

Entrepreneurial Opportunity Development -How entrepreneurs turn ideas into viable business concepts

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Abstract

This thesis sets out to provide contribution to the on-going and still emergent discussion of opportunity development. The focus of the research is opportunity development in the context of early stage start-ups. More generally, I was interested in how do entrepreneurs developing high novelty opportunities make sense of the early development phase of their new venture? The research follows qualitative phenomenological approach.

Start-ups were selected as target to inspect the opportunity development in a setting with little structures and processes. This also enabled the researcher to tap into the mind-sets and attitudes of innovators, while they were simultaneously refining their idea. The participants were sampled from a population of young entrepreneurs around Helsinki region, who were active in developing their start-up companies together with their entrepreneurial team.

Although small and experimental, this study highlights that early opportunity development is a combination of two distinctive groups of activities: 1.) Entrepreneurs conduct sense-making activities in order to piece by piece better understand the opportunity and its implications. 2.) They start building momentum and gathering resources for their venture, even when the opportunity is still unclear.

I have grounded the examination of opportunity development to uncertainty. The undefined stage of the idea leads to high level of uncertainty and especially in the case of new ventures we also don't have enough resources to deal with all possible sources of uncertainty and complexity (Miller, 2007; Sarasvathy et al., 2010). Subjects seem to have two distinctive strategies for handling uncertainty. Under the sense-making theme subjects were faced with a vast amount of possible directions to select, in order to refine the opportunity. Personal experiences and identity provided some direction for these selections. Limiting commitments and conducting only small steps effectively controls the potential losses of the development. The gathering theme proposes that entrepreneurs can actively influence the potential for success under high uncertainty. By gathering loose commitments and energy around the venture, entrepreneurs have a larger set of eyes and hands providing direction and help to overcome challenges. The momentum can drive the venture forward, even when the team is forced to significantly change the direction and features of the opportunity.

Keywords Opportunity Development, Entrepreneurship, New Venture Development, Managing Unknown

1. INTRODUCTION	1
1.1. RESEARCH OBJECTIVES AND STRUCTURE.....	2
2. THEORETICAL BACKGROUND	2
2.1. OPPORTUNITY DEVELOPMENT- FROM IDEA TO BUSINESS CONCEPT	3
2.1.1. <i>The fuzzy front end of innovation and the Startup phase of a new venture</i>	3
2.1.2. <i>Opportunity development and entrepreneurial process models</i>	5
2.2. MANAGING UNCERTAINTY AND COMPLEXITY	6
2.2.1. <i>Uncertainty and complexity in innovation</i>	6
2.2.2. <i>Traditional innovation management and uncertainty</i>	8
2.2.3. <i>Experimenting –Small steps toward unknown</i>	9
2.3. BROADER VIEW OF MANAGING UNCERTAINTY.....	10
2.3.1. <i>Managing uncertainty and complexity –Opportunity development view</i>	11
2.4. OPPORTUNITY DISCOVERY AND OPPORTUNITY CREATION –THE TWO THEORIES OF OPPORTUNITY DEVELOPMENT UNDER HIGH UNCERTAINTY	12
2.5. OPPORTUNITY DISCOVERY	12
2.5.1. <i>Learning about the opportunity</i>	12
2.5.2. <i>Limiting the risks of the development</i>	14
2.6. OPPORTUNITY CREATION	16
2.7. CONCLUSIONS OF THE LITERATURE REVIEW	18
3. METHODOLOGY	20
3.1. RESEARCH APPROACH	20
3.2. DATA GATHERING.....	20
3.2.1. <i>Company Alpha</i>	21
3.2.2. <i>Company Beta</i>	21
3.2.3. <i>Company Gamma</i>	21
3.2.4. <i>Company Delta</i>	21
3.2.5. <i>Company Epsilon</i>	22
3.3. DATA ANALYSIS	22
4. RESULTS OF THE RESEARCH	22
4.1. BROAD THEMES: SENSE-MAKING AND GATHERING.....	22
4.2. SENSE-MAKING- A ROUTE TOWARDS THE ENDS	24
4.2.1. <i>Internal sense-making</i>	24
4.2.2. <i>From internal ideation toward external validation</i>	26
4.3. GATHERING- ATTAINING MEANS TO EVENTUALLY REACH THE ENDS	28
4.3.1. <i>Gathering momentum</i>	28
4.3.2. <i>Gathering external actors</i>	28
5. DISCUSSION AND IMPLICATIONS	30
5.1. LIMITATIONS OF THE STUDY	31
6. REFERENCES	31
7. TABLE OF FIGURES	38

1. INTRODUCTION

Existing organizations are fine-tuned to efficiently manage and exploit opportunities that are close to the mature way of working. The further the opportunity is from the *modus operandi* of the company the harder it becomes to exploit it (Christensen, 1997; Johnson, 2010). However, this is exactly what is needed when organizations are aiming for strategic innovations or discontinuous innovations. Innovation activities and strategies need to be adjusted to deal with the high level of uncertainty and undefined goals (Bessant, Von Stamm, Moeslein, & Neyer, 2010; Tuulenmäki & Välikangas, 2011).

Because the value of the concepts cannot yet be projected or predicted, it is especially difficult to manage the opportunity development process (Bessant et al., 2010). One approach to solving this problem is to focus on rapid experimentation (Tuulenmäki & Välikangas, 2011). Experimentation provides a way for substituting high-risk decisions with a step-by-step approach (Ries, 2011) where the direction and goals can be altered during the development process.

Bessant and others (2010) argue that entrepreneurship is at the heart of discontinuous innovation. Starting a new venture is in essence an experiment and as is with all experiments, it is about finding relevant assumptions and testing them (Block, 1985). According to the effectuation theory entrepreneurs don't limit their exploration to predefined assumptions and goals, but allow new and unexpected effects to occur during opportunity development (Sarasvathy & Dew, 2005a). Traditional innovation management practices and theories have been criticized for the lack of encouragement for this type of behaviour (Christensen, 1997; Johnson, 2010). Start-up entrepreneurs often do three activities especially well. They identify, shape and develop opportunities into business ventures (Thornberry, 2003).

Innovation opportunity development can be studied from three perspectives. Innovation management literature focuses on the opportunities themselves and how to manage the process of searching, selecting, implementing and capturing them (Tidd & Bessant, 2011). Entrepreneurial literature broadens this approach by highlighting two other important perspectives: the identity of the developer and the difficulty of obtaining resources, both of which influence the development of the opportunity (Sarasvathy, 1998).

The aim of this research is to explore these identifying, shaping and development activities in order to better understand the early innovation opportunity development process. To tackle this highly tacit and difficult to quantify phenomenon, I will adopt a qualitative phenomenological approach.

The goal of this study is not to provide rules and best practices for opportunity development, but to better understand the nature of the phenomenon. Opportunity development under high uncertainty is an emergent field and many concepts of it clash with the traditional views of management theory. There is also local need for better understanding innovation opportunity development. Innovation and new ventures have been in public focus in Finland during the last few years and there are many initiatives aiming to provide help and financial aid to build up new, fast growing businesses (Hämäläinen, 2013). There seems to be large gap between the daily difficulties of growth entrepreneurs and the support activities aimed for them. In order to gain public funding or help, the iterative, open and dynamic opportunity development of new ventures is forced into a highly complex, non-essential and bureaucratic

process (Puttonen, 2010). Outside help and investments are often based on logic that doesn't take in to account the environment the entrepreneurs live in. If we would better understand the opportunity development as a phenomenon, we might find tools to better support the process.

1.1. Research Objectives and Structure

Traditional formal management methods don't provide good results, when developing high novelty innovation opportunities. So what kind of methods and approaches are needed to develop highly novel ideas? Innovation research calls for a more entrepreneurial approach to innovation activities. However, what this entrepreneurial approach is and how to define it, varies (Antoncic & Hisrich, 2003). Innovators don't rely on precise rules and plans to succeed in a highly uncertain and complex task, but act in a manner that provides direction and controls risks. This type of stepping in to darkness isn't random; nevertheless it isn't neither perfectly rational, nor explicit.

I will examine this type of opportunity development activity using existing literature on knowledge management, innovation, entrepreneurship and marketing. I will also conduct explorative qualitative research on early stage start-up entrepreneurs.

In the context of this research the term opportunity refers to a business idea or innovation that is developed further. Entrepreneurial opportunity consists of a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them (Venkataraman, 1997).

In the empirical part of this research I will focus on opportunity development in the context of early stage start-ups. More generally, I was interested in how do entrepreneurs developing high novelty opportunities make sense of the early development phase of their new venture? The early interviews I conducted and the relevant literature guided the research, and these early research questions were refined further, in order to focus on the descriptions of the actions the entrepreneurs in question described as central in taking the opportunity forward.

My research questions are:

- How do early stage start-up entrepreneurs describe the central activities in the early phases of their venture?
- What common themes arise from these descriptions?

It was important to find subjects that were presently going through venture creation, in order to investigate the early stages of new venture opportunity development. It was expected that later, after the company had proven its business model to be feasible, the subjects' explanation of the phenomenon would be biased towards things that had been proven successful. The goal of the research is to understand the phenomenon of opportunity development better. The subjects and methodology were selected to meet this goal.

2. THEORETICAL BACKGROUND

In this section of my thesis I will review the relevant literature of innovation opportunity development. Opportunity development is a very interesting topic, as it is a theme that situates itself in the cross-section of many disciplines. For example, opportunity construction

falls under both marketing and entrepreneurship literature (Carson, Cromie, McGowan, & Hill, 1995). Marketing literature is discussed here especially under product development process and experimentation.

In the next chapter, I will go through the relevant literature on opportunity development in conditions of high uncertainty. Firstly, I will examine the concept of uncertainty as an inherent feature of opportunity development. I will then proceed to summarise, how the activities or strategies used to manage this uncertainty are presented in current relevant literature (Figure 1).

Framing the problem of opportunity development

Opportunity exploitation	Innovation opportunity development	
Level of uncertainty where predicting is feasible	High level of uncertainty where predicting isn't feasible	
Recognition Realist & Planning view	Discovery Realist & Adaptive view	Creation Constructionist view
Planning & Implementation	Action, Search and Experimenting	

Figure 1 - Framing the problem of opportunity development

2.1. Opportunity Development- From idea to business concept

2.1.1. The fuzzy front end of innovation and the Startup phase of a new venture

In innovation management the innovation process is often divided into three phases: front-end phase, development phase and commercialization phase (Buckler, 1997; Koen et al., 2001). The first phase is also often described as fuzzy front end of innovation, to highlight the nature of the development where there are many unknown factors and even the goals or means of the work might be unclear (Kim & Wilemon, 2002; Koen et al., 2001). Previous research implies that improving these front-end activities could provide significant advantages (Koen et al., 2001), as there is much more space for change in the concept (Khurana & Rosenthal, 1998).

There are many possible explanations to why high novelty innovations lead to difficulties in existing organizations, for example path dependency (March, 1991; Teece, 2007), core rigidities (Leonard-Barton, 1992) and dealing with uncertainty (Wiltbank, Dew, & Read, 2006). Uncertainty provides an interesting lens through which to look at the problem,

because it seems that entrepreneurs have a different way for acting under uncertainty, when compared to managers of established organizations (Dew, Read, Sarasvathy, & Wiltbank, 2009; Sarasvathy & Dew, 2005a; Sarasvathy, 1998).

Moenaert, De Meyer, Souder and Deschoolmeester (1990) suggest that the key task during the front end –phase is to reduce uncertainty (Figure 2)(Moenaert & Souder, 1990). The management of uncertainty is one key element binding innovation management to entrepreneurship, because the question of where innovation opportunities come from is also one of the key research fields of entrepreneurship (Alvarez, Barney, & Young, 2010; Sarasvathy & Dew, 2005b).



