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How Innovation Occurs in the Software Industry:
A Qualitative Study on Innovation Management

By
Jihoon Rim

A dissertation submitted in fulfillment of the requirements
for the degree of Doctor of Business Administration
at Zicklin School of Business, Baruch College, City University of New York

2022

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This manuscript has been read and accepted by the faculty of the Zicklin School of Business
in satisfaction of the dissertation requirement for the degree of
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ABSTRACT

How Innovation Occurs in the Software Industry:
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by

Jihoon Rim

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Research in innovation has been widely conducted by academics. However, many of them merely define associations among innovation factors, findings are often contradictory, and research that involves innovation leaders with rich experiences, both successes and failures, is rare. Thus, how to best innovate remains a question among practitioners. This qualitative research is aimed at filling this gap in the literature. To that end, 23 innovation leaders, most of whom founded software companies worth hundreds of millions to billions of dollars, were interviewed with a grounded theory approach using Peter Drucker's innovation theory as a lens through which to view new theories and develop an innovation framework. As Drucker's theory is nearly 40 years old and technology has evolved dramatically, examining the extent to which the theory still applies to contemporary innovation management is crucial. Results confirmed six out of Drucker's 12 innovation principles, two were revised, one was contradicted and three could not be validated due to the lack of data. Beyond largely validating Drucker's theory, this paper proposes that the environment acts as a mediator in innovation and suggests ways to create the right environmental factors and foster innovation. Finally, this paper refines Drucker's theory and develops seven novel theoretical propositions to create a more holistic theoretical framework to better understand innovation in the tech space and guide business practitioners.

Keywords: Innovation, Innovation Management, Qualitative Research, Software Industry, Technology Industry, Innovation Leaders, Innovation Framework, Innovation Environment, Theory Development

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CHAPTER 1

INTRODUCTION

The term “innovation” is one of the most widely used buzz words among managers and is perceived as the key to survival for many companies. When executives are interviewed by the public media, they almost always mention innovation as the impetus for growth of their businesses and market share. Satya Nadella, CEO of Microsoft, famously proclaimed, “Our industry does not respect tradition; It only respects innovation.”¹ Former Chair and CEO of IBM, Ginni Rometty, also stressed the importance of innovation by stating, “For CEOs today, it’s all about achieving growth and efficiency through innovation.”² They know that many problems arise if growth stalls. The company will be subjected to increased scrutiny if growth slows. There will be fewer opportunities for employees, potential layoffs, and even the executives themselves might lose their jobs.

Unfortunately, however, as a business matures, the growth rate naturally decreases. More competition enters, market growth plateaus, and the margins are squeezed. That is why each and every executive eagerly seeks new growth engines to not only improve the dominance of their current company but also unearth breakthroughs for expansion or new revenue streams.

Practitioners always discuss innovation. “How to better innovate” is repeatedly on the agenda in executive meetings. However, there is no clear, agreed-upon methodology for innovation, and to make matters worse, it is not difficult to find conflicting theories. Peter Drucker’s innovation theory ³(1985) or Clayton Christensen’s disruptive innovation ⁴ theory

¹ CNET, Dan Farber, “Our industry respects innovation, not tradition.”

² Automation & Digisat, Anvita Pillai, “Achieving growth & efficiency through innovation.”

³ Drucker’s theory explains what the sources and principles of innovation are.

⁴ Christensen’s theory defines disruptive innovation and explains what dilemmas incumbents face.

(1997) are among the few widely accepted methodologies, but there are few others, especially in the technology industry.

Throughout my more than 15 years in the technology industry⁵, I was always seeking a better way to innovate. I studied the subject by reading both academic and practical papers, reading many CEOs' memoirs, watching executive interviews, working with innovation consultancies, and talking with fellow CEOs in the industry, but I always felt it was not enough. We practitioners always wanted to hear the honest opinions of our peers who had extensive successes and failures in attempts to innovate, but we also understood that they cannot speak that openly to the public media.

Therefore, I decided to conduct research to better understand how innovation occurs in the software industry⁶. This paper proceeds as follows. First, I present a short literature review on innovation management theories and their limitations and introduce Peter Drucker's innovation theory, a theory that will be used as a theoretical lens throughout this study. Next, I discuss the study method and design, which explains why and how I interviewed 23 innovation leaders and conducted qualitative research. In the following section, Peter Drucker's theories will be examined by analyzing interview data with innovation leaders, and new propositions will be developed as new insights are derived from the data. Finally, in the discussion section, I propose a holistic, theoretical innovation framework that refines and extends Drucker's theory. Finally, I discuss the contributions and limitations of this research.

⁵ During 2015-2018, I led Kakao Corp., one of the largest public technology companies best known for its mobile messenger Kakao Talk in South Korea, as CEO. (www.kakaocorp.com)

⁶ This research would not have been possible if I was still in the technology industry as innovation leaders who were interviewed would not have felt comfortable to speak their full minds to a (potential) competitor. In 2018, I stepped down as CEO and joined a Doctor of Business Administration program.

CHAPTER 2

LITERATURE REVIEW

2.1. Innovation and Innovation Management

It is widely acknowledged that innovation is key to business success. By definition, innovation is “a specific tool of entrepreneurs, the means by which they exploit change as an opportunity” (Drucker 1985). West and Farr (1989) defined innovation as “the application of new products, processes, procedures, or ideas that are designed to significantly benefit the individual, the group, the organization, or the wider society.” It is accepted that the ability to innovate enables firms to compete and outperform their competitors (Barney, 1991; Day, 1994). Therefore, it is not a surprise that innovation management has become one of the most actively researched fields during the past few decades (Horn & Brem, 2013).

Numerous researchers have focused on identifying associations between input factors and innovation outcomes. Panne et al. (2003) classified innovation factors into four categories: firm-related, including organizational culture; project-related, including management style and support; product-related, including technology and quality; and market-related, including the concentration of the market. Tidd and Bessant (2009) presented a five-construct innovation model consisting of strategy, organization, process, learning, and networking.

Although this kind of research is helpful, two issues arise when a practitioner tries to apply the knowledge. The first is well expressed by Balachandra and Friar (1997), who stated that the findings from innovation studies are not uniform, and in some cases, even contradictory. Second, practitioners want readily applicable knowledge, but understanding the high-level associations between variables is not enough, especially when some input factors are too broadly

defined. For example, one of the input factors that is widely used in innovation management theories is technology or R&D expenses, which are often expressed as the ratio between expenditures and the number of employees in R&D roles and the percentage of company employees in R&D roles. One of the most commonly used dependent variables, patents, also has its own limitations. Although it is understandable that these are used as proxies, to practitioners who have to manage a company on a daily basis, they are not enough. Practitioners want to know “how” they can innovate and foster innovation in their organizations and need rich explanations and readily applicable methodologies.

There are research studies that specifically looked at innovation in the software and technology industry that confirms generic innovation theories but some of them point out its limitations and demands future research. Edison et al. (2013) claimed that software industry lacks defined innovation process and measurement programs and argued that the importance of having an innovation strategy is not significant in the software industry. Huizingh (2011) argued open innovation is effective and suggested processes and practices to adopt it but also claimed that the area is still in the early stage and needs further study. Open source is another method that is widely used in the software industry for innovation. Ebert (2007) contended that novel business models, intellectual property strategies, and software development paradigms have resulted from the use of free and open-source software.

The software industry is a place where new technologies and innovation methods are adopted quickly and extensively but there is little research that provides a holistic viewpoint. Therefore, I decided to conduct research in the software industry by interviewing innovation leaders to uncover rich insights on innovation management.

2.2. Peter Drucker's Innovation Theory

Peter Drucker is widely respected and acknowledged as a thought leader on management; his innovation and entrepreneurship theory (1985) is extensively cited by researchers.⁷ In his research, Drucker specifically defines innovation as “a tool of entrepreneurs to exploit change as an opportunity to launch a different business or service.” He argues that “innovation results from a conscious, purposeful search for opportunities” and condensed his thoughts on the subject into five principles and seven sources of innovation that explain where innovation comes from and how effective innovation processes should look like.

Table 1: Peter Drucker's Innovation Theory⁸

Principles of Innovation	Sources of Innovation
1. Begin with analysis of the sources of opportunity.	1. The Unexpected
2. Go out and look, ask, and listen.	2. Incongruities
3. Innovation must be simple and focused.	3. Process Needs
4. Innovation must start small.	4. Industry and Market Changes
5. Innovation should aim at leadership.	5. Demographic Changes
	6. Changes in Perception
	7. New Knowledge

Although Drucker's recommendations are still widely used in the real world, nearly 40 years have passed since publication, and the business environment and technology have changed dramatically. Moreover, companies adapt their innovation management to the changing societal and business environment, which is evolutionary in nature (Ortt & Duin, 2008). For instance, Tarafdar and Gordon (2007) argued that the IT competencies improve the innovation process. Additionally, there is a challenge within academia that innovation research should be questioned due to the new technology. Nambisan, Lyytinen et al. (2017) argued that fundamental

⁷ The theory was cited 17,721 times, according to Google Scholar, By Dec 4th, 2021.

