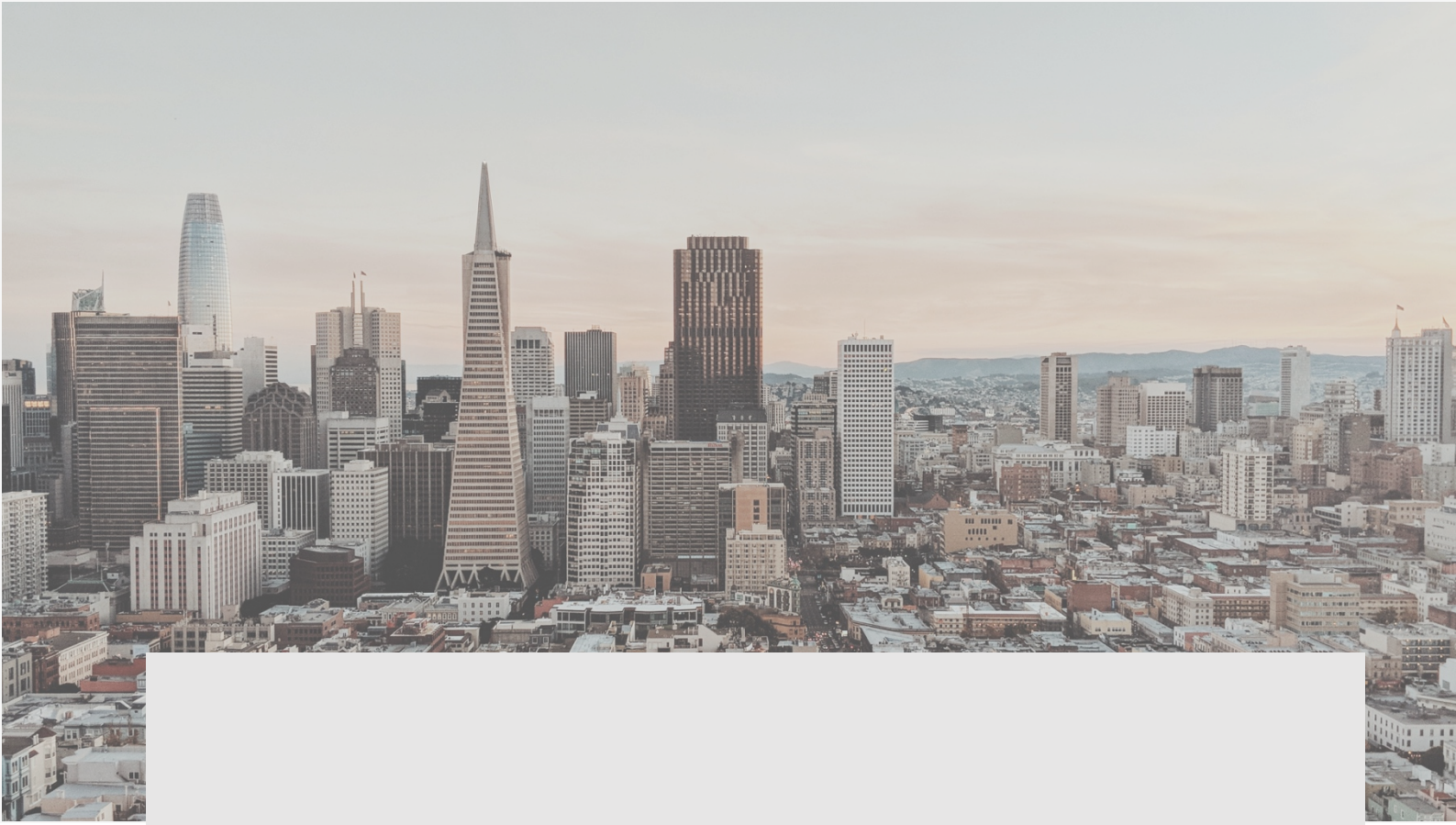

# The Innovation Race of Startups in Silicon Valley anno 2019

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by

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# Abstract

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The notion of large high-tech companies' influence on startups and their innovation process draws currently much attention, both among practitioners and scholars. However, the possible influence on startups has only been investigated to a minimum. This thesis tries to determine the influence of large high-tech companies on startups' innovation processes through the lenses of path dependence theory proposed by Sydow & Schryögg (2015). Drawing from a literature review, the framework from Sydow & Schreyögg (2015) and 5 interviews from startups, this thesis provides evidence, juxtaposing the media's belief that large high-tech companies affect the startups' innovation processes on an equal level as other competitors. Contributing to the body of literature it is proposed to link innovation processes and path dependence. The authors found that the startups did not reach a state of lock-in in terms of their innovative capabilities, however, tendencies to follow a path surfaced.

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# Abbreviations

**AI**: **A**rtificial **I**ntelligence

**B2B**: **B**usiness **2 B**usiness

**IPO**: **I**nitial **P**ublic **O**ffering

**ML**: **M**achine **L**earning

**MOE**: **M**etric **O**ptimisation **E**ngine

**SaaS**: **S**oftware **a**s **a S**ervice

# 1. Introduction

## 1.1 Background

Throughout recent years, innovation has changed technology and the way we work, live, and manage not only our professional life but also our everyday life. Organisations are driving both technological innovation as well as adopting and adapting to new innovations.

Two distinct waves of innovation in technology were seen in the 20th century. The first wave consisted of electricity, which enabled us to manipulate the physical world (Satell, 2018). The second revolution was driven by quantum physics, microbial science and computing that changed how we could "work with the microscopic and the virtual" (ibid.). In the present, we are entering, if not in the middle of, the digital innovation era. Digital innovations have allowed us to work with nanotechnology and have brought robots and artificial intelligence further into our everyday life. Constantly, new buzzwords emerge and become a big part of the everyday talk. Technologies such as blockchain, open data, cloud computing, and others have become significant and common buzzwords in 2019. Technologies such as AI and ML have highly impacted and changed how we know computer architecture, energy resources, services, etc. Especially the latter, services in the forms of for example SaaS, have experienced massive innovation throughout the last decade, and it is expected to continuously change the world we live in.

Innovations have always been a part of being human, especially in terms of evolving and one could argue that firstly, it has made many facets of life easier, more comfortable, and more efficient. Secondly, it has complicated other facets of life such as ethics and monitoring while having a significant impact on how human beings define themselves. Oftentimes, innovation is associated with something new, such as Apple's first iPhone in 2007 revolutionising the smartphone industry (Bajarin, 2017), or AirBnB's first launch of their platform in 2008, revolutionising the hospitality industry (Lemon, 2019) or even, Uber's first launch of their platform in 2009, creating a significant impact on how businesses view business models (Stark, 2017). Naturally, it is important to highlight that innovations do not necessarily only emerge from technology, multiple innovations have through time emerged from other foundations. For example, when immunotherapy was created in the 1970s (Ellis, 2017), or when self-healing concrete with bacteria was invented in the 2010s (Moneo, 2015). However, in the 21st century, one can argue that the high emergence of innovation primarily emerges from technology is due to the large high-tech companies such as Google, Apple, Amazon and Facebook ruling the innovation agenda.

However, innovation comes in many different shapes and forms and there are constant innovation processes in most technological products, services, etc. that are mostly intangible to the majority of people. Literature

differentiates between incremental innovation and radical innovation, the latter referring to how most people perceive innovation - something radical and new (Damanpour, 1991). Whereas, incremental innovation refers to innovation in the form of e.g. a new version of the same product, software, or improvements to existing products and services (Benner & Tushman, 2003; Germain, 1996). In order to achieve either incremental or radical innovation, previous researchers have proposed multiple different approaches and methods for each and how to manage both in the same organisation (Ettlie et al., 1984; Germain, 1996, Dewar & Dutton, 1986). Such methods include for example exploration and exploitation that can be linked to incremental and radical innovation. The exploitation of existing resources can be seen as closely linked to incremental innovation, whereas, exploring new ideas and knowledge is associated with radical innovation. The body of research within innovation is large and continuously growing. Multiple interpretations co-exist in the literature, and it can be argued that the term innovation can be linked to other concepts in the literature, which will be explored further in section 2.

To sustain a healthy competitive advantage, innovation has to happen, and it can, therefore, be argued that it (innovation) happens in all organisations but is, however, often associated with startups. Startups often create a new product or service that differs from the previously existing. Often these ideas start at universities when either an issue or an idea for a new product, technology, service arises (Center for Entrepreneurship, 2017). One can argue that it is noteworthy how startups often are considered innovative due to the newness of the company, business model, branding, etc. that might differ from more mature organisations. Prior researchers have investigated innovation in primarily established organisations and little in startups, however, most innovation literature does not imply its feasibility for startups, SME, Fortune 500 Companies, etc. In essence, it increases the significance of this thesis.

The body of innovation literature has previously been supplemented with the concept of path dependence (Pylak, 2015; Fagerberg et al., 2008; North, 1990; Pierson, 2000). Path dependence in its most simple form is the notion of 'history matters' - which means, past events influence future events. It is established in previous literature that innovation can inherently become path dependence. Examples of organisations that have been locked into an innovation path are e.g. organisations creating new product versions on different ethnological platforms, disregarding the cannibalisations throughout the organisation's multiple product versions (Thrane, Blaabjerg & Møller, 2010) or creating a local search behaviour that disables the organisation to research in new directions and generate ideas that differ from the past (ibid.).

This notion creates an interesting question on whether or not other companies can influence another company's innovation processes. The link between path dependence and innovation processes poses significant questions for the 21st-century world, such as whether the agenda of the large high companies will change the direction

of the market in favour of the large high-tech companies in terms of creating lock-ins for startups and other companies. This is inherently salient in today's world, where these large high-tech companies play such a big role in the overall market agenda. Essentially, since innovation poses as such a significant factor in many organisations' everyday life and overall strategy, it makes it inherently significant to research.

Another notion created out of this circumstance is how much the media have discussed which direction we as a world are headed towards. One could argue that there are two distinct directions it can go:

> (1) Companies, startups, government institutions and individuals will start to form a counter interest for these high-tech companies and their products and services, leaving the focus and hype around them to cool down. Eventually, creating space for startups and other companies to bloom.
>
> (2) The interest in the large high-tech companies and their products and services will continue to increase steadily, which could mean that they eventually would grow to a size that would make their influence and impact on the market the same level as governments. This is something the Danish government is preparing for - in 2017 the Ministry of Foreign Affairs of Denmark appointed the first Tech Ambassador, Casper Klynge - the first of his kind in the world (Ministry of Foreign Affairs of Denmark, 2019). His mandate is global and spans across Silicon Valley, Copenhagen and Beijing (ibid.). It can be argued as an attempt from the Danish government's side to prepare for and level with the large high-tech companies on the legislative side, in order to create a good and fair connection between legislation and the high-tech companies. Both Norway and France have since followed the initiative and have inaugurated a similar position in their government (Nikolov, 2018; Government of Norway, 2019).

The latter is just one example of how the world is affected by these high-tech companies, and essentially, it highlights the importance of this topic, which this paper, in some form, seeks to investigate. The following section will highlight the motivation behind this paper, and section 1.3 will highlight the research question that the authors seek to answer in this thesis.

## 1.2 Motivation

Behind this thesis, there are three primary motivations:

First, in recent years, startups have become a significant buzzword and a lot of focus has been directed at startups all over the world. Hundreds of startups have spun out of the universities around the Silicon Valley

area, especially startups within the tech field. The statistics of startup births are growing (GEM Global, 2019) and the increased focus on startups create some inherent market dynamics in terms of innovation processes, that sparks one of the motivations behind this thesis.

Second, along with the heightened focus on startups, there has been a heightened focus on the large tech corporations as well. The media have been widely stating how these high-tech corporations are obliterating the small startups, invading all industries and not allowing any fresh air into the market (Millard, 2018; Madrigal, 2018; Solon, 2017; Smith, 2018). Whether or not these large high-tech corporations have such power over the startups, forms the second main motivation behind this thesis.

Third, combining the two motivations above creates a third primary motivation, which is rooted in what the future will look like for startups. How are startups surviving under the weight of the high-tech companies in regard to bringing innovation to the market and how will they do so in the future? These questions pose as the third main motivation for this thesis.

## 1.3 Research Question

Based on the background and the three main motivations for this study, it aims to answer the following research question:

*How does the large high-tech industry affect startups' innovation processes?*

## 1.4 Definition

The definition of a startup can be based on different factors, and no consensus about the definition has been set. Blank and Dorf (2012) describe startups as "temporary organisations in search of a scalable, repeatable, and profitable business model (Blank & Dorf, 2012:17). Where Stevenson et al. (1994) believe startups to be in the search of opportunities without considering resources that they currently control (Stevenson et al., 1994). Moreover, the German Startup Monitor proposed three criteria for a company to be categorised as a startup: (1) a startup is less than 10 years old, (2) a startup has an innovative business model or develops innovative technologies, and (3) a startup presents substantial growth either in terms of employee size or in turnover (Ripsas & Tröger, 2014; Ripsas et al., 2015).

Not only researchers have diverse definitions of startups, but the media and people familiar with the startup milieu also seem to have different definitions of startups. Neil Blumenthal, co-founder and co-CEO of Warby Parker told Forbes "a startup is a company working to solve a problem where the solution is not obvious, and

success is not guaranteed" (Robehmed, 2013). Similar to the German Startup Monitor, TechCrunch writer, Alex Wilhelm described three criteria, and if a company meets or exceeds any of the criteria, it *cannot* be categorised as a startup. (1) the company has a revenue run rate of $50 million, (2) the company has 100 or more employees, and (3) the company is worth more than $500 million (Ireland, 2015). Lastly, Adora Cheung, Founder of Homejoy explained startups as a state of mind (Robehmed, 2013). For many in the startup community, startups work hard and fast to be innovative and to alter the general ways of working and living (ibid).

For the purpose of this paper, the authors will base their definition on a mixed set of criteria, inspired by both prior research and startup employees and founders. The criteria are as follows:

(1) The number of employees is below 1000.
(2) The organisation is at a temporary stage, with below 10 products and services in its product portfolio.
(3) The organisation has not launched an IPO
(4) The organisation maintains a startup state of mind.

The paper is structured as follows: Firstly, some of the existing research within the field is explained in a literature review section, followed by an analytical framework describing the specific theory utilised in this paper to analyse the collected data. Next, the research methods will be outlined for an overview of how the data was collected and analysed along with the quality criteria set for the data collection. The empirical setting follows, which briefly explains the background of the five startups that were interviewed. Hereafter, the findings are presented and a discussion that enables to answer the research question. Lastly the paper finishes off with a conclusion of the conducted research.

# 2. Literature Review

The purpose of the literature review is to get a sense of the literary fields that encompass literature on innovation processes and on startups and large high-tech corporations. The idea is to develop an understanding of the existing literature, thus to get an understanding of the research gap that emerged and the authors behind this paper are trying to fill. Additionally, the literature review provides a background and understanding of the terminology that will be utilised throughout this paper. The research gap between innovation processes within startups and the role of high-tech companies in that spectrum. The literature review be structured as follows: firstly, existing literature around innovation processes will be reviewed. Secondly, literature about startups, high-tech corporations in relation to innovation processes will be reviewed, if any are to be found.

## 2.1 Innovation Processes

To assess the innovativeness of an organisation, it is crucial to understand the definition of innovation, and multiple scholars have brought forward their outlook on the phenomenon (Galunic & Rodan, 1998; Lee et al., 2003). According to Schumpeter's (1934) work, innovation was defined as the introduction of a new product, process, method or system. This highlights how innovation has been seen based on a binary nature, that is, (a) innovation as a process (the introduction of innovation) and (b) innovation as an outcome (product, process, method or system) (Schumpeter, 1934 in Quintane et al., 2011:6). Innovation as a process (a) is described as "the generation, acceptance, and implementation of new ideas, processes, products or services" (Kanter, 1984:20). Thus, the process of "bringing any new, problem-solving idea into use" (ibid). Additionally, it is described as the "development and implementation of new ideas" (Van de Ven, 1986:590), which mainly occurs between individuals over time. Conversely, when defining innovation as an outcome (b), the primary characteristic in focus is that the innovation is, as written earlier, a product, process, method or system. However, these can be categorised further, and Damanpour (1991) proposed three classifications of innovation that have become rather well-known; (1) administrative and technical, (2) product and process, and (3) incremental and radical innovation. All of these three classifications are crucial in understanding the different nuances of innovation in the existing body of literature.

First, administrative and technical innovations entail probable, distinct decision-making processes, and in collaboration, both depict changes in organisational activities. On one hand, technical innovations comprise of either products, services or production technology associated with fundamental organisational activities (Damanpour & Evan, 1984). On the other hand, administrative innovations encompass organisational structure and administrative activities, hence, indirectly linked to fundamental organisational activities, and directly related to its management (Damanpour, 1991; Damanpour & Evan, 1984; Kimberly & Evanisko, 1981). Damanpour (1991)'s studies showed how specialisation and organisational inactivity had larger effects on technical innovations rather than administrative. While strong administrative power had a larger effect on administrative innovations rather than technical (Damanpour, 1991; Damanpour, 1987).

Second, the notion of product innovations refers to novel products or services developed to meet market demand or an external user's need, thus a reaction to external demands (Damanpour, 1991). Conversely, the notion of process innovations encompasses the new innovations introduced into the organisation's production operations, i.e., task specifications, work and information flow mechanisms and appliances supporting the production of products or the performance of services, thus a reaction to internal demands (Damanpour, 1991:561). Damanpour (1991)'s studies show that there have been no reports on the contrasting impact of organisational characteristics on product and process innovations. Therefore, the collection of research

findings enables the exploration of distinctions in organisational characteristics relating to either product or process innovations (ibid).

Third, fundamental changes in the activities or products of an organisation, representing reorientation, nonroutine and clear departures from existing practices are all under the notion of radical innovation (Damanpour, 1991). On the contrary, little variation to routines, organisational activities and existing practices are under the scope of incremental innovation (Damanpour, 1991:561). Scholars have suggested various indicators of the adoption rate of radical and incremental innovations, such as the top management's attitude toward alterations and technical knowledge resources are proposed to accelerate radical innovations (Dewar & Dutton, 1986; Hage 1980), whereas complex and decentralised organisational structures motivate incremental innovation (Ettlie et al., 1984).

In the literature, the distinguishing factor of an innovation being characterised as either an outcome or a process is the novelty (Quintane et al., 2011; Greve and Taylor, 2000; Obstfeld, 2005; West & Farr, 1990). How is novelty then determined? Van de Ven (1986:2) suggests that an idea is still characterised as an 'innovation', as long as the involved people perceive it as new, despite the fact that it may appear similar to other ideas in other contexts.

For the purpose of this paper, innovation will primarily be seen as *an outcome,* based on the definitions brought by Schumpeter (1934) and Damanpour (1991). Innovation is seen as both tangible products, and intangible processes and services, which is both categorised as an outcome in regard to the work by Schumpeter (1934) and Damanpour (1991).

## Organisational Ambidexterity and Innovation

The theory of innovation processes has been widely discussed among scholars, to be built on explorative and exploitative approaches (Smith & Tushman, 2005; Atuahene-Gima, 2005; Schumpeter, 1934; Lubatkin et al., 2006; March, 1991; Sheremata, 2000; Benner & Tushman, 2003). Whereas, the majority believe that ambidextrous firms that are capable of exploiting existing resources as well as exploring new opportunities and capabilities with evenly balanced acumen experience positive performance effects (Lubatkin et al., 2006; Benner & Tushman, 2003). According to March (1991), organisations that engage in exploration at the expense of excluding exploitation tend to present undeveloped new ideas and to a large degree similar competences. In contrast, organisations that engage in exploitation at the expense of excluding exploration are likely to find that they are trapped in a substandard presence of steadiness, not simultaneously evolving (March, 1991). The field of organisational literature on innovation processes has stressed the salience of equilibrium between exploration and exploitation.

However, Abernathy (1978) questions whether it is viable for organisations to follow and perform both exploration and exploitation synchronously. Even though exploration and exploitation are opposing organisational processes, both types of activities are salient for the survival of the organisation. Multiple scholars have presented their perspectives on how to achieve this balance. Hedberg et al. (1976) propose that organisations undergo various phases of learning when shifting between distinct organisational structures and by performing actions both consistently and inconsistently. Whereas, other scholars suggest that organisational structures need to be loosely coupled, in order to separate the exploratory and exploitative departmental sections (Levinthal, 1997; Weick, 1976). An example is Leonard-Barton (1995) conducted a study that explains exploratory units separated from exploitative units, focusing primarily on incremental innovation. Additionally, Christensen (1998) proposes that due to the innovative characteristics of technology, explorative units and exploitative units must be entirely separated from each other. He argues, that in the loosely coupled organisational structures it is uncertain where the integration needed to foster innovation is achieved. Contrasting, Lawrence and Lorsch (1967) highlight that ambidextrous organisational structure consists of very distinct but deficiently integrated units, where the exploratory units are small-scale and decentralised encompassing loose cultures and processes, and the exploitative units are large-scale and more centralised with tighter culture and processes (Benner & Tushman, 2003:247). They argue how process management activities tend to compel exploration away, and therefore, and organisations need to ensure that the explorative does not migrate into exploratory units and processes. Conversely, tight coupling related to process management activities is best located at exploitative units that have thrived by decreasing variability and increasing efficiency (ibid.).

