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The personality venture capitalists look for in an entrepreneur

An artificial intelligence approach to personality analysis

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Abstract

To date, the usual analysis of an entrepreneur personality is primarily a gut feeling of the venture capitalist and is hard to codify. This paper aims to explore in a qualitative way what it is about the characteristics and the personality of the entrepreneur that influences the investment made by the venture capitalists. These findings will then be used to discuss if an artificial intelligence application can be used to analyze the personality of entrepreneurs.

The primary source of information for this paper is interviews with venture capitalists. The authors searched for similarities within the available literature on entrepreneurial personalities and found that the majority of the personality traits mentioned by the venture capitalist can be found in the literature.

The research findings suggest that all venture capitalist value an entrepreneur that has passion for what she is doing and has the ability to get the job done. Additionally, most of the venture capitalist interviewed value an entrepreneur that is coachable, flexible, visionary, and is able to communicate that vision well.

Finally, based on the results, the authors proposed a framework for how an artificial intelligence system can be structured to assess personalities of entrepreneurs.

Key-words

Venture capitalist, Investment criteria, Entrepreneurs, Personality of entrepreneurs, Artificial intelligence

Table of contents

List of tables

List of figures

List of abbreviations

AI	Artificial Intelligence
AGI	Artificial General Intelligence
ECE	Entrepreneurial self-efficacy
FFM	Five Factor Model (Big Five)
GP	General Partner
IA	Intelligent Agent
LP	Limited Partner
MD	Managing Director
SaaS	Software as a Service
VC	Venture Capitalist
VCF	Venture Capital Fund

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1. Introduction

1.1. Background and definitions

‘The whole is greater than the sum of its parts.’ (Aristotle)

The concept of emergent properties is a widely used term within arts, science, and philosophy and can be defined as a process where smaller entities and patterns combine to form a larger entity that is unique compared to its constituents (O’Connor and Wong, 2002). In simple terms, it means that the whole is greater than the sum of its part. In this paper, the authors will look into three topics and try to determine, if combined, whether they can be used to create a whole that is bigger than the sum of its parts. Here, the *parts* being researched are personality traits of entrepreneurs, venture capitalists and their investment criteria, and artificial intelligence. The *whole* is an artificial intelligence system that can analyze startup founders´ personality.

In essence, a venture capitalist (VC) is an individual who invests in ideas or ventures that are usually at an early stage in their lifetime. When deciding to invest in a venture, a VC considers many elements, one of them being the personality of the entrepreneurs who seek funding. At the time of writing, the usual assessment of entrepreneurs personality is primarily a gut feeling of the VC and thus hard to codify. This paper aims to explore in detail what it is about the characteristics and the personality of the entrepreneur that influences the investment by the VC.

The paper analyses and connects these two areas, the VC investment criteria and the personality of entrepreneurs. Researching the VC investment criteria, the authors will study the available literature on the subject as well as conducting interviews with VC firms in Sweden and Iceland to determine in more detail what personality traits they look for in an entrepreneur. The second area is the literature and theory on the personality of entrepreneurs and here the authors discuss theories and models used to assess the personality of entrepreneurs. The Big Five model and several other personality characteristics will be dealt with. The findings will then be used to discuss if artificial intelligence can be applied to analyze the personality of entrepreneurs.

Throughout this paper, the authors will use the term founder and entrepreneur interchangeably.

1.2. Problem statement and research question

The problem the authors set out to solve is multifaceted. One problem is, when a VC decides to invest in a startup or not, that decision is often based on certain biases. For example, a VC may prefer founders, who have a similar background and CV or who have a greater sympathy towards the VC (Barnett and Finnemore, 2004). An AI system has the potential to eliminate these biases by making a rational analysis.

Another problem is the high failure rate of startups. According to Henry (2017), the failure rate is more than 50% for U.S. companies after 5 years, and 70% after 10 years. The greater aim of motivating the authors is to decrease this number by understanding the entrepreneur better and help him changing and developing his personality traits.

Plenty of software tools are already available for analyzing companies and startups but they mostly have to do with their financial status(Faggella, 2018). The current development in AI

(Bughin *et al.*, 2017) and AI companies, like HireVue are showing the potential and already possible solutions. Bughin et al. (2017) presented the current progress and increasing investment in AI in the last years. The company HireVue is claiming on their website to use interviews with predictive, validated industrial/organizational science and artificial intelligence to power and simplify the decision-making process of recruiting (HireVue, no date). Based on this, the authors suppose that the technology can fulfill the basic requirements to analyze one's personality. Nevertheless, data is necessary for an AI system and it is not known yet, which data is needed and if it is possible to gather this data. This leads us to the main research question:

How can artificial intelligence evaluate the personality of a startup founder according to venture capitalists' criteria?

To answer this question, the authors will consider the current literature, as well as primary data from interviews with venture capitalists. As it was mentioned before, in chapter 1.1, the thesis tries to combine three areas and accordingly, three sub-questions are stated:

(1) What personality traits do venture capitalists look for in a founder?
(2) What are the personality traits of entrepreneurs that are discussed in the recent literature?
(3) How can an AI system detect and determine these traits?

1.3. Delimitations

This thesis is bounded by several delimitations. The first delimitation is about the venture capitalists investment criteria. The basic investment criteria of VC's are (i) the venture's management team, (ii) the market, (iii) the product or service, and (iv) the venture's financial potential (Petty and Gruber, 2011). This thesis will only focus on the venture's management team and the entrepreneur. To study other criteria the authors would have needed a completely different approach.

The venture capitalists are the center of attention as they have the most thorough analysis of a startup before an investment takes place, due to the fact that they have a financial stake in the transaction, unlike most other organizations that evaluate startups.

The literature review on personality will not cover other types of persona.

The research into artificial intelligence covered will be limited to literature that sheds light on the research question. The authors of this paper do not have a background in computer science, therefore, they will not elaborate on in-depth knowledge in artificial intelligence, rather explore what is needed to develop a framework for an intelligent agent. How such framework can look like and how it is developed can be found in chapter 4.2.5.

The thesis will end with a matching of personality traits from literature and interviews and the AI framework of personality analysis mentioned above. The authors will not conduct any tests or validation of this framework. Therefore, this thesis can be seen as a feasibility study.

2. Methodology

2.1. Research paradigm

In the current literature, there are two basic research paradigms, one of them being the so-called ‘positivism’. The positivism paradigm rests on the assumption that social reality is objective and singular and is not influenced by the way of investigating it. In contrast to that is the ‘interpretivist’ paradigm, which rests on the assumption that the social reality is in our minds, that it is subjective and multifaceted. Therefore, it maintains that reality is influenced by the way of investigating or analyzing it. Research in the field of natural science is more often associated with the positivist paradigm, whereas research in social science is often connected to the interpretivist paradigm (Collis and Hussey, 2014).

In the following paper, the authors will apply the interpretivist paradigm. Whereas artificial intelligence is a part of computer science and mathematics, which belongs to the field of natural science, personality analysis is a part of psychology and belongs to the field of social science. The authors do not conduct in-depth research in AI but more on the underlying model of personality analysis and VC's criteria. The research in this paper about AI will be broad and applied but not in-depth nor on a fundamental or technical level. Instead, the research focuses on the theory of personality analysis and primary data will be gained from interviews. The data from the interviews will be non-numerical data, thus the interpretivist paradigm has a great fit for the research.

Broadly speaking, a research paper can be based on either a quantitative method or a qualitative method. The quantitative approach uses statistical methods (experiments, tests or surveys) to gain quantitative data (commonly called *variables*) to verify or falsify theories or hypotheses (Håkansson, 2013). The qualitative approach aims to understand behaviors, opinions or meanings to put forward or test a hypothesis or theory (Håkansson, 2013). As indicated in the paragraph above, the authors use a qualitative method because they collect qualitative data to answer the research question. The qualitative method fits the interpretivist paradigm because qualitative data allows interpretations of certain circumstances.

2.2. Research approach

A research approach can be inductive, deductive, or both. An inductive research is characterized by a study in which theory is developed from empirical reality and inferences are induced from instances. A deductive study starts with a development of a conceptual or theoretical structure, which is then tested by empirical observation (Collis and Hussey, 2014). This research paper uses an abductive approach. To answer the research question, mentioned in chapter 1.2 both approaches are needed. The abductive approach combines the inductive and the deductive approach. The inductive will be applied where interviews are used to find out VCs’ criteria for analyzing entrepreneurs. The deductive approach will be applied where the authors gain the theoretical structure from the current literature.

The orientation of the research is predominantly practical and therefore we see the paper as an applied research paper. We contribute knowledge to a very specific topic with a direct, practical application of science.

2.3. Data collection

The data collection for qualitative research commonly consists of questionnaires, case studies, observations, interviews, any text, and language. As noted before, the authors will use interviews to gain primary data for their research. The literature review provides context and secondary data.

2.3.1. Interview process

The aim of the interviews is to get insight data from VC's about their selection of founders and the evaluating their personality. By definition, an interview is a '(…) method for collecting primary data in which a sample of interviewees are asked questions to find out what they think.' (Collis and Hussey, 2014, p. 133). For this research, the authors will conduct semi-structured interviews with seven different VC's or business angels, the latter people providing capital to startups and early-stage businesses in return for a share.

In the table below all the interviewees are listed, along with their position, company name, interview form, date, and duration.

#	Function/Position	Company	Interview form	Date	Duration
1	Managing Director, Investment Manager	NSA Venture Fund	Face to face	04/04/2018	40min
2	Managing Director	Frumtak Ventures	Face to face	06/04/2018	45min
3	Managing Director	Crowberry Capital	Face to face	10/04/2018	40min
4	Partner	J12 Ventures	Face to face	11/04/2018	35min
5	Business Angel	STOAF Stockholms Affärsänglar	Skype call	12/04/2018	24min
6	Operating Partner	Nordic Makers	Face to face	08/05/2018	25min
7	Venture Manager	Anonymous	Face to face	15/05/2018	20min

Table 1 Overview of interviews with venture capitalists and business angel

The interviewees will be asked open questions, which they cannot answer with a simple 'yes' or 'no' but require a longer and developed answer. Further, the interview starts with a broad question about the background of their company, the number of employees, the size of investments, the field, and the stage (E.g. Series A, B, C funding, etc.) of the companies they invest in. After that, respondents will be asked about the process from the point they get to know an entrepreneur until they decide to invest or not. The follow-up questions will be narrower, drawing out how they evaluate the founder's personality. Based on the answers to this question, the interviewer will ask further questions spontaneously. The last question aims to get further insights into their evaluation process based on an example and asks about their last investments: What was it about, and how was the personality of the founder. Based on the answer to this question, it is possible to compare the general process of personality analysis they described before and their analysis in the particular example. Such examples might not be publishable due to data protection rights. The questionnaire for the interviews can be found in the appendix.

2.4. Data analysis

Since the authors are applying the interpretivist paradigm, the research will be conducted with a qualitative data analysis. The authors will conduct interviews with venture capitalists to find out their decision criteria and they will compare their criteria with personality characteristics they found in the literature of entrepreneurship, business, behavioral economics, and psychology.

First, the interviews will be transcribed from audio to text and analyzed by scanning each transcript for personality and other criteria, such as market, the product or service, and the venture's financial potential to gain as much information as possible out of it. This will bring about a table of personality traits. The literature review of 'personality of entrepreneurs' will also end with an analysis of personality traits in form of a table. These tables can then be compared in order to find common traits or differences. The comparison will be done in a qualitative way by comparing each trait with its definitions. This comparison will deliver the input for an AI framework. While this research is conducted in a qualitative way, the authors may still use numbers in their analysis, e.g. to show the frequency of certain traits. According to Sandelowski (2001), qualitative researchers can use numbers in their analysis if it helps them to conduct the research and to come to conclusions.

2.5. Ethics and Sustainability

The authors of this paper paid great attention to conducting the whole research according to ethical standards. This includes correct citing and referencing of all sources and the authors also prepared, conducted, and analyzed the interviews by keeping ethical issues in mind. All interviewees took part in the interviews voluntary and were asked for permission to record the interview, if any information is confidential, and if they wanted to be anonymous. All gathered information was handled with confidentiality. The authors state the name of the interviewees and companies only if they gave permission to do so.

Throughout the paper and especially when referring to the interviews, the authors sometimes refer to a third person as 'he' or 'she' but naturally, the authors always mean both genders equally.

It must be noted that the authors are handling a very sensitive topic, 'personality traits' since there are ongoing discussions regarding what extent certain traits are fixed through your genes or learned through your education or life experience (Loehlin, 1992). Therefore, the authors assume that no personality disqualifies you to be an entrepreneur but you have to be aware of your weaknesses to be able to compensate for them (Houpt, Gilkey and Ehringhaus, 2015).

A few words about sustainability are in order. Newman and Jennings (2012) define it as the needs of present and future generations regarding environment, society, and economy. However, the following research does not have big impacts on environmental sustainability since the interviews were conducted in Stockholm and Iceland where the authors lived or live. Therefore, no additional traveling was needed. The impacts of the researcher’s product on the environment is rather low as well, since, if it would be built, it would be a software, which processes data and gives results about one’s personality.

3. Literature Review

3.1. Venture Capitalist

One of the definitions of a startup is that it is an organization formed to search for a repeatable and scalable business model, i.e. how it creates, delivers, and captures value (Blank, 2010). At some point in a startup's lifetime, it needs to gain access to more resources to further enhance the venture, such as capital, mentorship, employees, access to people, a network, other companies etc. When faced with this need for resources, startups can turn to various entities for help, such as institutions or companies that offer grants, incubators, angel investors (angels), accelerators or venture capital (VC) funds, to name a few. The help angels, accelerators, and VC's give to startups is seen as an investment while incubators and grant givers do not necessarily take an equity stake in the company in return for their resources (Cohen, 2013). This part of the thesis is devoted to understanding what criteria these VC's look at when selecting a startup to invest in.

Broadly, venture capital refers to the pools of capital managed by specialists known as venture capitalists, who seek to identify companies with growth potential and great business opportunities but need financial, managerial, and strategic support (Maginn *et al.*, 2007). One of the first investments of a venture capital firm goes back to 1957 and was done by the American Research and Development Corporation (AR&D). AR&D invested $70,000 in the Digital Equipment Corporation (DEC). This investment was very successful, with a return on investment (ROI) of 500%. For this reason, this deal is known as one of the first investments of a venture capital fund (Feld and Mendelson, 2017).

Venture capital funds are the vehicle used to invest in companies like DEC but not all VC funds are the same. Each fund may have its specialty or area of focus. In the lifetime of a venture, it differs when the fund prefers to invest, in what sector it chooses to operate in or the type of technology it uses. While only a small percentage of companies raise venture capital, many of the world's most well known technology companies raised venture capital early in their lives. That applies to today's fastest growing companies (Feld and Mendelson, 2017).

How a venture capital firm operates

The investment cycle of a VC fund and its structure has not changed significantly since the first academic studies on the topic in 1970s (Kollmann and Kuckertz, 2010). The investment managers of a venture capital fund are called venture capitalists (Kollmann and Kuckertz, 2010) and usually, the most senior person in a VC firm is called a Managing director (MD) or General partner (GP). Sometimes these persons have a prefix in their titles, such as Executive MD or a Founding GP. They tend to make the final investment decisions and sit on the boards of directors of companies they invest in. Partners, Principals, Directors, Associate and, Analysts are all titles found in a VC firm (Feld and Mendelson, 2017). In short, they are investment professionals (Fleischer, 2008) that do a wide variety of things for the firm, except making the final investment decision. Their work includes activities such as going through and screening pitches proposals, helping the portfolio companies, writing the term sheet for deals, etc. (Feld and Mendelson, 2017).

A VC fund starts its lifetime by raising funds by outside investors called Limited Partners (LPs) (Fleischer, 2008). The VC invests those funds by looking at investment proposals, screening and evaluating them, and structuring a deal around them. Once an investment is made, the VC needs to manage it by monitoring and adding value to it with the resources available to them. Eventually, the VC exits the investment in the hope of a high return (Kollmann and Kuckertz, 2010). Each fund usually has a lifetime of 10 years (Mulcahy, 2013). This structure is shown in the figure below.

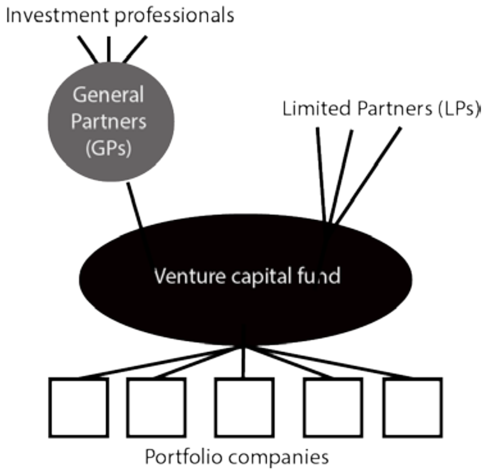

Figure 1 Adapted from Victor Fleischer (2008), *Two and Twenty: Taxing Partnership Profits in Private Equity Funds*

Each year thousands of entrepreneurs pitch their business idea to VC's in the hope of funding and access to their resources. Due to the numerous business proposals, many academics have sought to understand better how VC's select their investments. The process of making an investment can be split into three phases, the screening phase, evaluation phase and structuring phase (Kollmann and Kuckertz, 2010). When selecting investments, the business proposals are subjected to an initial screening, the deals considered interesting are evaluated further and, if the interest remains, they become the subject of an extensive and diligent assessment. In successful cases, the VC and the company negotiate specific deal terms (the term sheet), and if agreed, the VC makes an investment in the company (Petty and Gruber, 2011). The screening phase is primarily focused on the quality of the business proposal rather than finding out if the proposal meets the investment criteria. To pass the screening phase, the VC accepts the proposal as true, based on his experience and his beliefs, and that it will meet the relevant criteria when analyzed and evaluated further (Kollmann and Kuckertz, 2010). For every step forward with a proposal, the more research the VC has to do on it and fact checks the information. Additionally, with every step, the risk of the possible investment decreases (Kollmann and Kuckertz, 2010).