⁸ The Discipline of Innovation (1985), Harvard Business Review

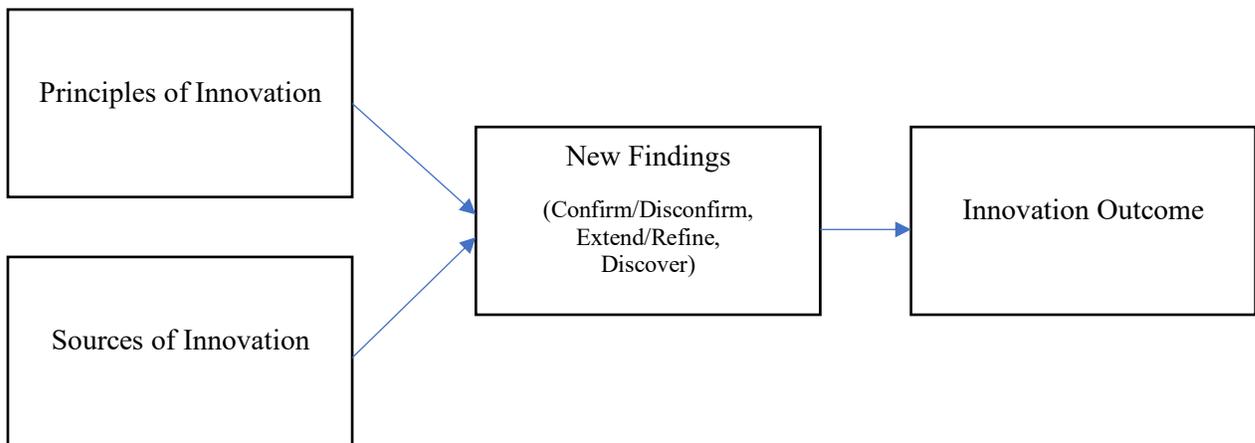
assumptions in innovation research should be challenged due to the rapid and pervasive digitization of innovation processes and outcomes, so revisiting and validating Drucker's work, especially as it pertains to the technology industry, would be meaningful. Therefore, in this study, I conducted qualitative research through a positivist approach by using Drucker's theory as a theoretical lens to confirm existing and develop new innovation theory.

CHAPTER 3
RESEARCH METHODOLOGY

3.1. Research Model

I chose a qualitative research design for this study to achieve the research goals of gaining a deeper understanding (Myers, 2009) of the innovation management process and its theoretical and practical implications through one-on-one interviews with selected innovation leaders. As innovation is the result of complex decisions and activities, it was essential to conduct qualitative research to understand the context of the phenomena and the nuances of the current innovation practices. Additionally, the openness and flexibility of qualitative research allowed me to modify the interview protocol and add more interviewees to elicit richer insight into how innovation occurs in the technology industry.

Figure 1: Research Model



Drucker’s innovation theory acted as a theoretical lens on innovation in this study, and through a positivist approach, I was able to examine and confirm most of Drucker’s theoretical propositions on innovation sources and principles and discover to what extent the theories held

up, especially in the software industry, after nearly 40 years has passed since they were first published.

3.2. Data Collection & Study Design

Table 2: Selected Companies⁹

	Firm Size (Market Cap)	United States	Asia
Mature Companies	Tech Giants (>\$10B)	4	1
Growing Companies	Unicorns (>\$1B)	3	6
	Startups (>\$100M)	5	1
	Startups (<\$100M)	3	N/A
Total (N=23)		15	8

I selected a convenience sample of 23 companies for data collection by organizing interviews along two theoretical dimensions – organizational maturity and economic/cultural region – that are considered critical factors in the innovation literature. Freeman and Engel (2007) argued that innovation process is slower in mature corporations than startups and that innovation methods are not identical. Therefore, I categorized the companies by maturity: Tech giants that are publicly valued at more than \$10B, so-called unicorn companies that are valued at more than \$1B, fast growing startups that achieved meaningful recognition within the industry by getting funded at more than \$100M, and promising startups.

Shane et al. (1995) studied the relationship between country culture and national preferences for innovation methodologies and discovered that the more collectivist a society is,

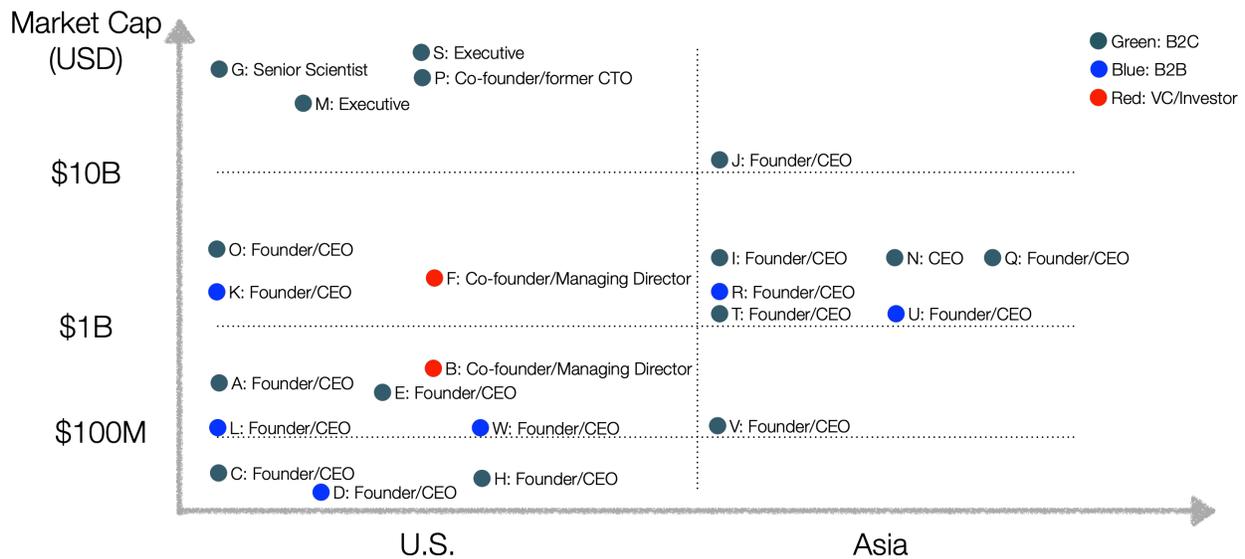
⁹ One innovation leader, mostly founders and CEOs, was interviewed per company.

the more people support for an innovative idea through cross-functional appeals for support. Kassa and Vadi (2010) argued that power distance, uncertainty avoidance, family-related collectivism, and masculinity are all connected to a country's ability to do innovation.

To investigate whether innovation management practices differ by region and culture, innovation leaders from 15 U.S. companies and 8 Asian companies were selected. Firm size was also a consideration; 5 interviewees were chosen from mature companies with a \$10B+ valuation, 9 interviewees were selected from unicorn startups that were valued at \$1B+, and 9 interviewees were from fast-growing startups that achieved meaningful milestones, such as getting funded at \$100M+ valuation. Finally, the industry type (B2B/B2C: Business to Business / Business to Consumer) was also considered as an important contextual factor to determine whether there is a difference depending on the type of customer. Thus, 15 consumer technology companies, 2 venture capitals that invest in B2C companies, and 6 B2B technology companies were selected for this study.

I conducted 23 in-depth, semi-structured interviews lasting from 30 minutes to one hour with leaders in the software industry who had a substantial amount of experience in innovation, both success and failure. All interviewees were senior executives who directly led various innovation projects from scratch; leaders who can provide a holistic viewpoint on innovation management. Out of 23 interviewees, 20 were CEOs and/or founders, and 3 were executives at large technology companies and all of them were accessed by using my personal network.

Figure 2: Selected Companies by Maturity, Region, and Industry Type



I developed an interview protocol before conducting the interviews to be systematic and repeatable in data collection rather than having ad-hoc, open-ended conversations with participants. Having predetermined, semi-structured questions was advantageous, especially as this study employed a positivist approach to validate Drucker’s innovation theories.

All interviews were conducted one-on-one through Zoom, a web conferencing tool, and recorded for review to transcribe the interviews and help capture insights in the interviewees’ own words. Auto-transcription was first done via Zoom’s tool and then I corrected the transcript by listening to the recordings. For some interviewees who didn’t speak English fluently, the interview was done in Korean and later translated into English.

As most of the participants were well known in the technology industry and were sought after by the mainstream media, all were promised anonymity. This also gave them the freedom to fully speak their minds. The audiotape was not made available to anyone else, and participants’ data and other personal identifiers were kept confidential during and after the study. To maintain

the anonymity of the participants, I labeled them alphabetically with some additional description that describes their company or type of business. (Appendix A)

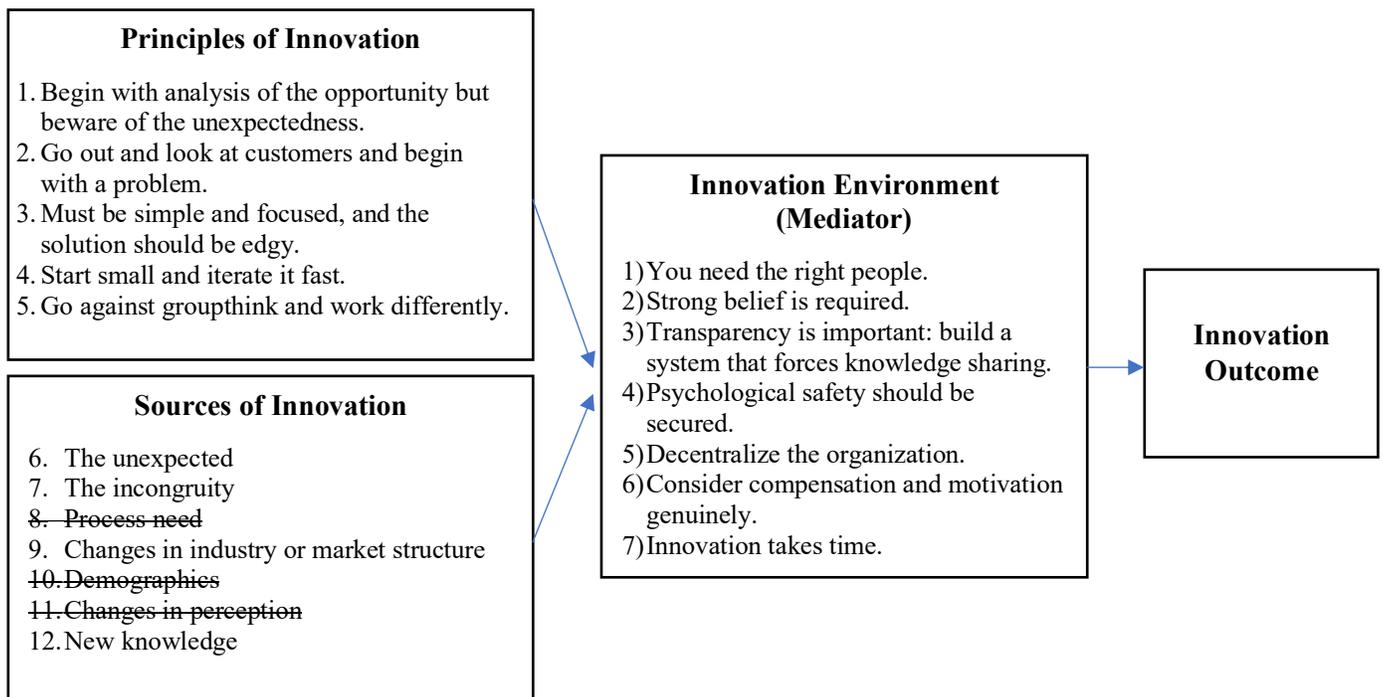
By the end of all interviews, data collection resulted in a total of 467 pages or 100,203 words of transcription. I analyzed the data using the grounded theory, as it helps “developing new concepts and theories of business-related phenomena, where these theories are firmly grounded in qualitative data (Myers, 2009).” During the coding process, I identified the main idea in each sentence or paragraph, and codes were summarized into categories that grouped certain ideas. Then, I coded patterns of similarities and differences with regard to the factors that facilitate innovation and compared them to Drucker’s theoretical propositions. I read and analyzed the transcript many times, updated the coding and translated the codes into a set of theoretical propositions. It was an iterative process.

