YouTube, investors report following particular trustworthy channels where people analyze ICO projects. The fact that community and social media lack trust makes relying on them as sources of information more difficult. Nevertheless, they have a strategic role in driving the investment decisions of the investors. For more experienced investors who assess the investment opportunities mostly single-handedly, the community is merely one parameter to assess the profitability of the investment. Investors recognize the importance of identifying the hyped projects in their social media channels to tap into profits. For less experienced investors, relying on the social media as a source of information for investment potential and trustworthiness is almost compulsory as they do not have the required expertise to assess the projects on their own.

In addition to lack of trust in social media sources, exploiting the data in the pre-investment phase is complicated by the fact that the amount of information is too vast to handle. One single telegram conversation of an ICO may include tens of thousands of people, and trying to follow such data for multiple ICOs is too overwhelming. The ocean of information in social media regarding ICOs is one of the most complicating issues for investors in the pre-

investment phase. They simply do not have enough time or energy to follow everything. This makes ICOs a challenging investment field to operate in. Affected by the rapid growth of popularity of ICOs the quality of information has gone down while the amount of it has skyrocketed: *“Last autumn was such time that you had real trouble finding any true content amongst all that garbage. For example two years ago it was completely different.”* (#2) The decreasing quality and increasing amount of information are directly linked to investors’ negative attitudes towards ICOs and in more detail towards the current state of the investment class.

Contacts in social media and the communities are not the only form of peer-to-peer support investors seek in assessing the investment opportunity. Many investors report discussing and getting support from friends in the process of making the investment decision (i.e., personal acquaintances). Investors use personal acquaintances as support for three purposes: 1) to ask for help in practical matters, 2) to ask for opinion and suggestions and 3) to reflect own thoughts about a project. They are first and foremost perceived as trustworthy sources of information; in the context of ICOs that is rare and thus valued highly by the investors. Furthermore, they are easily accessible, and they give direct and unbiased answers to investor questions. Inexperienced investors report having personal contacts as ‘mentors’ who guide their way through the journey of investing. As one investor put it *“I would say the meet-up was the most useful [part of pre-investment] because I finally met such people there who have experience about this topic and from whom I could get guidance directly.”* (#5) Discussing with real-life contacts is perceived valuable and easy compared to open discussions online. Investors assess the potential of the investment through discussions with friends, and similarly, as in the case of social media sources, they seek other people’s opinions on the ICO from these discussions. Personal social contacts are perceived important in the process of assessing the project, and through enhancing the feeling of security, they evoke positive experiences in investors.

To sum it up, making investment decision has a high level of social influences in ICOs and the process could be considered as socially driven for some investors. This characteristic is consistent with the existing research on equity crowdfunding where social criteria are argued to be compensative for unaccredited investors. It is, however, important to acknowledge the identified differences between investors in the context of ICOs and understand that the social support has different levels of importance and meaning for investors with different characteristics and levels of experience.

### 4.3.3 Expert evaluations translate and compress information for investors

As the findings have shown so far, investors struggle with information management issues in the pre-investment phase: the overwhelming amount of the information and the difficulty of comprehending it. Going through all the information single-handedly is considered exhausting, and investors feel that their own time and energy do not suffice to do it. To tackle these problems, in addition to merely following peer-to-peer discussions in the ICO community, investors turn to experts who share their views and opinions on ICO projects. Investors thus perceive the expert evaluations as workload relievers. These experts come in many different forms. They may be appreciated, famous or successful people or they may be peers who happen to have for example more advanced technical knowledge (i.e., developers). Either way, they are people that investors feel have more educated knowledge on the matter and whom the investors deem trustworthy. Similarly, as in the case of assessing the team, trust and belief in the project are built via known people who make public appearances with their own identities. Presented or verified expertise works as credibility builder for the information and, for example, YouTube videos by trusted or well-known experts have substantial implications on investors' perceptions about the investment's potential. In a way, these personas can be seen as opinion leaders with significant power over which ICOs succeed and which don't. Investors assessed their experiences related to YouTube-videos positively stating that interviews trigger excitement and feeling of credibility towards the project.

Blog posts related to the ICO are another liked source of expert knowledge in assessing the project. Investors like especially the way that they translate sophisticated and technically complex whitepapers into layman's terms. Blog texts are considered a more easily digestible form of information than whitepapers. Thus investors do not only seek unbiased expert analysis on the project but tend to read blog posts written by the ICO founders as a translation of the whitepaper: *"It may be so that the very same people who have written the whitepaper have some blog post where they have written the same thing [as in whitepaper] but in plain language and a much more digestible form."* (#2) This is linked to the investors' experience that whitepapers are targeted to more narrow segment of technically oriented investors and majority of investors need to rely on other sources of information in their process of due diligence. Especially regarding more technical details, investors feel that their knowledge isn't sufficient and they need to rely on expert analyses as secondary sources of information. This finding is analogous to the literature on investor behavior in equity crowdfunding where prior studies state that

appropriate due diligence is hardly conducted at all by the investors due to the exhaustive workload of it.

Services providing ICO reviews are created mainly to analyze the ICOs and provide investors assessments on projects in a compressed form. These services enable by far the most straightforward shortcut for investors to make investment decision if they do not have time, energy or the capacity to get acquainted with the project data themselves. For some investors, these services function as sources of confirmation for their sentiment and reflection, similarly as the community or personal acquaintances do. An ICO review that matches the investor's tentative sentiment is a factor building trust towards the ICO.

While ICO review services are a helping solution for information management problems faced by the investors, they suffer from the chronic issue of lack of trust as information sources. Investors have difficulties in assessing the trustworthiness and underlying motivations of these services: *"I know that there is the possibility that someone has paid for the reviews or has done some sponsoring and then not openly told about it, so there is that kind of risk present."* (#4) In addition to direct dishonesty, investors are suspicious about the sheer competence of the people conducting the assessments behind the services. No review service has become de-facto service in the scene of ICOs that investors would consider fully trustworthy and investors are suspicious towards the multitude of review services. However, some investors estimate that this is probably going to change as the context of ICOs matures from the current state and trustworthy review services are filtered in: *"The future also will fix it once reliability and reputation are accrued, so through that one might assume that the will to remain neutral and provide trustworthy information by the service providers also increases."* (#4) Reliable ICO services could give relief to the chronic issue of mistrust that prevails over the review services.

#### **4.3.4 The three assessment criteria: trustworthiness, potential, and profitability**

To conclude the findings regarding the pre-investment phase, the process between first awareness of the ICO and investment decision is not linear, and investors utilize many techniques in parallel to infer a satisfying conclusion about a project. Investors do not have a uniform process that they follow through this phase, and the selected path varies per investor. Similar variability has been identified in earlier studies regarding angel investor behavior also. The high-level criteria by which investors assess the projects are

trustworthiness, potential, and profitability. Trustworthiness is perhaps the most crucial criterion in the context of ICOs, and it was a criterion that was explicitly brought up by each interviewee. This shows the extent of the reliability problem in the ICO market. In ICOs investors are forced to figure out whether an ICO is a straight-out scam in addition to figuring out whether the team behind the project should be considered reliable in terms of the successful execution of the project. This necessity differentiates ICO investing from angel investing where prior studies also identify trustworthiness of the team as one of the most pivotal criteria for investment.

Assessing the trustworthiness is made more difficult for the investor due to the easiness of purchasing references and biased positive reviews in the fragmented market of ICO reviews. This so-called ‘growth hacker problem’ leads to the problem that investors have a hard time trusting any references or the ICO reviews that otherwise would make assessing the potential and profitability of a project less cumbersome for the investor. To assess the trustworthiness, investors conduct background checks on the team, follow discussion around the project in the social media, listen to expert opinions by trusted individuals or rely only on their instinct when assessing the credibility of the project through the ICO website and whitepaper. Lack of regulation and trustworthy parties in the context of ICOs is considered a problem amongst investors, which makes the process of due diligence a laborious task.

The second assessment criterion, potential, refers to assessing the possible future potential of the project. Assessing the potential is highly speculative by nature and investors rely on their intuition and prevailing sentiment in the community when assessing it. To make more educated assessments on the potential of the ICO, investors gather information from whitepaper, the project team competence, crypto ecosystem in general and the industry that the project concerns and speculate on the possible disruptive effects the project might have. For the speculation, they might discuss and reflect their ideas with their personal social contacts. Doing an accurate potential assessment single-handedly requires a high level of understanding about the underlying technological innovations and surrounding markets of the project idea. Less experienced investors tend to listen to opinion leaders instead of forming individual assessments about the potential of the project. They base their assessment on ICO reviews services and expert analyses in the forms of for example YouTube-videos and blog posts. Furthermore, relying on the sentiment in the crypto community is likely when the investor lacks the capability of assessing the potential of the investment by oneself. Investor behavior in ICOs has thus similarities with angel investor behavior, where assessing investment includes assessing the market growth and revenue potential. The significant difference, however, is that for investors in ICOs the



assessment is conducted mostly based on gut feeling and interpreting signals in the community. Angel investors often have professional experience and means of assessing the investment potential more accurately.

Profitability refers to assessing the expectations of possible financial profits in the investment. It is distinctive from assessing potential because potential refers more to assessing the potential of succeeding and disrupting conventional ecosystems. In the context of ICOs, substantial financial profits can be made without the project itself ever successfully realizing and reaching its goals. These profits are possible because of the speculative secondary token markets. Even if an investor did not see any future or sense in a project, he/she might invest in it, if it is evident that the community hype around it will increase the token value. Thus assessing profitability is separated from assessing other forms of the project potential. The two are still however interrelated, and the means of assessing them overlap significantly. Profitability is mainly speculated based on the sentiment in the community and the activity of the community around the ICO (i.e., it has characteristics of a Keynesian beauty contest). It is speculation about whether the ICO has the required interest of investors in the market and whether that interest is enough to make the token value increase after the token sale has finished.

Assessing profitability is tightly connected to the characteristic of the ICO phenomenon where investors are pursuing to get as early access as possible to the projects: “*Nowadays I would not anymore invest in ICOs but pre-sales or pre-pre-sales.*” (#7) Investors are attracted to join ICO campaigns as early as possible by making the early investments more profitable. With the high-level motivation of making a profit from ICOs, investors seek promising projects to which they get as early access as possible. This pressure of making quick decisions ‘before others’ is causing stress and discomfort amongst some investors and on the contrary, excitement is triggered as they find promising projects before others. Paradoxically, investors simultaneously try to assess the hype around a project and seek projects that haven’t yet reached big crowds.

#### 4.4 Actual investment process – the journey through the transaction

Actual investment process refers to the phase of investment in between of making the investment decision and a confirmed transaction. In comparison with the pre-investment phase, actual investment is a more linear process. It begins with *preparations for the transaction*, continues to *executing the*

transaction and finally ends after *monitoring the transaction*. Figure 4.3 presents a model of this process.

This process involves using a multitude of different services and tools that vary depending on the ICO. The ICO processes themselves often differ from each other, but also for similar base processes different founders use custom combinations of technologies and systems. The investor perceptions about this phase are fragmented, and incidents that each investor felt relevant to bring up in the interview varied considerably. The next sections present more detailed findings regarding the investor journey through the transaction.

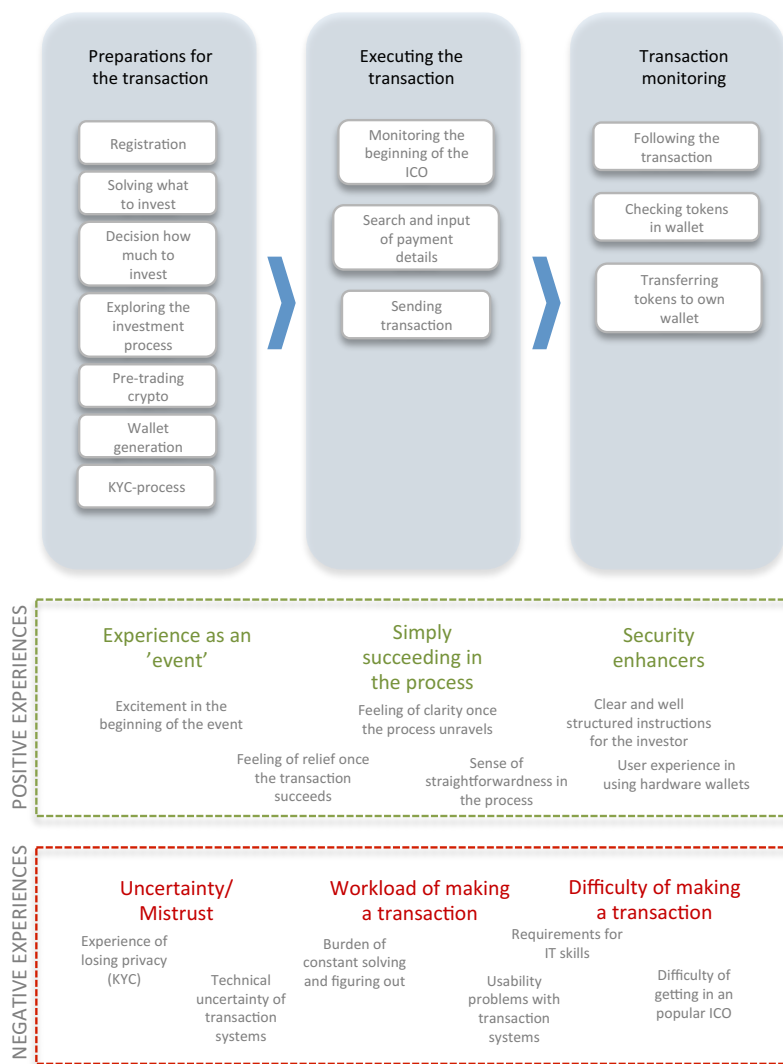


Figure 4.3: Model of the actual investment process

### 4.4.1 Getting ready for the transaction

Investing in an ICO requires a varied set of preparative actions by the investor before the transaction may take place. These actions depend on the way the ICO is structured and organized by the founders. As a result, the findings regarding the preparations for the transaction are somewhat fragmented. Furthermore, interviewees tended to bring up different types of incidents: for example, some investors felt relevant to note the action of deciding on how much to invest while others did not bring it up explicitly, even though it is evident that every investor has made that decision in any case. To make sense out of these activities, they were brought together in the category of *preparations for the transaction*.

