Master Thesis Report

Assessing The Impact of Business Incubation To Startup Performances In Indonesia

Lina Afriana

Technische Universiteit Delft

TU Delft

This page intentionally left blank.

Abstract

Startup arguably becomes one of the key drivers in the country economy. The growth of startup depends on how well the ecosystem provides the support needed by the startup. Like other young companies, startups have higher failure rates due to lack of resources, networks, reputations, credibility, innovation, or marketing knowledge for developing and selling the products. To survive, most startups collaborate and join business incubation to sustain and improve their performance. Several factors have been identified on influencing startup performance growth in business incubation. However, the impact of business incubation to startup performance has yet to be validated quantitatively by including all possible factors known from previous research. Thus, the research focuses on measuring the impact of business incubation to startup performance and whether business incubation is beneficial to startup performance based on quantitative approach. The performance measurement criteria was selected based on previous business incubation research and adjusted based on Indonesia startup ecosystem. The academic and practical gap on business incubation and its implications for startup performance are also addressed by doing survey research to startups community in Indonesia. The expected result will give an insight of business incubation impact to startup performance, and which factor most influenced startup performance in business incubation. Moreover, advice to help incubators improve and increase their impact on startup performance will also be presented in this research.

This page intentionally left blank.

Master Thesis Report

Assessing The Impact of Business Incubation To Startup Performances In Indonesia

by

Lina Afriana

in partial fulfillment of the requirements for the degree of

Master of Science
in Management of Technology

at the Delft University of Technology,
to be defended publicly on Monday August 27, 2018 at 01:00 PM.

Student number: 4607430
Project duration: January 1, 2018 – August 31, 2018

Graduation committee

Chairman:	Prof. dr. ir. M. Janssen,	Section Information and Communication Technology
Supervisor	Dr. ing. V. E. Scholten,	Section Economics of Technology and Innovation

TU Delft Delft University of Technology

This page intentionally left blank.

Acknowledgement

This master thesis is a product of passion, opportunity, luck, and grit. The topic was developed based on my great interest in entrepreneurship topic which led me to my first supervisor, Dr. ing. V E (Victor) Scholten. I was able to keep working on the topic knowing that it will be challenging from the beginning to the end due to the amazing dynamic of entrepreneurship theory and its practical aspect. By working on this thesis project, I tried to absorb as much as knowledge, information, advice, and critique to keep explore any possibilities in the theory and analysis development and to keep improving the thesis quality. I highly valued the code of honor of Technische Universiteit Delft (TU Delft) and keep it as my guide in my master life including working on this thesis project. Lastly, I would like to express my gratitude to all people that always support me and gave me a lot of positive impacts to me.

First of all, I would like to express my gratitude to my first supervisor, Dr. ing. V E (Victor) Scholten, for the opportunity to work on the topic that I proposed. His acceptance and interest to my thesis project mean a lot to me. He gave me a lot of support, insight, and the opportunity to shape, expand, develop, and complete my thesis project. By following his guidance, I could go through the most difficult time and complete my thesis project on time.

Secondly, I would like to express my gratitude to Prof. dr. ir. MFWHA (Marijn) Janssen as the chairman of my thesis research. His valuable feedbacks and insights on the research approach and process help me a lot to put me back on track when I seemed lost in the midway of the thesis development. His support and guidance help me a lot to give a clarity in my thesis project. His words that showed trust to me to complete my thesis project on time will be the one that I will remember forever.

Thirdly, I would like to express my biggest gratitude to my Husband, Arif Nurhidayat, M.Sc, my mother, and my family, who have supported me along the way from the beginning of master program until I complete my thesis project. Without their support, it would be impossible for me to keep the grit and perseverance during my study phase and my thesis project. I would like also give many thanks for my Indonesian and MOT collages that have become my support during my master program in TU Delft.

I would to also give my biggest thanks to all startups, business incubators, government institutions, companies, universities, and startup communities in Indonesia that welcome me warmly on my thesis journey. All your information, input, and feedbacks are the one that truly matters in this thesis project. I really hope my thesis project can be one that helps to shape the entrepreneurial activities in the country to a better one and that the project's result can give more publication on the development of startups and business incubation systems in Indonesia.

Additionally, I would like to give my special thanks for all my lecturers during my master program in Management of Technology who have given me the essential knowledge to complete my thesis project.

Lastly, I would like to express my gratitude to LPDP (Indonesia Endowment Fund for Education) who has given me the opportunity to join the Management of Technology program at TU Delft. Without LPDP financial support, it would be impossible for me to experience studying abroad in a world-class university such as TU Delft and to go

directly to Indonesia for collecting my thesis data.

In the end, by completing this master thesis, my master obligation is also completed. However, all the knowledge I gained will be forever embedded in me to pursue my next goal and career.

Lina Afriana
Delft, August 2018

Contents

List of Figures

List of Tables

1

Introduction

Startup with other new venture developments has many potentials to help increase employment and business opportunities (Bøllingtoft, 2012). New startups creation means that not only new jobs are created but also competition, productivity, and economic growth are expected from the establishment of startups. Startup refers to a young established company which started with a brilliant idea and yet still struggle to survive (Salamzadeh & Kesim, 2015). Startups and entrepreneurs have emerged as the motors of innovation and contribute to economic development (Schumpeter, 1956). A startup is also seen as essential components in societal progress (Aaboen, Lindelöf, von Koch, & Löfsten, 2006). However, young companies such as startups or small-medium enterprises (SMEs) have higher failure rates compares to established companies especially in their first five years (J. A. C. Baum, Calabrese, & Silverman, 2000; Lasrado, Sivo, Ford, O'Neal, & Garibay, 2016). This elimination of uncompetitive ventures are in line with the evolutionary theory which prospers the healthy business populations (Aldrich & Ruef, 2006).

Less than one-third of startup passed their early stages and developed into companies (J. A. C. Baum et al., 2000; Davila, Foster, & Gupta, 2003; Pettersson & Götsén, 2016; Salamzadeh & Kesim, 2015). This stages can be stated as the "valley of death" for startups (Hudson & Khazragui, 2013). As a young company, startup mostly lacks awareness of their resource and business knowledge gap or stated as 'unconsciously incompetent' to survive (van Weele, van Rijnsoever, & Nauta, 2017). Furthermore, startup failure can also be due to the lack of networks, reputations, credibility, innovation, or products marketing. This lack of knowledge is described as "the liability of newness" and the "smallness effects" (J. A. C. Baum et al., 2000; Lasrado et al., 2016; Neyens, Faems, & Sels, 2010). The environment condition surrounding the startups also become an essential factor in impacting startup survivability (Ayatse, Kwahar, & Iyortsuun, 2017).

To survive the market, most of the startups join business incubation or other startup support systems such as business accelerator (van Weele et al., 2017). Business incubator is an institution which created to help startup development (Bruneel, Ratinho, Clarysse, & Groen, 2012; Mas-Verdú, Ribeiro-Soriano, & Roig-Tierno, 2015; Pettersson & Götsén, 2016). The development of the business incubators differs from who is the owner of the business incubators and what is the goal of the business incubators. In general, the business incubator provides several facilities and supports such as office space, coaching, training, consultation, funding, and networking access (Bruneel et al., 2012; Hansen, Chesbrough, Nohria, & Sull, 2000; Lasrado et al., 2016; Pettersson & Götsén, 2016; Scillitoe & Chakrabarti, 2010; von Zedtwitz, 2003). This facilities and services are created to support startup in their development as a more stable and profitable company while increasing the survivability of the startup after they graduate

from business incubation programs.

Business incubator's contribution extends from helping country economic development to improve the startup industry and ecosystem development (Ayatse et al., 2017; OECD, n.d.). Business incubator promotes the country economic growth by supporting and assisting in new ventures and business creation such as startup. However, how much business incubator can help to achieve the goals depends on how many startups willing to join and participate in a business incubation program. Furthermore, the statement whether business incubation can help startups still become a debate in entrepreneurial research domain (Ayatse et al., 2017).

Several research has been done to understand the impact of business incubator on startup performance and how it can be measured (Ayatse et al., 2017; Kohler, 2016; Lasrado et al., 2016; Mas-Verdú et al., 2015; Peters, Rice, & Sundararajan, 2004; Pettersson & Götsén, 2016; Rothaermel & Thursby, 2005; Schwartz, 2011; Voisey et al., 2006; Abduh et al., 2007). Another research highlights the importance of matching the demand and supply of business incubator service to the need of startups to efficiently impact startup success (Peters et al., 2004; von Zedtwitz & Grimaldi, 2006). While researchers are still debating the positive impact of business incubation, business incubation activities and supports are proven to help startups in some phases of their development (Ayatse et al., 2017).

Even though there is a lot of business incubation study and its impact to startup performance has been done but the current research lack of comprehensive model which can elaborate the impacts of business incubation to startup performance and its influential factors. Furthermore, most of the study still lack in measuring the performance impact in more comprehensive and quantitative approach (Ayatse et al., 2017).

By creating more comprehensive model and relation between factors impacting startup performance, the level of impact and how significant the factors are to improve startup performance will be beneficial not only for business incubator as startup support system, but also for startup as the main subject and government as the policymakers and guidance in the entrepreneurial ecosystem (Lalkaka, 1996). In this research, the model for factors impacting startup performance will combine previous research in business incubation study and startup performance study. The combination of the two domains will complement each other to cover what genuinely impacting startup performance and whether business incubation programs impact startup performance in the program.

Business incubation programs are expected to help improve startup performance. Thus, startup behavior over the business incubation process and activities will also become an essential aspect of this research as it will become the mediating factors in impacting startup performance. The research will focus on measuring startup performance during their participation in incubation programs. Furthermore, this research will focus on reducing the academic gap on startup performance measurement by using it in the practical context. The measurement of the factors and its criteria will be done by using surveys study and semi-structured interview in several startup companies and business incubators. The expected result will give an insight of the impact of business incubation to startup performance and its most significant beneficial factors based on the quantitative approach and refer the result to the interview notes. Moreover, this research result also seeks to present advice to help incubators on improving startup performance.

1.1. Theoretical Implications

Business incubation has become a trending topic in the entrepreneurial study. The study of business incubation has started way back in 1984 until current years (Hackett & Dilts, 2004b). Along with the rising number of startups around the world, the topic of business incubation as startup support system has also increased tremendously with more than 157 thousand research have been published in various area and domains based on a search in google scholar per July 2018. Hackett and Dilts (2004b) has given an excellent overview of business incubation research to date. Based on the report, there are five main research domains mostly covered in business incubation research which are incubator development, incubator configuration, incubated startup development, incubator-incubation impact, and theoretical development of incubators-incubation studies. In those domains, incubators-incubation impacts to startup performance become of the primary interest as it gives a lot of conflicting conclusions in several discussion and research (Ayatse et al., 2017).

As stated previously, many research has been done to understand the impact of business incubators on startup performance and how it can be measured to understand the need of business incubators in startup development and growth (Ayatse et al., 2017; Lasrado et al., 2016; Kohler, 2016; Mas-Verdú et al., 2015; Pettersson & Götsén, 2016; Peters et al., 2004; Rothaermel & Thursby, 2005; Schwartz, 2011; Voisey et al., 2006). However, as found by Ayatse et al. (2017), there are several conflicting perspectives over the impact of business incubation to startup performance. While Schwartz (2013) and Amezcua (2010) argue that business incubation has no significant impact on startup survivability, sales, and employment growth, the other researches state the opposite. Al-Mubaraki and Busler (2013) and Weinberg, Allen, and Schermerhorn (1991) highlight that business incubation has a positive impact on startup survivability, employment growth, and turnover. Voisey et al. (2006) highlight the importance to measure both the hard outcome and soft outcome of business incubation. The hard outcomes refer to tangible and measurable output show the growth of startups such as sales or revenue increase while the soft outcomes refer to intangible output which shows the growth of intermediary factor to achieve the hard outcome such as the increase of knowledge and skill. The research suggests using both the hard and soft outcome to measure the benefit of business incubation in a more comprehensive and rounded way. The conflicting perspective over the impact has also become subject to many incubator research (Ayatse et al., 2017).

While there are extensive research on startup performance in business incubation, most of the researches either focus on one aspect such as knowledge flows (Rothaermel & Thursby, 2005) or absorptive capacity (Patton, 2014), self-efficacy (Mcgee, Peterson, Mueller, & Sequeira, 2009), networks (Soetanto & Jack, 2013), startup selection criteria (Aerts, Matthyssens, & Vandenbempt, 2007), focus on literature review (Ayatse et al., 2017), using historical data and information (Amezcua, 2010), use more qualitative approach (Ucar & Koch, 2016; Voisey et al., 2006), focus on incubation tenants satisfaction (Abduh et al., 2007), or focus on post-graduation aspect such as survivability (Mas-Verdú et al., 2015; Schwartz, 2013, 2011).

The lack of comprehensive mapping of all impacting and impacted factors contribute to selection bias in the research. This selection bias occurs due to the nature of most research to use the most convenient factors that can be assessed. Current researches that try to identify factors impacting startup performance and success are spread out researching different aspects and perspectives. This condition becomes a common occurrence given how complicated of startup performance evaluation is and difficult it is to obtain reliable data and information (Kuratko & Hodgetts, 1998). Cooper (1993) create a model to predict factors that may impact startup performance. This model incorporates elements such as environmental factors, entrepreneurs personal's goal, founding process, and ventures diversity. This model will be used as the initial reference

model in this research and will be implemented in business incubation context.

By creating a more comprehensive model, the relation between each factor and its impact can be shown to get an understanding on how significant business incubation impact to startup performance and whether business incubation has a significant impact on improving startup performance. Moreover, the model of startup performance evaluation can be visualized by incorporating only significant factors which impacting startup performance. Furthermore, this research will complement previous researches in both business incubation study and startup performance study with more general criteria by creating the aggregate model of essential factors known in quantitative and qualitative approach. The approach will take theory based-exploratory approach which is recommended in entrepreneurial study (Low & MacMillan, 1988). In conclusion, this research will try to lessen the theoretical and academical gap from current business incubation research by combining the theory built up from previous research and implement it in a contextual and practical model.

1.2. Practical Implications

In the practical relevance of the research, a positive impact of business incubation system to help improve startup performance will also be validated. Moreover, the most impacting factor will give an insight to business incubator and government which service or factor is good enough and which factor still need to be improved or revised.

Business incubators are expected to help improve startup performance and the whole startup ecosystem. Thus, understanding the impact and its determining factors can be an essential aspect for this purpose. Besides, in this research, the patterns of startup characteristics, environmental factors, the business incubation process, and startups performance will be mapped. This result can be an insight for business incubators to identify which kind of startups who have better performance growth in business incubation program and what need to be improved in the business incubation programs.

Meanwhile, the incubated startup can also use the result from this research as an insight to prioritize which factors that most beneficial for them to improve to get the highest performance in business incubation programs and to become an input for their decision to join business incubation program. In this case, this research may also help to change startup perspective and behavior within business incubation programs to maximize their potential during their participation in business incubation.

Accordingly, the government and other policy makers can also use this research as an overview on determining the basis of their policy support for startup and entrepreneurial ecosystem. After all, startup and business incubation ecosystem development still need to be supported by effective policy and regulation to grow and prosper. The government as the policymaker will have a significant role to achieve the suitable environment for both startup and business incubation to develop.

1.3. Research Objectives and Research Question

This research will focus on determining whether business incubation is beneficial to improve startup performance and how it can impact startup performance. The performance measurement criteria will be selected based on previous business incubation and startup performance research and will be adjusted based selected startup ecosystem. Furthermore, this research will also analyze which factor contribute to startup performance and how to assess it. By doing this research, both startup and business incubator can recognize the factor that directly contributes to startup performance and uses it as input for their future improvement. Business incubators perspective on startups performance will not be covered in this research.

Thus, to achieve the objectives defined above, the main research question needs to be answered:

How does business incubation impact startup performance?

The research question will explore relevant literature to identify what factors influence startup performance in business incubation. Then, the factors will be assessed by using survey research to understand the impact of those factors on startup performance. In this aspect, the startup performance evaluation model created by Cooper (1993) will be used as a basis to group several elements which related to startup and incorporate the business incubation process in the model. Cooper (1993) divided the startup into the founder of the startup, the founding process, and the startup characteristics. In this research, all those three elements will be merged as startup characteristics as the primary focus in the research will be the startup as an entity that represents the company and the team inside the company. Then, the business incubation process will be incorporated into the model to assess business incubation programs as an intermediary in improving startup performance. The initial startup performance model and incorporation of business incubation process is shown in Figure 1.1.

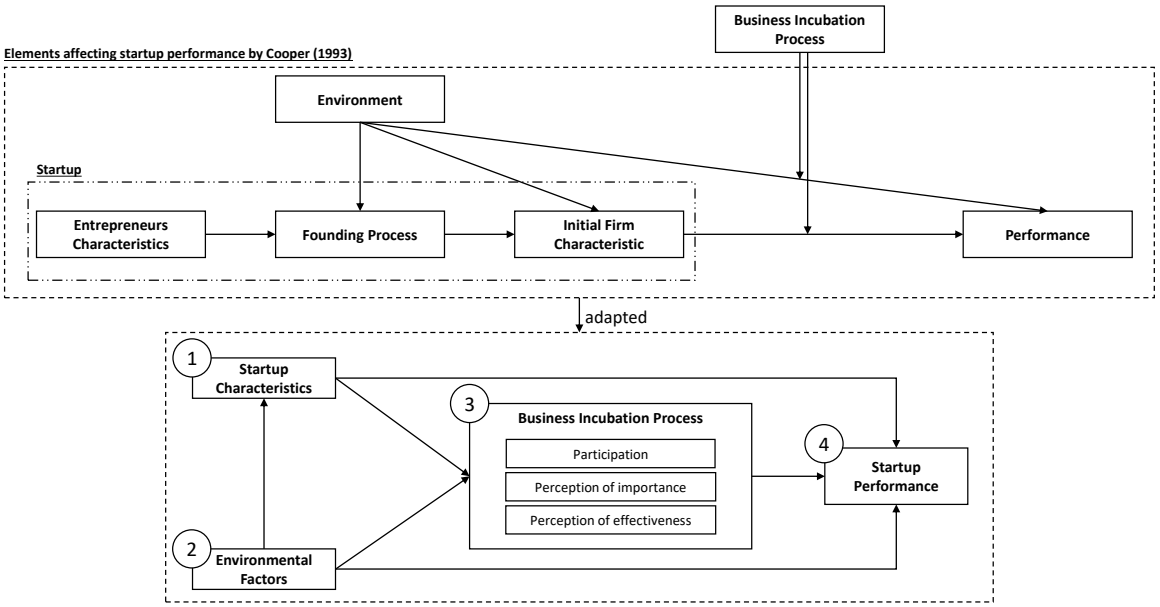


Figure 1.1: Incorporation of business incubation process in startup performance evaluation model by Cooper (1993)

Based on the adjusted model, the research will focus on four main categories which are:

- The startup characteristic
- The Environment around the startup
- The business incubation process experienced by the startup
- startup performance in business incubation

The model was created as a research effort to identify and recognize the key components in business incubation and startup performance research. The three first components will be measured against the startup performance in business incubation process. All the components will be assessed by exploring the literature relevant to the

topic and the research. First, the literature on startup characteristics will be explored and analyzed to map relevant startup characteristics in business incubation programs and startup performance. Second, the literature on business incubation program and its characteristics will be mapped with its relation to startup performance. Lastly, relevant environmental factors which may impact startup performance stated by (Chrisman et al., 1998) such as locational factor, industry structure, customer and supplier nature, and government support will be explored on analyzing its influence to the research sample and the survey research.

In this research, startup activities or behavior within business incubation programs which influence the startup performance will be assessed to represent business incubation process. Startup participation and startup satisfaction of business incubation programs are identified to influence startup performance (Lasrado et al., 2016; Fang, Tsai, & Lin, 2010; Abduh et al., 2007). Abduh et al. (2007) measure startup satisfaction in business incubation programs by using startup perception of importance and effectiveness of business incubation facilities and services provided. Thus, business incubation process in this research will focus on three main dimensions which are startup participation in business incubation programs and services, startup perception over the importance of business incubation programs, and startup perception over the effectiveness of business incubation programs and services provided by business incubator (Albort-Morant & Oghazi, 2016; Cheng & Schaeffer, 2011; Voisey et al., 2006; Abduh et al., 2007). The relation between each dimension will be assessed in this research to answer the main research question.

Thus, to achieve the main research question, there are several sub-research questions are developed:

- ***What is the impact of startup characteristics on startup participation, the perception of importance, and perception of effectiveness in business incubation programs?***

  Startup characteristics influence how startup perceive and react to business incubation programs. As startup suffers from the smallness and newness issue, startup background and characteristics help to define the startup behavior within incubation programs and services. Several factors related to startup characteristics such as startup team working and industry experience, skill, network access, and startup strategy has been identified to influence the startup creation and development process (Davidsson, Steffens, & Gordon, 2011; Schwartz, 2011; Gatewood, Shaver, & Gartner, 1995; Soetanto & Jack, 2013; Chrisman et al., 1998). The influence of startup characteristics on startup behavior in business incubation then impacts startup performance. Thus, startup characteristics which influence startup participation, the perception of importance, and perception of effectiveness in business incubation programs will be explored based on relevant literature review.

- ***What is the impact of environmental factors on startup characteristics, startup participation, startup perception of importance, startup perception of effectiveness, and startup performance in business incubation programs?***

  As modeled by Cooper (1993), environmental factors may influence startup performance and startup characteristic itself. In this research, the influence of environmental factors then will also be assessed in the business incubation process.

  A lot of environmental factors has been identified to influence startup performance. Geographical proximity and agglomeration effect as the locational factors are found to influence the performance of startups (Dornberger & Zeng, 2009). The geographical and agglomeration proximity refers to a concentration of supplier,

company, and the customer in one designated area. This locational structure help to eliminate physical barrier for supplier, company, and customer interaction. Besides, Chrisman et al. (1998) also highlight the importance of industry structure in influencing company performance. Thus, to eliminate unknown factor which may influence startup performance outside the business incubation process, relevant contextual factors will be analyzed. In this case, the contextual factors refer to environmental factors due to the unique characteristics of Indonesia's culture, industry competition, startup ecosystem, financial infrastructure, legislation, and how it is different with other countries. The influence of this environmental factors will be explored based on the relevant literature review.

- ***What is the impact of startup participation, perception of importance, and perception of effectiveness in business incubation programs on startup performance and how each factor in business incubation programs relates to each other?***

  Startup behavior in business incubation programs impacts their performance during and after their join business incubation. This behavior consists of how many they participate in the business incubation programs provided by the business incubator, how their perceived the programs to their startup needs and condition, and the satisfaction they perceived of the business programs during their stay (Albort-Morant & Oghazi, 2016; Abduh et al., 2007; Cheng & Schaeffer, 2011). Thus, the relation whether those behavior is genuinely impacting startup performance in business incubator programs need to be validated and verified in this research and how each factor relates each other will also be assessed.

- ***What is the mediating effect/the role of startup participation, the perception of importance, and perception of effectiveness over business incubation process in the relationship between startup characteristics, environmental factors, and startup performance?***

  The independent factors such as startup characteristic and environmental factor will influence the behavior of the entrepreneur or the startup on perceiving the usefulness, effectiveness, and importance of the business incubation process. The more the startup feel the need of business incubation or when they feel a business incubator is useful for their development, the more frequent they utilize the service and facilities of business incubation. Thus, the utilization, the perception of usefulness, importance, and effectiveness of the startup with business incubator programs will impact the performance of the startup itself (Albort-Morant & Oghazi, 2016; Abduh et al., 2007; Cheng & Schaeffer, 2011). The relation of the main components will be analyzed by using a questionnaire and will be mapped into a causal diagram. How the key factors influence each other will also be assessed and analyzed using the questionnaire result and literature review will be used to confirm the result and analysis.

- ***What are the recommendation to the business incubator to improve startup performance in business incubation programs?***

  After all relevant factors have been identified, and its impacts have been analyzed, a complete model on the relation of each factor will be built. Based on the model, several recommendations to improve business incubation processes and services can be provided to the business incubator and related government officials. The related startup also can use the research outcome to assess which factor that needs to be focused on to improve their performance and effectiveness in business incubation programs. The research outcome can help both the business incubator and its incubation tenants to pursue their goal to help improve the country economic growth.

After all the questions have been answered, the result also can help to determine whether business incubator is beneficial to startup performance by itself or also be influenced by other factors such as startup characteristics, environmental factors, and the business incubation process itself.

1.4. Research Scope

Indonesia is a country with the 4th most startups in the world with 3,566 startups (Tech in Asia, 2018). Despite a large number of startup, its Global Entrepreneurship Index (GEI) is laid behind at ranking 94 (The Netherlands #11, Singapore #27, Malaysia #58, India #68, Thailand #71, and Vietnam #87). Its entrepreneurship performance is also decreasing with it become one of the countries that have the most significant declines in GEI Score during 2017-2018 (The Global Entrepreneurship and Development Institute (GEDI), 2017). The fall might due to its low startup survival rate, business performance, and the ecosystem support to the startup developments. In term of economic activities, Indonesia's startups show a large number of investments total investment increases started in 2013 to 2015 with more than US$500 million funding announced in 2015 (Freischlad, 2016).

The funding growth, unfortunately, was not in line with the decreasing number of new startups created in the same period of years (CrunchBase, 2017). Furthermore, based on initial analysis of various sources, Indonesia startup which joined business incubators in Indonesia is less than 10% (Ayuwuragil, 2017; PT Telekomunikasi Indonesia, 2017; Tech in Asia, 2018). The low rate of join rate in Indonesia startup may due to startup skepticism of business incubator impacts and a small number of startups that pass business incubator selection process (Ayuwuragil, 2017). Proving business incubator benefit to the startup may improve the likeliness of startup to join business incubation activities and enhance their survivability and business performance. Thus, Indonesia becomes a compelling case for the research subject.

Besides, the number of research in Indonesia's business incubation are quite limited. Gozali, Masrom, Haron, Yuri, and Zagloel (2017) tried to map all business incubation studies that have been conducted in Indonesia, and the number of research regarding business incubation in Indonesia is still underwhelming as it still less than ten known publications. Even tough business incubation concept in Indonesia has been implemented since 1992, the entrepreneurship ecosystem in Indonesia itself is still in the development phase. Thus, how the incubated startups perceive the usefulness of their business incubation programs will also become compelling insight. The research result will help not only the theoretical gaps of incubation study in Indonesia but also help to shape the development of the business incubation programs and services in Indonesia. A report from Bank Indonesia (2006) and Direktorat Perusahaan Pemula Berbasis Teknologi (n.d.) shows that business incubation system in Indonesia is beneficial for startup development in Indonesia. Thus, more research and information on startup performance in business incubation will help the business incubation ecosystem in Indonesia to improve their system efficiently based on which factors which have the highest impact on startup performance.

1.5. Research approach

The research approach used in this is research is a combination of deductive and exploratory approach. Deductive research is a type of research which started with a general theory to a more specific problem and test it by using several hypotheses. Meanwhile, exploratory research is a research approach used when there is limited information or the model used in the research is quite complex (Sekaran & Bougie, 2016). In this case, there is no comprehensive model yet created to incorporate both business incubation process and startup performance model. Thus, the combination between deductive and exploratory research will help to test and create a more

comprehensive model to define factors impacting startup performance in business incubation programs by incorporating the known factors and elements from previous research to build a new theoretical model. The visual representation of the research approach used in this research is shown in Figure 1.2. The overall process of this research is divided into six main steps.

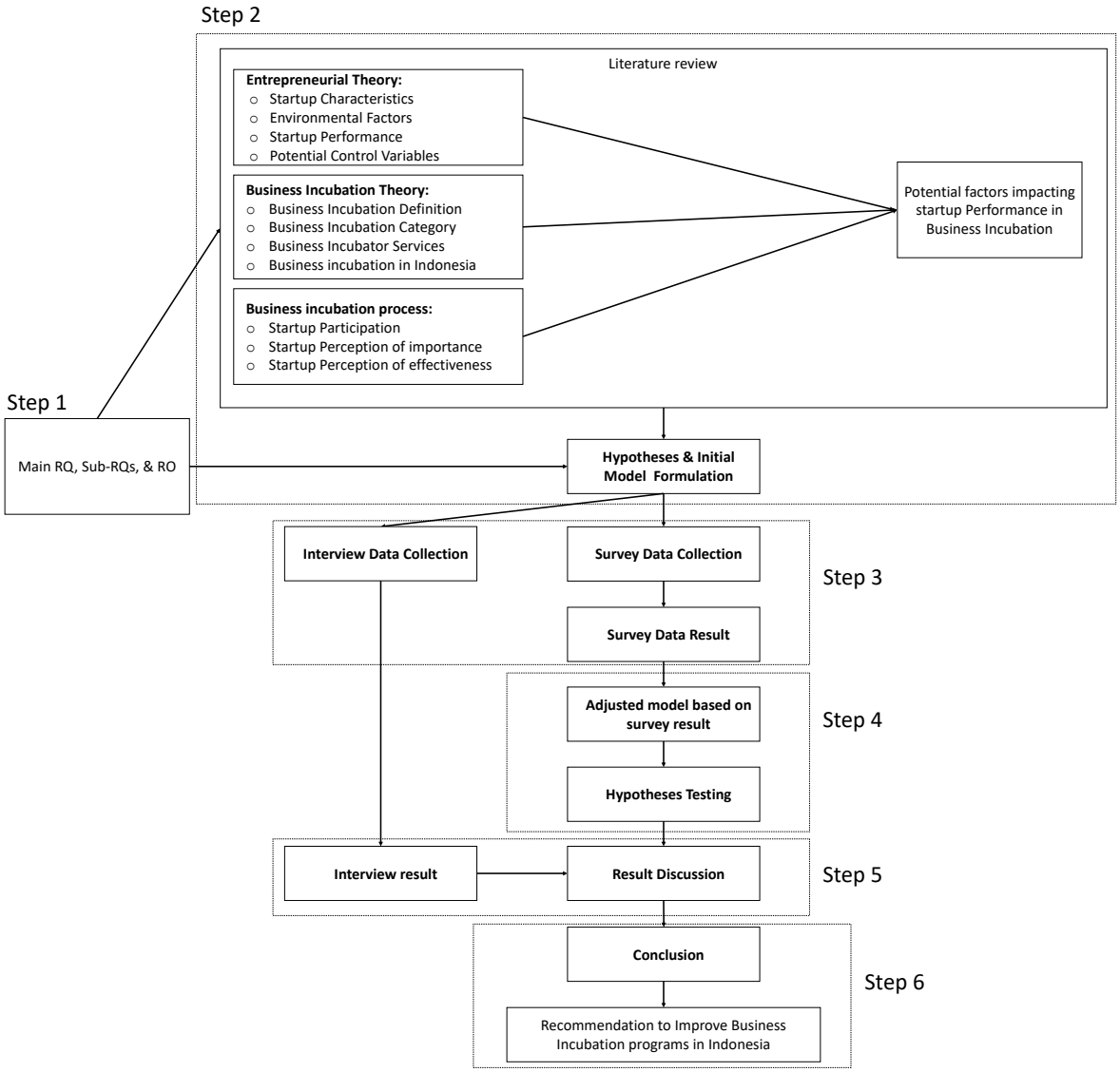


Figure 1.2: Key concept and theory used in the research to achieve the main objectives

In the first step, research objective, main research question, sub-research questions are created based on initial literature review and based on problems identified in theoretical and practical context. This research objective and the research question will be the guidance to conduct the whole research.

After the research objective and question have been selected and formulated, in the second step, a deductive approach is used to select previous research in business incubation and startup performance study to establish hypotheses and initial conceptual model. The initial conceptual model developed to include all relevant variables based on the literature reviews in startup characteristics, environmental factors, business incubation process, and startup performance domains following the model previously

defined in Figure 1.1.

The objectives of the research are to identify the impact of business incubation to startup performance and to make a recommendation to improve business incubators. Thus, most significant factors in influencing startup performance in business incubators have to be identified based on relevant theory in business incubation and startup or entrepreneurial studies. The research approach to build the model defines the relationship between core concepts with each other to achieve the objectives of this research (Verschuren & Doorewaard, 2010). The fundamental concepts of the research can be derived based on the noun found in the research objectives which in this case business incubation impact, startup, and startup performance. Each of the main concepts then elaborated more to identify the most critical factors that need to be included in the research.

In this research, the main theories or concepts as shown in Figure 1.2 will be used in building the initial model and hypotheses of the research. First is the entrepreneurial theory. The theory will cover all the startup definitions, characteristics, performance, environmental factors that will be analyzed further in this research. Also, potential control variables which may impact the model will also be explored.

The second concept or theory is business incubation theory. The business incubation theory will cover business incubation definition, category, and services to understand the concept of business incubation and its potential impact on startup performance. In this step, business incubation ecosystem in Indonesia is also explored to understand the differences between business incubation programs and services offered in Indonesia.

Lastly, the third theory will focus on business incubation process. In this case, the business incubation process will focus on startup participation, the perception of importance, and perception of effectiveness as stated in section 1.3. In this process, startup participation and perception over business incubation process are explored to understand their action as a company to improve their business development process by utilizing business incubation resources and facilities.

Then, after all the impacting factors have been identified, a detailed initial model is built to be tested. In the third step, all the identified factors are put as question items in the questionnaire and sent to incubated startups in Indonesia. The collected response from the items will be mapped into variables based on the initial model and combined into a construct. The construct, in this case, is a group of variables in the same domains. The constructs in this research are divided into four main domains which are the startup characteristics, environmental factors, the business incubation process, and startup performance. In the same time, interview sessions are also conducted to business incubators and incubated startups as additional data to interpret the survey result and to interpret the relation in the final model.

In the fourth step, the initial model is tested by using the survey result. In this process, the exploratory approach is started to test and build the relation and impact of one variable to other variables (Sekaran & Bougie, 2016). After the initial model have been built and data has been collected, new adjusted model is created by testing the first causal relation of each variable by using sequential equation modeling (SEM). As in other exploratory research, the grouping of the items will be adjusted accordingly based on the SEM result to identify new correlation and relation of each variable and construct. The new model will be used to test the hypotheses of the research and will be used to answer the research question and the research objective.

In the fifth step, a discussion of the survey result will be combined and supported based on notes and information from the interview session. The combination of interview and

survey data will increase the interpretation value of the research result.

Finally, the conclusion is derived from the research result and recommendation to improve startup performance will be given based on the result data and available works of literature.

1.6. Survey and Interview Research

This research project will use survey research with a questionnaire to collect required the primary information and data. Survey research is a type of research strategy which focuses more on analyzing empirical research in a large number of samples (Verschuren & Doorewaard, 2010). Survey research is chosen due to the condition that the existing literature cannot provide the sufficient information to achieve the objectives as the research over the subject is very limited and spread out to several research topics and area.

In gathering the required data, a questionnaire has been developed and sent to the business incubators and incubated startup in Indonesia once as cross-sectional research. The questionnaire was sent randomly by using email, and direct chat make sure that the result of the research can be used as general information and profoundly represent the nature of the research objects which are startups in Indonesia. Furthermore, survey research is also chosen to shorten the data collection process and information generation time compared to other data collection strategy.

As the data collection method will use a questionnaire with a large number of data and variables, quantitative processing and quantitative analysis will be used after the data collection phase. In this research strategy, the questionnaire will cover both the question on variables level and the relation of each variable as developed in the research questions.

Thus, to complement the survey data, interviews are also conducted to top managerial position to both business incubators and incubated startups. The interview process will be based on a semi-structured approach as the objectives of the interview is to complement the analysis data. The process of conducting the interview will be elaborated in Chapter 3.

1.7. Statistical Analysis

After data has been collected using a survey or questionnaire, the data will be processed and analyzed by using statistical methods. The questionnaire contains several variables that can be divided into several constructs which are startup characteristics, environmental factors, the business incubation process, and startup performance. Besides, startup demographic characteristics are also captured to identify the type of incubated startup that become the respondent in the research and used as a control and moderator variables that will be tested in the model.

Variables that related to environmental factors and demographics are defined as independent variables while variables related to startup characteristics and startup performance are defined as dependent variables. Variables related to business incubation process need to be analyzed whether it is covariate or independent variables. As the data collected as a cross-sectional study, the performance variable cover what the startup perceived as their performance during their stay in business incubation programs. To define the impact of time to startup performance, the variables related to the startup duration in each business incubator are created from the year when joining the business incubator, whether they still in the business incubator, and incubation period in each business incubator. The results from the questionnaire are treated as raw

data and have been treated to leave only valid data and related variables to be analyzed. When the data has been cleaned and transform, the statistical analysis is started. The detail of all the research strategy and data analysis method to answer the research questions are shown in Figure 1.1.

Item Name	Question	Research Strategy	Methods for data collection	Deliverables
RQ	How does business incubation impact startup performance growth in Indonesia?	-	Combine all the answer from sub-research questions	• The list of impacting and impacted factor in business incubation process to startup performance as independent variables • The causal relation of impacted and impacting factor in business incubation and startup performance
SQ1	What is the impact of startup characteristics on startup participation, perception of importance, perception of effectiveness and startup performance in business incubation programs?	Literature review and Survey research	Questionnaire based on factors known from previous research and using correlation and regression as statistical analysis tools	• The list of impacting and impacted factor of startup characteristics to business incubation process as independent variables • The causal relation of impacted and impacting factor of startup to business incubation process
SQ2	What is the impact of environmental factors on startup characteristics, startup participation, startup perception of importance, startup perception of effectiveness, and startup performance in business incubation programs?	Literature review and Survey research	Questionnaire based on factors known from previous research and using correlation and regression as statistical analysis tools	• The list of impacting and impacted factor of environmental factor to startup characteristics and business incubation process • The causal relation of impacted and impacting environmental factor to startup characteristics and business incubation process
SQ3	What is the impact of startup participation, perception of importance, and perception of effectiveness in business incubation programs on startup performance and how each factors in business incubation programs relates to each other?	Literature review and Survey research	Questionnaire based on factors known from previous research and using correlation and regression as statistical analysis tools	• The list of startup participation, perception of importance, and perception of effectiveness of incubator services in business incubation programs as independent variables • The causal relation of impacted and impacting factor of startup in business incubation programs to in startup performance and causal relations of each business incubation process to each others
SQ4	What is the mediating effect/the role of startup participation, perception of importance, and perception of effectiveness over business incubation process in the relationship between startup characteristics, contextual factors, and startup performance?	Literature review and Survey research	Questionnaire based on factors known from previous research and using correlation and regression as statistical analysis tools	• The comparison of relation of the startup participation, perception of importance, and perception of effectiveness variables to the independent variables and the research outcome • The causal relation of impacted and impacting factor of startup participation, perception of importance, and perception of effectiveness variables to the independent variables and the research outcome
SQ5	What are the recommendation to business incubator to improve startup performance in business incubation programs?	Desk research	Research result and literature review	• List of recommendation based on research result and literature review

Table 1.1: Research strategy for data collection method

1.8. Thesis Outline

This research will present a deductive and exploratory approach of startup performance growth in the business incubator. The performance criteria will be selected based on literature review and used as measurement criteria in this study. In the quantitative approach, the questionnaire will be used to collect the data required for startup performance growth measurement in business incubation. To get the data, business

incubation and company quantitative performance will be explored in both literature and practical context by collecting business incubation information in Indonesia.