Figure 2 -Opportunity development and uncertainty (Moenaert & Souder, 1990)

We can use a simple matrix (Figure 3) to understand how new opportunities can be approached and then exploited. The discovery or creation of an opportunity can either happen inside an existing organization, or outside by an independent individual. Then again this opportunity can be taken forward either by the organization, or by the individual (Sarasvathy, Dew, Velamuri, & Venkataraman, 2010). The matrix bridges the entrepreneurial opportunity with opportunity development inside established organizations. It also shows the four simplified options for turning an innovation opportunity into a business.

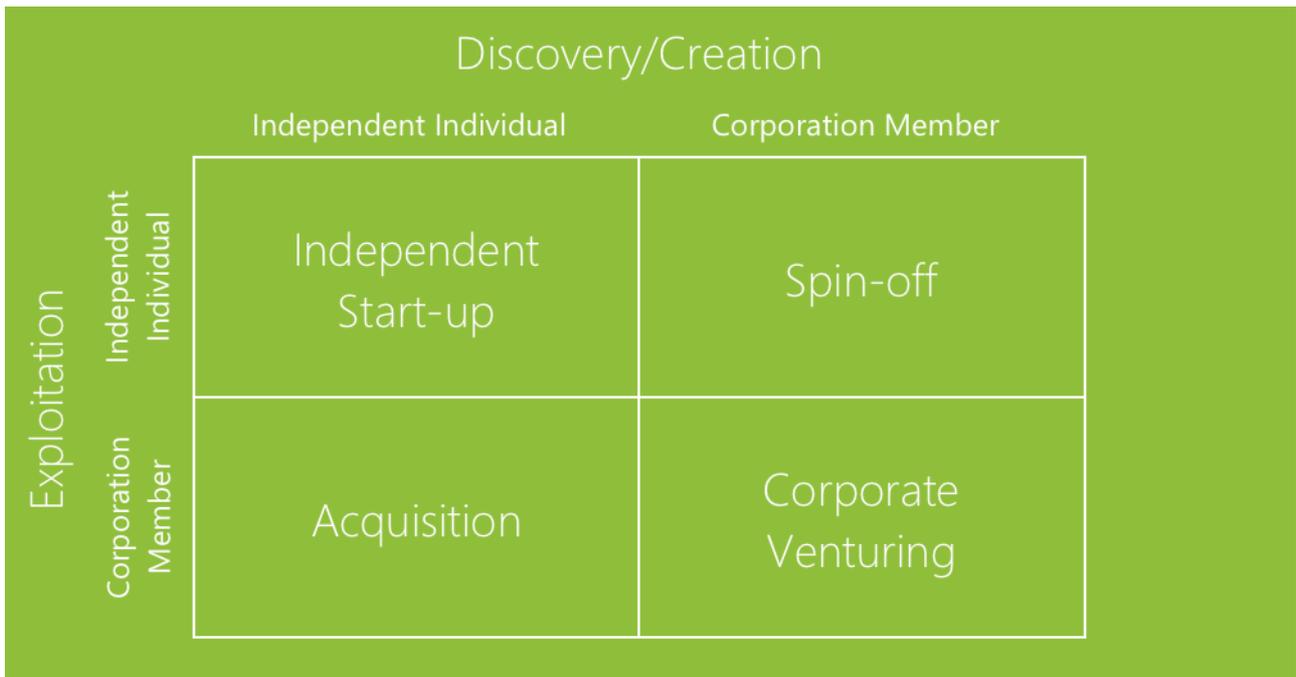


Figure 3 -Types of entrepreneurial efforts (Sarasvathy et al., 2010)

2.1.2. Opportunity development and entrepreneurial process models

Opportunity is a key theme of entrepreneurship research (Short, Ketchen, Shook, & Ireland, 2009). According to Sarasvathy and Venkataraman (2001) an entrepreneurial opportunity consists of four elements: (1) New ideas or innovations; with (2) one or more ends, which are either subjective aspirations or objective goals. (3) Beliefs about things favourable to the achievement of those ends and (4) possible implementations of those ends through the creation of new economic artefacts. In other words, entrepreneurial opportunity consists of a set of ideas, beliefs and actions that enable the creation of future goods and services in the absence of current markets for them (Venkataraman, 1997).

The opportunity development process can be seen as a part of the entrepreneurial process, where opportunity discovery precedes the exploitation of the opportunity (Shane & Venkataraman, 2000). Bhave (1994) presents a process model of entrepreneurial venture creation (Figure 4) which highlights the opportunity recognition sequences (Bhave, 1994). Bhave (1994) proposes that there are two distinct ways that venture creation can be initiated. The recognition of the opportunity can be externally stimulated. If the future entrepreneurs first recognize a need, the opportunity is internally stimulated. (Bhave, 1994) In other words Bahne's model depicts venture creation as a linear process, where the entrepreneurs proceed from *opportunity recognition*, to *selection* and finally to *commitment to physical creation*. This sequential order of things might not be as clear, when we consider development of highly novel opportunities. When making sense of the potential opportunity and forming commitments to explore it further, entrepreneurs don't yet know, what the exact opportunity is and how to exploit it. Only afterwards does the feasibility of the idea become clear (Miller, 2007)

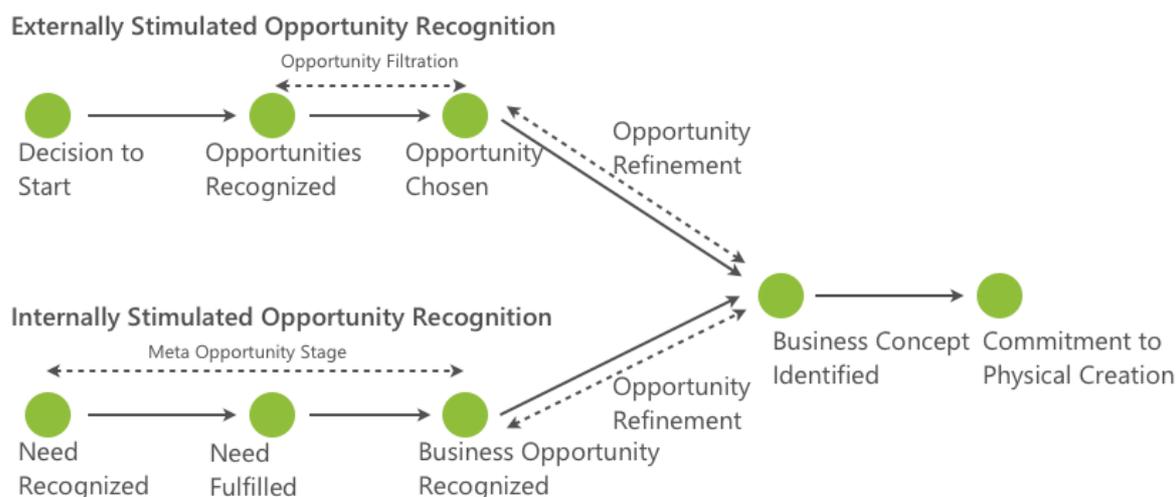


Figure 4 -Opportunity recognition sequences in entrepreneurial venture creation (Bhave, 1994)

It takes a certain, case-specific, amount of time for the opportunity to become clearer. The main sources of uncertainty are dealt with, allowing the company to step out of the fuzzy early development – phase into a more stabilized phase. When this happens, the highly refined tools of management and business start to make sense. In this phase of venture development there are less conflicts which arise from the unplannable nature of the phenomenon (Wiltbank et al., 2006). This should also make the acquiring of resources easier (Baker & Nelson, 2005). When a venture manages to collect significant investment, the stage of early development has ended. Investors then signal that the risk profile of the venture has lowered, to a level where the future earnings of the company can be valued and the valuation is higher than the risk inherit in the opportunity (Sarasvathy, 2009). Many ventures fail to reach this level and fade out. However, some will always succeed and prove that the search was worth the effort.

2.2. Managing uncertainty and complexity

2.2.1. Uncertainty and complexity in innovation

Strategic management literature focuses on two distinctive strategies of managing the unknown: planning and learning (Brews & Hunt, 1999). These two schools of thought differ in their outlook on whether it is better to use rigid plans with predefined goals (Chaffee, 1985) or to leave the means and ends open, and learn during implementation (Mintzberg, 1990). In other words, we can either build capabilities to predict the future better (planning school) or adapt to a changing environment (adaptive school)(Wiltbank et al., 2006).

The usefulness of trying to predict the future relies heavily on the nature of uncertainty (Sarasvathy & Dew, 2005a). There are many categorizations of uncertainty that organizations face (Samson, Reneke, & Wiecek, 2009). The classical categorization of Frank Knight (1921) provides an interesting approach for understanding uncertainty in opportunity development (Sarasvathy et al., 2010). Knight distinguishes between three types of uncertainties: 1.) known distribution with unknown draws (probability), 2.) unknown distributions with

unknown draws (statistical probability), and 3.) non-existent distributions (immeasurable uncertainty or Knightian uncertainty) (Dew, Read, Sarasvathy, & Wiltbank, 2008; Knight, 1921).

As long as the uncertainty of the environment is in the first two aforementioned categories, attempts to predict it might provide valuable. If the uncertainty is Knightian, the attempts to control it by predicting will be useless. (Wiltbank et al., 2006) Knight conceptualized that in situations relevant to business decision-making the statistical probability and Knightian uncertainty are two extremes of a continuum (Figure 5) (Knight, 1921, pp. 225–226; Miller, 2007). When acting under uncertainty, which follows statistical probability, one can be confident that the observed probabilities approach the true probabilities as the sample size increases. In the opposite end of the continuum no such confidence is possible, as it is impossible to classify states. (Miller, 2007)

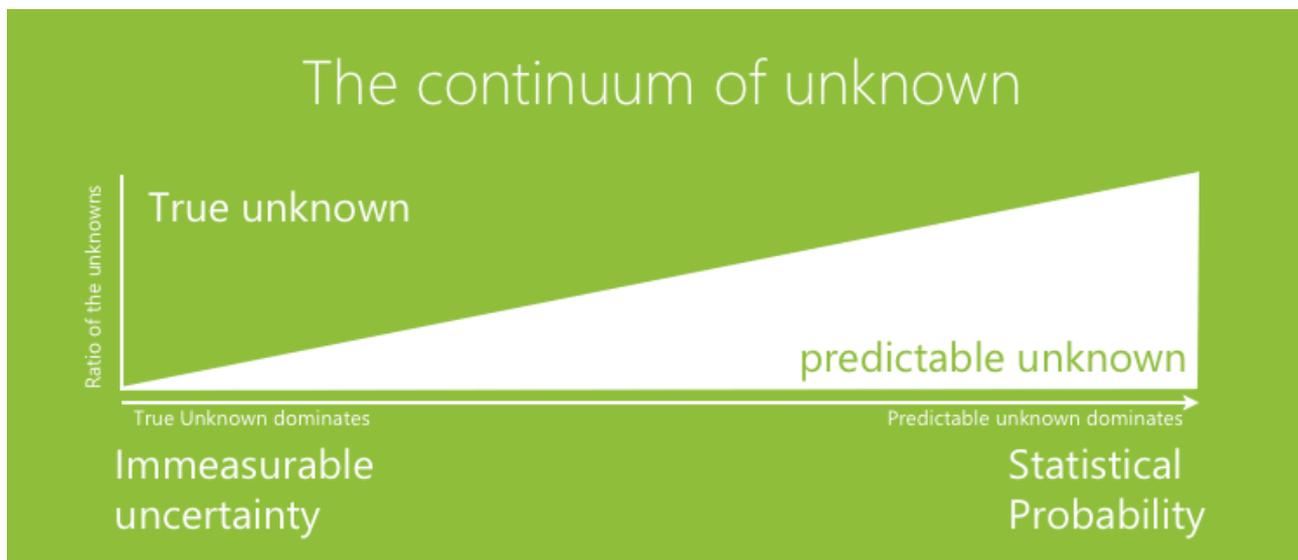


Figure 5 –Ration between true unknown and predictable unknown form the continuum of unknown (Knight, 1921; Wiltbank et al., 2006)

The concept of wicked problems attempts to tackle similar phenomenon of problems that are difficult to manage and predict, from a strategy perspective (Camillus, 2008; Rittel & Webber, 1973). The reasoning behind wicked problems does not arise from philosophical conceptualizations of risks and uncertainty, but from an empirical notion that many problems are complex and systemic in nature (Camillus, 2008). According to Camillus (2008), wicked problems can be distinguished from hard but ordinary problems, by going through a list of ten properties presented by Rittel and Webber (1973)(Figure 6). The problem can be wicked even if only some of these properties apply.