#### Registration and the "Know Your Customer" (KYC) process

The investor journey continues after the investment decision often by registering to the ICO website (or dashboard, depending on the preferred terminology). Investors perceive registration as a neutral process. It is a conventional process that is no different from the millions of services around the web. What is worthwhile noting, however, is the reported annoyance of needing to register to each ICO separately and trying to come up with new passwords for each one. As one investor described the differences between traditional investing and ICOs, *"This part of making the investment would be quite a different process traditionally in a way that I would not have to log in and register to every system separately all the time."* (#1) This is where centralized crowdfunding platforms in the traditional crowdfunding context have the advantage and provide a more convenient solution for the investors.

Know your customer (KYC) process is a relatively new concept in the context of ICOs and investors report first hearing about KYC processes in the context of ICOs in the fall of 2017. Nevertheless, in the short timeframe, according to the investors, it has become a default part of preparative activities before being able to invest money in an ICO. In the process, investors are required to send personal data and ID to the ICO founder through the founder's website. The general attitude towards the KYC process is first and foremost negative amongst investors: the ideological fundamentals of cryptocurrencies value privacy and anonymity and investors perceive that the KYC process violates these fundamentals. In a sense, investors feel that they are forced to give up part of their privacy in that process. Combined with the chronic issue of mistrust in the context of ICOs, investors are hesitant to send photocopies of their passports during the process especially, and they feel that they are taking a risk there: *"The greatest challenge for me*

*is the idea of sending a copy of my passport to someone. However, I have already done it on quite many exchanges anyways. At some point, you just have to let it go and just trust it. Time will show if that was a good idea or not.” (#7)* Additionally, there is also a doubt about the sensibility of having a KYC process. After all, the tokens are often instantly liquid assets and can be sold after the token sale anonymously to anyone. In that case, the whole point of doing the process in the first place becomes negligible. While investors view KYC primarily in a negative light, some investors cautiously also welcome it as a part of investing process. They argue that it is a step towards the longed-for structure and regulation that would calm down and bring clarification to the ICO market.

### **Exploring the investment process**

Since ICOs can have unique features implemented by the founders, investors are required to conduct a thorough study on the practicalities of the investing process before investing. The investment mechanisms in ICOs vary case by case, and there is no existing standard that investors could learn and comply with. As a result, the founders compile step-by-step guides (e.g., PDF-files on the ICO website) for the investors to read and follow. These guides contain information on for example the accepted currencies, accepted/required wallets for transaction, does the process involve generating new wallets, how tokens can be claimed safely to different types of wallets (e.g., using hardware wallets), how the transaction is conducted in a right way, or how the ICO model in general works (e.g., explanation on the principles of a Dutch auction). For inexperienced investors, the long lists of guides feel overwhelming at first, but in general, interviewees perceived that the provided instructions were beneficial and clearly communicated by the ICO organizers. On more abstract level positive experiences related to clear instructions could be interpreted as being a result of providing security enhancers to the investors.

Simultaneously the investors are frustrated by the fact that there are no standard instructions on how to invest in an ICO and they are every time forced to figure out how the investment happens in that particular ICO: *“There is no handbook for how to invest in an ICO, you have to be there every time hands in the mud figuring it out yourself how the system works.” (#7)* In other words, the workload of constant figuring out associated with investment activities burdens the investors. Worthwhile noting is the fact that this form of workload is unique to investing in ICOs and it is absent in the context of traditional equity crowdfunding. The results imply that while equity crowdfunding and ICO investing have a lot in common, one of the most considerable differences between the two is performing the actual

transaction.

In addition to the guides provided by the organizer, investors also lean on informal support from the community in studying how the investment practicalities work. Especially inexperienced investors feel that it is essential to have personal contacts that they can turn to. The risk and possibility of making mistakes and losing money is the primary driver for the thorough studying of the instructions. On a higher abstraction level, this implies that investors are not only bothered by the workload of figuring things out but they are also experiencing uncertainty during the investment process.

### **Pre-trading and deciding what to invest**

Another routine activity that is characteristic in the context of ICOs is the moving of cryptocurrencies before making the transaction. In other words, this can be labeled as ‘pre-trading’. In pre-trading investors reorganize their cryptocurrency portfolio or use fiat currencies to purchase more of a particular cryptocurrency to gather the desired amount of the desired currency to participate in the ICO. This trading activity is happening because in many ICOs the accepted currencies are limited (to for example Ether) and investors may need to move assets to a compatible wallet. Sometimes investors need to gather their desired amount to invest by combining multiple cryptocurrencies. This process is similar to investor activities in the context of the traditional stock exchange. In some ICOs the investors are given multiple currencies as options to choose the desired investment currency from. Conventionally the options are Bitcoin, Ether, and USD. To make this decision investors analyze the current exchange prices and figure out the most profitable option. Pre-trading currencies as a preparatory task is a differentiating factor when comparing ICO investing to equity crowdfunding and traditional VC and angel investing; it is a characteristic that comes along mediating the transactions on smart contracts in the form of cryptocurrencies. However, investors experience the pre-trading activities mostly neutrally. The exchange services are perceived as neutrally usable and moving the crypto assets is considered mostly a routine task.

Deciding the amount to invest is often embedded in the process of pre-trading. This task is similarly perceived as neutral and the decision is made mostly based on gut feeling. Interestingly one investor brought up the difficulty of comprehending the sums of real money at stake when describing his experiences about deciding the amount of investment: *“The idea here was to put a moderate amount of money which can still generate some profits, but then a type of blindness struck quite quickly with the cryptos so that quite substantial sums began to feel quite small ... And then greed strikes so that*

*you have to know how to stop yourself, like, don't put anymore, this is still only an ICO where there is no real substance and only marketing material instead.” (#5)* Such reaction is an implication about the risks that are associated with the general difficulty of comprehending the values when operating with cryptocurrencies. Furthermore, this implies that there are potential risks in allowing unsophisticated investors to take part in early-stage investing without restrictions. Because ICOs are nearly impossible to value using conventional metrics, these decisions are made based on intuition instead.

### Extra preparations for popular ICOs

In case of a more popular ICO, investors are required to make extra preparations for the moment the ICO begins. The extra preparations are required because a popular ICO as an event is comparable to buying tickets to a popular rock-concert: the sale is over in a matter of minutes, and the buyers are fiercely fighting to get in before the tokens are sold out. This applies to capped token sales only. In such ICOs investors make sure everything is ready at the predefined time (e.g., a specific block in Ethereum) so that they can focus entirely on making the transaction and getting successfully in. Investors may have cleared space from their calendars for the moment, and they might have for example multiple wallets, ICO website, block explorer and also the community discussion channels all simultaneously open approaching the moment. Towards the moment of the ‘zero hour’, investors get excited as the community wakes up in an unprecedented way. As one investor described it, *“At this point [getting close to the beginning of the token sale] I had very, very strongly positive feelings. I was very excited, expectant and perhaps a bit hopeful. I mean, like, this is so cool!” (#7)* To further emphasize, this is only in the case of a popular ICO. In such cases, investors are positively excited about the token sale *as an event*.

#### 4.4.2 The struggle of making a successful transaction

Going through the actual investment process in ICOs is laborious, complicated and requires using multiple different services. As presented in the previous section, investors not only have to make use of external exchanges in the preparative phase, but they also need to multitask on various services simultaneously during the investment. The investor is expected to know how to create crypto wallets, install those wallets, control cryptographic key pairs, exchange crypto assets in external exchanges, etc. In fact, the number of direct touchpoints with the ICO organizer during the transaction is rather small, and services external to the organizer mostly mediate the process of

investing. The organizers tend to provide merely instructions, a smart contract address where to send the payment and possibly a dashboard where the investor can monitor the progress of the ICO and check their token balance. Performing a single transaction seems like a simple task at first glance: investor copies smart contract address from the ICO dashboard, enters the address to his/her crypto wallet, and presses send transaction. However, executing the transaction and the following transaction monitoring involve challenges for investors and the experiences associated with these steps tend to have a negative tone. Investors perceive the transaction systems in ICOs as 1) technically uncertain, 2) difficult to use and 3) prone to user errors. Consequently, monitoring the transaction is rated by far as the worst experience throughout the customer journey of ICOs (see appendix B).

### Technical uncertainty

The history of hacks and technical errors in the general context of ICOs and cryptocurrencies are likely to cause concern in the investors. These concerns manifest as the experience of technical uncertainty with the transaction systems. Investors fear that they lose their money in some “technical limbo” where they can never be reached again. As one investor put it, *“Depositing fiat and buying Ethereum [in Coinbase] – secure feeling. Then for some reason as sending cryptos from a wallet to another began, I started to stress about if it will ever reach the destination.”* (#3) Such experiences imply that an authoritative intermediate (in this case Coinbase) promotes a feeling of security and stepping into the decentralized environment causes nervousness as responsibility is poured on the investor alone and investor trust rests solely on technological constructs. Enhancers of security thus have a direct effect on the investor experience. Another investor rationalized his feelings of uncertainty towards transaction systems as follows: *“You have some experience after all about where your Ether can end up in the worst case. I mean, they can be hacked and whatever other kinds of crap can happen. So it [making the transaction] is a bit stressful perhaps and nervous.”* (#7) This particular investor had the first-hand experience of participating in an ICO, which smart contract was hacked, and all the investors’ money was lost. This is where the irreversibility of contemporary transaction systems has an adverse effect on investor experience. In this regard investing in ICOs differ significantly from equity crowdfunding where a trusted third party mediates transactions with established payment methods, and error situations are solvable with the respective parties.

To conclude, the feelings of uncertainty towards technical systems stem from two types of perceived risks 1) technical bugs and 2) exploitable vulner-

abilities in the systems. These experiences are linked to the general lack of trust in the context and the common understanding that the systems are still in their infancy. Investors appreciate security enhancers in the investment process due to these uncertainties associated with it. The uncertainties are the underlying reason where the favorable ratings for clearly defined investing instructions provided by the ICO organizer stem from. Similarly, user experience of hardware wallets was highly appreciated by the interviewed investors as the devices build a perception of security and control. Investors report that also trust and belief in a good team behind the ICO helps them to get over the feelings of uncertainty in ICOs.

### **Level of experience and the perceived difficulty**

The difficulty of using the transaction systems also causes feelings of uncertainty in the process of actual investment. Perceived easiness of use is affected by the level of previous experience of the investor: more crypto-experienced investors tend to perceive the transaction systems straightforward and clear to use while less experienced ones might feel overwhelmed at first due to the multitude of services in an unfamiliar environment. Using crypto wallets and moving cryptocurrencies are more of a routine task for more experienced investors, but can cause uncertainty in inexperienced ones. The story of one investor describes this issue well: *“I almost gave up three times because I couldn’t get my head around the thing [making the transaction]. Then I asked some foreign friends on Facebook and they gave me guidance and told me that it is easy. When you have done investing in an ICO for a couple of times, it feels like a walk in a park.”* (#3) Such descriptions imply that while the first impression of the transaction systems is overwhelming, they are however perceived as straightforward after learning them. The need to use multiple separate services (e.g., Metamask and MyEtherWallet) to conduct the transaction might alone cause confusion and hence uncertainty amongst investors. These are the practicalities where less experienced investors feel the need to have personal contacts helping them out. More experienced investors tend to react more calmly to error situations with the transaction systems, and they consider making transactions even easy. One investor described his feelings after struggling to get a transaction through in an ICO as follows: *“[I] had an internal feeling that it [transaction] will work if I just keep on pushing it. Some other people worried a lot more about it as I followed the chat.”* (#6) It is thus argued that level of investor experience has a direct effect on the perceived difficulty of the transaction systems and the process may be perceived completely contradictory depending on the investor’s level of experience.



Supporting the common belief that investing in an ICO becomes considerably easier after the first time, less experienced investors also behave accordingly. As means of coping with the uncertainty and difficulty of using the transaction systems, they tend to conduct a test round investment with a small sum of money to see if and how the investing process functions. Of importance to note here is that this kind of activity is only applicable in a situation where the ICO is not popular and hence a competition of who manages to get in the quickest. Also, it is good to acknowledge that ICOs differ from each other and even more experienced investors need to figure out the investment process case by case. Still, inexperienced investors may even invest in some less interesting ICO ‘to practice’, aiming at participating in a proper one with more substantial sums of money in the future: *“I got a type of grab [of ICOs], it calibrated a kind of a level, so that in the next ICO, where I will put serious money in, I will know what to do and what things to pay attention to.”* (#5) This finding supports the motivation for some investors to invest in order to learn how the concept of ICOs works.