In overview, the remaining part of the thesis is structured following the research approach is shown in Figure 1.2 as follows: Chapter 2 will cover the stage 2 of the research which will cover the literature review, hypotheses, and initial model formulation. Chapter 3 will cover step 3 which define the methodology for data collection and handling of the data collection result. Chapter 4 will cover stage 4 of the research which will cover the statistical data analysis to build the new model and test the result to the hypotheses. Chapter 5 will cover stage 5 and elaborate the findings of the result of the survey and interview session to answer the research question. Lastly, in chapter 6, the conclusion of the research, the critical reflection on the research, and recommendations will be presented along with the contribution and future research.

This page intentionally left blank.

2

Literature Reviews

This chapter will cover the literature review approach used in the research, the result of the literature review, and the development of the research hypotheses to answer the sub-research questions and the main research question. In the final section of this chapter, a new theoretical concept built from the literature review will also be presented.

2.1. Literature Review Methodology

To build the detail on the initial model created in Section 1.3, a further literature review was conducted. The complete steps of the literature review process are shown in Figure 2.1.

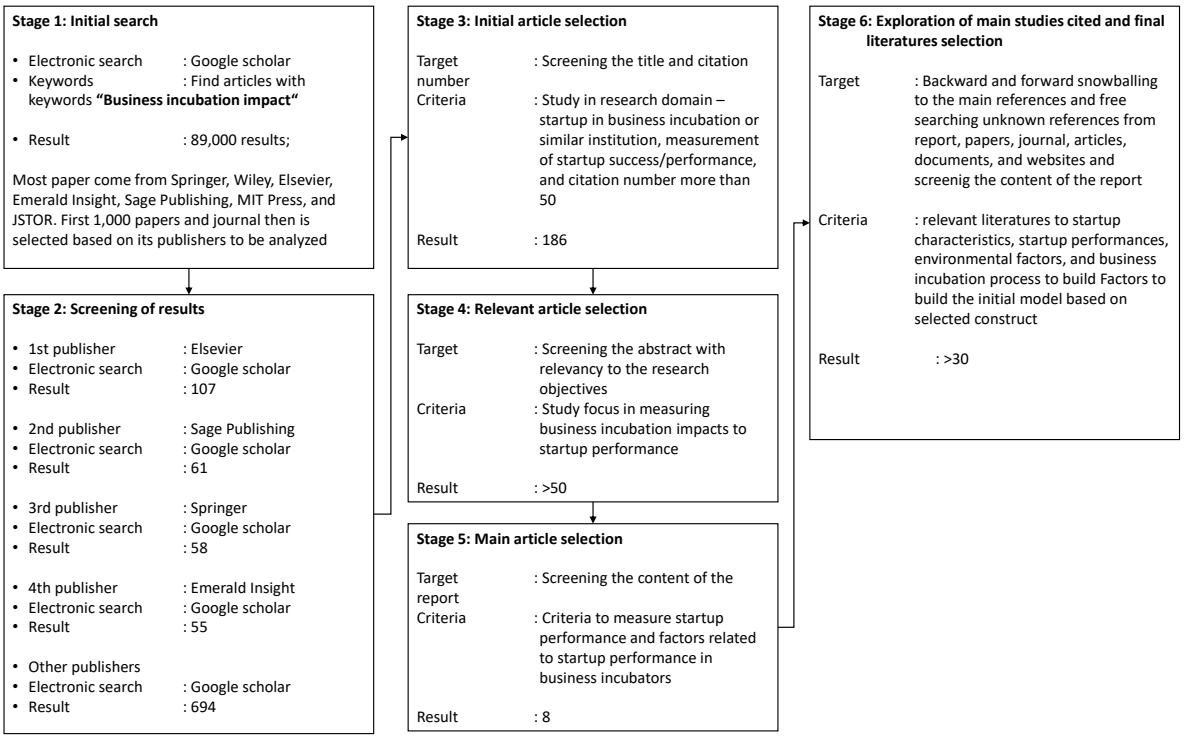


Figure 2.1: Literature review steps conducted in the research

In the first step, the literature reviews were conducted by exploring all papers or journals that relevant with business incubation impact study. Rather than using a full phrase as the keyword, using only ”business incubation impact” will help to gather all specific but relevant resources compare to other keywords. This keyword was used in

google scholars to gather potential literature sources for the research. Google scholar was selected as the first search engine in this process as it contains more data from various journals compare to other journals or search engines. In this step, more than 89,000 results were shown up with the keyword. Then all the paper were filtered in a batch based on its publishers, and the first 1,000 relevant papers were selected.

In the second stage, all the literature were mapped based on its publishers. In the third stage, the mapped resources were filtered to identify whether the papers or journals are in the same research domain with the research objective which is business incubation and its performance measurement. In this step, the number of sources had been reduced to 186 as the papers selected were only paper with citation more than 50. In the next step, the papers were filtered again to only focus on startup performance measurement in business incubation and its measurement criteria. In stage 5, eight papers were selected as the main sources for building the initial model and gathering more relevant literature. In this step, the eight main papers were used to provide more relevant references by using a backward and forward snowballing process. In this case, more literature from other publishers and resources can be found. In the last step, all collected resources were used to extend the initial model and create the questions for the questionnaire. All the relevant theory and information gathered will be elaborated in the next chapter in accordance to its dimension and study relevance.

2.2. Entrepreneurial Theory

Entrepreneurship can be expressed as a process of action to create or establish a new venture by an entrepreneur (Trott, van der Duin, Hartmann, Scholte, & Ortt, 2015). Meanwhile, an entrepreneur refers to a person that will carry out the innovation process which creates a new combination of four main conditions of entrepreneurship: "task-related motivation, expertise, the expectation on personal gain, and supportive environment" to create the new venture (Bull & Willard, 1993). In the entrepreneurial study, there are four aspects dominant which become the components of new venture creation framework: characteristics of the individual, the venture or the organization, the environment, and the process of venture creation (Gartner, 1985). Based on those elements, Cooper (1993) created the relation of main elements to startup performance as previously shown in Chapter 1. The Cooper model is used in this research as the initial model to build the relation model of factors impacting startup performance in business incubation programs. The initial model is shown in Figure 2.2. As the research will focus to startup as the unit of analysis, in this initial model, the entrepreneur as individual and the startup company as an organization are merged to be one construct which is the startup characteristic.

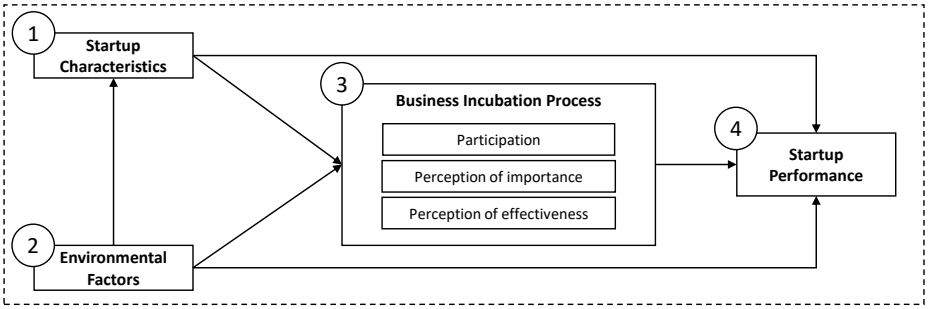


Figure 2.2: Initial model of main research elements

The literature selected from the previous section is used to create a new model for assessing the impact of business incubation in startup performance. As shown in the initial model, there will be four dimensions assessed in this research: the startup

characteristic, the environment related to the startup, the business incubation process, and the performance or impact of the relationship between the three other dimensions. The decision to use a more comprehensive model in assessing startup performance in business incubation system is also supported by Chrisman et al. (1998) who stated that performance of startups depends on several sets of factors and several identified elements should be considered to be included in the model. In this case, the four dimensions which are shown in Figure 2.2 will be used as the base of the initial conceptual model and as guidance in the literature review process.

2.3. Identifying Startup

A startup is a company which fulfills these three characteristics: younger than ten years, feature highly innovative technologies or business models, and (strive for) significant employee or sales growth (Kollmann, Stöckmann, Linstaedt, & Kensbock, 2015). Startup as other new venture business has many potentials to help increase employment and business opportunities (Bøllingtoft, 2012). A startup is a different type of company compare than Small-Medium Enterprise or SME. Based on EU definition of enterprises, the company categorization is created based on the employee size which is divided into microenterprise (with one to nine employee), small enterprise (with 10-49 employee), medium enterprise (with 50-249 employee), and large enterprise (with 250 or more employee) (Schmiemann, 2008). Thus, SMEs have larger employee size, which varies from 10 to 249 employees (from small to medium enterprise) compares to startups which usually diverse from 1 to 100 employee per company (Cressy & Olofsson, 1997; Schmiemann, 2008).

Young companies such as startups or small medium enterprises (SMEs) have higher failure rates compares to established companies especially in the first five years of the company establishment (J. A. C. Baum et al., 2000; Lasrado et al., 2016). Less than one-third of startup pass their early stages and continue into later-stage such as business and market introduction (J. A. C. Baum et al., 2000; Davila et al., 2003; Pettersson & Götsén, 2016; Salamzadeh & Kesim, 2015). Startup failure to survive can be due to the lack of resources, networks, reputations, credibility, innovation, or marketing the products which describe as "the liability of newness" and the "smallness effects" (J. A. C. Baum et al., 2000; Lasrado et al., 2016; Neyens et al., 2010). The "liabilities of newness" show startup lack of experience, standardized process, trust and credibility, knowledge, and established client and partners (Salamzadeh & Kesim, 2015; Stinchcombe, 1965). Meanwhile, the "smallness effect" show startup often have limited human, physical, and financial resources to be able to market and expand their new product (Neyens et al., 2010).

In term of determining company success, Van de Ven, Hudson, and Schroeder (1984) created excellent research based on literature to determine possible factors impacting company performance in three different levels of analysis. First, the entrepreneurial level. In this level, the focus will be on the founder or the entrepreneurs as an individual. In this level, the company success is related to the individual education, experience, personality trait, business idea, and personal investment. In the next level, the organizational aspect refers to the initial development and planning process of the company. In this level of analysis, the company success is influenced by the planning activities conducted by the company, the company size, how the company expands their business, the management of leadership and command, and the level of top management and board members involvement in the company decision-making process. In the next level of analysis, the environment and the industry surrounding the company becomes the focus. In this level, any form of capital, training, contracts assistance will have a positive impact on company success. The overview of these result will become a guideline in exploring each level of analysis in this research.

2.4. Startup Characteristics

With their limited capacities and capabilities, startups join business incubation programs or other intermediary supports to get assistance in the business development. However, the performance of startups in this business assistance programs are varied due to its dependency of several sets of factors such as the startup founder, the organization and industry structure, business strategy, and resources (Chrisman et al., 1998; Bergek & Norrman, 2008). In this case, the factors influencing startup performance in the startup or the company side will be mapped. Many research tried to map factors that affecting startup performance in the individual and organizational aspect of the startup. Chrisman et al. (1998) set entrepreneur, business strategy, resources, and organizational structure, process, and system as essential factors which influencing startup performance which is shown in Figure 2.3. As the initial model used in this research merged the entrepreneur and organization variables as an entity, the characteristics used on both of variables will be merged in one construct which is the startup characteristic. The startup characteristic factor will incorporate the most influential factors or variables in the startup as an organization and also the team within the startup as the individual. The decision to merge characteristic of the entrepreneur and the organization itself also supported by the findings that there will be likely little effect of entrepreneurs characteristics by itself to startup performance while the organization itself have strong effect (Sandberg & Hofer, 1987).

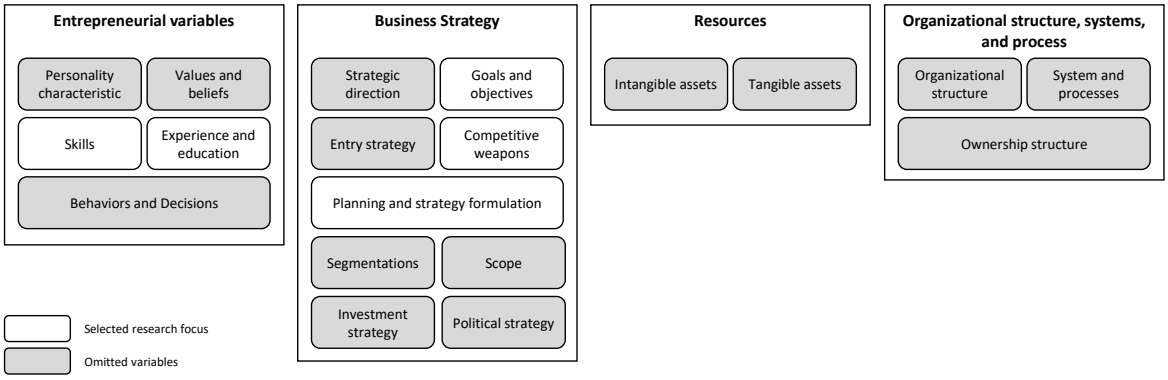


Figure 2.3: Startup elements which influencing startup performance by Chrisman et al. (1998)

As the research will focus on startup as a combination of startup's team and its company entity, the entrepreneur's side of the startup will be selected only for the factors that can be represented as a team level. In this case, from Chrisman et al. (1998) model shown in Figure 2.3, the selected factors or variables are colored in white while the omitted variables are colored in grey. Factors related to the personality of an individual such as personality trait, values, believes, and personal behavior are not included as the level of the analysis in this research are in the team level. Skills and the experience of the entrepreneurs can be used in team level as an aggregate level as used by (J. A. C. Baum et al., 2000) while education will be used as control variables as its value will be more straightforward than the formers. Both of the factors will be mapped in different variables to differ the impact of skills and experiences to startup performance.

In this research, both resources and organizational structures constructs will not be covered. As the unit of analysis will focus on startups which may refer to a very young and newly established company, it will be likely that the startups will not have fixed resources and organizational structures. This probability also stated in Chrisman et al. (1998) report regarding the model as in the early stages. A startup usually is a "one-man" company with little to no resources and no formal organizational structures

and system. Thus, both of the constructs will be omitted from this research. The characteristics of a startup as a young company which may also refer to their lack of detailed company strategy in the early stages. Cooper (1981) defined the early stage startup to have a limited understanding of their company strategy. In this phase, the startup can be considered only to have their goals, objectives, planning, and competitive strategy in hand. Thus, other factors except the three strategies are omitted in the research (Chrisman et al., 1998; Cooper, 1981).

Other than skills, experience, and strategy mentioned above, J. A. C. Baum et al. (2000) emphasized the importance of networks in the early stage of startup development. Startup performance can be enhanced by joining variation of alliances and networks. In this case, network as a company resource is also included in the startup characteristic factor. Thus, based on those initial findings, startup characteristics construct in this research will include experience, skill, network, and company strategy in the initial model as shown in Figure 2.4. The elaborations of each variable will be done in the following sections.

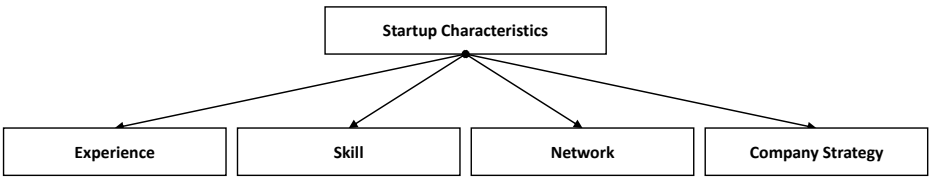


Figure 2.4: Initial startup characteristics category

In this research, rather than use hard facts information on startup characteristic, perception over the startup experience, skill, network, and business strategy will be used instead. The perception whether the startup possesses experience, skill, and knowledge necessary to build a startup will show the company level of self-sufficiency which will be important to set the company into success in the startup phase (Morales-Gualdrón & Roig, 2005).

2.4.1. Experience

Scillitoe and Chakrabarti (2010) highlight business experience of the founder's impact on company behavior in the business incubation. A company in the U.S. with more knowledge and industry experience tend to have fewer interactions with incubator management than other ventures such as in Finland. The importance of industry experience in influencing startup performance has also been explored by Cassar (2014), Soriano and Castrogiovanni (2012), Nielsen (2015), and Peake and Marshall (2009). Cassar (2014) showed the benefit of industry experience to new business performance while showed no support to entrepreneurial or startup experience. Despite the lack of support for startup experience benefit to startup performance, the research suggested to include a various experience of the founders or startups to predict future performance. Soriano and Castrogiovanni (2012) also support the influence of industry-specific knowledge and experience to startup performance as it positively impacts startup productivity. Along with other research, Nielsen (2015), Peake and Marshall (2009), Davidsson et al. (2011), and Chrisman et al. (1998) also support the positive impact of industry experience to startup performance. Industry experience is considered as the most impactful factors to startup performance as it may influence positive impact up to 54% followed by managerial experiences which may lead to improvement up to 40% (Peake & Marshall, 2009). Davidsson et al. (2011) and Chrisman et al. (1998) highlighted the impact of managerial experience to startup performance.

Chrisman et al. (1998) and Davidsson et al. (2011) supported the inclusion of startup and entrepreneurial experience in assessing startup performance. The entrepreneurial experience refers to the company experience in establishing a company or doing any entrepreneurial activities before the establishment of the current startup. Davidsson et al. (2011) shows that entrepreneurial experience can positively and negatively impact the survivability of the startup. The prior successful startup experience will lead to a higher probability of surviving while previous failed startup experience will have an opposite impact. In measuring the impact of experience on startup performance, Davidsson et al. (2011) shows positive impact of Subject Matter Expert (SME) experience to startup profit. Thus, in term of startup experience, there will be four types of experience measured which are managerial, industry, entrepreneurial, and SME experience. The technical experience can also refer to technical knowledge in the area focus of the startup. In this case, Nielsen (2015) shows that technical degree or education have a significant impact on startup performance. A team with a technical academic or degree tends to perform better than a non-technical degree in any industry environments.

The summary of the factors which used in experience variables and its references is shown in Figure 2.1.

Table 2.1: Summary of experience factors and its references

Items	Literature					
	Nielsen (2015)	Chrisman et al (1998)	Gordon & Davidson (2013)	Soriano and Castrogiovanni (2012)	Cassar (2014)	Peake and Marshall (2009)
Working experience in top managerial level		X	X			X
Working experience in the same industry	X	X	X	X	X	X
Experience in entrepreneurial activities		X	X			X
Subject-matter expert or technical experience	X		X			

2.4.2. Skill

To successfully acquire important knowledge provided by business incubation programs, entrepreneurs skill, and ability become an essential factor to be measured (van Weele et al., 2017). How the entrepreneur can absorb relevant knowledge and used provided resources required by their business development will determine how effective the business incubator programs to the startup success (van Weele et al., 2017). Thus, the company skill become one of the critical characteristics to assess the impact of business incubation on startup performances (Albort-Morant & Oghazi, 2016).

The impact of skills to startup performance has been explored in a six years study (J. R. Baum & Locke, 2004). Skill, in this case, refers to the capability of the entrepreneurs or startup to handle the startups through their self-efficacy which influence their company growth. Other research results also supported the positive impact of technical know-how or skill on startup performance. Technical and business skill will help the startup in managing and solving problems which the startup encounters (Vesper, 1990; Simon, 1985; Timmons, 1982). In this case, Stevenson and Jarillo (1990) and Jarillo (1989) emphasized the importance of having a set of specific skills that can help the startup to grow and develop.

Chrisman et al. (1998) stated almost all business skills are influencing startup performance such as financial, communication, interpersonal, managerial,

manufacturing, marketing, organizational, personnel, and technical skills. However, Davidsson et al. (2011) stated only administration/HR and production skills are influencing startup performance. The specification of specific set of skills required by startup to improve their performance and growth also stated by J. R. Baum, Locke, and Smith (2001), Chandler and Jansen (1992), Boyatzis (1982). J. R. Baum et al. (2001) tested both Boyatzis (1982) and Chandler and Jansen (1992) theory that business, managerial, technical, and industry-specific skill indeed have direct impact to startup growth. Thus, in this case, the specific set of skills from the previous research will be mapped into marketing, sales, and business development, finance and accounting, administration, human resource (HR), engineering, technology, and R&D, and operational, production, and manufacturing (OPM) Davidsson et al. (2011). The categorizations of the skill set are used to identify which skills influence startup performance in business incubation process.
The summary of the factors which used in skill variables and its references is shown in Figure 2.2

Table 2.2: Summary of skill factors and its references

	Literature							
Items and variables	Chrisman et al (1998)	Gordon & Davidson (2013)	Baum (2001)	Vesper (1980)	Simon (1985)	Timmons (1982)	Boyatzis (1982)	Chandler & Jansen (1992)
Marketing, sales, and business development	X	X					X	X
Finance and accounting	X	X					X	X
Administration and Human Resource (HR)	X	X	X				X	X
Engineering, Technology, and R&D	X	X	X	X	X	X	X	X
Operational, Production, and Manufacturing	X	X	X	X	X	X	X	X

2.4.3. Company Strategy

A strategy is defined as any action done by a person or a company to achieve its targets or objectives (Wickham, 2006). The strategy influence and drive the performance of the company. Several business strategies can be implemented by startups such as creating product and innovation differentiation (Chrisman et al., 1998; Miloud, Aspelund, & Cabrol, 2012). Furthermore, the clarity of the company objectives and strategy also help to define the approach of the company will take to improve their business and performance (Chrisman et al., 1998). For example, if the company objectives are clear that the company want to focus on increasing and maximizing social value than profit, then this goal may influence the company to be more egalitarian than efficient (Wickham, 2006). Those defined goals, objectives, and strategy are impacting the decision of the company on managing and improving their business and improve their behavior in the business incubation process.

In regards on company strategy, as previously mentioned in section 2.4, early-stage startup mostly have limited knowledge of their business strategy. Thu, in this case, the focus on business strategy factors used in the assessment of startup performance will be company goals, objectives, business strategy planning, and the company competitive weapons (Chrisman et al., 1998; Cooper, 1981).

For a startup to survive, the existence of business goals, objectives, and planning will not have any impacts if the startup does not use it. In this case, the goals and planning need to be clear and doable enough as it may help the startup to be able to assess their performance. The formulation of those strategy documents has proven to help the startup to increase the probability of survival and employment generation (Davidsson et al., 2011). Company competitive weapons refer to company strategy to compete in the market (Porter, 1980). (Teeratansirikool, Siengthai, Badir, & Chotchai, 2013) implied that all kind of competitive strategy would help to improve startup performance especially for company differentiation strategy which shows the strong direct impact on company performance. In this case, the differentiation strategy refers to the company strategy to be stand out in the market with either the uniqueness of the product or with product innovation. Product differentiation strategy will help the startup to enter the market with its innovative and unique products in which cost leadership strategy may not be able to be implemented as startup mostly lack capital power. Thus, this two business strategies along with clear business goals and planning will be the focus of this research.
The summary of the factors which used in business strategy variables and its references is shown in Figure 2.3

Table 2.3: Summary of skill factors and its references

	Literature				
Items	Chrisman et al (1998)	Gordon & Davidson (2013)	Baum (2001)	Teeratansirikool et al (2012)	Porter (1980)
Planning and strategy formulation	X	X			X
Business goals and objectives	X	X			X
Product uniqueness	X		X	X	X
Product innovativeness	X		X	X	X

2.4.4. Network

Another critical factor that influence startup success is the company network size. Company network is one of the vital resources of a young company such as startup in developing their business (Aldrich & Ruef, 2006). By having more extensive networks, the possibility of success also increased as the networks will help to provide resources and knowledge that the startup not yet have. Thus, network become one main criterion in determining the possibility of startup success (Ayatse et al., 2017; Soetanto & Jack, 2013; Aldrich & Ruef, 2006).

Ayatse et al. (2017) studied several factors that can impact startup performance in business incubation programs. In the network aspect, alliance or contact with external experts can be beneficial to startup performance. In regards to connection with external networks, Soetanto and Jack (2013) showed that business partnership with the university and other incubated startup have a positive impact on startup performance.

Furthermore, informal network and technical networks also can support startups development as it may be beneficial to startup performance and growth. Informal network refers to a connection to family, friends, or acquaintances who can be beneficial for startup development and growth. As startup lacks a lot of capital support needed to develop a company, most startup depends on their informal network than their formal network (Birley & Westhead, 1994). The social networks of the startup have been

proven to be strongly beneficial for startup establishment and performance in an uncertain industry and market environment (Birley & Westhead, 1994; Brüderl & Preisendörfer, 1998).

The networks contacts can be divided into weak ties and strong ties. The strong ties consist of closed networks such as spouse, families, friends, and relatives while the weak ties consist of acquaintances, business partners, former colleagues, and coworker (Brüderl & Preisendörfer, 1998). In term of startup development, both strong and weak ties have significant impacts to help startup and grow as they can provide support to startup need. Thus in this research, all possible strong and weak ties will be included in the model. The categorization of the network factors included are shown in Figure 2.5

Figure 2.5: Summary of network factors and its references

	Literature					
Items	Gordon & Davidson (2013)	Baum, Calabrese, Silverman (2000)	Soetanto & Jack (2013)	Ayatse et. al (2017)	Birley (1985)	Brüderl & Preisendörfer (1998)
Well developed informal alliances	x		X		X	X
External business partnership	x	X	X	X		X
Technical project collaborations		X	X			
Joining trade or business associations	X	X				
Customers	X					X
Suppliers	X					X
Capital or funding sources	X					X

2.4.5. Summary of Startup Characteristic Factors

In order to detail down the items included in the startup characteristic construct, all the items developed in each previous variables are gathered and incorporated into the model. All the items used in this research in regards to startup characteristic are shown in Figure 2.6.

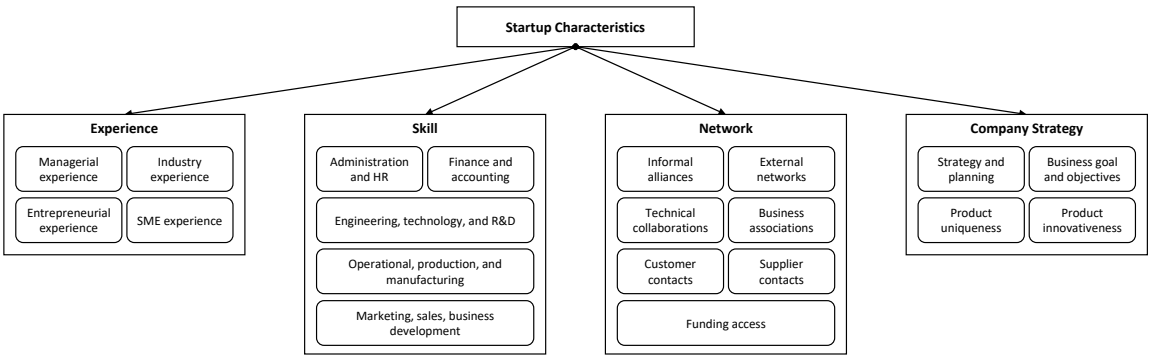


Figure 2.6: Summary of startup characteristics category

The literature review in this section was conducted to help to answer the first

sub-research question:

What is the impact of startup characteristics on startup participation, the perception of importance, perception of effectiveness and startup performance in business incubation programs?

Thus, based on the literature review result, startup characteristic is expected to positively influence the startup behavior in business incubation process and the startup performance. All startup characteristics items such as experience, skill, network, and business strategy have been found to have a positive impact on startup performance. The same effects then also expected to happen to startup performance in business incubation program. The research objectives are to test the positive impact of business incubation programs as mediating factors to startup performance in business incubation program. Thus, the same variables and items are also expected to have positive effects on business incubation programs. To test those assumptions, these two hypotheses are developed to be tested in the final model:

- **H1**: Startup characteristic positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs
- **H2**: Startup characteristic positively influences startup performance in business incubation programs

2.5. Business Incubation Characteristics

New and young companies such as startup lack experiences required to survive in the market (Lasrado et al., 2016). Thus, they need help from an institution that can give them access to the required knowledge, information, and resource. A business incubator is an institution providing startup support services and nurturing them in their business development process. The business incubator also helps the startup to secure resources required to develop their business (Albort-Morant & Oghazi, 2016). Business incubation provides several services such as advisory services (Albort-Morant & Oghazi, 2016),

2.5.1. Business Incubator Definition

To survive the market, most of the startups join business incubators, or another startup supports such as accelerators (Lasrado et al., 2016; van Weele et al., 2017). The business incubator can be described as an institution aimed to provide startups with several services, facilities, and resources to support their developments (Bruneel et al., 2012; Mas-Verdú et al., 2015; Pettersson & Götsén, 2016). Furthermore, business incubators' contributions extend from helping country economic development by supporting and assisting new ventures and business creation such as startup to improving the industry and research ecosystem development (OECD, n.d.). However, how many business incubators can help to achieve the goals depends on how many startups willing to join and participate in business incubators.

Other than the incubator, entrepreneurial companies also seek other external institution to help them survive the market. Angel investor and accelerator are some other startup support mechanisms that also popular in the public (Ian Hathaway, 2016). S. Cohen (2013) highlight the fundamentals differences between incubators and other startup programs such as accelerator. Accelerators tend to create short duration and pre-set period of programs which will lessen the codependency of the startups to accelerators. Compares to accelerators, incubators arrange longer program durations from one up to five years. Furthermore, accelerators tend to cover up the early stage of startup to their early stage of ventures while incubators start from the startup phase until their late stage of ventures.

2.5.2. Business Incubator Model

There are several business incubator model or archetypes developed over time. The common archetypes of incubators are regional business incubators, university incubators, virtual business incubators, independent commercial business incubators, and company-internal incubators (Barbero, Casillas, Ramos, & Guitar, 2012; von Zedtwitz & Grimaldi, 2006).

Common business incubator models implemented are mostly created based on Campbell et al. (1985) and Smilor (1987) business incubation model. Both of the models can be seen in Figure 2.7.

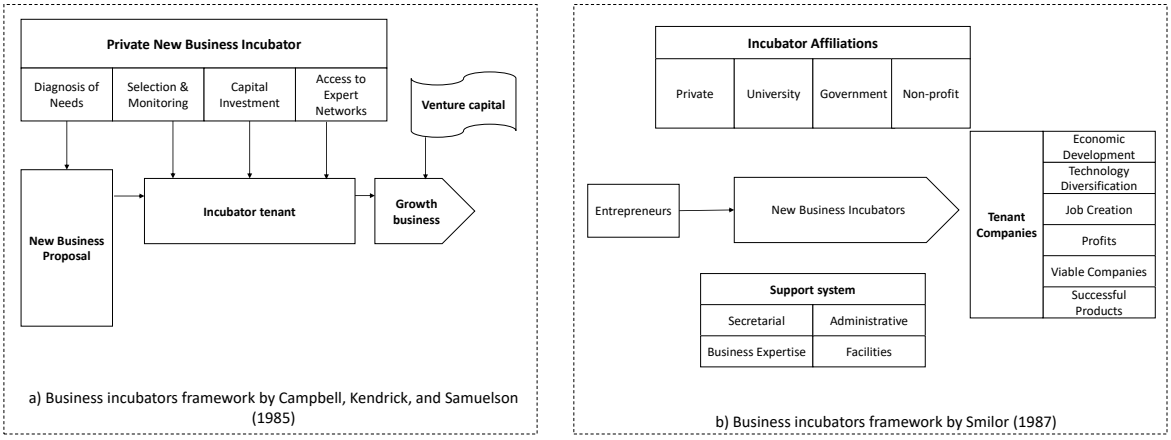


Figure 2.7: Business incubation model by Campbell et al. (1985) and Smilor (1987)

Campbell's business incubation framework was among the first one that visualized the concept of business incubation process and its relation between the incubator, incubated startup, and the incubation process. From the framework, it can be seen that the initial concept of business incubation process is focused on four elements which are the diagnoses of business needs, the selection and monitoring of the tenants, the capital investment, and access to expert networks. As the framework was developed based on survey data, it can be assumed that at the beginning of business incubation development phase, the main elements implemented in the business incubation system is presented by the framework. In later years, Smilor (1987) extended the Campbell's model to create an interaction relation from several stakeholders which are the university, private, government, and non-profit institution. The development of business incubation process continuously happen to include new elements and interaction in the process.

von Zedtwitz (2003) developed a categorization of business incubators into an independent commercial incubator, regional business incubator, and university incubator. Independent commercial incubators refer to incubator which created based on pure profit or commercial objectives. Mostly, an independent commercial incubator is created as a spin-off of venture capital or as an independent organization by entrepreneurs. Regional business incubators are a type of business incubator which established by local government or organization with political and economic objectives to improve local startup community and economic growth. Meanwhile, a university incubator refers to business incubator created and provided by the university to help their student or researcher continue to develop their research idea. Compares to other types of the incubator, university incubator selection process is less stringent and focus more on research rather than the commercial aspect of the business. Company-internal incubator refers to a business incubation system or internal organization that built to cultivate and develop company new idea and innovation. Lastly, a virtual incubator

refers to a type of business incubator that more focus on providing online support and services to startup. Thus, a virtual incubator does not provide physical infrastructure or support (von Zedtwitz, 2003).

The archetypes of the incubators are divided into two levels (Hackett & Dilts, 2004b). First, the incubator is categorized based on its financial sponsors: publicly-sponsored, nonprofit-sponsored, university-sponsored, and privately-sponsored. Second, the incubator is divided by its business focus: property development which is consist of single tenant and multi-tenant, and business assistance such as shared space, low rent, and business support service. Nunberger (2017) highlighted the objectives of the incubators for its categorization.

The categorizations are divided into multi-propose incubators which facilitate any business category and specialized incubators which focus on specific industry or technology. Nunberger (2017) also highlighted a new categorization of incubators such as virtual, new economy incubator, and pre-incubator in the categorization. The common categorization of business incubators is created based on the institution which create the incubators itself and whether it is profit or non-profit incubator. In this research, business incubator model will be determined based on five universal archetypes developed by von Zedtwitz (2003) (Regional business, university, virtual, independent commercial, and company-internal incubators) and its way to generate profit which is profit and non-profit incubator.

2.5.3. Business Incubator Services

In the first creation of a business incubator, the service provided by business incubators mainly consist of office space and shared resources (Bruneel et al., 2012). Along with the development of startup and entrepreneurial activities, the services, and support that business incubator provided also expand to various area. At the time business incubator is not only provide physical and facilities service but also business and skill support such as coaching, training, consultation, funding, and networking assistance (Bruneel et al., 2012; Hackett & Dilts, 2004b; Hansen et al., 2000; Lasrado et al., 2016; Pettersson & Götsén, 2016; Scillitoe & Chakrabarti, 2010; von Zedtwitz, 2003; Albort-Morant & Oghazi, 2016). The assistance and supports are created in order to help the incubated startup sustain and grow their business until they ready to graduate from the incubator (Scillitoe & Chakrabarti, 2010). Thus, the incubators aim to provide "one-stop-shop" service to reduce cost face by the new startup so the startup can improve their survival and growth rate (European Commission, 2002).

As there are no standard or rules on what incubator should offer, the incubation activities, support, and its operations may vary based on the demand or the need of services by the startup (Lasrado et al., 2016; Pettersson & Götsén, 2016). von Zedtwitz and Grimaldi (2006) define the five keys service category of business incubators: physical infrastructures, office support and facilities, access to funding, process support, and networking access. Physical infrastructure refers to office space and shared resources access such as a meeting area and phone access. The office support refers to facilities such as the computer or PC access. The capital access refers to access to funding sources such as an angel investor, venture capitalist, or investor. Process support refers to program and activities for speeding up the business process and development such as coaching, training, and mentoring program. Networking refers to access to required stakeholder or support such as potential customer, partner, or access to professional service such as legal and business consultant.

More straightforward categorization of business incubation services is created by Abduh et al. (2007). Based on its characteristics, business incubation services can be categorized into three main groups which are "facilities related services, counseling and

business assistance related services, and accessibility to incubator networks." The facilities-related services cover all business incubation services related to facilities provided by the incubator. In von Zedtwitz and Grimaldi (2006) categorization, it includes the physical infrastructure and office support.

Other than the facilities provided by the incubator, other aspects such as selection process, working environment in the incubator, quality of services, incubator age, and experience of the business incubator will impact the tenant success and performance in business incubation. Furthermore, the period of startup tenants in business incubation will also impact its business performance and success. Startup tenants should not extend their business incubation period nor leave prematurely (Ucar & Koch, 2016).

Thus, business incubation services and facilities in this research will use Abduh et al. (2007) categorization which is shown in Figure 2.8.