CHAPTER 4

RESULTS & FINDINGS

By thorough analysis of the interview data, I examined Drucker's innovation theory and was able to confirm most of his theoretical propositions but also found interesting, unanticipated themes that emerged throughout the study. The majority of the interviewees emphasized the importance of the environment for innovation, which was not explicitly discussed in Drucker's theories, and this study concluded that the innovation environment (which will be discussed in section 4.3 in detail) serves as a mediator.

*Figure 3: Refined and Extended Innovation Framework Based on Drucker's Innovation Theory*¹⁰



¹⁰(1) Process need, demographics, and changes in perception could not be validated due to lack of data. (2) Drucker's theoretical proposition 5 was contradicted by innovation leaders. (3) Innovation outcome is regarded as success in an innovation project as this research is studying factors that facilitates and fosters innovation.

Baron and Kenny (1986) defined the “mediator function of a third variable in quantitative analysis when it represents the generative mechanism through which the focal independent variable can influence the dependent variable.” Without a mediator, they stated, a formerly statistically significant relationship between the independent and dependent variables is no longer significant. In this study, interviewees repeatedly expressed the importance of innovation environment, arguing that innovation rarely occurs without it, so I propose that innovation environment acts as a mediator throughout the innovation process.

Figure 3 is the result of this research; I present some newly developed theory comprising a refined and extended innovation framework based on Drucker’s innovation theory that was verified through the collected, qualitative data. In this chapter, I will examine how well the Drucker’s innovation theory holds up in the software industry and will propose seven propositions that theorizes the desirable innovation environment.

4.1. Principles of Innovation

Peter Drucker argued that “innovation results from analysis, system, and hard work” and theorized 5 principles of innovation. In this section, I verify his theoretical propositions.

4.1.1. Theoretical Proposition 1: Innovation begins with the analysis of opportunities.

According to Drucker (1985), innovation begins with considering the sources of innovative opportunities, which should be systematically and thoroughly analyzed. He stated that being alerted to opportunities is insufficient, and that the search should be coordinated and performed on a regular, systematic basis.

The interviewees talked about how their innovation projects began, and the response was divided into three different schools of thought. Some interviewees agreed that thorough analysis is very important, while many others preferred informal planning, such as having a thoughtful debate with others and seizing an innovation opportunity when it arises. Additionally, there were quite a few respondents who argued that innovation is only recognized in hindsight, that it is more desirable to execute a number of experiments rather than having a thorough analysis process.

Interviewee B, who is a cofounder of a company building incubator that manages more than \$400 M, was a strong advocate of thorough planning:

“At a high level, it is very process driven, and there are moments when we’re creating many ideas. Then, there are moments when it’s very restrictive as we take a deeper dive into understanding entrepreneurial wants and what the capital market looks like for a particular opportunity. We try to figure out if we have unique arbitrage around the opportunity because the elements of solving that problem must fit our ability to become great.”

Echoing the importance of market analysis, a serial entrepreneur (Interviewee T) who sold his previous company at \$1B+ said,

“I think there are areas that are more difficult to innovate. For example, think about innovating in the local market where mom-and-pop stores are prevalent. It’s trying to solve a problem that has so many participants with different needs. I think that’s why Groupon wasn’t able to totally succeed. If you look deeply into the business models, there are some differences.”

A founder/CEO (Interviewee K) who grew his company to a B2B unicorn (>\$1B) also stressed the importance of market analysis:

“I believe there are some innovations that are capital intensive and some that are not. In the technology industry, understanding this difference is very important. The ability to raise money can be viewed as a key success factor in certain markets.”

Some interviewees shared their opportunity-finding tactics. A founder/CEO (interviewee L) of an AI company who was a former executive at a \$50B+ technology company confirmed

that he spends much time analyzing each opportunity and emphasized the importance of breaking down and recombining the components of a problem:

“Looking back at the innovation projects I led, I mostly used one of two methods. First, I broke down an existing problem to see whether it could be solved better or differently. Second, I recombined the components of a problem or a solution to see if new value could be extracted. And to gain these perspectives, talking to experts in different fields helped me the most.”

On the other hand, several interviewees were against spending too much time planning an innovation. They contended that most innovations are only acknowledged in hindsight, and that success or failure of an innovation is nearly impossible to know in the planning stage. For example, a founder/CEO who built a B2B unicorn company and has been in the industry for more than a decade (Interviewee U) stated,

“I know many successful CEOs and had several opportunities to invest in their companies. However, almost none of them succeeded with their first business plan; so, I’m not a huge fan of planning and predicting the success of an innovation. You only know it by doing it.”

A founder/CEO (Interviewee J) who grew his company from scratch to a \$10B+ valuation reflected on his experiences and shared his thoughts on why thorough planning might not be the best method to find innovative opportunities:

“I think being too rational isn’t good for innovation. I’ve observed ex-consultants coming up with business plans that were totally analytic and rational, but if you become too rational, you don’t believe you can beat the big incumbent because you lack resources. Then, your opportunity is limited. Most innovative endeavors fail, maybe 8 out of 10. So, I think rather than doing too much market research, you should pick a problem you believe in and do everything to solve that problem. If you work on the problem consistently, a great innovative solution will occur, in my opinion.”

A senior tech researcher (Interviewee G) who leads scientists went even further by stating that it is impossible to plan innovation. In his opinion, the only thing a company can do is provide the right environment:

“I think innovation cannot be planned out because innovation is supposed to go against conventional wisdom. Therefore, most of the so-called scientific breakthroughs are labeled as such in hindsight. What we can do is to create an environment where conventional wisdom can be challenged intellectually, and then hope that some of these challenges will turn out to be an innovation.”

A founder/CEO (Interviewee V) of a fast-growing startup who has nearly 20 years of experience in the consumer technology industry totally agreed that it's impossible to predict innovation:

“Looking back at successful innovations, honestly speaking, at the time, they didn't look like a success or an innovation. Most of them were small but became massive later on. In the beginning, I really can't tell the difference between a successful innovation and an unsuccessful one. If that were the case, there would be people who succeed all the time, but I don't think that's the case.”

Lastly, there were a few interviewees in the middle. They admitted to putting effort into planning but stated that planning was conducted informally, more in an ad hoc manner. For instance, a founder/CEO of a consumer technology company (Interviewee C) stated,

“If you have great people and put them in a room and make them chat with each other, I think a lot of magic happens. We call it having a thoughtful discourse, and that's how we find opportunities.”

An executive at a tech giant (Interviewee M) shared how innovation occurs in his organization, and it was more like an ad hoc activity rather than a formal process:

“We don't really have a process for innovation. Most of the time, we just talk to each other, and sometimes this leads to the initiation of a project. We use an internal messenger where we share tech news, market reports, or anything that is tech related, and it naturally leads to meaningful conversation.”

Based on the interviews, I was able to confirm that Drucker's Theoretical Proposition 1 about the planning process was valid to some extent or for some, but it was also true that many interviewees thought less of a thorough planning process. This could be due to changes in the

technology industry that have made it much easier and cheaper to launch a new project due to cloud computing, the internet, and mobile devices. Therefore, this paper suggests a modification of Theoretical Proposition as follows:

Refined Proposition 1: Innovation begins with the analysis of opportunities, but one should be aware of the unexpectedness of innovation and focus on execution.

4.1.2. Theoretical Proposition 2: Go out and look at the customers, the users, to understand their expectations, their values, and their needs.

Drucker stressed the importance of going out and observing customers. He emphasized that innovation is a process that uses both the right side and the left side of the brain and that only analyzing the data is not enough. Regarding Theoretical Proposition 2, I found universal support from the interviewees, although their support was expressed in various words.

A startup founder (Interviewee D) who builds both hardware and software described the limitation of market reports and the importance of talking to customers.

“To do innovation, I think you need to be very, very hands on. You can’t just rely on market research reports and conclude there is a lot of interest in a certain market. I believe there are a lot of things missing from those reports. That’s why you really have to talk to the customers directly.”