Venture capitalists investment criteria

In their study, Petty & Gruber (2011) analyzed the literature available on the topic of VC investment criteria and found that overall VC's emphasize characteristics of the venture's management team, the market, the product or service, and the venture's financial potential when making investment decisions. What is also interesting about this study is that it does not only a look at how VC's select their investments but also how they reject business proposals. Throughout the 11-year research period, Petty & Gruber found that the main reason for rejection changed over time. This may indicate that the selection criteria for investing in companies may be influenced by the wider economic environment. The main reasons for rejection throughout the research were that the product or service the company offered did not meet the VC criteria and the focus the VC fund had at that time.

Another study by Kaplan & Strömberg (2000) was consistent with the literature studied. Their findings were that VC's look at the attractiveness of the opportunity, the management team, and the deal terms. As mentioned, the criteria VC's use to select their investment are dynamic and thus there are many factors at play, e.g. in what stage of its lifetime the VC fund is and the economic environment (Petty and Gruber, 2011).

Now we proceed to analyze and summarize the literature on the topic so we can better understand the main criteria categories frequently mentioned by scholars and the factors behind each one. The authors cover this in two sections. The first section summarizes the criteria not connected to the main topic of this research, the market, product and financial potential. The second section looks at the entrepreneur and the management in more detail.

Market, product and financial potential

Market attractiveness depends upon the size, growth and accessibility of the market, and on the existence of a market need (Tyebjee and Bruno, 1984). According to Kaplan & Strömberg (2000), the most important factor when considering the attractiveness of the opportunity is the market size and growth. VC's tend to prefer market opportunities of considerable size and with high growth rates, as these market characteristics provide the conditions for strong revenue growth and high levels of value creation.

The evaluation criteria that VC's may apply when looking at the innovativeness of the offering, is its competitive advantage, some proprietary protection of the product, and the level of need a potential customer has for the offering (Petty and Gruber, 2011). Additionally, if the startup has not yet entered the market with its product, VC's may look at the prototype and if it has been developed to point of functioning (Macmillan, Siegel and Narasimha, 1985).

Finally, in terms of the venture's financial potential, Petty & Gruber (2011) highlight expected rate of return and the expected risk associated with these returns. In return for financing an early-stage venture, VC's look for a tenfold increase in investment value over a five-year time horizon (Zider, 1998). An example of reasons for investing found by Kaplan & Strömberg (2000), related to the financial potential, is the possibility of an early exit, i.e. being able to flip the investment quickly and that there are many strategic buyers available if the company is sold.

The entrepreneur and the management

This criterion takes a look at the top-level management but with an emphasis on the entrepreneur, founder or CEO. Weighing the most when considering the management team was the quality of the management. The VC's thoughts on management were for example that the experience of the team is a critical driver of success, a strong CEO and CFO and the team's ability to use limited resources well. Their ability to provide attractive financial performance was less important (Kaplan and Strömberg, 2000). A study by Macmillan, Siegel, & Narasimha (1985) suggests that five of the top ten most important criteria had to do with the entrepreneur's experience or personality. It states that a VC will not fund ventures unless the entrepreneur is capable of sustained effort, has demonstrated leadership in the past, evaluates, and reacts to risk well, has a track record relevant to the venture, and is capable of articulating the venture well.

According to Petty & Gruber (2011), the management team does not appear to be a major factor compared to the other factors in the decision-making process. Bob Zider (1998) also agrees by stating, ‘the myth is that venture capitalists invest in good people and good ideas. The reality is that they invest in good industries.’ This statement contradicts other finding such as the ones of Sharma and Monika (2015) which states that the characteristics of the entrepreneur and team are the most important criteria when distinguishing between the successful and unsuccessful ventures.

3.2. Personality characteristics of entrepreneurs

3.2.1. A brief history of Entrepreneurship

As Åstebro et al. (2014) mentioned in their paper about ‘Seeking the Roots of Entrepreneurship: Insights from Behavioral Economics’, Frank Knight was one of the first to start discussing entrepreneurship from an individual perspective within economics and set the starting point of research on personality traits of entrepreneurs. Frank Knight (1921) suggested that entrepreneurship is more than investing money under risk. It should rather be seen as a combination of highly uncertain returns and more than the average skill to perceive opportunities clearly.

In the following sections, the authors discuss different personality characteristics, which can be used to describe the personality of an entrepreneur. First, the Big Five model will be described, which is a general model describing personality with its roots in personality and organizational psychology research. Furthermore, typical entrepreneurial characteristics like locus of control, risk propensity, self-efficacy, and effectual reasoning are discussed. Chapter 3.2 will end with a complex process model of entrepreneurship (Kerr, Kerr and Xu, 2017) and a summary.

3.2.2. Big Five

A research paper by Kerr, S., Kerr W. and Xu (2017) summarizes the recent literature in the field of personality traits of entrepreneurs. The Big Five model is probably the best known, well-researched, well regarded, and widely accepted theoretical framework for personality analysis, as different researchers have claimed (Kerr, Kerr and Xu, 2017; Azucar, Marengo and Settanni, 2018). Often, the Big Five are called Five Factor model (FFM) (Selden and Goodie, 2018). Both are referring to the same factors but the term Five Factor model was introduced first and the Big Five were developed on the basis of the Five Factor model (de Raad and Mlačić, 2015). The Five Factor model was developed 1985-1987 (McCrae and Costa, 1987) and consists of (i) openness to new experiences, (ii) conscientiousness, (iii) extraversion, (iv) agreeableness and (v) neuroticism. The term ‘Big Five’ was introduced by McCrae and Costa (2008), where they were claiming why this model exists and how it can be used.

The Big Five model was not only developed to describe the personality of entrepreneurs but as a general model for personality analysis. Nevertheless, the Big Five model serves very well to describe the personality of entrepreneurs and to make predictions based on a Five Factor analysis. In a study Brandstätter (2011) compared personality aspects of entrepreneurs and managers, finding that personality traits of the Big Five could predict business intention, creation, and success.

The first factor of Big Five, openness to new experience, often referred to as openness only, describes the intellectual curiosity of a person, the abilities of imagination and creativity, and the acceptance of fantasy, feelings, and emotions. As this definition is broad and includes very different terms, there are ongoing discussions of how to understand this factor (Selden and Goodie, 2018). The article written by de Raad and Mlačić (2015, p. 560) describes the factor openness as a 'historical difference of opinion' among researchers. To some researcher, the factor openness might refer to intellectual traits, such as intelligence and insightfulness, but other researchers might see openness more as a factor of imagination and artistry (de Raad and Mlačić, 2015). Besides these opposite views, openness can indicate the network size and the network composition someone has, especially when someone has to connect with new people. The same study shows that people tend to connect with other people more easily when they have the same level of openness. Further, a high level of openness seems to have positive effects on the diversity of one's network, the leader emergence, and the ability to communicate over long distances (Selden and Goodie, 2018). Consistent to this study, Toegel and Barsoux (2012), see a highly opened person as inventive and curious and a less opened person as consistent and cautious.

The second factor in the Big Five is conscientiousness. This factor is associated with self-discipline, orderliness, competence, motivation, and dependability (Costa and McCrae, 1992). Another description defines conscientiousness as impulse control that enables task- and goal-oriented behavior (Kerr, Kerr and Xu, 2017). Further, conscientiousness has shown linkage to traits as self-control and predictability. If it comes to workplace achievements, high level of conscientiousness is showing good results when specific goals and deadlines need to be accomplished or when order and structure are required. On the other hand, people with a low fulfillment of conscientiousness tend to have problems with situations where the communication structure is not formalized. At the same time, they can be found as more flexible and spontaneous than people with a high level of conscientiousness (Selden and Goodie, 2018).

Extraversion, as a third factor in the Big Five model, can be defined as an active approach towards other people with traits such as assertiveness and positive emotionality. Further, extraversion is associated with sociability and activity (Costa and McCrae, 1992; Kerr, Kerr and Xu, 2017). People with a high level of extraversion tend to be outgoing, energetic, and open to social stimuli. Further, they are more socially competent in work environments where they have to interact and collaborate with other people, customers or co-workers. The opposite of extroverts are introverts, who are often seen as reserved, socially anxious, avoiding connection with new people, and feeling uncomfortable when they are confronted with strangers (Selden and Goodie, 2018). Furthermore, Barrick and Mount (1991) argue that extraversion is less important in skilled and professional jobs than for positions in management and sales. However, high extraversion seems to have a negative correlation with the invention in entrepreneurship (Leutner *et al.*, 2014). To sum up, most researchers argue for a positive relationship between extraversion and venture creation, but there are no proven results showing that extraversion has a positive or negative impact on venture survival.

The fourth factor of the Big Five is agreeableness. Traits such as trust, sympathy, and concern towards others belong to this factor (Costa and McCrae, 1992). A high fulfillment in this category describes people who are friendly, compassionate, and cooperative. Further, these people are less likely to have a conflict with others or to experience conflicts with bosses or supervisors. In a friendship, high agreeableness will lead to fewer conflicts and better quality. Agreeableness was proven to have positive impacts on your network, for both maintaining and developing new connections (Selden and Goodie, 2018). In contrast, people with low level of agreeableness are often perceived as a challenging, competitive in a positive way but as well as having little trust in other persons (Toegel and Barsoux, 2012).

Last but not least, neuroticism is the fifth factor of the Big Five. Neuroticism is associated mostly with negative feelings such as anxiety, depression, impulsivity, vulnerability, and anger (Selden and Goodie, 2018). Whereas low neuroticism indicates emotional stability, high neuroticism indicates people being anxious, nervous, and sad (Kerr, Kerr and Xu, 2017). People with a low level of neuroticism can be experienced as stable and calm as a positive outcome of it, but at the same time, they can be found uninspiring and unconcerned. In contrast to that, one with high value in neuroticism can be very dynamic, highly excitable and reactive, which can lead to insecurity and unstableness (Toegel and Barsoux, 2012). In relation to workplace settings, handling multiple tasks in uncertainty at the same time will probably be easier for one who is low in neuroticism and therefore, Selden and Goodie (2018) predict a negative impact of neuroticism on relationships.

3.2.3. Locus of Control

The term locus of control (LOC) goes back to Lefcourt (1991) who described it as an expectancy having whether personal characteristics and actions influence or determine the experienced outcomes or not. In simple terms, a locus of control describes where one sees his center of control. An internal LOC means that you control your life by your own decisions rather than external factors, such as fate or the environment controlling it. People are having an internal locus of control if they believe that success or failure is their own responsibility. An external LOC indicates that a person believes that mostly external factors (fate, chance, environment) control her life rather than her own decisions. People have an external locus of control if they believe that their success or failure depends on others (Kerr, Kerr and Xu, 2017).

According to the literature, an internal locus of control is often seen to increase the chance of being engaged in entrepreneurship (Kerr, Kerr and Xu, 2017). Although the authors assume that an internal LOC benefits an entrepreneur and the growth of his company, there is no clear evidence about this yet. Some researchers have found a positive connection between internal LOC and business success (Rauch and Frese, 2005), while others did not find evidence for it (Chell, 2008).

3.2.4. Risk propensity

‘Risk’ is a term that is often associated with entrepreneurship. Indeed, to found a startup is very risky and comes with many uncertainties, although it depends highly on the industry and market. A report from Åstebro et al. (2014) claims that only 50% of new ventures still exist after six years and three out of four startups exit the market without equity. About the terminology, there are several terms around like, risk preferences, risk tolerance, risk aversion, and risk propensity but all are used to describe the risk attitude (Kerr, Kerr and Xu, 2017). In the following paragraphs, several studies are summarized to give an overview of recent studies on risk attitudes in entrepreneurship. All studies have in common that they try to answer the question: Are entrepreneurs more prone to risk than the general population?

The first discussion about risk propensity goes back to Knight (1921). He hypothesized that entrepreneurs are not especially less risk averse than others but being better at recognizing and acting on opportunity than non-entrepreneurs. The entrepreneur will make use of an opportunity even if it might come with risk and uncertainty. Schumpeter (1935) conducted another early study about risk attitude of entrepreneurs. In an article, he discusses how entrepreneurs use existing opportunities to convert an invention into innovation, which is often a risky and uncertain undertaking. Although, he claims that the risk itself is not carried by the entrepreneur but more by the investor in the company.

The methods to measure risk attitude are usually by asking direct questions, e.g. ‘Do you like to take risks?’ or indirect ones, e.g. ‘Would you go to the same location for holiday as last year because you liked it?’. While indirect questions might deliver a more accurate picture than direct questions, both are obviously not very objective because one will always evaluate himself as different than others would do. Furthermore, it is important to distinguish between risks because one who likes to take risks in his free time (e.g. free climbing) might have nothing to do with his risk attitude in his career and business. Additionally, more accurate information about the risk attitude can be accomplished if the questions have to do with one’s behavior in a particular situation (Kerr, Kerr and Xu, 2017).

Unfortunately, the findings of risk propensity of entrepreneurs are very controversial. Some sources say that entrepreneurs have a higher risk tolerance while others say that other attributes, like the need for high achievement, equalizes the risk tolerance (Kerr, Kerr and Xu, 2017). The study of Stewart and Roth (2001), for example, came to the conclusion that entrepreneurs have a higher risk propensity than managers. However, a contrary result was delivered from Miner and Raju (2004) who found out that entrepreneurs try to avoid risk more than managers do. The study of Xu and Ruef (2004) concludes that entrepreneurs are more risk-averse than the average person because entrepreneurs are often starting businesses, not because of pecuniary benefits but rather looking for a fulfilling job with autonomy. Another study found a difference between opportunity entrepreneurs and necessity entrepreneurs. Opportunity entrepreneurs, as well as those who are motivated by creativity, are usually less risk-averse than necessity entrepreneurs (Block, Sandner and Spiegel, 2015).

Besides all the different opinions about the impact of risk propensity on entrepreneurship, there is a consensus about the impact of risk in the time of venture creation. Having a high-risk tolerance supports venture creation (Kerr, Kerr and Xu, 2017). On the other hand, there are different opinions about this in a later stage of venture growth. A study from Korunka et al. (2003) found out that a medium level of risk-taking is best for venture growth. Additionally, another study came to the conclusion that a positive or negative impact of risk depends on the degree of innovation a company includes (Cucculelli and Ermini., 2013), which means that risk has a greater impact on innovative companies than on less innovative companies.

The review of the recent literature indicates that there is no clear picture of the risk attributes of entrepreneurs. In recent years, the number of studies and paper has grown but it is still complicated when it comes to assessing the interplay of the risk attribute and other attitudes. Over-optimism and overconfidence, for example, are known to mediate low-risk tolerance (Parker, 2009).

3.2.5. Self-efficacy

Self-efficacy describes a person’s ‘belief that he/she can perform tasks and fulfill roles, and is directly related to expectations, goals and motivation’ (Cassar and Friedman, 2009, p. 242). Self-efficacy is measured on two levels, either as generalized self-efficacy or domain-specific

Entrepreneurial Self-Efficacy (ESE). Most researchers focus on the more situation-relevant ESE measure (Kerr, Kerr and Xu, 2017).

Further, according to Chen et al. (1998), ESE consists of five components: Innovation, risk-taking, marketing, management, and financial control. In a survey of business students, they came to the conclusion, that entrepreneurship students have a higher average value in ESE regarding marketing, management, and financials than other students. Another surveying study by Cassar and Friedman (2009), found out that a higher ESE would increase the likelihood of venture creation.

Even if there are not many studies about the impact of ESE on entrepreneurship, the authors conclude that entrepreneurs have a higher average ESE than non-entrepreneurs.

3.2.6. Effectual reasoning

The theory of ‘effectual reasoning’, developed by Sarasvathy (2001), tries to answer the question ‘What makes entrepreneurs entrepreneurial?’ Her model compares three different ways of thinking, the managerial, strategic, and entrepreneurial thinking. Managerial thinking has a given set of means to reach a specific goal. An example is a typical ‘Make vs. buy analysis’ in industrial production. A more creative version of it is strategic thinking, which includes new alternatives of means besides the existing set of means to reach a specific goal. Entrepreneurial thinking, in contrast, has not a specific goal at the beginning. It starts with a given set of means, which usually include their (i) traits and abilities, (ii) their education, expertise, and experience, and (iii) their social and professional network. The goal then evolves constantly over time, influenced by the founder’s imagination, interacting, and inspiration from his network. Further, Sarasvathy concludes that entrepreneurs believe that the future is shaped by human actions and those, as a human and entrepreneur, can shape the future. Therefore, they do not need to spend time and energy in trying to predict the future.

3.2.7. The complex process of entrepreneurship

Even if this thesis focuses on the personality side of entrepreneurship, there are always many other factors and mediators influencing the entrepreneur and his success. The following theory model should show what else, besides the already described personality traits, is important in entrepreneurship. Especially interesting are the possible mediators for personality traits, like the active performance and cultural context. This model was developed from Frese (2009) and Brandstätter (2011) to illustrate all the factors influencing the entrepreneur’s success. In this holistic model, personality, human capital, and the environment are mediated by the active performance of an entrepreneur. The personality consists of the Big Five factors, need for achievement, locus of control, self-efficacy, innovativeness, and risk-attitude. These traits are almost identical with the ones discussed above. The new personality traits in this model are the need for achievement and innovativeness. The active performance, as the mediator, consists of factors like entrepreneurial orientation and active task planning. The environment, for example, takes into account the speed of change in a certain industry (Dynamic) and the current stage a venture is in. All these attitudes and factors are put into a cultural context, which can act as a mediator or intensifier (Brandstätter, 2011).