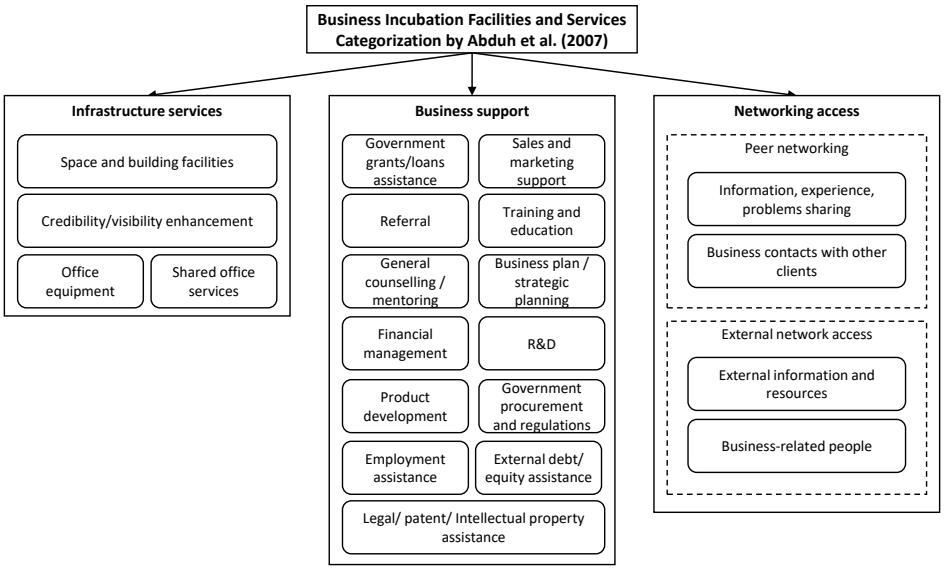


Figure 2.8: Business incubation services and facilities categorization by Abduh et al. (2007)

2.5.4. Business Incubation in Indonesia

Several research on business incubation services has been conducted in Indonesia (Al Mubaraki & Busler, 2011; Hutabarat & Pandin, 2014; Gozali, Masrom, Haron, & Zagloel, 2015; Gozali et al., 2017). Al Mubaraki and Busler (2011) highlight the impact of business incubation program to startup entrepreneurship and business growth in developing country including Indonesia. The research highlight that business incubator indeed has a significant impact on economic development and business incubator can support startup development in a developing country. Meanwhile, Gozali et al. (2017) highlighted the lack of specific research in business incubation ecosystem in Indonesia. In another study, Gozali et al. (2015) tried to develop a new framework for the development of university business incubator in Indonesia. Hutabarat and Pandin (2014) created a new business incubation framework that can be implemented in Indonesia's village. From the available literature, the information regarding the business incubation ecosystem is quite limited, and there are many opportunities to conduct a business incubation study in Indonesia.

Indonesia business incubation ecosystem was firstly developed in 1992 as a collaborative effort between Indonesia governments, cooperative department, and Indonesia

universities (Gozali et al., 2015). The collaborations effort were continued by having the development of entrepreneurship culture program in 1997 which created supportive activities to increase the number of university business incubator in the country. Since then, many efforts have been done by the government to improve entrepreneurship and business incubation ecosystem in Indonesia.

The most recent program to support startup and business incubation program in Indonesia is called Technology Business Incubation (TBI) or *Inkubasi Bisnis Teknologi (IBT)* and Technology Startup program or *"Perusahaan Pemula Berbasis Teknologi"* (PPBT) (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.). The programs were created as the government efforts to help both startup and business incubators in Indonesia to grow and survive. PPBT created supporting programs to only incubated technology startups and created a training development programs for the business incubators in Indonesia. The goals of the programs are to increase the number of startups in Indonesia which also supported by *"Gerakan 1000 startup digital"* or 1000 digital startup movement. The digital startup movement is another collaborations efforts between KIBAR, a startup ecosystem builder in Indonesia, and Indonesia Ministry of Communication and Information Technology to increase the number of digital startups in Indonesia up to 1,000 in 2020 (KIBAR, n.d.). While there are massive projects in supporting startup developments in Indonesia, the efforts which have been conducted are still partial and done separately by each institution and government officials in the country. Thus, the development of business incubation and startup ecosystem in Indonesia still in development phase even though it was started roughly 26 years ago. The findings from (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.) have shown that most of the business incubators in Indonesia are indeed still in developing stages.

Currently, 94 business incubators in Indonesia have been registered through AIBI (Indonesia Business Incubation Association) based on the list provided in the AIBI official website per 2016 (Indonesia Business Incubation Association, n.d.). The number of business incubators has been increased since then. Based on the list provided by AIBI, business incubators in Indonesia mostly consist of university incubator with it covers 70% of total registered business incubators in the country. This number is still similar with the percentage reported in Bank Indonesia (2006) which defined university business incubators in Indonesia covers around 70% of business incubators population.

Business incubation ecosystem in Indonesia is still in developing stage with many business incubators started to keep emerging from university, government, or as a private entity to help startups. In response to this startup and business incubation trend in Indonesia, the Indonesia Government have developed specific regulation to help standardize business incubators in Indonesia. This regulation is created in Presidential Regulation number 27 year 2013 (*PEPRES No 27 Tahun 2013*) about the development of incubator for entrepreneurs and Ministerial Decree of incubator for entrepreneurs number 24 year 2015 (*Peraturan Menteri NPSK No. 24 Tahun 2015*) (Gozali, Masrom, Zagloel, Habibah, & Haron, 2016; Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.). These regulations define the standard definition of business incubation and its standard facilities and services which serve as a guide for business incubators in Indonesia.
To get the idea of how business incubation system is currently implemented in Indonesia, a comparison between business incubation programs in several countries compares to Indonesia can be seen in Figure 2.4.

The data used in the comparison tables are a combination of two Indonesia's business incubation reports Bank Indonesia (2006) and Direktorat Perusahaan Pemula Berbasis Teknologi (n.d.). While other countries data stated from the year 2005 and 2006 and data from Indonesia is using the most recent one, it can be seen that Indonesia's business ecosystem is still lacked behind other countries even when being compared to

Table 2.4: Business incubation services comparison in several countries by Bank Indonesia (2006) and Direktorat Perusahaan Pemula Berbasis Teknologi (n.d.)

	Country				
Category	**European Union****	**Canada****	**Australia*****	**China****	**Indonesia* (Based on minimal business incubation standard)**
Number of business incubator	1,100	100	79	450	94
Stakeholders	Government University Private	Government University Private	Government University Private	Government University Private	Government University Private
Funding sources		Government Soft loan Tenant rent fee	Government	Private Local government University State-owned company	Government Soft loan Tenant rent fee Private
Average number of tenants in business incubator	25	18	12.56	36	minimum 5 people/startups inwall
Average number of employee	6.2	6.5	N/A	20.2	minimum 5 people
Average size of incubator area	3,000m2	1,106m2	N/A	11,475m2	minimum 500m2
Ratio number of incubator staf to its tenants	1:14	N/A	1:3.2 (full time)	N/A	N/A
Survival rate of the graduated tenants	85%	90%	>90%	90%	N/A
Average incubation duration	35 months	36 months	36 months	36 months	36 months

* Data from 2016

** Data from 2006

*** Data from 2005

out-of-date information. From the table shown, it can be seen that the number of business incubators in Indonesia has been lacked behind the other country except for Australia which may also have increased the country business incubators. The stakeholders refer to the type of business incubation owner which has been established in the country. In this case, the business incubation stakeholder in Indonesia is still similar to other countries. Other criteria that different between Indonesia and other countries are in term of the business incubator area. In Indonesia, mostly business incubation facilities have a small area in which why most of them only accept a limited number of inwall startup compares to other country business incubation (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.). In this case, the limitation of business incubation area in the country may also influence the effectiveness of the business incubation services to the respective tenants.

Based on a report from AIBI and The Ministries Of Research, Technology, And Higher Education of Indonesia, there are four models of business incubation system implemented in Indonesia. They are categorized based on its incubators type: university, a state-owned corporation, government institution, and private business incubators. As Indonesia business incubation ecosystem is still in developing stages, many adjustments have been done in order to facilitate startup with better service and facilities.

The model of incubation system implemented in Indonesia are shown in Figure C.1, C.3, C.2, and C.4 in Appendix C while standard business incubation services and facilities offered in Indonesian business incubators based on Presidential Regulation number 27 year 2013 is shown in Figure 2.9. The elaborations of the four models business incubation in Indonesia are shown in Appendix C.

From 2.9, it can be seen that the services offered in business incubation in Indonesia are not that different compares to the one implemented from the general model of business incubation services shown in Section 2.5.3 which also consist of service related to infrastructure facilities, business support, and networking access. Thus, in order to

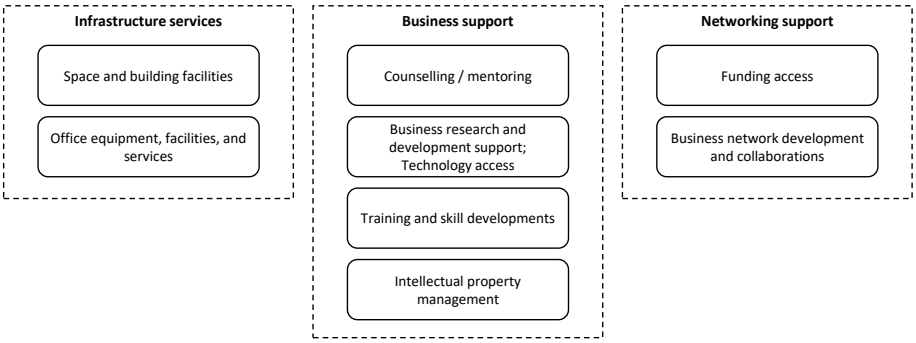


Figure 2.9: Standard business incubation services and facilities offered in Indonesia (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.; Bank Indonesia, 2006) mapped based on categorization by Abduh et al. (2007)

ensure that the model built in the research can represent the generality of the business incubation model, categorization over business services and facilities used in this research will be based on Abduh et al. (2007) business incubation service categorization. The summary of business incubation services and facilities are shown in Figure 2.10.

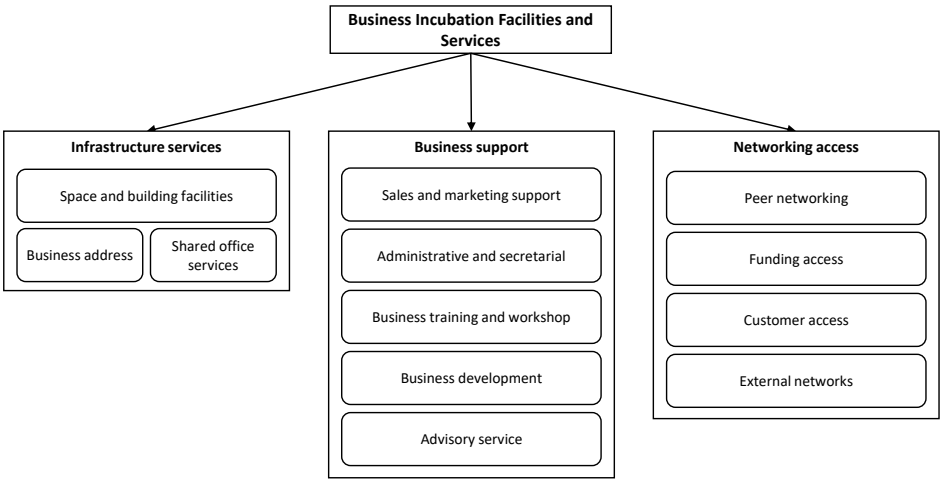


Figure 2.10: Summary of business incubation services and facilities used in the research

2.6. Environmental factors in startup ecosystem

In order to develop, new and young startup need a supportive environment to help them grow (Bull & Willard, 1993). A supportive environment in the entrepreneurial theory refers to the environment surrounding the entrepreneurs which can support the grow of the startup or help to minimize obstacles to the development of startups. The environment can consist of opportunities, resources, competitors and any other contextual factors (Kuratko & Hodgetts, 1998). In this case, several environmental factors may influence how an entrepreneur grow or creating innovation and included in many new venture creation processes.

Environmental factors can also refer to the support of the community in the location where the startup established, the economic factor, the political factor, and also a place where social connection and networks can develop. In business incubation ecosystem,

supportive environment also helps the startup to find balance in managing their Independence while joining business incubation programs (Bhabra-Remedio & Cornelius, 2003). Furthermore, environmental factors have become elements that need to be considered in the entrepreneurial and startup performance research (Bull & Willard, 1993).

The industry effects are one of the most critical environmental factors in new ventures performance research and can impact startup success (Rothaermel & Thursby, 2005; Chrisman et al., 1998; Lasrado et al., 2016). The industry comparison is crucial to show the different level of competitive advantages of the incubated startup (von Zedtwitz & Grimaldi, 2006). The lower the competitive advantages of the startup, the less likely the company will be successful. Thus, it is crucial to map the startup based on the industry structure to understand its possible impact on the research result. An industry with a lot of opportunities and resources will influence the chance of new startup creation (Aldrich & Ruef, 2006; Churchill & Bygrave, 1989).

Chrisman et al. (1998) define three main industry categories which impacting new venture performance: 1) industry structure, 2) industry competition and 3) the nature of buyer and suppliers. In this research, industry structure and industry competition will be merged into one category due to its similarity while the nature of buyer and supplier category will be defined as a separated entity. Besides, the support of government to the environment and industry which stated as of industry structure category will also be defined as separated category due to its importance to shape startup ecosystem.

In the industry structure, many factors can be considered affecting startup performance. Sandberg and Hofer (1987) shows that heterogeneity and industry growth has a significant impact on startup performance. Market with a various product offered will be more accessible to be entered than market or industry with homogeneous products hence increase the probability of the startup to survive and grow. Industry growth rate shows the evolution phase of the industry and will impact on how the startup develops in the industry as the level of competition in the market will also change. The market structure also has a significant impact on startup performance as the level of competition is influenced due to the concentration of the same company in the same industry and how the demand for the product. How market can be profitable for a startup to survive hence influence their performance. An industry with a lot of opportunities and resources will influence the chance of new startup creation (Aldrich & Ruef, 2006). Thus, factors such as industry concentration, the industry profitability, market heterogeneity, product demand, and the industry growth are needed to be assessed to know the influence of industry structure on startup performance.

In the buyer and supplier nature, Karabag and Berggren (2014) shows the significant impact of customer preferences and the supplier power. Suppliers and customers have a significant power to influence the company growth as the company will depend on both stakeholders to survive. Furthermore, the openness of the customer to new product will also influence how the startup survives in the industry. The importance of supplier and customer in the influencing startup performance has also shown in the incorporation of the supplier and customer in Churchill and Bygrave (1989), Ronstadt (1985), and Gartner (1985)'s new venture model.

While the industry, customer, and supplier power in influencing startup and company performance are known, the supporting law and policies also impact startup performance. A supportive industry will also have a supportive state system in it. In the case of the state support system, how the government provides supporting policies and regulation Karabag and Berggren (2014). By having as supporting policies, there will be a comfort in the young company such as startup to grow in the industry (Bull & Willard, 1993). Furthermore, less regulatory changes in the region or area will also help the

startup to be able to adjust to the market and industry condition.

Other than the industry structure, government, and its buyer and supplier aspects, locational factor such as the resources provided in the area is also impacting startup performance (Chrisman et al., 1998; Gartner, 1985). The locational factors have a significant impact on startup performances. Startup in a more advantageous location with more resources and support will likely have superior performance compared to startup in disadvantageous location. The measurement and identification of the locational factors are essential in performance measurement to avoid any bias in inherent negative bias which mostly applied for startup performance using best practice standard (Cheng & Schaeffer, 2011).

In term of locational factors, favorable location is needed for a company to survive (Cooper, 1981). Favorable location means that a location that can help the startup to develop and survive. In this case, the location with access to intangible resources are valuables for startup development. In order to grow, startup need access to a lot of intangible resources such as the research complex, high-skilled worker, and other support services such as professional business services, industrial and science park, and functional financial market (Dornberger & Zeng, 2009).

The summary of environmental factors impacting startup performance is shown in Figure 2.11.

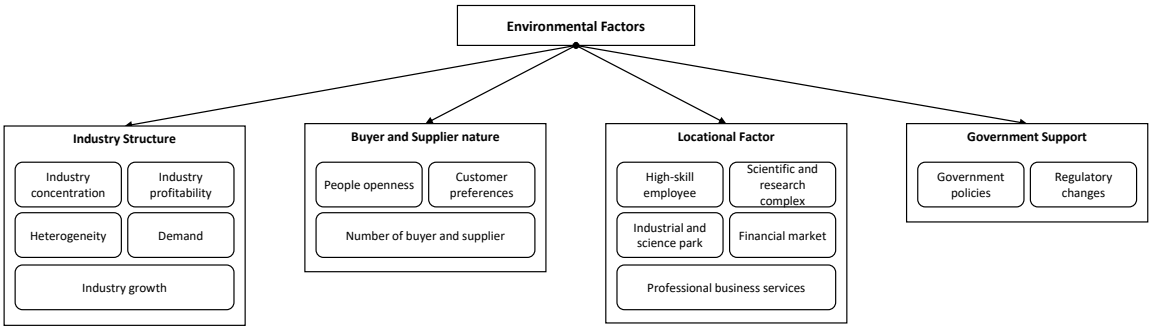


Figure 2.11: Summary of environmental factors category

Based on the literature reviews conducted, three hypotheses can be tested in term of the relevance of the environmental factors and business incubation programs, which are:

- **H3**: Environmental factors positively influences startup characteristics

  Environmental factors help to shape and develop startup both in a stable and unstable environment. Thus, the improvement of environment structures and condition where the startup located may improve and positively influence the character of the startup itself.

- **H4**: Environmental factors positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs

  As environmental factors are known to impact both of startups and its performance (Chrisman et al., 1998; Karabag & Berggren, 2014; Sandberg & Hofer, 1987; Cooper, 1981), the impact of environmental factors on business incubation programs have yet to be tested. As the environmental factors need to be incorporated in the model, the positive relation between the environmental factors to the business incubation process are also expected. If the supportive environment help startup to grow, the same result is expected in the relation of environmental factors to the business incubation process.

- **H5**: Environmental factors positively influences startup performance in business incubation programs

  Several research has been conducted to assess environmental factors impact to startup performance (Bull & Willard, 1993; Chrisman et al., 1998; Karabag & Berggren, 2014; Sandberg & Hofer, 1987). While most of the research supported that environmental factors influence startup performance, the influence of environmental factors on business incubation process interaction the system has yet to be assessed. As the business incubation process is created as intermediary tools in startup development, there may be other environmental factors that be able to influence startup performance in business incubation programs positively. Thus, the relationship between environmental factors to startup performance needs to be assessed.

2.7. Mediating Factors of Startup Performance in Business Incubation Programs

Entrepreneurs will not create any economic value if there is no action done (Mauer, Neergaard, & Linstad, 2017). Thus, company action in this research will refer to the company actions that taken by the startup and impact startup performances.

In an entrepreneurial process, how aggressive the startups to pursue entrepreneurial activities may positively affect the speed of their business realization. By taking and doing many startup activities, people tend to realize their business sooner than the one that does not. The aggressive approach to current opportunities will help to increase startup development and performance (Carter, Gartner, & Reynolds, 1996). As stated by Moore (1986), an entrepreneur in their business venture will focus on improving the company growth. This behavior is influenced by the personal characteristics of the startup and the company characteristics. The personal characteristics refer to education and experience background of the entrepreneur's team while the organization characteristics refer to management practices implemented by the company and other organizational characteristics. Other factors which may positively influence entrepreneurial behavior is the environment aspect such as competition in the business and environmental changes.

Eshun (2009) highlights the business incubation programs as one strategic behavior to improve the company probability of success. Business incubation programs have unlimited potential to help the company improve their human capital, business development, and networks. While the benefit of incubator intervention may be beneficial to the company, many companies have failed in utilizing the benefit of business incubation system. Thus, startup's active participation and resource utilization in business incubation system are crucial (Ayatse et al., 2017). The literature highlights that active participation of the company will likely positively impact the performance of the startup in business incubation. Other than startup willingness to participate in incubation activities, how the startup utilizes provided resources also impact startup performance in business incubation process.

Abduh et al. (2007) highlight startup perspective over importance, effectiveness, and satisfaction to business incubation programs and services. The three aspects will be assessed to understand the impacts of startup perspective on their performance in business incubation as the mediating factors. Startup perspective over business incubation programs are essential as more satisfied startup may see more benefit and impact to their company compared to the one that not feel satisfied and the more the startup feel the benefit of business incubation system, the more they will participate in the business incubation programs (Abduh et al., 2007).

The summary of the possible mediating factors to startup performance in business

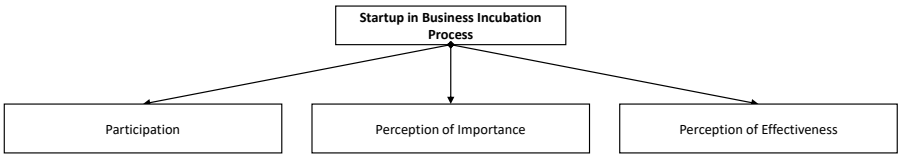


Figure 2.12: Initial business incubation process category

incubation are shown in Figure 2.13.

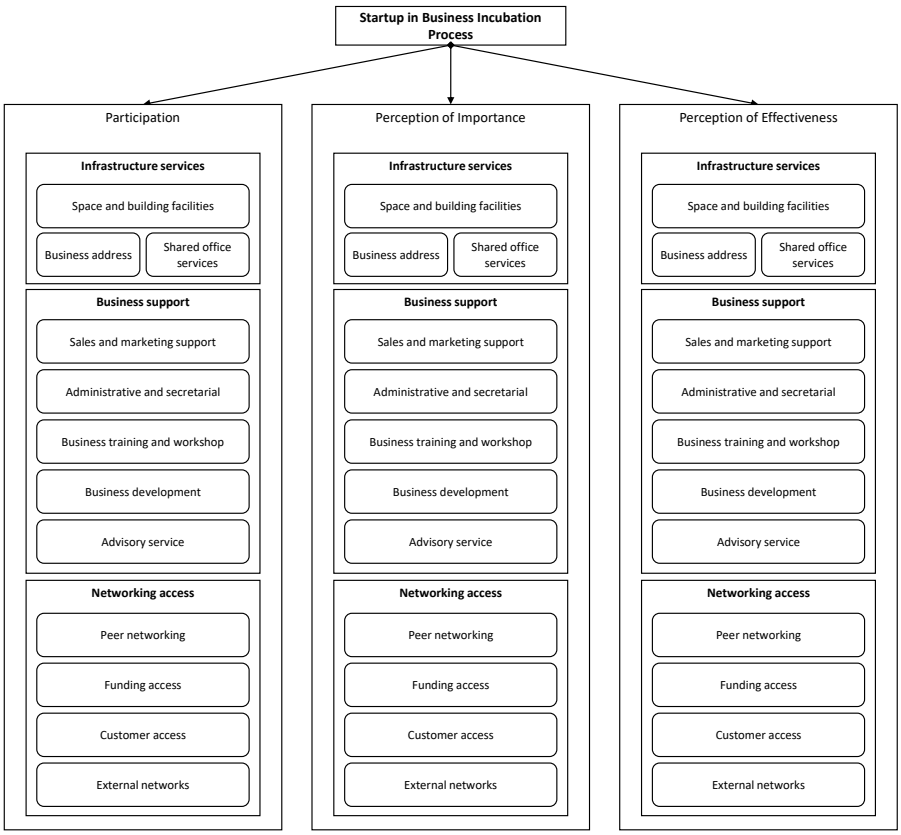


Figure 2.13: Summary of mediating factors in business incubation process

- **H6**: Startup participation, the perception of importance, and the perception of effectiveness in business incubation programs positively influences startup characteristic and startup performance
- **H7**: The perception of importance and the perception of effectiveness positively influences startup participation in business incubation programs

2.8. Measuring Startup Performance in Business Incubation

There are many methods to measure startup success (Moore, 1986). One of the most common is by measuring its performance growth (Carland, Hoy, Boulton, & Carland, 1984). The performance growth refers to the changes that the company perceive when joining business incubation programs. The performance measurements are varied from financially related measurement to non-financial measurements (Ayatse et al., 2017). While the financial measurement is not always possible due to the nature of a startup, several non-financial factors can become an important indicator of business incubation

impact on startup performance. There are several performance measurement criteria used in determining business incubation impacts to startups as defined by Ayatse et al. (2017) and Voisey et al. (2006).

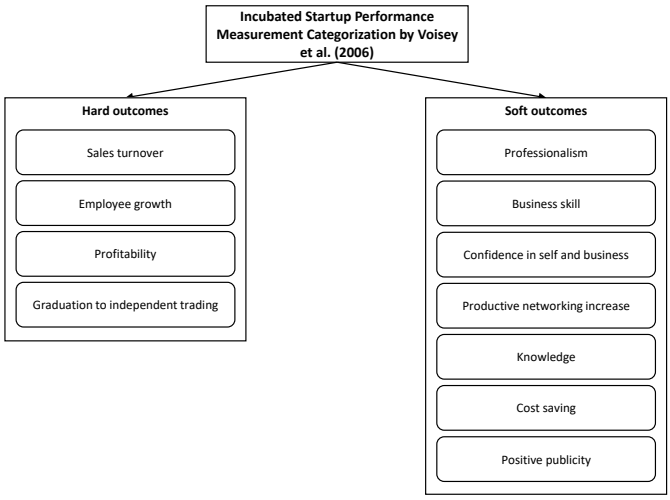


Figure 2.14: Startup performance categorization by Voisey et al. (2006)

While Ayatse et al. (2017) define the performance factors that impacted by incubation programs such as the revenue growth, employee growth, funding raised, and networking building. Voisey et al. (2006) create two categorizations of these measurement criteria as hard outcomes and soft outcomes. The two criteria are created due to startup characteristics as a new young company which uses business incubation to survive and helps to develop their business growth while the financial aspect of the company is not yet functioning. The two criteria will help to assess startup in both financial and non-financial aspects.

The hard outcomes refer to measurement criteria which are objective and can be measured with the same measurement standard. Criteria such as employment growth, sales growth, funding or capital raised, potential profit, and wage growth are used as indicators for many company performances in business incubation and fall into the category of hard outcomes (Amezcua, 2010; Voisey et al., 2006; Ayatse et al., 2017). The employment growth represents the company size growth which is an important criterion to define the growth of startup (Ayatse et al., 2017; Rothaermel & Thursby, 2005). While the startup perspective on their potential financial aspects such as sales turnover, profit, employee wage, and capital raised become the main performance indicators of their business growth.

In the financial aspect, it is crucial to assess the raised capital or funding of the startup during the incubation process. As startup start their company with a limited budget, the growth of the funding raised during the incubation process will determine the improvement of their legitimacy in the view of investors (Aldrich & Ruef, 2006). Stuart, Hoang, and Hybels (1999) said the number of funding support, especially from a venture capitalist, received by the company show the increase of credibility and trust-ability of the startup. Lack of funding during the startup phase will influence other startup performance and even their survivability (Blanchflower & Oswald, 1998). The measurement of the financial aspect is unlikely to be satisfactory. A startup is a very young company which make the startup invest more in new technology development in the early stage of their business and have no revenue (Rothaermel & Thursby, 2005) yet this measurement still becomes main key indicator on how the startup perceives their business growth in business incubation.

Other measurement criteria are the soft outcomes. Soft outcomes refer to measurement criteria which is more subjective such as skill, confidence, professionalism, potential survivability, productivity, time to market, competitiveness, and company networking size. The measurement of soft outcomes will help to determine the growth and performance of startup in zombie-like business. The zombie-business refer to the condition when the company is still operating with stagnant growth and gain no profit. This type of companies are marked as a failure rather than success which the hard outcomes may state otherwise (Voisey et al., 2006; Hackett & Dilts, 2004a).

The soft outcome measurements are essential in determining the growth of startups. As business incubation programs and services are created to help the development of the economy, its impact in improving startups, especially the entrepreneurs, personal skill and business knowledge become the critical value on its involvement to the development of human capital in the country (Voisey et al., 2006). This business skill and knowledge may be applied not only in the current business venture but also in their next future entrepreneurial activities (Hackett & Dilts, 2004a).

Other than the personal skill and knowledge, Gatewood et al. (1995) highlight the importance the growth of company network such as the number of customers contacted and the startup phase progress as the key criteria to determine startup success and define improvement of startup performance (Ayatse et al., 2017; Soetanto & Jack, 2013). (Aldrich & Ruef, 2006) stated that successful entrepreneurs tend to have a diverse network in which most of it is strong ties network. Strong ties network are a type of social ties that in this case refer to people that help the founder create the startup (Clausen & Korneliussen, 2012). In a young company such as startup, it is important to have such networks to help develop their business as it is not possible to do it alone (Aldrich & Ruef, 2006). By improving the network connection and collaboration of the startups, the likeness of the success of the startup will also increase. Thus, it is considered that the networks become one of the key measurement criteria to be assessed in the business incubation process.

The summary of the hard and soft outcomes for measuring startup performance is shown in Figure 2.15.

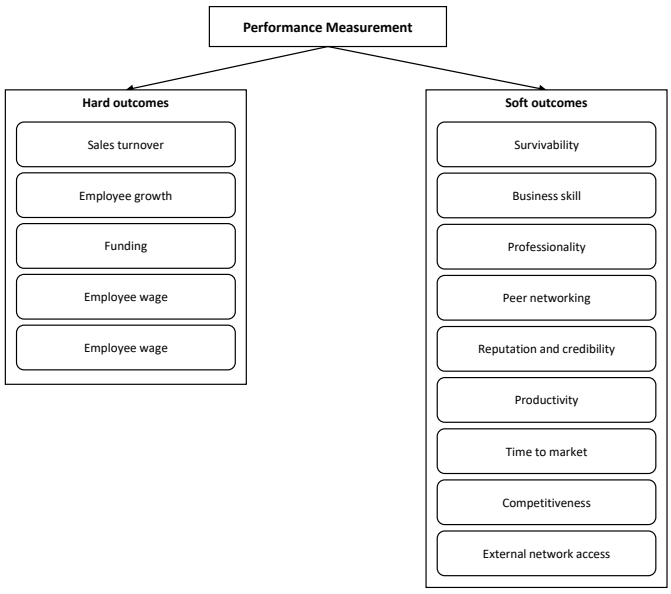


Figure 2.15: Summary of performance measurement category

- **H8**: Startup participation, the perception of importance, and perception of effectiveness in the incubation process positively strengthen the relationship between startup characteristics and startup performance

- **H9**: Startup participation, the perception of importance, and perception of effectiveness over business incubation process positively strengthen the relationship between environmental factors and startup performance

2.9. Moderator Variables

Moderator variables are established to identify whether any other factors can impact the relationship between independent variables to the dependent variables observed. In this case, the moderator variables may influence the strength of the relationship between each variable in the model (Sekaran & Bougie, 2016). In this research, the moderator variables are the continuous demographic data of the startup which mostly used and collected in incubation research.

First is the company age. Begley (1995) use startup age as one of the criteria to distinguish between entrepreneurs and SMEs. Startup age becomes key criteria to distinguish a young and old company. As startup age are usually below ten years old (Kollmann et al., 2015), it will be important to determine the age of the startup to distinguish the startup from a more mature company. Based on the age, the company may have short tenure or goals instead compares to an old and established-company and may behave differently through entrepreneurial and business decisions (Begley, 1995). Company age in term of years of the establishment will influence the entrepreneurial orientation in the company and may hinder company entrepreneurial behavior (Pittino, Visintin, & Lauto, 2017). Furthermore, the age of the startup may also become an indication of startup possibility of failures (Freeman, Carroll, & Hannan, 1983). The incubation duration is also needed to be assessed as it may have a similar impact on startup age. Based on the duration of the startups in the business incubation program, their performance, and perception over the programs may differ.

Other moderator variables are adopted based on demographics data from Davidsson et al. (2011) research which are team gender, the initial number of the employee, the team education background, the location of the company, the ownership type of the company, the initial capital, and whether the company has used business service before joining the business incubation. Davidsson et al. (2011) demographic factors are chosen due to the similarity of the level of unit analysis used in the study which is in the startup or team level.

2.10. Summary of literature review

The literature review which has been conducted to help to develop the measurement model to answer the research objectives and the main research question. The development of the initial model is developed based on several items and factors that can be used to explain and measure startup performance within the business incubation process. All the extracted factors from the literature review are combined into several constructs and developed into the initial model as shown in Figure 2.16. Thus, to build the model, all of the variables and construct need to be tested to each other to know which relationship is significant and need to be included in the model. The detail of all items which are included in the model for questionnaire creation is shown in Figure 2.17.

The initial model will help to answer several sub-research questions and will be combined to answer the main research question by using the survey approach. The complete research questions and its respective hypotheses are shown in Table 2.5.

Based on the model shown, many relationships need to be tested based on the

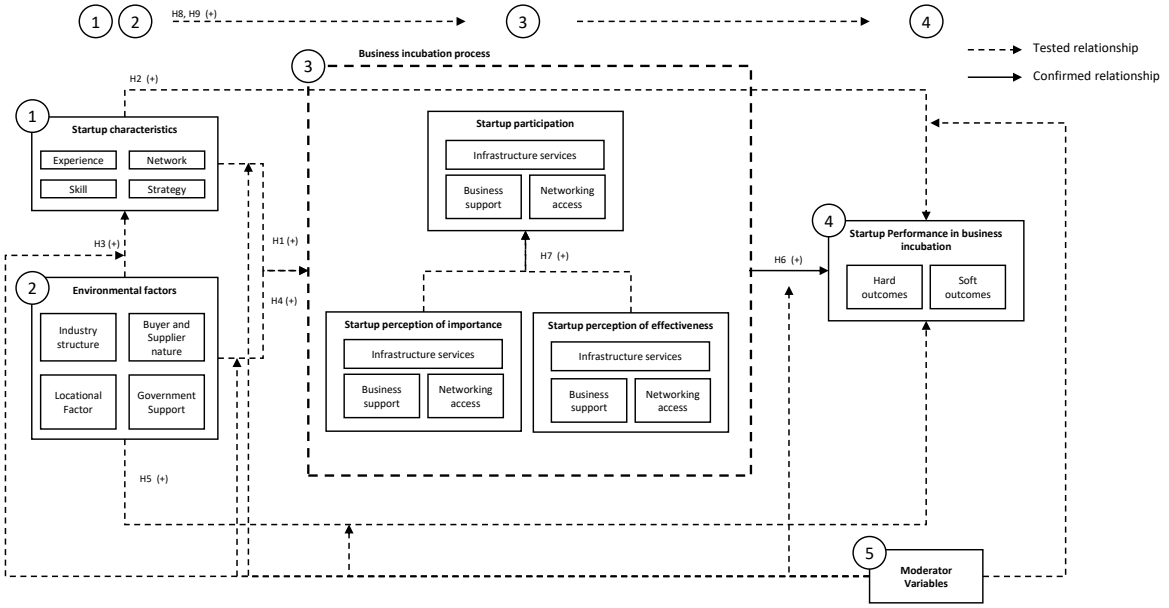


Figure 2.16: Initial conceptual framework

Table 2.5: Research questions and its hypothesis

Question	Hypothesis	Statistical method
RQ: How does business incubation impact startup performance growth in Indonesia?	• H0: There is no impact of business incubation programs to startup performance in Indonesia • Main Hypothesis: Business incubation programs positively influence startup performance in Indonesia	
SQ1: What is the impact of startup characteristics on startup participation, perception of importance, perception of effectiveness and startup performance in business incubation programs?	• H1: Startup characteristic positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs • H2: Startup characteristic positively influences startup performance in business incubation programs	• Partial least squares regression (PLS regression) to test startup characteristics to startup participation, perception of importance, perception of effectiveness , and performance
SQ2: What is the impact of environmental factors on startup characteristics, startup participation, startup perception of importance, startup perception of effectiveness, and startup performance in business incubation programs?	• H3: Environmental factors positively influences startup characteristics • H4: Environmental factors positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs • H5: Environmental factors positively influences startup performance in business incubation programs	• Partial least squares regression (PLS regression) to test environmental factor to startup characteristics, startup participation, perception of importance, perception of effectiveness , and performance
SQ3: What is the impact of startup participation, perception of importance, and perception of effectiveness in business incubation programs on startup performance and how each factors in business incubation programs relates to each other?	• H6: Startup participation, the perception of importance, and the perception of effectiveness in business incubation programs positively influences startup characteristic and startup performance • H7: The perception of importance and the perception of effectiveness positively influences startup participation in business incubation programs	• Partial least squares regression (PLS regression) to test environmental factor to startup participation, perception of importance, perception of effectiveness , and performance
SQ4: What is the mediating effect/the role of startup participation, perception of importance, and perception of effectiveness over business incubation process in the relationship between startup characteristics, contextual factors, and startup performance?	• H8: Startup participation, the perception of importance, and perception of effectiveness in the incubation process positively strengthen the relationship between startup characteristics and startup performance • H9: Startup participation, the perception of importance, and perception of effectiveness over business incubation process positively strengthen the relationship between environmental factors and startup performance	• Partial least squares regression (PLS regression) to test of startup characteristics and environmental factor to startup participation, perception of importance, perception of effectiveness , and performance
SQ5: What are the recommendation to business incubator to improve startup performance in business incubation programs?	-	

hypotheses built from the literature review to answer the research question and sub-research question. As the nature of the research of deductive and exploratory, all

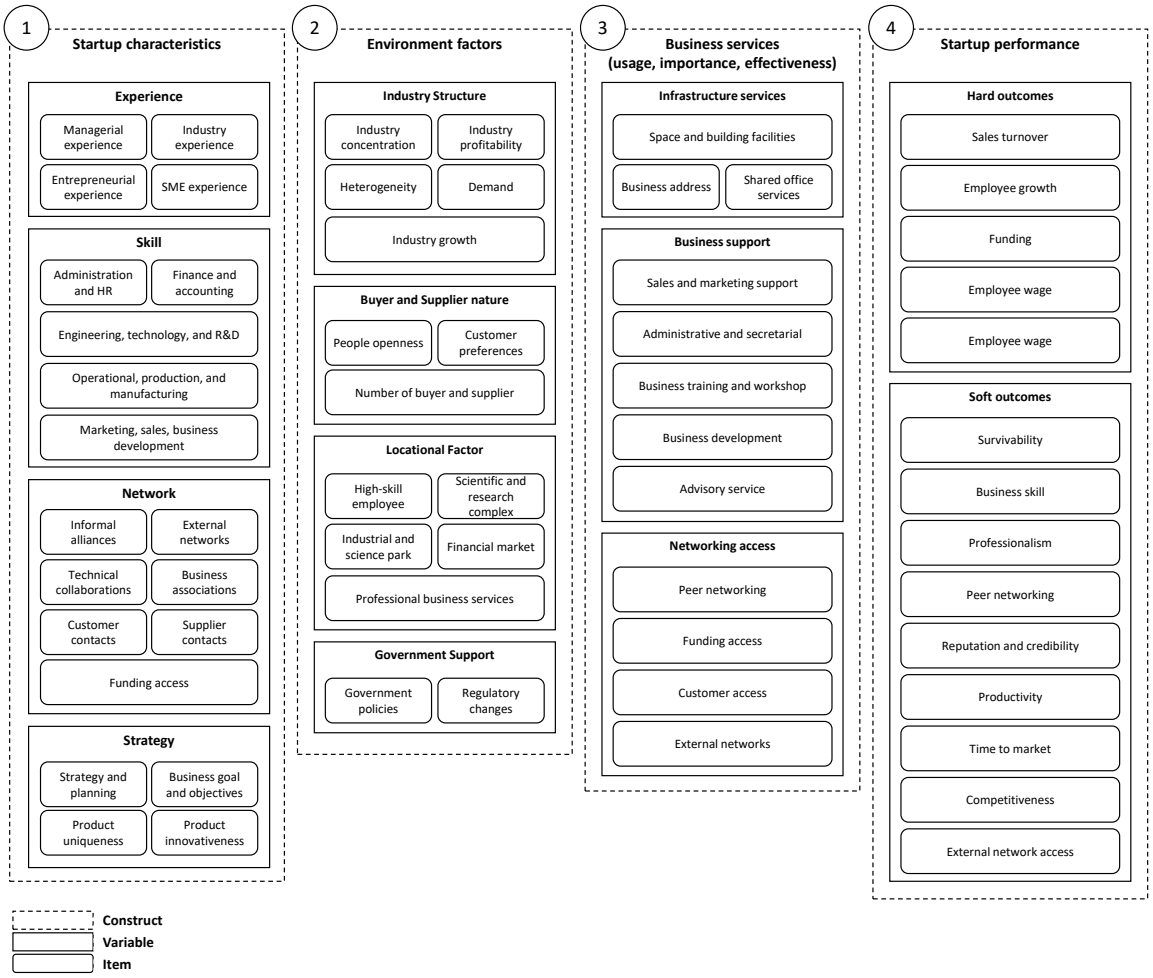


Figure 2.17: Detail items which are included in each variables

the relationship between each of the four main elements will be tested and confirmed by using the statistical process. Thus, all the hypotheses extracted from the literature review are built to test the model relationship. In this model, the fifth elements or moderator variables found from the literature review are added to test whether any other factors may impact the model. The moderator variables will be tested in all direct relationship between each of the variables.