Lubatkin et al. (2006) highlight how top management teams hold a key role in behavioural integration when facilitating the demands essential to achieve ambidexterity in organisations. Specifically, the reason how exploitation entails top-down learning, where top management works to establish the routines and procedures that best complements the exploitation of existing resources. Conversely, they argue how exploration involves bottom-up learning, where top management is compelled to renounce the existing routines and procedures in favour of a new plan of action (Lubatkin et al., 2006:648). Smith & Tushman (2005) add to this notion by highlighting the salience of the top management's position, i.e., balancing between short-term performance and long-term adaptability. Particularly, it happens when negotiating between existing products (exploitation) and new innovations (exploration), with the aim of identifying outcomes that will guarantee the functioning of both short-term performance and long-term adaptability (Smith & Tushman, 2005:524).

## From Explorative and Exploitative to Incremental and Radical innovation

Existing literature has shown a connection between explorative and exploitative innovation and the concepts of incremental and radical innovation (Benner & Tushman, 2003; Germain, 1996). Hence, incremental innovation can be connected with exploitative innovation in the way that incremental innovation is depicted by minor changes in the technological path while building on the company's existing resources. Consequently, existing literature has viewed incremental innovation to be improving and exploiting the company's existing resources and based on existing literature, if one were to view it the other way around, it would be possible to argue that exploiting a company's existing resources can empower minor and incremental changes in the technological and innovative path of the company (Benner & Tushman, 2003). On the other hand, earlier literature has depicted radical innovation as a fundamental alteration to the company's technological path, while building up new resources and capabilities (ibid). Hence, intensifying the company's exploration of new resources and capabilities.

Furthermore, it has been argued how incremental innovations are tailored to match the demands of current customers and are built on existing knowledge and capabilities within the company. That further strengthens the argument that incremental innovation fosters exploitation (Benner & Tushman, 2003). Conversely, it has been argued that radical innovations are tailored towards new, potential customers and markets while being built on new knowledge and capabilities. Essentially, it strengthens the argument that radical innovation fosters exploration (Benner & Tushman, 2003).

Consequently, innovation radicalness has been described as an organisational characteristic that leads to fundamental and considerable change in inputs, outputs, or processes (Germain, 1996:117). Since radical innovations are based upon new knowledge and clearly distinguish itself from past practice, these have the propensity to be both costly and risky for businesses. Conversely, incremental innovations are less costly and risky seeing as they are based upon improvements and changes to existing practices. Studies show how organisational structure affects innovation, from diversification, size, complexity, and formalisation (Ettlie et al., 1984) to specialisation, decentralisation, and integration (Germain, 1996; Champion, 1975; Miller and Dröge, 1986; Mintzberg, 1979).

Taking a deep-dive into the notions of specialisation and decentralisation and their interconnectedness to innovation, Germain (1996) explains how *specialisation* can be described as the degree of knowledge and competence in the organisation. Thus, if the organisation has a large knowledge base and a well-nurtured idea-sharing culture, the tendency to innovate becomes significantly higher. Dewar and Dutton (1986) conducted a study on this topic with the initial hypothesis that specialisation and incremental innovation were not interconnected since incremental innovation requires neither extensive knowledge nor information. However,

the results of their study proved different. They found that specialisation supports the demonstration that not all aspects of organisational structure influence incremental and radical innovation distinctively, i.e., specialisation invariably forecasts innovation irrespective of costs and degree of radicalness (Germain, 1996:118). *Decentralisation* describes the vertical position of decision-making, i.e., if the decisions are performed in the lower end of the organisational structure it indicates a more decentralised organisational structure. The participatory structures of an organisation encourage involvement, recognition, and dedication from organisational members, therefore, the higher degree of decentralisation, the higher degree of innovativeness (Germain, 1996). Dewar & Dutton (1986) made a hypothesis that the more decentralised an organisation is, the higher the tendency of adopting incremental innovation it has. They based their hypothesis on the fact that incremental innovations, i.e., minimum cost and risk, merely involve little new knowledge and therefore, might result in fewer managers opposing the innovation. However, their studies showed that there was no correlation between a decentralised organisation and incremental or radical innovation (Germain, 1996:118).

Moreover, studies show how the size of the organisation is correlated with predicting innovation (Ettlie et al., 1984; Germain, 1996; Thompson, 1969; Dewar & Dutton, 1986). From non-profit establishments, such as hospitals, libraries to for-profit establishments such as newspaper publishing and manufacturing organisations. Germain (1996) proposes that size is affiliated with the existence of slack resources, experts, operators and knowledge workers - all instrumental in enabling firms of considerable size to invest in innovation. Whereas, Germain (1996) states it is the size and the existence of the slack resources that overall enables innovations in larger organisations. Smith and Tushman (2005), conversely, state it is the presence of the existing products that produce the slack resources, knowledge, and routines, eventually enabling the launch of innovation (Smith & Tushman, 2005:523). Germain (1996) argues that organisations of all sizes can meet the expenses of incremental innovation, due to the existing products producing the knowledge and routines minimising the costs of incremental innovation.

Innovation is not merely influenced by organisational structure, the context in the form of environmental uncertainty is an alternative factor that is demonstrated to impact innovation (Germain, 1996). If an organisation is regularly exposed to environmental change, there is a high likelihood that the organisation becomes better at adapting to turmoil, focusing on the future and being more conscious of external innovations and signals. Thus, Germain (1996) argues that external change causes organisations to be more receptive to radical innovations. Gradual or incremental innovations account for less variability and restricted opportunities for generating competitive advantage, due to their incremental nature. Therefore, environmental uncertainty is hypothetically predicting radical innovation rather than incremental innovation (Germain, 1996:119).

In other words, the greater the organisation in terms of size, the more specialised, decentralised and integrated it is. Mintzberg (1979) conducted a study showing that the degree of the specialisation expands with the size of the organisation because the increased dimensions of labour encourage subsections to form. Therefore, it was argued that organisations of considerable size tend to be more sectioned, and one way to defeat the solitude and the vertical communication that it may cause is to initiate sidewise integration (Mintzberg, 1979). On the other hand, organisational structures that are more organic and more specialised, decentralised and integrated seem to derive from environmental uncertainty. Uncertainty results in more complex processes and less reiteration. Additionally, it is described how levels of skills and specialisation intensify with the presence of environmental uncertainty, thus it is affiliated with organisational structures that are integrated and evolves as subsections with an increasing need to harmonize the reaction to environmental change (Germain, 1996:120).

## Innovation in Process Management Literature

The above-mentioned sections show how previous studies have examined the correlation between organisational structure and uncertainty with incremental or radical innovation. Benner & Tushman (2003) additionally argue how process management impacts technological innovation processes, i.e., radical and incremental innovation. Since the application of process management techniques originally requires a direct focus on innovation along with a shift in company activities, there is a high likelihood to incentivise innovation (Winter, 1994; Benner & Tushman, 2003). The innovative stage of process management requires significant organisational change. However, the change is concentrated around enhancing efficiency within the current technological path, which is somewhat paradoxical (Benner & Tushman, 2003). The early process management scholars were pivoting the incremental and exploitative innovations as opposed to radical and exploratory innovations. As a result, process management techniques are focused on improving organisational efficiency through incremental changes in activities and processes. Innovation and change in those specific activities are achieved by moving away from current organisational routines. Thereby, the newly enhanced routines can become best practices (Benner & Tushman, 2003:243). Eventually, as the repetition of activities and enhanced routines proceed, the organisation continuously learns and simultaneously its incremental innovation intensifies. Benner & Tushman (2003) argues how process management activities, therefore, guides innovation. However, while those processes expand within the organisation with time, the number of linkages increase between organisational routines confining innovations to incremental shifts in current activities. Therefore, it is proposed that multiplications in process management activities encourage incremental innovations (Benner & Tushman, 2003:245).

Process management techniques are tailored to exploit current organisational resources and capabilities (Benner & Tushman, 2003). In aspects, where short term performance pressures, the needs of existing customers dominate, resulting in exploitation conquering exploration. Fast exploitation, such as organisational

members performing activities in organised processes develops short term advantages that are easy to measure (ibid.). Levinthal & March (1993) argue that as organisations obtain new product innovations, reductions of cost or enhanced customer satisfaction more rapidly, organisations tend to continue with more passion in regard to expanding process activities. As organisations repeatedly carry out processes of enhanced routines, it (the organisation) becomes more capable and efficient, whereas the difference in outcomes of these routines and activities declines. It is shown that this direct focus on incremental innovation and enhanced organisational capability, causes the unlikelihood of process management activities to develop innovations that to a large extent distinguishes from the field of the organisation's current technological capabilities (Benner & Tushman, 2003:246). That means, in a simpler way that the focus on incremental innovation in process management activities, decreases the likelihood of radical innovations.

## 2.2 Startups, Large High-Tech Corporations and the Innovation Processes

More startups than ever have emerged over the last decade (Audretsch, 2012) and its field of research has gained immense prominence in recent years. However, there is no one agreed-upon definition or criteria that a company must meet in order to be categorised a startup and thus multiple definitions of startups exist (ibid.) - see section 1.4 for the authors' definition of a startup (in this study). In existing literature, it is proposed that a company can be categorised as a startup either due to its organizational context (e.g. size, age, etc.), performance criteria (e.g. innovative performance, product innovation, etc.) or its entrepreneurial behaviour (e.g. ability to recognize an opportunity and exploitation or commercialization of the opportunity) (Audretsch, 2012).

Previous research has investigated the notion of large high-tech corporations and their relation to startups and found a myriad of answers (Wagner, 2011). For example, large high-tech corporations are advised to consistently observe startups aiming to "capitalise on the availability of potential" (Wagner, 2011;8) which would mitigate weaknesses in their innovation outcome (Wagner, 2011). Large high-tech corporations are also expected to practice more exploitation due to organisational inertia (Hanna & Freeman, 1977 in Wagner, 2011) that ultimately will drive out exploration (Tushman & Anderson, 1986, Christensen & Rosenbloom, 1995, Benner & Tushman, 2002, 2003 in Wagner, 2011). This approach pictures a situation where large high-tech corporations exclude exploration and should monitor startups to learn from them or acquire them at the right time. In that sense, the reasoning is that startups are superior in the exploration of innovation and large high-tech corporations should acquire the startup or merge with it when in need of more explorative innovation (ibid.).

Another approach to investigate both startups and large firms is the comparison of both and their survival rate in new and existing industries (Echambadi et al., 2008). Further, the research focuses on in which state the

industry is present, e.g. highly innovative, new industry, etc. and who has the highest survival rates when entering a given industry. Startups have relatively high survival rates in highly innovative industries if they enter the industry not being the first mover (Echambadi et al., 2008).
On the other hand, large corporations generally do well in creating new industries that are less innovative, where startups generally do better by waiting until the first movers have entered the market. Echambadi (2008) differentiates between large startups and small startups and sheds light upon the fact that their survival depends on different industry characteristics.

Startups are often recalled for their innovative approach and generating innovations that large high-tech companies are not. However, startups more often than not 'copy' other existing companies' products, organization style etc. (Freeman & Engel, 2007). Nonetheless, startups are simultaneously recognised to excel at generating new creative ideas that large high-tech corporations find more difficult to undertake (ibid.). Large high-tech corporations are considered to succeed regarding the execution of plans of newly generated and creative ideas than startups (Kupp et al., 2017, Freeman & Engel, 2007). Kupp et al., (2017) shed light on the fact how some startups can disrupt established firms due to their design for growth, flexibility and lean organisational structure. In order for established corporations and large high-tech companies to overcome the shortcomings, many try to get closer to the startups by either investing in startups or generate labs, startup competitions, hackathons, etc. (Kupp et al., 2017). Collaborations like this can help both the startup and the established company (ibid.). Additionally, large high-tech companies may have enough resources for investing in innovation, but they are prone to experience a wide range of issues that decreases their level of innovativeness. That is, large high-tech firms tend to build hierarchy and bureaucracy that is not beneficial in terms of creating a culture that spurs creativity (Kamien & Schwartz, 1975) and also, they tend to be more rigid than smaller firms such as startups (Cohen & Klepper, 1996; Wagner & Hansen, 2004).

Conversely, Freeman & Engel (2007) investigate startups' and large corporations' models of innovation and compare them to each other. However, the focus again is weighing towards how large companies can learn from startups by e.g. investing in startups due to the fact that what startups need the most is cash flow (ibid.). What mature corporations can learn from startups is how to successfully innovate since "existing mature corporations find innovation especially challenging" (Freeman & Engel, 2007:25). Thus, startups and large high-tech companies can learn from each other and ideally help each other out. As much literature exists on startups having effects on large high-tech companies, as little research has been conducted about the consequences and effects large companies can have on startups' innovation process.

To sum up, much research has focused on either startups, large companies, high-tech companies, or the relationship between those. Much has been investigated into innovation in startups and how large high-tech

corporations can learn from startups. Furthermore, existing research has investigated how large firms can benefit from startups in multiple ways, either by M&As or observing them, etc. However, there is a lack of research in the field of how larger firms can affect startups when it comes to innovation processes from a startup point of view, hence the size of this section. This research gap combined with the three primary motivations (see section 1.2) poses as the reason behind this study. The authors' motivations and reasoning behind this paper developed throughout the Business Administration and Information Systems Master's degree and the section below will explain the connection to the master's degree further.

# 3. Analytical Framework

## 3.1 The Business Administration and Information Systems Perspective

> *"In the MSc in Business Administration and Information Systems program, you learn how you use information and information technology to add value to companies and organisations. IT is viewed as something you can use and manage to reach the goals and solve the problems of a company."*
> (CBS, 2019)

The significance of understanding and utilising information and information technology has throughout the last couple of years increased rapidly, which has strengthened the importance of the MSc in Business Administration and Information Systems. It is reasonable to argue that the increasing significance of information and information technology has high potential to influence the innovation processes of companies. More specifically, the market has shown how some companies with a good understanding and utilisation of information and information technology have created to some degree revolutionising innovations that brought them to the top of their field and industry. Google almost creating a monopoly in the information service field, with a market share of 89,90% in the search engine field as of January 2019 (Statista, 2019). Facebook outrunning its competitors in the internet service/social media field with 67,7% of the worldwide market as of March 2019 (Statcounter, 2019), Uber revolutionising the transportation industry with 69,2% of the ride-sharing market as of December 2018 according to Second Measure (Molla, 2018) and Amazon creating a strong top position in the field of e-commerce and retail, with 49,1% of the US e-commerce market as of July 2018 (Lunden, 2018).

The connection between information and information technology along with innovation processes can be argued to be related, yet, not mutually-exclusive or -dependent. That is, the degree of understanding and use of information and information technologies affect the degree of innovation, which is deeply embedded in the innovation process. Based on the media coverage, one can argue that there is a rising tendency in the market

for companies to believe that strong management of information and IT does affect the companies' abilities to perform a successful innovation process. The criteria of a successful innovation process are for the top management of the specific company to decide. The interesting part is to investigate which role the factor of company size plays in this innovation process path, and eventually, the influence different company sizes have on innovation processes. More specifically, investigating how companies of large size affect and influence the innovation processes of small companies, i.e., startups. On this basis, the importance of investigating innovation processes can be argued as highly relevant for the overall perspective of Business Administration and Information Systems.

## 3.2 Theoretical Framework

In this second section of the analytical framework, the theoretical framework is introduced. The framework will shape the foundation of the research design along with the structure of the analysis. By presenting an integrated framework, the intention of this paper is to offer a more comprehensive analysis of what effects large high-tech companies have on startups' innovation processes in the Silicon Valley area. In the following subsections, the theoretical perspectives behind the model are specified. To briefly explain, the link between the literature review and the theoretical framework the purpose of the literature review is to understand the existing field of research, and essentially the research question will create the link between the theoretical framework and the literature review. Eventually, creating an overview of where this study would fit in with the existing body of literature. The theoretical framework poses as a means to answer the research question, i.e., the lenses the findings and the study will be seen through. Therefore, the theoretical framework will support the process of answering the research question, which will support the connection with the existing literature. This will be explained further in section 3.3.

### Path Dependence Theory

Multiple different perspectives and concepts have emerged in path dependence literature, whereas some will be presented below. The main theoretical framework for this paper is Sydow and Schreyögg's (2015) study on Organisational Path Dependency. It will be utilised to answer the research question of how the large high-tech companies affect startups' innovation processes in Silicon Valley.

> *"The basic point of any path-dependence argument lays stress on the importance of past events for current and future actions."*
>
> (Sydow & Schreyögg, 2015:385)

Path dependence is, as the quote specifies, based on past occurrences reflected in the present and future activities. Previously, path dependence has been defined as "history matters" or the future is influenced by the

past (Mahoney, 2000; Vergne & Durand, 2010; Onufrey & Bergek, 2015). Such definitions led scholars to understand path dependence incorrectly as "a form of analysis that simply traces outcomes back to temporally remote causes" (Mahoney, 2000:507). Due to the fact that all actions, such as experience, are based on the past and will affect the future in some way, this is too vague to call a theory (Mahoney, 2000). Researchers have only recently created a more nuanced picture of path dependence and its applicability as a theory in order to avoid a too vague framework (Sydow & Schryögg, 2015). Nonetheless, the central point revolves around the notion of 'the past influencing the future', and some criteria have to be met in order to identify this as path dependence. Different concepts have been included in path dependence in order to create a more focused and applicable concept that can explain why an expected outcome based on a different theory did not occur (Mahoney, 2000).

Sydow and Schreyögg (2015) proposed a framework to identify the drivers of the path dependence processes, where the focus is on the dynamics that are initiated by a critical occurrence or a sequence of occurrences that narrows the scope of action, consequently, causing a lock-in situation (Sydow & Schreyögg, 2015). It is important to remember that path dependence need not be perceived as a negative spiral with regard to establishing an early decision that turns out poorly. Contrastingly, studies have shown how path dependence processes tend to be propitious at the beginning, whereas the change in rationale comes later, which causes the development to be disturbed. Sydow and Schreyögg (2015), therefore, argue how the character of path dependence is intrinsically uncertain.

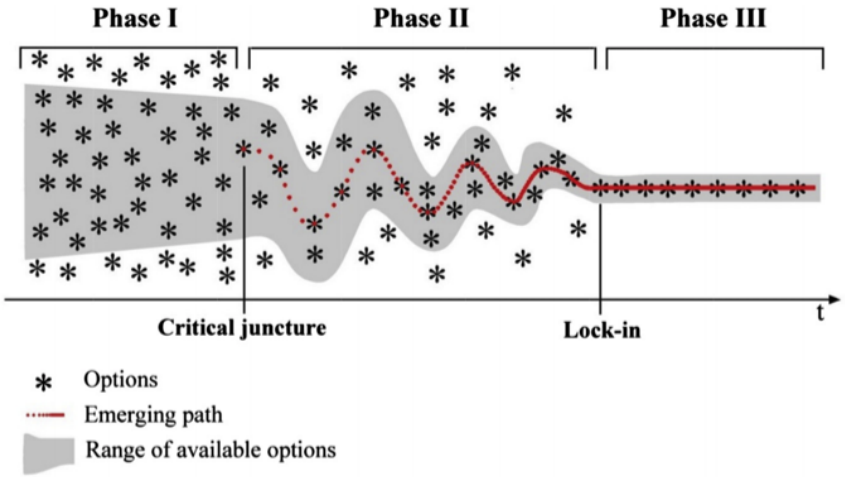


*Figure 3.1 - The Constitution of an Organisational Path (Based on Sydow, Schreyögg & Koch, 2009)*

Sydow and Schreyögg (2015) utilise the model in figure 3.1 from Sydow, Schreyögg, and Koch (2009) to describe path dependence through three phases.

Phase I named - *the Preformation Phase* - can be explained as a situation where the actions are taken cannot be anticipated by past activities or occurrences (Mahoney, 2000 in Sydow & Schreyögg, 2015). This phase can be characterised by a predominantly unconstrained scope of action. However, the phase is to some degree shaped by the prior events, i.e., all decisions made are historically framed, meaning they can be characterised as 'imprinted' choices. Therefore, the authors argue that one should avoid perceiving the first phase as an utterly unconstrained choice in relation to rational models of choice (Sydow & Schreyögg, 2015). To further explain the model, the grey shadow depicted is intended to indicate *the Preformation Phase*.