### **Investor mistakes and misunderstandings**

Investors define that succeeding in making a transaction requires orientation with the systems and even still there is a chance for investor mistakes. A high requirement of investor IT skills is an essential factor causing difficulties for investors. The investor needs to work with cryptographic key pairs with wallets, understand how transaction fees work and sometimes they need to understand how transactions on a decentralized ledger function altogether. These requirements set restrictions on what type of people can participate in the ICOs, and thus ICOs cannot be fully considered as an investment class for all consumers. The requirement for IT skills is emphasized in more popular ICOs in particular. The following quote gives a good idea about it: *“It [ICO] was so popular that if you wanted to get in, you had to have the skills to time your transaction in the detail of ten seconds. ... then you had to take into account that the Ethereum network will get congested and only transactions with highest transaction fees will get through, so you have to understand how Ethereum blockchain works in a way that it has fee-market and you have to know how to put higher fee than what your wallet provides as default to get into the two to three blocks during which the token sale already is finished.”* (#2) Not understanding the transaction fees may cause an investor to be left outside the ICO in case of a popular event. Investors perceive that for example gas- and gwei-values in Ethereum are difficult to understand and some even have experience about failing to invest in an ICO because of them: *“The biggest setback for me was that I didn’t understand*

*what the gas limit was going to be ... I didn't understand that my wallet, which is an official wallet ... I couldn't understand that the gas limit was not enough because the f\*\*\*ing slider didn't move any further to the right. (#7)*

Difficulties with using the transaction systems are caused not only because of the technical instability of the platforms under congestion but also because of the risks of misunderstanding and vulnerability of self-inflicted mistakes by the investor. Investors had stories about other investors who had failed to succeed due to misunderstandings: *“Many [investors] didn't eventually get their tokens because they sent the Lumens there [ICO wallet] but then they didn't realize that the transaction didn't go through. In principle, the website told you once you generated the wallet and the call for payment that ‘error error’ transaction failed, but if you thought that it would go through eventually while I just wait here, you might have never received the tokens.” (#6)* Such stories also imply usability problems with the transaction systems. Working with the contemporary systems, the investor has to cope with these risks, as the UX design of the systems has not reached the level where it would prevent them. Some investors who reported having difficulties with the transaction systems also admitted that it is typical in the context of ICOs because the domain is still in its infancy. This, in turn, supports the finding mentioned above regarding investors turning a blind eye to issues that would hardly be accepted in other contexts.

### **Monitoring the transaction**

The next few moments after executing the transaction are the most stressful for the investor. This phase, monitoring the transaction, is where the investor has handed over the payment and yet not received anything in return. The uncertainty about whether the transaction gets through successfully manifests itself at this stage. The uncertainty can be viewed from two separate angles: 1) the worry about losing money and 2) the uncertainty of getting through in a popular ICO due to congestion. The first one refers to the uncertainty related to the fear of ‘technical limbo’, malicious activities and the self-inflicted errors that could cause the payment to disappear somehow. In other words, some investors have a hard time relying on the smart contracts and other technical implementations that mediate the transactions. The risk of getting scammed also haunts the investors at this stage as they carry the heaviest risk: *“Let's say that if I had put any bigger sums in the ICO, it would've gotten quite thrilling at this point. Like, do I get something back or does the website disappear, the whole dashboard, and that's it.” (#1)*

The second perspective refers to the nervousness associated with getting through in a situation where the platform gets congested by the multitude

of simultaneous contributions in the ICO. This refers to the aforementioned ‘rock-concert’ effect. In these cases, the investor might have to try making the transaction again and again repetitively. To cope with the uncertainty investors follow discussions in the ICO community to see how others are managing. Similarly, as in the first perspective, investors get stressed about getting the transaction through successfully, but they are more afraid of not getting in than losing their money. Either way, investors monitor the transactions by using block explorer services and refreshing their wallets (or the ICO dashboard) to make sure that the tokens appear there. The process of actual investment ends as investor assures that he/she has received the tokens or at least a receipt confirming the ownership of tokens that shall be issued at a later date. Depending on the success, the monitoring ends either to feelings of relief and satisfaction after succeeding with the transaction or to feelings of frustration, irritation, and disappointment.

As presented, the process of investing is infested with experiences of uncertainty and challenges with the transaction systems. What is essential to take into account here is the fact that these problems are not caused specifically by the ICO organizer. The external services mostly cause technical uncertainties and difficulties with transaction systems, which is analogous if a person was purchasing shoes and he/she had problems with using a credit card. It is thus questionable if these issues are ICO organizers’ fault or if the organizers could do something to fix these issues. Still, however, these problems are unquestionably factors that drive negative customer experience, and the ICO organizers should address them one way or another. Comparing the investor journey in ICOs to crowdfunding and traditional VC or angel investing, it is evident that these problems are characteristic and unique to ICOs only, and not in a good way. To sum it up, the message to be delivered from the investors is that there is much streamlining to do with the actual investment process and the investors perceive the contemporary systems as uncertain and complex.

## 4.5 Post-investment activities – monitoring the investment progress

Post-investment activities, i.e., the investor activities that take place between the confirmed transaction and exit from the investment, and findings associated with them remained somewhat thin in this study. From the three main stages of investing, interviewees had the littlest to say about it, and different activities were few. Two generic categories of activities were identified in this

stage: *monitoring the token price* and *following the project development*. In short, investor activities are mostly limited to passively waiting and following project related events after the transaction. Figure 4.4 presents the model of post-investment investor journey.

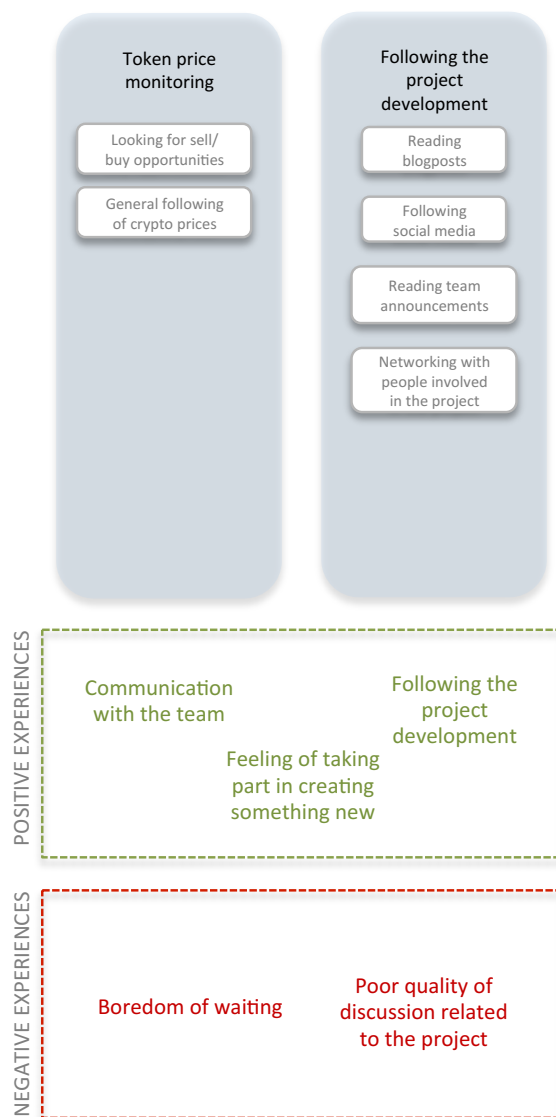


Figure 4.4: Model of the post-investment process

### 4.5.1 Token price monitoring

A common post-investment activity is the monitoring of the token price; investors are naturally interested to see what happens to the value of their investment. As a task, price monitoring is quite insignificant, and investors report monitoring the price alongside their general habit of following cryptocurrency prices. This monitoring happens mostly in [coinmarketcap.com](https://www.coinmarketcap.com), a popular website that lists cryptocurrencies and their price information from multiple crypto exchanges. In addition to just checking what is going on with the token price, some investors also look for opportunities to buy more or sell their tokens. If the investor perceives that the token price is highly overvalued, he/she may react by selling the tokens for a quick profit, and if he/she sees that the price has dramatically dropped, they may see it as an opportunity to invest some more in the project. Investors who have a strong belief in the project may be more actively looking for opportunities to buy more tokens, especially if they feel that they have not managed to buy as much as they would've desired in the token sale itself. More general events such as massive fluctuations of prices in the crypto domain also affect the investors' tendency of reacting to the changes in token prices in the secondary trading market. However, monitoring the token price is passive by nature, and some investors described even the whole post-investment phase as dull: *"All of this [post-investment activity] is quite frustrating, such that nothing happens. There is some interesting discussion on Telegram, but I have to admit that this is the boring phase."* (#5)

Surprisingly the interviewed investors viewed their investments primarily as long-term investments and argued that they are even quite indifferent towards the short-term price development: *"If it [token price] increases to, let's say 200 in June, I won't still sell because I think that it has more potential. So there won't be a so-called emergency sell."* (#3) Investors presented that they simply are not that interested in the short-term price development, which is why they described monitoring them quite seldom. Such behavior supports the finding according to which investors look for potential projects that they could profit big in the long run, that is in accordance with investor behavior in the context of angel investing. In fact, investors get somewhat attached to the projects and may even express some form of fandom towards the project after the investment. Related to this finding is the fact that none of the investors had exited the investment and technically the post-investment phase had not ended for either of them. To conclude, investors do not have precisely set price goals for their investment and their plans for the post-investment phase are vague: *"Now I'm just waiting that they get some functional product out and then at some point I'm going to*

*start to follow the token price development, once functional markets emerge ... I haven't done any more accurate decisions and [I'm acting] according to the situation.*" (#4) The lack of a precise plan for the investment could be interpreted as an implication of having non-accredited, unsophisticated individuals as investors. ICO investors differ from angel investors in this sense, as angel investors have well-defined exit strategies for their investment and they even assess exit opportunities as a criterion for the investment. One potential factor causing this kind of difference is that even though for example ESMA has specifically warned ICO investors about the possible lack of exit options, ICO tokens often are instantly liquid assets whereas traditional early-stage investments are not. For traditional angel investors, possible exit routes are scarce, which emphasizes the unique and novel characteristic of secondary aftermarket of ICOs that is absent in traditional opportunities in seed and pre-seed funding. The liquidity of ICO tokens is not however guaranteed, and it is always dependent on the available exchanges and sufficient number of buyers and sellers. The liquidity of the secondary token market thus varies significantly between different ICOs.

#### 4.5.2 Following the project development

Similarly, as with angel investing, some investors in the context of ICOs take a more active role in the development of the company while most investors remain passive. Participative activities include for example networking with the project developers by going to the project meet-ups or for more technologically oriented investors even making commits to the GitHub repository of the project. This is the closest to the value-adding participation (presented in the context of crowdfunding and angel/VC investing) that was identified in this study. No evidence of advisor type of investor activity was identified in this study nevertheless. To conclude, investors in ICOs have only little interest (or capability) in taking value-adding actions to support their investment. Investors who participate actively in the project development are the most enthusiastic ones who find it exciting to get involved with the project: *"I think that it is in a sense a part of the whole beauty of the scene that you have the opportunity to be a part of those things [projects] and personally get to know the people who make them."* (#8) As an experience, taking part in creating something new is perceived strongly positive by these investors.

Following the project development more passively is also perceived as highly positive by the investors, even though some describe the post-investment phase as dull and frustrating. Such following means reading announcements by the project team (e-mail, blog posts, Twitter posts, news, etc.) where they describe steps of development and reading discussions in social

media regarding the project. Investors share the interest to keep track of what is going on with the project. Following the project is considered as interesting and pleasant by the investors. Finding a project that would be nicer to follow was even a reason for one investor to look for an opportunity to exit from one ICO because he wanted to invest the money in some ICO that would be more pleasant and interesting to follow.

During the post-investment phase, investors appreciate and require active communication between the project team and investors in the form of announcements about the recent developments. This communication is one of the most critical factors in investor experience that the project team can affect on. Interviewed investors had mostly positive experiences regarding the communication. One investor also described that following the process works as a learning experience for him, relating to the finding regarding learning or self-development as one form of investor motivation.

Following the discussions in social media around the ICO can be however frustrating and annoying as some investors dislike the contents of them. They argue that the high emphasis on price speculation in the community does not interest them and is not worth wasting time. In this regard, the problems of information management already present in the pre-investment phase influence the post-investment phase also. Following the discussions and especially team announcements are however perceived significantly more positively by investors in the post-investment phase. Interesting to note is the fact that while investors described the discussions to be full of price speculation, the interviewed investors simultaneously claimed to be indifferent to the price fluctuations. The results leave unanswered the questions that who are the investors who maintain the speculative discussions around the price development, why none of the interviewed investors fit this profile if the domain is full of such investors and how do the behavior and characteristics of such investors differ from the sample in this study.

## 4.6 Summary of the results

While altruistic motivations are identifiable, investors have a strong emphasis on personal benefits and financial profits when it comes to ICOs, which is consistent with the finding that ICOs enjoy a specific reputation as an investment instrument in the world of crypto. Attitudes towards ICOs are primarily cautious, and investors are hoping for clarity and sense to the ICO market, implying the need for structure and regulation. Although interviewees brought up the frenzied and irrational state of ICOs, no investors in this study fully represented the stereotype of such ICO investor. Interviewed

investors viewed ICOs primarily as long-term investments, and after making the investment, they indicated attachment towards the projects, except for intentionally going for the quick profit from the start.

Investors acknowledge that the domain of ICOs is still unfinished, why it is infested with risks and problems. This elicits turning a blind eye to the sometimes critical errors in UX. Investors are willing to tolerate all the problems, risks and uncertainties because of unprecedentedly high possible profits and getting involved with disruptive projects.

In the pre-investment phase, investors assess the trustworthiness, potential, and profitability of the project. In order to make their decision, they make personal assessments, rely on community and peer-to-peer support and listen to expert evaluations about the project. The process is non-linear and investors utilize the different techniques in parallel to piece together their conclusion. Assessing the project single-handedly is done primarily based on inspecting the project team, studying the whitepaper and intuitive speculation. Investors are looking for a project team with high social capital and competence. The whitepaper is expected to be a very detailed description of the project, but simultaneously investors perceive too technical whitepapers cumbersome to use as a source of information. Technically less oriented investors rely on other investors to raise concerns about the whitepaper for them. In addition to assessing whitepaper and the team, concrete evidence of the project is highly appreciated by the investors and demos/MVPs are considered as signals about the team's competence.

Community and peer-to-peer support are used for exploring prevailing sentiment about the project, confirming own assumptions, as a shortcut to due diligence and assessing the level of hype (and thus profitability) around the project. Community and social media have strategic roles in driving the investing decisions, but simultaneously investors have significant problems with mistrust and information management due to the vast amount of the information and difficulties in comprehending it. Discussing with personal acquaintances is considered as pleasant and trustworthy sources of information, and these discussions are highly appreciated and positively experienced by the investors.

Relying on expert evaluations is one common way to cope with the perceived difficulties with information management. Blog posts, YouTube personas, and ICO reviews compress, translate and analyze information on behalf of the investor, thus working as workload relievers. Contemporary ICO review services, however, are considered suspicious with fears of biased motivations and lack of competence behind the services.