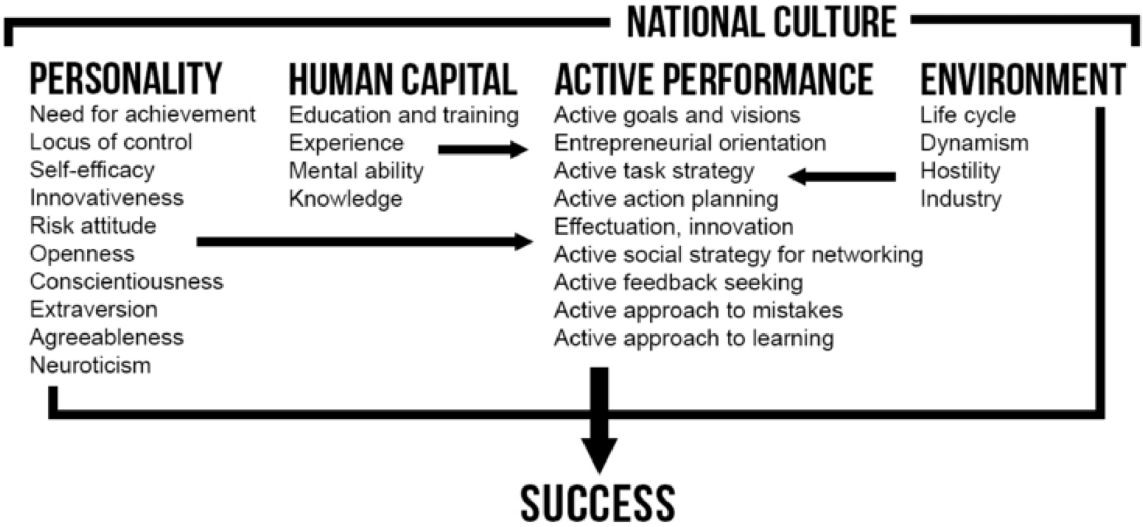

Figure 2 Complex process model of entrepreneurship (Kerr, Kerr, Xu, 2017)

3.2.8. Summary

To sum up the literature review of personality traits for entrepreneurs, the Big Five model is the best know model to describe personalities, also in the field of entrepreneurship. It is a holistic model for personality analysis in general, a very broad model with broad factors. Other characteristics, like locus of control, risk propensity, self-efficacy, and effectual reasoning are more narrow characteristics to analyze and describe an entrepreneur's character (Leutner *et al.*, 2014).

3.3. Artificial intelligence

'People have long imagined machines with human abilities – automata that move and devices that reason. Human-like machines are described in many stories and are pictured in sculptures, paintings, and drawings' (Nilsson, 2011).

3.3.1. A brief history of Artificial intelligence

Artificial intelligence is a not a contemporary phenomenon. Many might assume it has derived from the technological advancements in recent years, but the fact is that AI has a 75 years' history. The first work recognized as AI was done by Warren McCulloch and Walter Pitts in 1943; in 1950 Alan Turing introduced the Turing test and in the same year the first neural network was built by two Harvard students, Marvin Minsky and Dean Edmo (Russell and Norvig, 2010). From the 1950's, AI continued to evolve, becoming its own academic field around 1956, being commercialized in the 1980's and with the availability of large datasets around the millennia put it on the present track (Russell and Norvig, 2010). As noted, AI is not a new field within science but it has matured markedly in the past couple of decades and now it has many powerful computational tools. There are many reasons for the effective deployment of these tools, such as the increased power of relatively inexpensive computers, the availability of large databases, and the growth of the Internet (Nilsson, 2011). Many mental tasks, a typical person can do with less than one second of thought, can probably be made automatic by using AI (Ng, 2016). Today's AI programs are capable of doing many human cognitive tasks, automating some of them completely, and even doing them better than humans in some instances.

Because AI is now capable of contributing to the solution of many real-world problems, many graduates who have specialized in AI studies go to work for companies and start-ups instead of pursuing academic research (Nilsson, 2011). For example, McKinsey & Co (2017) estimate that $26 to $39 billion was invested in AI in 2016, a threefold investment growth since 2013. But what exactly is AI, how is it defined and what are its applications for individuals, organizations, society and most importantly, within entrepreneurship?

3.3.2. Artificial intelligence defined

Since AI is a very broad topic, where different people, even researchers, and professionals in AI, have different definitions, we will explore several definitions. The first definition of AI comes from Copeland (2018) stating that AI is 'the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings'. The Oxford Dictionary (2018) defines AI as 'The theory and development of computer systems able to perform tasks normally requiring human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.' The third definition by Tegmark (2017) divides AI into narrow AI and artificial general intelligence (AGI): narrow AI is able to reach a specific, narrow goal, for example playing chess but AGI is able to accomplish virtually any goal, including learning. Some scholars in computer science research avoid the term 'artificial intelligence' and use the term 'computational intelligence' instead. They define computational intelligence as the study of 'intelligent agents'. These 'agents' can be any devices that react to its environment and take actions to maximize its chance of achieving its goals (Poole, Mackworth and Goebel, 1998).

AI can be clustered into four categories: Thinking humanly, acting humanly, thinking rationally, and acting rationally (Russell and Norvig, 2010).

The first approach, thinking humanly, can be defined as the automation of 'activities that we associate with human thinking, activities such as decision-making, problem-solving, learning (…)' (Bellman, 1978). If you want AI to think humanly, you first need to understand how the human brain works. This field is referred to as 'cognitive science' and brings together computer models from AI and techniques from psychology to construct theories of the human mind. But cognitive science itself is another field of research and will not be discussed further (Russell and Norvig, 2010).

The second approach, acting humanly, is referred to as 'The art of creating machines that perform functions that would require intelligence when performed by people.' (Kurzweil, 1990). The Turing test is a well-known example of this definition. Developed by Alan Turing in 1950, it is a test where a human has to provide written questions and cannot tell whether the responses came from a computer or from a person. Even though this test might seem simple, the Turing test is still relevant in the testing of AI systems (Nilsson, 2011). A refutation of this definition is that it should not be the aim to replicate humans but rather studying the underlying models to solve complex tasks (Russell and Norvig, 2010).

Thinking rationally can be defined as ‘The study of the computations that make it possible to perceive, reason, and act.’ (Winston, 1992). The definition of ‘thinking rationally’ is based on a so-called logicist tradition, holding that any solvable problem can be solved in the form of logical notation. The drawback of this approach is that a problem might be solved in principle but still remains unsolved in practice (Russell and Norvig, 2010).

The fourth strand of an AI definition is ‘Acting rationally’ which can be defined as ‘(...) the study of the design of intelligent agents.’ (Poole, Mackworth and Goebel, 1998).

3.3.3. Intelligent agent

An AI program is called an intelligence agent (IA) (Russell and Norvig, 2010). IA can perceive the state of an environment through its sensors and it can affect it with its actuators. The heart of the IA is the function that connects the sensors to the actuators, called the control policy. The control policy deals with how an IA can make decisions with its actuators based on its sensors (Russell and Norvig, 2010). There are many types of IA, e.g. a human agent (homo sapiens), sensing the environment through eyes, ears and acting on it through its hands, legs or voice (Russell and Norvig, 2010). Another example is a financial trading agent. In that scenario, the environment could be the stock market, commodities market or the bond market. The agent senses the data about these markets or analyzes financial news and takes action, usually by making trades, selling or buying. How an intelligent agent interacts with the environment can be seen in the figure below.

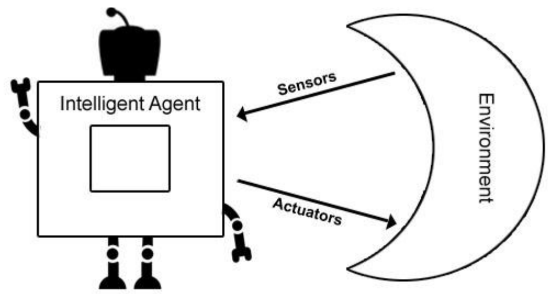

Figure 3 An intelligent agent and how it interacts with the environment (Russell and Norvig, 2010).

Understanding an IA is essential to the findings chapter in this paper. The authors aim to suggest a design of such an agent for the purposes of analyzing startup founders’ personality using a PEAS framework. PEAS stands for performance measures, environment, actuators, and sensors. The PEAS deals with the settings needed to complete the task of the agent. A well-known example used to explain this approach is a PEAS description of the task environment for a self-driving taxi. The PEAS for that task can be seen in the table below.

Agent type	Performance measures	Environment	Actuators	Sensors
Self-driving taxi	Safe, fast, legal, comfortable trip, maximize profits	Roads, other traffic, pedestrians, customers	Steering, accelerator, brake, signal, horn, display	Camera, sonar, speedometer, GPS, odometer, accelerometer, engine sensors, keyboard

Table 2 PEAS for a self-driving taxi (Russel and Norvig, 2010)

4. Findings and Discussion

4.1. Introduction to findings

The authors of this paper set out to answer the research question ‘How can Artificial intelligence evaluate the personality of a startup founder according to venture capitalists’ criteria?’. To be able to answer the question properly, further research was needed to understand personalities of entrepreneurs and founders of startups. In the literature review, the authors looked at different personality characteristics, which can be used to describe the personality of an entrepreneur. But to have a more narrow research scope, the authors view the personalities of founders through the lens of venture capitalists and what they look for when deciding on an investment. This research into VC investment criteria shows clearly that out of many factors, the personality and experience of the entrepreneur play a major role in deciding on an investment. To dive deeper into the mindset of the VC and how she evaluates people she invests in, the authors interviewed investment managers and managing directors of seven VC firms.

Each interview with a VC has been transcribed to text (See Appendix). Below, every interview will be analyzed and compared to other interviews to determine if there is a common theme in how the VC's we interviewed look at the founder’s personality and the importance of it. This analysis will be shown in a table of personality characteristics a VC looks for. The literature review of personalities of entrepreneurs, found in chapter 3.2, is presented in a table of personalities. At the end of the findings, both results will be compared in order to find if there is common personality traits or differences. The comparison will deliver the input for a framework or theory model of personality analysis based on an AI approach, which will be presented in the discussion section of this chapter.

4.2. Findings

All interviews conducted and questions asked were semi-structured so the interviewee could naturally express him/herself about their investment criteria without being influenced by the interviewer. In general, the overall investment criteria of the VC's interviewed are in line with Petty & Gruber’s (2011) analysis of the literature available on the topic. Summarized from chapter 3.1, these are the entrepreneur and the management team, the market, the product or service, and the venture's financial potential. How much emphasis the VC placed on the factors above varied. For example, the interviewee from Frumtak ventures (2018) stated that the criteria of importance are ‘number one: people, number: two, people, and number three: people.’ On the other hand, the interviewee from Stockholm Business Angels (2018) uses racetrack terminology to explain her criteria, where the horse and the track are more important than the jockey riding the horse. These statements underline that all interviewees look at the entrepreneur, the market, the product and the financial viability, but it varies how much importance they place on each one.

4.2.1. Personality criteria of venture capitalists

In all seven interviews conducted, the personality of the entrepreneur was discussed and all interviewees had a clear idea of what type of personality to look for. In this section, we will go through the interviews and summarize the conversation about entrepreneurial personality in each interview.

J12 Ventures

For J12 Ventures it is important to get to know the founders' personality early on. They seek a balance between an absolute expert in his or her area and humility, curiosity, being coachable, willingness to learn, constantly looking for new information, and liking being proved wrong. In addition, there are other important skills, such as the ability to build a culture, to build an organization, to attract talents, to sell their vision, to build strong relationships, and to be able to speak with authenticity. They also look for the entrepreneur's approach to work, being a hard worker and having the experience needed, such as knowledge of customers, market and product.

STOAF Business Angel

For the interviewee at STOAF Business Angels, it is much more important to have a great technology and innovation rather than looking for the best founder. STOAF Business Angels do have some criteria they use to evaluate the personality of an entrepreneur. The founder needs to be humble. That means he should be able to assess his potential with regards to skills and ability to run the company and be willing to step aside if needed.

Nordic Makers

Nordic Makers puts the founder in the center of importance but the criteria of a founder's personality depend highly on the company and the industry it operates in. There are personality traits that Nordic Makers want to see in every founder, independent of company or industry, such as leadership, execution, the ability to attract, motivate and retain talent, the ability to build a culture internally, drive and a clear vision. Regarding the vision, the interviewee stated that 'You need a visionary personality for some companies and for others, it can be almost a destruction' (Nordic Makers, 2018). It can be interpreted by this statement that having a visionary mindset might interrupt the job to be done for some specific startups.

Venture Fund X

The interviewed company wants to stay anonymous that is why the company will be referred to as 'Venture fund X'. The venture fund has structured and written criteria for their investments. The first category of eight is the 'entrepreneur'. The entrepreneur is not only the first category but also the most important one. They believe that 'you can always find a good idea but it is more difficult to find a good entrepreneur' (Venture Fund X, 2018). Additionally, they are looking for an experienced entrepreneur with a good track record, preferably within the technology, and having business knowledge. They like to see two founders, who can collaborate during both the good and the harsh times, are flexible, willing to learn, self-confident, driven, have a great passion and believe in the company's mission. In the best case, the team consists of one person with tech knowledge and the other person with business knowledge.

NSA Venture Fund

At NSA Venture Fund, they try to assess the team behind the venture, their experience, and background. The fund is in frequent communication with the team during the assessment period, so the management soon gets a gut feeling about the people. When it comes to personality, NSA Venture Fund uses the Icelandic term ‘eldmóður’ and places an enormous importance on it. The term comes up in all Icelandic interviews and means a combination of fire in the belly of the entrepreneur and his passion. This translates into stamina and commitment, being aware of what is needed to reach the goal. ‘You can’t just come with some idea and after two years it bores you and you don’t want to do it anymore. ‘This is a lot of work, people need to realize that, taking money from other people and then you don’t want to do what you are doing anymore’ (NSA Venture Fund, 2018).

NSA Ventures, alongside STOAF Business Angels, look for people who can accept and use feedback and learn and improve. It is seen as a strength if the founder is able to gather talented people around him in order to lessen his weaknesses. Additionally, the fund sees it as a strength when the entrepreneur is willing to let go of his power. ‘We have been burned when an entrepreneur with a good idea is not necessarily the best person to drive the company forward to create a thriving company’ (NSA Venture Fund, 2018).

Crowberry Capital

Like other Icelandic VC funds, Crowberry Capital looks for ventures with at least two founders with different skill sets who have passion and fire in their hearts to get the job done. The fund looks for people who are experienced in their field of work, preferably a CEO and a CTO persona, someone who has the capability to sell the vision, market the product, get people on board, and someone who has the technical capabilities to build the product.

Frumtak Ventures

The most important criteria for Frumtak Venture are by far finding the right people and that is why they mainly rely on a gut feeling. From Frumtak’s point of view, there is a certain job to be done in the venture they consider for an investment. Frumtak looks at experience, knowledge and the personality of the entrepreneur, and they try to form an opinion on whether he is capable of getting the job done. Along with the experience, they want founders who have a strong vision and understand that in order to succeed they need a co-founder, a partner on this journey. Further, the founder needs to have a conviction, sanity, passion, and fire in his belly to succeed.

4.2.2. Summary of personality criteria of venture capitalist

To structure this summary, the authors will first discuss criteria mentioned as valuable by all VC's interviewed for this research. Secondly, criteria mentioned as valuable by most of the VC's will be discussed.

When analyzing the interviews with the VC's, the authors often questioned if a personality trait mentioned was actually a trait. The line between, skills, experience and trait can sometimes be blurry. For the sake of this research, the authors consider anything a trait that is an action, attitude or a behavior and is mentioned by the VC in relation to founders of startups.

Personality valued by all VC's interviewed:

It became apparent early on in the interview process that the VC's interviewed for this research look for similar personality traits in founders when deciding on an investment opportunity. Alongside of having the right experience needed for the venture, there are personality traits that were mentioned in one form or another in all the interviews conducted. By analyzing the interviews and looking for criteria that fall under the category of a personality trait, some themes started to emerge. First one is 'passion'. Venture capitalists look for an entrepreneur that burns for what he is doing. The second one is the 'ability to get the job done'. Venture capitalist looks for an entrepreneur that has grit and stamina, the perseverance to follow through and get the job done during ups and downs.

Personalities valued by most VC's interviewed:

There are four personality traits that are valued by most of the VC's interviewed and they are the second most frequent traits venture capitalist looks for in an entrepreneur. The first one in this category is 'vision'. Venture capitalist looks for an entrepreneur who has a clear vision and is driven forward by it. The second one in this category is 'coachability'. Venture capitalist look for an entrepreneur who has a growth mindset, accepts feedback, and is willing to learn. The third one is 'adaptability'. Venture capitalist look for an entrepreneur who is flexible and has the willingness to change if needed. Finally, venture capitalists look for an entrepreneur who is a skilled communicator, good at presenting himself as well as selling his vision to other people.