Following, in Phase II – *the Formation Phase* – the scale of options becomes increasingly narrow and simultaneously it becomes more difficult to undo or go back to the initial choice (Sydow & Schreyögg, 2015). In this phase, the beginning is still open and rather challenged, however, the self-reinforcing processes will eventually take place. Those forces are also referred to as positive feedback processes, where a specific pattern of action or routine is repeated over and over again due to the growing benefits of such (Sydow & Schreyögg, 2015). The reinforcement of one pattern sets a dynamic in place of doing the same thing over and over again. This seems to lead to an organisational solution but also implies that the process is becoming increasingly irreversible (Sydow & Schreyögg, 2015). In Phase II decision processes are contingent (Sydow & Schreyögg, 2015), however, the choices are still possible. Self-reinforcing sequences are an institutional pattern that once it is adopted it creates increasing benefits with continuous adoption, thus it becomes increasingly difficult to alter the pattern or select previously available options (Mahoney, 2000). In other words, once an option of two or more is chosen a pattern of the same processes emerge and reproduce a pattern. Ultimately it is near to impossible to redirect to the initial point of where the path was chosen, even though it might have been a more efficient path (Mahoney, 2000; Onufrey & Bergek, 2015).

Different types of self-reinforcing dynamics have been identified, where the five below have shown to be most prominent and applicable; 1) coordination effects, 2) complementarities, 3) network externalities, and 4) learning effects, and 5) adaptive expectations (Sydow & Schreyögg, 2015). Additionally, these four effects have been discussed in an organisational micro-level context (Sydow, Schreyögg & Koch, 2009, Vergne & Durand, 2010), in a meso-level industry context (Arthur, 1989; Dobusch & Schüßler, 2012; Onufrey & Bergek, 2005, Vergne & Durand, 2010) and an institutional macro-level context (Vergne & Durand, 2010).

1. The most prominently featured effects, when describing organizational path dependence, are the *Coordination effects*. These refer to the phenomenon that "the more returns there are from sharing a rule, the more attractive (beneficial) it becomes for other people to adopt and so follow this very same institution" (Sydow & Schreyögg, 2015:386). In other words, the majority will find it more attractive to follow an industrial norm for instance. If one were to switch to a different or new norm, standard

coordination cost would appear. Coordination effects in regard to technology are often explained as direct network effects, where following the industry norms and standards can create advantages and switching to a new standard would imply coordination costs (Onufrey & Bergek, 2015).

2. *Complementary effects* emerge from the interaction of two or more individual, yet, related resources, practices or rules (Sydow & Schreyögg, 2015). The process of self-reinforcing within the complementary effects happens when practices are interrelated in a way, making it increasingly more attractive to exploit. Eventually, sets of patterns become gradually dominant and embedded in the organisation, making them organisationally path-dependent (Sydow & Schreyögg, 2015). Complementary effects are the dependence of the development of complementary products, services, or processes in order for a technology to succeed (Sydow, Schreyögg, & Koch, 2009; Dobusch & Schüßler, 20120 Onufrey & Bergek, 2015).

3. *Direct and indirect network externalities*, also referred to as network effects, encompass the increasing benefits to the user of a good or service the more other actors use the same good or service as well (Sydow & Schreyögg, 2015). Additionally, the effects strengthen the beneficiaries by the existence of indirect network externalities, i.e., the need becomes more concentrated because the complementary goods and services support the main product.

4. *Learning effects* refer to the fact that the more often an action is performed, the more efficiency will be accomplished when operating subsequent iterations (Argote, 1999, in Sydow & Schreyögg, 2015). Skills become more developed and it becomes thus less attractive to switch to a new learning site, where actors would need to start from scratch. This behaviour firstly promises increasing return, however, the learning curve flattens out at some point and also cuts out explorative learning (Sydow & Schreyögg, 2015). Additionally, learning effects are based on the "accumulation of resources and knowledge that are specific to a particular product or technology and cannot be easily transferred to or reused in alternatives" (Dobusch & Schüßler, 20120, in Onufrey & Bergek, 2015:9)

5. Lastly, *adaptive expectations* express the behaviour of not following individual preferences but rather what is expected that others do and prefer (Sydow & Schreyögg, 2015). That is due to the need for social belonging while making it easier for individuals to make a choice. By following what others already have chosen individuals feel certain to have made the right choice. That is, social belonging is reflected in a desire to choose the right well and thereby end up on the winning side (Sydow & Schreyögg, 2015). Consequently, a dominant solution might occur, and best practices in organisations tend to follow the same reasoning, i.e., organisational members willingly accept a practice because of

an expectation of others doing the same (ibid). Adaptive expectations may seem similar to coordination effects, but adaptive expectations seek a rather "softer" type of advantage, e.g. belonging to the winner side and avoiding becoming an outsider (Dobusch & Schüßler, 2012).

Altogether, these effects contribute to increasing the probability of leading an organisation to choose a path and exclude other available options due to the dynamic of repetitive routines, the pattern of actions, etc. In addition, the self-reinforcing effects are not mutually exclusive, meaning they often come in a combination of two or more dynamics and thus overlap. Subsequently, in Phase II a certain path becomes more and more clear and narrows down to a point where other paths become harder to choose. Furthermore, returning to the point of critical juncture is close to impossible at the end of Phase II.

Lastly, the transition to Phase III – *the Lock-in Phase* – is characterised by even more restriction and is likely to occur in a lock-in state (Sydow & Schreyögg, 2015). Such a state is reached in the sense that "the dominant pattern gets fixed and even gains a quasi-deterministic character" (Sydow & Schreyögg, 2015:387), and the organisation and also new entrants are bound to the emerged path. Lock-in is a state of irreversibility from the path and another alternative organisational solution is impossible at this time (Sydow & Schreyögg, 2015). Change within the lock-in state is unlikely to occur, resulting in a 'difficult-to-escape situation, which eventually becomes the outcome of the path dependence process (Vergne & Durand, 2010). This is where self-reinforcing mechanisms come into play, i.e., the self-reinforcing mechanisms strengthen the winner-to-be while impairing the remaining alternatives (Onufrey & Bergek, 2015). When the initial choice of a path through a critical juncture reaches a state where it self-reinforces the process over and over, it leaves alternative paths excluded - creating a state of lock-in (Mahoney, 2000).

In sum, Sydow & Schreyögg's (2015) study of organisational path dependence concludes that an organisational path is a "historically imprinted social process" (p. 388). In the first phase, the process is started by a conditional choice, possibly triggered by one or several events. The second phase is controlled by a system of positive, self-reinforcing feedback loops, establishing a particular pattern of actions, which receives gradual supremacy over alternative solutions to the possible extent of leading to the third phase lock-in (Sydow & Schreyögg, 2015).

### Path Dependency and Innovation Processes

The relation between path dependency and innovation processes has briefly been discussed by researchers in both fields (Coombs & Hull, 1998; Thrane et al., 2010; Meyer, 2007; Ingram & Fraser, 2006; Tushman & Anderson, 1990; Schienstock, 2004). Thrane et al. (2010) suggest that path-dependent innovation processes are more complicated in the sense that innovative and technological path dependence are two separate

concepts, yet both have a cognitive basis. They further suggest that it might be characterized by innovative path dependence and technological path creation (Thrane et al., 2010). Their study recognises how the "innovation approach frames the innovation problem and constraints in relation to technologies have an impact on the innovation process later after new technologies have been thoroughly researched" (Thrane et al., 2010:933).

Technological path dependence, in a cognitive perspective, is based on perceptions that indicate what "types of puzzles product development should solve, and that determine which solutions are excluded" (Thrane et al. 2010:933). Such models can be limited in the way that they prohibit the company from gaining a complete understanding of the 'world' and thus constrain decision-making and actions (Nelson & Winter, 1982). By the same token, restricted and directed search activities that are connected to technology development, the development of new capabilities is influenced by managerial cognition (Tripsas & Gavetti, 2000, in Thrane et al., 2010). This is supported by Cohen and Levinthal (1990) who discuss how previous knowledge, i.e., absorptive capacity, is essential for evaluating new knowledge and technology, with "lock-out from new technologies potentially occurring because they cannot be understood" (Thrane et al., 2010:934). Hence, the company is restricted to a local search habit and thereby reinforces the same pattern over again, possibly creating a path dependence. In regard to innovation, Levinthal and March (1993) argue that firms may end up in a competence trap, which can lead to decreasing returns to exploration. Such a decrease can become problematic in the sense that when a technology is discontinued, and thus old competencies become outdated (Tushman & Anderson, 1990). Thrane et al., (2010) refer to these issues as cognitive "blind spots", prior knowledge and competencies that constrain both innovation and organizational change processes that lie at the base for path-dependent behaviour. To summarize, an immense amount of literature exists on innovation processes and large amounts of literature on path dependency. Much less literature on the relation between innovation processes and path dependency, and specifically little to no literature about the relation between innovation processes and path dependency in startups. This gap in the literature is what this paper aim to explore.

## 3.3 Theory Rationale

To add to the part with the link between the literature review and the theoretical framework, described in the beginning of section 3.2 - the literature review creates the understanding of the background for the research setting. The theoretical framework is presenting the lenses which the setting is examined through. In order to create a thorough examination, it is important to understand the background of the setting and the existing research. Additionally, as stated at the beginning of section 3.2, the link between the literature review and the theoretical framework is rooted in the research question. Where the literature review ensures an understanding of existing research, the theoretical framework ensures that the study is conducted academically, and will,

therefore, end up filling a research gap and thus contributing to the body of literature. The authors believe that it would not be possible to conduct a comprehensive study and help fill the research gap without the literature review and the theoretical framework. Both sections pose as a significant part in this study's execution and contribution to the body of literature.

The theory of organisational path dependence provides a broad structure with concrete aspects allowing for an in-depth examination of multiple parts of the unit of analysis. This can especially be helpful when investigating startups seeing as startups are likely to not include a large hierarchical structure with all processes neatly in place. The broad scope of the theory allows flexibility to examine all parts of the potentially loosely coupled processes within startups. It forms the intention behind utilising this theory. Moreover, the theory is highly relevant, seeing as it has the potential to depict the structural inertia within the market as it is today, i.e., with large incumbents encompassing nearly full monopoly of the market. Additionally, path dependence researchers generally approach path dependency and self-reinforcing mechanisms in a setting where the only feasible link between diverse paths is market rivalry (Cecere 2009; Cowan & Gunby, 1996) and where the primary feasible output is lock-in (Vergne & Durand, 2010). It is thus interesting to study this phenomenon by seeing large high-tech companies as market rivalry and if it is possible to argue that the large high-tech companies can create lock-in for startups in terms of their innovation processes. Therefore, the intention is to utilise the theory to examine the selected startups and their innovation processes to see whether or not the large high-tech companies affect these. More specifically, by identifying the self-reinforcing mechanisms in these startups, which can highlight whether or not the large high-tech companies have created a lock-in state for the startups.

# 4. Methodology

Throughout this section, the methodological framework for this research paper will be introduced, hereunder the philosophical position, epistemological choice, the research approach, strategy and design along with sampling rationale. The section will be finalised by outlining the data collection, the data analysis, and the quality criteria. All of these are interrelated and will in some form the methodological framework, which can be seen as the structural backbone of this paper. An overall and simplified visualisation of the research position, research approach, and research design can be seen in figure 4 below. The orange colour indicates the stance of this paper:

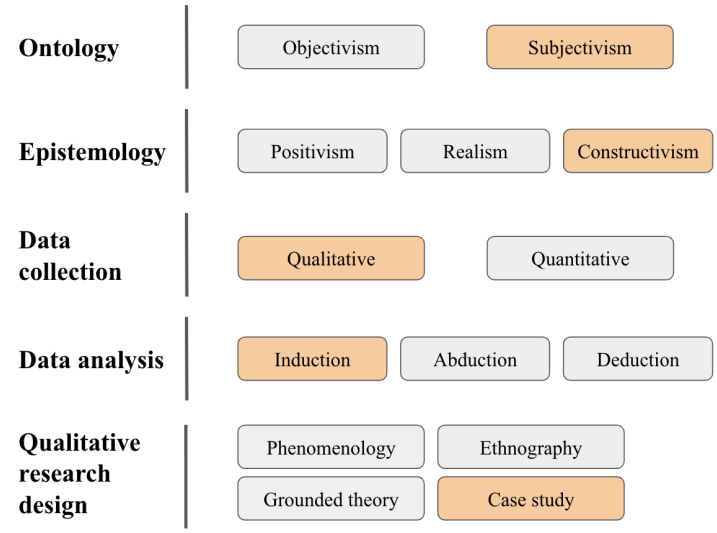


*Figure 4.1 - A Simplified Visualisation of the Research Position, Approach and Design of this Paper.*

## 4.1 Research Position

"The nature of reality" (Saunders et al., 2012:130) and "the existence of and relationship between people, the society and the world in general" (Eriksson & Kovalainen, 2009:5) are both sentences that are used to define what ontology is. Ontology is described as the way in which the researcher sees the world, i.e., the researcher's methodological position (ibid). Two main ontological perspectives have been outlined; Objectivism and Subjectivism and the distinct aspects setting the two perspectives apart are the aspects of conceptions of reality. The core belief of objectivism is that the social world exists regardless of individuals, their actions and interpretations, i.e., social reality does have an independent existence outside the individual (Eriksson & Kovalainen, 2009). The second perspective is subjectivism, and the two researchers behind this paper share a common worldview of subjectivism. Subjectivism is based on the social nature of reality, and the two terms 'subjectivism' and 'constructionism' are often used interchangeably (Eriksson & Kovalainen, 2009). Scholars have diverse perspectives on how similar these two terms and their definitions are. However, for the purpose of clarity, the authors of this paper support the stance of Eriksson and Kovalainen (2008), where subjectivism and social constructivism are described as equivalent terms. In the subjectivist, ontological view the key belief is that social and cognitive processes make up the reality of the individual. That is, no reality exists outside the individual - the reality is founded upon the interpretations of individuals (Eriksson & Kovalainen, 2009). Due to the fact that the two researchers of this paper are humans, and surrounded by humans, with an interpreted world view, it is natural that multiple beliefs exist, that there is no one truth and that the phenomenon that is studied, will in this paper be the researchers' interpretation of the phenomenon. Hence, the subjectivist ontological nature of this paper.

In connection, ontological perspectives are tightly linked with epistemological perspectives and they are frequently discussed in combination. Where ontology, as described above, focuses on the question 'what is the nature of the world?', epistemology is focused on the question "what is knowledge and what are the sources and limits of knowledge?" (Eriksson & Kovalainen, 2009:6). Therefore, on a broad and overall level, epistemology specifies how knowledge can be generated and debated. That is, it outlays the criteria by which knowledge is feasible (ibid). In epistemology, objectivist and subjectivist views exist as well, where (1) the objective epistemological perspective assumes that the existence of a world that is external to the individual and theory-neutral is feasible, and (2) the subjective epistemological perspective assumes that it is not possible for an external world to exists beyond the observations and interpretations of the individual (Eriksson & Kovalainen, 2009). Additionally, epistemology can be defined through various directions, and the directions do not necessarily endorse the qualitative-quantitative distinction but are founded on the ways through which knowledge argumentation is created (Eriksson & Kovalainen, 2009). The main distinction between the various epistemological directions are built on three basic assumptions:

(1) The difference between epistemological directions can be explained by whether epistemologies can be considered as 'foundationalist' epistemologies or not. Foundationalist epistemologies request permanent and trustworthy criteria for the produced research knowledge.
(2) Epistemologies vary in regard to the role it gives the researcher, i.e., whether the researcher is an autonomous and disconnected part or an integrated part of the knowledge production process, and to which degree.
(3) Epistemologies differ in how they develop the connection between concept and observation. They can be detached from, tightly connected with or contextually diverse from observation. (Schwandt, 2000)

In sum, there is a broad range of directions within the field of epistemology, and the three main epistemological positions are positivism, realism, and interpretivism. Note, these three are merely the three positions found in research and they are, therefore, <u>not</u> representational for the entire field of epistemology. To briefly explain the three epistemological positions, the first one, *positivism*, is closely related to the objective perspective and concerns the argument that only phenomena that individuals observe can result in the production of knowledge. That is, researchers prefer gathering data about an observable reality, hence, search for symmetries and causal relationships in that data (Saunders et al., 2012). The second position, *realism*, which focuses on the fact that what individuals sense is in fact reality. That means objects have an existence outside the human mind and

reality is therefore rather independent of the mind. Realism is an epistemological position comparable to positivism in its scientific approach to knowledge development (Saunders et al., 2012). The third epistemological position is *interpretivism*, which is tightly linked with the subjective epistemological view. It primarily focuses on understanding the contrasts between individuals in their role as social actors. The emphasis is on how humans interpret the social role of others based on their own set of interpretations and meanings. Interpretivism follows the stance that "knowledge of reality is a social construction by human actors" (Walsham, 1995).

The belief behind this paper is rooted in the world is socially constructed with knowledge being a product of social actors' interpretations and meanings. Since these synergies appear between this epistemological position and the philosophy of the two researchers behind this research, the paper can be considered as positioned as an epistemologically interpretive paper. Consequently, this paper can be considered with a research position in *ontological subjectivism* and *epistemological interpretivism*. The ontological subjectivism and epistemological interpretivism resonate well together, due to their interpretive nature. Seeing as we as researchers are interpreting the phenomenon under study, and the interviewees' interpretation of the phenomenon, multiple layers of interpretation emerges, which ultimately supports the ontology and epistemology of this paper. Essentially, through the sensemaking of interacting and interpreting first hand and second-hand data, the researchers were able to create a viable understanding of how startups' innovation processes in the Silicon Valley area are affected by large high-tech companies.

## 4.2 Research Approach

This paper builds on a mixed foundation in terms of research approach since the data collection and the data analysis were treated with distinct research approaches.

**Firstly**, the data was collected with a *qualitative* approach, which resonates with the subjective ontology and the interpretivist epistemology. As explained in the previous section, the paper is based on multiple layers of interpretation, i.e., our interpretation of the interviewees' interpretation of the phenomenon. The purpose of the research question is to investigate how large high-tech companies affect startups' innovation processes by trying to collect different startups' view on the phenomenon. To be able to understand startups' perspective on the situation, interviews posed as the best approach, enabling the interviewees to explain their interpretation in depth both verbally and with physical expressions. Seeing as interviews are categorised as a qualitative research approach, the research approach of this paper can also be seen as qualitative. A qualitative research approach enabled the researchers of this paper to interpret and reinterpret the interviewees' responses and gestures throughout the interviews. Furthermore, seeing as the ontological and epistemological position of constructivism and interpretivism, the authors operate with the interpretations and subjective answers from the

interviewees which leads to a qualitative research approach. The qualitative research approach suits this study well, seeing as if the research approach was quantitative, the study would operate more with objective answers which can be traced back to an objectivist ontology and a positivist epistemology - essentially, contradicting the worldview and belief behind this study.

**Secondly**, the overall data analysis can be seen as inductive. As Bhattacherjee (2012) highlighted the aim of the researcher is to deduce theoretical concepts and patterns from the collected and observed data. The data was collected with the purpose of understanding the interviewees' interpretation of the phenomenon, rather than a given theory. Eventually, enabling the authors to identify theoretical themes and patterns in the collected data and consequently, create a conceptual framework. As part of the data analysis, the code development was conducted following Boyatzis' (1998) terminology, which categorises the analysis as "*prior research-driven code development*" (Boyatzis, 1998:10). It means utilising codes developed by other researchers and their findings, which inherently could mean that the researchers behind this paper adopt another researcher's assumptions, interpretations and hence, biases (ibid). As Boyatzis (1998) argues, building on prior studies can pose as a powerful technique for the researcher to contribute to the field of knowledge, i.e., not necessarily having to reinvent the wheel for every research. For the purpose of this paper, it allows the researchers to create codes based on prior research and data from reviews of the literature. It means no specific theory is in mind while developing codes, rather various different concepts from both literature and the collected data. The literature and collected data function as an inspiration to the code development in the data analysis, hence the name *prior research-driven code development* (Boyatzis, 1998). Section 4.7 will describe the data analysis research approach more in-depth.

To briefly sum up, the qualitative and inductive approach enabled the researchers to interpret the investigated field of research, develop an understanding as patterns emerged and support the coding by relating it to relevant concepts. Through the chosen method, the authors were able to develop an understanding of the investigated field, ultimately enabling them to answer how the large high-tech firms affect startups' innovation processes.