A reputable venture capitalist who co-founded a VC that manages more than \$1 billion (Interviewee F) confessed that he has observed many entrepreneurs who claim they do customer interviews but, in his viewpoint, are not truly conducting them:

“Doing tons of consumer interviews is really important. It seems obvious, but many entrepreneurs do it for the sake of saying that they do it, but at the end of the day, they’re just listening to their gut or a fantasy they had in mind about what the product should be or what the company should look like.”

A startup founder/CEO (Interviewee H) who has experience working at several large technology companies also stressed the importance of focusing on a real customer problem and shared her thoughts about why innovation doesn't succeed often at large corporations.

“I always start with a real customer problem. I talk to my target customer and reach out to dozens of them. I ask them about their problem and dig deeper into why it's a problem. Then, I talk to a few other people, not only customers, to see if that pain is prevalent across multiple fields... At large companies, I haven't seen internal innovation teams succeed because they are kind of detached from a real problem, and they are trying to innovate for innovation's sake.”

Focusing on a customer problem is superior to trying to follow a trend, says a CEO at a multibillion-dollar company (Interviewee N) who has 20+ years of experience in the technology industry:

“I don't think there is a proven recipe for innovation, but I think there are some conditions that lead to a failure. Most of the innovation projects I've experienced that were initiated because of a hot trend without a clear problem to solve, failed. Projects that began with a problem at least didn't fail, even though not all of them became hugely successful.”

One interviewee (Interviewee J), who founded and leads a \$10B+ consumer app company, shared his methodology to make his colleagues focus on customers, as it is important not only in the beginning stage but also while growing and sustaining the business. He set a principle of continuous relaunch of their products to better focus on customers:

“One principle that helped us a lot is to release an updated app every 2 weeks in the Appstore. It can be a big update or it can be a small one, but I made it clear that there has to be an update. This forced us to be more focused on our customers, and of course, this practice greatly improved our product. Moreover, customers appreciated our efforts, and that led to loyalty.”

B2B technology companies were no different. Although the definition of customers is different, the founder/CEO (Interviewee U) of an \$1B+ ad-tech company stressed the importance of putting themselves in their customers' shoes:

“When I made our engineers use the current B2B solutions in the market as our clients do, that was when they had an Aha moment. From that point on, it wasn't just a software development

project they had to work on by following directions from the product manager, but it was a real problem with a real customer, and they came up with a brilliant solution.”

As illustrated above, Drucker’s Theoretical Proposition 2 was completely backed by the innovation leaders. Some interviewees went beyond and stressed the importance of not only talking to customers but also to industry experts, as this provides a reality check, but all of them agreed that innovation should begin by focusing on a customer problem.

Refined Proposition 2: Go out and talk to the customers and begin with a problem.

4.1.3. Theoretical Proposition 3: An innovation must be simple and focused.

Drucker says that innovation should do only one thing, as it is confusing otherwise. He contends that innovation should be aimed toward a specific, clear, intended use, and that it should be focused on a specific need that it can serve, as well as a result that it delivers.

Although some of the interviewees did not mention this proposition, those who did confirmed it to be true. This was well described by a founder/CEO who leads a multibillion-dollar consumer technology company in the U.S. (Interviewee O):

“If you have a big project and a bunch of people working on it, too many ideas get accepted and applied to the product. Then, the product is not edgy anymore. Actually, you have just created a monster that is useless.”

An executive at a large technology company in Asia (Interviewee M) shared his experience that most failed innovation projects did not begin with a clear direction:

“Most of the failed innovation projects didn’t have a clear direction. We just worked on some innovation project that sounded nice, and we didn’t know where to focus... Also, projects that were too visionary failed often as the team couldn’t tell what was important and just added too many product features.”

Most of the interviewees also mentioned that innovation should start small, which is Theoretical Proposition 4 by Peter Drucker. They discussed the importance of keeping it simple, so Proposition 3 and Proposition 4 are discussed simultaneously.

Refined Proposition 3: Innovation must be simple and focused, and the solution should be edgy.

4.1.4. Theoretical Proposition 4: Effective innovations start small.

According to Drucker, effective innovations are not grand, and they aim to accomplish one specific thing. He emphasized that grandiose ideas such as “revolutionizing an industry” are unlikely to succeed, and that innovations should start small, at first with little money and few people, with a restricted, targeted market in mind.

The proposition of starting small was completely supported by all the interviewees, which is not surprising, as the “lean startup” concept (Ries, 2011), which contains this message, is very popular within the software and technology industry.

A CEO of a multibillion-dollar consumer technology company (Interviewee N) in Asia restated this proposition very well:

“I often tell my team that there must be a way to test innovation much faster than we think. I keep telling them to come up with a smaller test... Testing a hypothesis shouldn’t be big.

“We did not even build a website when we tested a market for one of our e-commerce projects. We created one html webpage and linked that to another product. If customers were interested, we sent out an email with detailed information, and customers were able to call us to place an order. It really was a minimal test. Only after checking for a demand, did we enter the market...

“Setting constraints and keeping the project small actually helps innovation, I think. It helps the team act faster and focus on the core. And by focusing on that small problem, the solution becomes very edgy. After gaining initial traction, you’ll have a chance to expand and solve larger problems.”

A founder/CEO who has plenty of experience in various technology companies and VC, Interviewee H, stressed the importance of keeping the project small, as it enables the team to move faster without dependencies.

“I think small teams are better. As I mentioned, the two-pizza team, 10-12 people max, is great, as it removes as many dependencies as possible. Then, you can shift so much more quickly and just have a faster cycle to innovation.”

In the gaming industry, developing a game might take longer than a typical consumer app, but a former CTO of a \$10B+ gaming company (Interviewee P) shared his observation and stressed the importance of starting small and launching fast.

“There is a pattern of failure I see often. A team starts with a big vision and works on it for more than a year. Sometimes 2-3 years? Then, when they are about to launch, the market changes. The team tries to catch up with the new market trend and makes major revisions, but they don’t feel it’s sufficient and update it again without launching. It’s a vicious cycle. You have to launch it fast and then update it through customer feedback.”

A serial entrepreneur and founder/CEO (Interviewee V) of a fast-growing AI company that recently received funding at a \$100 M+ valuation made the same observation.

“I have not seen many successful innovation cases in which the team claimed to stick to a big vision. Most of the successful ones focused on smaller projects that could be validated in 6 months, and if one turned out to be a hugely successful innovation, they kept doing it for 10 years.”

One interviewee (F) who invested in many successful startups agreed that it is more beneficial to keep it simple in the beginning but also pointed out that this is easier said than done as founders do form attachments to their innovation projects.

“Launching quickly and failing fast is actually very hard to do if you are an entrepreneur. Your product is your life, and you are the product. You try to make it perfect before you launch, so it’s actually quite harder than said.”

One founder/CEO (Interviewee O) who leads a multi-billion dollar company in the U.S. shared his unexpected experience of laying off many people, and that during that time, great innovations occurred:

“Ironically, great innovations occurred after we laid off many people. Of course, I am saying this in the hindsight, but now if I think about it, I understand. With limited resources, we were small, we had to focus, and everyone was so eager to make things happen. We had to believe in ourselves, and we were able to concentrate.... That is when I realized how the cost of communication grows exponentially as an organization grows, and now, I try to keep the team as small and as decentralized as possible.”

None of the interviewees were against the idea of starting an innovation project small, while a few of them shared their experiences that it would be harder than expected, as it goes against human nature. With all the data collected through interviews, I confirm that Theoretical Proposition 4 is upheld as an important principle of innovation.

Refined Proposition 4: Innovation should start small, and fast iteration is required.

4.1.5. Theoretical Proposition 5: Innovation should aim at leadership.

According to Drucker, if an innovation does not strive for market leadership from the start, it is unlikely to be innovative enough and, as a result, unlikely to succeed. He admits that no one can predict whether a certain innovation will end up as a big business or a modest achievement but believes a mere attempt at innovation will just provide an opportunity for the competition if it is not aimed at the leadership position.

A few interviewees stated that innovation should be visionary from the beginning. For example, a founder/CEO of a consumer technology company (Interviewee C) compared innovation in the technology industry to that of the film industry.

“I believe innovation needs a strong product vision. It’s kind of like having a film director, and I think without that vision, it’s very difficult to get products that are great or products that are not copycats.”

Another founder/CEO of a consumer app that has millions of users (Interviewee E) echoed the sentiment:

“Figuring out what comes next before anyone else and doing it is important, and you should never copy competitors because you’re just creating a copycat culture if you do so. You create a culture where all people do is study what the competitor is doing ahead of you. So, that means you’re already behind. You should try to become the first in the world to come up with something.”

One interviewee who was an executive at a big tech company in Asia and now has his own startup (Interviewee L) shared an interesting observation about leading several projects at a large company and aiming big.

“When we set the goal reasonably, for example like catching up with a global technology company, the projects were not that successful. Ironically and interestingly, when we set the goal very high, such as being the best in the world in a specific area, and if everyone believed in the goal and worked hard, we sometimes succeeded. We didn’t succeed every time, but there were many people saying it’s impossible in the beginning.”

On the other hand, there were many interviewees who argued that innovation is very difficult to predict and that aiming high and having a big vision might do more harm than good in contrast to Proposition 3 and Proposition 4. The majority of the interviewees who opposed Proposition 1 also disagreed with Proposition 5, saying that small and fast executions are the key to innovation. One representative quote from a global tech giant executive (Interviewee S) explains this well:

“Success factors of innovation are explained in hindsight. When working on an innovation project, I’m pretty sure people didn’t know how their daily decisions would lead to a grand success. And that’s why we don’t see a company continuously succeeding in innovation. That’s why I don’t believe in planning big innovation.”