The actual investment phase is a more linear process, which begins with preparations for the investment, continues through executing the transaction



and ends after monitoring the transaction. Investors perceive this process as the most negative part of the investor journey. They consider it as laborious and complicated due to the requirement of using multiple different services. The adverse experiences spring mostly from transaction systems which are considered technically uncertain, difficult to use and prone to user errors. ICOs with different types of uncertainties were identified in the study, as more popular ICOs involve uncertainty of transaction getting through and other ICOs involve more likely worry about losing money due to technical errors, malicious activities, and self-inflicted errors. More popular ICOs also require extra preparations by the investor, as the ICO is considered analogous to getting tickets to a popular rock-concert. In the case of a more popular ICO, the token sale can be seen more likely as an exciting 'event' for the investors.

The preparations for making the transaction involve registration, KYC process, decisions about the amount and type of desired currency, pre-trading crypto assets and most importantly studying how the practicalities in the ICO go. These activities are perceived mostly neutrally, except for KYC process, which investors view in a somewhat negative light. Instructions provided for the investor by the ICO organizers at this stage are considered helpful and perceived positively in general, as they enhance the feeling of security. This is due to the lack of standard process in ICOs why investors have to figure out the investment process in each ICO case by case.

The level of investor experience affects the perceived difficulty of investing in an ICO, and the process may be perceived contradictory depending on the investor's level of experience. Making a successful transaction requires a high level of IT skills from the investor. The process of making a transaction feels overwhelming for inexperienced investors, and they tend to seek the support of personal contacts to help them through. However, investors point it out that the process feels straightforward and easy after learning it and some investors do practice investments with small sums of money to test the process first. The transaction systems still are struggling with usability problems and investor mistakes and misunderstandings are possible even for investors with considerable experience.

Monitoring the transaction is by far most negatively experienced part of investor journey of ICOs as investor carries the highest risk and uncertainty of losing money at that point. Depending on the success, the actual investment process ends either to feelings of relief and satisfaction after succeeding with the transaction or to feelings of frustration, irritation, and disappointment.

Findings related to the post-investment phase remained rather thin in this study. The phase is seen mostly as passive waiting by investors. Two categories of activity were identified: token price monitoring and following

the project development. Investors perceive the first one as a rather insignificant task, and some investors indicate even indifference towards the price development. Such attitudes relate to seeing ICOs as a long-term investment. Based on the price fluctuations, some investors look for buy and sell opportunities.

Following the project development is considered interesting and the most enthusiastic investors described even participating in the project development. Mostly, investors have however only little interest or capability in taking value-adding actions to support the investment. Following the project development means thus mainly reading announcements by the project team (e-mail, blog posts, twitter posts, news, etc.) where they describe steps of development and reading discussions in social media regarding the project. The community discussions are sometimes seen as frustrating due to their speculative nature, while close communication between the founders and the investors is highly appreciated and mostly perceived satisfying and good.

The investor journey of ICOs consists mainly of indirect touchpoints that are hardly controllable by the ICO organizer. Investors rely heavily and primarily on informal sources of information in the forms of peer-to-peer support and social media. Even the transaction process is primarily mediated by various external services (wallets, exchanges, block explorers, ledgers, etc.) and the role of ICO organizers in them is somewhat limited; they are merely the producer of the ICO smart contract. The service characteristic of ICOs is thus quite fragmented, and the journey appears to investors as unclear. The unclarity manifests itself in, for example, ICO organizers providing long lists of multi-step instructions to investors. After outlining the generic customer journey of ICOs, it seems that the service nature of ICOs is not formed in a conventional way where one service provider guides the customer (i.e., investor) through the process and the journey is not controlled by any particular entity, but by an ecosystem of services instead. The fragmentation of the customer journey to multiple formal and informal entities could be interpreted as some emergent form of decentralization in the service domain.

Investor behavior in ICOs has similarities with both equity crowdfunding and traditional angel investing. Especially the investment decision-making activities and criteria overlap with both: on the one hand, some investors represent unsophisticated practices for conducting due diligence utilizing social information similar to claims regarding investor behavior in crowdfunding but on the other hand investors in ICOs perform more thorough and sophisticated research on the investment similar to professional angel investors. The phase of making the actual investment and the challenges perceived there are however unique for ICOs. The challenges are due to using novel and complex systems that are still in their infancy for mediating the transactions.

In the post-investment phase, both passive and active roles are identified similarly as in crowdfunding and angel investing, even though advisory role familiar to angel investors did not emerge from the interviews. The investor motivations are in line with literature of crowdfunding as both altruistic and profit-oriented motivations are identified. Similar to VC and angel investing, the emphasis is firmly on financial profit nevertheless.

## Chapter 5

# Discussion and conclusions

### 5.1 Answers to the research questions

#### **Research question 1: How is a generic ICO process structured from investor's perspective?**

This study provides a model of a generic customer journey of ICO investing (see appendix D). Building on the prior studies in crowdfunding, the model consists of three main episodes: 1) pre-investment, 2) actual investment and 3) post-investment.

The first episode is a non-linear process during which investor becomes aware of the opportunity and assesses the investment to piece together a conclusion about the investment decision. Investors assess the project's trustworthiness, potential, and profitability as the investment criteria. As tools for this assessment investors rely on personal capabilities in assessing the opportunity based on provided information about the project, rely on crowd due diligence and social support and base their judgment on reputable sources of information that compress and translate relevant information for the investor. Social media channels play an essential role as indirect touchpoints between the company and investor in the form of word-of-mouth. Investors also assess community hype as an indicator of potential profits via social media channels. The convention is that the founder establishes some official communication channel for the community (most often Telegram chat). Furthermore, marketing material (i.e., videos, blog posts, website), demos and whitepapers provided for the investor constitute the more direct touchpoints during this stage of the customer journey. Some investors seek confirmation of their sentiment from external ICO review services.

The episode of actual investment is more linear and consists of three consecutive categories of activities for the investor: preparations for the trans-

action, executing the transaction and monitoring the transaction. For each ICO and even investor, the detailed contents of each category vary due to unstandardized nature of ICOs. Because of the lack of standardization investors need to go through the process of figuring out how the practicalities of the ICO work and how investing practically happens for each ICO separately. For less experienced investors this phase includes also studying how to transfer cryptocurrencies in general. The deal flow involves using multiple external services (such as wallets and block explorers) and different cryptocurrencies that vary case-by-case in addition to the ICO website. Investors tend to lean on the support of contacts in social media during this phase, which indicates that both direct and indirect touchpoints through social media play a crucial role in the deal flow. In fact, services provided by the founders are somewhat limited to providing merely instructions, a smart contract address where to send the payment and possibly a dashboard where the investor can monitor the progress of the ICO and check their token balance. The customer journey at this stage is highly fragmented into multiple indirect touchpoints that are hardly controllable by the founders. The empirical results in this regard contradict with the analysis based on service modules of crowdfunding and ICOs, which argues that ICO organizers should be responsible for managing a complex service system instead of merely collecting funding. The contradicting findings imply that ICO organizers are neglecting essential services that crowdfunding platforms provide in the traditional crowdfunding context.

The post-investment phase is somewhat passive for the investors, and this study identified only two categories of investor activity: monitoring the token price and following the project development. Active investor participation was detected, but not in the form of an advisory role. Direct touchpoints between the investor and the founder are mostly announcements and blog posts on social media. Discussions on social media channels used by the crypto community represent more indirect touchpoints that were identified in the post-investment phase. Similarly, monitoring token price can be considered as an indirect touchpoint as investors look for buy and sell opportunities. This monitoring takes place in crypto exchanges and other external web services that provide price charts for crypto investors in general.

Investor behavior in traditional crowdfunding and ICO investing has a lot in common. Similar patterns between the two are identifiable when it comes to relying on crowd due diligence and social information in making the investment decision. Similarly, as crowdfunders, some ICO investors do not have the interest or capability of doing proper due diligence, and they turn to secondary sources of information in assessing the investing opportunity. These sources refer to social information from peers and expert evaluations in the forms of blog posts, YouTube videos and ICO reviews. The influence

of opinion leaders is similarly recognizable in ICOs as in crowdfunding. Investors in both ICOs and crowdfunding base their investing decisions heavily on campaign material provided by the founders.

Investor behavior in ICOs, however, differs from crowdfunders in some ways. In this study, more thorough due diligence activities were identified in the context of ICOs. Some investors in ICOs tend to conduct their due diligence more closely to behavioral patterns and criteria characteristic to angel investors. The due diligence includes thorough studying of the team backgrounds and assessing their trustworthiness and capabilities when it comes to succeeding with the project. Investors also assess the disruptive potential of the project, although this assessment is often done based on intuition. A thorough assessment of the business plan, roadmap, technical details and current product implementation are all activities that are identified in ICO investor behavior and also characteristic to angel investors. Thus it is argued that investor behavior in the pre-investment phase differ so that in ICOs some investors are identified to perform more thorough due diligence than in the context of traditional crowdfunding.

Another significant difference in investor activities between traditional crowdfunding and ICOs is the actual deal flow. While crowdfunding is traditionally conducted through crowdfunding platforms using conventional payment methods, in ICOs the deal flow is mediated through ICOs own webpage and custom options for transaction systems in the form of cryptocurrencies. As a result, investors in ICOs conduct a thorough study on how investing in practice happens in each ICO, which probably is not a part of traditional crowdfunding. The literature on crowdfunding has so far neglected the deal-making phase perhaps due to its insignificance in that context, but for ICOs this phase is a critical defining factor of the customer journey. The results argue that the issues related to the deal flow in ICOs are unique and absent in the traditional context of crowdfunding. The requirement for a high level of investor IT skills in ICO investing is a differentiating feature between traditional investing and ICOs.

### **Research question 2: How investors experience the investing process?**

ICOs enjoy a questionable reputation amongst the investors, which manifests as cautious attitudes and behavior. Lack of trust fueled by the vast amount of scams in the domain is an underlying challenge driving investor behavior throughout the customer journey, especially in the pre-investment and actual investment phases. Investors perceive that due to the lack of trust they are forced to process more information themselves, which makes investing

more laborious. Overwhelming amount and difficulty of comprehending the information constitute the perceived difficulties of information management. Investors perceive that ICO tokens are difficult or even impossible to value and they consider them as high-risk investments. Other perceived problems in the context of ICOs identified in this study consist of technical challenges and lack of supportive structures and standards.

The findings of this study indicate that the lack of trust, difficulties of information management and perceived pressure of making decisions fast are the main factors causing negative experiences in the pre-investment phase. The findings also indicate that the positive experiences are related to alleviating the negative ones: positive experiences in the pre-investment phase are associated with builders of credibility and trust, facilitators of information management and triggers of excitement. This gives validation to the findings as the negative and positive experiences balance each other.

In the actual investment phase, investors similarly associate the negative experiences with feelings of mistrust and uncertainty, workload and difficulty by the investors. In this phase, however, the experiences are mainly related to the non-standardized transaction systems involved in the process of investing. Due to the lack of standards, investors are burdened of constant figuring out how the practicalities work in each ICO. As a result, the investors perceive security enhancers, in the form of, e.g., clear instructions, positively. The findings of this study indicate that investors perceive the transaction systems in ICOs as 1) technically uncertain, 2) difficult to use and 3) prone to user errors. The level of previous investor experience has a direct effect on the perceived difficulty of the transaction systems, and the process may be perceived entirely contradictory depending on the investor's level of experience. High requirements for investor IT skills and fragmented conventions are overwhelming for inexperienced investors, which raises the question whether ICOs (at least in their current form) genuinely have the applicability and disruption capability as an unmediated investment instrument for an ordinary, unsophisticated consumer.

Monitoring the transaction is rated by far as the worst experience throughout the customer journey of ICOs. The negative experiences in monitoring the transaction have two different forms: 1) the worry about losing money and 2) the uncertainty of getting through in a popular ICO. Such worries result in experiences of great relief and satisfaction after merely succeeding in making the investment. The experiences in the process differ greatly depending on the popularity of the ICO. A popular ICO from investor perspective resembles buying popular rock concert or festival tickets. In these cases, the investors perceive feelings of excitement at the beginning of the ICO. Popular ICOs suffer from technical uncertainties due to congestion and investors

experience frustration due to difficulties in getting their transactions through.

The investors perceive the post-investment activities somewhat neutrally. Following the project development is mostly perceived as interesting and investors like to read announcements and discussions in social media related to their investment. Investors appreciate close communication between investors and the project team and they are mostly satisfied with the current level of communication. Investors with more active post-investment involvement consider following the project development as exciting as they enjoy the feeling of taking part in creating something new. Token price monitoring is often perceived indifferently without indications about remarkable experiences in this study. In fact, some investors perceive the post-investment process as passive and boring.

## 5.2 Practical implications

This thesis provides a base foundation for designing ICO campaigns to companies and project teams who are considering collecting funding via an ICO. Referring to design terminology, the study presents knowledge about the customer journey and customer experience within that journey, which constitutes the first diamond in the double diamond model of the design process (see Design Council, 2007). The model of investor journey created based on the findings of this study can be utilized as such by companies as a starting point in designing their own ICO campaigns in a user-centered manner. The created knowledge on the investor journey helps companies to build better due diligence processes, provide better transaction systems, reach investors more efficiently and improve the overall investment process thus potentially improving the chances of successfully funding their project. Investors perceive current ICO investing processes as uncertain, untrustworthy, difficult, laborious, fragmented, unfinished and prone to investor errors. These results imply poor quality and inadequacy of service design in the context of ICOs and indicate the need for adopting principles of design thinking in the ICO design processes. Hopefully, this thesis promotes developing the ICO domain into a more investor-friendly environment.