On top of the personality traits mentioned above, there are more than dozen other traits that were mentioned as important, such as the ability to attract talent, stamina, humility, and problem-solving skills. The full list of traits mentioned can be seen in the bar chart below. The following figure shows a condensed list with an illustration of the frequency for each trait. The frequency describes how often one trait was mentioned in the interviews, whereas one trait was counted several times if one interviewee mentioned it repeatedly.

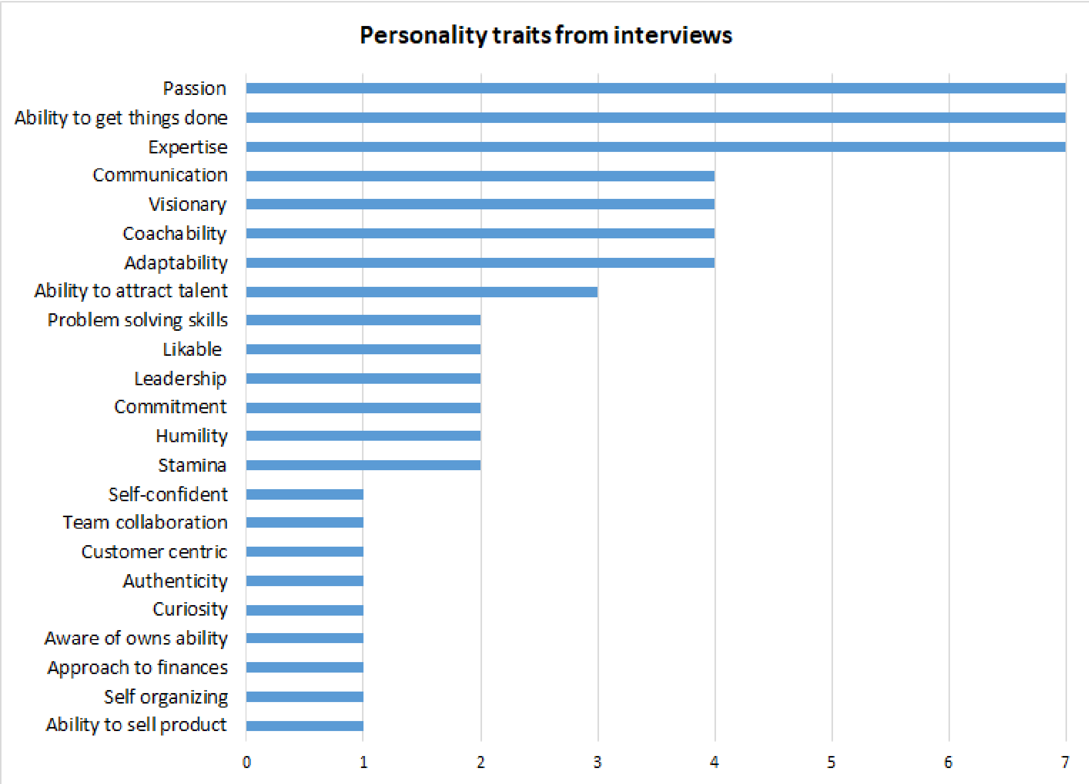

Figure 4 Personality traits of interviews with frequency

4.2.3. Further Findings from interviews

The authors gained valuable information in their interviews with VC's. The information sheds a light on how VC's assess the people they invest in but additionally it gave the authors insights about an industry that are not frequently shared. Below are some noteworthy findings that are unrelated to the personality of founders but still might interest the readers of this paper.

Although most interviewees agree on what they look for in the personality of a founder, they differ in other areas. One notable difference was between the only business angel interviewed and other VC's interviewed. STOAF Business Angels look for innovative technology and see the personality of the founder as secondary. However, it should be kept in mind that the authors interviewed only one business angel from STOAF Business Angels and that she does not represent the whole group.

It was apparent in the interviews with Icelandic VC's that they all value startups that have gone through the process of applying to soft financing, such as governmental grants. The VC's see that process as an important stepping-stone for the venture and the founders. When applying for grants, the founders need to prove the validity of their venture to go through due diligence.

The full transcript of every venture capital firm interviewed can be found in the appendix.

4.2.4. Personality criteria of literature review

Based on the literature review in chapter 3.2, the authors developed a table with all relevant characteristics and how each can be applied to entrepreneurs. The table, that can be seen below, indicates what an entrepreneur should have in a certain category to have a positive effect on the venture according to the literature covered.

In the table, a value for the tendencies will be given. The first one, openness to new experience, would have a positive impact for new ventures if the entrepreneur has a high value in that category. A high value would indicate positive effects on the diversity of one's network, the leader emergence and the ability to communicate over long distances (Selden and Goodie, 2018). Further, high openness is seen as an indication of an inventive and curious person (Toegel and Barsoux, 2012).

The second trait, conscientiousness, is also a part of the Big Five factors. A high value in conscientiousness can be assumed to have a positive effect on a venture since conscientiousness is associated with self-discipline, orderliness, competence, motivation, and dependability (Costa and McCrae, 1992).

The third trait of the Big Five, extraversion, should show a tendency towards high, since an individuals with a high level of extraversion tends to be outgoing, energetic, and open to social stimuli. Further, they are more socially competent in work environments where they have to interact and collaborate with other people, customer, or co-workers (Selden and Goodie, 2018).

The fourth factor, agreeableness, should show a tendency to neither high nor low. A high level in agreeableness describes a friendly, compassionate, and cooperative person, who is less likely to have a conflict with others (Selden and Goodie, 2018). A low level of this factor is often perceived as challenging and competitive as positive traits (Toegel and Barsoux, 2012). Therefore, according to the covered literature and to the authors' belief, a neutral level of agreeableness seems to benefit an entrepreneur most. He should not agree to every decision or discussion but rather try to be friendly, compassionate, and cooperative.

The last trait of the Big Five, neuroticism, should show a low fulfillment, whereas the lowest is better. The reason for this is that neuroticism is associated mostly with negative feelings such as anxiety, depression, impulsivity, vulnerability, and anger (Selden and Goodie, 2018). Whereas low neuroticism indicates emotional stability, high neuroticism indicates anxiousness, nervousness, and sadness (Kerr, Kerr and Xu, 2017).

The next trait is locus of control. An internal locus of control will benefit the entrepreneur in getting the job done because he believes that his own decisions control his life rather than external factors, such as fate or environment controlling it. People with an internal locus of control believe that the success or failure is their own responsibility (Kerr, Kerr and Xu, 2017). According to the covered literature and to the authors' belief based on this research, this attitude will help an entrepreneur.

The risk propensity is a factor that varies over time more than other factors. In the stage of ideation, one should have a higher risk propensity since it will increase the likelihood to be engaged in entrepreneurship. In later stages of the venture, when it comes to execution, one should have a lower risk propensity, since it might be a distraction to the vision when a CEO changes his direction too often (Korunka *et al.*, 2003).

Self-efficacy describes ones belief in his/her own abilities and capabilities. Self-efficacy is closely related to self-confident, which is more often used in everyday speech. According to the covered literature and to the authors' belief based on this research, self-confidence is helpful to perform the tasks entrepreneurs have to do.

Effectual reasoning is a way of thinking, which starts with a given set of means (traits, abilities, education, expertise, experience, and social and professional network) but has not a specific goal at the beginning. The goal evolves constantly over time influenced by the founder's imagination, interacting, and inspiration with his network (Sarasvathy, 2001). According to the covered literature and to the authors' belief, this way of thinking benefits an entrepreneur.

Personality traits from literature	Tendency
Openness to new experience	high
Conscientiousness	high
Extraversion	high
Agreeableness	neutral
Neuroticism	low
Locus of Control	internal
Risk propensity	mediate (higher in early stage, lower in later stages)
Self-efficacy	high
Effectual reasoning	preferred

Table 3 Personality characteristics with the desired tendency based on the literature

Many studies showed deviations from these tendencies. For example, Zhao and Siebert (2006) studied the relationship between personality and entrepreneurial status by conducting five meta-analyses to estimate differences between entrepreneurs and managers. Their results showed that those entrepreneurs scored 'high' on conscientiousness and openness to new experience but lower on neuroticism and agreeableness. There was no difference found for extraversion, which means that entrepreneurs and managers have a similar value in extraversion.

The authors will use this table to compare it to the findings from the interviews (See Table 3 and Figure 4).

4.2.5. Literature review connected to research findings

Based on the two tables above, the authors try to connect the personality traits found in the literature to the ones found in interviews with VC's. There are several reasons for this approach. It helps to establish if the findings on the personality traits VC's look for are in line with the available literature. Second, the Big Five personality traits can be analyzed in individuals with the help of artificial intelligence already. If the research findings can be linked to the Big Five personality traits, an AI analysis of individuals can be achieved.

To analyze if there is a connection between what is mentioned in the literature and the interviews, the authors studied in detail the definition of each personality trait mentioned in the literature review. For example, extraversion is defined as a 'person's tendency to seek stimulation in the company of others' (Costa and McCrae, 1992). One of the subcategories of extraversion is assertiveness. Assertiveness is defined as people 'who like to take charge and direct activities of others. They tend to be leaders in groups' (IBM Watson, 2018). With these two definitions, the authors were able to connect extraversion with leadership, a trait mentioned by the VC's. This thought process was used for all attempts to connect the literature to the interviews.

To make it more visible, colors were added. As it is shown in the figures below, not all personality traits found in the interviews can be linked directly to the literature. For example, ‘passion’, which was one of the most frequently mentioned traits in the interviews, has no equivalent in the literature reviewed. Further, ‘communication, approach to finances’, and ‘customer-centric’ do not have equivalents in the chosen personality traits. ‘Communication’ is partly included in extraversion and agreeableness of the Big Five but is does not fit completely to one of them. The factors, ‘approach to finances and ‘customer-centric’, have no connection to the literature neither. It is the authors’ opinion that these factors could also count as experience or skills. Another result is that none of the interviewees mentioned the factor ‘risk propensity’ or similar factors, which was discussed in the literature review.

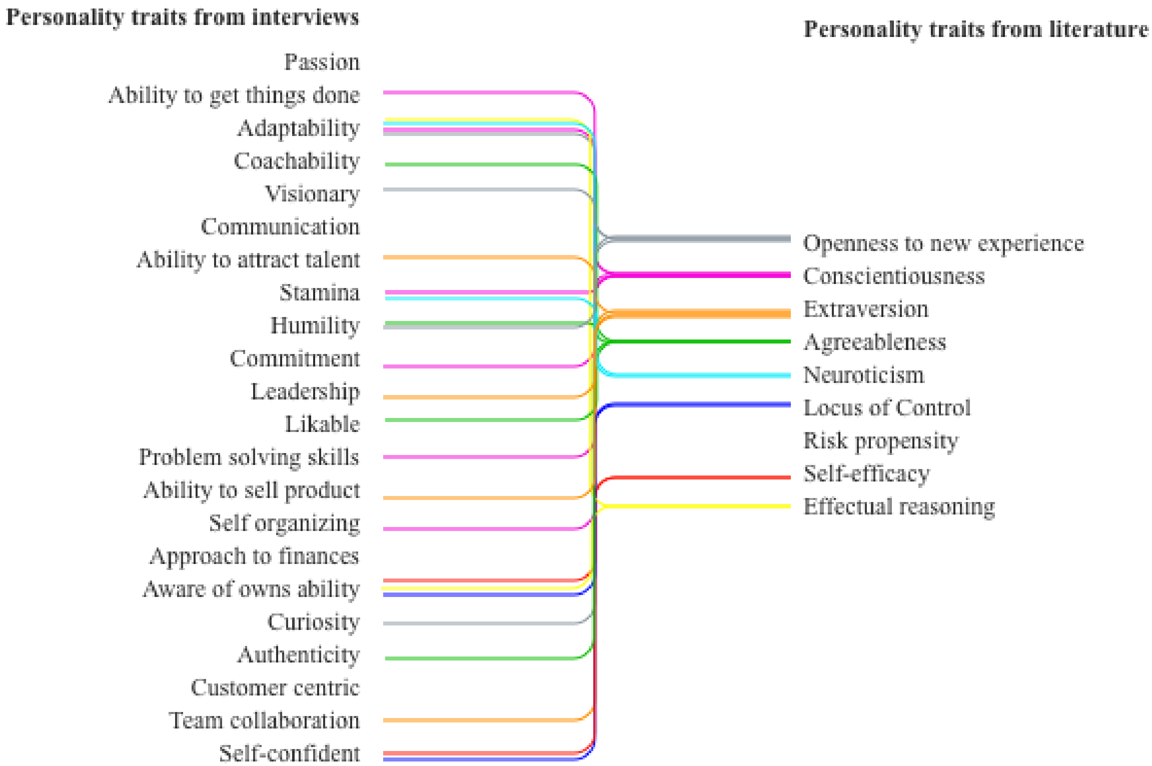

Figure 5 An overview of connection of personality traits from interviews to the personality traits from literature

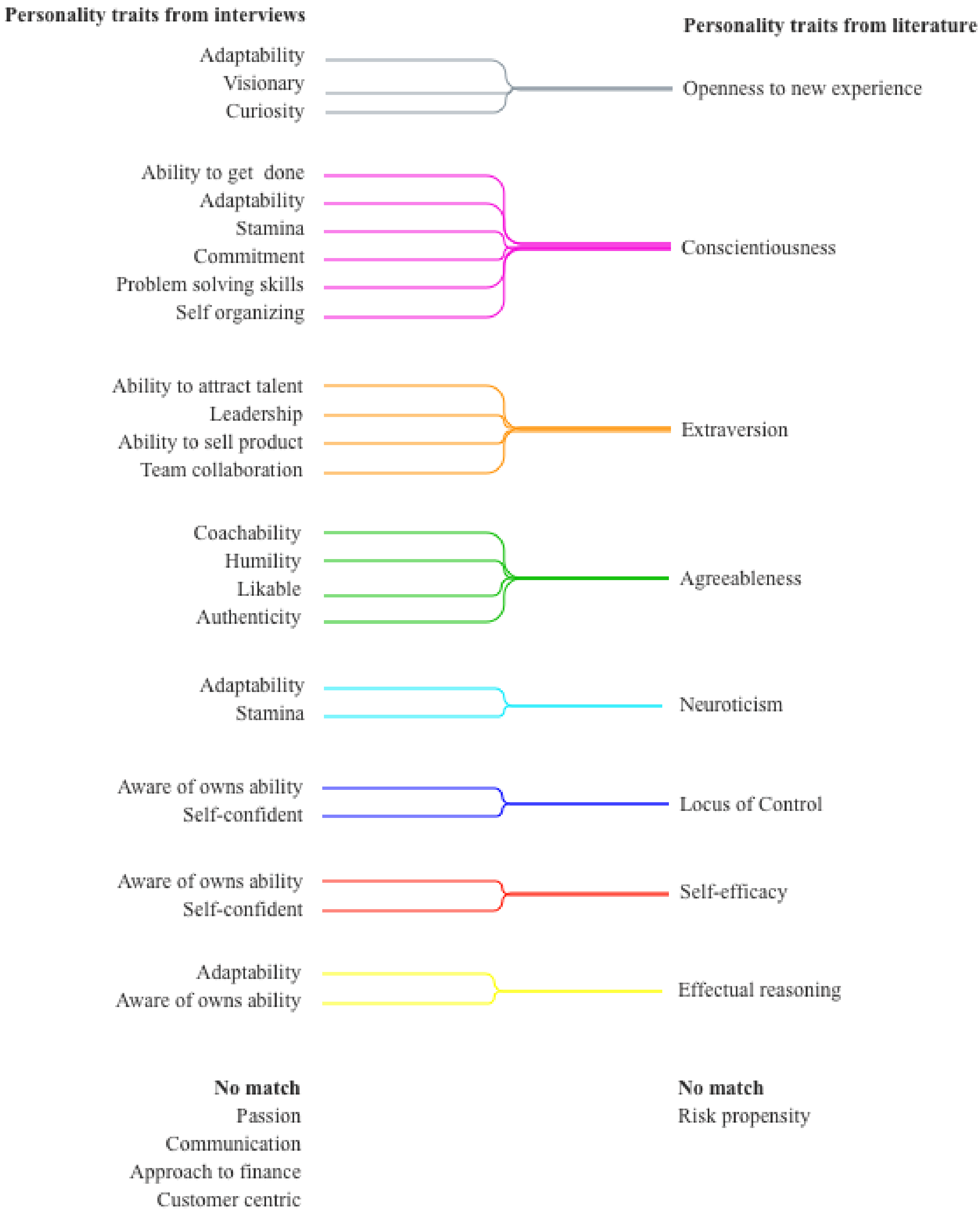

Figure 6 A breakdown of personality traits from interviews connected to the personality traits from literature

An artificial intelligence system to analyze startup founders

As stated in the introduction of this paper, the authors set out to research if an artificial intelligence application could be used to analyze the personality of entrepreneurs. Additionally, the research into the available literature on the fundamentals of AI led the authors to the PEAS framework, a tool for designing the settings needed to complete the task of the intelligent agent, in the case of this paper, a founder analysis agent. The framework consists of four parts: Performance measures, environment, actuators, and sensors.

The personality analysis agent will act in the environment of humans, in this case, entrepreneurs or those who want to become entrepreneurs. The agent should be able to analyze the entire communication of the entrepreneur. It should be able to detect verbal communication as well as non-verbal communication. To detect verbal communication, it will need text analysis and speech recognition and yet it might not be able to detect humor or sarcasm. To detect non-verbal communication, the agent needs an even more sophisticated system of facial recognition that is able to detect facial expressions, gestures, body language, and other kinds of non-verbal communication. The performance will be assessed in an accurate and reliable way to show to what extent the agent could detect the personality traits the VC is looking for. The actuator of the agent will show the result of the analysis in a way that enables the VC to know if the founder fulfills her criteria. The result could be either a written text and description or a chart with percentages for each category.