## 4.3 Research Strategy

The research strategy of this paper is the plan on how to carry out the research. Specifically, the research strategy pilots the researcher in the phases of planning, accomplishing and controlling of the research. While a research strategy offers helpful assistance on an overall level, it is necessary to supplement it with the research methods within data collection and data analysis. These are the methods on how to collect and analyse the data, e.g., through interviews, which consequently guides the research on a more specific level. The research strategy ought to have an appropriate fit for its goal, i.e., it should enable the possibility to answer the research question in the best way possible. (Johannesson & Perjons, 2014).

Therefore, for the purpose of this paper - to understand how the large high-tech companies affect startups' innovation processes, the research strategy is based on *case studies*. A case study is defined as: "a strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real-life context using multiple sources of evidence" (Saunders, 2012:145). That means interviewing startups embedded in the Silicon Valley ecosystem, to better understand the patterns between startups and large high-tech companies. From a practical standpoint, the researchers behind this paper had access to people working in different Silicon Valley-based startups, giving direct entry into the core of the startups, supplemented with relevant concepts and theories as well as second-hand data.

In essence, a case study is focused on studying one example of a phenomenon, which in this case would be the innovation processes of startups and how these are affected by high-tech companies. Eventually, case studies can offer rich and comprehensive descriptions and insights of that example of the phenomenon (ibid). Due to the fact that the authors had limited prior knowledge to the complex social phenomenon of startups' innovation processes and how large tech companies affect those - this is, essentially, why case studies were chosen as the overall research strategy to achieve a well-crafted answer to the research question.

Additionally, one can argue the cases are exploratory, as very limited research exists on the effects that large high-tech firms have on startups' innovation processes. As Streb (2010) explains: "the exploratory case study investigates distinct phenomena characterized by a lack of detailed preliminary research, specially formulated hypothesis that can be tested" (Streb, 2010:372). On the other hand, the cases can be argued as explanatory, since the research question is about a "how" question (Yin, 2009). Essentially, it deals with operational links between large high-tech companies and startups' innovation processes - that ideally needed to be traced over time. However, in terms of this study, the interviewees are providing the authors with an interpreted screenshot of the startups. The screenshot contains their interpretation of the startup in the timeframe the interviewees have been inside the given startup and their experience.

This study will, as stated earlier, focus on and investigate 5 'mini-cases' in the form of startups, where patterns, similarities and dissimilarities between the startups will be examined. It will lead to a summarised conclusion based on findings across the startups, that is, a cross-case conclusion. All the 'mini-cases', i.e., within this study fosters the one big overall study of how the large high-tech companies affect startups' innovation processes. Therefore, this study categorises as a single case study, based on various 'mini-cases', i.e., startups all under one large overarching focus that is the research question, according to Yin (2009)'s definition of single and multiple case studies.

As described in section 4.2, this research will be conducted from a mixed research approach of both *induction* and based on the *prior research-driven approach*, which is suitable with the case study research strategy. That is due to the nuanced and in-depth nature of the research approach that can give a rich and varied perspective of the specific case studies.

## 4.4 Research Design

The definition of a research design is, essentially, the logical order that links the empirical data to the initial research questions of the study and eventually, to the conclusions. In other words, as Yin (2009) explains:

> "The research design is a logical plan for *getting from here to there*, where *here* may be defined as the initial set of questions to be answered and *there* is some set of conclusions about these questions." (Yin, 2009:26)

The research design addresses at a minimum four aspects of the research process, which are what questions to study, what data will be applicable and important for the study, what data to assemble and how to analyse the findings (Philliber et al., 1980). Within the notion of research designs, Yin (2009) proposes five components that are substantially salient for the methodology of case studies. Those will briefly be explained in the context of this research paper below:

(1) Study questions, which inherently describes the nature of the research question and how it relates to the research design. Existing literature proposes that case studies tend to be built on "how" and "why" research questions (Philliber et al., 1980), which supports the argument of case studies being appropriate for this paper since the research question is *how the large high-tech companies affect startups innovation processes*.
(2) Study propositions are the reflections ensuring the research moves in the right direction, the reflections behind the "how" and "why" questions (Philliber et al., 1980). The exploratory nature of this paper makes it difficult to state-specific propositions, however, there is a purpose behind the paper, which eventually is to understand if startups' innovation processes are affected by large high-tech companies, and if yes to what degree they are affected. Additionally, the purpose of the research question is to understand in what way startups' innovation processes are affected by large high-tech companies.
(3) Unit of analysis, which refers to the nature of defining what a "case" is, i.e., it can be an individual, a group, an organisation, a process etc. (ibid). The nature of this paper is inherently based on the innovation processes of the five interviewed startups being the unit of analysis. There is a theoretical difference between the case and the phenomenon investigated (Philliber et al., 1980) and the cases studied within this research are the five interviewed startups, where the phenomena examined are the

innovation processes of these startups and how they are affected by large high-tech companies. In combination, these two notions make up the unit of analysis. Seeing as the cases are spread across five startups, the research can be categorised as a multiple-case, with a holistic design, which explains the same research design for the multiple cases.

(4) The logical connection between the data and the propositions, which focuses on the analytic techniques of the research (Philliber et al., 1980). These will be explained in-depth in section 4.7, however, to briefly explain them here, the analytical techniques of this research will be matching pattern across the five cases (assuming there are patterns across the five cases) in the collected data, building explanations on the base of these patterns and analysing the data-driven by prior research or prior data. The analysis implies that the case study data is calculated as a direct reflection of the initial research questions.

(5) Lastly, the criteria for interpreting the findings, which focuses on identifying and reflecting upon rival and alternative explanations for the findings (Philliber et al., 1980). Contrastingly, due to the inductive research approach with no theory in mind during data collection, this last component will be further explained in section 4.5 (Yin, 2009).

To sum up, the five components of the research design explained above are all enabling a more comprehensive understanding of an answer to the research question. The research design overlaps the research approach of the data collection and the data analysis which in combination is a part of the research strategy, i.e., the overall plan of carrying out this research study. For this paper specifically, it ensures the methodological red thread of linking constructivism and interpretivism to the qualitative and inductive research approach and the multiple data collection method.

## 4.5 Sampling Rationale

Prior to collecting the data, a sampling criterion was defined, in order to ensure the collected data contained a high level of relevance for the research. Sampling criteria should enable the possibility of examining only parts of a society without wasting information (Bauer and Arts, 2000). For the purposes of this study, the sampling criteria were focused on merely interviewing individuals working in startups based out of the Silicon Valley ecosystem. Since all of the interviewees occupy different positions within the startups, to ensure a broad perspective on the research interest, the importance of the sampling criteria increases to ensure the possibility of discovering patterns between the cases - that the cases, to some degree, have common ground.

Since the research approach of this paper is to analyse the collected data on the basis of prior research or prior data, it seeks to generalise from empirical statements to theoretical statements. What Lee and Baskerville (2003) call *Type ET Generalisability* and is in other literature known as Analytical Generalisation (Yin, 1984;

1994; Walsham, 1995; Klein & Myers, 1999), which can be described as generalising from case study findings to theory. It means the details found in the case study must be associated with theory in order to make generalisations (Klein & Myers, 1999). It fits well with the interpretivist study seeing as theory plays a large role in interpretivist research as theory differentiates itself from anecdotes (ibid). In terms of this study theoretical generalisations are linked with the data analysis approach of analysing data based on prior research. This allows the analysed data and the empirical findings to be generalised towards prior research, i.e. theory. Figure 4.2 shows a visual representation of the sampling rationale.

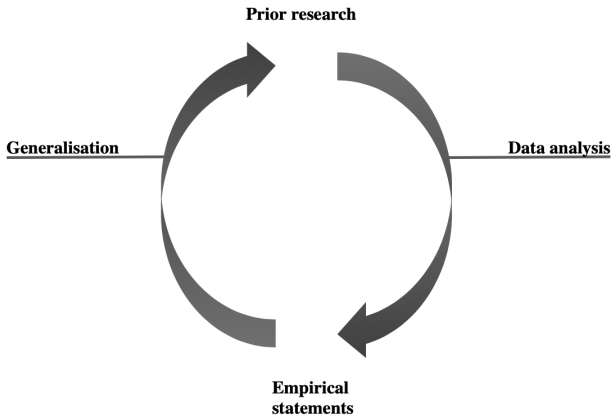


*Figure 4.2 - A Visualisation of the Sampling Rationale*

## 4.6 Data Collection

The data collection took place over the course of one month and consisted of semi-structured interviews with five interviewees from five different Silicon Valley-based startups, which will be further explained in the section below. In addition to utilising the semi-structured interviews, the authors collected data from various news articles and websites, which categorises the method as a multiple data collection method.

The choice to utilise multiple methods has potential to improve the accuracy, credibility and broaden the overall picture because the different ways of obtaining data can give access to more varied data. The choice to use interviews as the primary data collection method is based on the fact that interviews can give access to privileged information. That is, a lot of communication is expressed non-verbally, such as facial expressions, hand gestures and body postures. Thereby, enabling the interviewers to better interpret the interviewees' expressions, emotions, attitude and opinions from working at the startups. This enabled a more holistic approach when analysing and interpreting the interviewees' interpretation and understanding of the research domain. Additionally, being able to view the interviewees' non-verbal communication in combination with verbal communication helped to understand the interviewees' individual interpretations of the situation and context. That is well aligned with the paper's epistemological research position - *interpretivism*. A second

limitation of conducting interviews is the fact that there is no guarantee the interviewees fully disclose their interpretation of the innovation process. Different factors may hinder the interviewees in telling their interpretation of the situation. One factor could emerge from the location of the interviews. Even though, the interviews were conducted at the headquarters of different startups with the aim of the researcher to have the interviewees in familiar surroundings, where they would feel comfortable. However, the drawback of the chosen location may be that the interviewees would withhold some information due to the risk of co-workers overhearing. Other factors could also include differences between the interviewer and interviewee, for example in terms of age, gender and occupational status along with the mere physical presence of the interviewer may affect the interviewees' response (Johannesson & Perjons, 2014). Nonetheless, conducting five interviews from employees in five different startups enabled a collection of in-depth information about the five startups that could not have been accessed via second-hand data. The authors of this paper are aware that the interviewees merely expressed their own interpretation of the investigated research field or might reinterpret other people's interpretation of it. Further, through the interviews, a new understanding might emerge from a combined interpretation. However, it gives a broader and more detailed understanding, especially since the authors adapt the interpretivism epistemology research position, it is their belief that knowledge can only emerge through interpretation and reinterpretation.

All of the interviews were semi-structured, i.e., they were based on a set of questions, open and flexible for change in order to follow and adapt to the conversation (ibid). It enabled the interviewer to form new questions during the interview and for the interviewees to formulate answers in their own words. Semi-structured interviews have been explained to be a good approach when examining complex issues such as the innovation processes of startups in this case (Johannesson & Perjons, 2014). All of the questions were open-ended, and all of the interviewees got the same generic list of questions to start, which was made from the interview guide (see appendix 1). The intention of forming the interview was to create an open guideline for the interviewer to follow, ensuring the interview covered an extensive body for the research.

Due to the different locations of the two researchers behind this paper, i.e., one located in Paris, France and the other located in San Francisco, US, the interviews were conducted by merely one of the researchers, which was not the most optimal interview setting. However, the intention was to take advantage of the possibility of talking to Silicon Valley-based startups. All of the interviews were audio-recorded by the acceptance of all interviewees, which enabled both researchers to transcribe the interviews to further interpret and analyse them. Consequently, ensuring that no verbal communication was left out. This method, on the other hand, enabled the researchers to interpret the interviews in two different settings since one of the interviewers was not present during the interviews. Eventually, it can create a benefit due to the extra set of fresh eyes on the interview answers, which allows complex and nuanced interpretations to emerge.

Naturally, utilising interviews as a data collection method involves the limitation of being very time-consuming, especially in the transcription phase (ibid). All the limitations mentioned in this section were carefully considered before conducting the interviews, and the reason behind conducting the interviews, nevertheless, is based on the belief that being aware of the limitations and taking them into consideration throughout the process will decrease the impact of the limitations. Eventually, the outcome of rich and in-depth information prevails the impact the limitations can have.

Five interviews were conducted, and one could argue that conducting more interviews could contribute to a broader and more detailed picture of the situation examined. However, it was realised while conducting the interviews that obtaining one or two more interviews probably would not contribute with any additional and distinct information from what was already obtained. Therefore, it is the belief that five interviews were a critical mass. Table 4.1 summarises the five interviewees, their job title, their respective startup and employment time (at the time when the interview took place). The interviews can be seen in appendix 2.

| **Alias in paper** | **Name** | **Job title** | **Startup** | **Employment time** |
|---|---|---|---|---|
| Interviewee 1 | Andreas | Project Manager | Beaconforce | Approx. 1 year |
| Interviewee 2 | Lise | General Manager for Emerging Markets | Forkable | Approx. 1 year and 3 months |
| Interviewee 3 | Cassie | Head of Recruiting | Sonder | Approx. 10 months |
| Interviewee 4 | Tobias | Machine Learning Specialist | SigOpt | Approx. 7 months |
| Interviewee 5 | Karl-Henrik | Business Development Representative | Cloudflare | Approx. 5 months |

*Table 4.1 - Interviewees*

The data collection has also included obtaining secondary data about the five interviewed startups, from both each of the startups' websites but also from several online articles explaining about the five startups' businesses, services, and processes. A limitation to collecting data from multiple websites is that it can be difficult to assess the credibility of the data, that is, to identify if the data is authentic and free from bias. To overcome this issue, the data was mainly collected from the startups' own website, assuming the data to be authentic, and from articles from valid online news forums, such as The New York Times and The Spoon, which the authors behind this paper believed had a high degree of validity.

To summarise, five semi-structured interviews with participants from five different Silicon Valley-based startups were conducted. All interviews were audio-recorded and transcribed (as per acceptance of the interviewees). Multiple limitations were recognised and taken into consideration during the process of collecting data.

## 4.7 Data Analysis

Firstly, all the interviews were audio-recorded and transcribed by the approval of the interviewees. Secondly, the data were analysed on the basis of a qualitative content analysis method, where a coding frame was created (see appendix 3). The coding frame was created as a process for classifying the gathered interview data. A qualitative content analysis has been defined as a procedure for consistently outlining the points of qualitative data. It is performed by allocating parts of the collected data to categories or codes within a coding frame (Flick, 2014).

Developing a coding frame was a crucial step in the data analysis procedure, followed by developing codes based on Boyatzis' (1998) concept of *prior research-driven code development*, as briefly explained in section 4.2. Essentially, it allowed the researchers to utilise established codes developed by other researchers and their findings. For the purpose of this paper, the literature review posed as the base for developing codes, the thought process was based on no specific theories, rather various different concepts. Some of the codes utilised throughout the data analysis were; coordination effects, self-reinforcing mechanisms, and radical innovation. An extract of the coding frame can be seen in table 4.2 below:

| | | | |
|---|---|---|---|
| **C2: Innovation Process** | An internal process within the company, where the main focal point is innovation.<br>- "The generation, acceptance and implementation of new ideas, processes, products or services" (Kanter, 1984:20) | If the interview data includes either description, explanation or an opinion of all aspects of the *innovation process* definition within the contexts of their situation. | "Hvordan vi kan gøre vores produkt endnu bedre end det er nu. For det første har vi nogle visioner for hvordan vi gerne vil have udviklet vores projekter og hvad det er vi gerne vil og så er der også en anden del, kundebasen, der siger "vi vil gerne det her, er det noget I kan bygge ind i det [Beaconforces app, red.]"" (I1)<br><br>"Så vi laver ligesom innovation inden for hver vores del. og man kan sige, det hele vi laver, er at prøve ting af." (I1)<br><br>"Vi får ALDRIG nogensinde en bøde for at prøve noget af, så længe vi tager til os og lærer noget af det, hvis der så rent faktisk er noget der går galt." (I1)<br><br>"Så sådan en meget fra "alt er den fedeste ide i verden, uanset hvor latterligt det lyder" til en mere struktureret ide - altså alt kommer ligesom ind i sådan en tragt, hvor det så munder ud i en sammenfatning af hvad der |

*Table 4.2 - Coding Frame*

The codes extracted from prior research were briefly described in the coding frame, in order to assure the codes were applied in the same way in the collected data. The purpose was to secure coherence in the code application. Subsequently, coding rules were developed to determine under which circumstances the parts of the collected data could be categorised in the coding frame. The coding rule for the code C2 is: "If the interview data includes either description, explanation or an opinion of all aspects of the *innovation process* definition within the contexts of their situation" (appendix 3). The codes are tentative, meaning, they may be subject to change if the code does not contain any parts of collected data in the coding scheme after the coding process, the code will be removed from the coding scheme.

Regarding the definitions of the codes, alternatively, due to the prior research code development approach, the researchers adopt other researchers' assumptions about the concepts. However, since this paper is of interpretivist nature, the definitions of the codes will for the purpose of this paper, be based on the researchers' interpretations of them. For clarity, the coding definitions and coding rules explain how the researchers behind this paper view and define, for example, incremental innovation and radical innovation. It enables the audience of the paper to follow how researchers examine the innovations the interviewees talk about in the interviews.

The reason behind using the qualitative content analysis approach and the prior research code development technique to analyse and code the collected interview data was, essentially, to reveal patterns within the data. Consequently, it would enable the researchers behind this paper to recognise relationships between the codes and the interview data, eventually, helping to answer the research question. Another advantage of utilising this procedure is that the collected data will be condensed to merely the relevant parts of the data, which makes it inevitably more convenient to work with (Flick, 2014).

However, the utilised approach and technique also have its limitations. In regard to the prior research code development technique, Boyatzis (1998) points out that the use of this technique as the basis for code development causes the researchers to accept other researchers' assumptions, projections and biases. Therefore, the researchers behind this paper need to fully trust the codes utilised are established and valid codes. For the purpose of this paper, the codes were determined from prior research and chosen on behalf of their appearance in multiple papers, thus the researchers were of the belief that multiple appearances spoke to the codes' relevance and validity.

## 4.8 Quality Criteria

To further create credible research, it is inherently important to set some quality criteria. Klein and Myers (1999) have identified seven principles for conducting and evaluating interpretive research, and for this paper, some of them will be utilised as quality criteria. The seven principles are neither mutually exclusive nor "bureaucratic rules of conduct" (Klein & Myers, 1999:71).

The social and historical background of the research setting must be critically assessed in order for the interviewees to understand how the situation being examined arose, according to *the principle of contextualisation* (Klein & Myers, 1999). In this case, it refers to the background leading to the startups' innovation processes being affected by the large high-tech companies. This quality criterion ensures the interviewees' understanding of why startups' innovation processes started to be affected by large high-tech companies.

In order for the research to show a credible view of the situation being examined, it is necessary for the researcher to critically evaluate the collected data, as socially constructed between the interviewee and the interviewer. Thereby, keeping in mind that this research encourages multiple layers of interpretation, firstly, it contains an interpretation of how the world works and secondly, the researchers' interpretation of the interviewees' interpretation. It means, there exists no one truth, and it harmonises with the interpretivist epistemology of understanding the interviewees' interpretation of the context. Consequently, it is necessary for the researchers to be alert that the cognitive assumptions of the interviewees affect the development,

reporting and systematising of the collected data (Klein & Myers, 1999). According to Klein and Myers (1999), it is categorised as *the principle of interaction between the researcher(s) and the subjects*.

A third quality criterion to carefully consider is to critically assess the original assumptions that directed the initial research design and the information that appears throughout the accumulation and handling of the data (Klein & Myers, 1999). The most essential part for the researcher to overcome this quality criterion is for the fundamental philosophical presumptions as transparent as possible both for the researchers themselves and for the reader. Consequently, it allows both the reader and the researchers to observe whether there are any discrepancies between the initial research assumptions and the accumulated data. In section 4.1, the philosophical research assumption and the epistemological decision are explicitly stated, allowing the reader to read about the reasoning behind why and how the research phenomenon is interpreted. It is what Klein and Myers (1999) classify as *the principle of dialogical reasoning*.

Performing interviews with different interviewees about a particular phenomenon, which in this case is innovation processes, there exists a substantial risk of multiple interpretations to occur. It is inherently important for the researchers to assess the impacts that social context has on the research phenomenon. It can be done by searching for and reporting multiple perspectives and their reasons (ibid). Consequently, Klein and Myers (1999) state that this quality criterion is a confrontation of these contradictory interpretations of the interviewees. To handle the quality criteria for this research, it is believed that social interactions and social context influence the interviewees' interpretations. Hence, being aware of this notion, called *the principle of multiple interpretations*, is highly relevant and fundamental to ensure the quality of this research.