A more systematic and widely discussed approach to a similar frame is the complex adaptive systems (CAS) theory (P. Anderson, 1999; Meso & Jain, 2006). CAS research is highly multidisciplinary and it is hard to come by a single definition (Meso & Jain, 2006). Nevertheless complex adaptive systems have many features similar to the wicked problems. The complexity does not arise only from a large sum of elements, but from their non-linear, rich relationships and feedback loops, and from the openness of the system (P. Anderson, 1999). CAS theory has been linked to organizational science (P. Anderson, 1999) and agile software development (Meso & Jain, 2006). It provides an interesting toolset for modelling

complex and dynamic problems like opportunity development, but for now it only works as help in describing the nature of problems. Highly uncertain and complex situations need their own set of tools, that don't rely only on planning and predicting the future (Sarasvathy & Dew, 2005a).

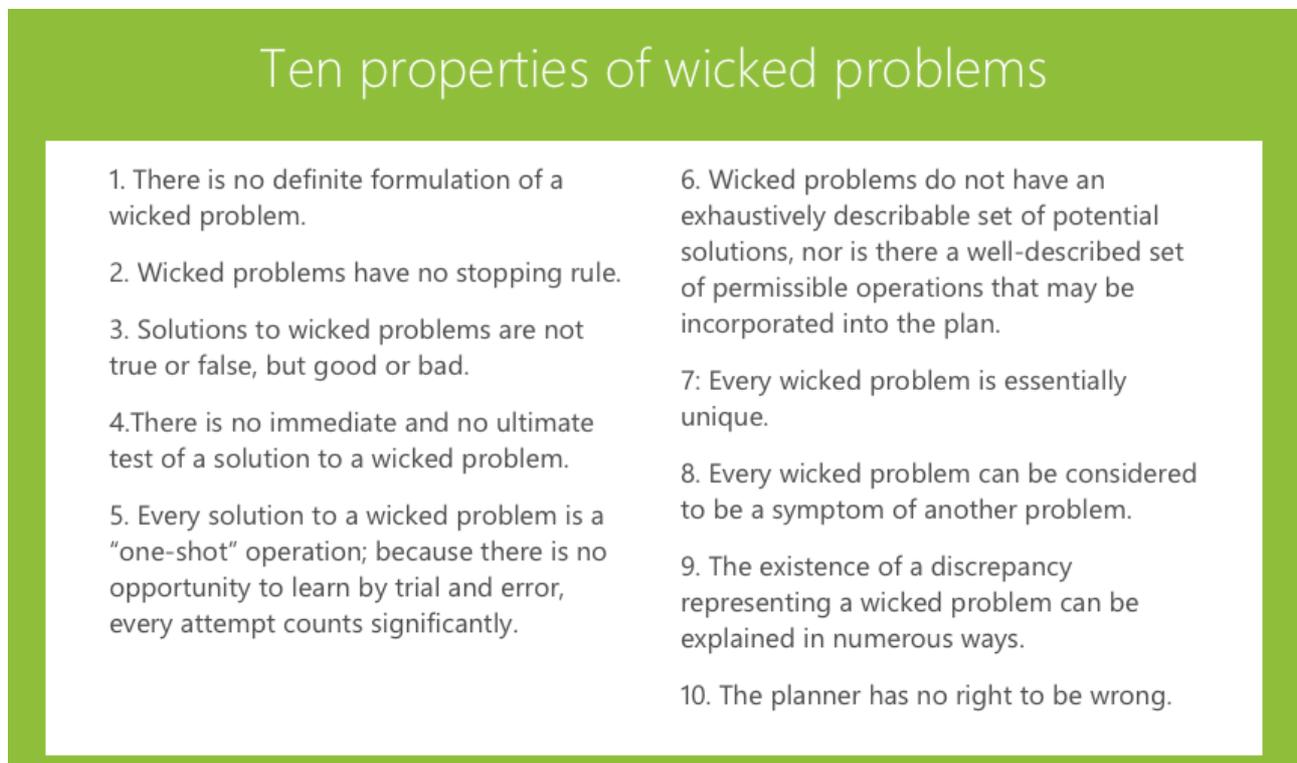


Figure 6 - Ten properties of wicked problems (Camillus, 2008; Rittel & Webber, 1973)

2.2.2. Traditional innovation management and uncertainty

In innovation management literature the key way of dealing with uncertainty is by emphasizing planning and control (Kim & Wilemon, 2002; Koen et al., 2001; Moenaert, Souder, De Meyer, & Deschoolmeester, 1994; Shapero, 1985). The problem of control and time-pressure affecting creativity and originality is also well documented (Amabile, Hadley, & Kramer, 2002; Redmond, Mumford, & Teach, 1993). This leads us to the key dilemma of front-end innovation management. A well-defined innovation process correlates with successful new development projects, but too much control will result in problems in innovating creative and original concepts (Cooper, 2008). Methods like the Stage Gate model (Cooper, 2000) seem to work well when the development process has established itself, but researchers haven't yet agreed on the best practices for front-end development (Koen et al., 2001).

Uncertainty in product development can be conceptualized into a matrix, where uncertainty about the means and ends forms the axis (Figure 7) (Pearson, 1990). The framework highlights, how the nature of uncertainty can be different under varying conditions and should be also managed accordingly (Raz, Shenhar, & Dvir, 2002).

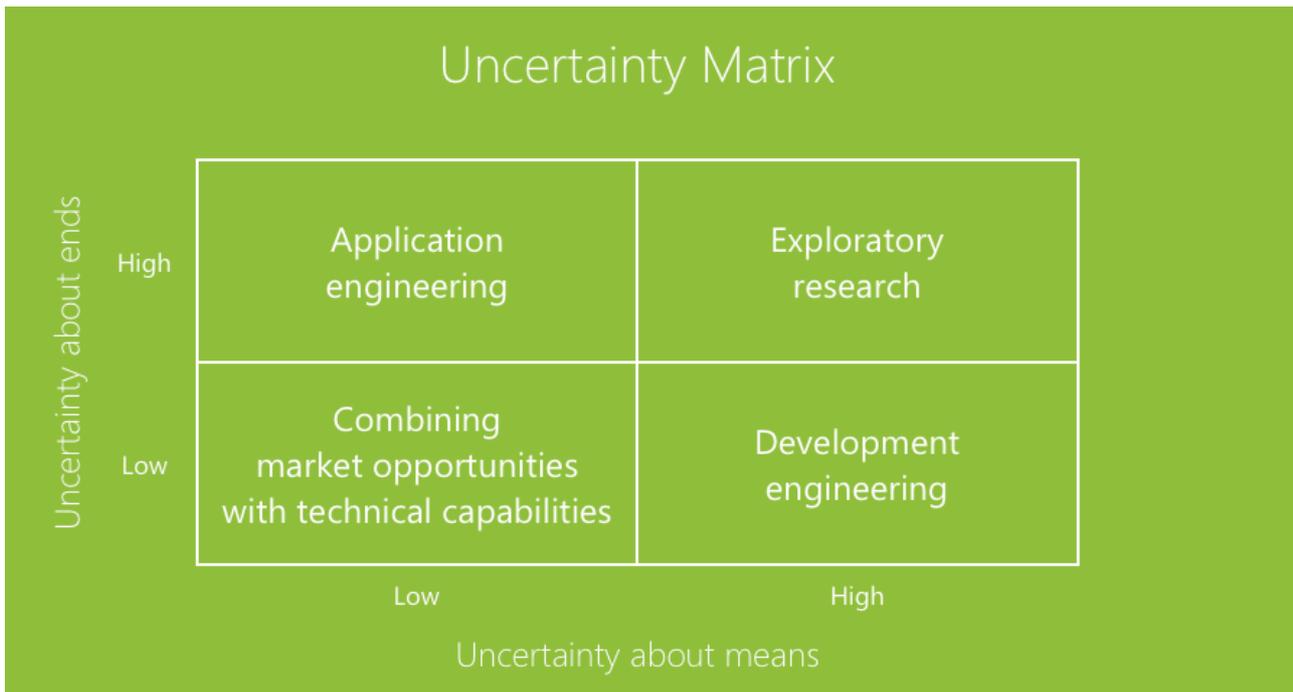


Figure 7 - Uncertainty matrix (Adopted from: Pearson, 1990)

There have been attempts in previous research to formalize the front-end phase of innovation management. Often the language and tools of the front-end are inherited from product development, which focuses on controlling the process. For example, innovation management has traditionally emphasized linear process models. (Koen et al., 2001) In real world, there is looping and iterations (Cooper, 2008), and the steps of the process can not be as clearly separated or as clearly sequential, as shown in the models (J. Tidd, Bessant, & Pavitt, 2005).

Methods used in controlling and measuring investments drive the innovation activities toward the planning school of management. Popular methods like net present value (NPV) and return on investment (ROI), assume that we have the right information about the upcoming in order to predict the future cash flows correctly. The risk inherent in the project is then valued by discounting future cash flows heavily (Van Putten & MacMillan, 2004).

The adaptive school is more noticeable in the front-end of innovation (Carolina & Hill, 1999), where uncertainty is high (Koen et al., 2001). For example experimentation and prototypes build knowledge iteratively and allow adaptive changes during the development (Koen et al., 2001).

2.2.3. Experimenting –Small steps toward unknown

Rapid experimentation has gained traction recently in management and business literature (E. T. Anderson & Simester, 2011; Davenport, 2009; Hassi & Box, 2012; Liedtka, 2011). The goal is to make “fast-failure” (Smith, 1999) possible, leading to a more adaptive and less risky development.

Prototypes can be used in different phases of idea development. Explorative prototypes are meant to provide ideas, and allow searching and learning outside predefined space. Evaluation prototypes are meant for more tightly defined problems, and for testing existing assumptions. (Blomkvist, 2011) This classification fits well with the learning and planning schools’ approaches to innovation. Explorative prototyping is not only suitable for the searching of value, but for actively creating new customer value and new markets as well

(Chesbrough, 2010; Sarasvathy, 1998). This *creation approach* is different from the learning and adopting schools from the point of view of control. Instead of predicting what customers or markets want by planning or learning, creators seek to influence the perceptions of the customers (Storbacka & Nenonen, 2011).

The creation approach does not imply that organizations should forcefully persuade the customers in to wanting what the company offers, but to actively participate in the shaping of the markets (Storbacka & Nenonen, 2011). These creation activities provide a true customer centric view to innovation. Actors need not only to watch and understand their customers, but also actively solve their problems together with them, in this way creating space for their offerings. This provides a strong reason for investing in experimenting activities. Although the concept deals with large established companies, the creation approach also has lot in common with the concept of market driving organizations (Schindehutte, Morris, & Kocak, 2008). Market drivers take a similarly active stance toward the market and introduce disruptive offerings (Kumar, Scheer, & Kotler, 2000).

Tuulenmäki and Välikangas (2011) propose that the whole development process, not only the front-end phase should be formed around experiments. Following a similar logic than the lean software development process (Abrahamsson, Warsta, Siponen, & Ronkainen, 2003) the goal is to build and launch first version of an idea as soon as possible to start learning from real customers and real execution challenges. (Tuulenmäki & Välikangas, 2011)

The execution innovation model follows a learning cycle (**Error! Reference source not found.**) where initial broad opportunity idea leads to first experimentation ideas and these ideas are then experimented. Only through these experiments we can find execution ideas that again refine the opportunity (Tuulenmäki & Välikangas, 2011).