Agent type	**Performance measures**	**Environment**	**Actuators**	**Sensors**
Founder analysis agent	Detect personality traits favorable to venture capitalist's	Entrepreneur or aspiring entrepreneur	Results of personality analysis	Input box for text, microphone, camera

Table 4 PEAS framework applied to personality analysis

4.3. Discussion

The findings suggest that there are similarities between the personality traits venture capitalists value and the personality traits mentioned in the literature review. The authors could match 18 out of 22 personality traits from interviews to personality traits from literature (See figure 5 and figure 6).

In the following, the four traits that were not matched will be discussed. 'Passion' was mentioned by all VC's interviewed. Since 'passion' was not listed as a trait in the literature review but plays a big role in the interviews, the authors find it necessary to define the word further: 'Passion is your inner fire and the best fuel to get results' (Meier, 2010, p. 174) or 'an extreme interest in or wish for doing something, such as a hobby, activity, etc.' (Cambridge Dictionary, no date). These two definitions vary in the description but they both define passion as a 'strong feeling'. Exactly this 'strong feeling' can be hard to spot for a human and even harder for an AI system. It is the author's opinion that 'passion' is undervalued in previous research about the personality of entrepreneurs.

Besides passion, there are three other traits mentioned by the VC's that the authors were unable to connect with confidence with traits found in the literature. These traits are 'communications', 'approach to finances' and being 'costumer-centric'. It is also debatable if these traits are indeed traits, and not just experience or skills. With the help of the PEAS framework, the authors find it highly likely that an AI system can detect these traits in individuals. Therefore, it should be theoretically possible to build an AI system, which can detect all 22 personality traits.

4.4. Limitations

This paper has several limitations and some of them are due to the time constraint of three months. The first limitation is the sample size of interviews conducted. Even if the thesis followed a qualitative approach, the number of interviews, which are seven, is rather small and therefore the conclusion are comparatively limited. Also, only VC's in Sweden and Iceland were interviewed for this research.

One of the biggest constraints is that neither the list of personality traits mentioned in the literature review, nor the list of personality traits elicited from the interviews can be claimed to be complete lists. An endeavor to build a complete list of traits, behaviors, or other social skills, is usually not successful, because someone could always argue that he has found more or less than another person has found.

It is also hard to determine the validity of the personality traits, which the authors gathered in the interviews. The experience, background, position, and several other factors relating to the interviewees might be different, leading to diverse expectations and ideas about personality.

5. Conclusion

Here the authors want to answer the research question. The research question consists of one main research question ‘How can artificial intelligence evaluate the personality of a startup founder according to venture capitalists’ criteria?’ and three sub-questions:

(1) What personality traits do venture capitalists look for in a founder?
(2) What are the personality traits of entrepreneurs that are discussed in the recent literature?
(3) How can an AI system detect and determine these traits?

First, the authors answer the sub-questions and later the main question will be answered.

The answer to the first sub-question is: There are 22 different personality traits that the VC’s interviewed look for in a founder. All 22 personality traits with a frequency can be seen in figure 4.

The answer to the second sub-question is: The most important model to evaluate one’s personality, the Big Five model, can also be applied to entrepreneurs and has been used in several studies before. Besides the Big Five model, several more characteristics were found, which are helpful when evaluating entrepreneurial personality. These characteristics are: Locus of control, risk-propensity, self-efficacy, and effectual reasoning. To be complete, the complex process model of entrepreneurship was introduced.

The answer to the third research question is: An AI system can detect 18 out of 22 traits mentioned in the interviews with VC's. These 18 traits can be traced back to the Big Five model. Currently an open source, artificial intelligence system exists that detect the Big Five (IBM Watson Personality Insights). However, the authors were not able to detect the most important personality for VC's, ‘passion’. As far as the authors know, there is no AI system available that can detect ‘passion’. Further, the traits ‘communication, customer-centric, and approach to finances’ did not have a connection to the personality traits found in the literature. However, these traits are on the borderline of personality traits and experience or skills.

The answer to the main research question is twofold: First, an AI system can be used to detect the majority of personality traits VC's value. An example of such AI analysis was given with IBM Watson Personality Insights. IBM Watson builds its analysis on the Big Five model, and as seen in the findings, 18 out of the 22 traits mentioned by the VC can be linked to the Big Five model. Secondly, a basic theoretical PEAS framework was suggested to help build and explain an AI system that can evaluate the personalities of startup founders. Whereas such a system is not limited to the Big Five model and can analyze all 22 personality traits.

5.1. Implications of research

These findings mean that an artificial intelligence system can be created, or an already existing one can be used to analyze the personality of startup founders. The impact of such a system can be beneficial for many companies or institutions that value the same personality traits as venture capitalists. The authors suggest that such a system can help individuals become more aware of their entrepreneurial personalities. It can help venture capitalist to screen potential investments and take more unbiased decisions. Finally, it can assist those in the startup ecosystem, such as incubators, accelerators, universities and institutions that offer grants to startups and help entrepreneurs.

5.2. Future research

There are several opportunities to continue and expand this research. One opportunity would be to conduct the same study at different locations. While this study was focused on Sweden and Iceland, it would be interesting to see if the results of comparable studies in the U.S. or Asia would confirm or disprove the findings of this study.

As noted in chapter 4.4 on limitations, the authors had no possibility of proving how valid the personality traits are, which the VC’s mentioned in the interviews. Further studies should follow up on this and could investigate the success of the interviewed VC firms and how it may correlate with the personality traits they are looking for. This investigation may take several years since it usually takes a long time to turn an investment into a profitable one.

In the part of the AI research, this study ended with an PEAS framework (See chapter 5.3, Discussion). Further research could follow up on this framework. For this future research, researchers with a background in computer science, AI or statistics would be needed. A step towards realizing the suggested PEAS framework, one could try to set up an AI system and find out to what extent the findings of this research can help an entrepreneur or even increase the likelihood of a venture's success.

Last but not least, the authors applied the AI approach to one criterion for VC’s only, i.e. personality. In other studies, it is possible to take an AI approach to analyze other aspects of the VC investment criteria, such as the market, financial potential and the product.

References

Aristotle (no date) 'Quote'.

Åstebro, T. *et al.* (2014) 'Seeking the Roots of Entrepreneurship: Insights from Behavioral Economics', *Journal of Economic Perspectives*, 28(3), pp. 49–70. doi: 10.1257/jep.28.3.49.

Azucar, D., Marengo, D. and Settanni, M. (2018) 'Predicting the Big 5 personality traits from digital footprints on social media: A meta-analysis', *Personality and Individual Differences*. Pergamon, 124, pp. 150–159. doi: 10.1016/J.PAID.2017.12.018.

Barnett, M. and Finnemore, M. (2004) *Rules for the World: International Organizations in Global Politics*, *Cornell University Press*. Available at: https://books.google.de/books?id=tNlBENWoq84C&dq=%22One+bias+comes+from+the+fact+that+decision+makers+like+all+individuals+usually+rely+on+their+personal+experiences+to+judge+the+likelihood+of+an+outcome%22&pg=PA148&source=ttb&redir_esc=y#v=onepage&q=%22O (Accessed: 26 May 2018).

Barrick, M. R. and Mount, M. . (1991) 'The big five personality dimensions and job performance', *Personnel Psychology*, 44, pp. 1–26.

Bellman, R. E. (1978) *An Introduction to Artificial Intelligence*. Boyd & Faser Publishing Company.

Blank, S. (2010) *What's A Startup? First Principles.*

Block, J., Sandner, P. and Spiegel, F. (2015) 'How do risk attitudes differ within the group of entrepreneurs? The role of motivation and procedural utility', *Journal of Small Business Management*, 53 (1), pp. 183–206.

Brandstätter, H. (2011) 'Personality aspects of entrepreneurship: A look at five meta-analyses', *Personality and Individual Differences*, 51(3), pp. 222–230. doi: 10.1016/j.paid.2010.07.007.

Bughin, J. *et al.* (2017) 'Artificial Intelligence the Next Digital Frontier?' Available at: www.mckinsey.com/mgi.

Cambridge Dictionary (no date) *passion Meaning in the Cambridge English Dictionary*. Available at: https://dictionary.cambridge.org/dictionary/english/passion (Accessed: 12 June 2018).

Cassar, G. and Friedman, H. (2009) 'Does self-efficacy affect entrepreneurial investment?', *Strategic Entrepreneurship Journal*, 3, pp. 241–260.

Chell, E. (2008) *The entrepreneurial personality*. Edited by 2nd. New York: Routledge.

Chen, C. C., Greene, P. G. and Crick, A. (1998) 'Does entrepreneurial self-efficacy distinguish entrepreneurs from managers?', *Journal of Business Venturing*, 13, pp. 295–316.

Cohen, S. (2013) 'What Do Accelerators Do? Insights from Incubators and Angels', *Innovations: Technology, Governance, Globalization*, 8(3–4), pp. 19–25. doi: 10.1162/INOV_a_00184.

Collis, J. and Hussey, R. (2014) *Business Research*. Fourth edi. Hampshire, England: Palgrave Macmillan.

Costa, P. T. and McCrae, R. R. (1992) *Revised NEO Personality Inventory (NEO-PI-R) and* *the NEO Five-Factor Inventory (NEO-FFI) Professional Manual, Psychological Assessment Resources*. Odessa, FL.

Cucculelli, M. and Ermini., B. (2013) ‘Risk attitude, product innovation, and firm growth. Evidence from Italian manufacturing firms’, *Economics Letters*, 118 (2), pp. 275–27.

Faggella, D. (2018) *Machine Learning in Finance - Present and Future Applications*, *tech emergence*. Available at: https://www.techemergence.com/machine-learning-in-finance/ (Accessed: 11 June 2018).

Feld, B. and Mendelson, J. (2017) *Venture Deals: Be Smarter Than Your Lawyer and Venture Capitalist*. 3rd editio, *Wiley*. 3rd editio. Audible studios. doi: 10.1017/CBO9781107415324.004.

Fleischer, V. (2008) ‘Two and twenty: Taxing partnership profits in private equity funds’, *New York University Law Review*, 83(1), pp. 1–59. Available at: http://www.scopus.com/inward/record.url?eid=2-s2.0-43049135749&partnerID=tZOtx3y1.

Frese, M. (2009) ‘Towards a Psychology of Entrepreneurship: An Action Theory Perspective’, *Foundations and Trends® in Entrepreneurship*. Now Publishers, Inc., 5(6), pp. 437–496. doi: 10.1561/0300000028.

Frumtak Ventures (2018) ‘Personal Interview’. Reykjavík, Iceland.

Håkansson, A. (2013) ‘Portal of Research Methods and Methodologies for Research Projects and Degree Projects’, *Proceedings of the International Conference on Frontiers in Education: Computer Science and Computer Engineering FECS’13*, pp. 67–73. Available at: http://urn.kb.se/resolve?urn=urn:nbn:se:kth:diva-136960.

Henry, P. (2017) *Why Some Startups Succeed (and Why Most Fail), Feb. 18, 2017*. Available at: https://www.entrepreneur.com/article/288769 (Accessed: 23 May 2018).

HireVue (no date) *About HireVue | The HireVue Story*. Available at: https://www.hirevue.com/company/about-us (Accessed: 23 May 2018).

Houpt, J. L., Gilkey, R. W. and Ehringhaus, S. H. (2015) ‘Personality Traits and Leadership’, in *Learning to Lead in the Academic Medical Center*. Cham: Springer International Publishing, pp. 35–44. doi: 10.1007/978-3-319-21260-9_4.

IBM (no date) *Watson Personality Insights*. Available at: https://www.ibm.com/watson/services/personality-insights/ (Accessed: 12 June 2018).

IBM Watson (2018) *Big Five extraversion*. Available at: https://console.bluemix.net/docs/services/personality-insights/extraversion.html#extraversion.

Kaplan, S. N. and Strömberg, P. (2000) ‘How Do Venture Capitalists Choose Investments?’, *Working Paper, University of Chicago*, 121, pp. 55–93.

Kerr, S. P., Kerr, W. R. and Xu, T. (2017) ‘Personality Traits of Entrepreneurs: A Review of Recent Literature’, *HBR Working paper 18-047*. doi: 10.3386/w24097.

Knight, F. H. (1921) *Risk, Uncertainty, and Profit*. Boston: Houghton Mifflin.

Kollmann, T. and Kuckertz, A. (2010) ‘Evaluation uncertainty of venture capitalists’ investment criteria’, *Journal of Business Research*, 63(7), pp. 741–747. doi: 10.1016/j.jbusres.2009.06.004.

Korunka, C. *et al.* (2003) ‘The entrepreneurial personality in the context of resources, environment, and the startup process—A configurational approach’, *Entrepreneurship Theory and Practice*, 28(1), pp. 23–42.

Kurzweil, R. (1990) *The Age of Intelligent Machines*. MIT Press.

Lefcourt, H. M. (1991) ‘Locus of Control’, in *Measures of Personality and Social Psychological Attitudes*. Elsevier, pp. 413–499. doi: 10.1016/B978-0-12-590241-0.50013-7.

Leutner, F. *et al.* (2014) ‘The relationship between the entrepreneurial personality and the Big Five personality traits’, *Personality and Individual Differences*. Elsevier Ltd, 63, pp. 58–63. doi: 10.1016/j.paid.2014.01.042.

Loehlin, J. C. (1992) *Sage series on individual differences and development, Vol. 2. Genes and environment in personality development*. Thousand Oaks, CA, US: Sage Publications, Inc. Available at: http://psycnet.apa.org/record/1992-97788-000 (Accessed: 27 May 2018).

Macmillan, I. C., Siegel, R. and Narasimha, P. N. S. (1985) ‘Criteria used by venture capitalists to evaluate new venture proposals’, *Journal of Business Venturing*, 1(1), pp. 119–128. doi: 10.1016/0883-9026(85)90011-4.

Maginn, J. L. *et al.* (2007) *Managing investment portfolios: a dynamic process, Michigan health & hospitals*. Available at: http://www.ncbi.nlm.nih.gov/pubmed/22165571.

McCrae, R. R. and Costa, P. T. (1987) ‘Validation of the Five-Factor Model of Personality Across Instruments and Observers’, 52(1), pp. 81–90. Available at: https://www.scopus.com/record/display.uri?eid=2-s2.0-0023208674&origin=inward&txGid=50d1df010365cd922774634e838a29b5 (Accessed: 16 April 2018).

McCrae, R. R. and Costa, P. T. J. (2008) *Handbook of Personality: Theory and Research*. New York.

Meier, J. D. (2010) *Getting results the Agile way : a personal results system for work and life*. Innovation Playhouse.

Miner, J. B. and Raju, N. N. (2004) ‘Risk propensity differences between managers and entrepreneurs and between low- and high-growth entrepreneurs: A reply in a more conservative vein’, *Journal of Applied Psychology*, 89, pp. 3–13.

Mulcahy, D. (2013) ‘Six myths about venture capitalists’, *Harvard Business Review*.

Newman, P. and Jennings, I. (2012) *Cities as Sustainable Ecosystems: Principles and Practices*. Island Press. Available at: https://books.google.com/talktobooks/query?q=Sustainability (Accessed: 27 May 2018).

Ng, A. (2016) *Andrew Ng: What AI Can and Can’t Do*, *Harvard Business Review*. Available at: https://hbr-org.ez.sun.ac.za/2016/11/what-artificial-intelligence-can-and-cant-do-right-now.

Nilsson, N. J. (2011) *The quest for artificial intelligence: A history of ideas and achievements, The Quest for Artificial Intelligence: A History of Ideas and Achievements*. doi: 10.1017/CBO9780511819346.

Nordic Makers (2018) ‘Personal Interview’. Stockholm, Sweden.

NSA Venture Fund (2018) ‘Personal Interview’. Reykjavík, Iceland.

O’Connor, T. and Wong, H. Y. (2002) ‘Emergent Properties’, *The Stanford Encyclopedia of Philosophy*. Available at: http://plato.stanford.edu/archives/fall2012/entries/social-institutions/.

Parker, S. C. (2009) *The Economics of Entrepreneurship, Cambridge University Press*. Cambridge, UK.

Petty, J. S. and Gruber, M. (2011) ‘“In pursuit of the real deal”’, *Journal of Business Venturing*, 26(2), pp. 172–188. doi: 10.1016/j.jbusvent.2009.07.002.

Poole, D., Mackworth, A. K. and Goebel, R. (1998) *Computational Intelligence: A Logical Approach*. Oxford University Press.

Press, O. U. (2018) *Artificial Intelligence | Definition of artificial intelligence in English by Oxford Dictionaries*. Available at: https://en.oxforddictionaries.com/definition/artificial_intelligence (Accessed: 17 February 2018).

de Raad, B. and Mlačić, B. (2015) ‘Big Five Factor Model, Theory and Structure’, in *International Encyclopedia of the Social & Behavioral Sciences*. Elsevier, pp. 559–566. doi: 10.1016/B978-0-08-097086-8.25066-6.

Rauch, A. and Frese, M. (2005) ‘Let’s put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners’ personality traits, business creation, and success’, *European Journal of Work and Organizational Psychology*, pp. 353–385.

Russell, S. J. and Norvig, P. (2010) *Artificial Intelligence: A Modern Approach*. Third Edit, *Artificial Intelligence*. Third Edit. England. doi: 10.1017/S0269888900007724.