Out of Drucker's five principles of innovation, Proposition 5 was the one that garnered the least support from the interviewees. Many of them emphasized that solving a specific pain point and then expanding on it works better. Considering that all interviewees were in the software industry, whether B2C or B2B, it is understandable that Drucker's proposition does not hold up well because most software products are upgraded continuously via the cloud, so the need to aim at leading the pack in a specific innovation from the beginning diminishes.

Instead, a number of interviewees claimed that one of the key principles of innovation is that success is usually generated from a contrarian viewpoint. Coworkers look at a problem from different perspectives, work on a project that many found disagreeable and try to make sure they are not following groupthink. For instance, one founder/CEO (Interviewee V) claimed that the most successful innovations were those that received 7 or so NOs out of 10 votes. Therefore, this paper proposes a new principle of innovation.

Revised Proposition 5: Go against groupthink and work differently.

4.2. Sources of Innovation

Drucker's theory argues that "innovation is the result of a conscious, purposeful search for innovation opportunities" and that systematic innovation means monitoring seven sources of innovative opportunity: four sources that exist within a company or industry (unexpected, incongruity, process need, industry/market structure) and three sources that exist outside a company (demographics, changes in perception, new knowledge).

During the interview, to examine Drucker's theory, I asked how these thought leaders found innovation opportunities and asked whether there were specific areas they looked into.

Not surprisingly, certain sources of innovation (process need, demographics, changes in perception) were not mentioned at all, and others were less discussed compared to the principles of innovation. Many interviewees believed the best way to innovate is to begin with a problem and discuss it with customers, industry experts and people outside of the industry. Most interviewees did not have a playbook of innovation sources and did not think finding an opportunity was particularly difficult. They kept mentioning the importance of execution and the right environment for innovation.

To make sure, I reread the transcript several times to see if some quotes implied sources of innovation. Further, I slightly changed the interview questions to see if that might elicit answers related to sources of innovation and added more interviewees but obtained little additional results.

Another potential explanation for this result could be due to the specific study of software technology companies. As it became easier and cheaper to launch new innovations, innovation leaders emphasized the importance of execution rather than analyzing and monitoring the sources of innovation. The value of this position is evidenced by the continuous evolution of

digital products long after an innovation has been launched (Hanseth and Lyytinen 2010; Lyytinen et al. 2016).

4.2.1. Theoretical Proposition 6: The Unexpected

According to Drucker, unexpected success (serendipity) provides richer opportunities for successful innovation than any other sources. However, he argued that as it is difficult for management to embrace unexpected success, most organizations deny, neglect, and even resent them.

Almost every interviewee who expressed the limitations of planning innovation (that was covered in section 4.1.1.) understood the importance of unexpected success and tried to increase their chances for a successful innovation by talking to outsiders, including Interviewees H, a startup founder/CEO and I, a founder of a multi-billion dollar company.

“It’s easy to head to a solution. However, if you have someone, especially an outsider who’s looking at the user research with a completely blank state, he or she might be able to come up with some things you didn’t really think about.” (H)

“I think having outsiders can help innovation because those who were already dealing with the project know too much and might be preoccupied with knowledge that hinders innovation.” (I)

The founder/CEO of a \$10B+ company (Interviewee J) shared how he began an innovation project that ended up becoming a mega success and stated that it was from an unexpected event.

“One day I was chatting with my friends who are not even in the technology industry and heard about a startup that got a lot of funding. I dug into the space and realized that this was a trend not a single event. After understanding that our company’s core strength was well aligned with the success factors in that market, I jumped on the opportunity.”

As seen above, Drucker’s Proposition 6 is recognized as an important source of innovation by interviewees, so this study confirms its validity.

4.2.2. Theoretical Proposition 7: Incongruities

An incongruity “is a discrepancy, a dissonance, between what is and what ought to be”, according to Drucker. It is a sign of change, whether it has already occurred or not, and a source of innovation. Insiders often miss it, taking it granted by claiming, “This is how it’s always been.”

One successful founder/CEO of a consumer app that has millions of users (Interviewee E) stated that great entrepreneurs can predict what comes next as it will be part of a logical sequence of events.

“The world is always in a position for what comes next. There is a logical sequence as to how the world evolves. I think the key in order to have a successful innovation is to determine the obvious next world change based on all the available technologies, political situations, and consumer trends. I think it is possible to do it. It’s like the Wayne Gretzky quote, that one should skate where the puck is heading, not to the puck. And, I think good entrepreneurs have an unquestionable track record in anticipating the next logical sequence.”

A VC who invested in many successful startups (Interviewee F) also emphasized that entrepreneurs should try to find something that has to be true that is not true today.

“One question that is helpful is, ‘what do you think should be true about the world that isn’t true today?’ Look at where the biggest suffering is in the world or look at where a company has fat profits or where government is overspending. Therefore, they’re like fundamental things that are broken in the United States.”

One serial entrepreneur who founded and led a multibillion-dollar consumer technology startup (Interviewee I) shared his belief that the world always has been and will become increasingly aggregated. To him, this was an incongruity throughout history.

“I believe in aggregation, and I believe in the power of platforms. If you think about it, almost everything gets aggregated. Every country becomes urbanized as cities grow, the internet search engine can be viewed as an aggregator, and many mobile businesses succeed by becoming a platform, and I think this will continue in the future.”

This discussion confirms the validity of Proposition 7.

4.2.3. Theoretical Proposition 8: Process Need

According to Drucker's proposition, process needs are a source of innovation that starts out with the job to be done. It is task-focused rather than situation-focused, and it improves an existing process, replaces a link that is weak, and redesigns an old process to take use of newly available knowledge. It can sometimes make a process possible by providing the missing link.

An example of a process-driven need, described by Drucker, was the Bell Telephone System prediction that human switchboard operators would not be capable of keeping up with the demand; therefore, Bell designed an automated switchboard. Another example cited by Drucker was Kodak's need to replace heavy glass plates with a cellulose film to design a lightweight camera.

Considering the fact that all interviewees were from software technology companies, not manufacturing companies, it is not unnatural that process needs did not emerge during the interview, so in this study, I was unable to validate Theoretical Proposition 8.

4.2.4. Theoretical Proposition 9: Industry and Market Structures

"A change in industry structure offers exceptional innovation opportunities that are highly visible and quite predictable to outsiders," according to Drucker. However, he argued that conventional industry leaders often overlook the fastest growing market segment, allowing outsiders who innovate to become a key player in an important industry quite fast and at relatively low risk.

A cofounder of a company builder (Interviewee B) that starts a new company every year stated that looking into market change and dynamics is very important in picking which business to enter.

“We do a lot of due diligence around both product and commercial research. That has to do with what actually exists now and what the market and the value chain is, and what unit economics and competition are like now and what they will look like going forward in that market.”

Interviewee J, who founded a \$10B+ consumer technology company, shared that he often looks into where VCs are massively investing, as there is a higher chance that the targeted market will be disrupted and provide new opportunities.

“I realized that VCs were investing massively in a certain market, and I could see the market growing fast. When I dug into the market, I became confident that this change was still in the early stages and that I had a chance to enter the business.”

Additionally, there were several innovation leaders who said they followed market trends to see if there was an opportunity for their businesses, which can be interpreted as viewing market and industry change as a source of innovation. Based on the aforementioned discussion, this study confirms that Drucker’s Proposition 9 is supported.

4.2.5. Theoretical Proposition 10: Demographics

Drucker said that “changes—in the number of people, their age distribution, education, occupations, and geographic locations—are among the most rewarding and least risky innovation opportunities.” One example he shared was the advancement of Japanese robotics, stating that it was obvious that the number of workers available for typical blue-collar manufacturing jobs would be reduced. Because of their awareness of the anticipated problem, the Japanese were able to capture an opportunity and move ahead in the manufacturing field.

However, this concept was not discussed during the interviews I conducted with innovation leaders. One potential explanation is that they were less interested in demographics, as they are in software business that can serve everyone who wants their products through cloud computing unlike physical products that have to target certain demographics. Another plausible

explanation is that they dealt with demographics unconsciously, as most of them were in their 30s and 40s and solving a problem that deeply mattered to them. Thus, Theoretical Proposition 10 was not validated in this study due to lack of data.

4.2.6. Theoretical Proposition 11: Changes in Perception

“Changing one’s perception of a half-full to a half-empty glass opens up big innovation opportunities” according to Drucker. One example he cites is how Americans seem to emphasize a need for longevity. This point of view has created great opportunities for innovation: health care magazines, exercise classes, exercise equipment, and all kinds of health foods. Another case he shares is how people changed their perception of computers. It took less than two years for the computer, which was once viewed as a threat and something only large corporations would use, to become something ordinary people buy.

In this study, no data pointed to changes in perception as a source of innovation; therefore, I was unable to validate Theoretical Proposition 11.

4.2.7. Theoretical Proposition 12: New Knowledge

According to Drucker, “all other innovations exploit a change that has already occurred while knowledge-based innovations bring the change.” He explained that many history-making innovations were based on new knowledge, which is why it is the superstar of entrepreneurship. He also noted that knowledge-based innovation, like most superstars, is temperamental, capricious, and hard to manage.

Drucker also stated that knowledge-based innovation has the longest lead time of all innovation, claiming that it takes 25-35 years for knowledge to become an applied technology

and begin to be accepted in the marketplace. As an example, he said that computers took decades to be developed even though all the necessary knowledge was available. All of the necessary knowledge, he claims, was available by 1918, but the first functioning digital computer did not appear until 1946.

As described above, Drucker primarily discussed innovation stemming from new knowledge in Theoretical Proposition 12. However, in this study, none of the interviewees were trying to build new knowledge or technology, although many of them stated that new knowledge or technology was a “tool” rather than an objective. A serial entrepreneur (Interviewee T) put it this way:

“I think technology is important in the sense that it enables a company to iterate fast based on customer feedback. The speed is actually a big asset and that decides the quality of the product.”