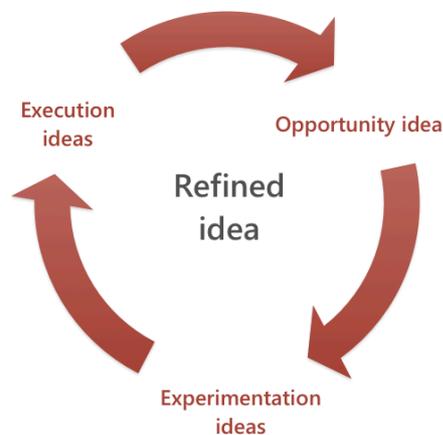


Figure 8 -Execution innovation model adapted from (Tuulenmäki & Välikangas, 2011)

2.3. Broader view of managing uncertainty

Planning and adaptive schools have both put the emphasis on the positioning of the organization within an environment that is given. How to handle this given environment is the key difference. These approaches take as an underlying assumption, that the environment is something exogenous, that the organization can't control. Or that the only way to control actions in the environment, is to predict the consequences of these actions (Wiltbank et al., 2006). When predicting the future is not possible the only way forward is becoming adaptive and reacting to the environment.

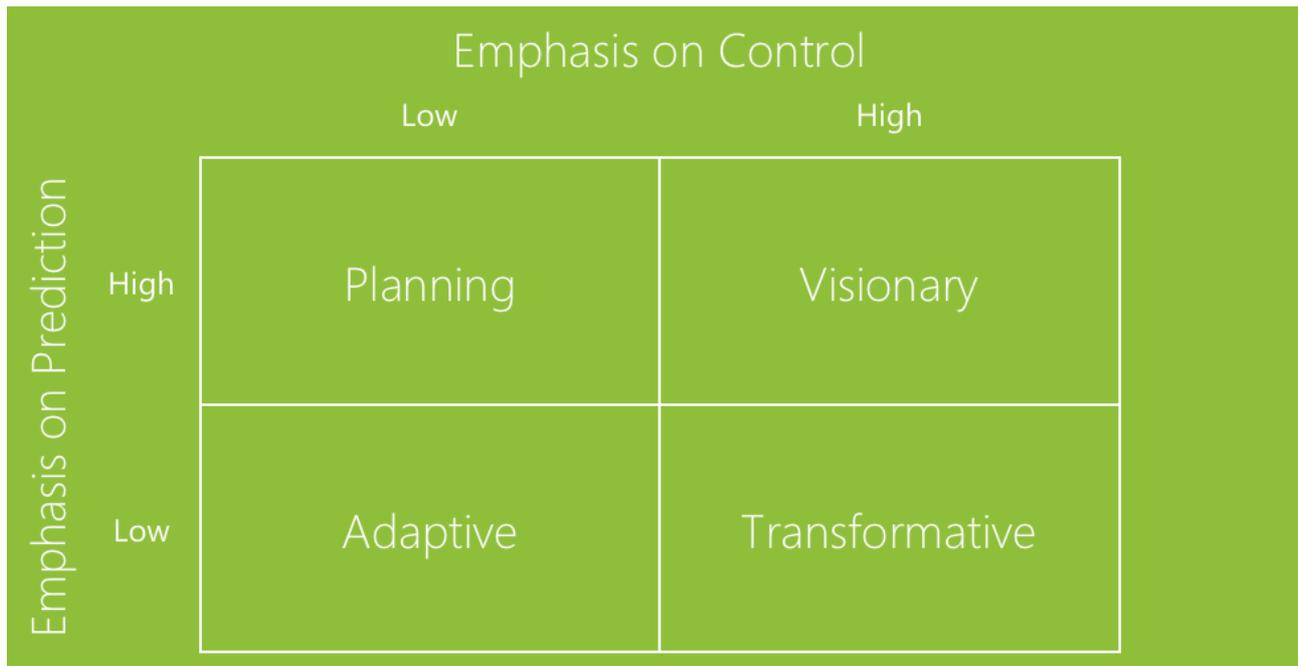


Figure 9 -Framework for prediction and control (Wiltbank et al., 2006)

Wiltbank, Dew and Read (2006) form another category of situational control by making a distinction between emphasis on prediction and emphasis on control (Figure 9). In planning and adopting approaches the underlying logic states, that individuals can control their environment only if they can predict how their actions influence the environment (Miller, 2007). If we focus on human action as a primary factor in the creation of reality, following the constructivist ontology, we can conceptualize control and prediction separately (Wiltbank et al., 2006). This brings us two new approaches labelled *visionary* and *transformative*. In visionary approach it is feasible to predict the future. The actor can then try to shape and influence the environment to create a valuable future. In transformative approach the emphasis is still on controlling and shaping the environment. However, the emphasis on prediction is low. The logic in transformative approach asks for active environment shaping, even when it is not feasible to try to predict how this shaping will effect the environment. (Wiltbank et al., 2006)

2.3.1. Managing uncertainty and complexity –Opportunity development view

The academic research especially in the fields of management and strategic innovation follows the neoclassical conceptualization of risk and rationality. This conceptualization is well suited for situations where it is reasonable assume that the future value of the opportunity can be estimated (Miller, 2007; Wiltbank et al., 2006). In the field of opportunity development (Figure 10) this view would lead us conceptualize the phase as *opportunity recognition*. In opportunity recognition, the environment is imposed on us and we attempt to recognize and exploit opportunities before others see them (Miller, 2007). Following the conceptualization of Miller (2007) and Wiltbank, Dew and Read (2006) we should expand our thinking about handling uncertainty in situations where the predictions of the future aren't feasible or possible. In these cases we can either conceptualize that, opportunities are

discovered (*opportunity discovery*) from relatively unknown environment by actively searching experientially, or opportunities are created (*opportunity creation*) from an uncontrollable environment, which is constructed by the actors (Miller, 2007).



Figure 10 -The continuum of unknown and opportunity development. Adapted from (Knight, 1921; Miller, 2007; Sarasvathy et al., 2010).

2.4. Opportunity Discovery and Opportunity Creation –The two theories of opportunity development under high uncertainty

When focusing on high novelty innovations, we step to the difficult waters of high uncertainty where it is reasonable to assume that future value of opportunities is impossible or at least highly laborious to predict or estimate. Traditional management of the innovation process leans heavily on the expected future returns of opportunities. In contrast the basic characteristic of opportunity discovery and opportunity creation frameworks is that valuing these opportunities is not feasible or that it is impossible. The opportunity discovery framework is closer to the traditional views of management, as it is still assumed that there is a world where the opportunities are waiting to be discovered (Miller, 2007). It is also argued, that the level of uncertainty makes it impossible to plan early opportunity development sufficiently to use planning as the main controlling mechanism (Alvarez & Barney, 2007). Opportunity creation framework takes a stronger stance against planning, as it is assumed that it is not reasonable to think that there are ready-made opportunities waiting to be discovered. Instead it is more valuable to assume that opportunities are actively created together with different stakeholders (Sarasvathy & Dew, 2005b).

2.5. Opportunity discovery

Opportunity discovery is essentially an adaptation process; the entrepreneur needs to re-adjust his objectives during the process and assess made discoveries retrospectively. This adaptable discovery process can be conceptualized as exploratory searching (Miller, 2007).

2.5.1. Learning about the opportunity

When aiming to discover opportunities from relatively unknown environment, the activity entrepreneurs take can be defined as *searching* (Miller, 2007). Searching is an active learning process, where the entrepreneur combines new information about the environment with his

existing understanding (Corbett, 2005). This active learning process can be better understood using the *experiential learning theory* (Corbett, 2005; D. A. Kolb, 1984). Experiential learning is an iterative process where the understanding gathered from the markets leads to abstract conceptualization of the phenomenon, and helps us to learn more from future experiences (D. A. Kolb, 1984). Entrepreneurs actively engage themselves with the market in order to gather understanding, conduct experiments and create prototypes and thus enable richer learning (Corbett, 2005).

Experiential learning

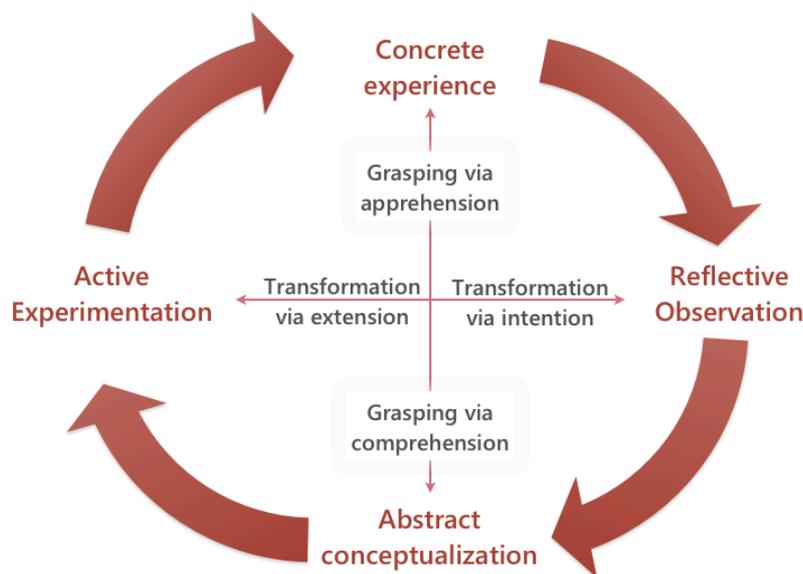


Figure 11 -Experiential learning (D. Kolb, Boyatzis, & Mainemelis, 2000)

According to the experiential learning theory learning happens in four stages: experimentation, experience, reflective observation and abstract conceptualization (Figure 11). These conceptualizations are then used to construct new experiments and the cycle begins again. (D. A. Kolb, 1984; D. Kolb et al., 2000)

The process of searching to overcome the unknown relies on the past experiences of the searcher. When the search happens in the proximity of old knowledge, more direct analogies can be used from the past to make the search more efficient (Gavetti, Levinthal, & Rivkin, 2005; Miller, 2007). Local learning is faster and easier, but might provide inferior results compared to results from a broader, more effective learning (Levinthal, 1997). Learner needs to balance exploration and exploitation of past knowledge in order to find appropriate answers. Past successes and failures in searching lower or higher the aspirations of the learner and this way guide the amount of exploration (Miller, 2007).

2.5.2. Limiting the risks of the development

Conventional valuation methods like discounted cash flow (DCF) analysis are widely used in managing innovation, and the problems they cause are also well known (Christensen & Stephen, n.d.; Dodgson, Gann, & Salter, 2001). When long-spanning opportunities are viewed through traditional financial methods, the downside risk involved seems huge (Figure 12). In reality most opportunities provide many places where the project can be aborted, if risks are realised (Mcgrath, 1999; Van Putten & MacMillan, 2004). If this characteristic is taken into account, projected risks and cash flows need to be analysed differently.