First, for hypotheses 1 and 2:

- **H1**: Startup characteristic positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs
- **H2**: Startup characteristic positively influences startup performance in business incubation programs

In hypotheses 1, the relationship between element 1 or startup characteristics to elements 3 (business incubation process) will be tested while in hypotheses 2, the relation between startup characteristics to performance will be tested. In this process, startup characteristic will be tested to each business incubation construct which as startup participation, the perception of importance, and perception of effectiveness, and will be tested to startup performance as shown in the model. The test result will determine whether a startup characteristic need to be considered in the final business

incubation process model. As shown in the model, the hypotheses support that startup characteristic will positively impact business incubation process in term of startup participation, the perception of importance, and perception of effectiveness and also will positively impact startup performance as shown previously in (Cooper, 1993) model. In this case, the startup characteristic construct will be built from experience, network, skill, and strategy variables. All the variables will also be tested to their relevance to the model and insignificant variables will be omitted in the final model.

For hypotheses 3, 4, and 5:

- **H3**: Environmental factors positively influences startup characteristics
- **H4**: Environmental factors positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs
- **H5**: Environmental factors positively influences startup performance in business incubation programs

In hypotheses 3 and 5, the relationship between element 2 or environmental factors to startup characteristics and startup performance will be tested. This relationship is derived from the Cooper (1993) model that stated environmental factors influence both startup characteristic and startup performance. In this research, the performance tested will be in business incubation context. Hypotheses 4 are a new path or relationship that need to be confirmed. In this relationship, the environmental factors will be tested to business incubation construct which as startup participation, the perception of importance, and perception of effectiveness. As the business incubation process are new elements incorporated into the Cooper (1993) model as its references, the significance of its relationship needs to be tested and confirmed. In this case, the environmental factors are formulated from industry structure, buyer and supplier nature, locational factor, and governmental support variables which extracted from the literature review.

For hypotheses 6 and 7:

- **H6**: Startup participation, the perception of importance, and the perception of effectiveness in business incubation programs positively influences startup characteristic and startup performance
- **H7**: The perception of importance and the perception of effectiveness positively influences startup participation in business incubation programs

In hypotheses 6, the relationship between element 3 or the business incubation process to startup performance will be tested. This relationship is a new path or relationship built to develop the main model of the business incubation process and its impact on startup performance. In this relationship, each of the business incubation construct (participation, importance, and effectiveness) will be tested to startup performance. A new model, the relationship will be tested based on its significance to each other. In this case, the significant path or relationship will be added in the final model.

A new model, the business incubation variables also will be tested from its relationship to each other. In this model, startup participation variables are combined with satisfaction perception of business incubation services which are represented by the perception of importance and perception of effectiveness. In this case, the relationship of perception of importance and effectiveness will be tested to its relevance to startup participation. Startup perception over business incubation services may influence how the startup behave and decide to participate in business incubation programs and services offered by the business incubators.

For hypotheses 8 and 9:

- **H8**: Startup participation, the perception of importance, and perception of effectiveness in the incubation process positively strengthen the relationship between startup characteristics and startup performance
- **H9**: Startup participation, the perception of importance, and perception of effectiveness over business incubation process positively strengthen the relationship between environmental factors and startup performance

After all the direct relationships are tested, the roles of business incubation programs as an intermediary to improve startup performance will be tested. Thus, in the hypotheses 8 and 9, both of startup characteristics and environmental factors as external factors of the business incubation programs will be used as inputs, and the startup performance will be stated as the outcomes. In this relationship, whether business incubation programs genuinely will enhance the input factors will be confirmed. As it claimed, the business incubation programs help to improve several startup performances. Thus in this aspect, the influence of business incubation programs will be positive for the improvement of startup performance within the programs.

The model and the hypotheses will be tested by using statistical analysis explained in Chapter 3.

This page intentionally left blank.

3

Methodology

This chapter covers the data collection process, handling, and methodology to answer sub-research questions 1 to sub-research question 4 in the research by testing its respective hypotheses as below:

- **SQ1**: What is the impact of startup characteristics on startup participation, the perception of importance, perception of effectiveness and startup performance in business incubation programs?
  - **H1**: Startup characteristic positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs
  - **H2**: Startup characteristic positively influences startup performance in business incubation programs
- **SQ2**: What is the impact of environmental factors on startup characteristics, startup participation, startup perception of importance, startup perception of effectiveness, and startup performance in business incubation programs?
  - **H3**: Environmental factors positively influences startup characteristics
  - **H4**: Environmental factors positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs
  - **H5**: Environmental factors positively influences startup performance in business incubation programs
- **SQ3**: What are the impact of startup participation, perception of importance, and perception of effectiveness in business incubation programs on startup performance and how each factor in business incubation programs relates to each other?
  - **H6**: Startup participation, the perception of importance, and the perception of effectiveness in business incubation programs positively influences startup characteristic and startup performance
  - **H7**: The perception of importance and the perception of effectiveness positively influences startup participation in business incubation programs
- **SQ4**: What is the mediating effect/the role of startup participation, the perception of importance, and perception of effectiveness over business incubation process in the relationship between startup characteristics, contextual factors, and startup performance?

- **H8**: Startup participation, the perception of importance, and perception of effectiveness in the incubation process positively strengthen the relationship between startup characteristics and startup performance
- **H9**: Startup participation, the perception of importance, and perception of effectiveness over business incubation process positively strengthen the relationship between environmental factors and startup performance

In order to test all the hypotheses, statistical analysis is required to process the collected questionnaire data. As the research is using quantitative analysis, quantitative data processing and analysis will be conducted starting by defining the construction of the questionnaire, sampling method, sampling strategy, the study setting of the research, the methodology of data collection, data handling, and lastly the data analysis process. All those steps are explained the whole sub-chapter in this chapter.

3.1. Questionnaire Construction

The questionnaire is designed by following sound design principles from Sekaran and Bougie (2016) and scaling methodology by Krosnick and Fabrigar (1997). The questionnaire is designed to cover all hypotheses and research question and demographic data to help categorize and describe the sample characteristic of the research.

The questionnaire is designed mostly to use closed questions. The open-ended questions are only asked at the end of the question as feedback to the research topic and questionnaire. As the survey question's main references are from paper and journal in English while the respondents are Indonesian, the questionnaires are translated to the Indonesian language before distributed to the respondent. Even though the researcher is a native of Indonesian language, validation for the questionnaire is needed. As validation to the language used in the questionnaire, a pilot survey has been done to several Indonesian students in TU Delft with several backgrounds. This pilot survey was conducted to make sure that the language and term used in the questionnaire are understood and also to measure the time taken to fill in the questionnaire. Some adjustments are made based on the feedback from the pilot survey to ensure the reliability of the questionnaire.

The questionnaire is using a 7-scale Likert scale. The usage of the Likert scale is common in social research as it can tap subjective phenomena such as perception, agreement, belief, and the ability of the respondent (Sekaran & Bougie, 2016; Hackett & Dilts, 2008; Krosnick & Fabrigar, 1997). In this case, 7-scale items are chosen to maximize the information gathered from the respondent (Krosnick & Fabrigar, 1997). The usage of 7-scale items in social research is also beneficial in this research, as all of the items tap are subjective measurements from the respondent. The items in the questions are divided into parts which have different but familiar measurement such as from disagree to agree, not important to important, and other similar scales.

The questionnaire is divided into five parts. At the beginning of the questionnaire, an introduction which explains the research is shown along with the confidentiality statement, estimation time to fill in the questionnaire, and the direction to fill in the questionnaire. The first part taps the startup demographic information such as the year when the startup established, initial startup funding, and the startup location. The second part of the questionnaire measures the startup characteristics variables such as startup experience, skill, network, and strategy. The third part of the questionnaire is used to measure the business incubation process experienced by the startup such as startup participation, importance, and effectiveness in business incubation programs. The fourth part measures the impact of business incubation programs to startup

performance. The last part measures the environmental factors experienced by the startup. The developed questionnaire is shown in Appendix A.

The questionnaire is created as a measurement tool only than a comprehensive scaling of the model. Thus, the items selected in the models are chosen based on its importance for the model based on theory and literature found.

3.2. Sampling Strategy

The unit of analysis reflects the aggregation level of the data collected and analyzed in the subsequent research Sekaran and Bougie (2016). In this research, a survey approach will be conducted to incubated startup in Indonesia. In the aggregate level, the unit of analysis will be a startup as individual as the group level will be aggregated and treated as an individual to the primary objectives and target of data collection in the questionnaire research. In this part of the research, incubated startups will be selected at random as representatives of the general startup community in Indonesia.

As the research will use a combination of deductive and exploratory research, convenient sampling will be used in this research. Convenient sampling refers to the collection of information or data collection from any available respondents. As the research will be conducted in Indonesia, the number of active startups are still unknown as there is no updated information regarding established startups in Indonesia. Thus, convenient sampling will be more suitable as it is faster and more efficient in exploratory research (Sekaran & Bougie, 2016).

For the research, sample startup companies were selected from Indonesia startup list in CrunchBase and available incubated startups contacts from business incubator data. CrunchBase is a company database platform which provides not only base information such as the founding year of the company but also the number of the employee and its funding information. List of Indonesia startup has been exported from CrunchBase in November 2017 and contained 849 Indonesian companies including startup and non-startup. In a further filtering process for identifying the startups, the number of the company have been reduced to 219 startups. The data then was complemented with startup contacts from the business incubator in Indonesia and led to 279 number of startup as the population sample in this research.

In the initial step, email and chat have been sent to 276 different startups in Indonesia which targeted company founders and top managers. Thus, there are 82 questionnaires has been gathered during the data collection process and made it as 30% respond rate which represents 15 business incubators in Indonesia. The data collection process is limited due to the lack of data information regarding startup which joins business incubation and due to the period of research which in line with the longest holiday season in Indonesia. Due to the reasons, the number of data collected that can be collected are impacted and hence provide only 82 questionnaire data. However, as the sample collected is more than 30 respondents, the sample is sufficient enough for the analysis (Sekaran & Bougie, 2016). Besides, there are 14 business incubators and 17 startups that respond to the interview request from 30 business incubators contacted.

3.3. Study Setting

In this research, cross-sectional study is conducted. As described by Sekaran and Bougie (2016), the cross-sectional study focuses on data gathering in a specific period to answer the research questions as the representative sample over the data population.

3.3.1. Data Collection

The process of data and information collection are divided to survey and interview.

Survey Research

This research project uses survey research with a questionnaire to collect required information and data. Survey research is a type of research strategy which focuses more on analyzing empirical research in a large number of samples (Verschuren & Doorewaard, 2010). Survey research is chosen due to the condition that the existing literature cannot provide the sufficient information to achieve the objectives as the research over the subject is very limited and spread out to several research topics and area. The step conducted in the survey research can be seen in Figure 3.1.

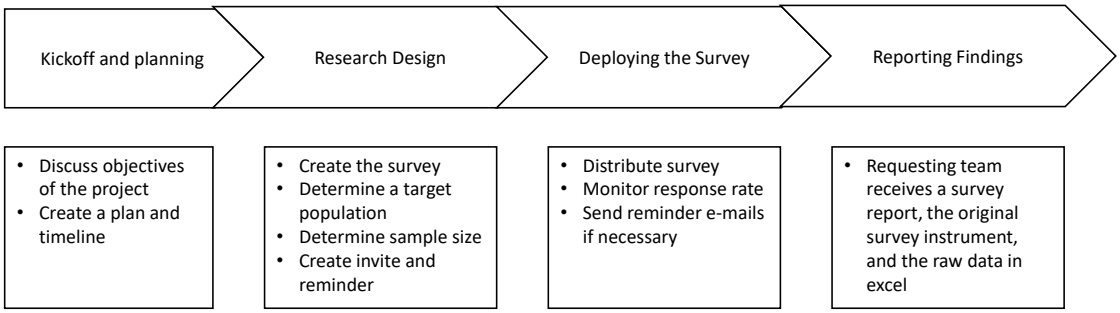


Figure 3.1: Survey Research Process developed by Beebe (2014)

In the initial process, the survey research is planned to make sure that the sufficient number of data will be collected within the research time frame. Along with the planning process, business incubators and startups contacts in Indonesia are gathered through personal connection, website, articles, and CrunchBase database. From the gathered contacts, filtering is done to make sure that the respondent targeted are suitable for the research. After filtering the respondent based on its active contacts and location (Indonesia only), request for the research is sent to the business incubators and startups.

In gathering the required data, concurrent mixed-mode survey approach was used. Concurrent mixed-mode survey approach is a survey approach which combine two or more data collection approach, which in this case is the physically distributed and online questionnaire, and distribute it in the same period of time (de Leeuw & Toepoel, 2018). The usage of mixed-mode survey is to cover potential respondent that may not be available in only offline or online mode and also to improve the survey coverage and response rate. The developed questionnaire was sent to the incubated startup in Indonesia once as cross-sectional research. The questionnaire was sent to the business incubators, and random samples within the selected population are chosen to make sure that the result of the research can be used as general information and profoundly represent the nature of the research objects which are startups in Indonesia. Furthermore, survey research is also chosen to shorten the data collection process and information generation time compared to other data collection strategy.

As the data collection method will use a questionnaire with a large number of data, quantitative processing, and quantitative analysis was used after the data collection

phase. In this process, the questionnaire will cover both the question on variables level and the relation of each variable as developed in the research questions.

Interview

In this research, semi-structured interviews are used to both startup and business incubators to gather more information regarding the startup and business incubation ecosystem in Indonesia. Limited information is available regarding business incubation research in Indonesia (Gozali et al., 2017). Thus, the semi-structured interview will help to fill the gap in the information needed to explain the result of the statistical analysis from the questionnaire. The interview will be used to add additional information which beneficial for the research. In this case, the interviews session were conducted face-to-face with top management levels of the business incubators and startups in Indonesia to ensure that the information gathered is from reliable sources. The questions asked in the interview session for both business incubators and startups are shown in Appendix B.

The detail of the interview session is shown in Figure 3.2.

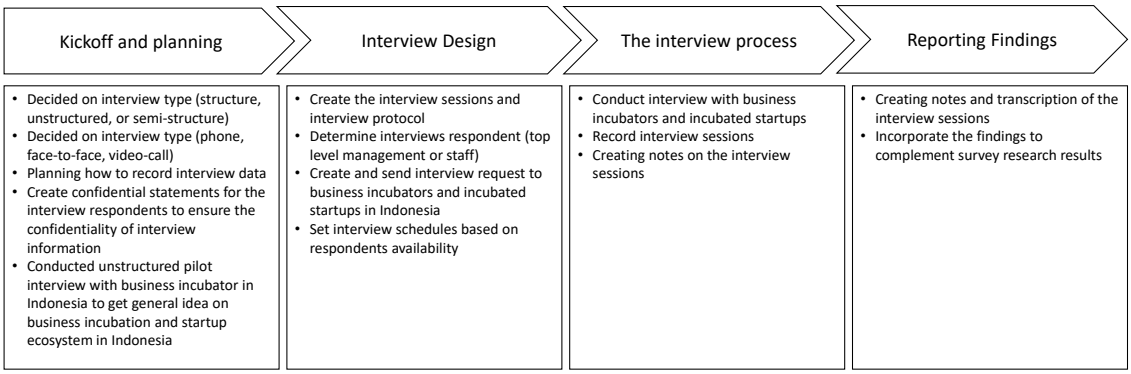


Figure 3.2: Interview process conducted in the research

Similar to the step and process used in the survey research, the interview process is started from planning the interview schedules, gathered relevant contacts, send invitations, and preparing the questions. All the interview are being recorded with the respondent consent. The interview conducted was the semi-structured interview. Semi-structured interview method is used to ensure that the relevant and required information can be gathered during the interview session. Furthermore, other feedback and information can still be gathered when the questions do not cover the topic. The recording then used to validate the answer from the interview sessions and to create a note from the interview session. In the last step, the data collected from the interview is used to complement the data from the literature to interpret the result of the survey research.

3.4. Data Handling

This section will cover the preliminary data handling before the data is processed in the data analysis stage. The data handling processes consist of the collection of the data, data coding, data entry, checking of missing data, outlier, and assumption checking. Each of the data handling processes will be elaborated in the following section.

3.4.1. Collected Data

From the questionnaire that has been sent to business incubators and startups in Indonesia, there have been 82 cases from 15 business incubators in Indonesia have been collected and can be considered as initial valid data. The initial selection of valid data is conducted by filtering the established year of the startup and when they join business incubator by using Microsoft Excel software. There are data entry errors both in established year and year when the startup join the business incubator. Thus, those data are removed before the data analysis is conducted. The data collection process was started from May to June 2018. The questionnaire was divided into an offline and online questionnaire. The offline questionnaire is the questionnaire that has been sent and fill in a physical copy, and the online questionnaire is the questionnaire that has been sent by email or WhatsApp chat to startup and business incubators. There are 64 online questionnaire respondents and 18 offline questionnaire respondents. Based on those respondents response to the questionnaire, the main data processing and analysis will be conducted.

3.4.2. Coding and Data Entry

After the primary research data has been collected from the questionnaire, there is some adjustment, and preliminary data processing need to be done to ensure the data are accurate, complete, valid, and ready to be processed by data analysis tools.

The first step is to code the data into a number so the data can be entered into data analysis tools or the database. This process is known as data coding (Sekaran & Bougie, 2016). In this step, the online and offline data has been merged and treated in one data set. In this step, a simple spreadsheet application such as Microsoft Excel was used to help code the data as required. Some string information such as the incubator, education, initial funding, location, and startup type have to be transformed into a nominal or categorical number to make it easy for processing the data. Furthermore, additional variables are also added such as respondent number, respondent ID, type of the questionnaire (offline or online), province of the company location, whether the company in the urban or suburban area, the incubation duration, and perceived satisfaction of the startup to business incubator services.

In coding the response, demographic variables are coded statistical standard referred from Sekaran and Bougie (2016). Categorical variables in demographic information such as location, education, startup type, initial funding, and incubator are coded by using a nominal scale based on its category. In variables that using a dichotomous scale with ”yes” and ”no” answer such as in question whether the startup still join incubator and whether the startup use professional service outside business incubator are coded by using dummy coding with 1 (as ”Yes”) and 0 (as ”No”).

After the data has been coded and transform, the data was then processed to a statistical application called SPSS version 24 (Statistical Package for the Social Science) which are provided legally by TU Delft and SmartPLS version 3, another statistical software that can be used free for a student (https://www.smartpls.com/).

The coding number and its category value which used in this research are shown in Figure 3.1.

Table 3.1: Coding code used in the initial data transformation

Business Type	Category Value
Private	1
University	2
Government	3

Initial funding	Category Value
IDR 0-50,000,000	1
IDR 50,000,001-100,000,000	2
IDR 100,000,001-150,000,000	3
IDR 150,000,001-200,000,000	4
IDR ≥200,000,001	5

Startup Type	Category Value
BUMN (state-owned)	1
Private company	2
Joint Venture	3
Foreign-owned	4
Company Spin-off	5

Education level	Category Value
PhD/Doctoral	1
Master	2
Bachelor	3
Vocational education	4
Basic education (high & middle school)	5
No formal education	6

Dichotomous question	Category Value
Yes	1
No	0

Questionnaire media	Category Value
Offline	1
Online	0

3.4.3. Dealing with the missing data

Missing data is a typical case in the research (El-Masri & Fox-Wasylyshyn, 2005). Missing data refers to a condition when there an invalid or missing value in one or more variables in the collected data (J. Hair, Black, Babin, & Anderson, 2009). Missing data impacts are not only loss of information but also can lead to a severe problem by creating biased finding and conclusion if it is not handled correctly as the sample of complete observation or cases decreased (Dong & Peng, 2013). Dong and Peng (2013) and (J. Hair et al., 2009) elaborate more on the problems if missing values are not handled correctly. First, as missing value reduced the number of observations and cases for the analysis, it can create a bias in the following data analysis result conclusion. The bias may happen if the ratio of the missing data is quite high or even higher than the case of complete data. Second, the removal of missing cases can also lead to higher standard error and decrease its statistical reliability. Lastly, most of the standard statistical functions and methods are designed for processing and analyzing complete data. Thus, the pre-processing method needs to be completed before the analysis process by editing those incomplete data. Any incorrect methods or procedures taken during this process will lead to a misleading conclusion of the result.

In this research, all questions are expected to be filled in and only have one answer per question. Any violation of those rules will make the answer categorized as invalid or missing. All missing value is left as blank without any transformation to make it easier for the later processing step. Before choosing any method to handle missing data, several steps defined by (J. Hair et al., 2009) are taken to identify the category of missing data in this research.

The first step is to identify if the missing items are ignorable or not ignorable. Based on the first analysis, the missing data are on item CS1 (Company strategy and planning), U12 (Usage of external networks), I12 (Importance of external networks), and Ef12 (Effectiveness of external networks) with each of the items missing 44 cases. As the four items are the main interval data and not demographic data, thus these items can be considered as non-ignorable. The missing data is known to be only for an online questionnaire as those questions not presented to several respondents. At first, the missing data per items are 61 cases which become 244 values are missing. Thus, to reduce this missing value, further contact with the respondents are conducted to reduce

the missing value cases into 44 cases per items which are 176 value. Due to time limitation and anonymous contact given by the respondent, further contacts for filled in the missing data cannot be continued.

The missing data can be stated as not ignorable. Thus, the extent number of missing data should be analyzed. In this research, the number of missing data are recorded quite high for variable CS1, U12, I12, and Ef12 which cover 44 of 80 cases which are 54% of the data per items. The high ratio of the missing case per items needs warrant action to be done to the data. As it is impossible to discard the missing data, some remedy is needed to be done before the primary data analysis process are taken. Based on the initial missing data analysis by using SPSS, from the 80 valid data, 44 cases has one or more missing values. Thus, there are 36 cases with complete data. In the question item side, from 100 items, four items have at least one missing value.

In this case, deletion of cases cannot be done due to the high number of missing data found and deletion of the cases will impact the sampling size which will also impact the next analysis process. As the missing data are gathered only in 4 specific items, the data is not random. Thus When the data is not random, it is advisable to discard the missing data or discard the item from the analysis process (J. Hair et al., 2009). In this case, as sampling size will be a concern if the cases are discarded, then the four items (CS1, U12, I12, and Ef12) then will be discarded. By discarding the four items, no further action should be taken as the data has been checked for completeness and **82 valid case** data are included in the next analysis.

3.4.4. Outlier and Statistical assumption testing

Outliers is a data which have unusually high or low value within an item or a variable (J. Hair et al., 2009). Descriptive statistic features in SPSS software test the outliers. The details on the outliers testing are shown in Appendix D.1. From the outliers testing, there are two cases which have invalid value each in one item. As the number of cases with outlier data is small, both of the cases are removed from the future analysis. Thus, the valid cases which will be processed for the next analysis are reduced to **80 cases**.

In the final check of the data, assumption testing is done to check the normality, homoscedasticity, linearity, and absence of correlated errors. All the process in assumption testing will use SPSS statistical software. All the detail result and process can be seen in Appendix E.

From the assumption testing, the data can be seen as non-normal, heteroscedastic, non-linear, and may produce correlated errors. Thus, for the future statistical test, the data will be handled by SmartPLS program and be treated with non-parametric testing.

3.5. Research variables

In order to analyze the result of the research more robustly, the items in the questionnaire will be combined into variables before further analysis is conducted. In the next analysis, the item will refer to one questionnaire question while variables will refer to one or more items. In this case, all the items will be analyzed whether they are suitable to be used for describing analysis. In this case, all 80 valid cases will be used in determining the item's variable, and reliability is combined in each variable.

In developing the variable and constructs within the research, an exploratory analysis will be used to shape the initial model and align it with the collected data. In this case, the exploratory model building use Partial least squares structural equation modeling (PLS-SEM) method which defined by Becker, Klein, and Wetzels (2012), J. F. Hair, Ringle, and Sarstedt (2013), Hair Jr et al. (2016), and Hair Jr, Sarstedt, Ringle, and

Gudergan (2017). PLS-SEM is a statistical model testing which has been developed based on the OLS regression model in non-parametric context (Hair Jr et al., 2016). SmartPLS is also used due to its capability to handle non-normal and small sample size data (J. F. Hair et al., 2013; Becker et al., 2012). The research objective is to create a model which will predict the impact of business incubation process based on the collected data which is suitable with the objective of the PLS-SEM approach.

In this research, three steps are used to build the final model. The first two model are used to prepare the variables and factors used in the research before the hypothesis testing start. The third step is used to assess the validity of the final model based on the result from the hypothesis testing. The overview of the process is shown in Figure 3.3.

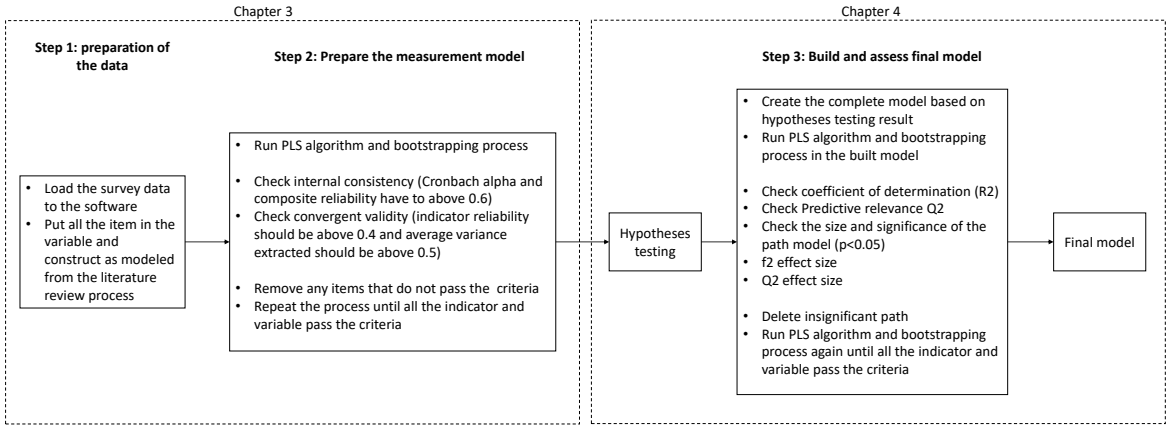


Figure 3.3: Final model building process adapted from Hair Jr et al. (2016)

In the first step, all the data from the previous step will be inputted in SmartPLS software. After that, each of the constructs will be evaluated separately to build the variables based on the theoretical model. In this case, there may be changes or removal of the items in each variable to fulfill the statistical requirement. In PLS-SEM model, this step is called the evaluation of the measurement model (Hair Jr et al., 2016). The evaluation will adjust each construct to be ready before the evaluation of the whole model is tested.

In this step, the validity and reliability of the measurement model will be tested. Second, test the validity and reliability of the structural model. The reliability refers to the measurement of data consistency and stability. While validity refers to a measure to check whether the correlation between factors and variables are as expected (Sekaran & Bougie, 2016). In both of the step, the relation between items, variables, and constructs will be tested by several evaluation criteria stated by J. F. Hair et al. (2013) and Becker et al. (2012). The purpose of these process is to ensure that the theoretical structure between items, variables, and its construct are justified based on the data. In this case, the evaluation criteria of the measurement model will be based on the threshold value of validity and reliability. In the case of PLS model, as it is created not only to assess theoretical model but also to create a predictive model, the validity and reliability check must be done in items to construct level. In the items or measurement model, internal consistency reliability between items in one variable will be assessed by using Cronbach's alpha value extracted from smartPLS software. Other measurement value includes composite reliability, average variance extracted (AVE), T value, and p-value. Composite reliability value measures the variable internal consistency by taking into account different loading extracted from smartPLS. This loading defines the relationship or path strength between an item and its variable. Both Cronbach's alpha and composite reliability should be above 0.6 to be stated as internally reliable (J. F. Hair et al., 2013;

Becker et al., 2012).

In the validity testing, PLS model uses average variance extracted (AVE) value to state the proportion of the variable variance. The variance will define whether the variable shares the same characteristics with the connected items or not. In the case of AVE, to be able to be stated as a valid mode, minimum 0.5 value should be achieved by the model. The minimum AVE value represents that the variable measurement error variance have less variance from the variable and its indicators. T value and p-value, in this case, are referred to significant test which checks whether the connection between the item and its variable is significant or not. A standard value for passing this test is to achieve at maximum 0.05 which represent 95% confidence interval of the data.

After the variables have been validated, the construct will be used for the hypothesis testing to build the final model. In this step, several connections between each variable and construct will be validated to select the relationship model. Single path with more significance and correlations will be selected for the final model. In the last step, the final model will be built based on the hypothesis testing and will be evaluated based on several criteria mentioned in Hair Jr et al. (2016) and Hair Jr et al. (2017). The hypothesis testing and the final model evaluation will be covered in Chapter 4.

3.5.1. Step 1

In this step, all the items from the questionnaire will be inputted in SmartPLS software. In building the variables and construct, all the items will be put in variables and construct based on the initial model extracted from the literature review. The initial model is shown in Figure 3.4. The items shown are less than the model initially build from the literature review process as four items deleted during the data preparation process due to the missing cases issue. The construct tested in this step is divided into six constructs which are the startup characteristic, environmental factor, usage, importance, effectiveness, and performance. The moderator items are not tested in the process as it will not be combined into a variable. The first constructs relation for the hypothesis testing is shown in Figure 3.5. The measurement model then tested and adjusted in SmartPLS software by using its factor analysis mechanism.

Then variables, construct, and final model will be developed by using the smartPLS software. PLS approach is used due to the characteristic of the survey data which are non-normal and have a small sample size which is less than 100 (J. F. Hair et al., 2013). A lot of conventional methods require sufficient sample size before factor analysis, or variable creation are done. Due to this reason, the PLS method is selected in order to get sufficient analysis with the current size of observations. By using the method proposed by (J. F. Hair et al., 2013), an adjusted model is created, and several variables are identified. In this research, an item will refer to question in the questionnaire, while variable will refer to a group of items, and construct will refer to a group of variables.

3.5.2. Step 2

In step two, each of the constructs is tested to adjust their significance to the variables and construct based on the statistical value.

Startup Characteristic

The initial items and variables construction in startup characteristic construct use the items constructed in the initial model shown in Figure 3.4. The connection of each variable then tested in SmartPLS software by using pls algorithm function in the factor

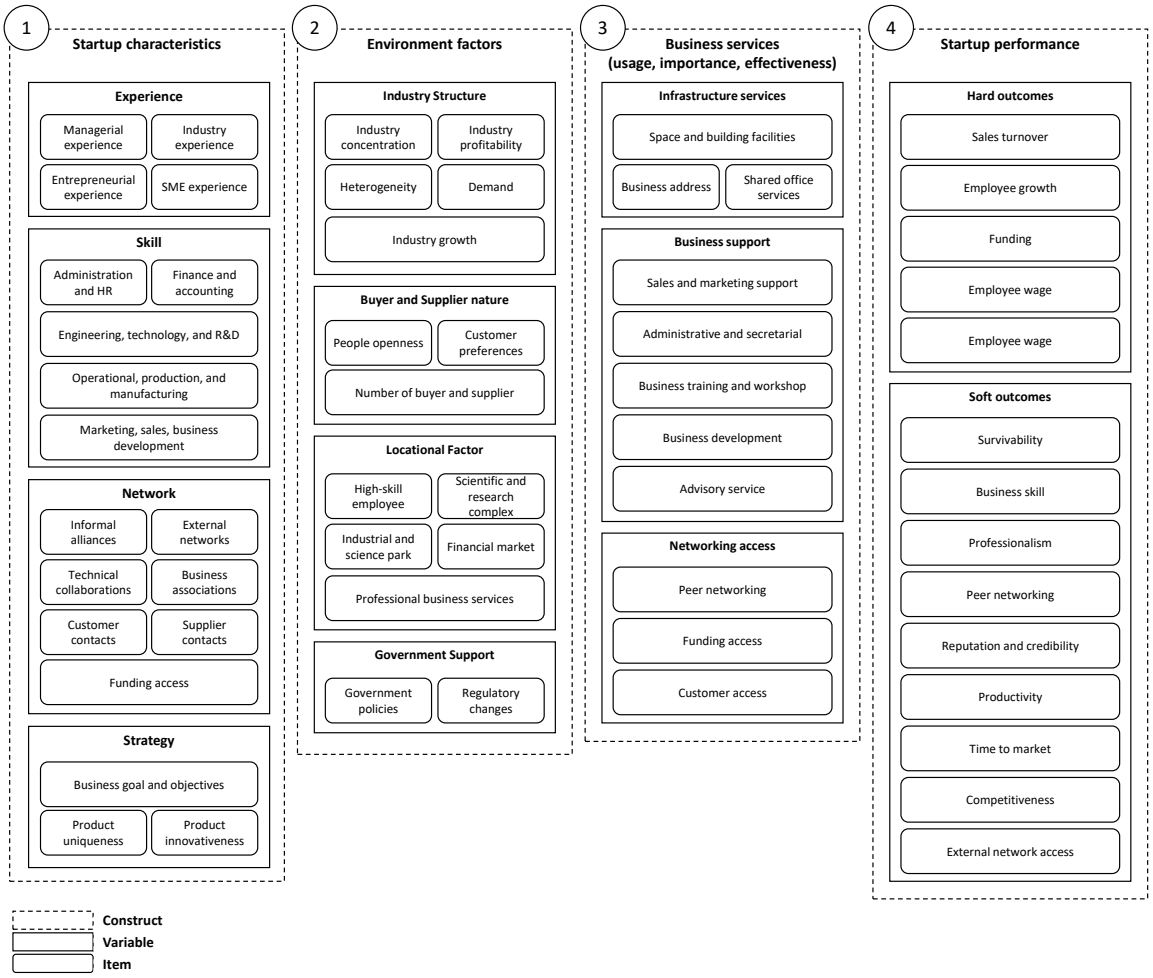


Figure 3.4: Variable formation step 1

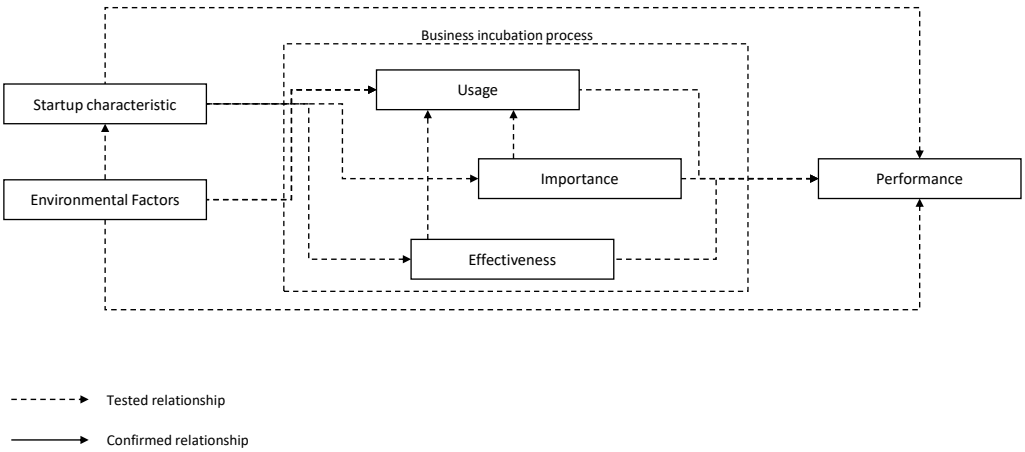


Figure 3.5: Initial relation of each construct

model while the significance testing is tested by using bootstrapping process with 5,000 iterations in the same software. The pls algorithm is developed by Wold (1982) which use weight vectors-based regression in non-parametric testing. The creation of construct uses hierarchical component models or HCM. The usage of HCM model as a construct will

be beneficial for next final model building as it will create a more parsimonious model as the number of relationship in the model will be reduced (Hair Jr et al., 2016, 2017). In the evaluation of the construction model of startup characteristics, evaluation criteria and formula from Hair Jr et al. (2017) are used in this model. The result for initial construct testing is shown in Appendix F.