Sandelowski, M. (2001) ‘Focus on Research Methods Real Qualitative Researchers Do Not Count: The Use of Numbers in Qualitative Research’, *Research in Nursing & Health*, 24, pp. 230–240. Available at: https://onlinelibrary.wiley.com/doi/pdf/10.1002/nur.1025 (Accessed: 27 May 2018).

Sarasvathy, S. D. (2001) ‘What Makes Entrepreneurs Entrepreneurial?’, *Business & Society Review (00453609)*, (17), p. 18. doi: 10.2139/ssrn.909038.

Schumpeter, J. A. (1935) ‘The Analysis of Economic Change’, *Review of Economic Statistics*, 17, pp. 2–10.

Selden, M. and Goodie, A. S. (2018) ‘Review of the effects of Five Factor Model personality traits on network structures and perceptions of structure’, *Social Networks*. North-Holland, 52, pp. 81–99. doi: 10.1016/J.SOCNET.2017.05.007.

Sharma, A.K., Monika, D. (2015) ‘Venture Capitalists’ Investment Decision Criteria for New Ventures: A Review’, *Procedia - Social and Behavioral Sciences*, 189, pp. 465–470. doi: 10.1016/j.sbspro.2015.03.195.

Stewart, W. H. and Roth, P. L. (2001) ‘Risk propensity differences between entrepreneurs and managers: A meta-analytic review’, *Journal of Applied Psychology*, 86, pp. 145–153.

STOAF Stockholms Affärsänglar (2018) ‘Persoal Interview’. Stockholm.

Tegmark, M. (2017) *Life 3.0: Being Human in the Age of Artificial Intelligence*.

Toegel, G. and Barsoux, J.-L. (2012) *How to Become a Better Leader, MIT Sloan*

Management Review. Available at: https://sloanreview.mit.edu/article/how-to-become-a-better-leader/ (Accessed: 17 April 2018).

Tyebjee, T. T. and Bruno, A. V. (1984) ‘A Model of Venture Capitalist Investment Activity’, *Management Science*, 30(9), pp. 1051–1066. doi: 10.1287/mnsc.30.9.1051.

Venture Fund X (2018) ‘Personal Interview’. Stockholm, Sweden.

Winston, P. H. (1992) *Artificial Intelligence*. Edited by T. Edition. Addision-Wesley.

Xu, H. and Ruef, M. (2004) ‘The myth of the risk-tolerant entrepreneur’, *Strategic Organization*, 2(4), pp. 331–355.

Zhao, H. and Seibert, S. E. (2006) ‘The big five personality dimensions and entrepreneurial status: A meta-analytical review’, *Journal of Applied Psychology*, 91(2), pp. 259–271. doi: 10.1037/0021-9010.91.2.259.

Zider, B. (1998) ‘How venture capital works.’, *Harvard business review*, 76(6), pp. 131–139. doi: 10.1038/clpt.2010.284.

Appendix

Interviews questionnaire

At the beginning:

- Ask for permission to publish name
- Ask for permission for recording, if yes record it

Introduction:

- Short introduction
- Topic of Master thesis and our motivation of doing this (increase the likelihood of success)
- Expected duration (30-40min)

Questions:

- Background information about fund
    - Size; Investment area or industry; duration; maturity of companies they investing in; etc.
- Can you tell me about the process from the point you get to know a startup until you make the decision?
- How do you evaluate the founder?
    - If they say gut feeling: How do you develop it (lunch meetings, pitch, etc.)?
- What about your last three investments? What were they like

Our aim:

- For what personality traits do VC's look for when they are analysing the entrepreneur?

At the end:

- Ask proprietary, confidential, or otherwise sensitive content
- Give them contact info
- Offer to send thesis

Interviews transcripts

Transcript
J12
Interviewees: Wants to remain anonymous
Date: 11. April 2018

Interviewer: I would like to ask you for an interview for my master thesis. As I said, I'm from Germany, 24 years old and I'm studying Entrepreneurship and Innovation management at KTH. The other topic of our master thesis is: How can AI help to evaluate the start-up founder's personality according to the venture capitalist criteria? Our motivation is to increase the likelihood of success for the startup as well as for the Investment or venture capitalist. Exactly. Maybe you want to say something about yourself?

J12: Interviewee King, originally from England and working now with J12 Ventures which we founded a few years ago to do early stage Investments. I founded a fintech company called Novo.

(...)

Interviewer: Can you tell me about the process from the point you get to know a startup until you make the decision?

J12: (...) I think of the market if it's a large and interesting market, so it looks like it's a company that has the potential to build, to grow to a big enough size, there a dressing a large enough market opportunity.

They do timing to do that is good. It looks from the material of the receipt, they're building an interesting product with a reasonable amount of tech risk for that risk and if the team looks to be competent.

I mean this is very much initial screening on your presentation so you can't produce too much from a team from that point. If I take a first analysis from a pitch there, it's largely regarding the market and the product whether it's interesting or not. Then we take a first meeting with those founders, with those teams to dig deeper.

Interviewer: What you now described is that you get the data per email and you just look at it in your computer before your first meeting. Right?

J12: What do you mean?

Interviewer: Is it just that you get a presentation from the founders and they explain you the market and the data or do you just get the data per email and read?

J12: We normally get a presentation. If it's a company that is introduced to us, we will also get those reference points. If it's a company that we don't know before, then we will get a pitch deck presentation and that should cover the team, the product, the market opportunity, what traction inbuilt so far, what they're go to market strategy is, what the road map is, if they're looking for funding, what kind of fundraising round doing right now. So that should cover those things and that's the information that we can look at to decide if it's interesting to take our first meeting with the founders or before if we feel like there are significant gaps in the information of the presentation, then will request more information. So deeper, if you want to get better segmentation of the market or better understanding of the size or better understanding if they go to market strategy in a bit more detail or competitive landscape from their perspective, more understanding of the product differentiation whatever might be that stands out as relevant, we request for information. But then assuming from the deck, from email correspondence essentially it looks interesting, then will meet with the founders. Generally to have more of a discussion rather than have them presenting to us.

Preferably, that's a good way to understand, to make a personal connection and have a deeper discussion to let it flow and go into more topics rather than somebody presenting and is somebody listening. Then it so you don't get a lot of that way. I think, I mean we always encourage that the founder should be at least as picky as the investors about who they take the money from. We want to give them the opportunity to feel us out as well and the personal fit because I said we invest for a very long term horizons. It was quite a long-term marriage. That's why it's also important to try to get to know the founder in advance when their fundraising, so that you can build that trust, and relationship, and not try to establish within a very short kind of timeframe of a few meetings in the months of fundraising.

That gives us the opportunity to dig deeper into the case on the different elements: Product, market, team, strategy and also to get to know the founders a bit more to see if we think this is the entrepreneur, the team that can execute this this plan. Then so we tend to take that first meeting, follow up with more information on the back of that meeting in case there a more unanswered questions and if they're more material that they can send it might be again, further depth of sales processes, go to market, maybe some product specifications and it more depth around that.

A budget financial modeling will be a very early so it's not too relevant for us to see a 5 year forecast because it's so made up. I mean you want to see what the numbers showing in terms of the potential to the market size in your ability to capture a part of that and achieve positive unit economics but you can't base an evaluation on a 5-year financial model.

In our process, if we take a second meeting or we start introducing those companies to individuals in our angel group that they start to get to know. The Angel groups that we have, is a mixture of people who have been successful entrepreneurs at themselves, people with a lot of investment experience or people who have reached the top of the corporate ladder in a specific sector. They have a deep domain knowledge. They are usually very relevant individuals within the groups that we work with that should meet a company because they can either evaluate in different ways or there might be a case that they're interested to invest in as an individual. That supports our understanding and decision-making. Then we take a couple of meetings at ourselves, introduce to the groups and then we host on a monthly basis for ourselves group investment meetings where we as a funds team invites our group of Angel investors.

So, we invite a group of 25. About half of them can make it per month, around 15. Then the best companies that we are seeing at that time are invited to that event. We invite about 3 per months to then present to the whole angel group and us. If a company has gone through the process of meeting us and we think it's very interesting and relevant and they're raising around then we invite them to a big investment meeting. Then they can meet all the angels so then those that haven't met the company before, can get to know them. Then start to see if this is the case that they would like to invest in as well.

Interviewer: You don't have different companies at the same time in the rooms. There just one presenting than the other companies are coming?

J12: We have like a three hour session and then each company gets like an hour. We run those relatively informally I would say. It's not a company presenting and a lot of people just stoic in the audience. It's often just very much for the discussion around the presentation. We can again get into the case a little bit and also it gives people a lot of exposure to how the entrepreneur is, a little bit presenting a case. That meeting really aims that those Angels that we were with can maybe then afterwards take their own individual meetings with the company. And then they'll see. Maybe some of them decide ok, this is the case that I like, I would like to invest as an individual. That's great! That has nothing to do really with our decision but it is obviously a good reference point for us.

Essentially, we collaborate with those angel, sharing what insides are they getting when they meet the company. What do they know from they're experience and network relevant to this case. We kind of deal with shared due diligence process with them. We as the funder, we have the time and the resources to go deeper and do more in the way of customer reference checks, team due diligence, text due diligence, to go deeper into market strategy. We run that process and then as an investment committee within the fund we'll decide if we want to invest or not and hopefully three or four angels from my group have decided that they want to invest too.

Then that's great because then we know post investment that we have greater strength than just us as the funds to support.

Interviewer: You mentioned the personal fit before. How do you evaluate the personal fit or the personality?

J12: Personality wise I often say what I really appreciate seeing in a founder is that some kind of difficult to achieve balance between getting the impression that this person is an absolute expert in their field and they know the area that are working in intensely, they know their customers, they know their market, they know the product. But at the same time he has a humility, and a curiosity, and a coachability that shows that they want to be challenged or they want to seek new information from elsewhere and be happy to be proved wrong because they understand that is part of the process. Their assumptions will surely be wrong along the way and they can know the most in a field but they're not naiv and they know the most probably because they've opened up to learn the most from the most different sources. Expertise with a curiosity and coachability, I think that is a strength in a founder personality-wise. Competence-wise it depends a little bit case by case if it's a company that has a high product risk. So if it's a company that building something difficult technically then obviously it needs to be an expertise within the tech team. That is a competitive advantage. I'm so looking at the backgrounds and what people have built before and in education. What is there is key and references for that.

I mean everything is execution at the end of the day because if it's a company where it may be less of a high tech product: Go to market, the speed of execution, execution on sales processes, B2B or whatever, is key. Then it need to analyse how good do we think the team is at executing, at moving quickly, and adapting quickly to change. That is especially something that where it helps to have known the team for a bit longer because you can see over 6 months we can see that this is how they executed. This is where they were and this is where they are.

So we know they moved quickly and we know that this roadmap about six months ago. We know that actually they went beyond that.

Otherwise, it's a little bit tricky. You kind of have to take a load of information and assume that that shows that they can execute looking forward. So it's nicer to have previous (...). That's why personal references or entrepreneurs that you have know before, I mean it's very helpful because you know how they execute.

Also, personality-wise not every CEO needs to be a sales and superstar. I mean there are more tech-affine CEO's. But somebody within the team or the team itself needs to have the ability to attract talent towards it.

So the ability to build a culture, build an organization, and to understand how it is to build a team of people at the end of the day because whether you need to attract the best tech talent or you need to attract great marketing or sales or you going to need country managers for expansion. I mean you need to be competitive in getting the best talent and being able to do that without necessarily been able to pay the highest salaries.

So it's important that the founders can sell their vision and build a culture that attracts talent for one. If they're going to have to raise further funding, they need to be able to attract investors and investment. At the end of the day, there's a lot of irrationality also about investing and if you can build strong relationships and speak with authenticity, you know, that's going to do a lot to attract good people around you. Authenticity is another factor that is important to see. People are genuinely passionate about what they do, authentic in the way that they approach, what they do. They have a genuine knowledge for what they do. You can tell if people aren't authentic in their beliefs. If the founder hasn't truly believe in it.

Interviewer: Can you tell me about your last investment or the founder of the startup of your last investment?

J12: (...) haven't finalized investment on but it's a recent process that was a long does that work as an example. So you want to talk about that founder that will be identified in their personality that was good. Here we met this found a few months ago and they're working with the marketplace model. They need to build up a kind of the consumer demand side and the business supply side and it was a challenge with a marketplace to build two sides together because one doesn't normally come if you don't have the surprising demand and there will be no demand if you can't supply. It's a challenge to build and balance those two sides.

What impressed us with this founder was that he and his team have always been very attentive in the data to understand why people are acting the way they are on the platform, on their product. What type of people do they manage to get retention from and what behaviors have those people exhibited that let to them being return customers or what do people in the onboarding journey not do and then it needs to them journey. They've been very smart to look into the days. This is how we need to change the product in the onboarding journey because if we can get everybody to do this behavior then we'll increase retention massively.

Or doing smart things in terms of the demand side of the marketplace to show to increase exclusivity and scarcity so that the quality do actually limit the number of businesses they work with on that side but ensure the quality is very high. And then that kind of elevating the brand and the quality of the product in this first initial phase, building up a long waiting list of people that want to be on there but then say no, you're not able to be on our platform yet. And then obviously, later down the road when they have a bit more awareness they can open the doors and be a very big volume market. Those were examples where we saw ok they addressing these challenges in a smart way, in a very data-driven way, like in the way that he and the team analyze the problems of the encounter that they showed over several months that they increase the conversion on their platform month on month. So they were showing continued progress by understanding the data or making improvements, understanding the customer very much, and the customer needs in order to drive their decision-making, rather than as some teams can do taking decisions based on what they think is best or based on what their vision is how the product should be but he is always taking a very customer centric, data driven approach to how it should be to serve the needs its best. So that was impressive. Also his passion for what they're building.

The way he talks about, it's a very interesting under digitized market that they're working in and he's a very clear passion with his ambition to really disrupts and transform that industry, to add a lot of value to it, and to (there an early mover there) grow the leading marketplace in that industry. So I think that passion, energy, and drive for reasons to transform an industry that he is passionate about, not just to build a successful company for himself. That passion tide in towards the smart thinking as to how to solve those problems add value to the actors in that industry. Those were two very key areas.

And then the more that we met with him and for example, challenged on their pricing model and pricing strategy. We had some meetings where we were talking: Why are you pricing like this? But have you not thought that maybe you could price it cheaper and grow the customer base more quickly and in doing that you would have more access to more data more quickly and then the product itself would improve. If you take a long term look towards value creation maybe it's a better strategy to lower the price point now, increase it over time as you add more modules to the product or as it gets better because you have more data, which makes it better. There's a lot of value now in that data and in having more customers so you a better job of closing the whole kind of transaction look.

He was very receptive and coachable. "Okay, honestly, I haven't really looked at it this way before. But you know that makes a lot of sense. This is something that we should look into." It's another point of data that shows, ok this is somebody that is set in thinking that they know its best. They really have an authentic drive to transform an industry that they are passionate about and they approached how to deliver that value in a humble way of collecting data from customers, from behavior, from people that he was speaking to. Because the most important thing is to build the best product, rather than to build a product that you came up with in the first place. To all of that was the combination that impressed us about him.

Interviewer: Thank you! Maybe my last question. It just came up. How is the ratio of companies, when you’re meeting them for a few months and you invest or do not invest? How many companies are investing in or is it a lot of companies you say “I am sorry, not interested in”?

J12: If we look at companies that we see. So in some way we take a look at, at the very top of the funnel. It's probably 1 in 120 more that we will invest in. That approach us, so that we take a look at ourselves out back when we receive the presentation and then we take 120-ish, I think. One of those, maybe a third will follow up in some way for more information, a meeting or so they will come a bit further in the process. They will get a bit closer and then a few of those we will look more deeply in and take to take a longer process and then one invest. I would say it's 1 in 120.

Interviewer: Thank you.

Transcript
STOAF Business Angels
Interviewees: Wants to remain anonymous
Date: 12. April 2018

Interviewer: (...) Could you tell me a bit about your background, which investments are you doing, and which field, which area, which size of investments?

STOAF: (...) actually, we are 50 angels. This is Stockholm business angels, we are 50 angels that invested into a fund that invest in early stage technology, life science and med tech. I've been doing investments with Stockholm business angels since 2011. The fund started in 2008. The second fund, we just finalizing our last investment, (...) which is a med-tech company. We are doing smaller investments, starting usually with around 500,000 SEK to a million up to about 5mio SEK. (...) So, we do invest in pre-product. We do invest early. Early in our portfolio, we need to have a (...) or a proven technology reasoning behind, so it is harder to copy it, the process. We do only business to business investments. The investment criteria of Stockholm business angels are sort of technology-driven or it is a market-new project or it is a disruptive sort-of segment. This sort of depends on investment structure and it's internal structure. We have developed at ourselves that we see that is beneficial. (...) So that's Stockholm business angels. Then we have also venture partner with Capital partner next. (...) Investing in VR, Machine Learning, all this kind. Anything that has disruption and digitalization in industrial network. Looking into materials, (...), shipping, a task-force, self-driving cars. (…)

So this is the fund. (...) It's a A-round looking into proven technology. It doesn't have to have a specific revenue model yet. (...) Since we are in this rating together with (...) Ventures in Finland. We are doing part of the investments together. So we are a partnership in early-stage investments. So this is sort of a seeder fund to this Nordics fund we have. We participate to do the first investments in A-3. (...) The business angels also setting up their own fund. It's an early round investment fund. We only have around 16mio SEK. But we want to presume and ride longer on the investments. So we're aiming for a around 5mio. SEK fund with money from EU. I mean, we'll see. This is what we do. (...) in collaboration with Israel and (...). And also we're having two partners, one in New York and one on the East Coast in the US. Here in Stockholm have a guy helping us out. He is handling in between Sweden and the US. I have lived in the US for 17 years. I'm having a dual citizen. (...) He is here in Stockholm now, he is here as an expat since 2013.