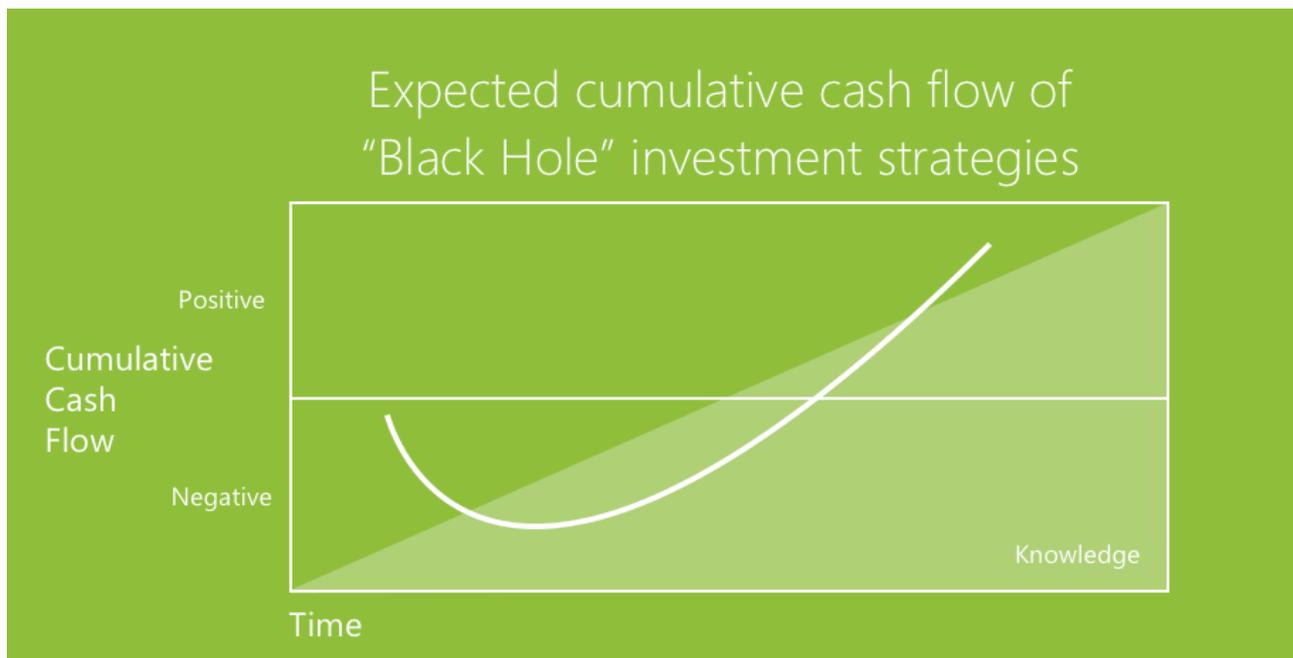


Figure 12 - Expected cumulative cash flow of "Black Hole" investment strategies. Adapted from (McGrath, 2010)

In *real options framework* investments option value is recognized similarly than in financial options (Dixit & Pindyck, 1994). Like financial options, the investment in to a real option conveys the opportunity to continue investing in an asset, but not the obligation to do so (Dixit & Pindyck, 1994; Mcgrath, 1999). The framework states that investments should be staged so that under poor conditions the losses can be contained, while maintaining the option to invest more, if conditions prove positive (Figure 13). Dealing with investments in uncertain environments using the real options framework provides advantages compared to conventional methods, as the staging of investments minimizes the downside risk while maintaining potential for upside events. (Dixit & Pindyck, 1994; McGrath, 2010)

In conventional investment valuation practice the upside and downside risks are dealt with as one, which leads to minimizing volatility being the only rational option (Van Putten & MacMillan, 2004). According to financial options theory, when the volatility of an underlying asset increases, the value of the option increases as the upside potential grows, but potential loss stays the same (Fama & Miller, 1972). The same logic holds true in real options framework: the upside becomes greater without influencing significantly the potential losses (Mcgrath, 1999).

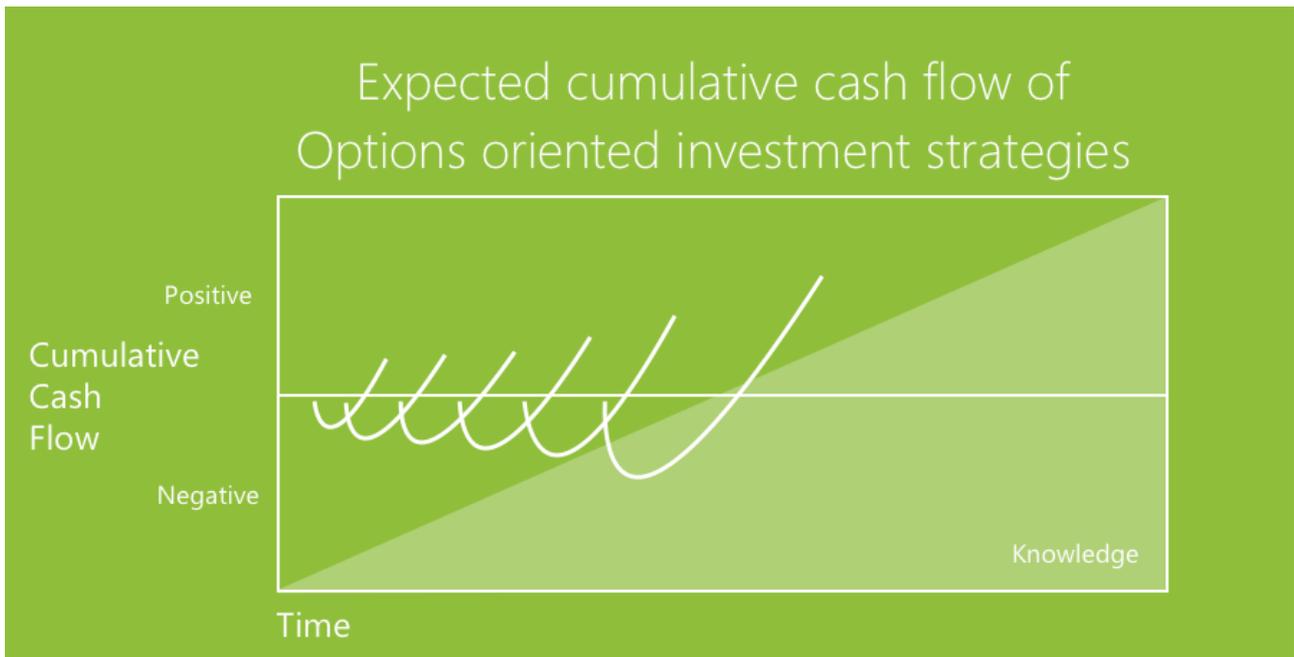


Figure 13 - Expected cumulative cash flow of Options oriented investment strategies. Adapted from (McGrath, 2010)

There are five basic sources of flexibility that allow the real option logic to work in innovation setting. A *defer option* means that it is possible to wait until more information has become available. An *abandonment option* refers to the possibility to stage the investment, so that the decision to abort or go to the next stage can be made using the most current information. An *expansion or contraction option* means that there is a possibility to adjust the scale of the investment, depending on new information. A *switching option* allows the change of the mode of operation of the investment to fit the new situation. (Huchzermeier & Loch, 2001; Trigeorgis, 1996)

Following the logic of real options reasoning, opportunity development should be staged and planned, so that the losses can be contained while holding the five flexibility options to further development, if conditions prove valuable. This reasoning suggests that it is not a key issue to avoid failure, but to manage the cost of failure, while preserving access to attractive opportunities (Mcgrath, 1999). Even failed experiments can be valued positively, because they open up and hold options for further learning with significant upside potential (Mcgrath, 1999). One has to be careful with real options reasoning, because if used too simplistically, it makes it is easy to overvalue high risk opportunities (Van Putten & MacMillan, 2004).

Van Putten and MacMillan (2004) develop the real options method further by some adjustments to the methodology and by combining it with conventional discounted cash flow analysis. They argue that there is an "Option Zone" (Figure 14) in growth projects, where combination of real option method and DCF provides best results. The total project value is then calculated by summing the adjusted option value to the net present value and the abandonment value of the project. Adjusted option value takes into account project cost volatility and revenue volatility separately. Abandonment value is an estimate of the amount of investment that can be recouped in the case of failure. (Van Putten & MacMillan, 2004)

Opportunity Development and Valuation of Opportunities

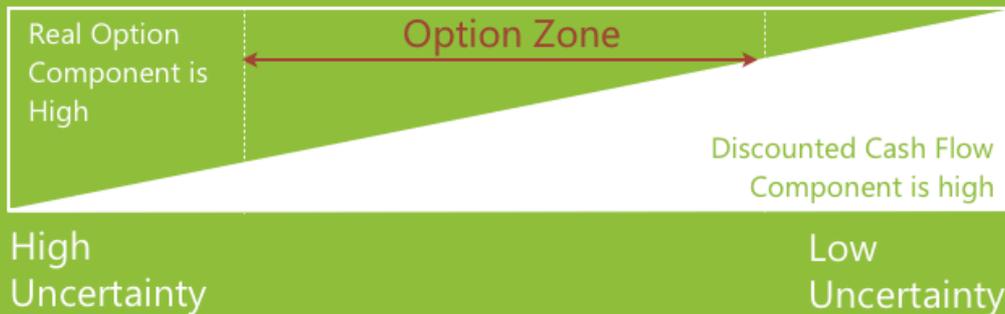


Figure 14 - Valuing opportunities by combining DCF and Real Option methods (Van Putten & MacMillan, 2004)

These kinds of methods and combinations are especially well suited for opportunity discovery frame. Real options reasoning is highlighted for example in *discovery-driven planning* as one of the key logics (see e.g. (McGrath & MacMillan, 1995; McGrath, 2010)). In highly uncertain situations it is not feasible to assume that good number estimates would be available for effectively using the financial methods (Van Putten & MacMillan, 2004).

Under the opportunity creation logic it is assumed that there is too little knowledge beforehand to use any planning method as a way of controlling the development (Miller, 2007). This makes valuing opportunities beforehand against the ontology of the theory (Alvarez & Barney, 2007). Maybe the main advantage that can be gained from using real options logic in high uncertainty situations is not the method itself, but the notion that the negative effects of risks aren't perfectly bound to the upside potential. Using small experiments and actions, downside risks can be kept to a minimum in early opportunity development (Chesbrough, 2010; Ries, 2011; Tuulenmäki & Välikangas, 2011).

2.6. Opportunity Creation

High level of risk and uncertainty dictates everything done in the early stages of opportunity development. To handle this uncertainty new ventures need to be highly adaptable. This doesn't mean that the new venture development would be directionless activity. In fact the opposite is true. New ventures need to manage and handle the high uncertainty by either acting systematically, and constantly validating assumptions, in order to bring structure to the unknown (Saravathy et al., 2010), or by acting intensively together with stakeholders to make sense of the unknown (Saravathy & Dew, 2005a).

Early phases of a new venture are about refining the business idea, but also about building the resource base of the new company (Brush, Greene, Hart, & Haller, 2001). Attracting resources is argued to be the greatest challenge faced by entrepreneurs (Brush et al., 2001). If we see early venture development from this perspective, the key activity has to be resource

acquiring. It also effects the development of the idea, as entrepreneurs are often willing to adjust the idea, in order to gain access to vital resources like partnerships or financing (Sarasvathy, 1998).

If opportunity discovery focuses on the experience of the entrepreneur, opportunity creation places the focus on his identity. According to Sarasvathy (2001) experienced entrepreneurs use *effectual reasoning*, which provides a systematic way of going forward under high uncertainty. The idea behind the theory of effectuation is that it is possible to go forward without knowledge of the exact goals by basing decisions on maximizing effects instead of goals (Sarasvathy, 1998).

According to the theory of effectuation, the innovation opportunity is formed in an effectual process that can be visualized as a cycle (Figure 15). Entrepreneur starts the process by pondering his identity and deciding on possible things he can do. This leads to a realization of possible broad goals. Then the entrepreneur aims for largest possible effect that takes him closer to this broad goal. Entrepreneur then conducts the action or interaction that he thinks will cause the largest effect. The action, or interaction, provides the entrepreneur with a stronger sense of the goal and possibly additional resources to get there. Iteratively the entrepreneur gathers more resources and momentum, and simultaneously the goal is refined and negotiated to please new stakeholders. (Sarasvathy, 2001)

According to effectual logic, the future isn't controlled by predicting but by actively creating and participating in to the forming of it (Sarasvathy & Dew, 2005b). Actions are considered through identity and not only through consequences. This allows entrepreneurs to act even when consequences of their actions are unknown.(Sarasvathy & Dew, 2005a)



Figure 15 -Effectual cycle (Adopted from Sarasvathy, 2001)

This seemingly small adjustment to the classical rational goal-based approach has a large influence. When entrepreneurs use effectual logic, they open their company toward the market around it, by actively redefining the opportunity together with the external stakeholders (Sarasvathy, 1998). This process of seeking maximal effects makes it possible to create totally new markets (Dew et al., 2008).