In the variables levels, all the items have sufficient loadings value with all of the loadings are above 0.4 except items S4 that have little value with 0.263. Item S4 represent Engineering, Technology, and R&D skill of the startup team. While this item is essential, the item has a significant low loading, and the deletion of the item is recommended as long as the content validity of the construct is not reduced while doing so. Furthermore, the skill variables are also removed from the model as it also shows significant low loading to the startup characteristic construct with only 0.166. After running another process of testing, variables Ex1, Ex2, N1, N2, N3, N4 are removed due to issue in cross loading and to improve the AVE value of the construct. Thus, in startup characteristic construct, there are nine items left which are included in three separated variables and has been validated to pass all the criteria of the measurement model. As other than the deletion of several items, other items which left in the model still have the same structure as the initial model. Thus, in this construct, there are no changes in the variables name nor the position of the items in the variables. The final test of the validity of the construct is shown in Appendix F.

Environmental Factors

Similar factor analysis steps are conducted in environmental factors model. The construct was tested by using SmartPLS software. The result of construct testing is shown in Appendix F. During the factor analysis process, there are several removals of the items in the environmental factors construct due to low loadings and cross loading. Furthermore, several items moved to other variables to create new variables. In this process, there are seven items removed and eight items that will be included in the construct. The final result of the construct validation is shown in Appendix F.

In this sense, both item BS2 and IS3 are the single item variables. These both items are to represent the theoretical concept in the model. Item BS2 define the customer preferences of the product in the market while item IS3 represent different product offered in the market by competitors. Thus, both of the items are renamed into customer preferences and market structure respectively. Item LF1, LF5, BS3 also become one new variable. Item LF1 represent professional business services which are offered in the market in the startup location. Item LF5 represent high-skilled employee which are available and attracted by the location. Item BS3 represent people openness to a new product in the market. As all these items represent the support of the location in the human capital development and resources, the variables will be named as human capital support. The last variable consists of item GS1, LF2, and LF4. Item GS1 represent the availability of the government policies to support startup in the location. Item LF2 represent the availability of scientific or research complex in where the startup located while item LF4 represent the availability of functional financial market in the location. As the items still represent the locational factors in which startup operated, the variables name will be kept as it is with a statement that the items included in the variables are different from the one extracted from the theoretical concept.

Business Incubation Process

This section will elaborate on the creation of variables in business incubation process for usage, the perception of importance, and perception of effectiveness.

In the usage of business incubation services, there are three items removed from the model. These items are removed due to the low loading and cross loading issue. In the

final model, there are nine items included for further analysis. Based on the final model constructed in SmartPLS, there is an item position change in the variables which is item U4 to networking variables. Item U4 represent sales and marketing support from the business incubators. While the other items are not changed in the variables, the name of networking access variables are still being kept as it is while the name of business support variables are changed to administrative support as all the items represent the business incubation support in administrative and operational activities.

In importance variables, there are five items which are removed from the construct to achieve the measurement validity of the construct. In this construct, there are no changes in the variables name as the items still be able to represent the variable name even though there are changes in the item position and structure.

As in critical variables, there are no changes in the variables name. There are four items in the effectiveness construct to meet the measurement validity criteria. In this construct, there is only one change in the item position in the variables which is item Ef9 which represent the effectiveness of peer networking in the business incubation. Thus, the name of the variable is kept intact as it is.

The final result of the construct validation for all the business incubation process constructs is shown in Appendix F.

Startup Performance

At the beginning of the variables structures in the initial model, the performance items are divided into two variables which are hard outcomes which represent tangible value or information and soft outcomes which represent intangible value. During the factor analysis process, the correlation between the two variables is quite high, and thus in order to minimalize the collinearity issue, the two variables are combined into one variable as startup performance variables. In this variables, there are five items removed from the model due to cross loading issue.

In step 2, there are a lot of items and variables are removed from the model. This case may be due to lack of the variance in the survey data. Furthermore, each items which included in the variables may also have extreme value identified in the factor analysis step. In building variables for a model, the ratio of the items loaded for factor analysis process to the number of cases should be 1:10 which can not be fulfilled in this research (Hair Jr et al., 2016). Consequently, many items are being removed in this research to achieve the minimal standard of PLS-SEM measurement model. The removed items from the step 2 model are highlighted in Figure 3.6 while the final model from the measurement model evaluation is shown in Figure 3.7. Both of the figures show the comparison of the factor analysis result. The final model from the measurement evaluation will be used in the hypothesis testing in the next chapter.

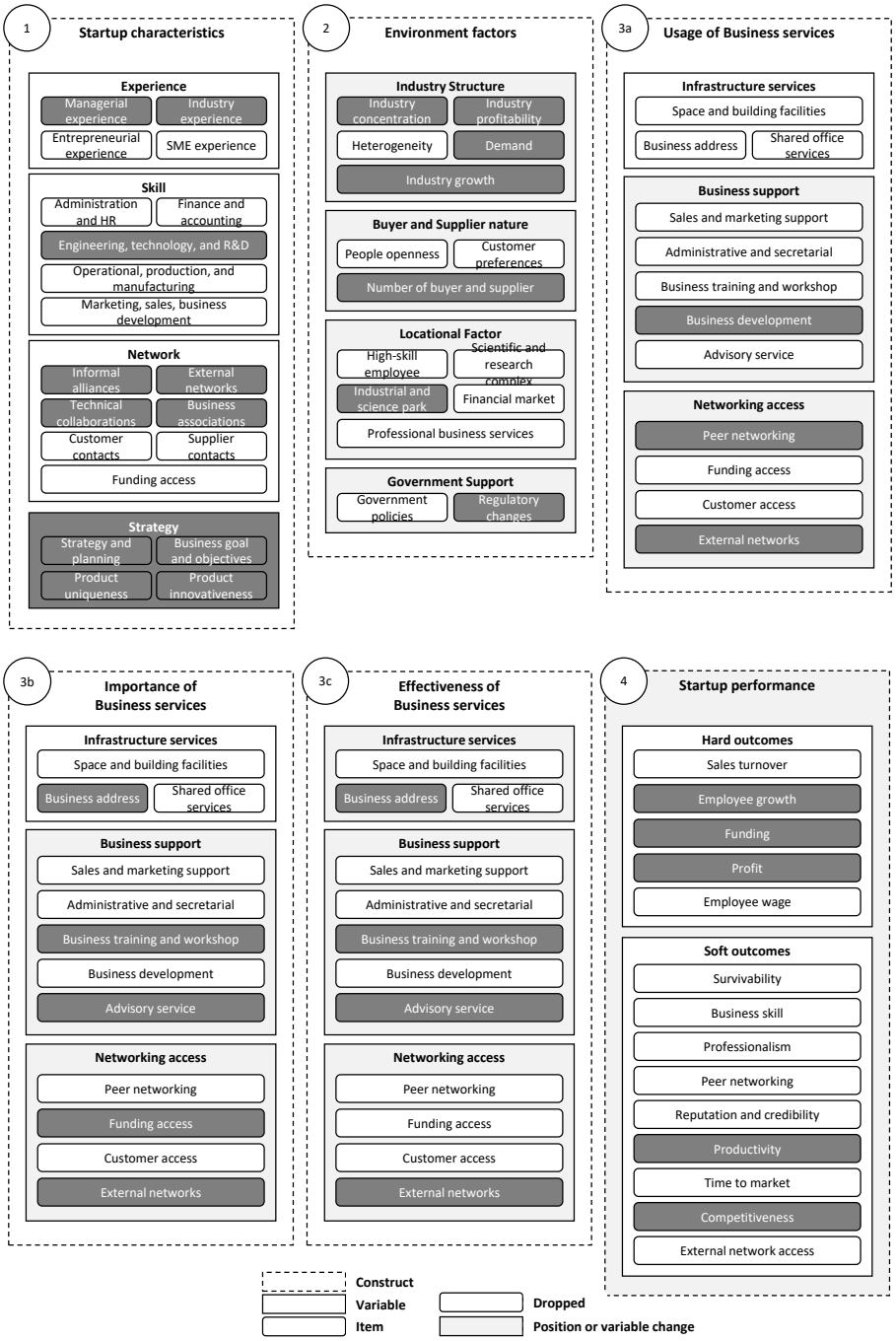


Figure 3.6: Removed variables and items highlight

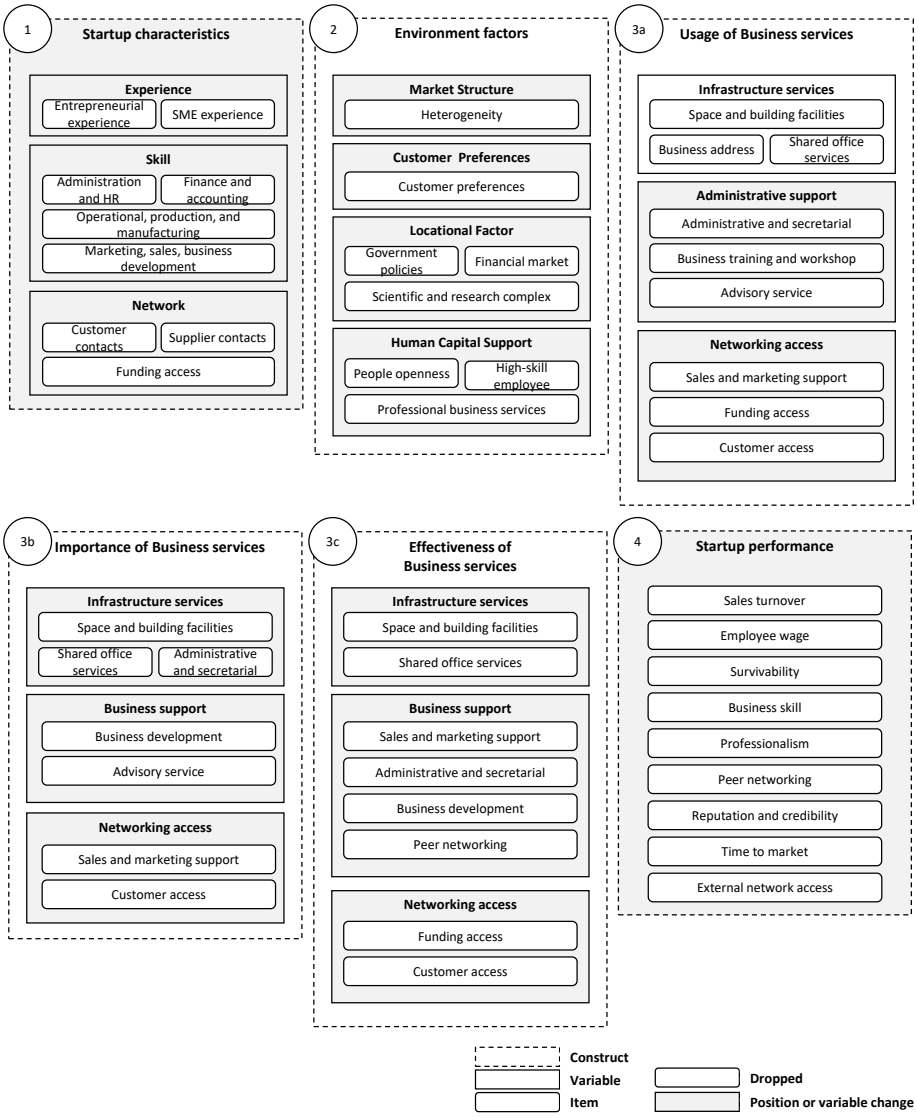


Figure 3.7: Variable formation result from step 2

3.6. Data Analysis

The data analysis section will only cover the primary data collection for this research which is the questionnaire. Information from the interview will only be used to complement the literature information about Indonesia startup and business incubation ecosystem. Mainly, the questionnaire data will be processed using data analysis tools. A data analysis tool is a software used to process and analyze data in the statistical method and technique such as correlation test, validation test, regression test, and other data analysis method (Sekaran & Bougie, 2016).

After the required data from the questionnaire are collected, the analysis of the data will be conducted to answer the research questions and objectives. The data analysis will be conducted based on quantitative data analysis developed by Sekaran and Bougie (2016). In the initial steps, preliminary actions will be conducted to ensure the accuracy, completeness, and relevancy of the data (Sekaran & Bougie, 2016).

As shown in the first phase of preliminary data analysis, the data has been prepared for further analysis. In this phase, the data has been coded, entered, and edited. Data coding refers to a process to assign a number to the respondent's response. Data coding phase is necessary to be able to enter the data into the database to be analyzed in the next phase. The data entry consists of the process of putting the data into the database system or applications. The last phase of data readiness preparation consists of editing the data to make sure that there are no errors, illogical, inconsistent, or illegal data inputted in the questionnaire data. In the next phase of the preliminary analysis, the data is visualized as checking the tendency of the data. In this phase, the relationship between variables is also assessed.

In the last part of the preliminary analysis, reliability and validity of the data will be checked. The reliability refers to a measurement of data consistency and stability. Validity refers to a measure to check whether the correlation between factors and variables are as expected (Sekaran & Bougie, 2016). The step of the validity and the reliability testing for the measurement and structural model conducted in this research are shown previously in Figure 3.3 in has been elaborated in Section 3.5.

Based on the result shown in Appendix F and the criteria previously stated in Section 3.5, in the measurement model, the reliability and validity of the model are sufficient as it mostly passes the criteria. The internal consistency reliability value of the constructs represented by its Cronbach Alpha value all have bigger value than 0.6 with the highest is on the effectiveness construct with 0.845. All the composite reliability of the constructs have also passed the minimal criteria with all the value are bigger than 0.6 and all in the satisfactory level based on Hair Jr et al. (2016) criteria. The validity of the constructs is checked by using convergent validity which is represented by average variance extracted value (AVE). From the shown result, all the construct's AVE value are bigger than 0.5. The result shows that the construct at least can explain higher that 50% variance that of its indicators (Hair Jr et al., 2016).

Meanwhile, the reliability and validity of the structural model will only be validated when the final model has been developed in Chapter 4. The result of the reliability and validity of the measurement model and the structural model will be shown in Appendix F and Appendix I respectively.

After the preliminary data check is conducted, the gathered data and information then will be checked based on hypotheses developed. The result will be analyzed whether the data support the hypotheses developed or the result create a new perspective on the given literature and hypotheses. The detail of the hypothesis testing result will be elaborated in Chapter 4.

4

Result and Analysis

This chapter will cover the data analysis and research result elaborations. In the first section, the research demographic information will be discussed as the initial result of the research. The second section will explain the data analysis process that will be conducted in this research. After that, the results of the hypothesis testing will be shown and explain to answer the hypothesis built in the previous chapter. Then, the hypothesis testing result will be used to build a final model to answer the main research question.

4.1. Survey Result

From the data collection process and preliminary analysis, 80 valid data has been analyzed for initial data overview based on the research demographics items. Several overviews of the collected data can be seen in Figure 4.1 and 4.2.

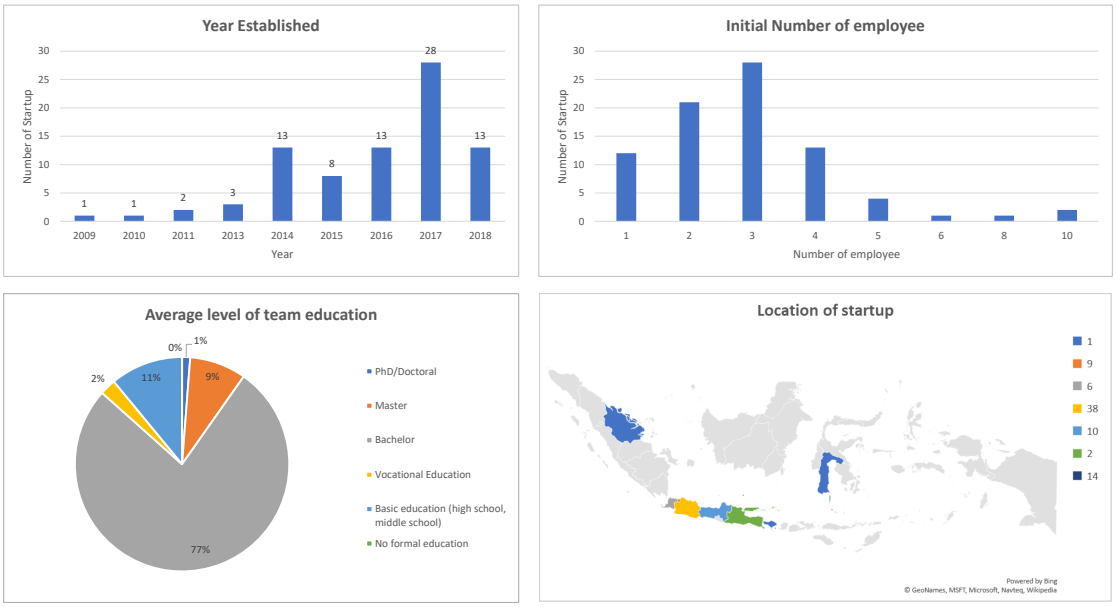


Figure 4.1: Overview of demographic data (age of the company, number of initial employee, average level of startup team education, and location of the startup)

In Figure 4.1, it can be seen that the respondents are a mainly young startup that mostly started in 2017. Some definition such as EU defined a startup as a company

which younger than ten years (European Commission, 2002). As shown in the demographic data, in Indonesia, the startups mainly consist of young companies which started within three years. The number of the initial employee also show that most of the startups in Indonesia are started by a single person or by a small group of people. Thus, this information will imply the smallness effect of the startup as a young company with a limited number of human resources in the next analysis.

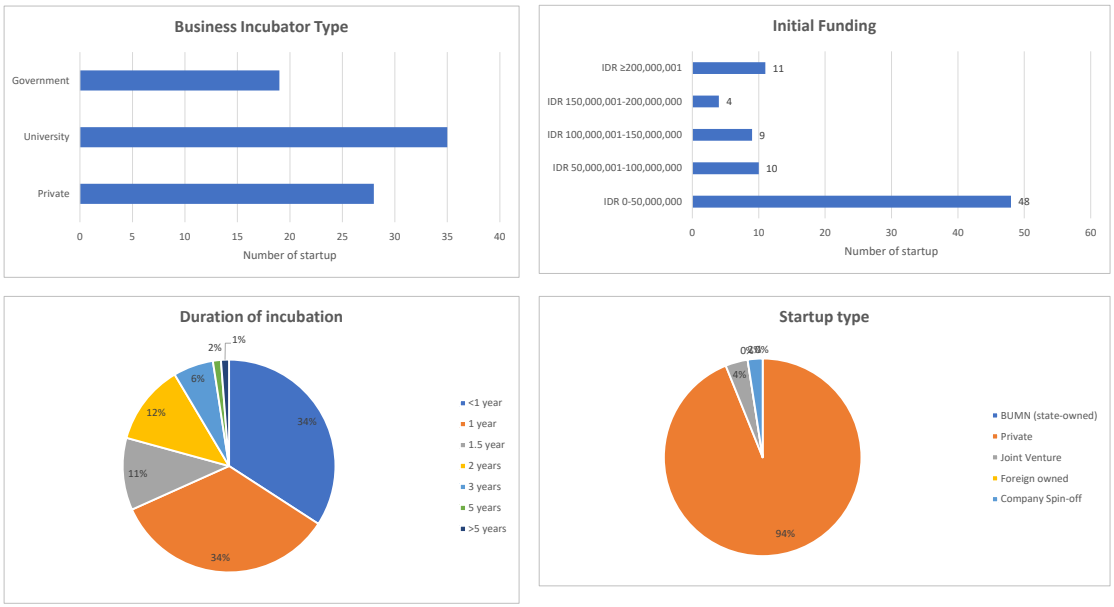


Figure 4.2: Overview of demographic data (business incubation type, startup initial funding, duration of incubation, and startup type)

In Indonesia, the standard duration of established business incubation programs is three years (Bank Indonesia, 2006). Some business incubators would have several adjustments with their incubation duration if they perceived that their startups are not yet ready to be independent. Several offers are made by those business incubators such as one-year free extension program or paid extension program (by paying rent fee or by adjusting the contract to include revenue sharing with the business incubators). Others business incubators create a strict procedure to limit their incubation duration only as stated in the initial contracts. Thus, startups which cannot develop within those periods will be pushed out by the business incubators as it perceived as underperformed startups. These approaches are used mostly by private and young business incubators as they have limited resources and prefer to open new seat to other new and promising startups other than continuing to support underperformed startups (Bank Indonesia, 2006; Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.).

Other information also can be seen in Figure 4.2. University started business incubations programs in Indonesia as a contribution to help develop young entrepreneurs in the country (Gozali et al., 2017). Thus, until now, business incubators mainly consist of University incubators followed by private business incubators that currently keep increasing day by day in the country. When startups start their business, their initial funding usually is limited and have a low number of the employee. Startups in initial stage mainly survive from their internal funding or external funding from competition or business incubators. This funding is insufficient to help the company grow to survive.

Based on the demographic data shown above, the research samples are not distributed

normally. For example, in the case of startup type as shown in Figure 4.2, the samples are dominated by private startups and mostly come from university business incubators. Furthermore, the samples are also not distributed normally in term of initial funding and incubation duration as shown in Figure 4.2 and the initial number of employee, year establishment, the level of education, and its location as shown in Figure 4.1. Thus, the data show that the level of variance in the samples are quite low and may impact to the generalization of the data as it can not represent not only the whole incubated startup community in Indonesia but also incubated startup in general. After all, in the initial testing in the normality assumption, the data has been marked as non-normal with low variance and homogeneity case. The complete information of the descriptive information of the data can be seen in Appendix D while the assumption testing result in Appendix E.

Thus, to solve the generalization issue, along with the survey result, the data analysis process will be complemented by interview results of 14 business incubators and 17 startups in Indonesia. The insight from the interview process will help to complement the research's finding as Indonesia's startup ecosystem may give a different perspective than other developing or developed country. Furthermore, the survey and interview result will also be complemented with a further literature review to increase the validity and generalization of the result.

4.2. Data Analysis

The data analysis section will cover the main data collection and data analysis based on the questionnaire result. Information from the interview will be used to complement the literature information about Indonesia startup and business incubation ecosystem. The beginning of the data analysis process has been covered in Chapter 3 and had produced the measurement model for the hypothesis testing. The hypothesis testing will be used to build the final model used for answering the research question and research objectives.

In this chapter, the final relation model will be built from the relationship of each constructed tested on the hypotheses testing result. Hypotheses built in this research are created to build the final model of the impacting factors in business incubation process. All the relation will be referred to a path in this chapter which represents the connection between one variable or constructs to other variables and constructs. As the research is a combination of deductive and exploratory research, all the paths tested in this research are originated from theory with new elements incorporated into the new model which is the business incubation process. In the model, there may be more than one path available for connecting to other variable or construct. Hence, the path with higher loading or correlation will be chosen for building the final model. All criteria used in the reliability and validity testing in this research are referred to Hair Jr et al. (2016) and Hair Jr et al. (2017).

After the relationship model for the analysis process has been built and validated, analysis on the model will be done to answer the sub-research question, the main research question, and the research objectives of the research. The statistical approach and its related research questions are shown in Figure 4.1.
The model is shown in Figure 4.3 is the adjusted model from the initial relation model in Chapter 2. After the measurement evaluation from Chapter 3, there are several changes implemented in the model such as the removal of strategy variables from startup characteristic construct, and the changes of variables name in startup usage and environmental factors construct. In this model, the hard outcome and soft outcome variables are also combined into one variable which is the startup performance. This model will be used as the guidance for the hypotheses testing.

Table 4.1: The association of research question, hypothesis, and its statistical approaches

Question	Hypothesis	Statistical method
RQ: How does business incubation impact startup performance growth in Indonesia?	• H0: There is no impact of business incubation programs to startup performance in Indonesia • Main Hypothesis: Business incubation programs positively influence startup performance in Indonesia	
SQ1: What is the impact of startup characteristics on startup participation, perception of importance, perception of effectiveness and startup performance in business incubation programs?	• H1: Startup characteristic positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs • H2: Startup characteristic positively influences startup performance in business incubation programs	• Partial least squares regression (PLS regression) to test startup characteristics to startup participation, perception of importance, perception of effectiveness , and performance
SQ2: What is the impact of environmental factors on startup characteristics, startup participation, startup perception of importance, startup perception of effectiveness, and startup performance in business incubation programs?	• H3: Environmental factors positively influences startup characteristics • H4: Environmental factors positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs • H5: Environmental factors positively influences startup performance in business incubation programs	• Partial least squares regression (PLS regression) to test environmental factor to startup characteristics, startup participation, perception of importance, perception of effectiveness , and performance
SQ3: What is the impact of startup participation, perception of importance, and perception of effectiveness in business incubation programs on startup performance and how each factors in business incubation programs relates to each other?	• H6: Startup participation, the perception of importance, and the perception of effectiveness in business incubation programs positively influences startup characteristic and startup performance • H7: The perception of importance and the perception of effectiveness positively influences startup participation in business incubation programs	• Partial least squares regression (PLS regression) to test environmental factor to startup participation, perception of importance, perception of effectiveness , and performance
SQ4: What is the mediating effect/the role of startup participation, perception of importance, and perception of effectiveness over business incubation process in the relationship between startup characteristics, contextual factors, and startup performance?	• H8: Startup participation, the perception of importance, and perception of effectiveness in the incubation process positively strengthen the relationship between startup characteristics and startup performance • H9: Startup participation, the perception of importance, and perception of effectiveness over business incubation process positively strengthen the relationship between environmental factors and startup performance	• Partial least squares regression (PLS regression) to test of startup characteristics and environmental factor to startup participation, perception of importance, perception of effectiveness , and performance
SQ5: What are the recommendation to business incubator to improve startup performance in business incubation programs?	-	

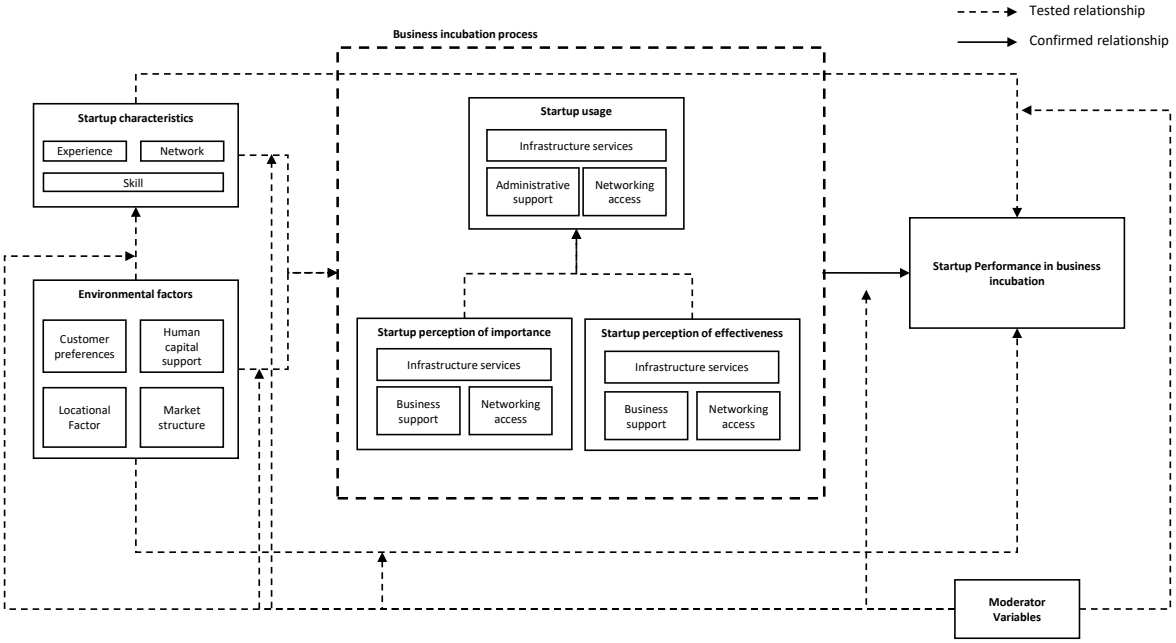


Figure 4.3: Overview of hypotheses and its respective relation path between each construct

4.3. Steps on model building and hypothesis testing

In this chapter, all relationship model for answering hypotheses 1 to hypotheses 9 question will be tested. Thus, this section will explain the step of the hypotheses testing result which will be elaborated in the next section. All the path tested in this chapter is shown in Figure 4.4.

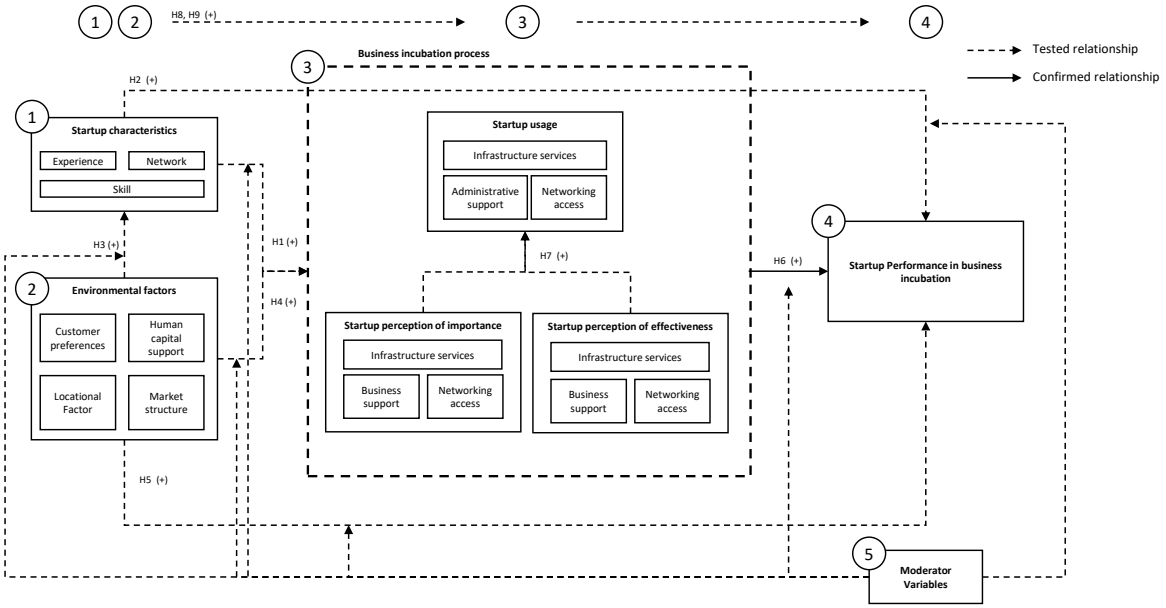


Figure 4.4: Overview of hypotheses and its respective relation path between each construct

The structure of the hypothesis testing will follow the sequence number of the hypothesis.

Thus, as shown in the Figure 4.4, the first hypothesis testing will be around the relationship between startup characteristic to both business incubation process and startup performance. In this step, the startup characteristics path's relation to each of the business incubation process (usage, importance, and effectiveness) and startup performance will be tested. The effect of moderating variables in each of the paths will also be tested.

In the second stage, the relation of the environmental factors to startup characteristic, the business incubation process, and startup performance will be tested. Similar to the first testing stage, in this step, the environmental factors path's relation to each of the business incubation process (usage, importance, and effectiveness) and startup performance also will be tested. The effect of moderating variables in each of the paths will also be tested.

In the third stage, the relation between each business incubation process construct (usage, importance, and effectiveness) are tested to startup performance. In this step, the relation between importance and effectiveness to usage construct will also be tested. As with any other path testing, the effect of moderating variables in each of the paths will also be tested.

In the fourth stage, the mediating effect of business incubation process to startup characteristic and environmental factors to startup performance will be tested. The mediating effect of each construct will be tested one by one in its relevancy with startup

performance.

Finally, in the last stage, the result from previous stages will be used to develop the final model. The final model then will be tested as a structural model by combining all the tested constructs and its relation to one model. The one final model then will be used to identify the most significant variables and factors to startup performance in business incubation programs.

4.4. Relation between startup characteristics to startup participation, perception, and satisfaction

This section will cover the first stage of the testing and will answer both hypotheses 1 and 2 which is shown in Figure 4.5.

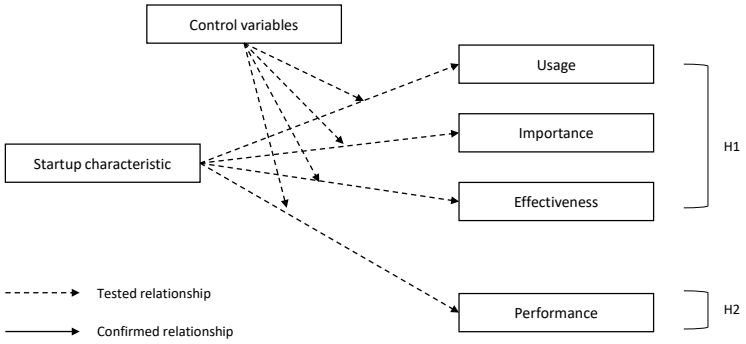


Figure 4.5: Overview of hypotheses testing for H1 and H2

The explanation of the result of the data to answer both of the hypotheses are as follow.

4.4.1. Startup characteristic impact to business incubation process

This section will test hypotheses one as follows:

- **H1**: Startup characteristic positively influences startup participation, the perception of importance, and perception of effectiveness in business incubation programs

In this research, startup characteristics construct defined by three variables which are startup team experience, startup team skill, and startup team network access or contacts. In this research, all the items measured as based on the startup top managerial team perspective. Thus, all the measurement over intangible aspects such as experience and skill should be cautiously analyzed. As entrepreneurs, startup shares the same characteristics with other entrepreneurs. In this case, how startup perceive their resources and ability will impact their action, intention, and decision making over their business. How the startup utilize the facilities provided by the business incubators will be perceived as dependent variables which will be impacted by their characteristic.

Based on the interview insight from 17 startups in Indonesia about how their utilize the facilities provided by business incubators, the startup decision mostly affected by their perception of the need to use the business incubation facilities. If the startup perceives that the business incubator or business incubation service does not provide what they need, they will not utilize the service, even though, it may benefit them in the long run. The challenge of a young company such as startup to keep progressing day by day force

startup to efficiently use their time to activities which are more beneficial for them. Moreover, their knowledge about the business incubation and business knowledge in general also have a significant impact on their behavior within the business incubation process. Startup with more knowledge over the importance of business, training, networking, and access will utilize business incubation services more than the one that has little knowledge over business incubation in general.

Hypotheses 1 is tested by using PLS algorithm in SmartPLS software while the significance of the paths is tested by using bootstrapping features in the same software. The bootstrapping create an estimation of the sampling properties distribution from available sampling data. The statistical result from this testing is shown in Figure 4.6.

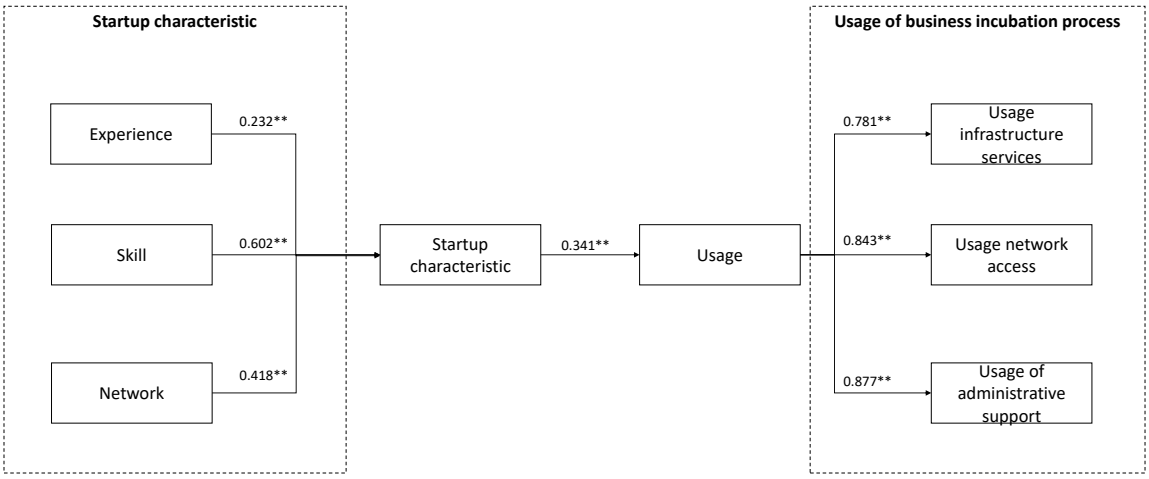


Figure 4.6: Startup characteristics impact to business incubation service usage

Figure 4.6 show the path relationship between startup characteristics to startup usage or startup participation in business incubation facilities and services. Based on the figure shown, it can be seen that startup characteristic have a significant relationship with startup usage or participation in business incubation services. The path coefficient shows the correlation link between each construct in the structural model (Hair Jr et al., 2016). In this relationship, it can be assumed from the model that startup characteristic have a positive impact on startup participation in business incubation programs. As PLS-SEM is mainly used for prediction purpose, based on this model, it can be assumed that an increase in startup characteristic value will increase the usage of business incubation service up to 0.341 times from the increase of startup characteristic value level. J. Cohen (1988) defined categorization of the path coefficient model for behavioral research into small (0.1), medium (0.3), and large (0.5). Behavioral research categorization is used as the data measured in this model was based on the perception of the respondent over their capability, the perception, and the agreement over the items measured. In this model, it can be stated that startup characteristic has a medium impact on startup usage in business incubation programs.