The results are also relevant to new business creators (e.g., brokers for ICOs), regulators and investors themselves, as gaining insights on the phenomenon from the investor perspective is in the interest of each group. With the results indicating lack of direct touchpoints in the current investment processes and significant experiences of uncertainty and mistrust amongst investors, there is tremendous space for new service innovations, for which this thesis provides an ideating platform. For regulators, this study pro-



vides understanding on the difficult-to-grasp phenomenon with the description about the generic process of investing in comparison to existing forms of funding. Different stakeholders involved with ICOs, such as regulators, researchers, financing professionals, blockchain community, etc., can utilize the produced knowledge and model of investor journey as a tool for communication. Furthermore, this thesis proposes a call for regulative actions on ICOs, as it discloses the perceived problems by the investors due to the lack of supportive structures and standards. The results indicate that also investors are frustrated about the current state of ICOs and are hoping for sense and clarification to the market. Based on significant overlapping between ICOs and crowdfunding, it is encouraged to reflect on existing means for reducing uncertainty in the context of crowdfunding when considering means for developing more stable and sensible market for ICOs (see Agrawal et al., 2014). It is worthwhile noting that while investors are hoping for clarity and sense to ICO market, simultaneously they want to hold on to the underlying ideology in the crypto world where people embrace libertarian attitudes and decentralization of power and eschew authoritative intermediaries. It is a paradoxical situation and this thesis questions whether it is even possible to hold on to the ideological premises while making the environment more investor-friendly. The results of this study indicate the problem of deteriorating UX when the context changes from centralized services towards a decentralized environment.

### 5.3 Theoretical implications

The phenomenon of ICOs is barely studied previously in academia. Thus there is lack of knowledge that this thesis contributes to. This study contributes to the general understanding of the phenomenon of ICOs starting from presenting a basic definition and describing characteristic features of a generic ICO. Mainly, however, the results provide understanding about the investor perspective on the investing process. In this regard, this thesis accompanies the recently emerged (yet not peer-reviewed) studies addressing the investor behavior and perspective in ICOs (see Adhami et al., 2018; Amsden and Schweizer, 2018; Fisch, 2018; Hargrave et al., 2018; Varnaite, 2018). Whereas these studies have focused on success factors, signaling and investor decision making criteria, this study contributes to this novel area of research by creating a model for investor journey and actual investor experiences in the context. The study shows that investing in ICOs has characteristics of a Keynesian beauty contest that is strongly influenced by social community and unsophisticated individual intuition.

The theoretical implications of this study consist mostly of contributions to crowdfunding literature. This thesis complements existing research on crowdfunding and introduces ICOs as a novel class of crowdfunding. In more detail, this thesis provides a model for investor behavior and compares it to the existing research on conventional crowdfunding. The results show that investing in ICOs has a lot in common with equity crowdfunding as a phenomenon, but that there are specific differences in the investing processes that distinguish the two, especially in the deal-making conventions and means for due diligence. Although neglected in the previous research on crowdfunding (Macht and Weatherston, 2015), this thesis emphasizes the deal-making phase as an essential part of investor journey, which in fact this thesis argues to be a significant differentiating factor between ICOs and other forms of funding. In this sense, the study fills a gap in research, although the findings on actual investment phase are most likely only applicable to ICOs, not to other forms of crowdfunding. The modeled investing criteria and techniques for assessing the investment opportunity in the pre-investment phase provide a comprehensive framework for investor behavior, which could, however, be at least tried in the context of equity crowdfunding also.

This study fits ICOs in the categorization of more traditional forms of funding. According to the results, investor behavior in ICOs shares characteristics with both equity crowdfunding and angel investing when it comes to investing criteria, even though earlier studies indicate that investors in equity crowdfunding and angel investing do not share same criteria for investing (see Lukkarinen et al., 2016). The results regarding the pre-investment phase indicate that investors in ICOs perform more thorough due diligence than in traditional equity crowdfunding. Possible reasons for such behavior could be for example the lack of trust and uncertainty related to ICOs and the amount of available information, which seems to be higher than in equity crowdfunding. Still, there is substantial overlap with investor behavior in equity crowdfunding especially when it comes to less experienced ICO investors, and crowd due diligence is significantly identifiable in the context of ICOs also. Complementing prior studies in crowdfunding, investment decisions in the context of ICOs are affected by both signals of project quality and electronic word-of-mouth (see Bi et al., 2017). This study shows that investors in ICOs are not homogenous and some investors fit characterizations of studies on crowdfunders well (see descriptions in Lukkarinen et al., 2016; Macht and Weatherston, 2015), while others could be considered more like angel investors based on their pre-investment activities (see Prowse, 1998; Sudek, 2006). Identified angel investor characteristics in ICO investors contradict earlier studies on crowdfunding which argue that crowdfunders are unlikely to conduct due diligence when making investing decision. Table 5.1

presents a comparison of key features of ICOs with similar forms of funding.

Table 5.1: Key features of ICOs compared to similar forms of funding.  
Modified from (Lukkarinen et al., 2016)

Features	Equity crowdfunding	Initial coin offerings	Business angels
Typical founder background	Various, many have no investment experience	Various, many have no investment experience	Former entrepreneurs
Source of funds	Investing own money	Investing own money	Investing own money
Funding instruments	Shares	Crypto tokens that may have various characteristics	Shares
Deal flow	Through web platform	ICO website and various external services strongly influenced by community and social networks	Through social and/or angel networks
Due diligence	Conducted by individuals, if at all	Conducted by individuals, in varying levels of detail	Conducted thoroughly by individuals based on their own experience
Geographic proximity of funders	Investments made online: funders often distant from venture	Investments made online: funders often distant from venture	Most investments local
Exit opportunities	Scarce, somewhere in the future	Varied, often instantly liquid secondary market for tokens	Scarce, somewhere in the future
Post-funding role of funders	Most remain passive	Most remain passive	Active (hands-on) or passive
Return on investment	Financial return important (but not the only reason for investing)	Financial return important (but not the only reason for investing)	Financial return important (but not the only reason for investing)

In addition to the theoretical implications related to ICOs as a phenomenon, this thesis contributes to the field of service design by introducing a customized method of journey mapping for future use. It contributes to the identified problem of fragmentation in methods for journey mapping (see Følstad and Kvale, 2018) and promotes method development based on SIT, as encouraged by Følstad and others (2013). The presented journey mapping tool combines SIT and lightweight journey mapping to create a generic customer journey from actual customer journeys in sufficient detail. The method used in this study proved to be efficient in outlining a detailed description of a process that is previously unknown while allowing a customer-driven narrative approach to the data collection and gathering of rich insights on customer experience. The presented journey mapping method is applicable to other studies as such.

The research approach adopted in this thesis also introduces a novel interface between research on service design and the world of investing. It takes a novel perspective of presenting investor as a customer and applies principles and methods of human-centered design to explore the phenomenon and

investor behavior within it. In other words, this thesis takes the initiative of viewing investing activities from design thinking perspective and thus introduces a novel perspective for investment science. The study proves that this approach is well applicable to the context of investing and adopting principles of design thinking could benefit the future development of funding platforms and investment processes. Further research on this particular mixed field of service design and investment science is encouraged by this thesis.

## 5.4 Limitations

Due to the qualitative research approach, the results of this study are not statistically significant. Thus, the generalizability of the study remains low, even though the seeming saturation of the findings towards the end of the interviews. The sample size (8 interviewed individuals) works well in drawing descriptive and interpretive conclusions, but claiming correlations or definite causalities is not possible with the given sample size. For example tendencies between the levels of investor experience and behavioral patterns were identified in this data set, but these tendencies remain at an interpretive level without statistical proof. This concerns also conclusions made based on the experience ratings by users and thus those values cannot be used for reliable statistical analysis, but as fuel for interpretive conclusions instead, as they were used in this study. The interviewees in the sample unintentionally had all higher level of education in their background and were all men, which further questions the transferability of the results. On the other hand, it could also be interpreted as an indication about the description of an average investor in the context of ICOs. Counterweighting these limitations, the congruency with prior research in the field of crowdfunding and angel investing support the external validity of the results and enhance the transferability of the study.

One significant limitation associated with qualitative user research affects this study also: the subjective nature of the data. All empirical data used in this study represents interviewees' subjective perceptions and responses, which means that the statements do not necessarily represent their actual behavior. This is due to choosing interviews as the method for data collection. The data represents investors' recollections about their customer journeys, and thus the results rely on interviewees' memories of past events. This has negative implications on the reliability of the data, which needs to be noted. The subjective data does, however, provide understanding about investors' genuine perceptions on the journey and the associated experiences, which are the primary focus of this study. It is debated whether qualitative research

should even pursue objectivity as the methods are inevitably subjective and it is suggested that in qualitative research context the mandate to be objective should be replaced with trustworthiness and authenticity (Patton, 2002, p.574). In the study, a validation exercise in the form of member checking was utilized to enhance the trustworthiness and credibility of the study. Furthermore, the thesis describes explicitly and openly the data collection and analysis methods with the intention to enhance the confirmability of the study.

As the study was completely conducted by one single researcher, it is essential to note that there is a risk of researcher bias in the results of the study. In addition, worthwhile noting is the researcher's prior inexperience in the field of academic research and possible unconventionalities caused by that. These are perhaps the most considerable limitations regarding this study. Especially in the phase of data analysis, having multiple researchers would've reinforced the reliability of the interpretations and conclusions drawn from the data. Furthermore, having multiple different researchers conducting the interviews would've reduced the risk of researcher effect on the data collection. With the given nature of the thesis work and available resources, this approach was not however feasible. The research approach and methodology were validated with more senior scholars before conducting the data collection and analysis to alleviate the researcher effect.

The difficulty of the research topic may have also affected the quality of the study. The novelty of the phenomenon and lack of prior research on ICOs was a significant factor leading to the reluctant relying on fragmented non-academic sources of information in studying the features and characteristics of ICOs. Furthermore, this forced making assumptions about the studied phenomenon based on literature in neighboring fields of research, which in turn could be further questioned. The results of the study can thus hardly be confirmed by prior studies, which further emphasizes the need for further research on the topic.

## 5.5 Further research

The results of this thesis create a rich set of new avenues for further research. In fact, by creating some knowledge on the investor journey in ICOs, the study elicits even more questions to be answered by future research. This thesis works as one of the pioneering studies on investor perspective of ICOs, and thus it aims at fueling further research on the phenomenon in academia.

**Quantifying the results:** As the qualitative nature of the study restricts making statistical conclusions on the phenomenon, it is necessary for

future research to quantify the presented results. This thesis provides indications about the existence of certain patterns within the context of ICOs and different types of investors whose behavior varies between typical behavior for crowdfunders and angel investors. It does not, however, provide knowledge on what percentage of investors represent which findings and what is the actual coverage of the identified problems within the domain. Furthermore, this study was unable to reach the irrational, ‘money-crazed’ laymen, who are rumored to constitute a significant portion the investor base in ICOs. Thus, classification of different investor personas with quantitative analysis on the causalities between demographics (e.g., professional background, education, investing experience, etc.) of ICO investors and their behavioral patterns would be a natural continuation for this study to generalize the results.

**Applying the journey mapping method in other contexts:** As this study successfully utilized a customized method for mapping customer journeys, it is desirable that the method is tried in other contexts to verify its feasibility and generalizability as a tool for data collection. Developing a novel method for customer journey mapping was not the primary focus of this study, and it is emphasized that it was merely a byproduct of the research process. Thus more detailed analysis of the method’s strengths and weaknesses in various contexts is welcomed to promote wider adoption and further development of customer journey mapping practices.

**Focused analysis on the UX of the transaction systems in decentralized context:** The results of this study indicate severe UX problems related to transaction systems within the domain of ICOs. The research approach of this study took a broader viewpoint on the investing process and was limited to studying episodic UX of investing in ICOs, which also leaves the insights on UX rather general. Understanding the UX problems of the transaction systems more thoroughly calls for ‘during usage’ UX study in the form of for example usability evaluation. Such research could pinpoint in greater detail the factors causing the experiences of uncertainty and difficulty in investors, further helping the ICO domain to evolve into a more investor-friendly environment. Also more generally, implications of having decentralized systems instead of centralized service providers on UX are yet an undiscovered field of research in academia, and future research should address these implications. As discussed earlier, it is questionable whether improved user-friendliness and decentralization can even be achieved simultaneously.

**Further studying of decision-making practices of ICO investors:** A large share of the results and theoretical implications of this study relate to the pre-investment phase of investor journey and making the investment decision. This thesis presents a generalized model for these activities and in-

vesting criteria, which have similarities with practices in both crowdfunding and angel investing. Conformability in other research settings and possible additions to the presented model should be deductively studied to gain understanding whether for example, some parts of the model are applicable only under certain circumstances or whether some practices are left outside of it. Furthermore, this study focuses on merely describing the identified practicalities and thus deeper understanding of the underlying drivers behind these findings are yet to be analyzed.

**Studying the ICO phenomenon from other stakeholders' perspective:** This study describes the ICO phenomenon solely from the investor perspective. Pursuing the principles of design thinking, it is encouraged to proceed to study ICOs from the perspectives of other stakeholders involved, to contribute to the knowledge generation of the barely studied phenomenon. This includes, for example, ICO founders, regulators, professional investors and ICO review services. Especially when it comes to ICO founders, current practices for designing ICO campaigns should be studied. Furthermore, the current level of design thinking principles utilized in those processes is a topic that should be reviewed. Based on the findings of this study it is hypothesized that principles of design thinking and practices of service design are not applied comprehensively in designing of ICO processes, because of the identified number and severity of problems and the identified fragmented nature of the investment process.

**Studying the implications of ICOs as a disruptor of current funding and investing conventions:** As concluded in this study, ICOs can be categorized as a novel form of crowdfunding that lies somewhere between crowdfunding and angel investing based on its identified features. The significant differences between ICOs and conventional forms of funding are related to the workflow of investing and the wide range of novel functionalities and capabilities that crypto tokens as a funding instrument enable. It is speculated that ICOs could have substantial disruptive implications on existing funding conventions by cutting off intermediaries and enabling early-stage funding for ordinary consumers. Simultaneously this thesis recognizes that investing in contemporary ICOs requires a high level of IT skills and certain sophistication from investors to succeed and thus it argues that investing in ICOs seems to be accessible by only a limited segment of people, hence limiting the disruption potential. What the effectively potential implications are and how they are expected to disrupt the field of funding remains yet unclear. More focused studies on these high-level implications and barriers for disruption are thus encouraged.