Another founder/CEO (Interviewee H), who has plenty of product development experience, thought that technology should be perceived as a tool:

“I look into technology only after I define a clear problem to solve. I’ve seen many fancy, shiny, cool products that don’t necessarily solve a customer problem. For example, if you believe AR is so cool and try to build something and put AR in it, I don’t think that’s the right way to innovate.”

On the other hand, several innovation leaders mentioned that there might be a downside to emphasizing technology, that it might even do more harm than good:

“Although I’m an engineer, I don’t think technology is the most important factor. Actually, I see a lot of cases when technology is over applied everywhere. As the saying goes, if you only have a hammer, everything will look like a nail.” (Interviewee N, CEO of multi-billion dollar company)

“I see engineers focusing too much on technology, trying to force-fit the tech to the problem. They have spent a lot of time building the technology, so it’s difficult for them to abandon it. They are too invested. And, sometimes it leads to a reality distortion field that pushes the technology approach even further and fails.” (Interviewee R, Founder/CEO of an AI unicorn)

Although there were just a few interviewees who perceived new knowledge or technology the way Drucker did, many of them admitted that technology is a great tool to devise a better solution to a problem so Theoretical Proposition 12 is validated to some extent, but it was also true that many innovation leaders stressed that technology should not be over-emphasized.

4.3. Innovation Environment

The principal contribution of this study is not simply confirming (to a large extent) Peter Drucker’s innovation theory but also discovering new findings related to innovation management. An unanticipated theme emerged during the interviews. Innovation leaders not only discussed the importance of sources and methodology of innovation but also spent much of their time explaining that a right environment is necessary to foster innovation. Therefore, I propose, based on qualitative data analysis, that innovation environment” acts as a mediator, as it enables better execution of principles of innovation and better leverages the sources of innovation that Drucker theorized. Through Qualitative Data Analysis, I abstracted and organized interview data into seven, high-level environmental factors that foster innovation.

Table: Innovation Environment Propositions

Innovation Environment
1. You need the right people.
2. Strong belief is required.
3. Transparency is important: Build a system that forces knowledge sharing.
4. Psychological safety should be secured.
5. Decentralize the organization.
6. Consider compensation and motivation genuinely.
7. Innovation takes time.

4.3.1. Proposition 1: You need the right people. There are people more suited for innovation.

While Drucker theorized innovation methodology and sources, he did not discuss much the people who are behind innovation. However, throughout the interview, I noticed that the majority of innovation leaders believed that there were people better suited for innovation than others and that having them on the team was crucial to success.

There is plenty of research regarding the importance of having the right people in innovation, as Gupta and Singhal (1993) contended in their paper that it is a top priority, but most discussion was about having the right skill mix among team members. Brem (2011) also stressed that choosing the right people is probably the most important step in innovation.

Innovation leaders differed in the way they expressed their thoughts. They did not focus on the attributes of an innovative person or the skillsets that are needed, but one theme that constantly came up during the interviews is that working on an innovation is quite different from working at a large company and that there are certain people who would be better off working for a large organization.

“Most of the people working at a big tech company are there because it’s a good, stable job that provides career development opportunities. In other words, they are not there to commit to one crazy idea.” (Interviewee S, executive at a tech giant, former entrepreneur)

“Professional CEOs or executives are different from founders and entrepreneurs. They are smart people, but it’s difficult for them to take risks, and they are not trained to take risks. That’s how they moved up the corporate ladder with different skill sets. Personally, I think there has to be a crazy founder or entrepreneur and followers to make innovation happen.” (Interviewee U, founder/CEO of an ad tech company valued over \$1B)

“I think there are people who fit well within large corporations and people who are suited for startups, and that’s why we observe so many serial entrepreneurs. Those who have experienced a success with a small team keep doing it.” (Interviewee K, founder/CEO of a U.S. unicorn startup)

Some innovation leaders stressed the importance of having the right team from the beginning, as it is very difficult to change people.

“People usually don’t change, especially adults. Trying to change your employee because you pay them doesn’t work. So, you have to pick the right people who are willing to go through the innovation process. Maybe this is the most important factor: having the right team. Some people prefer a stable environment, and they are not good at innovation.” (Interviewee Q, founder of a multibillion-dollar consumer technology company)

“I really think you have to have the right people on the bus from the beginning. If not, you might be able to succeed, but it will probably take much more time and energy.” (Founder/CEO of a U.S. consumer tech startup acquired at a value of \$500 M)

Interviewees described the key characteristics of people who excel in innovation, rather than pointing out desired skillsets. Many of them also said that ideas are cheap and that execution is much more important; finding individuals who are execution-oriented is thus a priority.

“In many organizations, the person who sounds the smartest often wins the argument, but the best ones are those who push crazy ideas and execute them.” (Interviewee B, Co-founder of a company builder that manages approximately \$400 M)

“Not everyone has it. There are some people who actively detract from the ability to get things done by over complicating things, and there are people who simplify things and just push the ball forward and get things done. The more bias toward action people, the better.” (Interviewee H, founder/CEO of a U.S. startup, former VC partner)

“Most people just don’t care about a problem. Let’s say there are 100 people who think sending money is inconvenient. Ninety-nine of them would just think about the inconvenience and do nothing. However, there is one person who can’t stand this problem and has to solve it. Those are the people who lead innovation.” (Interviewee N, CEO of a multibillion-dollar consumer tech company)

While the majority of interviewees argued execution is the key to innovation, some innovation leaders admitted that intelligence is also an important factor.

“Innovation often doesn’t come out of 1,000 people but from less than 20 brilliant people working together. So, you should hire top talent from diverse disciplines.” (Interviewee G, former senior researcher at a global tech company)

“People who are great at innovation usually fall into two categories. First, those who have really high intellectual curiosity. They are smart; they always challenge the norm and question the fundamentals. Second, those who are extremely ambitious and want to make things happen no matter what.” (Interviewee T, serial entrepreneur, previous startup acquired at \$1B+)

Finally, one innovation leader (Interviewee U) stated that it’s important to hire people who are committed, that there are many people who will jump ship when a startup faces difficulty, which it will. Another entrepreneur (Interviewee T) stressed the importance of the

CEO as the one who will limit potential growth. As these insights were expressed only once, they were not categorized as themes but relevant to choosing the right people.

4.3.2. Proposition 2: An effective innovation requires strong belief within the organization.

Innovation leaders often said the key difference between a successful or failed innovation was whether the team, especially the leader, truly believed in the project. Some of them even contended that the innovative process can be compared to religion.

In academia, the importance of leadership or commitment of managers is well researched. Jung et al. (2003) claimed that leadership is one of the most critical variables impacting organizational innovation, and Zibarras et al. (2008) argued that innovation potential may be viewed as a positive outcome of innovators' dysfunctional traits, particularly those covered by the factor 'moving against people.' Warrick (2011) stressed the importance of a leader's role in making the direction as clear as possible, demonstrating commitment, and empowering employees to do what needs to be done. However, when innovation leaders commented on their beliefs, their remarks were more nuanced than the way in which leadership or commitment is discussed in academia. They were more akin to faith.

“Maybe the biggest difference between success and failure is the founder's belief and perseverance. It takes a lot of time to make something extraordinary and to keep going. Belief is necessary, as others will keep saying it will fail.” (Interviewee I, founder/CEO of a multibillion-dollar consumer tech startup)

“Innovation is a lonely journey. If you think about it, when you are working on something that everyone agrees on, by definition, it's not innovation. You are working on something you believe in, but others don't, it's tough. It will take at least a few years for them to understand you, and that's why believing in yourself is important.” (Interviewee R, founder/chair of an AI unicorn)

“Successful entrepreneurs are crazily committed to their work, and to enable that work, I’ve seen many of them brainwashing themselves to believe in the opportunity.” (Interviewee S, executive at a global tech company, former entrepreneur)

“It’s more about the belief system that is fundamentally different. What do you think should be true about the world that isn’t true today? I think there are many entrepreneurs who shouldn’t be entrepreneurs as they don’t have something they want to fundamentally change. To be successful, you should have a very differentiated belief system.” (Interviewee F, Co-founder of a U.S. VC managing \$1B+)

“I think it’s critical that people feel it’s their mission and that they’re in for the mission. They believe they can really contribute to the world.” (Interviewee H, founder/CEO of a U.S. startup, former VC partner)

“Having a strong will and belief is the most important thing when it comes to innovation. If you have that, maybe you are already at 50%. Isn’t the belief nearly everything? (Interviewee M, executive at a tech giant)

“There should be a leader who is totally committed, who pushes the innovation to the extreme, who can work like crazy.” (Interviewee V, founder/CEO of a fast-growing AI startup)

For other intriguing insights related to beliefs, interviewee U, who founded a B2B unicorn company, said that one of the key abilities a founder/entrepreneur should have is the ability to make others believe in them. He argued maybe the most important job of a founder is to instill that belief in colleagues, and again, he did not mean in terms of commitment. He also claimed that smart experts do not do crazy things that are required in innovation, as they know the space too well, and that can be a drawback.

4.3.3. Proposition 3: Transparency is important. Building a system that forces knowledge sharing within your organization helps.

Most of the interviewees said that the best way to find innovation opportunities is to let their smartest people exchange thoughts, especially with people they do not often interact with

on a daily basis; this is echoed by Lundvall and Nielsen (2007) who contend that knowledge sharing within groups or organizations generates ideas for new business opportunities and facilitates innovation activities. Sher and Lee (2004) pointed out that sharing knowledge among employees leads to faster responses to customer requirements, and Carbonell & Escudero (2010) empirically confirmed that there is a positive association between speed-to-market and overall new product success.

However, several innovation leaders stated that acknowledging the importance of knowledge sharing is not enough and that creating a system that forces their employees to share their work is increasingly important as organizations grow and siloing occurs. I decided that this practice should not be categorized as knowledge sharing but as having a transparent system.