Effectual logic is especially useful in situations of high uncertainty as it provides a way to navigate and control a situation that would other ways be uncontrollable (Wiltbank et al., 2006). In many situations the future might be predictable, but the actors don't have the means or resources necessary for the extensive predicting (Sarasvathy, 2001). In these situations the effectual logic is as useful.

2.7. Conclusions of the literature review

In this literature review I have described how early opportunity development of novel ideas is a distinctive phenomenon, compared to the highly rationalized and well-defined world of established organizations and ideas. I have also sought answers to the difficult question of how to operate in this kind of environment. I started the examination from a philosophical level and then proceeded towards more practical points of view.

I have grounded the examination of opportunity development (Figure 16) to uncertainty. The stage of the idea leads to high level of uncertainty, we simply don't yet know about the idea enough. Especially in the case of new ventures we also don't have enough resources to deal with all possible sources of uncertainty and complexity. Resource scarcity and uncertainty logically follow each other. As willingness to invest time or money in something is tied to the riskiness of the investment.

Opportunity development from discovery and creation perspectives.

Innovation opportunity development		
High level of uncertainty where predicting isn't feasible		Wiltbank, R., Dew, N., & Read, S. (2006); Miller, K. D. (2007); Sarasvathy SD, Dew N, Velamuri SR, Venkataraman S. (2003).
Discovery Realist & Adaptive view	Creation Constructionist view	
Action, Search and Experimenting		Miller, K. D. (2007); Sarasvathy, S. D., & Dew, N. (2005); Mcgrath, R. G., & MacMillan, I. C. (1995).
Adaptation	Effectuation	
Assumptions about the future are tested through experimentation	Future is created through action	Mcgrath, R. G., & MacMillan, I. C. (1995); Van Putten, A. B., & MacMillan, I. C. (2004); Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009).
focus on the idea that develops through experiments	focus on the commitments formed through interaction	
Managed using a set of stages to adapt to new knowledge.	Resource acquisition and identity gives direction.	

Figure 16 -Opportunity development from discovery and creation perspectives

Most tools and practices of innovation management have an underlying assumption that the level of uncertainty is sufficiently low, so that reasonable estimates of the future can be made. When we then try to use these tools in early opportunity development, it easily leads to difficulties and discomfort (Sarasvathy & Dew, 2005a). It is not easy to trust on plans that have long list of untested assumptions behind them.

Acting without a reasonable understanding of the consequences of the action defies the common understanding of rational action (Sarasvathy & Dew, 2005a). I divided the possible solutions under two headings. In opportunity discovery framework we can make small steps toward a highly uncertain goal, if we adaptively adjust the steps and the goal according to the new knowledge. In opportunity creation framework the focus isn't on the goal of an action, but on the action it self (Dew et al., 2008). By aiming to create as big of an effect as possible for the action, and not focusing that much on the overall goal, we can accumulate resources and eventually create the goal together with all the stakeholders.

Both of these frameworks rely heavily on the individual and his past experiences, however some guidelines can be made that seem to exist discretely from the performer. In discovery framework the idea and its development are in the focus (Miller, 2007) and in the creation framework the idea and its development are more the result of the process and the focus is in forming commitments (Dew et al., 2009). In other words if you create the network of stakeholders and commitments, the opportunity follows. These concepts can be dealt with separately, while the true insight is that they are two sides of the same coin. Discovery framework focuses on the idea and creation framework to the resource accumulation and identity of the creator (Wiltbank et al., 2006). The idea is the device with which to get resources, but resources also shape the idea.

In practice these two approaches stress that we should make fast, iterative steps forward. From discovery perspective this action can be conceptualized as searching or learning through experimentation. Creation perspective focuses on fast iterative interaction with possible stakeholders, in order to make maximum effect. As resources are scarce the idea is to use as little as possible. This can be conceptualized into a rule of affordable loss, where the downside potential or risk is estimated (Sarasvathy & Dew, 2005a). Using the concept of real options, the idea is to maximize expected upside potential, while at the same time minimizing the downside risk by phasing the investments (Mcgrath, 1999).

In the next chapter I will empirically examine early opportunity development under high uncertainty.

My research questions are:

- How do early stage start-up entrepreneurs describe the central activities in the early phases of their venture?
- What common themes arise from these descriptions?

The frameworks and theories of opportunity development presented in the literature review are conceptual in nature and have not been examined empirically. There is also no clear understanding of relationships between the frameworks of opportunity discovery and opportunity creation (Sarasvathy et al., 2010).

3. METHODOLOGY

This chapter will focus on the way the empirical research was conducted. The research method, research philosophy and the subjects will be described.

Research started in the spring 2012 with the interest in utilizing market knowledge in front-end innovation and entrepreneurship. I started the research process by conducting an initial literature review. I also conducted the first test interview. My interest started to focus on the opportunity development view and the action focused based perspective started to emerge. I conducted three more interviews and carried on the initial coding of the data. I strengthened my empirical data by conducting two more interviews in the spring of 2013.

3.1. Research approach

In order to dig deeply in to the mind-sets and attitudes of the young entrepreneurs, the research follows a qualitative research method. The qualitative approach is preferable, when in-depth information and understanding is needed (Eriksson & Kovalainen, 2008). A more explorative and phenomenological approach is also well suited, given the current understanding of the front-end activities and the nature and role of entrepreneurial opportunities (Gartner, Carter, & Hills, 2003).

Berglund (2007 pp.76) sees phenomenological approach especially suited for enriching theoretical constructs like risk and opportunity. Entrepreneurs were interviewed using semi-structured method (Bailey, 2007), which gives the researcher the possibility to benefit from the conversational setting and to react to the knowledge gained during the interviews (Hirsjärvi & Hurme, 2001; Silverman, 2006) Subjects' tendency to try to give "right answers" was eliminated as much as possible by keeping the interview topic flexible and avoiding questions that might lead to rationalizing own actions. Subjects talked relatively freely about their business idea and how it had developed. More specific questions were used to highlight themes that I had picked from the earlier interviews and from the research literature.

Subjects were first asked to describe the events and things leading to the innovation opportunity and the decision to go after it. Next they were asked to recognize important moments that had led to the development of the idea, and later more specifically about things that they felt were important to this development.

Epistemologically this research follows the essentialist/realist approach, as the focus of the study is in experiences, attitudes and meanings of the subjects and it is assumed that these can be interpreted from the answers subjects give during the semi-structured interview (Braun & Clarke, 2006).

3.2. Data gathering

The selection of interviewees draws on a purposive sampling strategy (Gartner et al., 2003). The aim of the selection was to gather a manageable and relevant group of individuals currently involved with opportunity development. Start-ups were selected as target to inspect the opportunity development in a setting with little structures and processes. This also enabled the researcher to tap into the mind-sets and attitudes of innovators, while they were simultaneously refining their idea. This was considered important, because it was feared that retrospective analysis of opportunity development might lead to artificially rationalized and narrow accounts of the phenomenon.

The participants were sampled from a population of young entrepreneurs around Helsinki region, who were active in developing their start-up companies together with their entrepreneurial team. Companies were in the early days and hadn't yet stabilized their business. However, all the companies had made commitments to develop their business idea into an offering and had formed a company or a team around the concept. All the subjects were founding members or founders of their start-up, and had been actively participating on the development of their venture.

The start-ups in question were aiming for innovative new offerings, from a new product to novel service systems. Innovativeness of their offerings implies that there is a high level of uncertainty in their business(Christensen, 1997).

3.2.1. Company Alpha

Company alpha is a young venture aiming to provide a new platform for custom food packaging. Alpha has recognized an opportunity for business, as technical development in printing and package manufacturing has opened the field for new customer segments. Alpha's innovation is in short a platform that enables new needs and new customer segments to be served.

Many business model options that Alpha is considering have a highly networked nature. Networked model brings uncertainty and complexity to their opportunity development, in addition to the uncertainty arising from new-to-the-business customers. There is also potential for competitive actions from large established players in the market.

3.2.2. Company Beta

Company Beta is also a very young venture developing a solution for communication challenges in the medical field. Beta has discovered a broad need for enhanced communication between patients and medical professionals. During the research Beta was searching for a more specific set of features for the web-based solution together with a partnering medical institution. The solution is tailored for a specific niche, where there are no current solutions or competitors.

Medical business is highly regulated and monitored, which produces risks and complexities for Beta. As the current solution is developed to answer a niche need, the future scalability and broader customer interest is also uncertain.

3.2.3. Company Gamma

Gamma is a company that has been formed around an older business idea that is now developed from new direction and with a different team. Gamma is stepping towards a broad and ambitious opportunity in personal health. The opportunity that Gamma is aiming towards is highly novel technically and from customer perspective. However, the first solution Gamma is developing, to eventually reach the goal, is more anchored to the current technology and market. The approach and interface of the first solution is nevertheless novel and innovative.

3.2.4. Company Delta

Company Delta has been around for a few years, but the company has recently made a pivotal turn toward new opportunity. Delta operates in the field of renewable energy and was pursuing an opportunity around analysing large data sets. The approach and offering was new to the world and challenged established ways of working in the traditionally conservative

energy business. The new direction utilizes some of the technical capabilities of the initial offering in a new, different market.

3.2.5. Company Epsilon

Company Epsilon was founded around a relatively simple product idea that is, however, new to the world. The product enables a totally new kind of interaction between the audience and the presenter during seminars, lectures and other public events. The invention is very different from other products that could be considered competing ones. This leads to uncertainties in business model and distribution options of Epsilon.

3.3. Data analysis

Data is analysed using *thematic analysis* method, sometimes also described under *grounded theory* method (Braun & Clarke, 2006), although in this research genuine theory development using grounded methodology is not in the scope of this study. In order to gain insights from a relatively small set of data, I refined my research questions based on both the empirical data and relevant research literature. The theoretical concepts of opportunity discovery and creation formed a philosophical background for the coding, and helped me to make sense of the rich data.

Interviews were first transcribed word-by-word into a text document and coded with interviewer prefix (I) and subject prefix (S). These raw transcriptions were then copied into a spreadsheet program for coding.

I conducted the thematic analysis, by slicing the interviewing data into short sections. I selected the meaning unit as a unit of analysis in this research. The length of the meaning unit was driven from the content, so that one unit consisted one meaningful thing and the content couldn't be meaningfully divided into smaller sections. (Braun & Clarke, 2006) After I had separated the meaning units I started the initial coding. In the coding phase I assigned a code for all the meaning units. By examining assigned codes and combining similar topics together, I started to experiment with broader themes that seemed to fit in to the data. Interviews that were done later were added to the same material and new possible combinations and structures were considered. (Braun & Clarke, 2006) Interviews were conducted in Finnish and quotations from the subjects were translated to English.

4. RESULTS OF THE RESEARCH

4.1. Broad themes: Sense-making and Gathering

Two broad themes emerged from the data and were influenced by the literature review conducted simultaneously. Under sense-making theme the subjects described their steps forward in highly uncertain environment of early new venture. Under the gathering theme subjects described the ways of expanding the limited resources of the small venture.