Lastly, it is inherently important to be aware and handle potential biases and methodical distortions from the interviewees. Biases and distortions from the interviewees can be both intentional and unintentional, and the important part for the researchers is to be aware of and remain sensitive to it (Klein & Myers, 1999). For the purpose of this research, these potential biases from both interviewees and interviewers were talked through before collecting data. Since one of the researchers was not present during the interviews, she remained a neutral factor and could consequently, point out any potential biases before and after the interviews. These measures were taken in order to decrease biases and distorted answers from the interviewees. This quality criterion is called *the principle of suspicion* (Klein & Myers, 1999).

In sum, these five principles were taken into consideration and acted upon to enhance the overall quality of the accumulation and handling of the data. Consequently, posing as an important factor in regard to the research to be viewed as credible research for the reader.

# 5. Empirical Setting

The five interviewed startups; Beaconforce, Forkable, Sonder, SigOpt and Cloudflare are all based in San Francisco and the Bay Area. It implies that they all to some degree are embedded in the mindset of the Silicon Valley ecosystem. Consequently, it can be argued that the pool of interviewed startups is not inherently varied. However, for the purpose of this paper, it is believed that the similarities of the startups are narrowed down to merely being the embeddedness in the Silicon Valley mindset and the fact that they are all in the startup phase. The differences are grounded in their "stage" within the startup phase, where Forkable and Beaconforce are representing the early stage of the phase, SigOpt is representing the middle stage, while Sonder and Cloudflare represent the late stage of the startup stage. Figure 5.1 below shows a visualisation of this argument. The startup 'stage' is based on different variables, explained in section 1.4.


*Figure 5.1 - The Interviewed Startups on a Startup Phase Continuum*

## 5.1 Increasing Individual Work Environments, Two Questions a Day

**Beaconforce** is a 2017 startup based out of San Francisco. Their product encompasses a B2B SaaS tool that measures real-time employee motivation while at the same time coaching managers on how to keep their employees in the flow (Hitchcock, 2017). On an operational level that means the employees of the organisations using Beaconforce's product answer two questions per day through an app. Allowing Beaconforce to collect information about employees' perceptions, sentiments and mental states at work which they combine within an individual dashboard for the employees and a dashboard for the employer. The information in each dashboard is combined with machine learning and emotional intelligence to give a real-time indication of the work environment of the individual employee. That output is for the employees and the employers to work on in order to increase the work environment for the individual employee and thus increase the performance (Craft, 2019a). That corresponds well with its mission statement:

> *"Our mission is to create environments that allow people to be the best version of themselves"*
> (Beaconforce, 2019).

The startup was founded with the intention of "increasing trust, intrinsic motivation, and a sense of belonging at work" (Beaconforce, 2019) while improving the performance of teams across the organisations. The company's rationale is based on a vast number of research studies showing 87% of people in the US find work dull and uninteresting, eventually resulting in depression, ulcers and other conditions. US and Europe employers spend nearly $200 billion a year on stress-related healthcare - giving rise to the rationale behind Beaconforce (ibid).

The startup encompasses around 32 employees as of April 2019 and has offices in Toronto and Milan besides their headquarters in San Francisco (Craft, 2019a). Their clients include companies such as PwC, IKEA and BMW and additionally, they are part of international programs such as Google for Entrepreneurs, TechCrunch Disrupt, Web Summit and Plug and Play (Beaconforce, 2019). Beaconforce has been in one funding round, *pre-seed*, in March 2018, where they received $800,000 in total funding (Crunchbase, 2019a).

### The Rationale Behind Choosing Beaconforce

Beaconforce is highlighting the importance of the discussion of employee happiness, by applying two technologies that are taking over in a majority of industries and markets with rapid pace, i.e., machine learning and artificial intelligence.

## 5.2 Revolutionising In-Office Lunch Meetings With AI

**Forkable** is a startup that provides an online platform for companies to order lunches for in-office meetings or events. In practice, through the online platform team members start by telling what they like and their food restrictions for example if they are on a special diet, intolerant or allergic to certain types of foods. By utilising machine learning and artificial intelligence Forkable's platform "the lunch robot" automatically selects individual lunches for everyone based on the preferences given. Forkable collaborates with local food contractors to cook and deliver the lunches on time. The lunch robot sends out reminders and collects feedback in order to improve the lunch suggestions created for the team (Forkable, 2019). Every Friday the team members receive a notification with the lunch suggestions for the following week. The AI-driven lunch ordering service works like the Netflix recommendation service, for lunch options. The systems allow for team members to either accept the suggestions or substitute it with alternative choices from the menu (Albrecht, 2018).

The startup was founded in 2013 and consists of 22 employees as of April 2019. They are based in San Francisco and currently, only has one office located in San Francisco (Craft, 2019b). However, they offer their services in 10 markets including the Bay Area, New York, Seattle, Chicago and Austin (Albrecht, 2018).

Among current clients, companies such as Glossier, Lyft, Salesforce, Shopify and Udacity can be found, and the clients seemingly appreciate the product quality and the user experience in comparison to Forkable's competitors, as stated in the following quote from Ravi, which works at Heap, one of Forkable's current clients (Forkable, 2019):

> *"Forkable provides us with high-quality catered lunches every day with very little administrative work on our part. We tried several other services, and none were as easy to use or as high quality as Forkable*"
>
> Ravi, Heap

One of the intentions behind the startup was to help companies optimise their lunch offerings which consequently could increase the employee satisfaction and help reduce food waste by offering smart-recommended individual lunches instead of massive buffets (Albrecht, 2018).

### The Rationale Behind Choosing Forkable

Forkable is utilising technology similar to some of the large companies and applying it to a field, of for example food waste, that may not be many companies' first organisational problem to solve if they even recognise it as a problem. It is the small changes that can have a massive impact in the long run.

## 5.3 Establishing a New Standard in Stay

In 2012, Francis and Lucas visited San Francisco for the first time. They had booked an apartment for the stay but had problems with getting in contact with the host. After arriving at the building with merely unreturned messages, they finally got a message from the host, saying that the key was under the doormat. The apartment was unclean with half-eaten food in the fridge and dog hair everywhere that made Lucas' allergies blush up. Francis and Lucas ended up booking a hotel room downtown with merely generic chain restaurants in the neighbourhood. This experience made them wonder what if there was a place as reliable as hotels but with the warmth and feeling similar to a home. That was the thought that made them found **Sonder** (Sonder, 2019). Their value proposition is well explained in the following quote from the co-founders (ibid);

> *"You shouldn't have to choose between great service and an authentic travel experience"*
>
> Francis and Lucas, Founders of Sonder

Sonder is a San Francisco based startup that offers apartments individually designed with the purpose of creating a 'home away from home'. In function, the startup scouts for locations in the best neighbourhoods in cities around the world. Once locations have been found they lease studios and apartments which they design uniquely so that no Sonder looks the same. Furthermore, they are maintaining the Sonders, in order for guests

to feel the reliability of always knowing what they can expect when they walk through the door. The startup has no staff on-site but have representatives throughout the cities that can help guests having problems. Guests book a Sonder through the startup's platform and will throughout the journey be guided by the startup (ibid).

Currently, Sonder is available in 18 cities across the world with 15 across the US, such as San Francisco, Miami, Chicago, New York, and Boston; 2 in Europe being London and Rome, and Montreal in Canada (Sonder, 2019). The startup consists of 454 employees as of April 2019 and has been through 5 rounds of funding. In their latest round, Series C, they raised $85M bringing the total funding raised on $135M (Crunchbase, 2019a). CB Insights, a data analysis company, reported that Sonder may become the next unicorn, i.e., a private company with a valuation of $1 billion (Griffith, 2019a)

### The Rationale Behind Choosing Sonder

Sonder is a startup believed to be one of the next unicorns with a very bright future ahead of them, and they are taking part in a field which is primarily dominated by the large tech incumbent, Airbnb and secondarily by large hotel chains such as Marriott and Hilton Hotels.

## 5.4 Improving Every Data Scientist with One Optimisation Engine

The desire to make experts more efficient is what drove Scott Clark and Patrick Hayes to found **SigOpt**. When Scott was finishing his PhD at Cornell University, he observed that frequently the concluding stage of research was a domain expert adjusting what they had built via trial and error. After finalizing his PhD, he developed a metric optimisation engine (MOE) to solve this issue and utilised it to optimise machine learning models and A/B tests at Yelp. Consequently, SigOpt was founded to convey this technology to experts in every field, which is explicitly stated in their mission statement: (SigOpt, 2019)

> *"Our mission is to accelerate and amplify the impact of modellers everywhere"*
> (SigOpt, 2019)

Simplified, their product is an optimisation platform that magnifies clients' research, i.e., SigOpt takes any research pipeline, machine learning, deep learning and simulation model pipeline and attunes it (Craft, 2019c). Their end-to-end solution unites an optimisation engine with an enterprise-grade platform and a visual web dashboard for insights on experiments. It enables teams to decrease data scientist time spend on tuning and increasing the periodicity in which models are being tuned, while scaling across any variety, volume and complexity of models under development without accessing clients' models or data (SigOpt, 2019). SigOpt's collection of optimisation algorithms is easily deployed and is currently utilised within fields of insurance, credit cards, algorithmic trading and consumer packaged goods. Their range of partners includes Skymind,

Nvidia, Amazon Web Services, Intel.ai and Google, their clients include Two Sigma, IQT and Carbon Relay and their investors include Andreessen Horowitz, SVAngel, Blumberg Capital and Y Combinator (Craft, 2019c).

Up until this date, SigOpt has been through three rounds of funding (two seed rounds and one series A), where they raised $6,6M in the latest round, increasing their total funding to $8,7M (Crunchbase, 2019b) SigOpt is based out of their San Francisco headquarters and has 23 employees as of April 2019 (Craft, 2019c).

### The Rationale Behind Choosing SigOpt

SigOpt's product is based on research and academia, making their backend services highly interesting to follow, seeing as it can have a major impact on a lot of businesses and their operations, while MOEs may not be widely recognised as the first thing companies can utilise to improve their product and reduce waste of time.

## 5.5 Building a Faster, Better and More Secure Internet Experience

In 2009, during a talk, Matthew Prince and Michelle Zatlyn discussed Project Honey Pot, i.e. a system that enabled any website owner to track how spammers harvested email addresses built by Matthew Prince and Lee Holloway in 2004. Michelle recognised the opportunity to create a service that would take Project Honey Pot to the next level; not merely tracking internet threats but terminating them too. Consequently, Matthew, Michelle and Lee ended up founding **Cloudflare** (Cloudflare, 2019).

Cloudflare is a web performance and cybersecurity startup that offers online services to shield and expedite websites online. Some of their products include; a Cloudflare Content Delivery Network that dispense content worldwide to accelerate websites, Cloudflare Security that shields websites from a variety of online threats including spam, SQL injection and DDOS, Cloudflare Analytics that provide website owners with insight on the website's traffic including threats and search engine crawlers and Cloudflare Applications that support its users install applications on their respective websites (Craft, 2019d).

> *"We serve more web traffic than Twitter, Amazon, Apple, Instagram, Bing, & Wikipedia combined"*
> (Cloudflare, 2019)

Currently, Cloudflare has 953 employees and has offices in Austin (TX), Champaign (IL), New York (NY), Washington (DC), San Jose (CA), München, London, Singapore, Sydney and Beijing in addition to their headquarter in San Francisco (Craft, 2019d). They serve data from over 175 data centres around the world and has acquired 4 other companies; StopTheHacker (in 2014), CryptoSeal (in 2014), Eager (in 2016), and Neumob (in 2017) (Cloudflare, 2019).

Cloudflare has raised $332,1M in total funding through six funding rounds, where they in their latest funding round, Series E in March 2019, raised $150M from one investor, Franklin Templeton Investments (Crunchbase, 2019c). Their current market valuation is on $3,2 billion making Cloudflare a Unicorn and some of their clients include: Marketo, DigitalOcean, IBM, Library of Congress, Udacity, Zendesk, and Mapbox (Cloudflare, 2019).

**The Rationale Behind Choosing Cloudflare**

Cloudflare is the largest of the interviewed startups and is backed by strong VCs and large tech incumbents making it interesting to get insight into. There might be divided opinions on whether Cloudflare can be categorised as a startup. The authors behind this study believe it is a matter of perspective and definitions, and for the purpose of this paper, Cloudflare is seen as being on the verge to stepping away from the startup stage, however still remaining in it.

## 5.6 The Rationale of Choosing All Five Startups in Collaboration

In sum, the rationale behind choosing all five startups in collaboration is primarily due to their different state of business within the startup phase. For the purpose of this paper, it is believed that in collaboration these five startups would enable the analysis to be based on a varied perspective, thus allowing us to answer our research question with a comprehensive base. Additionally, all the interviewed personas within the startups have different positions ranging from product managers to specialists to general managers, which further strengthens the argument of enabling a varied perspective to answer the research question.

# 6. Findings

Throughout this section, the findings from the collected interviews will be presented. The findings will appear as finding 1 (F1), finding 2 (F2), finding 3 (F3), etc. and will be highlighting patterns and relationships across the 5 interviewed startups. Each finding will have two or more components to it, which will be outlined and explained in subsections within each finding's section.

## 6.1 F1: Startups Need to Constantly Scan and Assess Competitors and Large High-Tech Companies in Order to Stay Alive

One of the most prominent findings in the collected data is how the fast-paced Silicon Valley ecosystem is pressuring the startups to, constantly, think two steps ahead. Four of the five interviewees expressed how they consistently need to scan the market for new entrants and large corporations that might pose a threat to their

business (interviewee 1, 2, 3 & 5). That simply means that there is a constant need for the startups to excel every day, as interviewee 1 stated:

> "*We need to create miracles every day, otherwise we'll die tomorrow." (Interviewee 1)*

### The Competitors

In regard to consistently scanning the market for new entrants and large high-tech corporations moving dangerously close to the startups' products or business model, three of the five interviewees agreed on how to keep competitors at a distance that is neither too close nor too distant (interviewee 2, 3 & 5).

> *"I think it is very important to constantly keep yourself updated to certain standards. Look at which kind of companies you want to be compared to within your field, so you know how large a market share you potentially can capture." (Interviewee 2)*

As indicated above by interviewee 2, competitors can pose as a mark of comparison, in which startups can measure themselves. In order to get a fair interpretation of the overall market and how much of the market the startup potentially could capture. In that way, it enables the startups to constantly spot and check market trends, which eventually, clarifies for the startup where the gaps, if any, are in the market in order for them to potentially leverage that information. Another positive side that competitors contribute to is rooted in their successes and failures, partly it can lead the startups to keep track of their own progress in comparison to their competitors, and partly it can give the startups an indication of where the market is headed in terms of what is trending and what does not work with the consumers. However, comparing oneself to competitors or towards large behemoths in the market must be performed with caution, because if everyone looks towards the large high-tech corporations the risk of market homogeneity increases. Market homogeneity is referred to as when the majority of companies start to copy one another resulting in the majority of products on the market starting to look, feel, and work in similar ways (Zeuthen, 1936). Interviewee 1 highlighted this notion:

> *"It is difficult to stop comparing yourself to your competitors, which makes it easy to fall in the trap of thinking 'oh, they have this. It is very cool, we need to have that as well'. It means, however, that you will start to resemble your competitors. But, the question is: should we copy them, or should they copy us? It is easier to copy something rather than rethinking something new?" (Interviewee 1)*

Another notion of the negative aspects that competition may infer when constantly scanning and assessing the ecosystem is the mass of talent in the area. Seeing as all 5 startups are based out of San Francisco Bay Area aka Silicon Valley, the talent mass across startups and large high-tech corporations is immense. Along with

the large corporations' vast amounts of resources, both economically and physically, it naturally creates pressure on the startups. The area has a high concentration of large high-tech company headquarters, such as Google, Apple, Facebook, Tesla, Microsoft, Intel etc., which naturally creates a concentrated flow of resources within the market. That is, the large high-tech companies attract talent from all over the world, which essentially, directs additional pressure on startups (Bariso, 2016). A side note to that is the level of learnings that startups could learn from the large high-tech companies. These companies all started out as startups and managed to climb their way to the top of the high-tech industry. The startups in this study may be able to learn some characteristics or acquire key knowledge that the large high-tech corporations picked up along the way that eventually could be useful for the startups in the pursuit of their respective goals.

Returning to the highly concentration talent mass in the Bay Area that was talked about before the side note - it also encompasses multiple startups becoming Unicorns, i.e., reaching the $1 billion value mark (Griffith, 2019b), and thousands of startups emerging out of UC Berkeley and Stanford University (Wolfe, 2018). In fact, based on data collected from 2006 to June 2018, Stanford University and UC Berkeley the number 1 and 2, respectively, on the list of universities producing most startup founders in the US. With 1,178 entrepreneurs in 1,015 startups graduating from Stanford University and 1,137 entrepreneurs in 1,012 startups graduating from UC Berkeley (ibid). The immense degree of competitors in the area highlights a potential constraint for the startups, which interviewee 2 also noted:

> *"One of our biggest competitors has raised $17M and we have raised $200,000, which means we have fewer resources to work with, hence giving us less space to be creative. I think that poses a challenge to what we can offer in comparison to what our competitors can offer." (Interviewee 2)*

Based on the above-mentioned, it became clear that the competitors pose as a great factor in this finding (1). However, one of the five interviewees mentioned how he did not particularly see any competitors they could compare themselves to in their industry:

> *"The advantage of having employed all the best people in the world within a field is that you do not have any particular competitors to compare yourself to, which can be both positive and negative, because it would be good to be able to go out in the market and see how others would solve the same problem, we're trying to solve." (Interviewee 4)*

That presents an interesting factor since the remaining interviewees acknowledge their competitors and the importance of their presence. In contrast to interviewee 4, interviewee 3 stated:

*"We actually have a few competitors in our industry, and it would be really stupid of us to say that there is not going to be anymore. We know there is going to be a lot of people entering this market." (Interviewee 3)*

The existence of large high-tech corporations and other competitors, such as new market entrants pressure the startups to consistently scan the market and think two steps ahead in order to survive the fast-paced Silicon Valley ecosystem. Whether or not the startups recognise the existence of direct or indirect competitors, it can play a significant role, how they plan and perform their strategy concerning competition, which will be further explored in the next subsection. Essentially, one can argue that this subsection shows what can have an influence on startups (and their innovation processes). An extra notion to this is: *how* competitors affect their innovation processes and it can be based on how the startups let their innovation processes be affected, which among other things is shown in their strategy towards competitors, hereunder new market entrants and large high-tech corporations.

### Strategy

Just one of the interviewees explicitly stated how the CEO and top management tries to keep the primary focus internally on the startup itself and on how the startup itself can continuously grow to be the best business. However, while maintaining transparency about the competitors and the large high-tech companies:

*"For us, they [top management, red.] give us knowledge bases, how fast everyone is doing in comparison to our competitors, just to keep us motivated. They [the competitors, red.] drive us to do what we do, but we are not saying 'Oh, they are doing that, let us move away from that'." (Interviewee 3)*

While this approach seemingly shows a mindset that is primarily closed towards competitors and large high-tech companies, interviewee 3 gives a clear example of how the CEO and the top management handle their competitors:

*"There is a certain extent where our CEO says, because for us we have to find properties, we can sign a lease with, that if we go into a bidding war with our competitors, we just have to see if it is worth it or not. and if not, we will just let them have it. We are not going to win all of them, and that is smart because you do not want to just throw bids and tons of money at winning, it is just not worth it." (Interviewee 3)*

It clarifies the reasoning behind this strategy, and it indicates a fairly integrated top-down approach, meaning the decision to focus internally and not to seek inspiration from competitors and large high-tech companies originated from top management, and not the entire company. However, interviewee 3 explained that "*it is always good to keep tabs on what is happening externally, but I do not think we make any decisions based on what they [the competitors, red.] do.*" (interviewee 3), which can be interpreted as if the decisions made from top management are well-aligned with the employees' beliefs around the company strategy. Essentially, this strategy could decrease the level of direct effects by the large high-tech companies and competitors on the startup and their innovative processes, culture and mindset. Direct effects would be effects that the startups are consciously aware of.

The remaining four of the interviewees did not explicitly state their respective startups' strategy positions. However, three out of the five interviewees did explicitly state how being a startup, strategically, could be used as an advantage in a market with large high-tech corporations (interviewee 1, 2 & 3).