“I think the key is to create a system where work becomes transparent without necessarily communicating this out loud, making sure people share what they do without trying to do so. Creating a smooth workflow that increases transparency and enforcing it is important because most teams silo within their organizations.” (Interviewee A, founder/CEO of a \$500M startup)

“Transparency and nonhierarchical culture are essential to innovation. We made sharing mandatory. If your organization is working with a shared vision, trust can be built, and respectful debate can occur by creating transparency.” (Interviewee I, founder/CEO of a multibillion-dollar technology startup)

“We use an internal messenger where we share tech news, market reports, or anything that is tech related, and it naturally leads to meaningful conversation. Additionally, as organizational silos naturally occur, we intentionally set up workshops at least every quarter and make every team present their work.” (Interviewee M, executive at a tech giant)

“Everyone claims they are open to feedback but let’s be honest, who likes it? It’s against human nature, and that’s why it’s difficult to have a culture of transparency, but of course, it is a crucial part of innovation, so you should work on that.” (Interviewee O, founder/CEO of a multibillion-dollar tech startup)

4.3.4. Proposition 4: Psychological safety should be secured.

Psychological safety has become a major theme in academia, and it is widely accepted among practitioners. One of the key studies in the field was led by Edmondson (1999), who argued that a psychologically safe work environment will make employees feel that it is safe to experiment and take risks. “Psychological safety is significantly associated with feelings of vitality which, in turn, result in involvement in creative work (Karl & Carmeli 2008).” After studying it for years, Google’s People Analytics Unit (2015) concluded that psychological safety was recognized as the most significant factor contributing to the success of high-performing teams. Although the innovation leaders did not use the exact term “psychological safety,” their meaning was clear:

“I think innovation happens by creating a culture of innovation. One of the values needs to be something along the lines of courage because to innovate, you have to express ideas that some people may find stupid or outrageous. The bolder the idea is, the more potential impact it has, and the more you can get instantaneous negative backlash. So, setting the example should start at the top. If the CEO is willing to express a really big bold crazy stupid idea, he or she is creating a culture where employees do not feel like they have to be prepared all the time. Otherwise, you’ll have a culture of fear.” (Interviewee E, founder/CEO of a consumer tech startup)

“One great CEO I know rewards his senior managers for pushing and challenging him. That has created a culture that shows there are no mistakes you shouldn’t make.” (Interviewee B, co-founder of a company builder)

“I can’t say innovation is guaranteed to happen, but it can happen in an environment where individuals at least feel safe to challenge the existing knowledge as well as common sense. So, you should create an environment where conventional wisdom can be challenged intellectually. Then, you hope some of these challenges become innovations.” (Interviewee G, former senior researcher at a global tech company)

“At a non-innovative big company, I’ve observed that new ideas were shot down a lot. Eventually, people were discouraged about voicing their ideas because they knew that follow-up would never happen. Managers usually said, ‘We’ve tried that before.’” (Interviewee H, founder/CEO of a startup, former VC partner)

One leader (Interviewee S) who has 20+ years of innovation experience shared the observation that even while working at a global tech giant, psychological safety could be secured even at the individual level. He said some very talented engineers were able to innovate because they believed that the company would not fire them.

“To make an organization more innovative, a safety net is important. People need to feel okay to work on things they believe in as opposed to only doing what they are told. I’ve observed some great innovative projects coming from top-tier engineers, and interestingly, they didn’t listen to their supervisors. They didn’t care about performance evaluations because it was clear to everyone that they are top engineers who can go to any company they want. So, that’s a different kind of safety net, in a sense.”

Finally, a founder/CEO of a fast-growing technology company (Interviewee V) said that most innovation is controversial, and for that reason, it is important to create an environment where people feel safe.

“Innovation should not be driven by consensus, and most successful innovations are often controversial. Therefore, it is important to create an environment where people can disagree, and it’s important to have a system that allows a project to proceed even if the majority of executives think it will fail.”

4.3.5. Proposition 5: Decentralize the organization.

As discussed in section 4.1.4, the majority of innovation leaders believe it is more beneficial to start small when innovating, and many of them argue that keeping the organization small or decentralized is an effective way to innovate. This supposition was confirmed by Zammuto and O’Connor (1992), who argued that decentralized decision-making procedures and enhanced communication improves an organization’s capacity to quickly respond to change. Foss and Lyngsie (2014) also empirically confirmed a positive relationship between decentralization and opportunity realization. Some of the innovation leaders, however, went even

further to claim that innovation is impossible at large corporations and that having a decentralized structure is a must.

“I know I might be too adamant, but I don’t think innovation is possible in large organizations. If that were the case, most innovations would come from the biggest global tech companies, but in reality, that’s not the case. If you look closely, many of the successful innovations at big tech companies were bought in from the outside.” (Interviewee S, executive at a global tech giant)

“If a large corporation asked me how to innovate, I would tell them to cut their R&D budget by 50% and invest it all into the acquisition of startups that actually know how to innovate and serve your end customers.” (Interviewee F, co-founder of a top-tier VC)

Many other interviewees agreed that keeping a decentralized organization fosters innovation.

“There are great technology companies that have really decentralized cultures where they have these small teams that are able to move quickly without dependencies. They have good infrastructure and tools to make sure that you can work separately, and all the technologies are interoperable... When I worked at an innovative tech company, leaders were so good at empowering their employees. Anyone could come up with an idea, and anyone should be empowered to implement that idea. The company leadership really believed in everyone and gave a lot of ownership and responsibility.” (Interviewee H, founder/CEO of a startup, former VC partner)

As a method of decentralization, several leaders believed in spinning off or totally separating the innovation team as a good solution and shared their stories:

“There was a project within a large business unit that wasn’t performing as well as I expected. After much discussion, I decided to spin off the project into a separate team, and pretty soon it became very successful. After that experience, I made sure that all project teams could operate by themselves with no dependencies and that they knew they would be well compensated for successful projects. I’m even spinning off business units into subsidiary companies.” (Interviewee J, founder/CEO of a \$10B+ consumer tech company)

“If you demand innovation on a team that has an operational business with a numerical target to meet, they would be reluctant. They don’t have much time to spare on innovation. They have day-to-day business needs to meet. So, I believe one should separate a team that focuses on innovation from an operations team.” (Interviewee R, founder/chair of a unicorn company)

“When new innovation projects begin at large corporations, the big teams from the main business often claim they can create a greater impact if the resources are invested in their team. That’s a typical hindrance I’ve observed. So, separating the innovation team from the main business is important.” (Interviewee K, founder/CEO of a multi-billion-dollar tech startup)

In a slightly different wording regarding decentralization, one founder/CEO of a multibillion-dollar tech startup (Interviewee O) said that he makes sure there isn’t a rock-star culture in his company as that can concentrate innovation efforts and not decentralize them.

“We don’t promote a rock-star culture. Once you have those superstars, the power gets concentrated, and other employees just rely on those few. And, ironically, those rock stars feel the pressure, and there is a high chance that they won’t perform as good as they once did.”

4.3.6. Proposition 6: Consider compensation and motivation genuinely.

Usually, innovation leaders do not often talk about money or compensation, at least in public. Many of them argue that money is not an important driver in pursuing an entrepreneurial innovation, and there is also a substantial body of research that echoes that argument. There are many studies that find that pay for performance undermines creative work (Kohn, 1993; Amabile 1996) and should not be used to motivate people. However, research done by Ederer and Manso (2013) contradicts this and contends that well-designed compensation is effective in enabling entrepreneurship and motivating innovation.

As conflicting theories exist in academia, innovation leaders also have different thoughts on compensation. A very successful innovation leader who founded a \$10B+ consumer technology company (Interviewee J) bluntly stated that compensation matters and that employees view compensation differently if the amount is considerable.

“I believe compensation is important. If you show the whole company that key members from a successful project are being showered with huge bonuses that would make them financially independent, that sends a clear signal to the others... There was a big technology company I worked for a long time ago, and interestingly, many of my colleagues became successful

entrepreneurs. Back then, we talked about how little our lives would change even if we succeeded in a huge innovation project there, and all of us quit.”

Another interviewee who has 20+ years in the technology industry (Interviewee S) also stressed that compensation is important while mentioning that to some entrepreneurs, power or influence can also be drivers. He contended that those who succeeded big had a very strong desire to do so.

“I’ve observed that most successful innovations are driven by leaders with a very strong desire for something. Many of them wanted money. Some were more into power. Some were more interested in being influential. It is an extraordinary force that won’t be found in a large corporate setting. Innovation occurs when you are crazily committed.”

Of course, there were several interviewees who argued that mission, not money, should be the biggest motivator and that there are various ways to motivate colleagues. For example, a founder/CEO who has a great deal of product innovation experience stated:

“Presenting something at an all-hands meetings can be a big deal. Another big deal is for a consumer-facing company to build something, ship it, and then to see it in the hands of customers and see that it actually solved some problem, I think the greatest motivation is that we solved this problem for these people, and their lives are better off.”

4.3.7. Proposition 7: Innovation takes time.

Whether a company understands the fact that innovation takes time was an idea that emerged several times during the interviews. Many innovation leaders complained that people think innovation can magically take place because they don’t understand the hard work and perseverance behind the great outcome. They reassured that innovation does not occur overnight, and that willingness to wait and patience is needed.

“People often think innovation is something like genius, but we get there by understanding the micro steps and the sequencing and working harder than others.” (Interviewee B, co-founder of a company builder)

“Creating an innovative product is only a part of success. Sustaining innovation, continuing to develop and satisfy customers is a whole different thing.” (Interviewee P, former CTO of a \$10B+ consumer tech company)

“It will take at least a few years for others to understand what you are doing, so you have to understand it is a tough, lonely journey.” (Interviewee R, founder/chair of an AI unicorn)

“Innovation in B2B tech usually takes more time than B2C. It needs to change companies in the ecosystem, and it takes time, years most likely.” (Interviewee U, founder/CEO of an Ad tech unicorn)

One interviewee shared his thoughts about friends who founded startups around the time he founded his and said that he believed they could have been quite successful if they had stuck with it a little longer.