## 5.6 Conclusion

This thesis provides a model of investor journey through the investment process of ICO with related customer experiences. It creates understanding about the investor behavior, motivations, characteristics, and attitudes in the context of ICOs, and presents the distinctive characteristics of ICO as a novel form of fundraising. The conducted study viewed ICOs user-centrally, and the results argue that from a service perspective ICOs are unstandardized, fragmented and lack direct touchpoints between the investor and the ICO founder, indicating an excellent opportunity for new businesses. Furthermore, design thinking principles could benefit the development of the ICO campaigns, and ICO organizers are thus encouraged to adopt design thinking principles in their processes. On a more general level, this thesis encourages further exploring of the interface between the field of service design and investing science. It encourages taking the investor, considering the investor as a customer and utilizing service design methodology into gaining investor driven insights on the investing processes and systems.

ICO as a form of funding is close to equity crowdfunding, with the distinction of having crypto tokens as funding instruments and the deal flow making use of decentralized systems, smart contracts and cryptocurrencies instead of crowdfunding service platforms and conventional payment methods. Investor behavior in ICOs shares characteristics with both equity crowdfunding and angel investing. Some investors fit well the descriptions presented in prior research on crowdfunders while others resemble more closely angel investors in their means of making the investment decision. Generalizations made in prior studies of crowdfunding, which indicate that funders in crowdfunding are unlikely to conduct proper due diligence, do not thus directly apply to investors in ICO context.

Bad reputation and lack of trust are driving forces affecting investor behavior and experience throughout the investment process. Missing standards, history of illicit activities, technical uncertainties and lack of authoritative actors cause mistrust amongst investors and force them to conduct a more thorough investigation regarding the investment opportunities by themselves. This thesis speculates whether this is one reason for the identified difference between the due diligence processes of crowdfunders and ICO investors. Altogether, this study identified that while there indeed are entirely legit companies and projects collecting funding via ICOs, the investors have cautious attitudes towards them nevertheless.

This thesis shows that the current ferocious state of ICO markets is undesired from investor's perspective and investors are hoping for clarity and



sense to the markets. Paradoxically, some investors would like to hold on to the ideological foundations of the crypto world that promote decentralization of power and disruption of existing economic structures, thus making regulative actions by governments somewhat undesired. The results of this study imply that with decentralization come novel challenges regarding the customer experience, especially with unintuitive and unstable transaction systems. Decentralized service environment has peculiar characteristics where traditional bilateral dynamics between the customer and the service provider are unlikely to apply. It is thus questioned whether user-friendliness and decentralization are in fact mutually exclusive. Investing in an ICO requires a high level of IT skills by the investor, and thus it is argued that ICOs, in fact, are only feasible investment class for a limited segment of people, not for every ordinary consumer. To conclude, this thesis indicates that the poor customer experience currently limits the disruption potential of ICOs and the decentralized ideal of financial markets is unlikely to become a reality unless the ICO industry overcomes these hurdles.

# References

- ACCA (2018), ICOs: real deal or token gesture? Exploring Initial Coin Offerings, Technical report, The Association of Chartered Certified Accountants, London.
- Adhami, S., Giudici, G. and Martinazzi, S. (2018), ‘Why do businesses go crypto? an empirical analysis of initial coin offerings’, *Journal of Economics and Business* **forthcoming**.
- Agrawal, A., Catalini, C. and Goldfarb, A. (2014), ‘Some simple economics of crowdfunding’, *Innovation Policy and the Economy* **14**, 63–97.
- Ahlers, G. K., Cumming, D., Günther, C. and Schweizer, D. (2015), ‘Signaling in equity crowdfunding’, *Entrepreneurship Theory and Practice* **39**(4), 955–980.
- AMF (2017), ‘Discussion Paper on Initial Coin Offerings (ICO)’, Autorité Des Marchés Financiers. [Online]. Accessed: 2018-04-26.  
**URL:** <https://bit.ly/2JqcY5q>
- Amsden, R. and Schweizer, D. (2018), ‘Are Blockchain Crowdsales the New ‘Gold Rush’? Success Determinants of Initial Coin Offerings’, SSRN eLibrary. [Online]. Accessed: 2018-05-10.  
**URL:** <http://dx.doi.org/10.2139/ssrn.3163849>
- Bargas-avila, J. a. and Hornbæk, K. (2011), ‘Old Wine in New Bottles or Novel Challenges? A Critical Analysis of Empirical Studies of User Experience’, *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* pp. 2689–2698.
- Barsan, I. M. (2017), ‘Legal Challenges of Initial Coin Offerings ( ICO )’, *Revue Trimestrielle de Droit Financier (RTDF)* **2017**(3), 54–65.
- Belleflamme, P., Lambert, T. and Schwienbacher, A. (2014), ‘Crowdfunding: Tapping the right crowd’, *Journal of Business Venturing* **29**(5), 585 – 609.

- Bi, S., Liu, Z. and Usman, K. (2017), 'The influence of online information on investing decisions of reward-based crowdfunding', *Journal of Business Research* **71**, 10 – 18.
- Bracamonte, V. and Okada, H. (2017), An exploratory study on the influence of guidelines on crowdfunding projects in the ethereum blockchain platform, in G. L. Ciampaglia, A. Mashhadi and T. Yasseri, eds, 'Social Informatics', Springer International Publishing, Cham, pp. 347–354.
- Bramanathan, R. (2017), 'The perfect token sale structure', GDAX blog post, May 19. [Online]. Accessed: 2018-01-23.  
**URL:** <https://blog.gdax.com/the-perfect-token-sale-structure-63c169789491>
- Brown, T. (2009), *Change by Design: How Design Thinking Transforms Organizations and Inspires Innovation*, HarperCollins, New York.
- Brugnoli, G. (2009), 'Connecting the Dots of User Experience', *Journal of Information Architecture* **1**(1), 6–15.
- Clayton, J. (2017), 'Statement on Cryptocurrencies and Initial Coin Offerings', U.S. Securities and Exchange Commission statement, December 11.
- CoinDesk (n.d.), 'CoinDesk ICO Tracker - CoinDesk'. [Online]. Accessed: 2018-01-23.  
**URL:** <https://www.coindesk.com/ico-tracker/>
- Colombo, M. G., Franzoni, C. and Rossi-Lamastra, C. (n.d.), 'Internal social capital and the attraction of early contributions in crowdfunding', *Entrepreneurship Theory and Practice* **39**(1), 75–100.
- Conley, J. P. (2017), Blockchain and the Economics of Crypto-tokens and Initial Coin Offerings. unpublished,.
- Corbin, J. and Strauss, A. (2008), *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 3rd edn, Sage Publications, Thousand Oaks, CA.
- CSA (2017), 'CSA Staff Notice 46-307 Cryptocurrency Offerings', Canadian Securities Administrator staff notice. [Online]. Accessed: 2018-04-26.  
**URL:** <https://bit.ly/2kFsdQl>

- Design Council (2007), Eleven lessons: managing design in eleven global companies, Technical report, Design Council. [Online]. Accessed: 2018-04-26.  
**URL:** <https://bit.ly/2r2mvg>
- DiCicco-Bloom, B. and Crabtree, B. F. (2006), ‘The qualitative research interview’, *Medical Education* **40**(4), 314–321.
- Dove, L., Reinach, S. and Kwan, I. (2016), Lightweight Journey Mapping, *in* ‘Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA ’16’, ACM Press, New York, New York, USA, pp. 880–888.
- Elo, S. and Kyngäs, H. (2008), ‘The qualitative content analysis process’, *Journal of Advanced Nursing* **62**(1), 107–15.
- Eskola, J. and Suoranta, J. (2003), *Johdatus laadulliseen tutkimukseen*, 6th edn, Tampere: Vastapaino.
- ESMA (2017), ‘ESMA alerts investors to the high risks of Initial Coin Offerings ( ICOs )’, European Securities and Markets Authority statement. [Online]. Accessed: 2018-04-26.  
**URL:** [https://www.esma.europa.eu/sites/default/files/library/esma50-157-829\\_ico\\_statement\\_investors.pdf](https://www.esma.europa.eu/sites/default/files/library/esma50-157-829_ico_statement_investors.pdf)
- FCA (2017), ‘Initial Coin Offerings’, Financial Conduct Authority statement. [Online]. Accessed: 2018-04-26.  
**URL:** <https://www.fca.org.uk/news/statements/initial-coin-offerings>
- Fenu, G., Marchesi, L., Marchesi, M. and Tonelli, R. (2018), The ico phenomenon and its relationships with ethereum smart contract environment, *in* ‘2018 International Workshop on Blockchain Oriented Software Engineering (IWBOSE)’, pp. 26–32.
- FINMA (2018), ‘Guidelines for enquiries regarding the regulatory framework for initial coin offerings (ICOs)’, Swiss Financial Market Supervisory Authority statement. [Online]. Accessed: 2018-04-26.  
**URL:** <https://www.finma.ch/en/news/2018/02/20180216-mm-ico-wegleitung/>
- Fisch, C. (2018), ‘Initial Coin Offerings (ICOs) to Finance New Ventures: An Exploratory Study’, SSRN eLibrary. [Online]. Accessed: 2018-05-10.  
**URL:** <http://dx.doi.org/10.2139/ssrn.3147521>

- Flanagan, J. C. (1954), 'The critical incident technique', *Psychological Bulletin* **51**(4), 327–358.
- Flick, U. (2000), Episodic Interviewing, *in* M. Bauer and G. Gaskell, eds, 'Qualitative Researching with Text, Image and Sound: A Practical Handbook for Social Research', SAGE Publications Ltd, London, pp. 76–92.
- Følstad, A., Kvale, K. and Halvorsrud, R. (2013), Customer journey measures - State of the art research and best practices, Technical report, SINTEF. [Online]. Accessed: 2018-04-26.  
**URL:** <https://brage.bibsys.no/xmlui/handle/11250/2390670>
- Følstad, A. and Kvale, K. (2018), 'Customer journeys: a systematic literature review', *Journal of Service Theory and Practice* **28**(2), 196–227.  
**URL:** <https://doi.org/10.1108/JSTP-11-2014-0261>
- Gerber, E. M. and Hui, J. (2013), 'Crowdfunding: Motivations and Deterrents for Participation', *ACM Trans. Comput.-Hum. Interact. Article* **20**(32).
- Giudici, G. and Martinazzi, S. (2017), The age of FinTech: Providing a liquid and efficient secondary market for security based crowdfunding with Distributed Ledger Technologies, PhD thesis, Politecnico Di Milano.
- Haas, P. and Blohm, I. (2017), Blueprinting Crowdfunding Designing a Crowdfunding Service Configuration Framework, *in* J. Leimeister and W. Brenner, eds, 'Proceedings der 13. Internationale Tagung Wirtschaftsinformatik (WI)', St.Gallen, pp. 151–165.
- Haas, P., Blohm, I. and Leimeister, J. (2014), 'An empirical taxonomy of crowdfunding intermediaries', *35th International Conference on Information Systems "Building a Better World Through Information Systems", ICIS 2014* .
- Hanington, B. and Martin, B. (2012), *Universal methods of design: 100 ways to research complex problems*, Rockport Publishers, Beverly, MA.
- Hargrave, J., Sahdev, N. and Feldmeier, O. (2018), 'How Value is Created in Tokenized Assets', SSRN eLibrary. [Online]. Accessed: 2018-05-10.  
**URL:** <http://dx.doi.org/10.2139/ssrn.3146191>
- ICO Watchlist (n.d.), 'ICO Guides: Introduction - ICO Education'. [Online]. Accessed: 2018-01-23.  
**URL:** <https://icowatchlist.com/education/>

- Indiegogo (2017), 'Indiegogo announces initial coin offerings blockchain investments', Indiegogo blog post, December 12. [Online]. Accessed: 2018-01-23.  
**URL:** <https://go.indiegogo.com/blog/2017/12/indiegogo-ico-cryptocurrency.html>
- Investopedia (n.d.), 'Initial Coin Offering (ICO) Definition'. [Online]. Accessed: 2018-01-23.  
**URL:** <https://www.investopedia.com/terms/i/initial-coin-offering-ico.asp>
- Kaal, W. and Dell'Erba, M. (2018), Initial Coin Offerings: Emerging Practices, Risk Factors, and Red Flags, in F. Möslein and S. Omlor, eds, 'Fintech Handbook', Verlag C.H. Beck.
- Kastelein, R. (2017), 'What Initial Coin Offerings Are, and Why VC Firms Care', *Harvard Business Review*. March, 24. [Online]. Accessed: 2018-01-23.
- Kimbell, L. (2011), 'Rethinking Design Thinking: Part I', *Design and Culture* **3**(3), 285–306.
- Kolko, J. (2015), 'Design Thinking Comes of Age', *Harvard Business Review* **93**(9), 66–71.
- Lauslahti, K., Mattila, J., Hukkinen, T. and Seppälä, T. (2018), Expanding the Platform: Smart Contracts as Boundary Resources, in A. Smedlund, A. Lindblom and L. Mitronen, eds, 'Collaborative Value Co-creation in the Platform Economy', 1 edn, Springer Singapore.
- Law, E. L.-C., Roto, V., Hassenzahl, M., Vermeeren, A. P. and Kort, J. (2009), Understanding, scoping and defining user experience, in 'Proceedings of the 27th international conference on Human factors in computing systems - CHI 09', ACM Press, New York, USA, p. 719.
- LeBeau, Z. (2017), 'What's the Difference Between an 'ICO' and a 'Token Launch'?', Medium blog post, December 29. [Online]. Accessed: 2018-01-23.  
**URL:** <https://medium.com/@SingularDTV/whats-the-difference-between-an-ico-and-a-token-launch-d892d4d689a4>
- Lemon, K. N. and Verhoef, P. C. (2016), 'Understanding Customer Experience Throughout the Customer Journey', *Journal of Marketing* **80**(6), 69–96.