> *"We see it again and again: a small company coming out of nowhere overthrowing a large behemoth.* ***We [the startups, red.] do not have the resources, but the fact that we are working in short runways added to the possibility and independence to do innovation****, I think maybe the core drivers in our opportunity to overthrow the large companies. I think the large corporations are getting too comfortable - they got the resources and the people, of course, they'll be able to find a solution - but it is not always like that" (Interviewee 1)*

> *"I think with our generation,* ***everyone that is working 'on the floor'*** *would like to have a say. There are some specific things that are beneficial in alternative ways." (Interviewee 2)*

> *"The cool thing about startups is that you are working with a whole bunch of different types of people that are going to think differently. That spurs creativity. There are so many sticky notes on my whiteboard and so many of them get me thinking 'whoa, I never thought about that', and I think that is* ***why startups do move a lot faster****. It is because of the thought process that everybody has is driven by the mission of the company." (Interviewee 3)*

All of the three quotes above indicate a link between the perception of being a startup and the perception of competitive advantage between startups. The text in bold poses as the indicators of that link between those two perceptions. It supports the general understanding in society that startups are unconstrained and free of the traditional hierarchy that is often found in large corporations. It enables startups to move in different ways than large companies and it enhances the startups' flexibility and openness towards trying new ideas. As interviewee

3 stated in the quote above, startups merely move a lot faster than large corporations because there is less hierarchy and the perception of the company is that it is a lot more flexible and fast-paced. This notion of the interviewees' perception of being a startup and how that affects their innovation processes will be analysed further in the sections below.

Another explanation to why interviewee 1, 2 and 3 perceives the state of startups to be a competitive advantage, could be due to the history of some of the large tech companies, Amazon, Google, Apple, and Facebook. They all started out as startups disrupting the industries, which is something one could argue to be what the majority of startup founders are dreaming of but may not say out loud. Therefore, some startups may unintentionally orient themselves towards the large disrupting high-tech companies' early way of operating. That is, in the pursuit of becoming either the next big disrupting company or by expanding your startup worldwide, thus increasing global awareness of it. Essentially, being a startup with the wide world in front of you can either strengthen an '*everything is possible'* mindset. If this energy is transformed work ethics, encompassing this mindset can be perceived as a competitive advantage. On the other hand, being a startup, focusing on the scarce resources available and seeing how every company, small and large, are fighting to survive the market, can be argued to be a demotivation. The point is that balance is key, and seeing as interviewee 1, 2 and 3 believe that the state of startups is a competitive advantage, indicates that these startups are leaning towards an encouraging culture with an '*everything is possible'* mindset.

Therefore, a lot of factors are crucial for startups to consider in order to survive in the fast-paced Silicon Valley ecosystem. Some of the factors being the constant competition of either newly founded startups or large high-tech companies along with the constant need to adapt their strategy to the flow of the market. Eventually, it all comes down to startups that need to constantly scan and assess the fast-paced Silicon Valley ecosystem, hereunder competitors and large high-tech companies in order to stay alive.

## 6.2 F2: Early-stage Startups' vs. Mature Startups' Organisational Culture and Their Relation to High-Tech Corporations

This section highlights the similarities and differences of the five startups in regard to their organizational structure and the allocation of human resources in comparison to large high-tech companies. Since organisational structures affect the innovation processes, the authors of this paper believe this finding to be important and relevant in the discussion of how large high-tech companies affect startups' innovation processes. This section aims to answer the nuance of the research question that concerns how the startup stage, hereunder organisational structure affects their innovation processes, in comparison to the structures of large high companies.

### The 'All Hands on Deck' Approach Within Early-stage Startups

Another finding that stood out in the collected data is that the startups all have the 'startup state of mind' embedded in their operations. One of the most recognisable characteristics of startups is the fact that everyone works together "on the floor" - being one team with little to no hierarchy. Three out of the five interviewees emphasise how this is an important trademark of being a startup and additionally what the consequences are.

> *"We are a startup, so we need to pull on everyone." (Interviewee 1)*

This statement indicates multiple qualities that are characterised by a startup. Firstly, every employee is essential due to limited resources and an 'all hands on deck' approach. Secondly, because of typically smaller teams in startups and fewer human resources, employees work across hierarchical levels - if there are any to be found. Such a flat hierarchy enables the employees to work out of their field of expertise and try new work tasks. And lastly, it indicates the phenomenon of startups of working closely together with everyone else in the organisation that ultimately can lead to strong relationships in the organisation and foster motivation, productivity, etc. Similarly, another interviewee states that:

> *"We have fewer resources to work with, so we do not have as much arm movements [possibilities, influence red.], we have a little less [than other more established startups red.]" (Interviewee 2)*

Having to work with limited resources and hence, according to interviewee 2, being short on the possibilities than the other, more established and mature startups have. Ultimately the consequence is that all employees work on the floor level and have to manage different and multiple tasks simultaneously. However, the interviewees confirm later, how working on the floor enables them to explore new skills, work tasks, etc. and how the limited resources push them to work in new innovative ways that may lead to unexpected and unthought of processes and results.

In addition, the interviewee 3 demonstrates the practical implications of everyone working together on the floor level.

> *"All the time, we focus on what the ROI is, what is the effort you are going to put into it and is it going to be worth it. Everyone has their own opinions and let's say the majority wants to try the idea and the majority wants to put any effort into it - then they will try the idea, and if they fail, they fail." (Interviewee 3)*

In other words - when someone has an idea, no matter his/her position, it will be considered and if the majority

agrees to implement the idea and invest their resources, the startup will aim to realize that idea. Ultimately, anyone can generate an idea, regardless of their position, and thereby contribute to the startup's overall directional path towards their goals. Moreover, it is explicitly stated by all three interviewees that failing is part of working the floor level in a startup. However, it is to stress that the importance lies in the employees working in a flat hierarchical structure, where individuals are motivated to contribute, work as a team and learn how to operate an organization on limited resources. The early-stage startups that were investigated (1 and 2) and the mid-stage startup (3) indicate how their limited resources compromises of both human resources and also time restriction. Since fewer human resources are present, more and diverse tasks have to be managed by a few people, which simultaneously will decrease the time for each task.

Due to the limited resources that causes a flat hierarchy and embraces an 'all hands on deck' culture, the early-stage startups incorporate a 'fail fast and learn' approach to innovation - meaning that ideas should be investigated but if it does not meet the expectations be disregarded immediately and one should learn from it, for the future. The approach is one both interviewee 1 and 3 talked about - where due to the time constraint and constant pressure to produce miracles, the startups have to just try out ideas. If they do not work, the employees have to fail fast and learn from it, while moving on to the next idea. This approach ensures the startups' innovation processes to be effective in terms of trial and error. It allows the startups to quickly move on and to increase the number of ideas they try before finding one that is successful.

Although interviewee 1 and interviewee 2 share their belief of working on the floor level in their startup, the hierarchical structure differs. Whereas interviewee 1 illustrates his respective startup's structure as flat, where close to no hierarchy and top-down order is present. Seemingly, they try to enforce a bottom-up approach to e.g. innovation, by accepting ideas that come from the floor level. Thus, many ideas are generated on the floor level. Such a bottom-up strategy can motivate employees to share their ideas and thoughts, thus enhancing the identification with the startup, and the startup can harness the knowledge, ideas, innovation, etc. that can be valuable. Motivating employees presents itself in an additional practice - namely the feedback sessions that happen once a day in interviewee 1's startup.

In contrast, interviewee 2 experiences a different hierarchical structure when it comes to decision making and idea generation. Even though interviewee 2 portrays how everyone is working on the floor level together, it is also shown how the management of her respective startup utilises a more top-down approach when making decisions about ideas and innovative initiatives in the startup. Thus, the decision making appears to be more centralized - the CEO takes many decisions. On the other hand, they do motivate their employees too by having not daily but weekly meetings in order to track and manage where everyone is in the process.

Altogether it presents two organizations that agree on being an early-stage startup but differ in their approach to delegating work. However, the early-stage startups (interviewee 1 and 2) and interviewee 3 from a mid-stage startup are working with limited resources and have encompassed the 'fail fast and learn' approach that ultimately affects their innovation process.

Due to the fact that the large high-tech companies, such as Amazon, Facebook, Google, Tesla, etc. have grown immensely and are sitting on large amounts of capital, startups are to some degree dependent on the large high-tech companies. Firstly, many of these high-tech corporations invest in, merge with or acquire some of the favourable startups (see literature review), which provides the startups with a larger pool of resources. These can come in the shape of additional employees, talents, etc. - in other words: human resources - that enable the startup to create departments with specific work tasks and take employees away from the floor level. Especially early-stage startups are dependent and waiting for an opportunity to get supported by a large high-tech company that can increase their resources. As the interviewees stated above, work tasks vary, and everyone needs to assist one another in order to keep up in the fast-paced Silicon Valley startup ecosystem.

One of the interviewees stated the fact that the goal for her given startup is to be acquired by another company, favourably a large high-tech company (interviewee 2) in order to accumulate resources and expand their possibilities to grow. However, others are sceptical towards being bought by a high-tech corporation, such as Facebook, Google, etc. – assumedly, because there is a risk that a startup is bought in order for the large high-tech corporation to gain a competitive advantage (e.g. investing in the newest high-tech such as AI) and simultaneously to minimize competitors. Additionally, some startups may have a desire to turn into large companies, thus moving away from the startup culture. Whereas others prefer to work in a startup that is characterized by its innovativeness, flat hierarchy and managing the few resources that ultimately both enables and forces them to work in different and more agile ways.

### Mature Startups

In contrast to the three interviewees mentioned above, one of the remaining two interviewees perceives his startup merely as a startup in terms of the culture in the organisation and not as a startup regarding the startup's economy and revenue.

> *"There is significant growth happening, and even though we like to think of ourselves as a startup, maybe in terms of the culture of transparency and being open and talking to people you don't know, maybe less so in the revenue department or in just the growth department" (Interviewee 5)*

His understanding, however, is well-aligned with figure 5.1 - the visualisation of the maturity of the

interviewed startups. Interviewee 5 works in a more mature startup than the three interviewees mentioned above and thus it seems natural to gradually 'outgrow' the startup culture and slowly mature into a more traditional organizational structure, resource management, growing revenue, etc. However, the startup has, for the time being, managed to capture the startup state of mind in their culture, while still being able to rely on more resources, compared to the early-stage startups. Essentially, this startup stands out with a different foundation for innovation and innovation processes, due to more resources both human and economic.

Additionally, interviewee 4's startup perceives itself different to all above stated. Due to the fact that the startup that interviewee 4 is employed by is explained to have hired some of the best people in the world to work for them, i.e., they do not regard themselves threatened by any competitors;

> *"One could say that the advantage of hiring all the best people in the world within one field is that you don't have any competitors to measure yourself against, which can be both a good and a bad thing, because it could, of course, be pleased to be out there and watch how others would solve a problem. There exist some that we choose to label copycats, for instance, one company, I don't want to mention their name or where they are from, but for one reason or another, they have the same API interface as we do and also the same slide deck that we have." (Interviewee 4)*

Having the best people in the world in their field is a crucial element of the startup's self-awareness. However, it is important to note that interviewee 4's perception of the startup might not reflect the perception of the other employees at the startup, due to the fact that everyone within the startup might have their own interpretation and hence, multiple interpretations might exist simultaneously.
He continues to explain how the startup manages its way around big corporations in the field.

> *"One of our strategies is to find who is the bigger player within the different verticals and then we go out and talk to them. Typically, they will become our customers, and then they are evidence that what we do - we do right. This is the trend we try to push forward." (Interviewee 4)*

Approaching large companies this way displays the startup's process to interact with them than avoid them or perceive them as competitors. However, seeing as this approach is not explicitly aligned with the remaining four interviewees approach to large companies, it raises the question of whether or not this approach is applicable to the majority of startups, or whether it merely fits these particular startups because of their current state of business, company culture, and mindset towards competitors. In comparison to the remaining four interviewees explaining how they perceive the 'all hands on deck' approach to be suitable for their respective startup, interviewee 4's statement supports the general understanding in Silicon Valley that no startups are

alike in all aspects and that no model works for all. Whether or not any patterns around how the startups approach innovation and how they perform their innovation processes will be explored in the sections below.

Interviewee 4 states how they are able to have the best people in their field, which proves the previous finding in this part of the findings - mature startups have more resources and simultaneously also more time, which results in different innovation approach and processes between mature startups and early-stage startups. Seeing as interviewee 4's startup is perceived as a mid-stage startup in this study (see fig. 5.1), it differentiates itself from interviewee 2's and 5's startups that are perceived as early- and late-stage startups, respectively. Essentially, it supports the argument that there are differences between startups relating to their "startup stage" and their approach to innovation processes. Thereby, also supporting this finding, F2: *the maturity of startups affect their innovation processes.*

Ultimately, the resurfacing pattern throughout this section of the analysis is that the more mature the startup grows, the more resources it will accumulate and with the growth a change in culture, hierarchy, etc. can happen. As exemplified, the smaller startups practice a higher degree of an 'all hands on deck' approach, which decreases when they evolve into a more mature state. More mature startups that have managed to accumulate an increase of resources are approaching innovation inherently different than startups in an early stage. By the same token, mature startups are less interested in large high-tech corporations' effort to either participate in startup conventions, hubs, etc. and being acquired. Since more mature startups might already move out of the startup phase, the interviewees of the more mature startups that were investigated throughout this research, have expressed how their aim is rather to succeed now on their own and not being bought by any large high-tech corporation (interviewee 5, interviewee, 4). In the early-stage startups, limitations on resources that e.g. provoke an 'all hands on deck' approach simultaneously affects the innovation approach and innovation process that is investigated in the following section (section 6.3).

## 6.3 F3: All but Very Late-stage Startups Build Their Idea Generation Mainly on Customer Feedback and Influence from Other Companies

With the immense amounts of innovation in the area and the sky not being the limit anymore, one significant question to ask oneself when analysing startups' innovation processes is; how are these startups generating ideas? The collected data showed two primary sources fostering the idea generation; customer feedback and influences from other companies, which will be explained in-depth in the following subsections. However, one of the interviewees mentioned a contrast to the two primary sources - he explained how their innovation processes primarily build on their existing products (interviewee 5). It might to some degree overlap with the following subsections, where, the distinction is that the primary focus when generating ideas is on extending and expanding their product portfolio on behalf of the already existing product portfolio. Interviewee 5 is from

one of the startups that is perceived as a very late stage startup in terms of economy and revenue, and as a characteristic startup in terms of the organisational culture. It coincides with their approach to idea generation, which naturally could be a coincidence, but also could be due to the startup having an already extensive product portfolio and a strong and more secure position in the market due to their mature status. Where early-stage startups can, but are not limited to, be slightly more insecure in their market position and therefore more reliant on either feedback from customers or influences from other companies.

### Feedback from Customers

One of the two most significant aspects of this finding is that the interviewees in early-, mid- and one of the late-stage startups, i.e., 4 out of 5 interviewees - all interviewees except interviewee 5 that is in the very late stage startup, base their idea generation merely on feedback from customers.

As interviewee 1 explains how they bring in customer feedback and uses it to generally improve their products and not merely the specific point that particular customer may have had an issue with:

> *"When it comes to customers giving feedback, it doesn't necessarily mean that we are adding that specific orange button in the bottom-right corner that the customer wants. Rather, we take their feedback and their ideas to what they would like to see and then we brainstorm about it, where we try to understand what the underlying problem they want to have solved is. Then, we try to look at it from a broader perspective and see how we can solve it aiming at the broader spectrum of customers, and not merely for this specific use case." (Interviewee 1)*

It shows a concrete example of how they approach the idea generation, he later explains that their sales personnel in the startup are out talking to a lot of their clients to gain a great quantity of feedback, which they perceive as a crucial part of their innovation process (interviewee 1). That claim is supported by interviewee 4, however, despite similarities in the overall approach, he and his respective startup address the idea generation phase slightly different.

> *"For all of the verticals, we need to figure out what our clients need and where we can fill out the need. So instead of saying 'we have this client that needs x', we go out in the market and ask whether or not there are actual people needing this, and whether it makes sense to invest time and energy into'. That way, we get external people to say what we need to build, then we define their needs." (Interviewee 4)*

The approach interviewee 4 explains above is rooted in their perception of their startup, being the experts in

the field. That means they define their potential clients' needs based on their feedback on what the clients think the startup should build. It enables the startup to freely assess and interpret the market needs and thereby applying their expertise to the subject matter.

The way in which the two startups approach idea generation by relying on customer feedback enables them to get direct insight into how to best satisfy their clients. However, one could argue that relying solely on this approach does not leave enough room for fundamentally changing innovations. This is seeing as customers may to a large degree build their feedback on already existing products and innovations - meaning they request changes based on the current circumstances. Their clients may not know what they are missing or needing if they are not aware that it is an opportunity. Hence, the clients may not know what they are missing or needing before the startups point out what the clients should be missing or needing. One could argue that in the end, it is the startups that set the agenda of what the clients are needing or missing. On the other hand, one could argue that in the end, it is the clients that set the agenda on what is being invented or produced, seeing as it is based on the needs and feedback of the client, which fosters a thought process and eventually an idea generation process within the startups. This argument fits well with the collected data from interviewee 1 and 4.

### Influence from Other Companies

When it comes to gaining influence from other companies, interviewee 1 explained how they, unintentionally, compare themselves with competitors - seeing what they are successful in, then utilising it to think about how the interviewee 1's startup can do it even better along with seeing what their competitors are not so successful in, thus what the interviewee 1's startup should avoid doing. That way it enables the startup to assess whether or not the market is ready for a specific innovation. However, when a company constantly assess competitors, small or large, it makes it difficult to be the first one out there with an innovation for example, because it means their competitors need to be somewhat out on the market with a similar innovation, already. In the Silicon Valley area, where high-tech companies and startups are rapidly deploying innovations, it is a difficult balancing act for many startups whether they should be the first movers regarding an innovation or whether they are following right after the first movers, leaving time for assessing how successful or not successful the first movers may be. Therefore, startups need to be fast in determining which approach they should follow in regard to their go-to-market strategy. To return to the focus of idea generation, interviewee 3 proposed a slightly different perspective on her personal idea generation.

> *"All of my thoughts have come from previous experiences that were from other people's ideas, so I only know how to think through what I have done before, did it work or not, and then move forward and creatively implement it, but not necessarily come up with new ideas. I am an executioner, and it is just the way that I operate." (Interviewee 3)*

It poses an interesting contrast to interviewee 1's approach, while still being rooted in influence from other companies because she (interviewee 3) explains how all of her ideas have come from other people's ideas. That implies, her ideas have been formed not necessarily on the background of competitors, but merely other people. Eventually, it allows her to bring in former experience from former projects and then seeing it in her current startups' perspective, meaning she relies on previous experiences and information to bring new ideas and innovation into the startup. An additional and contrasting approach is proposed by interviewee 4, who pays attention to inspiration from the academic world. See his statement below:

> *"The most important thing is to figure out how we fit in the market. Additionally, we use a lot of time and resources on working with academia, meaning we go to a lot of conferences and we collaborate with a lot of research labs globally to find out what is trending around the world." (Interviewee 4)*

For this statement to be interpreted as the rest of the statement academia is seen as a specific player in the field as well, which may not pose as a direct competitor. However, the academic world, especially in the Silicon Valley area is well-grounded and forward-looking. That means one could argue that academia may be a good place for startups to look for inspiration - while interviewee 4 expressed their use of the academic world for inspiration, none of the other four interviewees mentioned academia. Hereby, not stating that their respective startups do not look for inspiration from academia but seeing as the interviewees tend to answer with the most obvious answers fitting their situation, one could argue that interviewee 1, 2, 3 and 5 do not use academia as the primary or secondary source of inspiration. It may be the third or fourth place they would look for inspiration. Lastly, interviewee 5 described how his influence was not necessarily rooted in one large tech company that he would admire, rather he explains how the different initiatives from various companies motivate and inspire him:

> *"I wouldn't say that I am looking at one specific organization for influence. I would say I am more influenced by what I hear, what initiatives other companies are doing. There are companies out there, such as Patagonia doing something on the environmental side, or Carlsberg and I see what they do when it comes to getting rid of plastic rings and sticking cans together, and I think 'that is significant innovation. It is an initiative that people respect and understand. When you see things like that are inspiring to me, and that makes me want to do something similar in my industry or in this field." (Interviewee 5)*

It becomes clear how he interprets their idea generation at their startup - that is the startup that stated they primarily were building innovation or new products from their already established product portfolio. This

poses an interesting notion - the innovation is based on existing products, but their individual motivation and inspiration come from initiatives across industries. It enables interviewee 5 and his startup to view multiple innovations across different industries, evaluating them and seeing how the problems that they are solving could be applied to their products.

To summarise: all of the interviewees mentioned how they perceived idea generation and some briefly touched upon the strategies and thoughts behind, the next question is how they actually work with the idea generation and the inspiration. How do they contain all the ideas, if they do, and how do they carry out their innovation processes? These questions will be explored further in the following section.