Interviewer: Sounds great. You have a lot of different funds, what you now described. Do you have a process from the point where you get to know the founder until the point that you make the decision of investing in or not?

STOAF: It's an interesting question. I had just a discussion or question about this because it's definitely depending on which state you're in. I believe that as a VC you are in a longer coaching as you are in your organization (...). That's usually what you doing (...) innovator there is no company around or team. You have only the luxury as a VC to look into a company. They usually have a team outside. Then you also coming in much new decks. Then you're looking at the entrepreneurs and see if they are doing good things. It's little bit tricky, you know, in this conversation with (...) they are the weak. (...) and you guys, you have the luxury to look into really fascinating teams. Where we are looking on the investment process as a race track. We are looking at the horse and a jockey. When you can have a really handsome jockey then it doesn't matter if you have a pig or a donkey that the professional super jockey is riding. It's gonna be a good win anyway. So here we are looking more at the horse and the track. (...) We are talking about replacing the entrepreneur with a stronger CEO or a stronger CTO. (...) and usually the innovator is not the strongest leader.

Interviewer: Very interesting! So that means that you're not looking so much for the personality? You're not looking so much for the entrepreneur itself?

STOAF: We do. We have that as one of the things, as one of the key opinions, but is not the biggest one. It's actually the innovation and [..] that we look at, because we also want to have a proven technology with a patent and the process or the research or whatever it is. Because we are in that kind of segment of investing. So we would never invest in a platform which is business to (...). We invest in tech, life science and in this kind of stuff. (...) Is usually a strong team behind do the innovation (...).

Interviewer: Okay. But could I say, in the field where you are into you, the product and the market is more important than the founder itself?

STOAF: Yeah. Actually, in the beginning, yes, because then it actually proves that there is a reasoning behind the innovation itself. You can always hire a good team or you can not. But you need to have a really good product to have the opportunity to build a (...). The entrepreneur is actually not the first thing we are looking at in an early stage. (...) If we look in the VC funds for the US perspective, we look into, before we have any talkers at the other side. What I mean we need to have an industrial partner interested in the opportunity, in the innovation. If we don't have them, we don't invest. We are also looking into a third player as a partner. We have industrial partners. I think it is an ever more complicated deal than to do in an early stage because you already know it's gonna be good and we have different companies looking into the materials (...). So we recruit that kind of innovation rather than (...).

Interviewer: I see. As we are a bit more into the personality of the founder with our thesis, I would like to ask even if it's not your first priority, I think you evaluate the founder somehow or the personality. If so, how do you do?

STOAF: Say again.

Interviewer: If you evaluate the founder and his personality. How do you do so?

STOAF: We don't have any interviewing criteria. I thought that we become more and more sensitive if it's possible to work with the founder. But it's also important for us to see that the person is humble enough to understand his or her potential. And also that he is able to hire an external CEO or whatever is needed. That person is probably much better in product development (...). Look at this for example at Daniel from Spotify. He is not the most charismatic leader. When you look at his speeches, he looks like he is arrogant, maybe not the friendliest person. (...) He is probably surrounding himself with a lot of really good people (...). So it's more about how can we manipulate the team to make people (...). Our investment criteria in an early stage fund is that we can make ten times of the money than we put in. That's what we are looking for. Because if you have that perspective then you also know that certain things gonna be too expensive, so we are not able to get ten times of the money when it's time to do an exit. This is how we made and negotiate to be able to get the funds we need and we can exit out at a certain point. So it's sort of our process.(...)

Interviewer: Ok! Actually, I feel like I got the insights and the most important things. What you're looking for and what your criteria is. I would have a last question if you still have a minute?

STOAF: Absolutely! Go ahead!

Interviewer: What was your last investment? What kind of company? If you can say it?

STOAF: Okay. One of the latest deals that we dealt with Stockholm Business angels was (...). This is a platform that actually shortens the (...). That is a huge bottleneck and we had a very good exit with a similar company few years back. So we are hoping to see this as a quicker or higher return than the last time. (...) So that is one. Cap A did the last investment, we went in with 1.25mio SEK find in this investment. This is for Cap A early stage. And with Cap A one of the later investments that we did was together with Pacemaker, which is a music application. I think we have a very tiny point in that. I don't think is was more than about 750.000SEK together with (...).

(...) Another investment was in a company called "We don't have time". It's an environmental product company. They are doing (...) to reduce the carbon footprint. (...).

Interviewer: The last two one you just told. How long was the process when you got to know the founder? For how long did you know them before?

STOAF: For of all of them, referrals was the drive. So it was a well-known source. The second one, I know that they were cooperating together with Pacemaker for maybe a year. The one I personally invested in it, I know him since 2013 but I didn't know that he has this project. So when he called me and said that he had this, I knew that it would be a good deal because I know that he is a good entrepreneur. When I invest at myself, it is not a long DD process.

Interviewer: I really appreciate your time and thank you very much. That was very helpful and very valuable information for me.

STOAF: Alright. So if there is anything you can just call me or email me.

Interviewer: I will do. Thank you.

STOAF: Thank you! Bye!

Transcript
Venture Fund X
Interviewees: Wants to remain anonymous
Date: 15. May 2018

[Introduction not recorded]

Interviewer: Maybe you can first tell me something about your VC company? Which size it has and in which industries and startups do you invest.

Venture Fund X: We are Venture fund X. We have three pillars of investment in ventures. We have an incubator business and we are also working with consulting. So, we have our infrastructure for all the companies we dealt with and portfolio. If you look at the size of the companies, we have invested in about thirty companies in a bit different industries. Actually it's quite spread.

Interviewer: So you don't have a preference for certain tech field?

Venture Fund X: We would like to say that everything that fits our investment criteria's and also things that are disruptive, is interesting.

Interviewer: Okay, you just mentioned the 'investment criteria's'. What are you investment criteria's?

Venture Fund X: We can take it from here actually. (Showing here laptop screen) We have eight investment criteria's. First of all, we look at the team. It is supposed to be a great team and the entrepreneur is very important.

Interviewer: How do you evaluate 'a great team'? How do you find it out?

Venture Fund X: Actually, I would say it's more like a sense.

Interviewer: A gut feeling?

Venture Fund X: A gut feeling. And also experience and the track record of the entrepreneur. It is very important. And also, if the person has both, some tech background or tech understanding together with business. Then, it's really a good match. But it's really a gut feeling. So, that is our main investment criteria.

Interviewer: Okay. You would say that's not only your number one (at the presentation slide) that's also your most important criteria?

Venture Fund X: Yeah, I would say that. Yes because you can always find a good idea. But you can't find a good entrepreneur. Yeah, I would say that it's easier to find a good idea than to find a good entrepreneur. Then, if you find an entrepreneur who has slightly bad idea, we can change it. We can change the business model, we can change the distribution channel, the price strategy or whatever together. But it's not interesting if it's not a great entrepreneur.

Interviewer: Interesting.

Venture Fund X: Also, that there should be an inventive business idea, digital and scalable, attractive markets, when it comes to size, growth and margins. Valuation and cap table.

Cap table are actually the people who owns the company. So, if you have a spread of maybe ten investors in one company, then you have like capital table (cap table) and your cut of the company. So, when it's a lot it's more difficult, I would say. So, it's better to have a good cap table with investors who have invested in companies before, for example, and have a good track record, maybe have done a few exits, than to have like twenty small, minimal investors. It will be difficult with the communication. And also, it should fit our business, has a Nordic presence and a clear exit strategy

Interviewer: Okay. That are quite clear investment criteria. I would like to focus a bit more on the first one, that's the most interesting for me, since we are looking for the personality of the founders and how to evaluate it. What do you have there (on the slide)? Optimal two founders, they can collaborate in ups and downs, one to build product and service and one to handle sales and marketing. So, you mean like one tech guy and one more business guy?

Venture Fund X: Yes.

Interviewer: They should be flexible, believe in company's mission, willing to learn, drive and passion. Drive and passion that are terms what I hear very often in the interviews. That the people should be passionate. And, communicative, likable, easy to talk, and personal chemistry.

Venture Fund X: So, it's a lot of soft things.

Interviewer: Could you tell me also about the process from the point you meet a founder the first time until you make a decision for investing in or not.

Venture Fund X: I can show you this for example. (Showing another slide). We have very structured investment process. We have a venture manager. That's me. I'm doing that and scanning at my own, where we source. We call it deep flow. So, we evaluate all of the companies requests. And it could come through phone, e-mails, someone knows someone, or we have this form. And we always (…) because then we have all the track records, all the documentation, the pitch deck, etc. So, we do an initial evaluation and depending on our investment criteria compared to the entrepreneur and the idea, we plan the first meeting. After the meeting, we have this investment committee, where we have all the partners sitting together in the same room and talk about the presentation or the business case, actually. And depending on the voting of the different partners, we decide if we will have a project initiative. Then maybe we have an NDA discussion. And we evaluate together with other partners and the entrepreneur. Maybe do a DD process and it depends on what kind of business it is. Is it a very technical oriented company, maybe we need a tech guy who help us evaluate the technology. And then, we provide decision material for the investment committee or actually the department. And then, we have that final committee approval, where we say yes or no to the business case. And after that, we have the final negotiation with the entrepreneur or the company.

Interviewer: Okay. So the final approval is done by the committee with all the partners again, who make the decision?

Venture Fund X: Yeah. To invest in the company or not.

Interviewer: How long is usually this process from one to nine?

Venture Fund X: It's so difficult to say because it's so different. But I would say that from sourcing, every week, I go through a lot of cases, so every week we do this evaluation and every week we have pitch meetings, so I would say, the investment committee here has taking around two to three weeks from the first application. So three weeks. And then, you have all these (shows on slide) and that will take several months or it can take weeks.

Interviewer: So it highly depends on the case.

Venture Fund X: Yes.

Interviewer: And also during this time you develop your gut feeling about the team and the founders?

Venture Fund X: Yes.

Interviewer: Or do you maybe have special meetings? So, you say yeah let's meet for lunch a bit informal to get to know each other a bit better? Or is it everything strict in this process?

Venture Fund X: Oh no. Absolutely not. It's both ways, I would say.

Interviewer: Okay. Let's see what if I have forgotten anything. I don't know if you can say it of if it's confidential but if you think about your last investment, how was it or how were the founders like as a team, personality-wise? Maybe you can say it anonymous.

Venture Fund X: I'd rather not. Unfortunately, because it's more confidential. But I can tell you another story. It's actually that some people who apply to us, maybe their business idea or the state, the business is in, is not interested or valid for our business. But we think that the person behind it, is very interesting. So, we have had cases, where we have had an entrepreneur in there with an idea, who had changed the idea and doing something different within the Venture fund X infrastructure. And now, actually we have two go's, two different companies, which are very interesting. Good track record, great passion. What can I say more about them? They were very driven, self secure, self-confident, etc. I believe that we will, in the future, somehow cooperate with them. But maybe it will be in another setting. So when it comes to people and teams it could be very, very different how we handle it. So in this case, we said 'I'm honest' I to talk to one of the girls today and said that 'Unfortunately, this doesn't fit our business right now but we think you are very interesting. So, we want to meet you anyway to take a Fika and talk about the future. Maybe then, later in life or if something happens maybe we will do something together. And of course, good people know other good people.

Interviewer: Yeah that's always the case. And maybe a completely other question: Are you a greenfield VC fund or do you want to see a company exit at some point?

Venture Fund X: That I would leave to the partners to talk about. So, if want you can send an e-mail to our CEO with some more questions, if you want and he or the other partners can sit down.

Interviewer: Okay, it’s not the most important question.

Venture Fund X: Is there something more, you're interested in?

Interviewer: Actually, this was the most interesting for me. I asked everything and I'm very happy here.

Transcript
Crowberry Capital
Interviewees: Helga Valfells (HV), MD
Date: 6. April 2018

Q: Can you tell me a little about the fund, it size and investment policy etc.?

HV: Crowberry was formed in july 2017. We worked at NSA venture fund. Have all worked for startup or companies focusing on innovation. We want to be a fund that invests in startups who aim to be international. Scalable internationally. We have 3-5 year service time. We 4 bn ISK to invest with, aim for 10-15 ventures. We enter early, depending on industry. We need a product, not revenue. But we like one grant from funds for example. We have met 80 startups, closed one deal and are working on 2 more. We want the companies who have a technical advantage. We also have the rights to allocate up to 15% of the fund to one investment. We are also in connection with foreign investors. We like more people to participate on a deal

---- Recording stopped----

Summary. Talked about passion, problem solving skills, ability to form a team

---- Recording stopped----

HV: We want to see result and problem solving people, you can see that when creating the term sheet, some people can work around some areas. Its an indicator.

Q: Do you take a board seat?

HV: Yes, its our duty. We are also looking for people who want to share their power, share the power, knowledge and experience.

Transcript
Frumtak Venture fund
Interviewees: Eggert Claesen(EC), MD
Date: 11. April 2018

Q: Can you tell me a little about the fund, it size and investment policy etc.?

EC: Frumtak Venture has two funds in management. Fund 1 is founded 2008 and starts 2009. That fund invested in 15 ventures. 10 ventures survived, we have sold 2 and 8 remain. 5 failed. Most of them were in tech, diverse but mostly in software. Fund 2 was founded in 2015. The size in ISK is 5 billion and there we have already invested in 10 ventures. We are betting on SaaS and AI ventures. Meanwhile we are also in non-tech, such as Artic Trucks (creating upgraded vehicles for extreme conditions), Tulipop which is in Animation.

The criteria for investing is you need a product, revenue and customers, one of each, and big scalability internationally.

Q: When are you entering a venture?

EC: Late seed, early growth.

Q: Besides product, revenue and customers what are you are looking for when deciding on an investment?

EC: People, number 1, 2 and 3, people.

Q: What characteristics are you looking in the people?

EC: The color of their hair, no just kidding. The thing is, there is a certain job to be done in the venture and we look at experience, knowledge and the person of the entrepreneur and we try to form an opinion in whether he is capable of getting the job done. And then we look at specially, taking knowledge of the industry or a certain topic aside, and give us they know what they are talking, left is how it is talking to the entrepreneur, do they have vision, do they understand what needs to be done, do they know they cant do it alone, what's their take on money and etc. There are so many things, and its not documented anywhere, just our gut feeling. On the other hand there needs to be all formalities, business plan and so on, so we can check all the boxes of who are analyzing us. Are we taking our return into the picture, the risk and so on. Lastly we want to know how we exit the investment. It is often said about investors like us: we are more busy thinking about how we sell, rather then how we buy. Because its always easy to buy, its harder to sell. We need our money 5-7 fold back to us.

Q: You have sold 2, and 8 left. Is that good in your opinion?

EC: My private opinion is that the golden rule of thumb is that out of 10 ventures 3-4 venture fail, 3-4 go so-so 3-4 go well, but your lucky if you get one star. I am afraid that the middle pile in the 2009 fund, there are going to be more so-and-so.

Q: If you deep dive in to your thinking when analysis. What personal characteristics you think is important.

EC: It is conviction, passion, fire in their hearts, and vision. And is the person sane or insane.

Often we have spotted our target many years before investing in the startup community. So when we invest, we have already gotten to know the founders. But it has to be said. These decisions, you can talk to all the Icelandic funds, you will find out, no one is using the same methodology to make decisions. Some place importance on the idea, some on the business, on the people and so on. What we do then is take the other variables besides the founder, how is the market, is it growing and so on. Then we read about exit in the market, are VC getting the multiple rate of return based on revenue, EBITDA, are people selling technology and so on. Then we look at what the entrepreneur wants to do. Knowing all this we try to determine if we can stir this all together. We go into the investment as a active investor. We try to drive strategic part while the founders do the work. In the end, we hope to score enough goals to be able to say we are winning. I often say, we play beautiful football, but we still remain to score some goals. Overnight success in our asset class is minimum 10 years. So this takes 15 years. 1/5 of your work life, so it becomes a little philosophical talking about this topic in the end. When you have crunched the data, I think most will invest with the gut feeling. And you just like people differently. A vc-founder relationship is often longer than most marriages, so you better get along and like each other.

Q: If you look back at your two last investments, do what you have said fit the founders of your investments?

EC: they all have these things and fit our investment decision. This one founder, he had the willingness to change and adapt. For example, the venture needed him to move to Boston. We ask founders often, when are you going to move out.

Q: when you have invested, are you a mentor to your investments?

EC: Yes, I’m 1717 of the CEO's (1717 being the Icelandic helpline phone number). It’s my style to or intention that everyone can call and chat but i will never force a founder to do what I suggest. They should themself form their own opinion. Making them more willing to talk to me. But it depends on the experience of the founder CEO. Being a CEO in a startup is a lonely job. The problem is, whenever you talk to someone you are afraid of him or her biting you (knife in back). Then my contribution, I have made so many mistakes myself. So I say to myself, at least I can make sure these people wont make my mistakes. I feel like that’s value added. This, we hope, will make a potential chose us, because we can contribute on different levels.

Q: Well thank you, we have gone over everything I have to ask you. Thanks for taking a time out of your schedule to meet me.

Transcript
NSA: New Business Venture Fund
Interviewees: Huld Magnúsdóttir (HM), CEO and Örn Viðar Skúlasson (ÖVS), Investment manager.
Date: 4. April 2018

Q: Can you walk me through your investment decision process?