As startup characteristic consists of three variables which are the startup team experience, skill, and network, all the three variables relation to startup usage or participation in business incubation program has also proven as significant. Table 4.2 show the total effect of each startup characteristic variable to startup usage variables.

Based on those result, it can be seen that all variables from startup characteristic have a significant positive impact on each of startup usage variables. Moreover, it can also be seen that in term of impact to startup usage in business services that background skill of

Table 4.2: Path coefficient and significant testing for startup characteristic impact to startup usage of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	Experience	0.062	2.835	0.005	[0.021-0.105]	**
		Network contacts	0.111	2.986	0.003	[0.038-0.183]	**
		Skill company	0.266	3.004	0.003	[0.082-0.428]	**
	Usage network	Experience	0.067	2.868	0.004	[0.022-0.112]	**
		Network contacts	0.120	2.988	0.003	[0.039-0.194]	**
		Skill company	0.173	2.950	0.003	[0.05-0.281]	**
	Usage of Adm	Experience	0.069	2.868	0.004	[0.022-0.115]	**
		Network contacts	0.125	3.000	0.003	[0.039-0.2]	**
		Skill company	0.180	2.972	0.003	[0.05-0.287]	**

the company has the most influence with 0.266 impact level to startup usage of infrastructure facilities. The skill variable is consists of marketing, sales, business development, finance, accounting, administration, HR, operational, production, and manufacturing skill. The skill, in this case, represents the perception of the startup team knowledge which has been measured by using 7 points Likert scale. From the table, it can also be seen that each of the variables are less impactful as separated variables than when they are combined as one variable which is startup characteristic. All the separated variables have a low impact only on startup usage in business incubation services. In this case, it can also be assumed to create a higher impact on startup usage in business incubation services, all the three variables in startup characteristic need to be considered.

Moderation analysis is also conducted in these model to test the impact of several moderator variables extracted from the literature review on the relation between startup characteristic to startup usage. The moderator analysis approach in this model use features provided by SmartPLS software. In this case, the moderator variables will impact the strength of the relationship between variables. The result from the moderation testing is shown in Figure H.4 in Appendix H.1.

The moderation testing result shows that there no significant impact of the moderator variables into the relationship between startup characteristic to startup usage. This result means that there are no differences in the strength in the relation between startup characteristic to startup usage when the value of the moderator variables are changed.

Different results are shown for the impact of startup characteristic on both the importance and effectiveness of the business incubation process as shown in Figure H.2 and Figure H.3. In this research, effectiveness value will be used to represent satisfaction as the relation between satisfaction and effectiveness are quite related, and the usage of effectiveness score rather than satisfaction in the measurement will help to avoid respondent bias and subjectivity (Gatian, 1994). Based on the statistical result, both of the constructs are shown not to be impacted by startup characteristics (with low path coefficient from startup characteristics to each variable in both constructs which range from -0.057 to 0.086). The detail on these findings are shown in Appendix H.1.

Based on the bootstrapping testing result as shown in both figures, there is no significant correlation of startup characteristic to both the perception of importance and perception of effectiveness in business incubation programs. In order to analyze whether each of separated variable has a different impact than when combined into one construct, the total effect of each variable will be assessed. The total effects for both startup importance and effectiveness are shown in Figure H.2 and Figure H.3 in Appendix H.1.

Total effects to importance and effectiveness variables are also tested as shown in Figure H.2 and H.3 in Appendix H.1. Based on the value of the total effects between variables, a similar result from the model are shown in the table. All the variables in startup characteristic have no significant impact or influence on both startup perception of importance and effectiveness in business incubation programs.

Another test was done to test the moderation effect to both path from startup characteristic to the perception of importance and perception of effectiveness. The result for the moderation tests are shown in Figure H.5 (in Appendix H.1) and in Figure 4.3.

Table 4.3: Testing of moderator variables effect to startup characteristic relationship to startup effectiveness of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup characteristic - Effectiveness	Education	-0.028	0.191	0.848	[-0.239-0.335]	-
	Female employee	-0.377	1.343	0.179	[-1.19--0.098]	-
	Incubation duration	0.387	2.000	0.046	[0.021-0.769]	*
	Initial employee	-0.106	0.589	0.556	[-0.323-0.36]	-
	Initial funding	0.022	0.160	0.873	[-0.257-0.249]	-
	Male employee	-0.140	0.796	0.426	[-0.435-0.218]	-
	Startup age	-0.150	0.735	0.462	[-0.709-0.078]	-

While there is no impact of moderator variables on the perception of importance, there is an impact of moderator variable on the relation between startup characteristic to startup effectiveness as shown in Figure 4.3. In this case, the relation between startup characteristic become significant when influenced by incubation duration. The incubation duration variable refers to how long the startup joins the business incubation program. In this case, by including the moderation effect of incubation duration to the path, the relationship between startup characteristic to the perception of effectiveness become positive with 0.387 moderating effects. This result means that high or low level of incubation duration will strengthen or weaken the path between startup characteristic to the perception of effectiveness to 0.387 level based on the increase or decrease one standard deviation unit value (Hair Jr et al., 2016).

In this case, by using moderation impact level calculation formulated by Hair Jr et al. (2016), the moderation effect of incubation duration to the path is high with value 0.446. This moderation effect is calculated by subtracting the R^2 value between startup characteristic to the perception of effectiveness without moderator variable and with moderator variable and divide the value by one minus the R^2 value when the path includes moderator variable. The formulation of the impact size is shown as

$$f^2 = (R_(included)^2 - R_(excluded)^2)/(1 - R_(included)^2) \quad (4.1)$$

where f^2 refers to the moderating effect size while $R_(included)^2$ and $R_(excluded)^2$ refer to R^2 value of the endogenous variables which included the moderating variable and excluded moderating variable in the model (Hair Jr et al., 2016).

The level of the effect size value of incubation duration impact to startup characteristic path to the perception of effectiveness can be stated as significant based on J. Cohen (1988) criteria which define 0.02 as small, 0.15 as medium, and above 0.35 as large.

In order to know which variables in the perception of effectiveness is being directly affected by the moderator variable, further analysis was conducted in variable level. The

result of variables testing of the moderating effect can be seen in Figure 4.4.

Table 4.4: Testing of moderator variables effect to startup characteristic relationship to startup effectiveness of business incubation services in variable level

Relation	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Incubation duration -> Effectiveness	0.387	2.000	0.046	[0.065-0.886]	*
Incubation duration -> Effectiveness Infra	0.292	1.941	0.052	[0.061-0.7]	-
Incubation duration -> Effectiveness network	0.299	1.945	0.052	[0.051-0.689]	-
Incubation duration -> Effectiveness of Business Support	0.37	1.999	0.046	[0.062-0.843]	*

From the variables level testing, it can be seen that the moderator variable is positively affecting the perception of effectiveness in term of business support services. In this case, the business support services in effectiveness construct consist of support for sales, marketing, administrative, secretarial, business planning, development support, and peer networking services. Thus, in the relation of startup characteristic to the perception of effectiveness, moderator variable incubation duration will be included.

4.4.2. Startup characteristic impact to startup performance

This section will test hypotheses two as follows:

- **H2**: Startup characteristic positively influences startup performance in business incubation programs

Other than positively impacting the usage of business incubation service, the startup characteristics are also expected to positively impact startup performance in business incubation program. After all, a lot of research refers to the impact of company skill, knowledge, and experience to their respective success (Chandler & Jansen, 1992). The result from the data in Figure 4.7 show a positive impact of startup characteristic on startup performance in business incubation program.

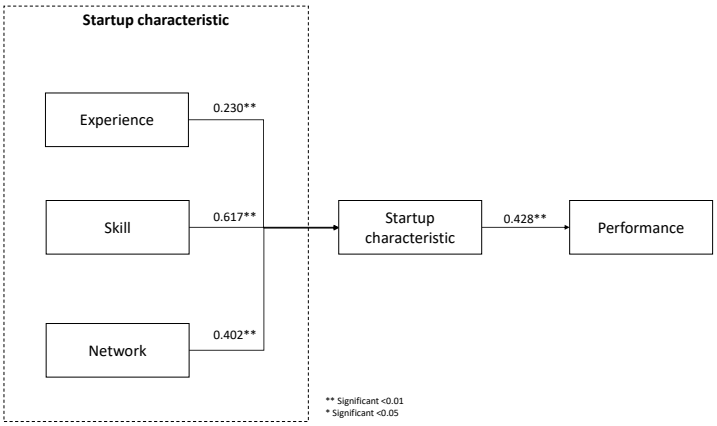


Figure 4.7: Startup characteristics impact to startup performance

The variables impacting startup performance were assessed by testing the total impacts of each separated startup characteristic variable to startup performance variable. The result of this testing is shown in Figure 4.5.

Based on the total effect calculation shown in Figure H.7, it can be seen that all the variables are positively impacting startup performance even though all the impacts are

Table 4.5: Path coefficient and significant testing for startup characteristic impact to startup performance in business incubation services

Dependent Construct	Dependent Variables	Startup characteristic Variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Performance		Experience	0.098	3.768	0.000	[0.05-0.148]	**
		Network contacts	0.172	4.601	0.000	[0.094-0.236]	**
		Skill company	0.264	4.395	0.000	[0.137-0.365]	**

categorized as low as all of the path coefficients are below 0.3. In the case of startup characteristic impact on startup performance, similar with the result in usage of business incubation services, the startup perception of their skill become the most significant factor with 0.263 impact value. In this case, with the increase of one standard deviation unit in startup characteristic variables, startup performance in business incubation services will increase 0.263 standard deviation unit as the impact.

Moderation variables impact was also tested in this correlation between startup characteristic and startup performance. The result of the test is shown in Figure H.8 in Appendix H.2. As shown in the table, there is no impact of moderating variables in the relation between startup characteristic to startup performance in business incubation programs.

Finally, based on the result, both hypothesis one and two can be proven that startup characteristics have a positive impact on startup participation and startup performance in business incubation programs. In relation with the perception of effectiveness, startup characteristic has an positive impact while being moderated by incubation duration while startup characteristics have no impact to perceive the effectiveness of business incubation program and facilities. The summary of the relation model is shown in Figure 4.8.

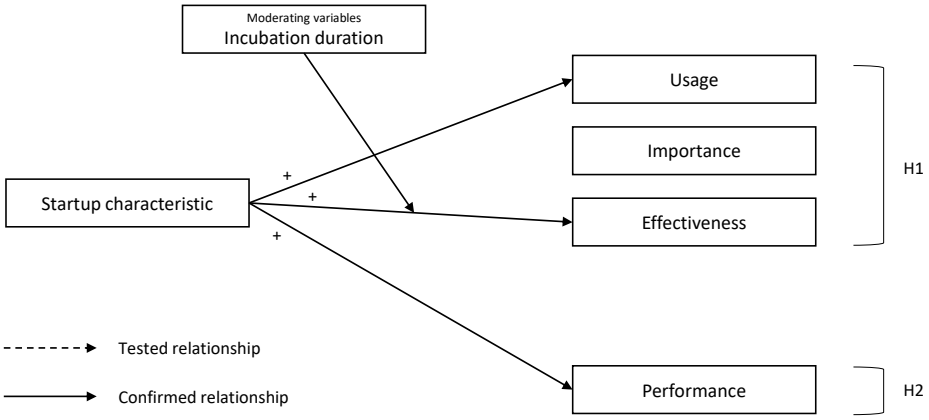


Figure 4.8: Overview of hypotheses testing result for H1 and H2

4.5. Relation between environmental factors to startup participation, perception, and satisfaction and startup performance

This section will cover the second stage of testing and will answer hypotheses three, four, and five which is shown in Figure 4.9.

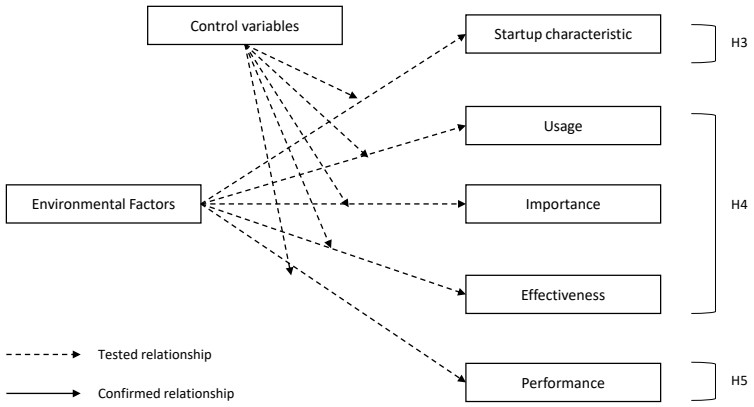


Figure 4.9: Overview of hypotheses testing for H3, H4, and H5

The explanation of the testing result to answer all of the hypotheses are as follow:

4.5.1. Environmental factors impact on startup characteristic

This section will show the result of hypotheses three testing as follows:

- **H3**: Environmental factors positively influences startup characteristics

The relation between environmental factors with startup characteristics was created based on the theoretical model developed by Cooper (1993) which used as the initial reference model in this research. The environmental factors are expected to influence the startup characteristic depending on the items and variables measured. In this model, the environmental factors are represented by customer preferences, human capital support, locational factor, and market structure. When the environment surrounding the startups are supportive to startup development, the improvement over startup characteristic which in this case are represented by experience, skill, and network level are expected. In this research, all the items in environmental factors are measured by 7-points Likert scale with value one represent ”almost not supported”, and value seven represent ”most supported”. PLS algorithm and bootstrapping mechanism in Smartpls software are used to test hypothesis 3, 4, and 5. The result of hypothesis three testing is shown in Figure 4.10.

From the testing result, it can be seen that environmental factors have a significant impact on startup characteristic. Environmental factors are positively and significantly influencing startup characteristic variables. In this case, with path coefficient 0.516, startup characteristic will increase as much as half the increase of the environmental factors in one standard deviation unit. From the model, it also can be seen that locational factors and human capital support variables are the most significant variables to affect startup characteristic. Meanwhile, skill is the most impacted variables from startup characteristic construct. Thus, to increase the experience, skill, and network level of the startup, the locational and human capital support in the location surrounding startup should be improved. From the model, it is also can be seen that market structure have the less impact compares to other environmental factors in the model. The detail of the total effect of each environmental variable to the variable in the startup characteristic is shown in Table 4.6.

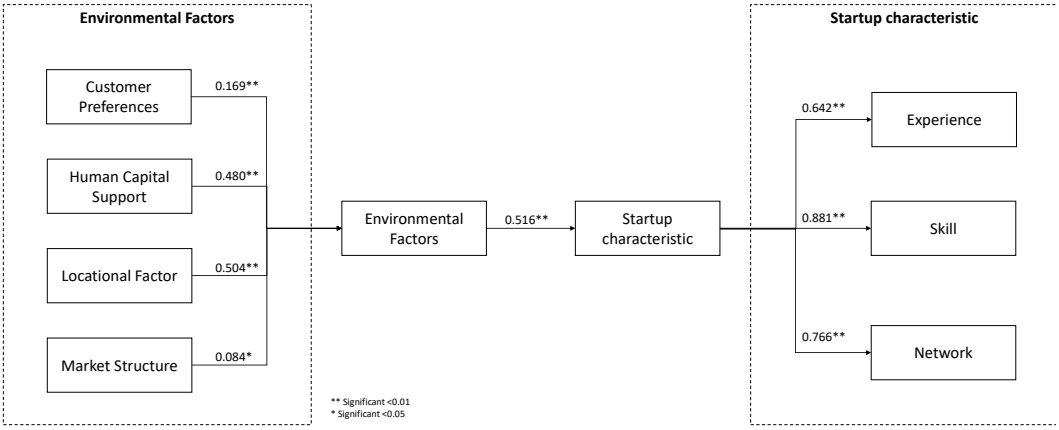


Figure 4.10: Environmental factors impact to startup characteristic

Table 4.6: Path coefficient and significant testing for Environmental factors impact to startup characteristic

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup	Experience	Customer preferences	0.056	3.599	0.000	[0.027-0.088]	**
		Human capital support	0.159	5.335	0.000	[0.099-0.216]	**
		Locational factor	0.167	4.918	0.000	[0.1-0.232]	**
		Market structure	0.028	2.085	0.037	[0.004-0.055]	*
	Network contacts	Customer preferences	0.067	3.571	0.000	[0.03-0.103]	**
		Human capital support	0.190	4.969	0.000	[0.116-0.264]	**
		Locational factor	0.200	4.866	0.000	[0.116-0.278]	**
		Market structure	0.033	2.170	0.030	[0.004-0.063]	*
	Skill company	Customer preferences	0.077	3.905	0.000	[0.038-0.114]	**
		Human capital support	0.218	5.738	0.000	[0.14-0.29]	**
		Locational factor	0.230	5.482	0.000	[0.141-0.305]	**
		Market structure	0.038	2.190	0.029	[0.004-0.072]	*

Similar to previous hypotheses testing, moderation testing is also conducted to environmental factors related to startup characteristic. The result from this testing is shown in Figure H.10 in Appendix H.3.

From the moderation testing, there are no moderating variables that significantly affecting environmental factors concerning startup characteristics. Hence, there will be no moderating variables included in this model.

Based on the statistical result, the hypothesis three that environmental factors are impacting startup characteristic has been proven, and the relationship is confirmed as positively affect the startup characteristic construct and variable.

4.5.2. Environmental factors impact to business incubation process

This section will test hypothesis four as follows:

- **H4**: Environmental factors positively influences startup participation, perception of importance, and perception of effectiveness in business incubation programs

Other than startup characteristics which are directly affecting startup behavior, other factors also have to be considered to positively influence startup behavior and

performance in the business incubation process. In this case, the environmental factors constructs are reflected by customer preferences, human capital support, locational factor, and also market structure. In this case, the condition surrounding startups will most likely affect their behavior and performance within the incubation process. In this case, those variables are not stated as the most influencing factors for startups. However, those factors influence will be assessed to know whether there are external factors that can impact startup performance in business incubation process and its performance. The impact of environmental factors to startup participation within business incubation process is shown in Figure 4.11, while the impact of environmental factors to perception of importance and effectiveness are shown in Figure H.9, and Figure H.8 in Appendix H.4.

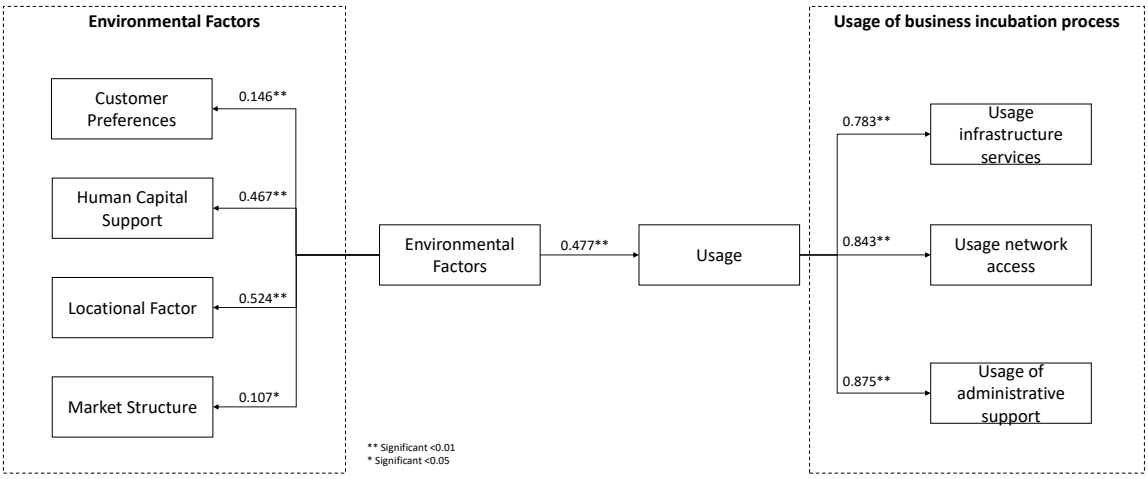


Figure 4.11: Environmental factors impact to business incubation service usage

Based on the result of relationship testing between environmental factors to startup participation in business incubation programs as shown in 4.11, it can be seen that environmental factors and all the variables within the construct are positively influencing startup participation in business incubation program. The impact of environmental factors on startup usage is in a medium level of impact with a value of 0.477 (J. Cohen, 1988). Further correlation analysis is done in the variables level, the total effect of environmental factors on startup usage are shown in Figure 4.7.

Table 4.7: Path coefficient and significant testing for Environmental factors impact to startup usage of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	Customer preferences	0.054	3.021	0.003	[0.021-0.091]	**
		Human capital support	0.174	4.174	0.000	[0.089-0.253]	**
		Locational factor	0.196	4.011	0.000	[0.091-0.287]	**
		Market structure	0.040	2.232	0.026	[0.009-0.078]	*
	Usage network	Customer preferences	0.059	3.105	0.002	[0.022-0.097]	**
		Human capital support	0.188	4.252	0.000	[0.096-0.269]	**
		Locational factor	0.211	4.041	0.000	[0.1-0.305]	**
		Market structure	0.043	2.254	0.024	[0.009-0.082]	*
	Usage of Adm	Customer preferences	0.061	3.117	0.002	[0.024-0.1]	**
		Human capital support	0.195	4.321	0.000	[0.1-0.277]	**
		Locational factor	0.219	4.088	0.000	[0.101-0.315]	**
		Market structure	0.044	2.216	0.027	[0.009-0.086]	*

From Figure 4.7, it can be seen that the level of impact of environmental factors as a separated entity are less than when combined into environmental factor construct. Thus, it can be assumed that the environmental condition of the startup has to be improved to increase the usage of business incubation services. In this case, as shown in the previous model, human capital factor and locational factor have the most impact to startup participation compare to other variables in environmental construct while market structure and customer preferences have a similar level of impact.

Moderation testing has also been conducted on the relation between the environmental factors and the startup usage as shown in Figure H.13 in Appendix H.4. From the testing result, it can be seen that there are no impacts from the selected moderator variables to the relationship between environmental factors and startup usage in business incubation services.

Different result are shown for the impact of environmental factors to both importance and effectiveness of business incubation process as shown in Figure H.9 and Figure H.8 in Appendix H.4.

Based on the statistical result as shown in both Figures, both of the constructs are shown not to be impacted by environmental factors (with low path coefficient from environmental factors to each variable in both constructs which range from 0.152 to 0.202). Then, additional testing in the variables level is done for both importance and effectiveness to know whether a similar result is also shown in the variables level. The result for both variable testing in importance and effectiveness are shown in Figure H.11 and Figure H.12 in Appendix H.4.

From the variables testing, it can be seen that similar result with the construct relation testing between environmental factors to the perception of importance and effectiveness happen at the variable level. Both of the path direct correlations are not significant.

Moderation testing is also done for both direct paths in the model which shown in Figure H.14 and H.15 in Appendix H.4. The results from the moderation testing show that there are no impacts of selected moderation variables to both perceptions of importance and effectiveness in business incubation process. Thus, it can be assumed that hypothesis four is proven only in the relation between the environmental factors to startup participation in business incubation services in which the relationship is proven as a positively affecting to the construct.

4.5.3. Environmental factors impact to startup performance

This section will test hypotheses five as follows:

- **H5**: Environmental factors positively influences startup performance in business incubation programs

The influence of environmental factors on startup performance is modeled based on Cooper (1981) model of new venture performance. In this case, the improvement over the condition of the environment to support startup will positively affect startup development and performance. Thus, the same impact is expected in startup performance during their participation in business incubation programs. The relationship between environmental factors to startup performance is tested by using PLS-SEM algorithm and bootstrapping testing in SmartPLS software. The result of this testing is shown in Figure 4.12.

Based on the Figure, the environmental factors have a significantly high impact on startup performance with a value of 0.570. This means that environmental factors can

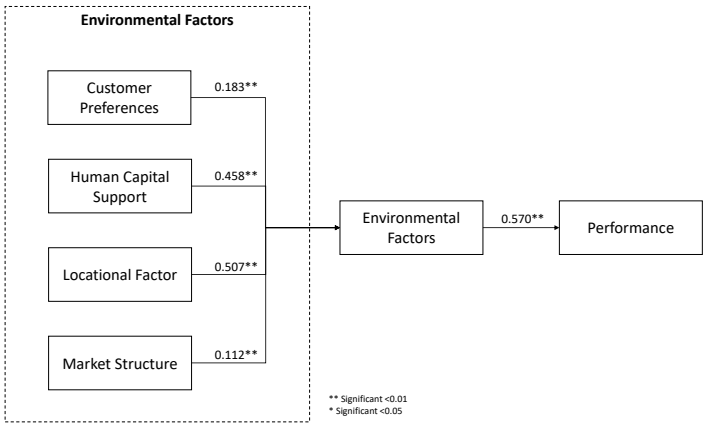


Figure 4.12: Environmental factors impact to startup performance

influence startup performance until 0.57 standard deviation unit when there is one standard deviation unit increase in startup performance value. From the path coefficient value, it can also be confirmed that the influence of environmental factors on startup performance is positive. Based on the result, human capital support and locational factor have the highest impact compare to customer preferences and market structure which have similar impact value. The detail of the effect of this variable on startup performance is shown in Figure 4.8.

Table 4.8: Path coefficient and significant testing for Environmental factors impact to startup performance in business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
	Performance	Customer preferences	0.104	4.445	0.000	[0.051-0.147]	**
		Human capital support	0.262	6.698	0.000	[0.181-0.333]	**
		Locational factor	0.289	6.906	0.000	[0.203-0.364]	**
		Market structure	0.064	2.901	0.004	[0.018-0.104]	**

While the direct correlation between environmental factors to startup performance is confirmed, the moderation variables impact to this correlation will also be tested. The moderation testing used moderating testing features in SmartPLS software. The result of this testing is shown in Figure H.17 in Appendix H.5. From the moderation testing, there are no significant impact of selected variables on the correlation path between environmental factors to startup performance.

Finally, based on the result, hypothesis five is proven that the environmental factors positively affect startup performance in business incubation programs.

In summary, from the statistical testing, all the hypotheses are confirmed that environmental factor has an impact on startup characteristic, startup participation in business incubation services, and startup performance. Meanwhile, the environmental factors have no impact on both perceptions of importance and effectiveness of business incubation services and facilities. The summary of the hypotheses testing for H3, H4, and H5 are shown in Figure 4.13.

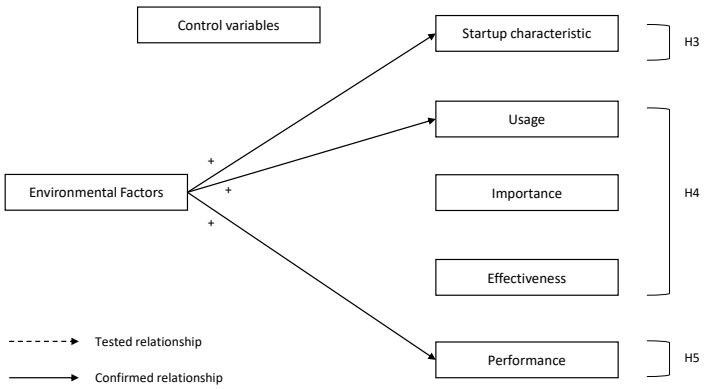


Figure 4.13: Overview of hypotheses testing result for H3, H4, and H5

4.6. Relation between business incubation process performance and its relation to other business incubation variables

This section will cover the third testing stage and will answer hypothesis six and seven which are shown in Figure 4.14. The explanation of the result of the data to answer all of the hypotheses are as follow:

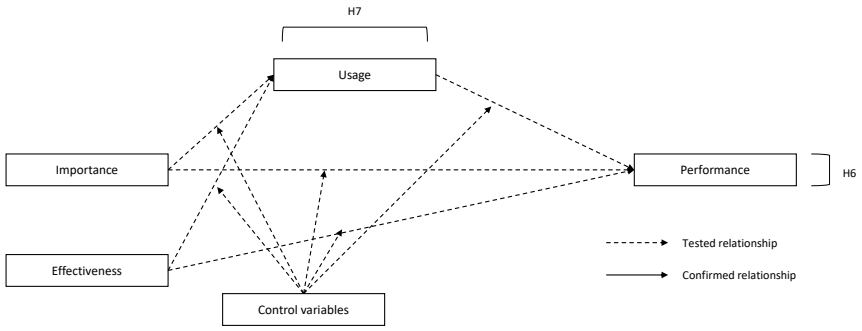


Figure 4.14: Overview of hypotheses testing for H6 and H7

4.6.1. Startup participation, the perception of importance, and perception of effectiveness to startup performance

This section will test hypothesis six as follows:

- **H6**: Startup participation, the perception of importance, and the perception of effectiveness in business incubation programs positively influences startup characteristic and startup performance

In this research, the impact of business incubation process on startup performance will be assessed. After all, business incubation programs will not have any impact on startup performance and its growth if the startup has not utilized or even joined business incubation programs and services. The impact of startup usage to startup performance

is shown in Figure 4.15, while perception of importance and perception of effectiveness to startup performance are shown in Figure H.12, and Figure H.13 in Appendix H.6.

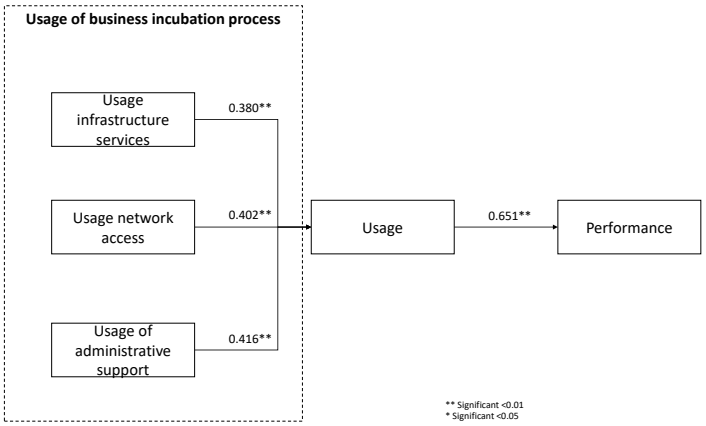


Figure 4.15: Business incubation service usage impact to startup performance

Based on the testing result, the usage of business incubation facilities and services are shown to have highly positive impact to startup performance with path coefficient 0.651 compares to importance (0.306) and effectiveness (0.300). This result is aligned with the theory and interview session as stated before. Furthermore, there is no significant impact of perception of importance and perception of effectiveness to startup performance in business incubation programs. The importance and effectiveness of business incubation programs to startup are quite acknowledged regardless of the background of the startup and their perspective over business incubation services and facilities. Hence, the result has shown the supporting relation to the statement.

In the variables level, total effects from all variables in the business incubation process are tested to its total influence to startup performance. The result of this testing is shown in Figure 4.9.

Table 4.9: Path coefficient and significant testing for business incubation service variables to startup performance

Dependent Variables	Business process Variables	Path coefficient	p value	Significant?	Sig level
Usage	Usage Infra	0.247	0.000	Yes	**
	Usage network	0.262	0.000	Yes	**
	Usage of Adm	0.271	0.000	Yes	**
Importance	importance Infra	0.099	0.223	No	-
	Importance network	0.171	0.197	No	-
	Importance of business support	0.105	0.146	No	-
Effectiveness	Effectiveness Infra	0.177	0.176	No	-
	Effectiveness network	0.085	0.175	No	-
	Effectiveness of business support	0.085	0.145	No	-

The calculations for the total impact of business incubation process variables show that

in variable level, it can be seen that only variables from usage construct are affecting startup performance while variables from importance and effectiveness construct have no significant impact to startup performance.

Moderating testing has also been conducted on all correlations between the business incubation process to startup performance. The result of this testing can be seen in Appendix H.6. From the result, it can be seen that there is no impact of selected moderator variables on the correlation between the business incubation process to startup performance.

In summary, from the statistical testing, only half of the hypotheses six are confirmed that startup participation in business incubation services have an impact on startup performance while startup perception of importance and effectiveness have no impact on startup performance.

4.6.2. Startup perception of importance and perception of effectiveness impact on startup participation in business incubation programs

This section will test hypothesis seven as follows:

- **H7**: The perception of importance and the perception of effectiveness positively influences startup participation in business incubation programs

As the business incubation process constructs and variables are developed based on theoretical findings rather than the known model, the relation between startup participation to startup satisfaction in business incubation services will be tested. In this case, startup satisfaction in business incubation services will be represented by their perception of business incubation importance and effectiveness. Satisfaction over business incubation services is expected to positively influence startup participation in business incubation service. Hence, the relation over importance and effectiveness to startup usage of business incubation services are tested by using PLS-SEM algorithm and bootstrapping significant testing. The result from this testing can be seen in Figure 4.16 and Figure 4.17.

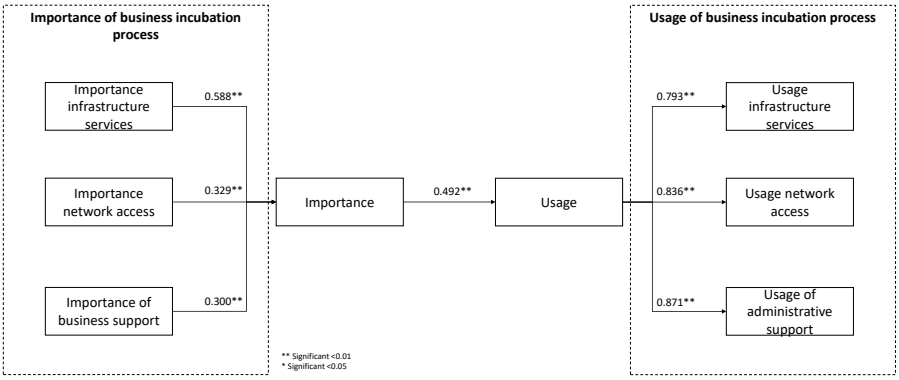


Figure 4.16: Business incubation service importance impact to business incubation service usage

Based on the testing result, it can be seen that there is a significant positive impact of both importance and effectiveness to startup usage with both of the correlation have an almost high-level impact value with each value are 4.92 and 4.83. From the importance construct, it also can be seen that importance over infrastructure services has the

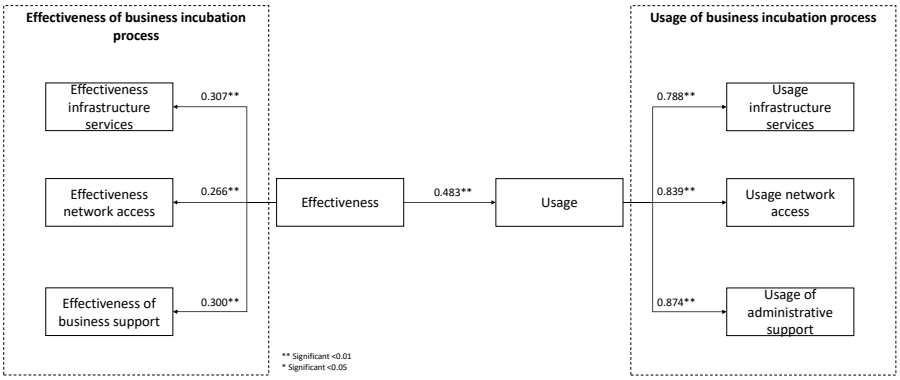


Figure 4.17: Business incubation service effectiveness impact to business incubation service usage

highest value with a path coefficient of 0.588. Based on the total effect of the variables into startup usage variables shown in Table 4.10, the total effects of those variables on startup usage are low in value based on J. Cohen (1988) categorization. The total effect of the variables is measured by adding all the direct and indirect path from the variable to the targeted variable (Hair Jr et al., 2016). In the effectiveness construct, it seems that the effectiveness of infrastructure services have a similar impact on the effectiveness of business support. In this case, further analysis of the total effect of the variables needs to be assessed. From the variables total effect size to startup usage shown in Figure 4.11, it can be seen that the effectiveness of business support have higher total effect value compares to the effectiveness of infrastructure services.

Table 4.10: Path coefficient and significant testing for importance to business incubation service usage

Construct	Dependent Variables	Independent Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	importance Infra	0.230	3.906	0.000	[0.116-0.345]	**
		Importance network	0.128	4.114	0.000	[0.069-0.191]	**
		Importance of business support	0.117	4.474	0.000	[0.068-0.169]	**
	Usage network	importance Infra	0.242	4.336	0.000	[0.136-0.357]	**
		Importance network	0.135	3.979	0.000	[0.069-0.204]	**
		Importance of business support	0.123	5.167	0.000	[0.078-0.17]	**
	Usage of Adm	importance Infra	0.252	4.317	0.000	[0.136-0.363]	**
		Importance network	0.141	4.289	0.000	[0.078-0.206]	**
		Importance of business support	0.129	4.767	0.000	[0.077-0.182]	**

Table 4.11: Path coefficient and significant testing for effectiveness to business incubation service usage

Construct	Dependent Variables	Independent Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	Effectiveness Infra	0.117	4.289	0.000	[0.049-0.186]	**
		Effectiveness network	0.101	15.351	0.000	[0.057-0.149]	**
		Effectiveness of business support	0.223	0.000	0.000	[0.111-0.323]	**
	Usage network	Effectiveness Infra	0.124	4.114	0.000	[0.054-0.192]	**
		Effectiveness network	0.108	0.000	0.000	[0.06-0.156]	**
		Effectiveness of business support	0.237	0.000	0.000	[0.121-0.335]	**
	Usage of Adm	Effectiveness Infra	0.129	3.488	0.000	[0.057-0.203]	**
		Effectiveness network	0.112	4.379	0.000	[0.064-0.162]	**
		Effectiveness of business support	0.247	4.168	0.000	[0.12-0.352]	**

Moderating variables are also tested between the relationship of importance and effectiveness to startup usage. The result of the moderation testing are shown in Figure H.24 and Figure H.25 in Appendix H.7. Based on the testing result, it can be assumed that there are no impacts of selected moderator variables to the relation between perception of importance and effectiveness to startup participation in business incubation services.

Finally, based on the statistical testing result, hypothesis six is proven that business incubation process affects startup performance in business incubation programs. Meanwhile, the perception of importance and effectiveness have no impact on startup performance in business incubation program. In hypothesis seven, the relation of startup perception of importance and startup perception of effectiveness is also proven to be related and positively affecting startup participation in business incubation programs.