Broad Themes	Themes	Categories
Sense-making	Internal Sense-making	Identity gives direction
		Experience forms basis for decisions
	External validation	Fast external input vs. readiness of the concept
		Trustworthiness of customer input
		Competitors validate the opportunity
Gathering	Momentum gathering	Focus is in the forward movement
		Gathering external actors
		Informal network building

Table 1 – Broad themes, themes and categories

Under sense-making theme the action is focused on the idea and learning. The underlying logic under sense-making theme is close to the logic of discovery, where the opportunity gets more focused as new knowledge influences the process. All subjects started their opportunity development from a situation where many important aspects of the opportunity were unverified. Some of the subjects had a more refined and systematic process for attaining vital knowledge. Some described the early sense making from broader, tacit level. The goals or ambitions of the entrepreneurs were surprisingly broad, and had strong link to the person's identity. These broad goals then guided the activities and limited the wide number of possible directions forward. Other way of directing the process came from the pressing need of having something concrete, and in this way attaining credibility and means of getting external resources.

Under gathering theme entrepreneurs took a more active role in pushing the idea forward and seeking ways to make an effect. Instead of focusing on learning and listening, entrepreneurs took a more active role in pursuing their goals. Entrepreneurs also operated very openly in an attempt to broaden the means of their venture. In a sense a venture with only a few active members could attract an informal network many times its own size. This network brought market knowledge, business opinions, and all in all formed a group that supported the initiative.

This dual nature of opportunity development is emergent in entrepreneurial process models, as discussed in the literature review. Previous research highlights the role of discovery of opportunities and also takes note of the more creative approach to opportunities, but the interplay between the different concepts is still unclear (Sarasvathy et al., 2010).

4.2. Sense-making- a route towards the ends

4.2.1. Internal sense-making

Entrepreneurs described similar first moments of their commitment to the idea. The motivation to be an entrepreneur and create something new preceded the formation of the idea. Subjects described active and intentional search of potential opportunities, and the initial idea was first described broadly. Only later did it become specific enough to form the basis of the opportunity. One subject described, how the initial idea came in to existence: *"It was actually quite an analytical process, I have marvelled that later. We were drinking beer with a few friends and consciously thought about everything that we could do as grown-ups and got ideas for everything from Pizza-Online and the like. Next time we saw each other we concluded that all our initial ideas had already been made and started open-mindedly again. It was clear that we would start some king of "Shop of our own"*

Another subject described how the initial idea or need was discovered from earlier work cases. But also behind this idea there was a strong recognized view that the subjects wanted to start something new. Subject described: *"...actually we had a conscious goal to search for a scalable business model around design, to benefit from our design know-how and this opportunity matched this goal."* In this case the motivation behind the idea was quite developed and rationally formalized, however the key is that it left a lot of room for the further refinement of the idea. There was a clear need for a new opportunity, but the idea itself was very undeveloped in the beginning.

The entrepreneurs differentiated in how the initial broad idea was crystalized in to a specific offering. Three saw the process from systemic validation point of view. They brainstormed internally to form the concept, and recognized the key assumptions behind it, in order to go and test them. Two also gathered a wide range of external experts to act as advisors, and help in conceptualizing the broad and difficult opportunities. One entrepreneur described how they relied more on their own understanding in the beginning and delayed visits to potential customers in order to have more refined concept to show.

4.2.1.1. IDENTITY PROVIDES DIRECTION FOR EARLY SENSE-MAKING

The process of forming an opportunity that is worth creating a company around appears to start from a wide scope opportunity, which is tied strongly to the identity of the entrepreneur. The sense of ownership of the idea forms the basis for the opportunity development.

One entrepreneur explained that: *"This idea and how it developed...so the leading thought has all the time been that when we make profit, we don't make it from the back of mother nature. Or that by making profit you can also do good. This has then ruled out different business areas straight away, but also maybe clarified the palette..."* The strong presence of identity supports the current understanding of entrepreneurship and effectuation theory, where the identity of the entrepreneur acts as the key point in opportunity creation (Sarasvathy, 2001). The strong linkage between the opportunity and the identity of the entrepreneur can be conceptualized

also from the discovery logic point of view. Here the identity of the entrepreneur guides the discovery process (Miller, 2007).

In one case the broad idea of the company came from outside, and had been around for many years. In this case the entrepreneur made the idea her own by describing how she had taken a different approach to the initial concept. Subject described how: *"...it was actually short of mash up of new and old. Maybe it was my own personal preference a little. I had one other project that used that time-line approach. Certainly it is like an old idea, that there isn't anything new about it, but it is still like somehow in my opinion a great way for researching information and life and somehow it seemed to fit in here well."* She formed her own distinctive interpretation of the opportunity and contrasted this interpretation with the original idea. There was a sense of proudness in the way she contrasted the previous attempts to take the idea forward with her own initiative. In this way she highlighted how she had made the idea her own. She describes: *"It was then a little bit different approach... it felt that it was bit more like business-to-business approach, and we now clearly have developing something valuable for consumers, something that gets them excited about exploring their own health. Not that much anything "corporate" that we would sell to governments, insurance companies or drug businesses."*

Identity was linked to the opportunity development of the subjects in two distinctive ways. Either the entrepreneur used identity based reasoning in the discovery process to narrow the scope of the inquiry, or the identity seemed to form the basis for the opportunity.

Traditionally opportunities are described from the point of view of the idea itself. Behind the opportunity there is the idea about a product or offering, and a business logic or model how to create a business around it (Venkatarman & Sarasvathy, 2001). Here the opportunity seemed to build on the idea of entrepreneurship. Subjects described how a will to start a company was the key driver behind the venture and the opportunity was merely a device to fulfil this goal. Subject describes how: *"Our deeper motivations and drivers were some where there in our own things and we had an urge to do own things, possibly our own company one day. The three of us were sort of turning over things in our heads... and thought like "would there be sense in this idea" and went a bit further with some ideas. We did pitches and went to some pitching events somewhere. We went to try out how these things work a bit and quite systemically searched for a good idea."*

As opportunity is mere a device to fulfil a bigger goal, subjects were ready to modify the opportunity when needed. Subject describes this attitude: *"We are open-minded so that we don't fall in love with an idea, and that we will develop the thing actually for the users. If we talk of manufacturers, then we will be open-minded also to that direction. From there can come some ideas that show how this would be best made."*

4.2.1.2. EXPERIENCES GIVE DIRECTION TO SENSE-MAKING

When not identity based, the reasoning for actions of the entrepreneurs highlighted past experiences. One entrepreneur describes: *"I know from (previous workplace) that...it is sort of a brilliant example of how much energy and love should be devoted to forming the right team. It is like everything, how they say "Culture eats strategy for breakfast" it is just like that, everything starts from the fact that you have the good guys and that it is fun, together with them."*

Past experiences shape an individual way of approaching the uncertain. As described in the literature review, past experiences form a basis for a fairly local search and it is easy to miss the larger picture (Gavetti et al., 2005). Past experiences are however key element in

discovery process, where the next steps are highly influenced by the experiences from the past attempts. Continuous success in past phases of the search will build up the aspirations and past failures will lower them, providing a heuristic for deciding when to stop (Miller, 2007).

One subject described how they forced themselves to do rapid iteration with the product design. Fast iterative process allowed the team to examine the many possible aspects and directions fast, and with limited resources. Iterations provided an experiential learning loop, which allowed the team to learn internally from the opportunity. The Idea for the iterative process came from team's background in product design. Later the prototypes were used to gain external input to the idea.

4.2.2. From internal ideation toward external validation

The initial internal brainstorming and conceptualization of the opportunity formed a basis for first probes toward potential customers. As all subjects were developing relatively novel and innovative opportunities, they did not only need to manage the high uncertainty and ambiguity of their idea, but to cope with customers' lack of understanding about the concept and its implications.

Some subjects took a more careful stance with external validation and delayed discussions with potential customers. However, they also felt the need for external input and discussed the idea together with experts, friends and fellow entrepreneurs. Subject describes: *"...the biggest changes have happened in the early phase when we were searching for...sort of if we think that this is like a radar of 360 degrees (shows with hands) ...then we have managed to always narrow down the area where we are going. The segment is narrowing and narrowing so that we are focusing our efforts. It has gone like that in quite linear manner."*

Others went straight to potential customers and framed the opportunity already at the beginning together with them. One subject described the first months of the company: *"I had made myself a set of business cards and went to Germany to sell these things. For the first half a year I didn't know at all what I was doing. I don't have any background in the specific fields but they were nevertheless combined in a new way and I was pretending to know how this thing is going to be optimized. Nevertheless actually it went quite well."* This is quite an extreme example of jumping to the deep end, however the need of external validation of idea was pressing.

4.2.2.1. CONFLICT BETWEEN FAST EXTERNAL INPUT AND READINESS OF THE CONCEPT

In order to learn from potential customers entrepreneurs were struggling with the question of when to show something specific, and when it is better to wait to have something more refined. The concept had to be built to a level where external actors could easily understand the idea and the key element of it. Subject describes how: *"We have noticed that there is a big difference in how they (external stakeholders) see the idea and its potential and the potential of the whole team from how well we manage to communicate it forward. It has had a big impact on the immediate feedback when we have managed to communicate the idea clearly and in the right order."*

Validation of assumptions concerning the customer's needs is a struggle, if the value of the offering is not apparent and easy to concretize. One entrepreneur described that *"Actually those (cases) where we managed to get to the "skin of the customer" worked best. Where we could glue our own graphs on top of customers real systems...so it has to be emotion-based, as*

when the graphs are in the right colour, then the thing goes forward... If we would have just taken a graph from our demo site and pasted that into the screenshot from the customers system, the first comments would have been that "this is quite nice, but these elements don't fit here at all, it has to be blue".

One team with an ambitious idea was stuck for a long time in a situation where it seemed that there is no easy way to prioritize the sequence of the development activities. In one hand, it was important to focus on the system level development that formed the backbone of the idea, and on the other hand it was seen important to develop the front-end application to gain user input. Subject describes how: *"It is like that there is not one without the other. If there is no platform it is not really believable and if there is no application then there is no relevance to anyone. So between these two we were swinging back and forth, as one advisor said something and the next one the opposite. We were there for quite many weeks hesitating which way to approach the problem."*

4.2.2.2. WHEN CUSTOMERS DON'T KNOW WHAT THEY WANT

Subjects had difficulties in gaining correct information from customers. Either the customers could not understand the implications of the novel offering, or they could not focus on relevant things. One entrepreneur described how customers gave positive impressions even though it was later concluded that there are no markets for the offering. *"...I should have gone more to the direction of for example Germany, but even there the product development teams of big companies and others were saying that this is a useful thing and absolutely a good thing. But it didn't mean that there would have been (a market for it)...So if I have learned something it is that this kind of "I feel that this is a good thing"(from a customer) doesn't mean anything before the euros are in your account."*

"Validation of this kind of things was in practice quite hard. There wasn't a question for it, or that we couldn't find an answer for it no matter how much we tried to investigate."

This highlights the problem with market data. Customers are bad at understanding what they will want in the future, especially when the offering has radically different features. (Lynn, Morone, & Paulson, 1996) In this case the problem manifested itself, not only when the data is collected through market research, but also when discussing with potential customers face to face.

4.2.2.3. COMPETITORS VALIDATE THE OPPORTUNITY

Competitors show that there is potential in the market and provide clues about the readiness of the market. Some of the subjects had a very open and almost reckless view of competition as described by one: *"We regard competition with high interest and competition is good. It makes firms run faster and if someone can make this better than us then maybe it is how this should go."* Competitors were seen as a sign that the opportunity was worth pursuing. One entrepreneur even described how they now see competition as a necessity in all their potential ideas, as it guarantees that the company doesn't need to create the market alone.

Some subjects were bit more careful in what they showed to potential customers, before they had substantial lead in their development. Subject describes how: *"We have decided that we don't speak to the manufacturers (potential competitors) in perfect openness about the idea before we can make it to look so, that we have seen so much effort to develop it, that for them it doesn't seem something they should compete with us in."*

4.3. Gathering- Attaining means to eventually reach the ends

Entrepreneurs took an active stance to coping with the market knowledge ambiguity. They didn't only seek answers using experiential learning, but actively shaped the situation to handle the uncertainty. Entrepreneurs started to create momentum to the venture even when the idea itself was still highly undeveloped. The wide goals of the entrepreneurs allowed them not only to seek the most promising opportunities, but also to adopt the opportunity in order to get the means to exploit it.