- LHoFT & SDF (2017), Understanding Initial Coin Offerings: Technology, Benefits, Risks, and Regulations, Technical report, Luxembourg House of Financial Technology (LHoFT) and Stellar Development Foundation (SDF).
- Lukkarinen, A., Teich, J. E., Wallenius, H. and Wallenius, J. (2016), ‘Success drivers of online equity crowdfunding campaigns’, *Decision Support Systems* **87**(C), 26–38.
- Macht, S. A. and Weatherston, J. (2015), ‘Academic Research on Crowdfunders: What’s Been Done and What’s To Come?’, *Strategic Change* **24**(2), 191–205.
- Mager, B. (2009), Service Design as an Emerging Field, in S. Miettinen and M. Koivisto, eds, ‘Designing Services with Innovative Methods’, Kuopio Academy of Design, Kuopio, pp. 28–42.
- Mangiaracina, R., Brugnoli, G. and Perego, A. (2009), ‘The ecommerce customer journey: A model to assess and compare the user experience of the ecommerce websites’, *Journal of Internet Banking and Commerce* **14**(3).
- Marks, H. (2018), ‘The ICO Is Dead. Long Live the ICO 2.0’, Hackernoon blog post, February 21. [Online]. Accessed: 2018-03-29.  
**URL:** <https://hackernoon.com/the-ico-is-dead-long-live-the-ico-2-0-7bb269987513>
- Marquez, J. J., Downey, A. and Clement, R. (2015), ‘Walking a mile in the user’s shoes: Customer journey mapping as a method to understanding the user experience’, *Internet Reference Services Quarterly* **20**(3-4), 135–150.
- MAS & CAD (2017), ‘Consumer Advisory on Investment Schemes Involving Digital Tokens (Including Virtual Currencies)’, Commercial Affairs Department and the Monetary Authority of Singapore statement, August 10. [Online]. Accessed: 2018-01-23.  
**URL:** <https://bit.ly/2gvDsSch>
- Meyer, C. and Schwager, A. (2007), ‘Understanding Customer Experience’, *Harvard Business Review* **85**(2).
- MFSA (2017), ‘Discussion Paper on Initial Coin Offerings, Virtual Currencies and Related Service Providers’, Malta Financial Services Authority, MFSA REF: 08-2017. [Online]. Accessed: 2018-04-26.  
**URL:** <https://bit.ly/2HwkoYk>

- Miettinen, S. (2016), *An introduction to industrial service design*, 1st edn, Routledge, London.
- Miles, M. B., Huberman, A. M. and Saldaña, J. (2014), *Qualitative data analysis: a methods sourcebook*, 3rd edn, SAGE Publications Inc., Thousand Oaks.
- Mirnig, A. G., Meschtscherjakov, A., Wurhofer, D., Meneweger, T. and Tscheligi, M. (2015), A Formal Analysis of the ISO 9241-210 Definition of User Experience, *in* 'Proceedings of the 33rd Annual ACM Conference Extended Abstracts on Human Factors in Computing Systems - CHI EA '15', ACM Press, New York, USA, pp. 437–450.
- Mollick, E. (2014), 'The dynamics of crowdfunding: An exploratory study', *Journal of Business Venturing* **29**(1), 1–16.
- Mougayar, W. (2016), 'How Cryptocurrencies and Blockchain-based Startups Are Turning The Traditional Venture Capital Model on Its Head', Startup Management blog post, October 6. [Online]. Accessed: 2018-04-26.  
**URL:** <https://bit.ly/2dh63f2>
- O'Leary, R. R. (2017), 'South Korean Regulator Issues ICO Ban', *CoinDesk.com*. [Online]. Accessed: 2018-01-19.  
**URL:** <https://www.coindesk.com/south-korean-regulator-issues-ico-ban/>
- Ordanini, A., Miceli, L., Pizzetti, M. and Parasuraman, A. (2011), 'Crowdfunding: transforming customers into investors through innovative service platforms', *Journal of Service Management* **22**(4), 443–470.
- Patton, M. Q. (2002), *Qualitative research & evaluation methods*, 3rd edn, SAGE Publications Inc, Thousand Oaks, CA.
- PBC (2017), 'Public Notice of the PBC, CAC, MIIT, SAIC, CBRC, CSRC and CIRC on Preventing Risks of Fundraising through Coin Offering', The People's Bank of China statement, September 8. [Online]. Accessed: 2018-01-23.  
**URL:** <http://www.pbc.gov.cn/english/130721/3377816/index.html>
- Popper, N. (2017), 'An Explanation of Initial Coin Offerings', *The New York Times*. [Online]. Accessed: 2018-04-26.  
**URL:** <https://www.nytimes.com/2017/10/27/technology/what-is-an-initial-coin-offering.html>



- Popper, N. (2018), 'Subpoenas Signal S.E.C. Crackdown on Initial Coin Offerings', *The New York Times* . [Online]. Accessed: 2018-04-26.  
**URL:** <https://www.nytimes.com/2018/02/28/technology/initial-coin-offerings-sec.html>
- Prowse, S. (1998), 'Angel investors and the market for angel investments', *Journal of Banking & Finance* **22**(6-8), 785–792.
- Reuters (2017), 'Bitcoin: South Korea Bank Chief Warns Investors', *Fortune* . [Online]. Accessed: 2018-01-23.  
**URL:** <http://fortune.com/2017/12/20/bitcoin-south-korea-bank-warning/>
- Roberts, J. J. (2017), 'Petterfy: Bitcoin Futures Could Trigger Lehman-Style Crisis', *Fortune* . [Online]. Accessed: 2018-01-23.  
**URL:** <http://fortune.com/2017/12/04/bitcoin-futures/>
- Roto, V., Law, E., Vermeeren, A. and Hoonhout, J. (2010), User Experience White Paper: Bringing clarity to the concept of user experience, Technical report, Dagstuhl Seminar on Demarcating User Experience. [Online]. Accessed: 2018-01-23.  
**URL:** <http://www.allaboutux.org/files/UX-WhitePaper.pdf>
- Rytilahti, P., Miettinen, S. and Vuontisjärvi, H.-R. (2015), The theoretical landscape of service design, in A. Marcus, ed., 'Design, User Experience, and Usability: Design Discourse', Springer International Publishing, Cham, pp. 86–97.
- Schwienbacher, A. and Larralde, B. (2012), Crowdfunding for small ventures, in D. Cumming, ed., 'Handbook of Entrepreneurial Finance', Oxford University Press, pp. 369–391.
- SEC (2017a), 'Investor Bulletin: Initial Coin Offerings', U.S. Securities and Exchange Commission statement, July 25. [Online]. Accessed: 2018-01-23.  
**URL:** [https://www.sec.gov/oiea/investor-alerts-and-bulletins/ib\\_coinofferings](https://www.sec.gov/oiea/investor-alerts-and-bulletins/ib_coinofferings)
- SEC (2017b), Report of Investigation Pursuant to Section 21(a) of the Securities Exchange Act of 1934: The DAO, Technical report, U.S. Securities and Exchange Commission. [Online]. Accessed: 2018-01-23.  
**URL:** <https://www.sec.gov/litigation/investreport/34-81207.pdf>
- Serenko, A. and Stach, A. (2009), 'The Impact of Expectation Disconfirmation on Customer Loyalty and Recommendation Behavior: Investigating

- Online Travel and Tourism Services', *Journal of Information Technology Management* **XX**(3), 26–41.
- SFC (2017), 'Statement on initial coin offerings', Securities and Futures Commission of Hong Kong statement, September 5. [Online]. Accessed: 2018-01-23.  
**URL:** <http://www.sfc.hk/web/EN/news-and-announcements/policy-statements-and-announcements/statement-on-initial-coin-offerings.html>
- SFS-EN ISO 9241-210 (2010), Ergonomics of Human-System Interaction. Part 210 : Human-Centred Design for Interactive Systems ( ISO 9241-210 : 2010 ), Technical report, International Organization for Standardization.
- Silverman, D. (2000), *Doing Qualitative Research: A Practical Handbook*, 1st edn, SAGE Publications Ltd, London.
- Stanford d.school (n.d.), 'An Introduction to Design Thinking PROCESS GUIDE', Hasso Plattner Institute of Design at Stanford educational material. [Online]. Accessed: 2018-01-23.  
**URL:** <https://stanford.io/2foBN7V>
- Stauss, B. and Weinlich, B. (1997), 'Process-oriented measurement of service quality: Applying the sequential incident technique', *European Journal of Marketing* **31**(1), 33–55.
- Stickdorn, M. and Schneider, J. (2011), *This is Service Design Thinking*, BIS Publishers, Amsterdam, The Netherlands.
- Sudek, R. (2006), 'Angel investment criteria', *Journal of Small Business Strategy* **17**(2), 89–104.
- Svinkin, R. (2016), 'Fixing Bitcoin's Big UX Problem', *CoinDesk.com*. [Online]. Accessed: 2018-01-23.  
**URL:** <https://www.coindesk.com/digital-gold-rushed/>
- Teixeira, J., Patrício, L., Nunes, N. J., Nóbrega, L., Fisk, R. P. and Constantine, L. (2012), 'Customer experience modeling: from customer experience to service design', *Journal of Service Management* **23**(3), 362–376.
- The Economist (2017a), 'Manias, panics and ICOs', *The Economist* **425**(9061), 73–75.
- The Economist (2017b), 'Regulators have intervened to rein in ICOs, but big legal questions remain', *The Economist* **425**(9066), 67–68.

- Thomas, S. (2017), 'The Death of the ICO (And 4 Other 2018 Predictions)', *CoinDesk.com*. [Online]. Accessed: 2018-01-23.  
**URL:** <https://www.coindesk.com/death-ico-4-2018-predictions/>
- Tuomi, J. and Sarajärvi, A. (2002), *Laadullinen tutkimus ja sisällönanalyysi*, 1st-2nd edn, Tammi, Helsinki.
- UXPin (n.d.), 'Customer Experience vs. User Experience: See the Difference'. [Online]. Accessed: 2018-01-23.  
**URL:** <https://www.uxpin.com/studio/blog/customer-experience-vs-user-experience-why-the-difference-matters/>
- Vargo, S. L. and Lusch, R. F. (2004), 'Evolving to a New Dominant Logic for Marketing', *Journal of Marketing* **68**(1), 1–17.
- Vargo, S. L. and Lusch, R. F. (2016), 'Institutions and axioms: an extension and update of service-dominant logic', *Journal of the Academy of Marketing Science* **44**(1), 5–23.
- Varnaite, I. (2018), Identify the success factors of the initial coin offerings from the investors perspective, Master's thesis, ISM University of Management and Economics, Vilnius.
- Venegas, P. (2017), 'Initial Coin Offering (ICO) Risk, Value and Cost in Blockchain Trustless Crypto Markets', *Economy Monitor*. [Online]. Accessed: 2018-01-23.  
**URL:** <http://dx.doi.org/10.2139/ssrn.3012238>
- Voss, C. and Zomerdijs, L. (2007), Innovation in Experiential Services – An Empirical View, in DTI, ed., 'Innovation in Services', Department of Trade and Industry, London, pp. 97–134.
- Vulkan, N., Åstebro, T. and Sierra, M. F. (2016), 'Equity crowdfunding: A new phenomena', *Journal of Business Venturing Insights* **5**, 37–49.
- Wetter Edman, K. (2009), Exploring Overlaps and Differences in Service Dominant Logic and Design Thinking, in S. Clatworthy, J.-V. Nisula and S. Holmlid, eds, 'First Nordic Conference on Service Design and Service Innovation', pp. 201–212.
- Yadav, M. (2017), 'Exploring Signals for Investing in an Initial Coin Offering (ICO)', SSRN eLibrary. [Online]. Accessed: 2018-05-10.  
**URL:** <http://dx.doi.org/10.2139/ssrn.3037106>

Zhao, W. (2017), 'China's ICO Ban: A Full Translation of Regulator Remarks', *CoinDesk.com* . [Online]. Accessed: 2018-01-23.

**URL:** <https://www.coindesk.com/chinas-ico-ban-a-full-translation-of-regulator-remarks/>

Zomerdijk, L. G. and Voss, C. A. (2010), 'Service Design for Experience-Centric Services', *Journal of Service Research* **13**(1), 67–82.