The summary of the hypothesis testing result for H6 and H7 are shown in Figure 4.18.

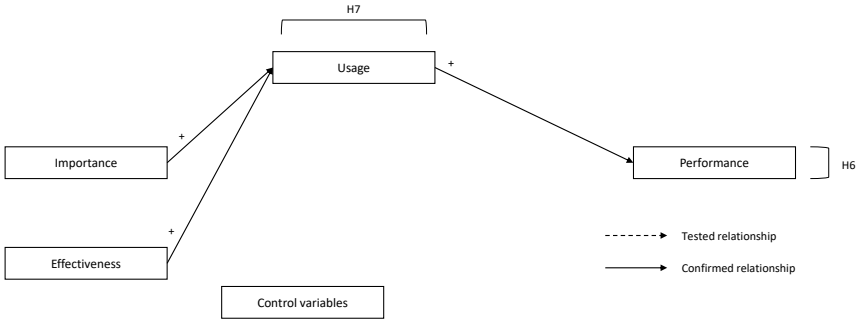


Figure 4.18: Overview of hypotheses testing result for H6 and H7

4.7. Mediating effect of startup participation, perception, and satisfaction between startup characteristics, environmental factors, and startup performance

This section will cover the fourth stage of testing and will answer hypothesis eight and nine which are shown in Figure 4.14.

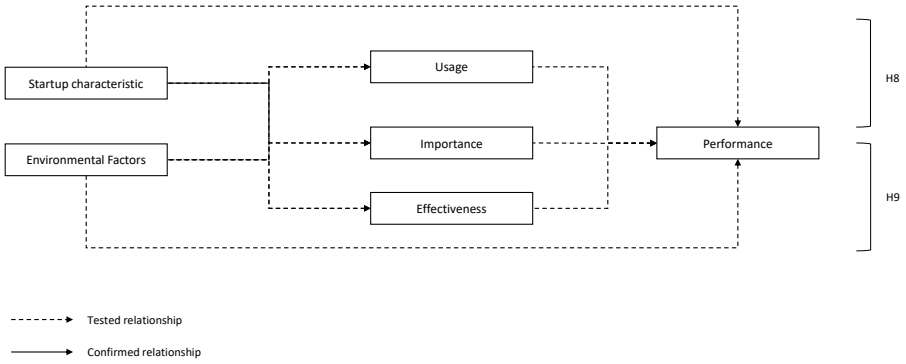


Figure 4.19: Overview of hypotheses testing for H8 and H9

The explanation of the result of the data to answer all of the hypotheses are as follow.

- **H8**: Startup participation, the perception of importance, and perception of effectiveness in the incubation process positively strengthen the relationship between startup characteristics and startup performance
- **H9**: Startup participation, the perception of importance, and perception of effectiveness over business incubation process positively strengthen the relationship between environmental factors and startup performance

Figure 4.20 and Figure 4.21 both show the relation model of mediating impact of business incubation process to startup characteristics, environmental factors, and startup performance.

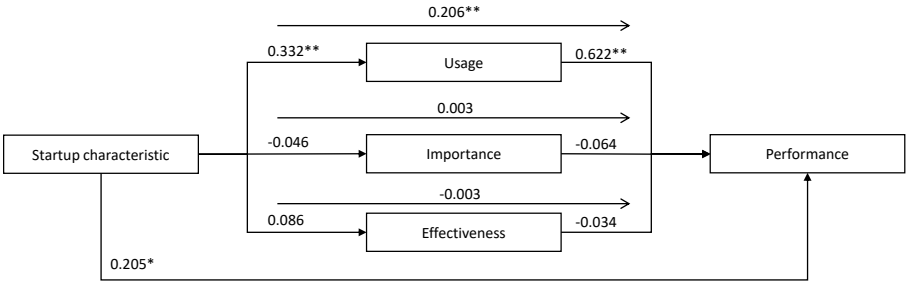


Figure 4.20: Mediating effect of startup business incubation to startup characteristic and startup performance

Figure 4.20 shows that business incubation services have a positive mediating role in the relation between startup characteristic to startup performance and the business incubation usage positively strengthen the relation between two variables. The direct effect of startup characteristic to startup performance is less significant and slightly lower compares to the total effect of startup characteristic to startup performance which mediated by usage in business incubation services with a total value of 2.06. In this case, while there are mediating impact for business incubation services usage, the differences of the impact size to startup performance are not entirely different. Although, based on the significance level, the connection from the startup characteristic to startup performance might be better to be mediated by startup usage rather than using the direct path in the model. Meanwhile, as with the direct connection to the perception of importance and effectiveness, both of the constructs also have no significant impact on startup performance as mediating variables of startup characteristic.

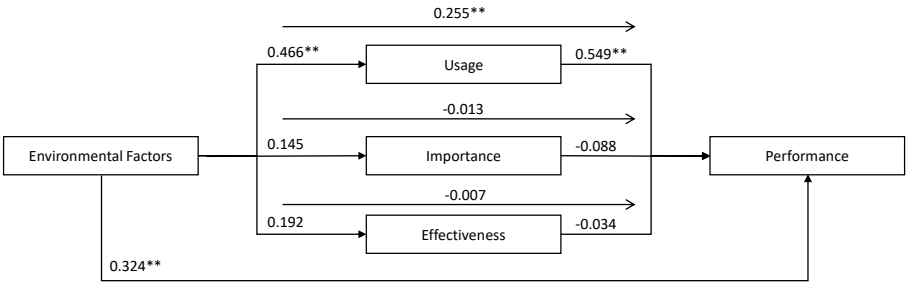


Figure 4.21: Mediating effect of startup business incubation to environmental factor and startup performance

The mediating roles of the business incubation process were also tested on the relationship between environmental factors to startup performance. Figure 4.21 shows

that business incubation services have a positive mediating role in the relationship between environmental factors to startup performance in term of the usage of the services and facilities but not strengthen the relationship between the two constructs. In contrast with the result from the previous test, the direct effect of environmental factors on startup performance is higher (0.324) than its mediated effect by business incubation usage (0.255). In this case, both paths will be tested in the final model to measure the best path to predict the relationship between environmental factors to startup performance. In term of mediating role of importance and effectiveness, both of the relations are assumed to have no significant mediating effect on environmental factors related to startup performance. The comparison of the total effect of each variables relation to startup performance can also be seen in Table 4.12 which also show similar conclusion.

Table 4.12: Total effects of relation between construct and variable

Dependent variables	Independent variables	Mediator variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Performance	Startup characteristic	**Usage**	**0.206**	**2.761**	**0.006**	**[0.066-0.366]**	**
		Importance	0.003	0.191	0.848	[-0.013-0.064]	-
		Effectiveness	-0.003	0.128	0.898	[-0.082-0.022]	-
		- (Direct)	**0.205**	**2.450**	**0.014**	**[0.046-0.372]**	*
Performance	Environmental factors	**Usage**	**0.255**	**3.374**	**0.001**	**[0.121-0.414]**	**
		Importance	-0.013	0.604	0.546	[-0.078-0.012]	-
		Effectiveness	-0.007	0.223	0.824	[-0.081-0.045]	-
		- (Direct)	**0.324**	**3.676**	**0.000**	**[0.147-0.492]**	**

Based on the result, both hypothesis eight and nine are proven only in the case that the business incubation usage has a mediating role to both startup characteristics and environmental factors related to startup performance. In regards to positively strengthen the path between the two constructs, only hypothesis eight is confirmed while hypothesis nine is proven false that business incubation process does not strengthen the relationship between environmental factors to startup performance.

From the testing result, it also can be assumed that there is no mediating impact of startup perception of importance and effectiveness from startup characteristics and environmental factors to startup performance.

The summary of the hypothesis testing for H8 and H9 is shown in Figure 4.22.

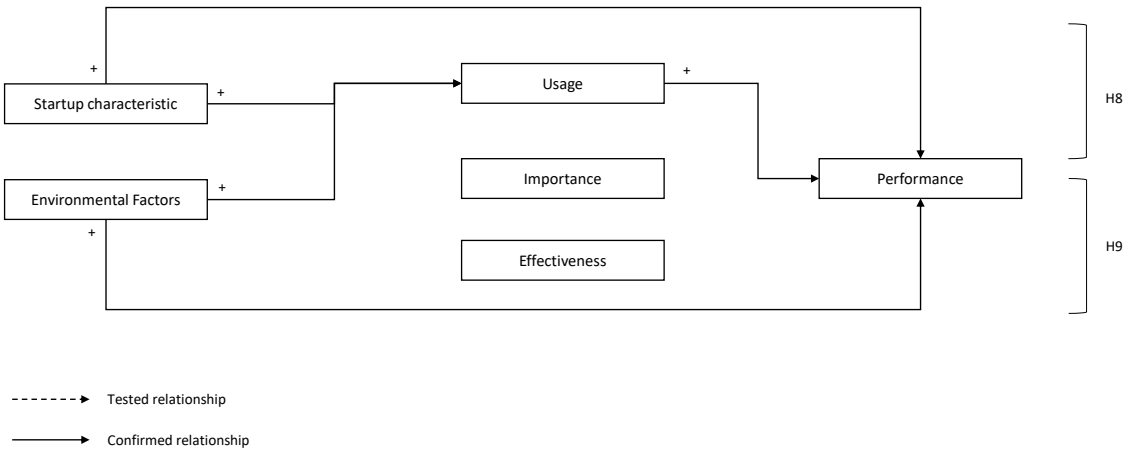


Figure 4.22: Overview of hypotheses testing result for H8 and H9

4.8. The building of the final model and identifying the most significant factors impacting startup performance

In this section, the final relation model will be built based on previous hypothesis testing result and will be presented to answer the main research question of the research. Before the hypothesis testing, the initial model is created by connecting almost all constructs to each other to test which path and correlation are significant. The initial model which extracted from the literature review process is shown in 4.23.

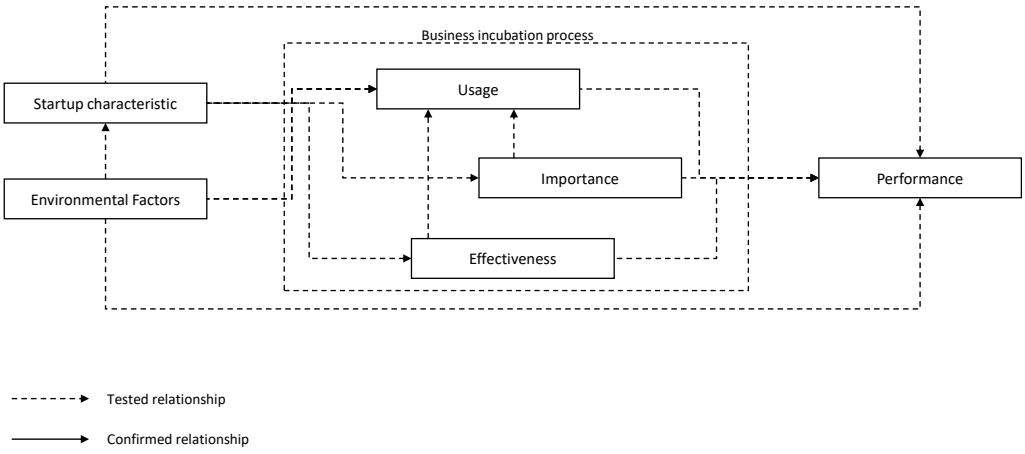


Figure 4.23: Initial model from the literature review

As stated previously, the initial model will be used as the guide to develop and test the hypotheses in the research. In this case, the hypotheses are not only created to answer the main research question but also as a building block to create the final model. The hypothesis testing has been done to test the relation of each construct developed from the measurement testing in Chapter 3 and has been tested in this Chapter. Thus, the combination of all the hypothesis testing results can be seen in Figure 4.24.

In order to build the final model, step 3 from the model building stated previously in Chapter 3 will be conducted. In this case, the model shown in Figure 4.24 will be tested

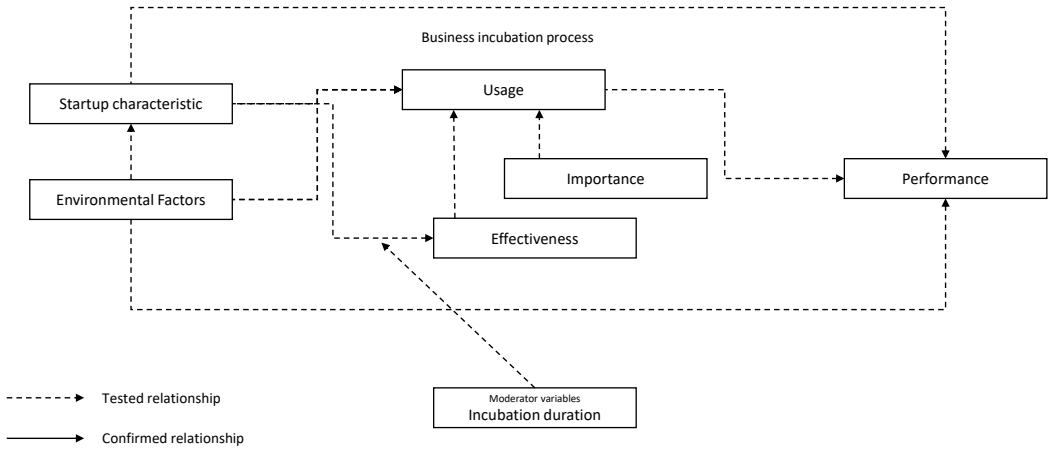


Figure 4.24: Model test for model fit

by using structural model evaluation stated in Hair Jr et al. (2016) and Hair Jr et al. (2017). The structural model testing will be conducted in six steps. The detailed steps of the structural assessment model are shown in Appendix I.

Based on the structural model assessment, the final model is adjusted to achieve the structural model fit criteria. Furthermore, the reliability and the validity of the model also has been represented in the model fit criteria testing. As shown in I, the final model has been tested and pass all the reliability and validity as a structural model. Thus, the result of the test defines the final model in this research. The final model for the relation between startup characteristic, environmental factor, the business incubation process, and startup performance is shown in Figure 4.25.

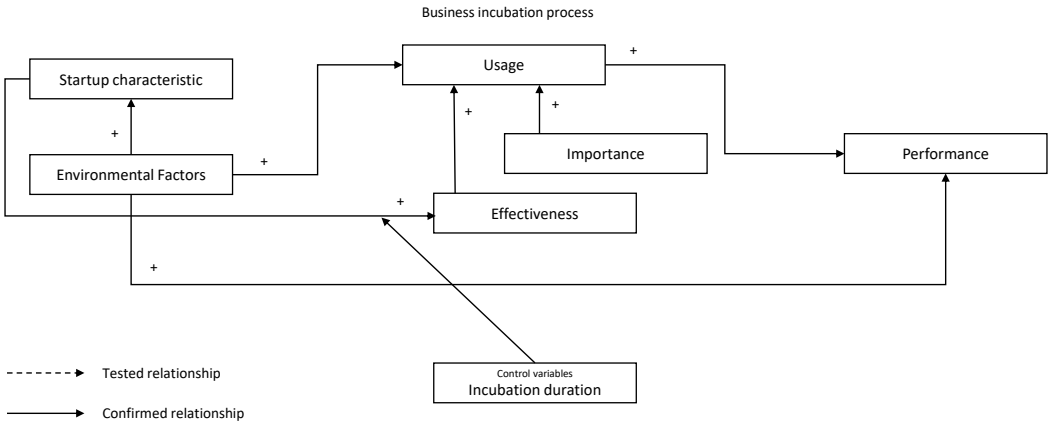


Figure 4.25: Final model of startup characteristics, environmental factor, business incubation process, and startup performance relations

By using the same model, the most significant factors to startup performance in business incubation process are identified by measuring the total effects of each construct to startup performance. The result of the total effects measurement is shown in Figure 4.26.

Figure 4.26: Overview of the total effects of all variables relations in the model

Dependent variables	Independent Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Startup characteristic	0.090	1.580	0.114	[0.012-0.25]	-
	environmental factors	**0.410**	**4.291**	**0.000**	**[0.213-0.584]**	**
	Importance	0.265	2.904	0.004	[0.082-0.444]	**
	Effectiveness	0.269	2.632	0.009	[0.069-0.466]	**
Performance	Effectiveness	0.125	2.415	0.016	[0.037-0.245]	*
	environmental factors	**0.549**	**6.891**	**0.000**	**[0.364-0.686]**	**
	Startup characteristic	0.042	1.437	0.151	[0.005-0.128]	-
	Importance	0.123	2.496	0.013	[0.039-0.229]	*
	Usage	**0.464**	**5.595**	**0.000**	**[0.284-0.617]**	**
Startup characteristic	**environmental factors**	**0.498**	**5.767**	**0.000**	**[0.3-0.642]**	**
Effectiveness	**Startup characteristic**	**0.333**	**2.251**	**0.024**	**[0.061-0.641]**	*
	environmental factors	0.040	0.595	0.552	[-0.07-0.193]	-

Based on those result, it can be seen that in term of startup performance, environmental factors have the most impact to startup performance along with the usage of business incubation services with both positively and significantly impact startup performance with 0.549 and 0.464 effect value. Thus, in order to identify which factor in environmental factors and usage factors that have the most impact on startup performance, importance-performance matrix map analysis or IPMA was conducted by using the smartPLS function. Other than only use path coefficient to define the relationship between variable and constructs, IPMA uses the average value of the latent variable scores in order to determine the importance level of items, variables, and constructs to targeted factor. This importance level then will be positioned alongside their influence to targeted factor (Hair Jr et al., 2017). In this research, as the objectives are to know the most significant factor on startup performance in business incubation programs, the target factor is the performance of startup. The IPMA map creates a correlation between the total effects of the input variable to the targeted factor as shown in Figure 4.27.

Furthermore, from the IPMA testing, the rank of the most impacting factor to startup performance can also be identified. From the testing, the rank of the items in both business incubation usage and environmental items are shown in 4.13.

By analyzing the IPMA map and factor rank, several factors that have a substantial impact but low performance can be easily identified. By using this method, which factors that need to be improved are shown in the figure. In this case, from Figure 4.27, the focus will be to factor within a lower right area which represent factor with the high effect but low performance. In this case, usage of business counseling and mentoring in business incubation (U7) can be seen as the factor which has the most impact and performance compares to other factors. In the environmental factor construct, BS2 or product popularity have the highest impact compare to other factors, followed by customer openness to the new product, and professional business services offered in a startup location. The complete list of the impact level of each indicator to startup performance can be seen in Table 4.13.

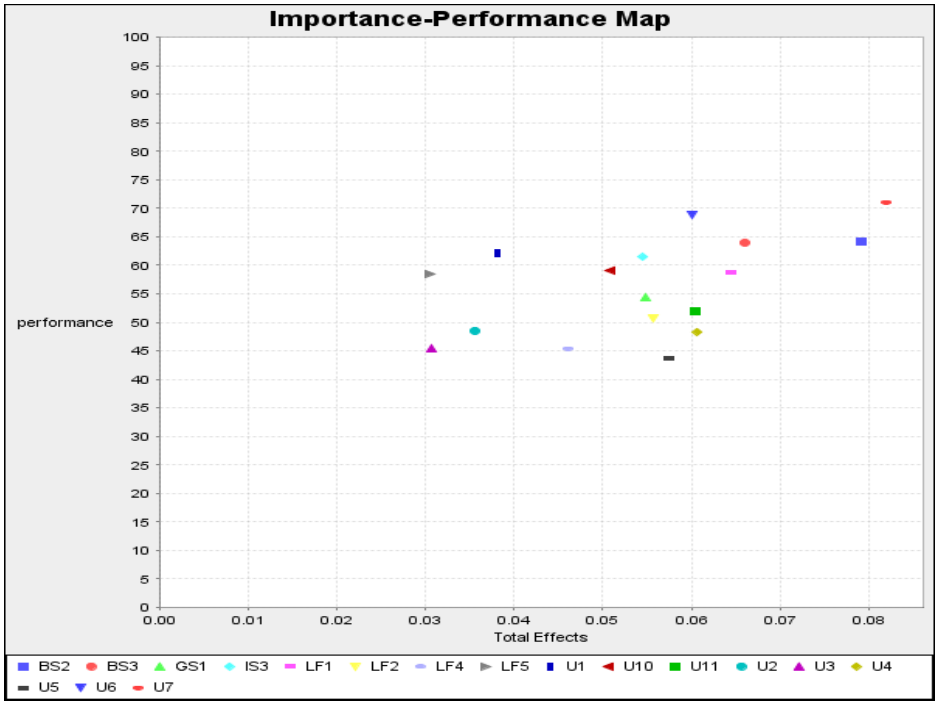


Figure 4.27: Importance-performance map analysis (indicator level)

Table 4.13: Rank of importance factors from IPMA testing to business incubation usage and environmental factor items

Items	Description	IPMA Performance
U7	Usage of business counseling and mentoring	0.082
BS2	The product has become customers favorite in the market	0.079
BS3	People are open to new product in the market	0.066
LF1	There is a lot of professional business services offered	0.064
U4	Usage of support on product sales and marketing	0.061
U11	Usage of access to potential customers	0.060
U6	Usage of business training, seminar, and workshop	0.060
U5	Usage of administrative and secretarial services	0.057
LF2	There is scientific or research complex where the company located on	0.056
GS1	There is government policies for supporting entrepreneurs	0.055
IS3	There is a lot of different products offered in the market by competitors	0.055
U10	Usage of access to funding, grants, and loans	0.051
LF4	There is functional financial market	0.046
U1	Usage of space and building facilities such as office and working space	0.038
U2	Usage of business (postal) address provided by business incubator	0.036
U3	Usage of shared office services and equipments such as meeting room, cafeteria, printer, and building security	0.031
LF5	The area attracts high and requisite-skilled employee	0.030

This page intentionally left blank.

5

Discussion

The research has established the relation model between startup characteristic, environmental factor, the business incubation process, and startup performance based on theoretical concepts of new venture performance. The model also has incorporated the business incubation process to identify the relation of startup performance model in the business incubation process. By incorporating the business incubation process to the model, the impact of business incubation process as an intermediary tool to improve startup performance will be assessed. In this case, the statistical data from the incubated startup will define the startup perspective and perception over their tenure in business incubation programs.

The initial model which has been built based on the literature review is shown in Figure 5.1. This model is built by combining the theoretical model known in new venture performance by Cooper (1993) and theoretical concepts over business incubation services and model from the business incubation research defined in the literature review. In the literature review, the initial model becomes a guide to select items which will influence business incubation programs and startup performance. In this case, the selected items then incorporated in the questionnaire and used as measurement tools to build and assess the final model.

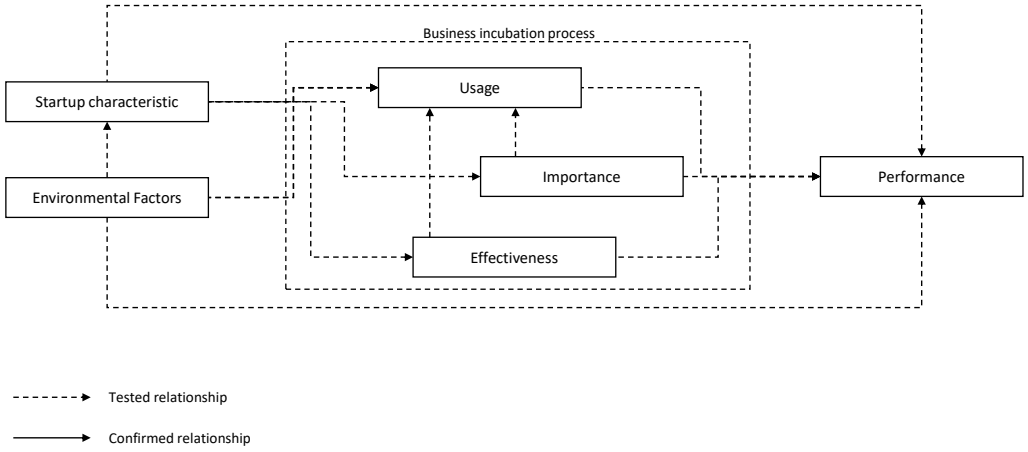


Figure 5.1: Initial model from the literature review

Previously in chapter 4, hypothesis testing has been done to identify the correlation model of each construct to other constructs or variables. At the end of chapter 4, the

data analysis from the statistical result have created the final model of the relation between startup characteristic, environmental factor, business incubation process, and startup performance as shown in Figure 5.2.

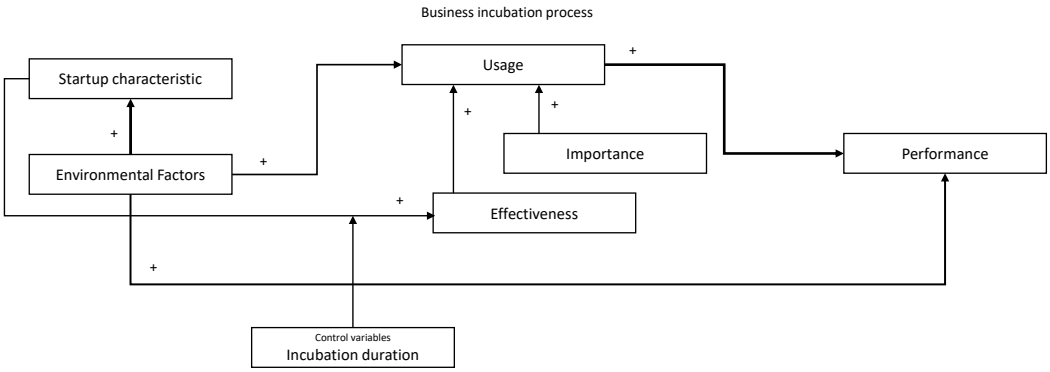


Figure 5.2: Final model of startup characteristics, environmental factor, business incubation process, and startup performance relations

From the developed model, it can be seen that there are several positive correlations between one construct to another construct marked with the plus (+) signs. The final model shown in this chapter is the simplified version of the model tested in the statistical analysis. In the final model, the thickness of the connection represents the level of correlation between the construct. The thicker the connection line, the higher the correlation between the constructs is. In this case, based on the final model, it can be seen that the thickest connection is shown in the relation between environmental factor to startup characteristic and the relation between business incubation usage to startup performance. Moreover, the arrow in the model shows the direction of the influence between one construct to another construct which means the positive relation between construct A to construct B. This means that construct A will influence construct B in the level of its correlation value when there is an increase in one standard deviation unit in construct A.

By comparing the initial model to the final model, there are several unexpected findings have been found. First, there is no direct path between startup characteristic variable to startup usage of business incubation services. Second, there is an impact of incubation duration to startup characteristics to startup perception of effectiveness over business incubation services. Third, there is no impact of startup characteristic nor environmental factor to startup perception of importance in business incubation services. Thus, the explanation of these unexpected findings will be incorporated in its relevant construct discussion.

Previously, the explanation of the findings from the statistical result has not yet explained. Thus, this chapter will cover the explanation for the findings in the hypothesis testing and the statistical analysis. The explanation of the result will be based on the literature review previously conducted in Chapter 2, the result of the interview process, and newly added literature which required to explain the research findings. The explanation of the result will be divided into each construct, its relevance to startup performance, and the final model.

First, the discussion of the findings surrounding startup characteristic impact on business

incubation process and startup performance will be explored. In this section, the discussion over the insignificant relation between startup characteristic and startup perception of importance will be discussed. Furthermore, the roles of business incubation relation over the relationship between startup characteristic to startup perception of effectiveness will also be discussed in this section. The second section will explore the environmental factors in affecting startup characteristic, business incubation process, and startup performance. The unexpected findings that environmental factors have no impact on startup perception of importance and effectiveness will also be explained in this chapter. The third section will cover the business incubation process impact on startup performance. In this section, the relation between startup perception of importance and effectiveness to startup participation in business incubation services will also be elaborated. Lastly, the most impacting factors in influencing startup performance in business incubation programs will be analyzed in the last section.

To increase the generalization of the findings, the explanation of the result will utilize both of statistical result, the initial literature use in the literature review, and the result from the interview process. All the information will be combined to get a more generalized outcome and conclusion as the statistical data will insufficient to generalized the outcome of the research. By using this approach, the data will be able to be used to both interpret the condition in Indonesia by using the interview data and the condition in a more generalized environment by using previously known theoretical concepts and knowledge.

5.1. Startup Characteristics impact on business incubation process and startup performance

This section will provide the explanations of the findings surrounding startup characteristic construct which consists of the startup team skill, experience, and networking. Based on the statistical analysis conducted in the previous chapter, the overview of the relation between startup characteristic to all other elements in the model is shown in Figure 5.1. From the model, each of the relations will be elaborated and discussed.

Table 5.1: Overview of startup characteristic significance relation to other constructs in the model

		Dependent Variables			
Variables	**Items**	**Usage**	**Importance**	**Effectiveness**	**Performance**
Startup Experience	Experience in startup or entrepreneurial activities			Yes*	Yes
	Subject-Matter Expert or technical experience			Yes*	Yes
Business Network	Contact with potential or targeted customers			Yes*	Yes
	Contact with potential or established suppliers			Yes*	Yes
	Contact with capital or funding sources			Yes*	Yes
Company skill	Marketing, sales, and business development			Yes*	Yes
	Finance and accounting			Yes*	Yes
	Administration and HR			Yes*	Yes
	Operational, Production, and Manufacturing			Yes*	Yes

* = Significant when moderated by other variables as startup characteristic construct

5.1.1. Startup experience

Based on the statistical analysis result, startup experience is proven to have a positive impact on startup performance in business incubation process which is in line with the

hypothesis. In this case, the experience refers to entrepreneurial and SME experience. The entrepreneurial experience refers to the knowledge over entrepreneurial activities that need to be conducted to make the startup success and grow. The experience can also refer to prior experience in building a startup or other entrepreneurial ventures. This type of entrepreneurs will be called as experienced entrepreneurs. Based on the interview sessions, experienced entrepreneurs have a better understanding of what the startup should do in developing their business. In this case, the more experienced the entrepreneurs over entrepreneurial or startup development, the highest possibility that it can influence the startup performance within or outside business incubation programs. While young startups have difficulties in establishing the company business goals and orientation, the experienced entrepreneurs already move the company towards growth and are more independent from their respective business incubators. Since they can handle challenges and obstacles in their startup development based on prior startup experience.

How an entrepreneur can utilize their entrepreneurial experience depends on the level of experience the entrepreneurs had. While Cassar (2014) argue that there is no significant impact of entrepreneurial experience in predicting startup performance, Toft-Kehler, Wennberg, and Kim (2014) shows that different level of experience is indeed influencing startup performance. Entrepreneurial experience will only have an impact when the entrepreneurs have already become an expert or have encountered many entrepreneurial activities before the establishment of the startup. In this case, if the level of entrepreneurial experience is not sufficient enough, the experience may negatively influence the performance of the startup as the entrepreneur may fail to generalize their experience or fail to implement the knowledge for a suitable purpose.

In the interview, there were two respondents with more than three years of entrepreneurial experience before establishing the current startup. The startups can become the example of the influence of entrepreneurial knowledge into the behavior of the startup over the business incubation process and how it may impact the startup performance. The reason both of the startups to use business incubation services because of the benefit over business incubation services in learning something new, for example regarding business and technical knowledge that they need. The translation of the respondent answers regarding the question of why as an experienced entrepreneur they still joined and used business incubation services interview are shown below:

> There is a lot of new knowledge I got in this business incubation, when it may be insufficient for things related to technology, but for things related to business, valuation, and company, I got a lot,...For things related to technology I searched it by myself on the internet...(Respondent 7, 2018)

> ...Initially we developed a tool, then we hope that the business incubation can support us for the research fundings....business incubation services that we use a lot are training, a lot of technical training, while it is not provided directly by the business incubator, but the business incubator supported the activity such as provide us the place.. we also use the office and meeting room provided in business incubation area..But when the number (of clients) is 20 people, we use hotel instead....(respondent 16, 2018)

Both of the startups have similar behavior in deciding to utilize the business incubation program to learn new things which may improve their startup performance. Align with the theoretical and statistical findings, the level of experience will influence the performance and their reasoning to use the business incubation services and facilities. As the startups already know how to utilize the programs better, the impact of business incubation programs to their business operations is more significant which may help to fasten up the improvement of the startup performance in business incubation programs. The experienced entrepreneur's reasons to join and use a business incubation service

can also be assumed as being influenced by their respective entrepreneurial experience and knowledge that they got before joining business incubation programs. This experienced reasoning is also the one that supported some startups to join and use business incubation services.

In the similar case, SME experience has also been proven to have an impact on startup performance. As SME experience refers to the expertise of knowledge, the positive impact of the experience is expected, see Toft-Kehler et al. (2014). People with more expertise and experience in the entrepreneurial activities will use their knowledge and experience in the decision-making process to get more opportunities and to solve problems by themselves. Hence, this behavior may lead to better startup performance. The example of the SME influence on how the startup behave in business incubation process is shown in the interview statement below:

> ...We have no contacts or communication yet with research institution as we have a lot of specialists and they can handle the issue in their respective area.. (respondent 16, 2018)

SME experience has a significant impact on startup performance in business incubation process. However, in regards to the possible impact of SME experience to startup participation in business incubation programs, the result may produce a different result. The interview result showed that due to the SME experience, the startup might not utilize some of the services being offered to them as they perceived that they have the required knowledge. Thus, this case shows why there is no significant relationship between startup experience to startup usage in business incubation services. As they already have the knowledge needed, they may not use some of the known services or training. Instead, they will utilize or participate in the programs when they have less or no knowledge before joining the business incubation programs.

5.1.2. Business Network

In this research, a business network refers to the entrepreneur's external connection to the potential customer, suppliers, or funding sources. Based on the statistical data, all those three network connections have been proven to influence startup performance and startup usage in business incubation programs. A business network is an asset for startups as it can provide access to many stakeholders in the ecosystem and hence increase the probability of success (Ayatse et al., 2017; Soetanto & Jack, 2013; Aldrich & Ruef, 2006). By having access to the respective stakeholders, the startup entrepreneurial activities and development will also be more expeditious as they can utilize the established networks to help improve their performance. The final model suggests that prior business network of the startup have a positive impact on startup performance while they have no direct relation with startup usage in business incubation program.

From the interview session, some interesting findings can simulate the influence of having an established network before joining business incubation:

> ...as the company started by myself, and other team members were gathered after the startup created, it took one year to get a connection to clients, even searching for the pilot project took as long as six months when I did it by myself...
>
> ..for the clients, I already know them informally and already in progress for the contract for months, the business incubation help to create broader network access such as ministry and other networks and help to become the bridge to the new connection and strengthen for the networks I have already..
>
> ...In our case, as we have established networks already to the customers, we do not find the business matching event is useful... (respondent 11, 2018)

In regards to respondent experience, the startup already has several networks established which in this case are their potential customers. Thus, business incubator helps them to strengthen the relationship and help the startup to develop new network during their tenure in business incubation programs. Hence, having established networks can be seen as more beneficial than having no network at all when joining a business incubation program. As business incubation programs is an intermediary tool that helps to strengthen startup performance rather than creating new improvement in the startup. In this case, the network resources that the startup already had prior joining business incubation programs reduce the startup perception of importance over the business incubation process, and it influences them not to use the services.

5.1.3. Company skill

Company skill in this context refers to the entrepreneur's perception of knowledge over the market, sales, business development, finance, accounting, administration, HR, operational, production, and manufacturing. Based on the statistical data, all those four skills connection have been proven to influence startup performance and startup usage in business incubation services. The startup team skill help to influence startup performance in its relation to the entrepreneurs and startup absorptive capabilities to learn new things or new knowledge provide by the business incubation programs (van Weele et al., 2017). When the startups have relevant skills required in developing the startup, the learning process in business incubation process will be faster as they already have relevant knowledge than the one that has no relevant knowledge in the area. Furthermore, the level of business or technological skills will also help the startup to become more independent to solve any obstacles and problems they face. While this research tap to any possible skill set required for startup development, in general, any of the skill set will arguably beneficial to startup development. The skill set will help the startup to effectively participate in business incubation programs and use the services to develop their business.

The importance of prior skill or knowledge in business incubation programs can be highlighted by the quote from several findings from the interview process of startups in a business incubation programs as shown below:

> ...Some of the knowledge used such as we create [sic] framework, we also create business model canvas but the issue at that time was We did not understand the usefulness of the training as We though our startup as a social and non-profit organization and will not need the business training. However, We think about it again the business model canvas should be the same for us, just the contents that need to be adjusted.... *(some wordings are adjusted to explain the context of the conversation)* (respondent 14, 2018).

> ..The company startup with only me to handle technical things and process for searching funding all handled by the business incubation...The business incubator handles most of the networking process. *(some wordings are adjusted to explain the context of the conversation)* (respondent 11, 2018).

Based on those experiences, the importance of prior skill and business process will be beneficial to both startup and business incubators only in term of influencing the startup performance. The knowledge and skill before joining the business incubation program may influence the participation of the startup to business incubation programs. The prior business knowledge help startup to adapt and absorb new knowledge faster and will help them to implement the knowledge directly to the startup. Thus, the prior skill or knowledge of the startup team has a significant impact on startup performance and how they use the business incubation process which has been proven by initial literature review and the statistical analysis result.

5.1.4. Moderating impact of incubation duration to startup characteristic

There is an unexpected finding in the correlation between startup characteristic to the perception of effectiveness. In this case, incubation duration becomes a moderating variable between a path from startup characteristic to the perception of effectiveness which changes the insignificant connection from startup characteristic to the perception of effectiveness to significant. Incubation duration has a moderating impact and positive influence on the correlation. Even though this finding is not expected in this research, Hytti and Maki (2007) shows a similar result between the impact of incubation duration to startup perception of business incubator benefit. As the effectiveness in this research represents the satisfaction of the startup to business incubation programs offered, the variables can also be assumed similar to Hytti and Maki (2007) research. Thus, the finding then has been proven with a similar result in the previous research.

5.2. Environmental Factors impact on business incubation process and startup performance

This section will explain the findings surrounding environmental factor construct which consists of the customer preferences, market structure, locational factor, and human capital support. Based on the statistical analysis conducted in the previous chapter, the overview of the relationship between environmental factors to all other elements in the model is shown in Figure 5.2. From the model, each of the relations will be elaborated and discussed.