## 6.4 F4: There is no Difference Between the Level of Influence of the Tools and Systems Provided by High-Tech Corporations and Other Companies on Startups' Innovation Processes

As briefly explained above, this section will present the multiple tools that are used across the five investigated startups throughout their innovation processes and additionally how the tools are utilised in each given startup. This will essentially give an understanding of the startups' use of tools, both from large high-tech companies and from other startups, which will indicate whether or not the startups are prone to be influenced by these other companies through their tools.

### From a Simple System of Sticky Notes...

Once more, similarities occur between the startups of interviewees 1, 2, and 3. Whereas interviewee 4 and interviewee 5 differ slightly in the tools and systems that are implemented throughout their innovation process and daily tasks.

Interviewee 1, 2, and 3 explain how sticky notes are one of their primary tools to generate new ideas and which essentially plays a big role in their processes of being innovative. As an example, interviewee 1 describes their approach to sticky notes:

> *"Post-it-wars - is what we call it. The aim is to find a solution to an issue and so you set a timer to 5-10 minutes and then you almost have a competition of who can write the most post-its. This is almost just a very loose brainstorm, where all ideas are accepted in the first place and get smacked on a board, where after we start to slowly filter through and set together those ideas. You can then start so see that "okay, you just thought of that - that seems genius" and you might be able to find another post-it that can be connected to the first one, and another one, and so on. So you start building this*

*pipeline of post-its that will take one or another form that we will try to work with then" (Interviewee 1)*

Similarly, interviewee 3 expresses how:

> *"Sticky notes are probably the most creative tools. It is not even just about creativity at this point, but more on how you are going to execute this." (Interviewee 3)*

In that sense, sticky notes are widely used to generate ideas through brainstorms - not only to generate new ideas but also on how to execute certain ideas. Based on interviewee 1, 2 and 3, it is possible to argue that sticky notes motivate people to share ideas and thoughts they might otherwise not have vocalized, shared, etc. By the same token, the interviewees state how such a short time frame to develop a solution to an issue enables the brain to work in an alternative way that normally is not enforced. Due to the fact that mainly employees are expected to introduce thoughts through developed ideas, brainstorming disregards many of those aspects and one might write or vocalise an idea they otherwise would have held back due to e.g. uncertainty. The startups benefit from those spontaneous ideas because it may lead to a solution, or part of a solution, that otherwise would have been kept in the person's mind due to e.g. being self-conscious. Additionally, when a previous idea was well-received it potentially motivates people to share ideas outside of brainstorming sessions and/or increase participation in brainstorming sessions. See figure 6.1 below for a visualisation.

*Figure 6.1 - Visualisation of a Sticky Note Brainstorming Session.*

Although sticky notes in these startups are good tools for producing solutions, new ideas, etc. it requires a subsequent system or tool to document these ideas, processes, etc. in order to keep track and follow up on those. Here is where the large high-tech corporations come in. Whether the use of systems provided by large

high-tech corporations indirectly affects the startups in regard to keeping track of ideas, progress within the innovation processes and general documentation poses a significant question that the authors behind this paper will examine in this section.

### … to More Comprehensive Systems by Mid-size Companies, such as Trello and Jira...

Firstly, both interviewee 1 and 2 stated that they, to some extent, are utilising Trello. Trello is an online, visual way for teams to collaborate on projects (Atlassian, 2019a). See figure 6.2 for a visualisation of Trello. The software enables a "big picture" view or to zoom in to more details, track individuals' progress, organise multiple apps, communicate with each other, features real-time updates and is available on the browser or as an application on one's phone (ibid.). Trello is owned by Atlassian, an Australian software company - not categorised as a high-tech company in this study. Interviewee 1 explains:

> *"Trello is a pleasant way to work, where one can move around items, colour code and extract a general overview of how far the process has come along." (Interviewee 1).*

Interviewee 2 states that they use Trello Software, however, not all ideas will be implemented in it due to the system's limited backlog capacity.

> *"We use Trello [Software, red.] more limited. It works for keeping track of one's development process, the backlog would be too big if we would through all ideas into it though." (Interviewee 2)*

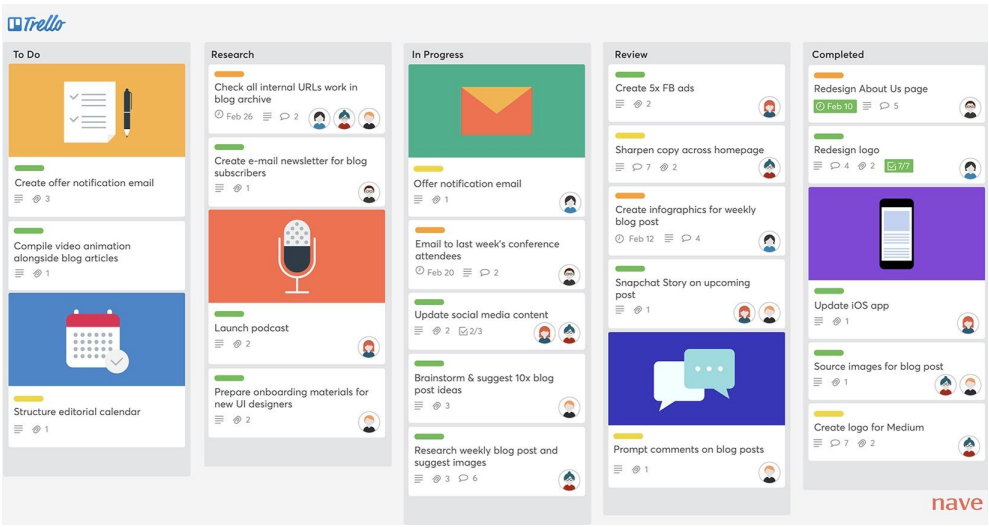


*Figure 6.2 - Visualisation of Trello*

In essence, it means that the startup will have to supplement with yet another system to encounter all the details of their innovation processes. Therefore, as a more complex tool, interviewee 2 explains how they utilize Jira, which is made for agile, software teams, and is incorporated in a myriad of organisations worldwide. Jira is, just as Trello, owned by Atlassian (Atlassian, 2019b).

> *"We are brainstorming ideas and might be saying 'okay, this might be some fast ROI' and then we will put it in Jira. Jira is probably one of the biggest programs that hold together our whole organisation. It is a good program, but it is also pretty complex. We built this project in Jira and even though our whole organisation is in Jira, the project exists as an entity on the site for itself [...]. There are specific action items and timelines in order to manage what we need to do when. In this way, we take all these ideas out of the brainstorming and take the most promising into Jira." (Interviewee 2)*

As already mentioned in the statement above, organisations can track what needs to be done and when. Jira enables organisations to plan, track, and manage each member of the team, and further to discuss projects within the team. The team performance can be enhanced by real-time, visual data that can be put into use (Atlassian, 2019b), and can either utilize an already existing workflow or create one that matches the individual team's way to work. Jira allows the startup to integrate external developer tools, such as knowledge management, development workflow, etc. and external apps in order to maximize the Jira Software. Ultimately, Jira is customizable and extendable und thus fits into many organisations and fulfilling their needs towards an agile project management tool. See figure 6.3 below for a visualisation of Jira. Therefore, one can argue that Jira is a comprehensive tool that enables the startup to do in-depth track keeping for all of the brainstorming ideas produced via a sticky note system (interviewee 2). However, seeing as both Jira and Trello are owned and offered by Atlassian, an Australian mid-sized company, it may not have the same indirect effect on their innovation processes as the large high-tech companies - it is possible to argue that the level of effect comes down how well the system is integrated in the startups' innovation processes and how much data it covers.


*Figure 6.3 - Visualisation of Jira*

Similar to Trello and Jira, another tool exists to assist organisations to track, manage, etc. their projects - called Asana. The Asana software is offered by another San Francisco startup by the same name: Asana. Interviewee 3 describes two different scenarios of how Asana is utilised in her respective startup:

> *"We use Asana, there are two ways of using Asana. One is making a whole list, like a checklist, where you can assign it to different people like 'Cassie will do this task. My co-worker will do that task'. Then you can set due dates on it and you can track your progress of how you are doing on the project. [...] There is another visual way of using Asana, it is called 'Kanban', both Trello and Asana use it. It is almost like sticky notes, where you can have one called 'started', one called 'in progress'. Then you are moving through the timeline and progress of your project. That is one methodology too." (Interviewee 3)*

Asana (see figure 6.4 for a visualisation) and Trello (shown in figure 6.2) are two similar working tools, that in their basic form enable tracking of a project utilising the Kanban method - a method to achieve just-in-time, mostly using a scheduling and tracking system (Sugimori, Kusonoki, Cho & Uchikawa, 2007). It permits organisations to retrieve both an overview of a project and a zoomed-in approach with more details. In contrast to Jira, however, Asana and Trello are not as rich in complementary tools, e.g. integrating third-party apps and software, and less complex in the way they operate. Nevertheless, these tools might also enhance work due to their simplicity and rather be an aid to help teams keep track of the progress, or a reminder on the project's status and thus simplifies team-based work. As interviewee 3 described they utilise Asana as a digital way of using sticky notes - and just as Trello and Jira are used by interviewee 1 and 2's startups - Asana is overall utilised to keep track of progress in their innovation processes and to get an overview of all the tasks within the innovation processes.

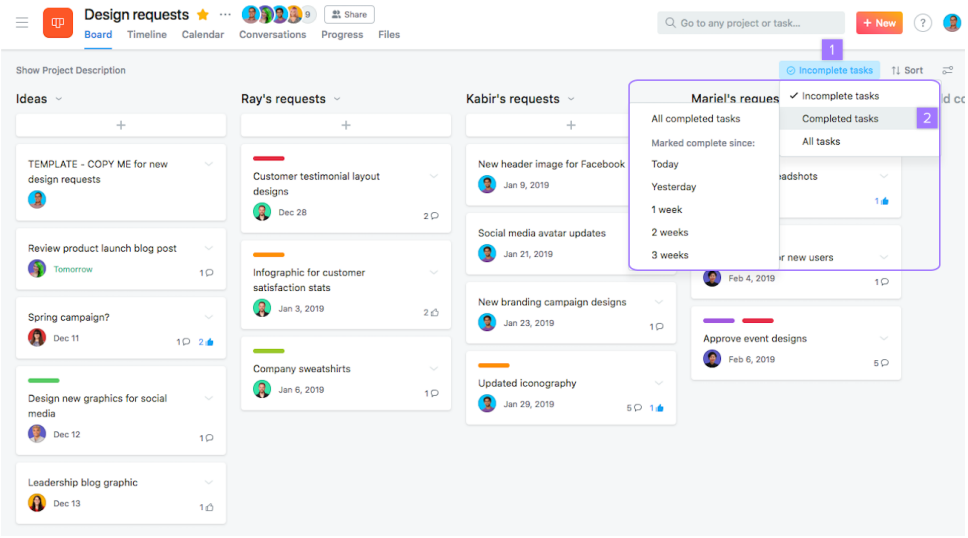


*Figure 6.4 - Visualisation of Asana*

### … and Lastly, to a Very Comprehensive Software System by the Large High-Tech Corp, Salesforce

In contrast to the above-mentioned use of systems and tools, interviewee 5 explains how they have incorporated Salesforce as one of their workflow tools. Salesforce is a cloud-based customer relationship management (CRM) software that promises to "build more meaningful and lasting relationships and connect with [...] customers across sales, customer service, marketing, communities, apps" (Salesforce, 2019). See figure 6.5 for a visualisation. The software is offered by the large high-tech company Salesforce and therefore poses as a subject of examination in regard to this study. Evidently, utilising Salesforce enables interviewee 5's startup to lay some of the daily workloads in the software to keep track of. As much as the Salesforce software has the potential to affect their innovation processes, seeing as the startup utilises a lot of time, daily, interacting with the software, the software is causing them a great deal of frustration. Essentially, it can create some issues that will turn out to be so significant that the startup will change to another system, making their point of indirect influence equal zero.

> *"We use Salesforce every day. Salesforce is the one go-to tool that we have that takes up a significant portion of what we do, but also some frustration evidently. There are operational efficiencies that could be done on Salesforce that I think we are constantly trying to improve upon and work to optimise." (Interviewee 5)*

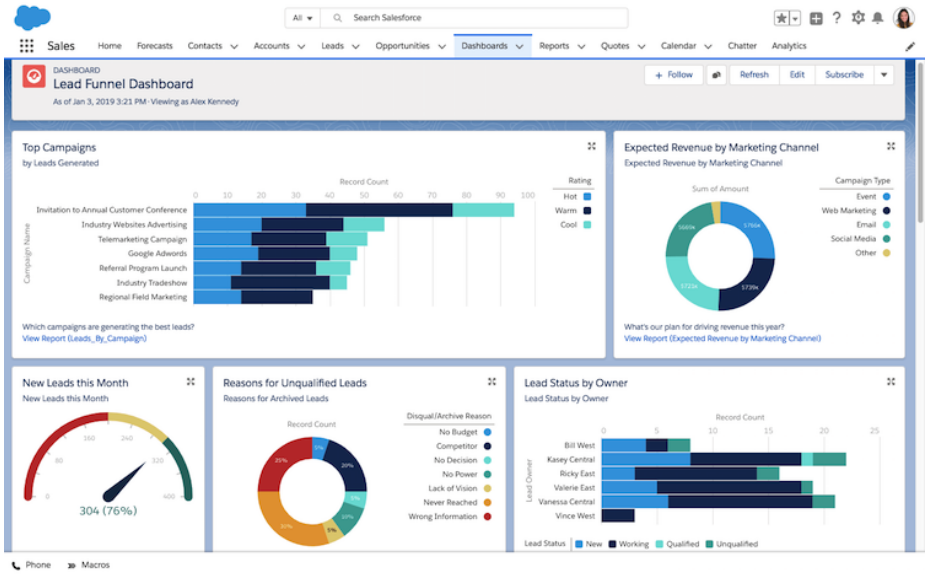


*Figure 6.5 - Visualisation of a Salesforce dashboard*

In the case of this startup, multiple tools are used for multiple distinctive purposes and tasks to facilitate their needs in order to fulfil the work tasks, i.e., the startup utilises a Google Chrome extension called Datalyze, a cloud-based tool called Clare and an emailing system called Nova. As the last-mentioned interviewee 5's startup finds itself in a more mature status of a startup compared to the remaining investigated startups, it is appropriate for them to utilize a higher number of tools and systems. More tasks have to be accomplished, and these tasks can become more complex, thus require multiple systems and tools to achieve the desired outcome. By utilising more systems, one could argue that the startup has a higher risk of exposure to influence by other companies and especially from large high-tech corporations. However, whether or not the startup is exposed to a higher degree of influence if they rely all their work tasks in one system or if the exposure is higher if they divide their work tasks on multiple systems from multiple large high-tech companies poses an interesting question. Additionally, whether there is a higher risk of influence by systems of large high-tech companies than startups for instance, and vice versa.

Additionally, he names some other tools and more importantly how the organisation approaches the idea of integrating new tools into their workflow:

> *"We use a couple of email tools as well, called Nova we started with one called Outreach as well. And I would say that the one thing I enjoy about Cloudflare is that there is a lot of the test-runs with many of these tools and actually adopting them depends on how the team takes it. Not just the team here in North America but also the teams in London and Singapore. All of that matters in the end, so if it is primarily positive feedback then we might consider within weeks or even the day of just adopting that tool. That is another thing that I enjoy about it, is the fact that we listen to 'hey I can operate very*

*productively with this, why don't we just set it up?'" (Interviewee 5)*

Evidently, the startup is still keeping the startup feeling and culture to some extent regarding their approach to embark on new tools, software, systems, etc. Testing the new tools across all their offices in different locations also shows their engagement to only integrate a new tool if the majority is convinced of its productivity.

Subsequently, the five investigated startups use are utilizing similar tools and systems for similar tasks. As shown above, three of the five startups have vocalized their preferred way of the sticky note system for brainstorming ideas and solutions, which enables the startups to approach innovation freely based on ideas and thoughts. This system is, in terms of indirect influence via tools, free of influence from the large high-tech companies. Similarly, all of the startups seem to utilise tools that enable them to retrain detailed pictures of the project and progress of it, as well as the big picture of it. The above-mentioned tools help the startups to approach innovation in a structured and manageable order. Sticky notes are used in the early-stage startups (1 and 2) and one of the mid-stage startups (3) mostly to generate ideas and afterwards tools such as Trello and Jira are used to organise the ideas and develop the project trackable. The tools alternate between the startups, given their preferred way to work, but are used for the same purpose - streamlining the innovation process.

Secondly, it supports finding 2 that more mature startups differ in their innovation process partly due to increased resources. It became evident that the most mature startup relies on multiple tools for multiple reasons that not all are directly connected to innovation. The tools, however, do facilitate some of the necessary day-to-day tasks (e.g. communication via email) and influence the innovation process indirectly. Essentially the early-stage startups seem to primarily utilise tools that are *not* based on software from a large high-tech company. Whereas, the very late-stage startup does rely on Salesforce software. It creates some interesting questions as to why and what impact that could have on the startup's innovation processes. For example: whether or not this startup is indirectly affected by Salesforce, which can be categorised as a large high-tech company to structure and organise their (the startup) ideas and innovation in ways Salesforce indirectly direct them to via their software.

Essentially, the findings did not show any clear and obvious signs of influence from Salesforce but seeing as it would be a difficult factor to measure, it leaves room for further research. As written earlier, the level of influence on the startups' innovation processes would rather be measured in how well the tool or system is integrated in the startup, to what degree it is utilised and how much of their data is within the system. Based on the interviews, it was not possible to find concrete evidence of this statement.

## 6.5 Summary of Findings

Table 6.1 below shows the four main findings of the analysis, which all will be discussed in the next section regarding their potential significance for the field of literature, research and practice.

| No. | Finding |
|---|---|
| **1** | Startups need to constantly scan and assess competitors and large high-tech companies in order to stay alive. |
| **2** | Early-stage startups' vs. mature startups' organisational culture and their relation to high-tech corporations. |
| **3** | All but very late-stage startups build their idea generation mainly on customer feedback and influence from other companies. |
| **4** | There is no difference between the level of influence of the tools and systems provided by high-tech corporations and other companies on startups' innovation processes. |

*Table 6.1 - The Key Findings in the Analysis*

# 7. Discussion

## 7.1 Discussion of Key Findings and Suggestions

Both external and internal factors of the case companies were analysed based on the interviewees' interpretation. In this study, demographics such as a number of employees along with product portfolio were chosen to measure startup maturity, as depicted in figure 5.1. This showed to be appropriate when detecting startups' perception of their own maturity level.

The result (finding 1 in table 6.1) does not fully support the prior literature, which depicts how most organisations rely on a mix between exploration and exploitation during their innovation processes, i.e., embracing an ambidextrous state to reach positive performance effects (Lubatkin et al., 2006; Benner & Tushman, 2003). Contrastingly, the result of finding 1 showed how the interviewed startups rely mainly on exploration when innovating in order to survive. This relates to the studies conducted by Wagner (2011) - namely that startups focus their resources on exploration during their innovation processes.

On the other hand, prior findings have shown high organisational benefits if companies were consisting of a separate exploratory unit and a separate exploitative unit (Hedberg et al., 1976; Levinthal, 1997; Weick, 1976; Leonard-Barton, 1995; Christensen, 1998). This is contrasting with finding 1 that shows, how the startups commonly do not possess the resources to manage separate exploratory and exploitative units. As stated in finding 1, the startups are under constant pressure to perform and are exposed to a hazardous threat from other new startups and established companies. This forces the startups to constantly scan and assess the market and entire ecosystem to stay on the market, i.e., making their survival dependent on exploration. Essentially, finding 1 corresponds well with Germain (1996) that explains how an organisation, if regularly exposed to environmental change, are more prone to becoming better at adapting to turmoil, focusing on the future and being more attentive of external innovations and signals (Germain, 1996).

Finding 1 also brought to light that some startups aim to pursue the same or a similar path as the large high-tech corporations. Throughout the analysis, the fact emerged that following the path of a large high-tech corporation such as Google, Facebook, Salesforce, etc. could become self-reinforcing mechanism. Sydow & Schreyögg (2015) refer to this as coordination effects. If startups will obtain much of the large high-tech corporations' knowledge and skills to ultimately pursue their own goal, the startups can end up in a path dependence due to e.g. orienting themselves to such a degree on another organisation that the startup will start to minimize the options available. However, even startups that consciously avoid the large high-tech companies possibly minimize their possibilities and are increasing chances of ultimately a state of lock-in. Startups can exclude possibilities that large high-tech corporations might offer them and thus eliminate valuable options in the future to e.g. launch a new innovation.