4.3.1. Gathering momentum

There was a generic need for going forward. Subjects described how things got frustrating immediately when the momentum forward stopped. The momentum itself was not described that clearly, it was something tacit that was hard to describe specifically. One subject describes: *"We should have been able to dig up the thing with the least amount of effort, to get forward. That we shouldn't get stuck in to something like SAP integration that won't take us forward as we couldn't even do it ourselves but someone else would have had to implement it. We should have found what is then the easy way to get forward."* Another subject described the momentum similarly in quite general terms: *"We prioritize, it is only about focusing and prioritizing... and in principle we shouldn't do anything else than this number one thing all the time. That is the thing that takes us forward."*

The concept of momentum here stands for all energizing, forward taking and over all positive effect to the venture. The momentum presented itself in many forms. One subject described how publicity gained through a start-up award, initiated a cycle of positive things for the venture. This momentum then led to more publicity and more positive things. The momentum has a lot in common with effectual theory and the concept of effects. Similarly to effectual effects, momentum was also described as something eminently positive.

Subjects took an active stance when the sense-making approach didn't seem to give the answers needed. For example Company Gamma decided to approach their ambitious goal, by starting with a less radical product. They had difficulties in prioritizing all the vast things needed, before the original opportunity would be ready to be tested. Instead of crushing under the pressure to prove the ambitious and complex opportunity was worth pursuing for, they changed the course and focused on a simpler product for similar customers. The simpler product was seen as a device to gain customer insights and early cash flow. Later when the more ambitious and radical product was ready, the company would have already gained experience from customers and the other way around.

Company Epsilon was conducting prototypes in rapid iteration, and had a market-ready prototype ready from their product, after only four months from the initial idea. This prototype was then rented to real customers to gain insights of real use cases. This approach allowed the product to gain publicity and a positive cycle of momentum towards the opportunity was created.

4.3.2. Gathering external actors

Ventures were active in acquiring external actors around their initiative. Subjects described how they openly pitched and told about their idea and gathered people around them. These people mostly didn't have any formal relationship with the company. Entrepreneur's own

personality is important in motivating the network, but also the idea or opportunity acted as a device to gain publicity and interest. External actors gave entrepreneurs opinions, market information and provided contacts.

The conflict, that arises from the entrepreneurs need to decide whether to modify the idea according to external influences, or follow their own initial path, is also interesting. Effectual theory proposes that two questions are needed to solve the conflict (Sarasvathy & Nicholas, 2007). Firstly, the direction that promises larger effect toward the generic goal should be selected. Secondly, the entrepreneur considers the maximum loss he is willing to accept, if the direction proves unfruitful (ibid). Subjects had varying level of openness toward external influences. For example one subject described quite a visionary approach, as many external actors were pushing the idea down. He stated that: *“We got a lot of critique about the idea, and still we get it. In a way the critique comes for a reason, because we haven’t yet validated the idea...on one hand we shouldn’t think too complicated, on the other hand my own thought is that a Finn fails just when he thinks the technology needs to be something crazy or that he doesn’t believe in his own thing and that the design needs to be something or that the design is ashamed of as if it is not something special... but I think it is easier to short of just do the thing and then you see how it goes.”*

4.3.2.1. GATHERING LOOSE STAKEHOLDERS

Most of the subjects were active in gathering advisors and experts of the field to give insights to the team. The goal was not to get formal members to the organization, but to gather influential and competent people close by. The will to be a part of something new was the main feeling the entrepreneurs tried awaken in them. One subject describes: *“in practice I asked that who could be the best for the thing (advising) and then called them through and asked would they be interested in coming to chat around with croissant and coffee as a salary. It went surprisingly well when I made it clear straight away that no rewards are given...”*

These loose stakeholders or advisors gave good insights and provided contacts, but one subject described how it was tricky to get them to commit to the opportunity. The cycle of meetings with informal advisors was too long for building strong relationship with all of them. The subject describes how: *“Those then who were more interested or got latched onto the thing they have had a quite big impact on what we do now with their knowledge and input. So it seems that there is no midway, either people are committed with full force or then with less force.”*

4.3.2.2. INFORMAL NETWORK BUILDING

External people are seen as extension of the company that allows the small team to act larger. Outsiders validate ideas that would be hard to validate internally. Entrepreneurs weren’t only gathering advisors, investors and other stakeholders, but likeminded people. Subjects described how they went around talking about their venture, and intentionally built an informal network around them. This network was seen as a way of attaining more eyes and hands behind the small initiative. These external actors were giving insight and feedback, but also acted as messengers for the opportunity. Subject describes how: *“You get feedback and people start to think about your thing and then when they see something similar they relate it to this our thing and sends us a link that check this out. It sort of explodes our supporting network to a whole new level and it is awesome.”*

The balance between secrecy and openness was seen as trivial, when talking about expanding the network: *“It is much better to expose yourself to the world and people. Because “we only know that much” and then it is like as many people you know raised to the second power. From*

there opens up whole new worlds and it is something like zero point one present chance that someone would steal your idea so you gain so much more (by being open)."

5. DISCUSSION AND IMPLICATIONS

Although small and experimental, this study highlights, how early opportunity development can be seen as a combination of two distinctive groups of activities. When acting under what I have classified as the sense-making theme, the entrepreneurs discovered and learned about the opportunity and adjusted their expectations. When acting under the gathering theme entrepreneurs took a more active role in seeking momentum for their opportunity and expanding their network. These activities seem to also happen side by side. Using terminology from management, the implementation seems to start before even general understanding of the opportunity is defined. The sense-making never realizes in to formal plans, but stays as a tacit moving picture in entrepreneurs minds. Sense-making activities build the understanding of different sides of the opportunity. At the same time, the idea and vision behind the venture is actively promoted to possible stakeholders to create momentum around the idea.

In conclusion, entrepreneurs seem to have two distinctive strategies for handling uncertainty. Under the sense-making theme subjects were faced with a vast amount of possible directions to select, in order to refine the opportunity. Personal experiences and identity provided some direction for these selections, however high uncertainty guarantees that many initial assumptions will be proven incorrect. Entrepreneurs handled uncertainty by conducting iterative small steps and in this way minimizing losses from unfruitful decisions. Limiting commitments and conducting only small steps effectively controls the potential losses of the development. However, even when using minimum amount of resources, the money can easily run out. The gathering theme proposes that entrepreneurs can actively influence the potential for success under high uncertainty. By gathering loose commitments and energy around the venture, entrepreneurs have a larger set of eyes and hands providing direction and help to overcome challenges. It also seems that the drive and momentum of the venture is not perfectly tied to the specific opportunity or its features. This implies that the momentum can drive the venture forward, even when the team is forced to significantly change the direction and features of the opportunity. This way the drive and momentum around the venture can provide additional energy to overcome uncertainties.

Interesting direction that opens from the research is the closer examination of the temporal link of opportunity identification and exploitation. It is commonly seen that opportunity identification and exploitation happen in sequential order (Tötterman, 2008). Results of the research suggest that in the highly uncertain world of early opportunity development, the sense-making is not enough and entrepreneurs seek positive forward taking effects, even when the opportunity itself is not yet well-defined.

Entrepreneurs are active in creating momentum and interest around the opportunity. This active use and gathering of external resources gives the entrepreneurs more tools to face risks and uncertainty (Berglund, 2002), but also seem to help in sense-making and information gathering. In future research the extent and effect of this momentum seeking would open interesting research direction. The open nature of this activity contrasts with the common view of product development that often happens under secrecy. How much and in what manner these external actors influence the opportunity development and venture formation, is a very interesting question for future research.

The results suggest that the external actors are willing to commit to the venture, even when there is no eminent way for profiting from this commitment. It seems that there is no formal or even semiformal bind between the venture and these actors. What elements drive this forming of external commitments and what are the potential downsides, is also an interesting future research question. The influence of vivid start-up ecosystem is widely appraised when discussing growth entrepreneurship on macro level (Feld, 2012). However, to my knowledge effects of informal external commitments to opportunity development on micro level have not been investigated.

In innovation management theories there is no place for constructs like momentum created together with external actors. The aim of the classical development processes is that the level of uncertainty about a concept is lowered to an acceptable level, before the idea is presented to the external stakeholders (Mcgrath & MacMillan, 1995). This way it neglects the role of momentum of the opportunity created together with these external actors. In modern development methods the role of fast execution and early stakeholder involvement are essential (Ries, 2011; Tuulenmäki & Välikangas, 2011). The momentum of the idea is not nevertheless highlighted as the models focus only on the learning that the early involvement makes possible.

5.1. Limitations of the study

Limitations of the study consist mainly about the empirical explorative research. Even though qualitative research is not about large sample sizes the amount of data available might have influenced the results, as the scope of the research didn't allow reaching full saturation point. Nevertheless the last two interviews didn't influence the thematic analysis significantly, so we can conclude that in this limited scope the research sample was sufficient.

The results of the research are not meant for wide generalization. The goal of the research was to give new insights and understanding that could be later expanded and researched further. The researcher had a significant role in interpreting the results of the interviews. It is clear that literature and past experiences influenced the data interpretation. All the subjects were young, university level educated and relatively inexperienced entrepreneurs that had connections to the start-up ecosystem around Aalto University. This should be kept in mind when taking the results of the study forward.

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7. TABLE OF FIGURES

FIGURE 1 - FRAMING THE PROBLEM OF OPPORTUNITY DEVELOPMENT	3
FIGURE 2 - OPPORTUNITY DEVELOPMENT AND UNCERTAINTY (MOENAERT & SOUDER, 1990)	4
FIGURE 3 - TYPES OF ENTREPRENEURIAL EFFORTS (SARASVATHY ET AL., 2010)	5
FIGURE 4 - OPPORTUNITY RECOGNITION SEQUENCES IN ENTREPRENEURIAL VENTURE CREATION (BHAVE, 1994)	6
FIGURE 5 - RATION BETWEEN TRUE UNKNOWN AND PREDICTABLE UNKNOWN FORM THE CONTINUUM OF UNKNOWN (KNIGHT, 1921; WILTBANK ET AL., 2006)	7
FIGURE 6 - TEN PROPERTIES OF WICKED PROBLEMS (CAMILLUS, 2008; RITTEL & WEBBER, 1973)	8
FIGURE 7 - UNCERTAINTY MATRIX (ADOPTED FROM: PEARSON, 1990)	9
FIGURE 8 - EXECUTION INNOVATION MODEL ADAPTED FROM (TUULENMÄKI & VÄLIKANGAS, 2011)	10
FIGURE 9 - FRAMEWORK FOR PREDICTION AND CONTROL (WILTBANK ET AL., 2006)	11
FIGURE 10 - THE CONTINUUM OF UNKNOWN AND OPPORTUNITY DEVELOPMENT. ADAPTED FROM (KNIGHT, 1921; MILLER, 2007; SARASVATHY ET AL., 2010)	12
FIGURE 11 - EXPERIENTIAL LEARNING (D. KOLB, BOYATZIS, & MAINEMELIS, 2000)	13
FIGURE 12 - EXPECTED CUMULATIVE CASH FLOW OF "BLACK HOLE" INVESTMENT STRATEGIES. ADAPTED FROM (MCGRATH, 2010)	14
FIGURE 13 - EXPECTED CUMULATIVE CASH FLOW OF OPTIONS ORIENTED INVESTMENT STRATEGIES. ADAPTED FROM (MCGRATH, 2010)	15
FIGURE 14 - VALUING OPPORTUNITIES BY COMBINING DCF AND REAL OPTION METHODS (VAN PUTTEN & MACMILLAN, 2004)..	16
FIGURE 16 - OPPORTUNITY DEVELOPMENT FROM DISCOVERY AND CREATION PERSPECTIVES	18
TABLE 1 – BROAD THEMES, THEMES AND CATEGORIES	23