“When I left a global big tech company, four of my friends also left, and we began our startups. All of them received some VC investments but were acquired in the early stages. It’s their personal choice, and they became comfortable, so good for them, but I believe their companies could have been like ours if they have done it for a few more years.” (Interviewee K, a B2B unicorn company in the U.S.)

CHAPTER 5

DISCUSSION

5.1. Conclusion and Contribution

As Drucker's seminal innovation theory is still greatly respected in the academic literature and well known among business practitioners, even today, the first contribution of this study is that I was able to largely confirm the main theses of Drucker's original theory from 1985 with newly collected qualitative data from the software industry. Not only are these theories old, but the business and technology environment has changed tremendously since they were first published. Thus, verifying whether these theories remain valid is important. Additionally, as Nambisan, Lyytinen et al. (2017) argued that fundamental assumptions in innovation research should be challenged due to the rapid and prevalent digitization of innovation processes and outcomes, this study can be viewed as a response to their challenge. For academics or practitioners referencing Drucker's work, this research can act as a complementary study.

Second, this study collected data from top innovation leaders who rarely participate in academic research. All of them are highly successful and reputable in the technology industry. Twenty out of 23 interviewees were founders or CEOs, and 14 of them were leading companies valued at more than \$1 billion, a so-called unicorn company. Additionally, when these leaders speak to the traditional media, it is very difficult and unlikely for them to speak freely. Thus, this study was able to take advantage of the unique opportunity to access founders and C-level managers and obtain their experiences and insights regarding innovation practices and processes in the tech industry.

Third, this study not only validates Drucker's (1985) innovation theory to a large extent but also refines and expands it into a more comprehensive innovation framework that contributes

to innovation theory which can also be used as guidance for innovation in business practice. Innovation methodologies/principles and sources of innovation are not sufficient for successful innovation. The right environment is essential, and this study confirms that the environment acts as a mediator. Additionally, although the field of innovation management has benefited from the proliferation of relevant research, many researchers have studied only the association between variables. I argue that there is little research that is cohesive and provides a holistic viewpoint. In this study, I proposed a conceptual framework (Figure 3) that will assist future innovation management research.

5.2. Limitations

Throughout the research, I was not able to find evidence in support of 3 Theoretical Propositions due to lack of data (sources of innovation: process need, demographics, change in perception). As discussed in section 4.2., this partially can be a result due to the nature of software industry; A product is easily developed and can serve everyone who wants it thanks to cloud computing and various tools including open-source software. However, it is also true that I could have revised the interview questions, interviewed more people to obtain more and better data. I concede that the proposed innovation framework (Figure 3) is not complete.

Also, some researchers might point out that this study does not incorporate the views of frontline employees, and I acknowledge the limitations. I conducted two interviews with frontline employees at the early stage of this study but realized it was difficult for them to give a holistic viewpoint on innovation as they were more focused on tactics and execution in a predefined situation. Therefore, I deliberately focused on innovation leaders who were responsible for planning, designing, and executing innovations.

Lastly, I acknowledge that studies on other industries might come to different conclusions. Even within the technology industry, companies that are developing hardware such as semiconductors, robots, and next-generation telecommunication systems, might have different innovation management methodologies. Additionally, biotechnology companies are known to have different product development approaches, and nontechnology companies such as CPGs might not directly benefit from this study. Therefore, the results and findings of this research would be limited to the software industry and should be studied to find out to what extent may be transferred to other industries.

5.3. Future Research

As this study is qualitative research, the innovation framework that was introduced can be further validated with confirmatory quantitative research. Additionally, similar qualitative research can be conducted in other industries. Conducting complementary research with frontline employees would also complement the research.

Besides, the genuinely honest quotes from innovation leaders can give a fresh idea and motivation to academics and provide a fruitful research opportunity. How crisis (including layoffs) affects innovation, how to understand and embrace serendipity or luck, to what extent money plays a role on innovation, how long one should wait for innovation can be a few exemplary research topics. There were also some insightful comments from the innovation leaders that were not included in Chapter 4 because they were not directly related to Peter Drucker's theory or the content on innovation environment. For instance, some leaders discussed the role of competition in innovation. Several interviewees contended that market timing is one of the keys to success but is often difficult to predict. A few mentioned that luck is also an

important factor in innovation but is even less predictable than market timing. I believe all of these ideas can be interesting future research topics.

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APPENDIX A

LIST OF INTERVIEWEES

Interviewee	Location	Firm Size (Market cap, \$)	Role	Business	Description
A	US	500M	Founder/CEO	B2C	Consumer tech
B	US	400M	Co-founder	VC	Consumer tech / Investment
C	US	50M+	Founder/CEO	B2C	Consumer tech (content)
D	US	10M+	Founder/CEO	B2B	Software and Hardware tech
E	US	500M	Founder/CEO	B2C	Consumer tech, millions of users
F	US	1B+	Co-founder	VC	Consumer tech / Investment
G	US	100B+	Senior Researcher	B2C	Former researcher at a global tech giant
H	US	10 M+	Founder/CEO	B2C	Former partner at top-tier VC
I	Asia	1B+	Founder/CEO	B2C	Consumer tech
J	Asia	10B+	Founder/CEO	B2C	Consumer tech
K	US	1B+	Founder/CEO	B2B	Ad tech
L	Asia	100M	Founder/CEO	B2B	AI startup, former executive at a >\$50B tech company
M	Asia	50B+	Executive	B2C	Consumer tech
N	Asia	5B+	CEO	B2C	Consumer tech (transaction)
O	US	1B+	Founder/CEO	B2C	Consumer tech
P	Asia	10B+	Co-founder	B2C	Former CTO, consumer (gaming)
Q	Asia	5B+	Founder/Chair	B2C	Consumer tech (transaction)
R	Asia	1B+	Founder/Chair	B2B	AI startup
S	US	100B+	Executive	B2C	Global tech giant
T	Asia	1B+	Founder/CEO	B2C	Serial entrepreneur
U	Asia	1B+	Founder/CEO	B2B	Ad Tech
V	Asia	100M	Founder/CEO	B2C	AI startup
W	US	100M	Founder/CEO	B2B	AI startup

APPENDIX B

INTERVIEW PROTOCOL

INTERVIEW OPENING

Before asking the interview questions, the interviewer reminds the interviewee that it is safe to speak his/her mind out as this study would collect data anonymously without disclosing the person or the organization being interviewed. After the warm-up conversation, the interviewer tells the interviewee that recording will begin and initiate the formal interview.

1. Tell me about an innovation project you led. Can you share your experience regarding how the innovation happened, from start to finish? Could you perhaps give me an example of a successful innovation (project) and one that was not that successful?
2. How did it get started?
 - How did you find innovation opportunities?
 - Were there specific areas that you looked into?
 - Did technology play a role? How so?
 - Did changes in industry structure (or demographics or changes in perception) play a role? How so?
3. In your view, why do some innovations projects succeed while others do not?
4. How does your organization generally do innovation? How do they help or hinder innovation happening?
 - How to foster innovation?
 - Who did what? (CEO, leaders, employees etc.)
 - What are the factors that drive innovation?
5. In your mind, how does innovation in technology companies differ from innovation in other industries?
6. Has innovation changed in the last ten years? How?
7. (Optional) How do you select an innovation project if there are many promising candidates?
8. Is there anything you want to add before we finish the interview? What's your general advice on doing innovation?

INTERVIEW EXIT

After the formal interview is complete, the interviewer thanks the interviewee and tells him/her that there might be follow-on questions and that the interviewer might reach out again.

APPENDIX C
CONSENT FORM

Re: Research on “How to Innovate in Technology Companies”

Dear Participant,

You are being asked to participate in a research studying how innovation occurs in the technology industry.

- If you agree to participate, I will conduct a one-on-one interview via Zoom, a video conferencing tool. The interview will be recorded to help me capture your insights in your own words.
- Your insight shared during the interview will only be used for writing a qualitative research paper. Though direct quotes from the participants may be used in this publication, their name and other identifying information will be kept anonymous and confidential during and after the study.
 - For example, a participant’s quote will appear in the research paper as followings: “A senior executive from a unicorn startup”; “a CEO of an Asia-based startup that was recently funded by a prominent VC”; “an executive from a US-based mega technology platform”
- The interview is expected to take approximately 30-60 minutes.
- I will be the primary researcher but there might be other doctorate and/or MBA students assisting me. In that case, I will remove the identifying information and only provide the transcript to my student assistants.
- Once the research is completed, the recorded interview will be destroyed and deleted, and the final paper will be sent to you.

I would sincerely appreciate your participation as I believe that unearthing ways to foster innovation will help countless companies in various industries succeed.

Warmly,

Jihoon Rim

APPENDIX D

HRPP/IRB EXEMPTION

Home | Create New | Manage | Help
Welcome Jihoon Rim Log Out IDΣATE

LiveList™

Finder: Subject:
[Reset](#)

1 results found.

[Protocol Number](#) [Protocol Title](#)

Lifecycle Event Manager | **Communications** | **Enrolled** | **Summary** | **Personnel** | **Research Sites** | **Research Design** | **Participants** | **Attachments**

Main

Protocol Number: 2020-0536 Actions

Stage: Protocol Approval Start: 09/15/2020 Risk Level: Review Frequency: 0 days
Status: Active Approval End: - Assigned IRB: Original Approval Date: 09/15/2020

HHS: FDA: Prisoner Categories:

Exempt Categories: 2

Submissions

Type	Receipt Date	Summary	Status	Decision	Lifecycle	Details	Actions
1 Initial Application	07/17/2020	View	Completed	Exemption Granted	View	View	

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