## Appendix A

# Matrices used in data analysis

Meta-matrix of the main topics of the empirical study per interview (1/2)

Interview	Descriptive quotation	Interest in cryptocurrencies	Motivation to invest in ICOs	Involvement in crypto-domain (years)	ICO experience (number of participation)
#1	"A random ICO from nowhere. It doesn't surprise me if I never get anything back from there."	- Novelty - Freedom - Straight-forwardness - Pioneering spirit	- Exploring curiosity of how systems work	> 6 yrs	2
#2	"I might conduct this whole process up until here [transaction], purely out of interest towards the project."	- Technology and economy combination - Novelty - Interest towards IT	- Will to see the project come reality - Supporting the project - Financial profit	5 yrs	10-20
#3	"My goal in life is financial freedom."	- Financial profit	- Financial profit	6 months	1
#4	"[I've] been very careful and still are about which ICOs I invest in."	- Financial profit - Decentralization/libertarianism	- Financial profit - Buying the future service with discount	6 yrs	1
#5	"I don't want to be the one who thinks afterwards that how in hell I didn't tap into the profits when I could've."	- Financial profit - Getting involved with growing investment opportunities	- Will to learn how things work - Getting involved in growth - Financial profit	4 months	1
#6	"I have just watched as the markets crash and a bit sadistically spectated how younger investors lose their money while I've bought in early enough."	- Novelty - Disruptive implications - Growth potential	- Financial profit	> 6 years	2
#7	"Nowadays I want to meet [the ICO founders], otherwise I won't invest a dime."	- Decentralization/libertarianism - Freedom - Same spirited community	- Financial profit	5 years	3
#8	"I want to support the development of the ecosystem as a whole. That's why I've chosen the projects so that they truly benefit the ecosystem"	- Technology - Freedom - Decentralization - Growth potential - Disruptive implications	- Supporting the project - Financial profit - Will to develop self in the crypto-domain	4 years	6

## Meta-matrix of the main topics of the empirical study per interview (2/2)

Interview	Following up-coming ICOs	Investment process: positive	Investment process: negative	ICO problems and challenges
#1	- Does not follow actively, only information coming through social media	- Not especial positive things. Routine and neutral.	- Laborious and complex actual investment phase	- Laborious and complex process - Need to investigate thoroughly single-handedly due to lack of trust - Possibility of investor errors - Requirement of IT skills - No investor protection - Risk of Getting scammed - Overwhelming amount of projects and information - Uncertainty of the transaction and monitoring of IT - Vagueness of provided project material
#2	- Does not follow on-going ICOs - Follows up-coming ICOs amongst other web content - Following is annoying because channels are full of price speculation	- Investigating the technological mechanism - Enjoys following the project	- KYC-process - Otherwise the ICO was well organized	- Valuing the project and the tokens - Requirement of IT skills - Overwhelming amount of information - Congestion of the network - Possibility of investor errors - Single responsibility of investor - Vagueness of provided project material
#3	- Dedicated to one ICO, feels no urge to follow others	- Youtube-content in the pre-investment phase and the resulting excitement	- Risk of getting hacked - Uncertainty in the transaction	- Uncertainty of the transaction - Complexity and difficulty of investing - Stressfulness of making and following the transaction - Risk of getting hacked
#4	- Seldom, perhaps once a month visits ICO-review sites - Good ICOs will emerge without active searching	- Well made marketing material in the pre-investment phase - ICO-review services positive surprise	- Feeling of uncertainty and fear of getting scammed - Sloppy impression by the organizers	- Difficulty of valuing the project and the tokens - Risk of getting scammed - No clearly defined rules or standards
#5	- Best ICOs emerge by following telegram channels	- Positive learning experience, easy to participate in the next ICO	- Exhausting pre-investment phase, overwhelming amount of information - Risk of getting scammed and lack of trust - Investing event is stressful	- Information management is laborious and requires time and energy - Transaction fees are difficult to understand - Single responsibility of investor and risk of misunderstanding - Complexity (multiple steps) - No rules or authorities - Lack of trust - Requires knowledge and skills - Uncertainty of transaction success
#6	- Waits for the opportunities to emerge - Marketing is so aggressive that it is pointless to try to actively look for ICOs	- The team and active communication between investors and the team	- Congestion of the network - The complexity and laboriousness of the process - Figuring things out by himself	- Risk of getting scammed - Investing is laborious and complex - Possibility of investor errors - Requirement of IT skills - Congestion of the network - Difficulty of information search and management
#7	- Doesn't follow nowadays - Wants to stay away from the current ferocious markets - Strong signals emerge from own social media channels anyway	- The beginning of the ICO as an event (excitement)	- Congestion of the network - Failing to successfully do the transaction - Difficulty of understanding the transaction costs	- Active trading requires time and energy - Risk of getting scammed - Risk of getting hacked - Possibility of investor errors - Information management requires too much time and energy - Making and monitoring transaction is stressful - Requirement of IT skills - Uncertainty of transaction success - Congestion of the network
#8	- Doesn't look for ICOs - ICOs emerge through own social media channels - "I open telegram and the first thing I hear is a good ICO if there is one"	- Enjoys the studying of the project in pre-investment phase - Enjoys following the project	- Congestion of the network	- Lack of trust (information sources) - Risk of getting scammed - Uncertainty of transaction success - Following transaction is stressful - Congestion of the network - Vagueness of provided project material - No rules or regulation - Majority of investors are after quick profit and don't do proper due diligence

Conceptually clustered matrix of investment process workflow and experience ratings

	Studying whitepaper	Reading chat/forums	Reading a blog	Youtube videos	Googling	Inspecting the marketing material /website	Discussing with acquaintances	Assessing the website	Reading ICO-reviews	Testing demo/MVP	Inspecting the team	Reviewing code	Inspecting legal documents
#1	2	-	-	-	2	-	4	-	-	-	-	-	2
#2	5	3	-	-	-	-	-	-	-	-	-	4	-
#3	-	3	-	4	-	4	-	-	-	-	-	-	-
#4	4	3	-	-	3	4	5	-	4	-	-	-	-
#5	-	3	-	-	2	2	4,5	4	2	-	5	-	-
#6	4	4	-	5	-	-	-	-	-	-	5	-	-
#7	4	3	4	-	-	5	-	5	-	5	-	-	-
#8	3	4	5	4	-	-	5	-	-	3	-	-	-

	Registration	Figuring out what to invest	Figuring out the investment process	Decision on how much to invest	Pre-trading	Creating wallet	Preparing for the transaction	KYC-process	Following the ICO reviewing and input of information	Sending transaction	Following the transaction	Transferring the tokens to own wallet	Confirming tokens in own possession
#1	3	4	2	-	-	2	-	-	-	3	3	2	3
#2	-	2	-	-	-	-	3,5	3	4	-	3	-	4
#3	-	-	-	-	4,5	-	-	-	-	5	3	-	4
#4	5	4	-	5	-	-	-	2	-	-	5	3	-
#5	5	3	-	2	3	-	-	-	-	-	5	2	5
#6	4	-	4	-	-	4	-	2	-	-	4	2	-
#7	-	-	3	-	-	-	3	-	5	-	2	1	-
#8	3	-	-	-	4	-	-	-	2	-	2	1	-

	Token price monitoring	Buying more tokens	Following the project development
#1	4	-	3
#2	-	-	5
#3	4	-	5
#4	4	-	3
#5	-	-	2
#6	5	4	4
#7	3	1	-
#8	2	3	5

## Appendix B

# Curve of investor experience

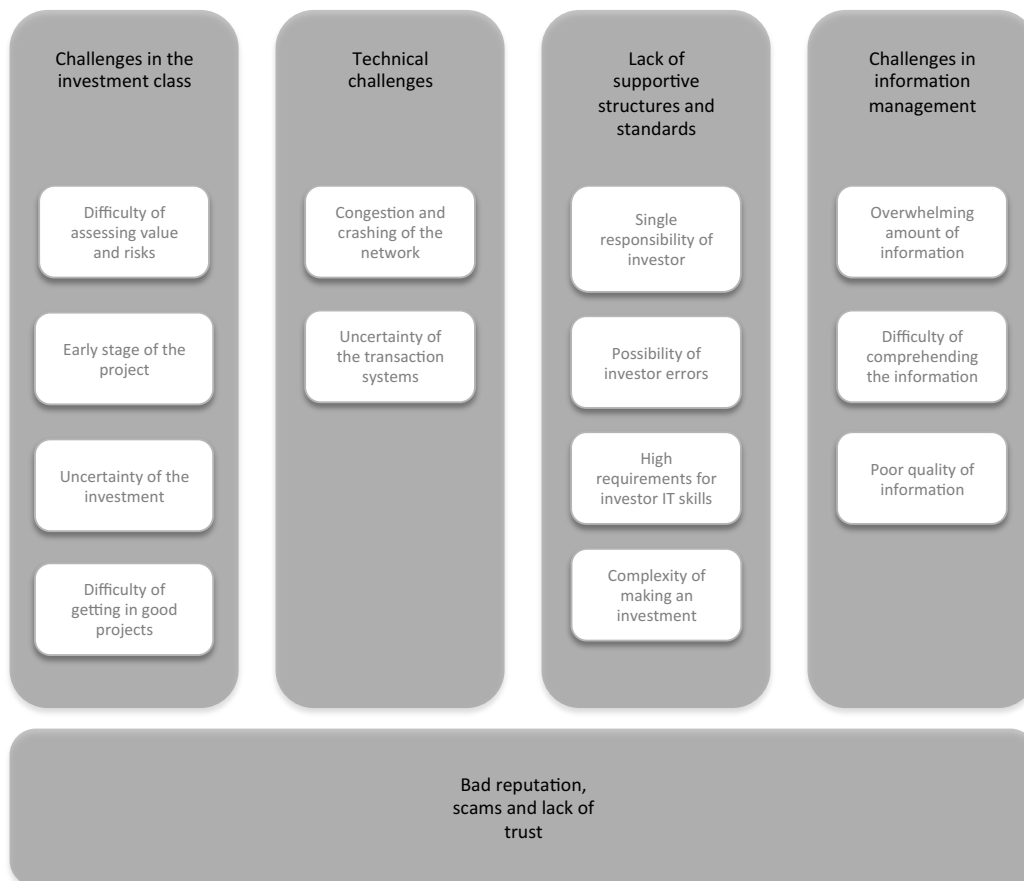
Mean values of experience ratings (1 = most negative, 5 = most positive) for each generic category of investment process per investor and on average.





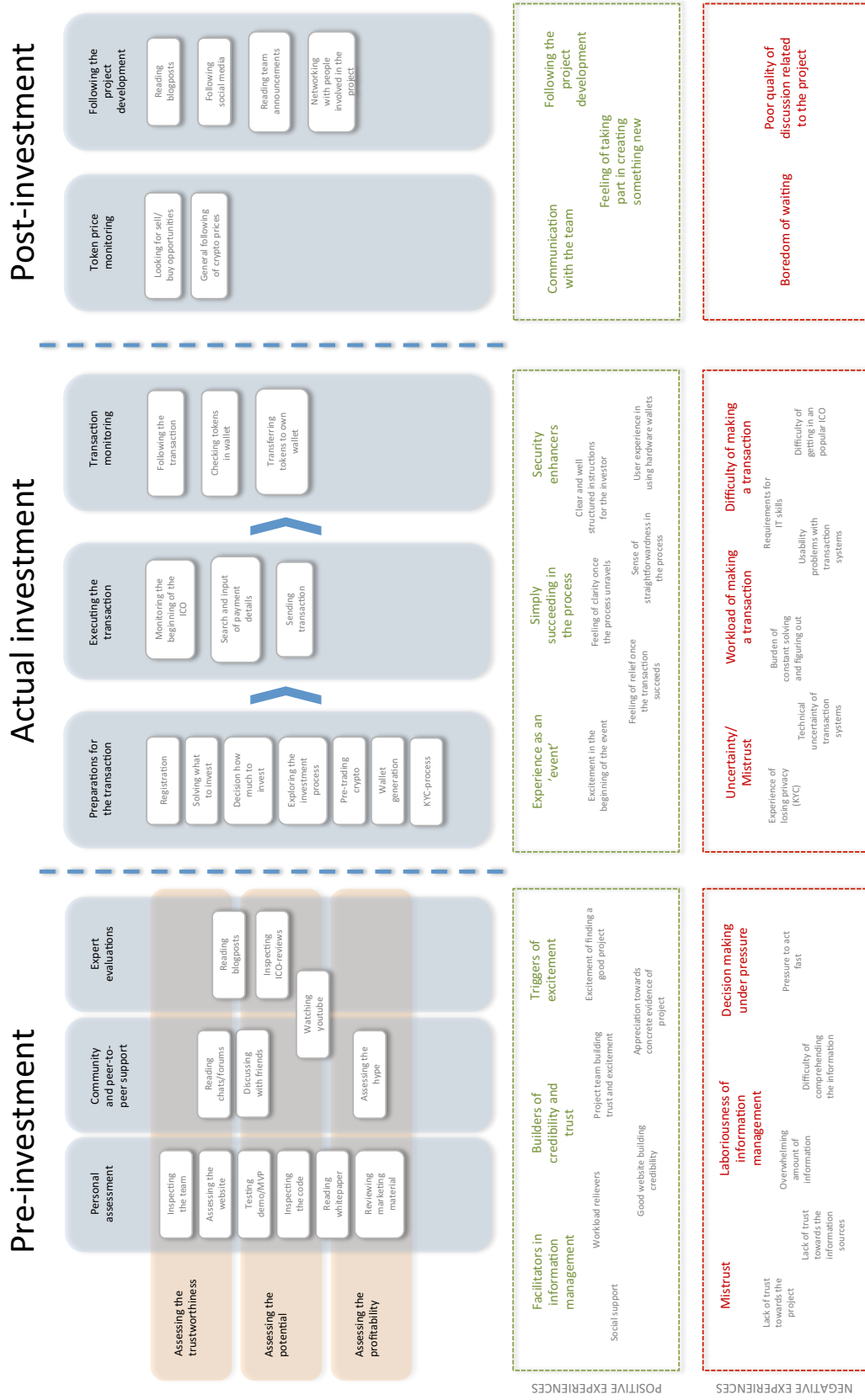
## Appendix C

# Model of the ICO problem domain



## Appendix D

# Model of the generic customer journey



# Appendix E

## Interview script

*Translated, originally used in Finnish*

### **Background**

- Introduce yourself briefly.
- What type of investing have you experience on? Why these?
- How did you end up in the domain of cryptocurrencies? Tell story.
- How have you been involved with the crypto domain in general? Why?

### **Participating in ICOs**

- What kind of history do you have in participating in ICOs?
- How many have you participated in?
  - On what basis have you selected these ICOs?
- Why have you wanted to participate in the ICOs?
  - What goals do you have regarding ICOs?
- How would you characterize, how ICO investing is different from traditional investing?
- How do you follow upcoming ICOs? Why this way?
  - What channels do you use? Why?
  - What good/bad do you see in this way?

**Exercise: Journey Mapping**

Recall the latest ICO you participated in.

Starting point: First contact/awareness with the ICO

1. Pre-investment
2. Actual investing
3. Post-investment

Ending point: selling tokens / product launch / refund

Go through every main episode one by one:

- Describe the course of this stage.
- What single steps or actions this stage included?
  - Who were involved? Which channels you used? What kind of information you gathered/needed? What tools did you use? Why?
- Please attach an experience assessment to each step and explain the reasons behind the assessment.

Ask the interviewee to summarize the experience as a whole.

- What especially positive things about the investment process do you recall? How about negative ones?
  - What kind of challenges or problems? What benefits?
  - What could have been done differently? How?