ÖVS: In general, entrepreneurs call us or email and ask for a meeting and we encourage them to come visit us for us to stay on top on what is going on in the environment. After that we send out 6 questions that we like them to address in the pitch.

Q: What are those questions?

ÖVS: They are a bout the idea, marketing, planning, exit strategies and so on. And then the come and pitch. We are two that take the first meetings, me and Ólöf. Then after assessing the everything we decide if this is something for us. If so, the venture goes through our investment board, we are 4 that sits in that board. There we talk about the venture in general. In that meeting we decide if the venture meet the fund criteria or we want to research the venture better. If so we call for more information and have other meetings with the venture team. After those meetings, everything is laid before the investment board again. At that stage we decide on going forward or not. If yes, we go to work on the term sheet. If everything goes to plan, the term sheet is approved or denied by the fund board of directors. At that stage we have done a lot of analyze.

Q: You give the term sheet before a final decision is made?

ÖVS: Yes.

Q: Can you walk me through what it is that you are looking out for? You start with the 6 questions, but what is it that makes you take a yes or a no decision?

HM: Even though we get a request, we don't meet everyone. We can screen at the email stage. If it is not innovation, just a company operating or a designer designing clothing were innovation is hard to pinpoint, for those calls or emails we wont get a meeting to pitch. But we usually are open to meet people to talk but it is stated in those circumstances that the talk is not for investment proposes.

Q: How many funds do you have?

ÖVS: One:

Q: How is he structured? At what stage do you want to enter a venture, what type of ventures are they?

ÖVS: The Icelandic government owns the fund so we have certain laws. In those laws it is defined what role we play. Our role is to enter early. Usually first investor and want to the lead the rounds. The venture that come to us have finished a certain done in the angel environment, grant environment and are going forward to look for investors. We are usually a bridge from that stage to Series A. We define us as early seed. Most companies we invest in have gotten grants, from Rannís or The governmental Technology development fund. We don't demand it, but we like it when they have gone through those processes before they come to us.

Q: I don't want you to tell me your secret sauce to a good investment, but i would like to get a better sense of your way of thinking. An idea or a venture contacts you and you meet it for a pitch, what are you looking for in that pitch?

ÖVS: What we try to sense. Is the venture in competition to something else in Iceland. We got a request for a meeting with a data center. Its hard for us to invest in a data center even though there is a certain innovation in it. There are data centers already existing in Iceland. That would alter the competition environment if a governmental fund would invest in that venture. So is there competition out there. Another factor is venture disrupting the market. That is a big deal for us. Is what you are doing likely to bring new approach to a market. You can have competition, but if you are approaching that competition with in a new way, then you are scoring high in innovation for us. The team is a big deal as well. There we look at the team experience and background. Have they done anything like this before, or are they going forward of just interest. Then we try to demine the fire in their hearts or the passion. It is enormously important. It is a big deal if you have used grants available. It is a stamp of quality. For example if you have gone through the angel process, it is a good learning process. You need to learn how to sell your idea, explain it and somebody bought it. The grant environment is like that as well. That process, if approved for a grant, puts a quality label on the venture, is it innovative, are you trying to develop someone else don't have. Then the believability of the data and the team. People have to know if they know they have the stamina for what it takes. You cant just come with some idea and after two years it bores you and you don't want to do it anymore. This is a lot of work, people need to realize that, taking money from other people and then you don't want to do what you are doing anymore. Is this believability at hand when we analyze the team? Commitment.

Q: you started talking about the personality of the team, passion for example, can go deeper into that subject and what you look for there. Taking f.x. the last two investments you have made, how do those people look like and is there a trend in their personalities?

ÖVS: Passion and fire at the heart is extremely important, mainly for stamina and all that. Then experience is important. Sometimes people talk about serial entrepreneurs, sometimes in a positive manner, sometimes negative. But it can be really positive that you know what you are bout to embark on and it will take time, blood, sweat and tears. So, we try to sense what people have done before, background and the team. We have had individuals with good ideas and nicely presented but they were alone, no co-founder. Risk for quitting is more when alone. It's better when there are a few people on the venture with a different knowledge.

HM: This is also just like when you apply for a job, how do present your self, first impression. Are you data well presented and worked on. Are you able to present what you are selling or do you bring a 100 slides in a PowerPoint and after 15 slides you have no clue what they are talking about. This rings alarms for us because it says so many things about how they organize themselves.

The team is extremely important. Is the founder/s gather people around him to improve his weaknesses or not. If you tell the entrepreneur about their weakness, how will they take it. To start a company and the work, you have to be able to take feedback. We have also been burned when entrepreneur with a good idea is not necessarily the best person to drive the company forward to create thriving company. So entrepreneur or a team member, he has to be willing to let go. For example we had a entrepreneurs that saw his weakness and said he needed somebody else to take the idea forward, but i want to participate. That's a strength.

There is also one thing, that is known in this industry. Some companies become a lifestyle company, not just for the customer but for the entrepreneur. That is something we try to sense. If we sense that it might happen, we wont invest.

Q: Can you elaborate on that?

HM: An entrepreneur is just seeking investment to fund and support a certain lifestyle, for himself or a group of people. You might want to have a certain salary and you can create a lifestyle you want when you have all this funding. Not saying that when you are a entrepreneur you need to be poor and eating noodles all the time but if its all about creating a startup in Iceland but you live in Barcelona and you are with you laptop trying to operate a business from there. Is the funding for a lifestyle?

ÖVS: We also ask about the exit strategy. Some find it right to know this strategy, but it is about knowing if the entrepreneur is about to create and build up a business that we, the fund and the founders, can sell to some other business in 5-10 years. Or are you trying to build a good working environment for you yourself and plan to have it like that. It not necessarily bad for in general, but its bad for us as investors. Because when we say " we now need the money back because we want to help other entrepreneurs", then there is no exit strategy. Then the founder might just buy us out, in best case, at the rate we invested in the beginning. Meanwhile we need to work with a rate of return, so the fund strengthens, so he can help others a meet holes where we loos money.

HM: One thing unlike other fund is that we are so-called "constantly green" fund. All money in the fund just rolls in circles. There was initial investment in the fund when it was created 20 years ago from the business sector and the government, then two other funding on the way to 2018. Otherwise there is no other funding. The lifetime of the fund is open. Most other are closed with 7-8 years. They invest the first 3-4 years, help the founders the next 2 years and then start trying to pay back to the owners of the fund. This is not the case with us, like in Sweden, Industryfunden. It's really important for us that our investments make a return, so we can help others. Sometimes an investment is lost but it is so important to know the exit strategy.

Q: You asked for the exit strategy early on, how do you analyze the strategy put forward.

ÖVS: When we ask the 6 questions, exit is one of them. People then come prepared for that question. But usually, you figure out if there is general plans for exit if everything goes well in 3-6 years or if concrete plan that in 20XX we will IPO the company or sell it to bigger players and so on. We just invested in a company called Florialis. And in that company there was a clear strategy for exit and we were really happy with. The plan there is to register the company in a startup market in Sweden.

HM: If someone comes to us and tells us a potential exit isn't until in 15 years. Then our decision is different for us. Then its not just a matter of the initial investment, but you have to be able to follow the company if you want to live with it for 15 years. You know its going to need funding in these 15 years. Are we ready for a 15-year investment and many other investments during that time.

Q: when you are further into the decision about investment, deep diving, what steps do you take to get to know the team, the entrepreneurs?

ÖVS: there are no one way to analyze just the people. We have let it happen during the process automatically. Also we just talk about the weakness in team, we talk about it.

HM: It is different how deep the deep dive is according to the size of the investment. There is a data room set up were all kinds of professionals, law, accountants and more that go over the data and help us. On the other hand, the feeling for the venture and the people comes quickly. The frequency of communication is high, you soon get the feeling. A process of buying and selling a company is long as it takes a toll on our patients. If people are hard to communicate with and work with, its a indicator. Last investment we made, Örn sat with the team "In his lab" for many weeks. He would have flagged it if he worried about the team and potential problems working with them.

ÖVS: then following The investment we try to take a seat in the board. So we can monitor progress and help if need. That's why its important people work good together.

HM: we are all active investors, we have a large portfolio, each one of us have 6-7 ventures under our arm with a seat on the board, and in a lot of communication. So we see really quickly if there are communication problems. But that's our approach, like most fund, want board seat and be active.

Q: What's the average size of investment?

ÖVS: About 100 million ISK.

HM: it was 80-100 million ISK. We want to increase it and invest in fewer and larger. The fund ha made so many investments that have been small. The fact is that those types do little for us.

Q: We have covered most of what we wanted to talk about. We really want to thank you for your time and this valuable information.

Transcript
Nordic Makers
Interviewees: Wants to remain anonymous
Date: 8. May 2018

[Introduction not recorded]

Interviewer: Can you say something about yourself? About your fund, about the investments you are doing, in which stage of companies you are investing in, which industry, which area.

Nordic Makers: So, Nordic makers is a fund and we invest private capital from people that have built and sold large businesses out of the Nordics or (...) just eaten off by big companies. My background is a bit different. I didn't come from building unicorns but I came into this from a fund. So, I was part of a venture fund prior to this. Our investments, in terms of stage, we operate from the pre-series A or early/pre-scale. We invest money up to around a million euros. We also invest time commitment from someone internally to see that they will work with the company and we help them bring it to the next level.

So, we also work quite closely with a number of funds across Europe and the U.S. primarily on some further financing of our companies. We invest where we see a large potential. We're okay to take quite significant risk, which also means that we will fail sometimes in exchange for an upside later on. We don't have a fund structure. So we don't have fixed percentage or following reserves in the same sense that others will be. In terms of decision criteria, for us, founders are the most important.

Interviewer: Yeah, you mean for you the personality is the most important or more the product and the technology?

Nordic Makers: Well, we would say one is a function of the other.

Interviewer: Isn't it kind of independent?

Interviewee: Not really, I would say. It's not just the personality of the founder. Personality is (…) chemistry level if you click or not. Versus, if there's a fantastic product that means it has been built by someone. So, that is a founder that can build great products.

Interviewer: But maybe then he is good on the technical side but not in other respects.

Nordic Makers: But then we will do the same analysis for, how someone's metrics are in a company or similar. We are trying to understand what type of founder this is. So, it's more of a reflection of the founder; what type of problems did this founder choose to tackle or what type of team is he or she able to attract.

Interviewer: Maybe we are already a bit too deep into it. Some basic questions. So, as I understood you invest in very early stage startups?

Nordic Makers: We would call it late-seed capital. We're typically not the first money. We can invest and we have done so first money but typically we are a little bit later. We sort of sit between first money and larger funds. There's sort of a gap there in the middle and that's where we sit.

Interviewer: Okay, I understand. Do you focus on a specific industry?

Nordic Makers: We would not stick if we can see that we can add value to that industry, to that team. So that means our unique value propositions is, having someone work with the company that is either built a company in the space, towards a customer group with this technology (…). There is usually that little something that makes one person directly say I can help this company to the next level. And then, we vote on it and if we can convince this message to rest of the crew, then we invest, even if someone will be against we'll also invest. Does it makes sense or not?

Interviewer: Yeah. Definitely. And again to the personality side. So, you're saying it's kind of connected, the product with the personality. But, if I would ask you about the personality what would you say, what do you look for in a founder?

Nordic Makers: In the terms of my (…) types of personalities or?

Interviewer: Yes.

Nordic Makers: We don't really look at it that way. I don't think it's a little bit too dangerous.

Interviewer: Do you like to see specific traits?

Nordic Makers: We like to see leadership in terms of being able to attract talent but we also know that leadership comes in very different ways and forms and depending on what type of company you're building. I think we started (…) a couple of years ago, going to the reports and sort of dividing personality types by company type. You have companies that are very challenger like or you have integrator-type companies and you have everything there in the middle. For some type of companies, you need a very visionary personality and for other types of companies it is almost a destruction. It's extremely here and now focused stitching together different types of things and products to other people's building blocks and creating a unique experience around that where sometimes not even that is unique, right? And you can still build quite massive companies in that space. So, depending quite a lot of what type of company it is.

Interviewer: Independent of the type of the company, you said it's definitely important to see leadership skills. Besides that, something else?

Nordic Makers: Execution.

Interviewer: The ability to get things done?

Nordic Makers: Exactly.

Interviewer: How do you evaluate or how do you see that he or she has leadership skills or the ability to get things done? Do you look at the past or do you follow them for a certain time?

Nordic Makers: The second question is easier. We usually meet companies for a longer time.

We might visit them one time, then a couple of months later and then later again. It's a dialogue back and forth. And in the process we see or we understand what is happening. We can also understand if we can help the company. We can try out working a little bit together before we invest. So there we see progress. We met a month ago or two customers we meet today. Therefore, you see clearly something happened in the middle. We can talk about that. Does that make sense?

Interviewer: Yeah. You just mentioned the process. Could you maybe think about the last example, the last investment, how the process usually looks like from the point you meet a possible founder the first time to the point you make a decision of investing in or not.

Nordic Makers: The last investment was (…) a year ago. The timing was not right for them, they didn't need money. We weren't looking to invest at the right time just.

Interviewer: You were contacting them?

Nordic Makers: We met quite randomly. The first contact with them was two years ago. And at that time we were too early. A year ago, there wasn’t the right timing and now we are investing in them. And a lot of things have changed on all ends. We know the team and trust them.

Interviewer: That it quite a long time.

Nordic Makers: But that's unusual.

Interviewer: What is the most common process?

Nordic Makers: Most common is that one or the other one knows each other or has been introduced to our company. We sort of dating back and forth to try to understand each other. The founders typically do also a due diligence on us. If all plans out well, we proceed.

The tricky thing with all the AI’s or some of them (…). We’re big believers by the way. The big promise of it is, they’re eliminating biases.

Interviewer: But that’s actually a good thing.

Nordic Makers: Yeah, it will be good. But it's a lot easier to apply it for certain verticals, marketplaces and certain size models. E-commerce would be very good for this. They use it for debt financing and they can use it. There it’s a lot simple. Versus, on the earlier stage of personalities it becomes more difficult. It's more fluid. And there are some biases that are good and some are bad.

Interviewer: Yeah, okay. What do you think is a good bias?

Nordic Makers: Good bias is hopefully having develop a gut feeling of spotting good entrepreneurs. The bad part is that there is a selection bias. You can make errors in judgment because someone reminds you of someone who was successful or in some cases someone big maybe remind of themselves. At a certain point in time and you are more likely to get a positive view.

Interviewer: Do you have some companies you invested in, they are doing some stuff with

AI or do you have some knowledge about it?

Nordic Makers: Yes we’ve got two companies in Denmark that are quite heavy on the AI side. They appear great. You can look them up. They are doing some classroom peer grading across universities. We've got an AI company doing NL (Natural language) processing for emergency services. They are listening on call and become a decision-making support for the operator. We’ve got a hardware company that we invested in. They are doing quite advanced stuff also in AI and NLP. And several of our other investments touch this. We are quite active in that field.

Interviewer: Cool. There is a lot of going on now in this topic and everyone wants to be there and wants to have it. I would come back again to the question of personality traits. Independent from the company, you mentioned the leadership skills and the ability to get things done. Could you think about some more general traits, you would like to see a founder?

Nordic Makers: I mean there are plenty of traits that we like to see.

Interviewer: Could you give me some examples?

Nordic Makers: The ability to build the culture internally, how do we see the team as a whole, being able to attract, retain, and motivate people. We are quite keen to invest in mission-driven values. That they have a pretty clear view of where they believe the world is heading and what it will look like in certain years. And why, what they're building is a natural solution in answer to the problem. Typically stuff like that.

I think with the current state of AI it's more difficult for an AI to understand that someone is a good public speaker, that someone can convey a strong message on a stage or if someone is a good salesman.

Interviewer: I mean it always depends on the information you give the system.

Nordic Makers: You're not going to be able to get it to the system. If someone who leans forward in a meeting and does other types of tricks that are sort of known for selling, in that you see their way of interacting with customers. How quickly do they follow up on emails? Etc. You can probably train an AI to say how often do the quickly reply an e-mail and what is the content.

Interviewer: You're right. I have to say we're also only focusing on word processing at the moment or analyzing written text.

Nordic Makers: Sarcasm for instance. An AI cannot pick up today and a sense of humor.

Interviewer: That’s still a problem but I think it could be solved.

Nordic Makers: But I'm not sure that then this is the best use case for it. I mean if you want to look more into the space, so social capital and social capital as a service in the US and for some verticals this will happen quite soon. E-commerce, marketplace and SAAS. Verticals that are very, very metric driven where you can essentially dock into an existing data source. Do this, this, and this, look at customer attention, turn, and a bunch of others. And then it's easier to say yes or no.

Interviewer: Maybe what I forgot to mention, the aim of our thesis is with analysis to help founders to improve on weak areas or weak spots in their personality, to give them tailor made mentorship. It could also be a product for accelerator or a VC company to support them more customized.

Nordic Makers: Sure but then you're optimizing for what we want to see. Well, that may not necessarily be the best. We want to make sure what is best for the companies. This is what we care about and for the founders. And some of this is conveying accelerators to pitch training and stuff like this. But in other parts that may be more difficult to change someone's personality. You're not going to change it. But absolutely telling people about the importance of responsiveness or creating a team culture.

Interviewer: Yes. If he is maybe not the best speaker you could train him to be a better speaker. That’s the idea or one of the ideas. I think I got the most important information what I'm looking for. The last question is, it would be anonymous in the thesis later, but if there is some confidential information. If you have any direct quotes, you can send it to me but I think that’s fine.

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