However, finding 2 (see table 6.1) is in line with prior research stating higher benefits for companies that manage both exploration and exploitation simultaneously (Birkinshaw & Gibson, 2004 in Andriopoulos & Lewis, 2009). This is said to enable and encourage employees to make their own judgment of time management between contradicting demands for alignment and adaptability (McDonough & Leifer, 1983; Tushman & O'Reilly, 1996 in Birkinshaw & Gibson, 2004:210), which falls in line with finding 2 stating how everyone in the early- and mid-stage startups will have to weigh in on all the work that has to be done and judge what is appropriate at certain times.

In the literature review, the term 'innovation process' was comprehensively elaborated on, in terms of the characteristics of innovation (see section 2.1). The results of finding 3 (see table 6.1) showed how the interviewees perceived their idea generation process, which in this paper is believed to be equal to the innovation process. It was shown how most of the interviewees (4 out of 5) among other things, primarily, focus their idea generation on feedback from customers to improve their existing product portfolio. This falls

in line with the prior literature describing both exploitative-, incremental innovation and the connection in between (Benner & Tushman, 2003; Germain, 1996). Furthermore, finding 2 (see table 6.1) that showed that the maturity of the startups, i.e., size and product portfolio, affect their innovativeness contradict prior research (Dewar & Dutton, 1986) that found that not all organisational structures influence incremental and radical innovation distinctively.

Early-stage startups are more likely to practice incremental innovation since the large high-tech corporations have previously released products/services/goods that startups can innovate complimentary products/goods/services. Thus, startups do not have to produce a radical innovation that would require more resources. On one hand, this approach requires fewer resources, on the other hand, this can lead to increasing complementary self-reinforcing effects. Additionally, with Germain (1996)'s notion of specialisation, i.e., if an organisation has a large degree of knowledge and competence and a well-nurtured idea-sharing culture, the tendency to innovate becomes significantly higher - it is possible to argue that large high-tech corporations with immense supply of resources have a higher tendency to innovate than startups with scarce resources. Where Dewar and Dutton (1986) explain that specialisation demonstrates that not all aspects of organisational structure influence incremental and radical innovation distinctively, meaning, specialisation invariably forecasts innovation irrespective of costs and degree of radicalness - which ultimately supports finding 2 stating that despite the organisational structure, flat or with little hierarchy in the startups, they all manage to increase their innovation processes by implementing the 'fail fast and learn' mindset. Therefore, the overall degree of their innovations, incremental or radical is highly based on the knowledge base retrieved from the 'fail fast and learn' mindset.

Furthermore, Germain (1996) claims that the higher degree of decentralisation in an organisation, the higher the degree of innovativeness. Throughout the analysis, it was found that the early stage startups are more likely to impose a highly decentralised decision-making due to the limited resources. Limited resources force a decentralised vertical position because employees are motivated to take decisions with little regard to their hierarchical position in the startup. Thus, the flat hierarchy of especially the early-stage startups is linked and enhances the decentralisation. However, the more mature the startups is, the more likely it is that the hierarchy will become less flat and decentralisation decreases simultaneously. By the same token, large high-tech organisations in nature have a higher hierarchical structure than startups due to the larger amount of Human Resources and more complex work tasks, etc. The degree of innovation was said to be higher in startups, which is one of the reasons why large high-tech corporations are looking towards startups in order to increase their innovation. It can thus be argued that the degree of decentralisation and the degree of innovation are interconnected. Conversely, Germain (1996) argues that a decentralised organisational structure increases the degree of innovation because organisational members feel a higher degree of involvement, recognitions, and

dedication, which the findings have not been stating to a high degree. Thus, further factors could exist that play into why a decentralised structure leads to a higher degree of innovation. Lastly, the findings did not directly support the claim that decentralisation is influencing the degree of innovation. It is questionable if the two factors - decentralisation and innovation are influencing each other, meaning that the degree of innovation might also lead to a more decentralised organisational structure. The findings, however, have not supported a strong enough argument for that so further research is needed in order to prove this theory.

From a different point of view and as mentioned above, Dewar and Dutton (1986) argue that no correlation between a decentralised organisational structure and the notion of incremental and radical innovation could be found. Even though their study has not directly investigated if decentralisation increases the degree of innovation, their approach seemed to imply a connection. However, since the study did not show any correlation between decentralisation and incremental and radical innovation it can be questioned whether decentralisation has any influence on innovation or vice versa. Throughout the analysis, it was found that the more decentralised startups had a higher degree of innovation, however, no correlation between decentralisation and incremental or radical innovation was evident. Thus, the findings align with Dewar & Dutton's (1986) study that no correlation between a decentralised organisation and incremental and radical innovation. Based on the above-mentioned and finding 2 and 3 the authors posit the first suggestion:

*S1: There is a connection between startups' maturity stage and their approach to innovation processes, where all but late-stage startups are inclined to base their innovativeness on incremental innovations and complementary effects.*

Finding 3 (see table 6.1) also shows how unintentional mirroring becomes effective for the startups in the pursuit of innovation. Specifically, interviewee 1 stated how they subconsciously compare themselves with competitors in terms of success and failures projected onto his own startup. This statement and finding support prior studies (Sydow & Schreyögg, 2015) describing a path-dependent self-reinforcing mechanism named the coordination effects. Essentially, stating that organisations tend to follow four phases in which self-reinforcing mechanisms occur. The results show a significant tendency among the startups that unintentionally mirroring others, whether it is other companies, prior employees, or the academic world spark their innovation processes. Essentially, this finding is not directly supported by Sydow & Schreyögg's (2015) notion of self-reinforcing mechanisms, however, it adds a valuable layer to the notion and positively supports the overall question of whether innovation processes are to some degree path-dependent. Additionally, finding 3 & 4 shows how these unintentional mirroring methods result in a focus on how both assessing new radical innovations and changes to existing products, i.e., incremental innovation. None of the interviewees clearly stated how the mirroring effects lead to radical innovation and hence, the authors propose the second suggestion:

*S2: There is a correlation between startups' unintentional mirroring of others and incremental innovation, that is the higher the degree of unintentional mirroring the higher the degree of incremental innovation.*

Finding 4 is also in line with Sydow & Schreyögg's (2015) notion of self-reinforcing complementary effects which essentially states that related practices occurring between two or more individuals become gradually more dominant in an organisation (ibid). The use of post-its and sticky notes explained by interviewee 1 and 3 combines the practices of brainstorming and progress monitoring. Essentially, this spurs creativity and makes it easier and more convenient for the involved individuals to keep track. However, the degree to which these practices have manifested themselves as an integrated part of the innovation process is different between the two startups. Where interviewee 3 experiences the sticky note practices as a fundamental part of the innovation processes, interviewee 1 only experiences the practices when it is introduced by another member of the organization and he is involved in the project. This indicates different path-dependent behaviours, partly supporting the overall and general claim that innovation processes are inherently path-dependent (Sydow & Schryögg, 2015; Mahoney, 2000; Vergne & Durand, 2010; Onufrey & Bergek, 2015).

The results in the current findings show that mirroring can, in fact, lead to innovation by reflecting others' successes and failures in the startup's own situation. Prior research shows a diverse opinion on this matter with perceptions that (1) an innovation process can only occur if no imitation has happened (Maclup, 1962; 1980) and (2) innovation can encounter existing products and processes created externally, indicating that imitation can be a part of innovation processes (Woodman et al., 1993; Quintane et al., 2011). This aligns with prior research in knowledge literature stating that knowledge is a precondition for innovation (Cohen & Levinthal, 1990; Machlup, 1962; Quintane et al., 2011). In other words, mirroring other organisations also means learning from others and increasing the knowledge, which can be beneficial in startups due to the fact that only little pre-existing knowledge exists. Hence, the authors proposed the third suggestion:

*S3: There is a connection between startups' approach to innovation processes and the degree of self-reinforcing mechanisms, where startups approaching innovation processes open-mindedly towards external influence experience a higher degree of self-reinforcing complementary effects.*

Additionally, finding 1 supports Sydow & Schreyögg's (2015) claim that innovation processes are inherently path-dependent, in terms of the self-reinforced mechanism named learning effects. In essence, these learning effects are described as; the more often an action is performed, the more efficiency will be accomplished when operating subsequent iterations (Sydow & Schryögg, 2015). The results in finding 1 shows that due to the repetitive and continuous process of scanning the market and thinking two steps ahead, the startups

continuously become better at performing these practices. It is evident in the statements from interviewee 1 & 3 that both startups have performed the practices of scanning the market and thinking two steps ahead before, due to both interviewees' statements (see section 6.1 under "competitors") indicating reflection and iteration. Eventually, it is possible to argue that not only will the self-reinforcing learning effects originate from own learnings, the learnings can also originate from the large high-tech corporations. Even though literature suggests that large high-tech firms encompass a lower degree of innovativeness than startups due to their tendency to build hierarchy and bureaucracy (Kamien & Schwartz, 1975; Cohen & Klepper, 1996; Wagner & Hansen, 2004) - the new high-tech firms, such as Facebook, Google, Tesla etc. have also been startups recently, and have managed to climb to the top. Based on the positive connection between the prior studies and finding 1 and 4, the authors propose a fourth suggestion:

*S4: The more aware of and actionable upon the situation of the market the startup is within, the better it will become at thinking two steps ahead and the stronger the self-reinforcing learning effects may be.*

Looking back to finding 4, it was stated in the analysis how interviewee 5's startup utilizes a software that is offered by a large high-tech corporation - Salesforce. Even though the interviewee states that the employees in the given startup are not necessarily satisfied with the software, it can be anticipated that the startup will not change the software in the future due to a couple of reasons: a) the startup has bought the software (expenses), b) the startup has already invested its time (resources) into understanding and utilising the software which leads to c) employees have already acquired certain skills working with the software and d) positive network effects because the more people are interacting and working with the software, the more satisfaction one will retrieve. Together, these factors are referred to as self-reinforcing investment and learning effects and self-reinforcing network effects (Sydow & Schreyögg, 2015). Ultimately, the switching cost - the number of resources that are needed to change to a different software - are increasing over time and with the effort that is put into the software (such as learning, acquiring add ons, etc.) and thus decreases the likelihood of the startup changing the software. Hence, large high-tech corporations can have an influence on startups, even mature-staged startups, and possibly lead them to a lock-in state in the future due to high switching costs. However, this argument is based on assumptions on whether or not this would have an effect on the startup's innovation process and what the effect would/could be.

Path dependence implies that past behaviour constructs a company's present and future activities (Sydow & Schreyögg, 2015; Mahoney 2000). In this study, it relates to learning from previous successes and failures or those of other companies. As described in finding 2, it is shown how the startups encompass the '*fail fast and learn'* mindset, which is rooted in the startups' limited range of time and resources. In essence, the '*fail fast and learn'* mindset is that every employee will try out an innovative idea if they believe in it. If the innovative

idea turns out negatively, the employee will reflect upon it, learn from it and move on to the next idea rapidly. It slightly relates to self-reinforcing learning effects and overall path dependence (Sydow & Schreyögg, 2015). Essentially, finding 1 and 2 support the claim that innovation processes are path-dependent. In regard to learning from others' successes and failures which both interviewee 1, 2, 3 and 4 indicated.

The maturity stage may also affect the openness towards the '*fail fast and learn'* mindset since interviewee 1-4 are all from startups that have not reached the very late stage of maturity and essentially the $1 billion in valuation unicorn status. One could argue that early- or mid-stage startups are inherently more prone to perceive their market situation as easily threatened by new entrants, rapid innovations and large high-tech corporations with what seems to be endless resources to create new innovations. As this may appear logical, the difference is centred around the question of why very late stage startups seemingly are less inclined to widely adapt to the '*fail fast and learn'* mindset within their innovation processes. However, the authors posit the following and fifth suggestions:

*S5: There is a connection between startups' maturity stage and their openness towards a fail fast and learn mindset, i.e., all but very late stage startups may be more open towards the fail fast and learn mindset during innovation processes.*

Additionally, combining the results in finding 2 and 3, it is clear that the flat hierarchical structure of startups enhances the '*fail fast and learn'* mindset along with the loose and little structured approach to innovation processes. This combined with a strong perception of being a startup could increase the tendency to look, unintentionally or intentionally, at the large high-tech incumbents. This could be either by looking at the large tech companies' successes and failures or utilising their products. Eventually, this falls in line with prior research of the self-reinforcing coordination effects which leads back to the mirroring of others (Sydow & Schreyögg, 2015).

To summarise, throughout the discussion it was discovered that innovation processes in startups, in general, can be path-dependent. The three strongest suggestions showed the high synergy between the startups' innovation processes and path dependence that was shown in this study, i.e., suggestion 2, 3 and 4 (see table 7.1). Essentially, suggestion 5 (see table 7.1) shows how the '*fail fast and learn'* mindset supports the claim of self-reinforcing mechanisms, hence strengthening the claim that startups' innovation processes can, in general, be path-dependent. To juxtapose this argument, the authors did not discover any indicators of lock-in within the investigated startups. This decreases the claim that the startups' innovation processes can be path-dependent, however, the three dominant suggestions show patterns that support the claim. Hence, in order to get ahead in the startup race, startups in Silicon Valley are to some extent being influenced by others, which

encompasses both large high-tech companies, new market entrants and academia. Eventually, making their innovation processes path-dependent. Additionally, based on the findings and since no indicators of lock-in was found in the interviewed startups, they all can be categorised to be in Sydow and Schreyögg (2015)'s part of the Path Dependency theory called Phase II - *The Formation Phase* – see figure 7.1 for a visualisation. That means, their scale of options in terms of innovations are becoming increasingly narrower, while it becomes increasingly more difficult to choose another direction in terms of innovation processes.

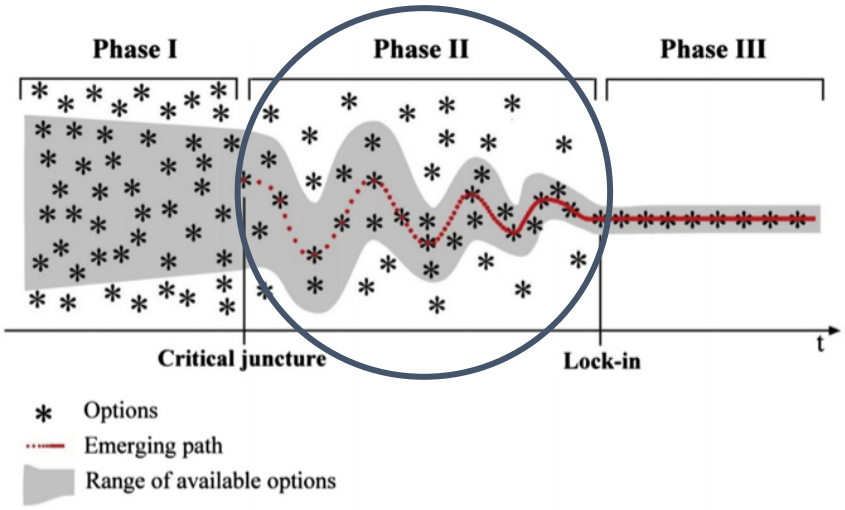


*Figure 7.1 – Visualisation of Interviewed Startups' Current State of Path Dependence*

## 7.2 Summary of Suggestions

Table 7.1 below shows a summary of the 5 suggestions proposed in the discussion.

| No. | Suggestion |
|---|---|
| 1 | There is a connection between startups' maturity stage and their approach to innovation processes, where all but late-stage startups are inclined to base their innovativeness on incremental innovations and complementary effects. |
| 2 | There is a correlation between startups' unintentional mirroring of others and incremental innovation, that is the higher the degree of unintentional mirroring the higher the degree of incremental innovation. |
| 3 | There is a connection between startups' approach to innovation processes and the degree of self-reinforcing mechanisms, where startups approaching innovation processes open-mindedly towards external influence experience a higher degree of self-reinforcing complementary effects. |
| 4 | The more aware of and actionable upon the situation of the market the startup is within, the better it will become at thinking two steps ahead and the stronger the self-reinforcing learning effects may be. |

| | |
|---|---|
| 5 | There is a connection between startups' maturity stage and their openness towards a fail fast and learn mindset, i.e., all but very late stage startups may be more open towards the fail fast and learn mindset during innovation processes. |

*Table 7.1 - Summary of Suggestions Proposed in the Discussion*

## 7.3 Practical and Theoretical Implications

### Practical Implications

Being a startup tends to encompass the myriad of work processes not being completely in control, making a lot of the work very ad hoc and trial and error. As it, seemingly, work out fairly well for the interviewees' startup, it is significant to ask oneself whether the unintentional mirroring of others is perplexing the work of the decision-makers within the startup. Seeing as it is unintentional it may be difficult to address, thus, not necessarily simple to overcome.

Based on the findings and the discussion, the authors highly encourage early-stage startups to focus on processes that will decrease the risk of reaching a state of lock-in. This could be mixing approaches to innovation processes, to ensure a higher diversified approach. That is, focusing around 50/50 percentage on being exploitative and explorative in nature. Furthermore, the authors encourage late-stage startups to decrease their mirroring effects and encompass a higher focus on the exploitation of existing resources. Hence, decreasing the risk of reaching a state of lock-in. Lastly, the authors encourage the startups of all levels to take note of the indirect influence that the startups may be exposed to by large high-tech corporations and other companies when utilising tools and systems offered by these. It would be significant for the startups to evaluate whether or not the influence would be larger when utilising merely one tool or system from one large high-tech company or whether the degree of influence would be smaller if the usage of tools and systems were spread out on multiple tools and systems.

### Theoretical Implications

In this study, innovation processes were viewed from a startup perspective and widely analysed from different theoretical angles, utilising a qualitative approach to collect data. This approach was utilised to gain a more thorough comprehension of innovation processes and connections in the analytical framework.

The prior studies reviewed stated they were primarily based on 'organisational' settings, which essentially could be interpreted as organisations in all different sizes and shapes. However, it could impose a theoretical implication that these earlier studies that are used as lenses to view this study are primarily intended for large organisations. One could argue that the authors behind this thesis are utilising the earlier studies based on their interpretations thereof. However, it may have caused gaps in the analysis between the literature and the

collected data, seeing as the aim of this thesis is to project a startup perspective. Lastly, the thesis authors believe that the lack of literature on the perspective of startups in terms of innovation processes enhances the importance of this study, thus the contribution of this study to the body of literature.

# 8. Conclusion

This thesis investigated the research question of *how startups' innovation processes are affected by large high-tech companies*. Based on an analytical framework and 5 different interviews of startups in Silicon Valley, the authors found that startups' innovation processes are affected by large high-tech companies on an equal level as other competitors, such as new market entrants, and other organisations. Thereby, to some degree juxtaposing the dreadful stories on the large high-tech companies and their power over startups, that the media has written. In regard to prior research, it did not significantly state how much power the large high-tech companies have over the startups but instead talk about the state of lock-in (Sydow & Schreyögg, 2015), which the authors found no evidence of in the startups examined for this study.

A framework of path dependence from Sydow & Schreyögg (2015) was obtained from previous literature to examine *how* the startups' innovation processes were affected by the large high-tech companies. Since the results, in general, showed that the large high-tech companies affect the startups' innovation processes equally as much as other companies, the results and discussion showed on a broader level which factors that affect the startups' innovation processes. A multitude of self-reinforcing mechanisms was found across the startups, and especially, the learning effects and coordination effects were significant. The framework proved to be useful in terms of examining which factors affected the startups' innovation process on a general level. Nonetheless, the framework conjoined with in-depth information from within each investigated startup delivers a comprehensive understanding of the startups' innovation processes and which factors that affect it. Essentially, it gives the startups awareness of their innovation process dynamics, which enables them to strategically work with those to fit their desired direction.

Specifically, the results show that there is a correlation between startups' unintentional mirroring of others and incremental innovation, hence, the higher the degree of unintentional mirroring the higher the degree of incremental innovation. This showed, in effect, to be the point where the startups connected to the large high-tech companies. While the startups did not state explicitly that they mirrored themselves towards the paths of the large high-tech companies, it was mentioned indirectly, and the authors thus interpreted it to be unintentional mirroring. For practical implications, unintentional mirroring may be difficult to address and not necessarily simple to overcome, which eventually could make it inherently difficult for the policymakers in the startups to navigate through the fields of constant competition, while thinking two steps ahead.

## 8.1 Further Research

This thesis contributes to the literature of path dependence and innovation processes in terms of startups and large high-tech companies. The intention behind the framework of path dependence by Sydow & Schreyögg (2015) was to guide the researchers in their attempts to comprehend the phenomena of path dependency and self-reinforcing mechanisms in startups. For further research, the amalgamation of geographical factors and the path dependency in startups, combined with the results in this study, could be highly interesting to examine. Additionally, further researching how startups affect the large high-tech companies if they do, could be significantly interesting to further investigate.

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