Table 5.2: Overview of environmental factors significance relation to other constructs in the model

Variables	Items	Usage	Importance	Effectiveness	Performance	Startup characteristics
Human capital support	People are open to new product in the market	Yes			Yes	Yes
	There is a lot of professional business services offered	Yes			Yes	Yes
	The area attracts high and requisite-skilled employee	Yes			Yes	Yes
Customer preferences	The product has become customers favorite in the market	Yes			Yes	Yes
Locational Factor	There is government policies for supporting entrepreneurs	Yes			Yes	Yes
	There is scientific or research complex where the company located on	Yes			Yes	Yes
	There is functional financial market	Yes			Yes	Yes
Market structure	There is a lot of different products offered in the market by competitors	Yes			Yes	Yes

5.2.1. Customer preferences

The customer preference variable defines the impact of product popularity on startup performance, startup participation in business incubation process, and startup characteristic. In this case, the customer preference over the product may impact startup performance since the more popular the product, the more sales and profit of the company will increase. Customer preference over a product may become an opportunity or a threat as it represents the buyer power in the market. Customer preferences as an opportunity will be achieved when the customer tendency is to the startup product while the contrast condition will happen if the customers are not fond of the product. The importance of customer preferences are positively impacting startup performance

Churchill and Bygrave (1989), Ronstadt (1985), and Gartner (1985).

The case of the influence of customer preferences in the market can be explained based on the interview result with one of the incubated startup in Indonesia as shown below:

> ..one of the startup challenges is that there is perspective in the customer that prefer foreign brand over local brand.. (respondent 11, 2018)

As shown in the quotation, it explains the obstacle that has to be through by the startup when the customer does not prefer the startup's product in the market. In the market competition model, if the startup has lost its product popularity, the sales and profit of the startup will be dropped which influence their company performance as a whole (Gartner, 1985). Furthermore, as the part of the environmental structure, the buyer power also impacts the startup characteristic and development process which in this case may happen in business incubation programs for incubated startup (Porter & Advantage, 1985).

5.2.2. Market structure

The market structures variables define the impact of the different product offered in the market to startup performance, startup participation in business incubation process, and startup characteristic. Various product offered in the market refers to the condition of market heterogeneity which in this case can become beneficial for a young company such as startup. When there are a lot of different products offered in the market, the level of competition decrease, and it will open an opportunity to enter the market (Aldrich & Ruef, 2006; Porter, 1979; Gartner, 1985). Furthermore, the market with heterogeneity structure will increase the probability of the startup to survive and grow which directly impact the startup characteristic and behavior in business incubation process (usage). Meanwhile, the level of importance and effectiveness will not be impacted as the industry changes will not impact the startup perception of importance and effectiveness in the business incubation programs.

5.2.3. Locational factor

Locational factor variables define the impact of the government policies on supporting the entrepreneurial process, the availability of scientific or research complex in the startup location, the availability of functional financial market to startup performance, startup participation in business incubation process, and on startup characteristic.

As part of environmental factors in the new performance model (Chrisman et al., 1998; Gartner, 1985), the locational factors have a significant impact on startup performances. Startup in a favorable and advantageous location can get access to many resources which needed by the startup. Furthermore, the right location may also provide more opportunities for the startup to grow. Thus, getting favorable and advantageous location will not only impact startup characteristic and performance as shown in the theoretical model and statistical result but also will impact on how the startup behaves in the business incubation process. The startup may use or participate more business incubation services along with the increase of entrepreneurial support in the location. The favorable location also provides several beneficial intangible resources (Dornberger & Zeng, 2009).

Supporting government policies for startup development are needed to help the startup develop and grow within the provided ecosystem. As shown in the statistical model, there is significant impact between government policies on the entrepreneurial process in the location. Supportive location needs a supportive state system. In this case, the supportive state system refers to the policies and the regulation in the location (Karabag & Berggren, 2014). Supportive regulations and policies will help the startup to feel comfortable in

the location and help them grow and prosper. The importance of supportive government policies and regulations are shown in the statement extracted from the interview process as below:

> ...currently in term of regulation, I think it is already good...in term of regulations, as long as any of the regulations does not block the startup, it has been beneficial for us as startup...problems happen when the regulations are created to block startup development, but in this case, there is no regulation like that yet here..
>
> ..Startup can grow by themselves, but if the government can support startup, for example in funding and investment, it will help startups.. Without support, startup growth is slower or may even be acquired by a large company. Hence, the government support for startup will help startup a lot as a startup cannot compete with the large company in the market..
>
> ...there are no communication from the local government, any connection to any networks always helped by the business incubator, not from the government. I have never really had any direct communication with the local government...
>
> ..As our biggest cost is the accommodations if the government can help the startup in this matter will help us a lot.. (respondent 11, 2018)
>
> ...there are significant differences between startup ecosystem in our location with other locations.. (respondent 9, 2018)
>
> ..For the local government, it will be better if they can provide co-working space as it is not possible for the startup to work separately and also access to funding.. (respondent 10, 2018)

As shown in the interview results, almost all the respondent shows their concern over the government support to the development of startup ecosystem in Indonesia. In this case, while the government should have a significant role in shaping the ecosystem, the incubated startup seeks more aggressive support from the local government in term of funding, infrastructure facilities, and accommodation. Along with other environmental factor variables, the locational factors especially the government support need to be improved in order to improve the development and performance of the startup itself.

5.2.4. Human capital support

Human capital support variables define the impact of people openness of new product, availability professional business services, and the availability of high-skilled employee in the location to startup performance, startup participation in business incubation process, and the startup characteristic. People or customer openness over new product in the market is required for a startup with a highly innovative product. In this case, customer needs to be open enough to be able to accept a product which is unfamiliar to them. If the startup product is highly innovative and the customer in the location is open for the new product then the performance of the startup may perform better than when the customer has lower openness trait.

In trying to survive before joining business incubation services, the startup may use professional business services to complement their lack of skill and knowledge (Cooper, 1993). Startup as a young company suffers from their limitation in business knowledge and support. In this case, external professional service will help the startup to be able to survive in the market while improving their performance.

Lastly, the high-skilled employee is required in supporting the development and growth of a startup. If the location can provide or attractive enough for the high-skilled employees to come to the location, it will positively impact the startup performance and

the team characteristics as it will improve their experience level, skill, and network as a company. Moreover, when the startup can acquire high-skilled employee to their team, it may also impact the startup's usage of business incubation services. The following respondent statements show the importance of having a high-skilled employee in the startup's location:

> ...rather than support from local government, we need high-skill talents from university more, as current graduates from the university are not ready yet to join startups in term of skill... (respondent 11, 2018)

If the government can create a policy or regulations to improve the quality or to create an attractive incentive for the high-skilled labor in the area, it will directly impact the respective startup performance.

5.3. Business Incubation Process impact to startup performance

This section will explain the findings surrounding business incubation construct which consists of the startup participation, the perception of effectiveness, and the perception of importance. Based on the statistical analysis conducted in the previous chapter, the overview of the relation between the business incubation process to all other elements in the model is shown in Figure 5.3. From the model, each of the relations will be elaborated and discussed.

Table 5.3: Overview of business incubation process constructs significance relation to other constructs in the model

			Dependent Variables	
Construct	**Variables**	**Items**	**Usage**	**Performance**
Usage of business incubation services	Usage of Infrastructure facilities	Usage of space and building facilities such as office and working space		Yes
		Usage of business (postal) address provided by business incubator		Yes
		Usage of shared office services and equipments such as meeting room, cafeteria, printer, and building security		Yes
	Usage of Network Access	Usage of access to funding, grants, and loans		Yes
		Usage of access to potential customers		Yes
		Usage of support on product sales and marketing		Yes
	Usage of Administrative support	Usage of administrative and secretarial services		Yes
		Usage of business training, seminar, and workshop		Yes
		Usage of business counseling and mentoring		Yes
Perception of importance of business incubation services	Importance of Infrastructure facilities	Importance of space and building facilities such as office and working space	Yes	
		Importance of shared office services and equipments such as meeting room, cafeteria, printer, and building security	Yes	
		Importance of administrative and secretarial services	Yes	
	Importance of Network Access	Importance of Access to potential customers	Yes	
		Importance of support on product sales and marketing	Yes	
	Importance of Business support	Importance of business planning and development support	Yes	
		Importance of peer networking (sharing information, experience, business partnership, etc with other tenants)	Yes	
Perception of effectiveness of business incubation services	Effectiveness of Infrastructure facilities	Effectiveness of space and building facilities such as office and working space	Yes	
		Effectiveness of shared office services and equipments such as meeting room, cafeteria, printer, and building security	Yes	
	Effectiveness of Network Access	Effectiveness of access to funding, grants, and loans	Yes	
		Effectiveness of access to potential customers	Yes	
	Effectiveness of Business support	Effectiveness of support on product sales and marketing	Yes	
		Effectiveness of administrative and secretarial services	Yes	
		Effectiveness of business planning and development support	Yes	
		Effectiveness of peer networking (sharing information, experience, business partnership, etc with other tenants)	Yes	

Entrepreneurs will not create any economic value if there is no action done by the entrepreneurs to induce entrepreneurial activities (Mauer et al., 2017). Thus, company action in this research will refer to the company actions that taken by the startup to

improve the startup performances. In the business incubation process, the action taken in the program is the startup participation of business incubation facilities and services offered by the business incubators. In this case, based on the theoretical concept and statistical result, the influence of startup participation to startup performance has been confirmed while the relation between perception of importance and effectiveness have no impact to startup performance. As previously stated by Mauer et al. (2017), these conditions may be affected due to the condition that even though there are changes in the perception of importance and effectiveness in the startup, when there are no changes in how they participate in the business incubation programs, there will be no changes in the performance. Even though in the business incubation process tested in this research, only business service and facilities usage have been proven to influence startup performance. Furthermore, the relation itself have been confirmed by the respondent in the interview session as shown below:

> ...business incubation help our startup to connect to broader networks and open new opportunity.. (respondent 11, 2018)
>
> ...we use mentoring services a lot to help us solve our problem. Mentor also help to shape our business objectives and targets.. (respondent 9, 2018)
>
> ...during business incubation programs, mentor help connect us to an expert when we have a problem.. business incubation also connect us to peers in business incubation programs and communication with them are still being kept until now.. (Respondent 7, 2018)
>
> ...for us, the most essential business process facilities and services are the one related to the access provided to infrastructure facilities such as support on implementation of networking and business address.. It is hard to imagine our startup without the support infrastructure services from the business incubator (respondent 10, 2018)
>
> ..business incubator helps us in validating our product, mentoring, and we get access to many networks.. We seldom use the coworking space as we already have our office but may use it later on.. (respondent 15, 2018)
>
> ...at first, when many people use the working space in the business incubator, there are many peer networking and sharing sessions. When there are fewer people come to the business incubator, we also lessen our visit to business incubator.. (respondent 9, 2018)

The last quotation has also proven the impact of how the startup perceive the business incubation services and facilities, if they feel that the service or facilities are no longer useful, they may stop using the services, and it likely will impact the startup performance as a whole.

5.4. Most Impacting Factors in Business Incubation programs

From the IPMA testing result in Chapter 4, the list of importance rank of factors which can influence startup performance is extracted. The rank of the factors is shown in Figure 5.4.

Based on the IPMA result, it can be seen that the usage of business counseling and mentoring service is the most significant factor in startup performance. Furthermore, based on the interview result, most of the respondent also showed that they frequently use the mentoring and business counseling services as it can help them solve problems that need expert feedbacks or advice. Other than the usage of counseling and mentoring services, the popularity of the product in the market has also been proven to have a high impact on startup performance. When a product becomes a customer favorite in the market; the competition level in the same market reduced which improve the startup performance. Other factors impacting startup performance based on its impact level can be seen in Figure 5.4.

Table 5.4: Rank of importance factors from IPMA testing to business incubation usage and environmental factor items

Items	Description	IPMA Performance
U7	Usage of business counseling and mentoring	0.082
BS2	The product has become customers favorite in the market	0.079
BS3	People are open to new product in the market	0.066
LF1	There is a lot of professional business services offered	0.064
U4	Usage of support on product sales and marketing	0.061
U11	Usage of access to potential customers	0.060
U6	Usage of business training, seminar, and workshop	0.060
U5	Usage of administrative and secretarial services	0.057
LF2	There is scientific or research complex where the company located on	0.056
GS1	There is government policies for supporting entrepreneurs	0.055
IS3	There is a lot of different products offered in the market by competitors	0.055
U10	Usage of access to funding, grants, and loans	0.051
LF4	There is functional financial market	0.046
U1	Usage of space and building facilities such as office and working space	0.038
U2	Usage of business (postal) address provided by business incubator	0.036
U3	Usage of shared office services and equipments such as meeting room, cafeteria, printer, and building security	0.031
LF5	The area attracts high and requisite-skilled employee	0.030

5.5. Overview of startup feedback to business incubation process

In the interview process, several feedbacks are extracted to know what factors or elements in their respective business incubation programs that can be improved. Several inputs and the feedbacks are shown in the quotation below:

> ..current business incubation sometimes is not ready to face the fast growth of startups.. For example, when the startup was still small, the business incubation management can handle the startup. However, when there is a sudden growth of the startup, the business incubation cannot handle the startup anymore.. In this case, because the business incubation cannot handle the growing startup, most of the startup then forced to go live. Most of the business incubation system is rigid (respondent 11, 2018)
>
> if the business incubators can provide legal expert.. and technological expert or mentor that can help in when we face product development issue (Respondent 7, 2018)
>
> Many startups are struggling in funding.. and a lot of business incubator only provide funding for a limited period only while startup need a lot of money to survive so at least startup can help to get access to another funding when the money is running out (respondent 9, 2018)
>
> ..many startups have limited resources such as limited networks and money while startups in the business incubation are expected to have those already.. (respondent 14, 2018)
>
> ..business incubation programs with grants scheme of funding are more attractive than the one with investment scheme.. (respondent 15, 2018)

Based on those inputs, aside from the result from the model testing and analysis, the feedback from the interview session can also be considered as feedback for business incubators in Indonesia.

5.6. Additional findings on business incubation programs in Indonesia

Table 5.5: Insight on Indonesia's business incubators categorizations and supports

	University Business Incubators	Government Affiliate Business Incubators	Private and state-owned Busines Incubators
Objectives	- Commercialization of University research - Development of surrounding local residents - University entrepreneurial ventures	- Commercialization of governments and institutions research - Institution entrepreneurial ventures	- Business profit - Company portfolio and business scaling and development - Ecosystem and area development
Standard Service and Supports		7-S (Standard business incubation services advised by Indonesian Government): 1) Space 2) Shared of office facilities 3) Service (business, technology, marketing, counseling, and financial services) 4) Support (business, technology, and product development support) 5) Skill development (business, management, and skill training) 6) Seed capital (support on internal or external funding) 7) Synergy (support on business network development and scaling)	
Pros (Additional support / focus):	- Access to university research and development facilities (such as university laboratory facilities and tools) - Access to university networks (technical experts, professionals, companies, government officials, research institutions, high-skilled employee) - Large research and patent portfolio - Mostly not yet applied fee or payback mechanism for its tenants	- Access to government research and development facilities (such as product workshop and development facilities) - Access to government assets and facilities (such as product testing facilities, product ceritification and registration, and patent and copyright certifications) - Large funding supports and opportunities - Large infrastructure facilities and supports - Mostly provide grants and free business incubation system as BI founded by government fundings (some applied office room rent for its outwall startups, otherwise mostly free)	- Extensive professional networks and access (business incubators, professionals, accelerators, angel investors, coworking spaces, and startup communities - Additional support depends on company capabilities and portfolio (such as infrastructure, software, technical expertise, and resources access) - Comprehensive business supports and services - Faster to adapt to changes to startup development and innovation system - Small to medium working facilities (larger for state-owned business incubators) - Mostly applied sharing revenue or equity system
Cons (Limitation)	- Limited internal funding - Limited resources (mostly managed by part-time university staff) - Limited working facilities	- More rigid structures and systems due to its obligation to follow government timelines, regulations, and standards	- Limited workshop and R&D facilities - Limited access to government assets, facilities, and officials (easier for state-owned business incubators)
Ideal for:	- Student startups - High-tech startup and other startups in need of laboratory and research, workshop, and product development facilities - Startups with university or academic institution as its customers	- High-tech startup and other startups in need of laboratory and research, workshop, and product development facilities - Researcher or research-based startups - Startup with government institution or officials as its customers	- IT-based startups - Non high-tech startups or startups without a need to laboratory and research, workshop, and product development facilities - Startup in need of extensive business trainings and professional networks access

During the process of visiting and interviewing 14 business incubators in Indonesia, there is a categorization that can be identified outside the formal categorization shown in Appendix C. This categorization was built based on the business incubator's characteristics, objectives, incubation system, support, and facilities provided to their incubated startup in Indonesia. The complete categorization can be seen in Table 5.5.

The first categorization is the university business incubator. As stated before in Section 2.5.4, Indonesia's business incubators landscape mostly consists of university business incubators. In this case, university business incubators were firstly built to help the country entrepreneurial development. In the current period, as seen in Table 5.5, the objectives of most university business incubators are to develop the university research into a product and bring it to market along with its original intention to develop surrounding residents and to develop entrepreneurial ventures of the university. Most university business incubators in Indonesia have limited funding for their operational support. Thus, the type of supports that the incubator can provide to their tenant is quite limited. However, university business incubators provide access to university facilities and assets such as laboratory, product workshop facilities, and access to high-skilled students as an intern or potential employee for the startup. Furthermore, university business incubators are also ideal for student entrepreneurs that want to build startup early before graduating from the university as most private business incubators are not accepting students as their tenants.

The second categorization is the government-affiliated business incubators. As the business incubators are either owned by the government or are parts of a government institution, they have a lot of access to government assets, networks, and facilities. As most of the objectives for this type of business incubators are to develop a product from government's institution research facilities to the market, they are fully supportive on providing product research and development facilities such as a private workshop room for product development and testing, product patent and copyright registration, and research funding support. In this case, a high-tech startup or research-based startup will be suitable to join this type of business incubators as they can save a lot of fixed asset cost to develop the product. Other advantages of government affiliate business incubators are that the funding offered as grants rather than incentives. Thus, the startup does not have to pay back the funding with sharing revenue or equity contracts.

The last categorization is the private business incubators and state-owned business incubators. In this categorization, state-owned business incubators are combined with private business incubators due to the similarity in objectives and industry focuses. The most significant differences between both of them are the support of fundings which in Indonesia may be more prominent in state-owned incubators rather than in private incubators. In this categorization, the business incubator view startup as their resources. In the case of profit-based business incubators, their primary objective is profit by creating a contract of revenue or equity sharing while for social-based business incubators, their primary objective is to develop their area or startup ecosystem. The main strong points of this business incubator category are their extensive professional networks and business training supports. Other characteristics of this type of business incubators that they can provide additional support correspond with their capabilities. A business incubator with infrastructure access and facilities may provide their incubated startup to use their infrastructure backbone. In the same way, a company spin-off business incubators may provide access to their company expertise and facilities to their incubated tenants. Thus, startups which need to develop their networks and business knowledge can choose to join this type of business incubator.

This business categorization may create a useful insight for building recommendations for startups, business incubators, and governments presented in the next chapter.

6

Conclusion

6.1. Revisiting Main Research Questions and Research Objectives

The objectives of this research are: 1) to understand the impact of business incubation programs, 2) to understand how it can impact startup performance, and 3) what factors may impact the performance in business incubation programs. Thus, the main research question is created as follow:

How does business incubation impact startup performance?

In the previous chapters, several sub-research questions and hypotheses were created to answer the main research question. In chapter five, the answers to the sub-research questions and its corresponding hypothesis has been presented. The findings from the research then used to create a model to identify the roles of each element and its influence on startup performance. Thus, the answer to the main research question will be revisited to create recommendations to help startups, business incubators, and the governments, especially in Indonesia. The recommendation will focus on which factor they should improve to increase startup performance in the business incubation programs.

Based on the statistical results, the null hypothesis which stated that there is no impact of business incubation process to startup performance can be rejected. There is a positive impact of business incubation program, especially of using business incubation services and facilities, on startup performance in Indonesia.

It can be concluded that the more startup participates in the business incubation programs, the stronger it may influence startup performance. As startup is a new and a young company, improving their performance will be beneficial not only in the short period but also in the extended period as it will help them survive longer in the market. Furthermore, the incubation period has also been proven to increase the startup perception of the business incubation programs effectiveness. In this case, favorable views over the business incubation effectiveness will also influence the usage of business incubation programs itself along with the views on the importance of the programs. Thus, to increase the startup performance, the perspectives over business incubation programs have to be improved by having more useful and beneficial services for the startup. By catering the startup needs and giving high-quality services, the participation rate of the program will increase, and it will improve startup performance. Furthermore, socialization of the importance of the offered services and facilities will also help to increase startup participation rate in the program.

The improvement of startup performance in business incubation programs will be beneficial not only for the startup but also the business incubator. After all, the objectives of business incubation programs are to improve startup possibility to survive and succeed in the market. Potential survivability has been portrayed as part of startup performance in this research. Thus, the improvement of startup performance means the closer the business incubators to their objectives. Furthermore, the research findings can be used to develop the essential services in business incubation programs. In response, the creation of business incubation programs should be based on which program or services are demand-able and required by the startup and which program can help to improve startup performance. In this case, the business incubators can enforce a more aggressive approach to ensure that startup understands the business incubation benefit to increase their motivation to join all the business incubation programs offered. As the more knowledge the startup has in regards to business, the perspective over the business incubation benefit will also increase and motivate them to participate in the program. Furthermore, the business incubators should also ensure the quality of provided services and facilities to attract participation from their incubated startup. A customized program based on startup stage, needs, and progress may work well in this aspect.

Other than the business incubation programs, the environmental factors were also found to have a significant impact on startup performance. In this research, the environmental factors were created by selecting several indicators of industry structure, buyer and supplier nature, locational factor, and governmental support from various research. Based on the result, the environmental factor's impacts on startup performance are similar to the impacts created by using business incubation facilities and service. Thus, it is essential to also consider the roles of environmental factors as external inputs to improve the startup performance in business incubation programs. As the environmental factors are considered as external factors in the business incubation system, there is a need for the policymakers intervention to shape the surrounding environment into a supportive one. The role of government in this ecosystem is needed to ensure there is a supporting system provided in the location and ecosystem of startups in the region. After all, without a supportive environment, the startup cannot survive only by business incubation supports. A cohesive and supportive system is needed to create a strong backbone for the startups to survive and grow. Thus, both direct and indirect factors influencing startup performance need to be included in creating a supportive environment for the startups, and the government can become the main stakeholder to help to shape the baseline for the ecosystem development.

6.2. Business incubation and environmental factor as the critical drivers in influencing startup performance

In conclusion, based on the research result, several elements need to be considered by all the stakeholders to improve startup performance as shown in Figure 6.1. As shown in the model, business incubation programs have an impact on startup performance when it is utilized well by the incubated startup and supported by surrounding entrepreneurial ecosystem.

In business incubation programs, the impacts are especially to essential services and facilities such as 1) business counseling and mentoring, 2) product sales and marketing support, 3) business training, seminar, and workshop, 4) administrative and secretarial services, 5) access to funding, grants, and loans, 6) space and building facilities, 7) business address, and 8) shared office service and equipment. The services and facilities mostly are provided by business incubators. Thus, the startups can freely join the programs based on their needs and availability. However, as their participation has a significant impact on performance, it will be beneficial for the startup to try to join as

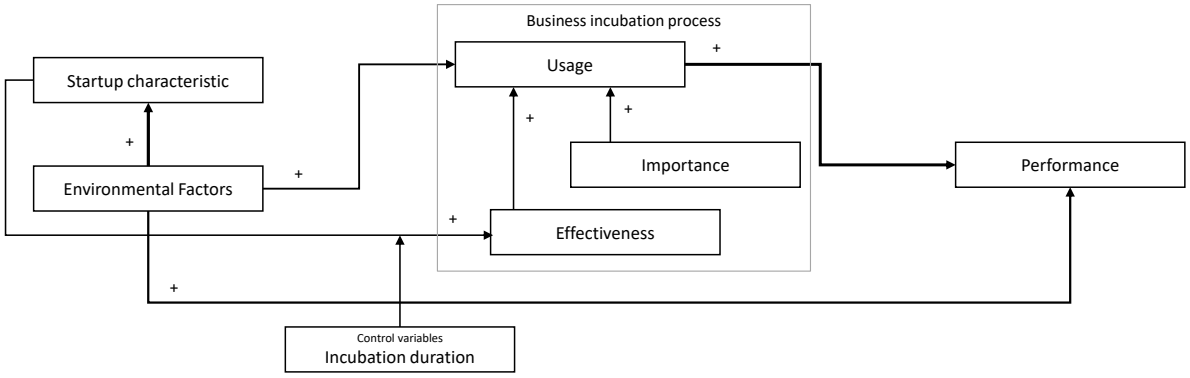


Figure 6.1: Final model of startup characteristics, environmental factor, business incubation process, and startup performance relations

many as programs provided by the business incubators despite experience, skill, and network that they had before joining business incubation program.

Startup participations in business incubation programs are affected by other internal and external factors such as startup perception of effectiveness and importance on business incubation programs and external environmental factors surrounding the startups and business incubators ecosystem.

Startups participate in business incubation programs based on their perception of how useful and essential the programs help their company to grow and survive. If the program can not support their needs or not useful, it will be likely they will choose to not participate in the program. Instead, if they perceive that the programs will be beneficial to the company, they will be motivated to join and participate in the programs. However, the perception of the effectiveness of the business incubation programs is affected and changed based on the duration of the business incubation program itself. The longer the startup has involved in business incubation programs, the understanding regarding the benefit of business incubation programs will be more evident. Thus, the perception over the benefit of the business incubation program will become more positive and will motivate the startup to participate more in the program.

In the external aspect, the environmental factors surrounding the startups and business incubators are also essential to be considered as influencing startup performance in business incubation program. After all, a startup which incubated in the business incubation programs will be affected by the external environment outside business incubation as any other startups. The environmental factors are impacting both startup participation in business incubation programs and startup performance within and outside business incubation. The essential environmental factors considered in this research are 1) product popularity in the market, 2) people openness to a new product, 3) business professional service offered in startup location, 4) availability of scientific and research complex, 5) supportive government policies for startups, 6) product heterogenity in the market, 7) functional financial market, and 8) availability of high-skilled employee in startup location. However, it also needs to be considered that the environmental factors may differ due to the region, culture, and other location characteristics.

Thus, all these factors need to be considered by the startup, the business incubators, and the government as an input in improving startup performance and in developing the startup ecosystem and regulation. By incorporating all the essential factors, the growth and performance of the startup within and outside business incubation programs can be improved and may lead to more significant economic impact to the country. Rather than

only focusing on one element in the system, slowly improving all the elements will be more promising in the long term as the backbone for the ecosystem will be established to be extended in the future.

6.3. Study limitation and potential future research

Several study limitations have been identified during the research. The impact of the study limitations to the research's result will also be explored. Based on the study limitations, potential future research and its possibilities can also be explored and elaborated in this chapter.

6.3.1. The limitation of the questionnaire

The research used a survey approach and utilized a questionnaire as a tool for collecting the data. The questionnaire is newly created by the researcher based on the items that want to be tapped in the model. Thus, there are several limitations of the questionnaire.

First, the questionnaire is too long. As the items that want to be tapped to build the model are enormous, the questions to tap those items are also excessive. Several respondents gave feedbacks on the length of the questionnaire and wished to have a shorter questionnaire. The length of the questionnaire will impact the response rate and the quality of the respondent answer (Galesic & Bosnjak, 2009; Kalantar & Talley, 1999). Furthermore, Galesic and Bosnjak (2009) also shows that the length of the questionnaire impacts the variability of the respondent answers which has also shown in this research. At the beginning of the research, a small pilot test had been conducted to know people responses on the questionnaire length and whether other people will understand the content and question in the questionnaire. Based on the pilot project, several questions have been dropped and merged to reduce the length of the questionnaire. Unfortunately, feedbacks on the length of the questionnaire remained. However, several respondents have also given feedback that it is required to take as many data and information as possible to ensure all possible factors have been included in the questionnaire. Based on those feedbacks, it will be better if the data collection process is divided into several stages in the future. The stages are used to divide the data collection process of each element in the model. By using this approach, not only the items that can be tapped can be more detailed but also it will be easier for the respondent to fill in the data.

Second, the scale used in the questionnaire are different for several sections. As the questions are newly developed based on the tapped items, the style of the questions and its respective scales differ due to the nature of the question itself. For example, in part II of the questionnaire, for the questions related to experience variable, the 7-scale range from "totally inexperienced" as one and "extremely experienced" as seven while in the same part, for question related to business networks, scale one represents "Not at All" while scale seven represent "A great deal". Thus, the respondent may become confused and need a longer time to read each of the scales before filling in the questionnaire. In this case, it would be advisable to use uniform scale criteria throughout the questionnaire. Uniform scale will shorten the length of the questionnaire and will make the questionnaire more readable. Krosnick and Fabrigar (1997) highlighted the importance of minimizing the questionnaire difficulty. The more comfortable the respondent to the questionnaire, the more accurate the data will be. Furthermore, the amount of the efforts put on thinking how to fill in the data align with the level of data inaccuracy (Krosnick & Fabrigar, 1997). Thus, it will be advisable to consider to shorten and simplify the questionnaire for the future research.

6.3.2. The limitation of the sampling data

The small number of cases or observations directly impact the data analysis process in which the researcher has to drop a lot of insightful items due to low variance and scaling reliability. With a larger number of cases or observation conducted, more items will be available to be analyzed and will give more insight into the causal model. However, the number of data available can still be used to develop a base model for future research. The limitation of the sampling data and its low variance also impact the generalization of the research result. Further test of the model by using a completely new data using same questionnaire can be conducted to improve the generalization of the model. Furthermore, the future research can use the data and model from this research as the basis to create a more comprehensive model of startup activities and its impacts on business incubation programs.

6.3.3. The limitation of the data collection

Due to limited information on the number of startup and business incubation in Indonesia, the sample collected as respondents are only spread out to several areas. In a large area country such as Indonesia, the sampling approach should be cautiously selected to ensure that the sample can represent the population of the country. In order to anticipate this issue, several triangulation approaches to reach out to the respondents are used which lead to the use of mixed-mode survey approach. The combination of offline and online data collection can help to improve the response rate in the similar or future research. The future research is also advised to increase the number of samples to keep more variables and items in the model. One of the option to increase the response rate is by using incentive for the respondents (Kalantar & Talley, 1999). The usage of incentive such as attractive lottery gift for the respondent may help to increase the first mail respondent to the questionnaire rather than only use a souvenir give to the respondent which used in this research.

6.3.4. Time and cost limitation

The limited time and cost of the research and the period of the research have affected the data collection process. The data collection process was conducted in the same period as a religious holiday in Indonesia by using mixed-mode survey and interview. Thus, the data collection process took longer than predicted and impact several processes on collecting and confirmation of missing data and information. Still, due to the limitation of the data collection period, the sample data collected may less than ideal (Sekaran & Bougie, 2016). The trade-off between time and cost limitation in collecting the data also shows that this research may not be purely scientific and may not be able to use as a general result to represent all the startup and business incubation ecosystem in Indonesia. Thus, for future research, more extended research period may help other researchers to reach out to more incubator and startups in Indonesia. Furthermore, more extended research period can also make it possible to use longitudinal study instead of cross-sectional study for collecting the data as it will be more advisable for measuring the differences between before and after treatment of the samples (Sekaran & Bougie, 2016).

6.3.5. Limitation on the model

The model in this research was built based on several new venture performance model (Gartner, 1985; Cooper, 1993; Chrisman et al., 1998) and combined it with startup and business incubation literatures (Abduh et al., 2007; Voisey et al., 2006; Hackett & Dilts, 2004b; Ayatse et al., 2017). Despite the intention of the research that wants to create a more comprehensive model of startup performance in business incubation programs, several potential variables and factors are not included in the final model. The limitation

to include more factors and model in this research emerge due to the research approach to use survey and interview as the data collection method. By using practical information and respondent response as the data input in the model, the length and the number of information to be collected are quite limited as it may impact the quality and the response rate of the data (Galesic & Bosnjak, 2009; Kalantar & Talley, 1999; Krosnick & Fabrigar, 1997). Thus, in this case, rather than incorporate all the extended version of the Cooper's and Gartner's model defined by Chrisman et al. (1998), the research focuses on selecting which factor that can be measured and suitable for respondents in Indonesia.

In the original model itself, Cooper (1993) include the characteristic of the entrepreneurs as input which influences startup performance. In this aspect, entrepreneur behavior characteristics such as commitment, determination, motivation, and ability to assign others may become critical factors in the individual level. Furthermore, the personal goals of the startup teams affect how they behave in the decision-making process. Those personal and individual characteristics are not covered in this research as the focus of the analysis is on the team and company level. Several respondents in the interview process also stated that motivation to join business incubation programs affect how the startup behave in the programs itself which yet another factor that needs to be covered in the model. Thus, in the future research, the motivation to join the business incubation programs and personal characteristics of the founders may be included as an input in the model. Other factors to be included in the extended version of this model can refer to (Chrisman et al., 1998) factors and categorizations.

Another important aspect of the model is the company strategy. As shown in Chapter 2, company strategy affect the behavior of the startup and directly influence their performance and probability for success. Thus, company strategy has been included in the initial model in this research. Business strategy become of the key factors in measuring startup performance (Cooper, 1993; Chrisman et al., 1998). Unfortunately, due to the lack of data, company strategy items and variables have to be dropped from the final model and not covered in the final analysis in this research. Hence, future research can extend the model from this research to include company strategy with a sufficient number of data.

From the interview and the data collection process, there are also several respondent feedbacks to focus on the roles of funding in influencing startup performance which may also be further developed in the next model. Most of the respondent put funding as their vital source to survive which can be an exciting topic to be included in the model not only as a moderating variable but as an input for the model.

6.4. Contributions

This research is aimed to lessen the gap between theoretical and practical data and insight regarding startup in Indonesia. While there are no comprehensive map or model to relate all factors which impacting startup performance in business incubation, this research can be the fundamental knowledge or information to develop a more comprehensive model on startup in business incubation programs. The result of the result can also become an insight for the government, business incubators, and also startups to focus on improving which factor that has the most significant impact on startup performance.

6.4.1. Theoretical Contributions

Fill the knowledge gap

The research was conducted as an effort to fill in the knowledge and research gap in business incubation research in general and in Indonesia. In Indonesia, the research

which covered business incubation study is still limited, see Gozali et al. (2017). Despite the popularity of business incubation study in general entrepreneurship research (Hackett & Dilts, 2004a), there are still several gaps that need to be covered in the business incubation domains. Some of them are the application of theoretical concepts developed over the years to more practical measurements and applications and the application of the concepts into several focuses in the business incubation model.

Thus, this research wants to fill those gaps by creating a new model based on theoretical concepts that have been developed over the years as the baseline and using several entrepreneurial aspects that have been previously studied to fill in and complete the model. The implementation of previously developed theoretical concepts to a new application and model were advised by Cooper (1993). As stated by Cooper (1993), there is a lot of opportunities to develop or extend a model based on the previous theoretical concept. In this way, the model will have more theoretical ground rather than develop a new model with new theoretical concepts.

Furthermore, this research also shows the possibility to test combined theoretical concepts and applied it to practical applications. The application of theoretical concepts to practical applications will bring life to the concept and create a more relatable example not only to the academia but also to business practitioners, governments, and the public.

Thus, this research has contributed in creating a new model which is built from previous research and combine it in a new context and domain and also implement the concept to new practical applications in a new landscape which is in Indonesia. The research will add new knowledge in business incubation research in general and in business incubation research in Indonesia.

Creating a more comprehensive theoretical model

As stated in Chapter 1, currently there are no comprehensive mapping of all impacting and impacted factors contribute to startup performance model in business incubation programs. The measurement of startup performance itself has always been a challenging task as there are a lot of factors and conditions that need to be considered to measure startup performance (Cooper, 1993). Thus, this research tries to be one of the pioneers to initiate the creation of the more comprehensive model in predicting startup performance by incorporating business incubation programs as one of the elements in the model.

The final model built in this research was created by using new venture performance model developed by Cooper (1993) and combined it with several theoretical concepts and factors from other startups, business incubations, and entrepreneurial research (Gartner, 1985; Chrisman et al., 1998; Abduh et al., 2007; Voisey et al., 2006; Hackett & Dilts, 2004b; Ayatse et al., 2017). Furthermore, the model then was confirmed not only based on previous research but also by using survey data which will confirm the practicality of the model in business practice.

In the scientific aspect of the model, the final model has also been modeled and tested by using PLS-SEM method. The PLS-SEM (Partial Least Square Sequential Equation Modeling) is a new mainstream method in business and management research (J. F. Hair, Ringle, & Sarstedt, 2011; J. F. Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014; Sarstedt, Ringle, Smith, Reams, & Hair Jr, 2014). PLS-SEM method was used as a method to help predict and develop the new model based on known theoretical concepts (J. F. Hair et al., 2011). The usage of PLS-SEM in this research also helps to contribute to another PLS-SEM application in the business research studies.

As new foundation for other research

This research still has many limitations that need to be fixed in the future as shown in Section 6.3. Thus, there are a lot of opportunities to develop more extensive models. In this case, the final model created in this research can be used as the baseline for future study and can be extended with more factors and variables. Furthermore, the model can also be tested in another scope and another country which have similar characteristics to Indonesia. The questionnaire created in this research can also be modified with its future improvement possibility to tap other startup supports such as accelerator, angel investor, or other institution that provide incubation services. After all, the research can become the start of more extensive and detailed research in the business incubation and startup performance measurement domains.

6.4.2. Practical Contributions

Validation of business incubation benefit

As other business incubation research, this research can also be used to validate the positive impact of business incubation programs to startup performance. By confirming that business incubation programs are directly affecting startup performance especially in Indonesia, the result may be able to influence startups to participate more in the business incubation programs as it will help to increase their performance. As stated in the interview process with business incubators, one of the issue in the business incubation in Indonesia is that the several incubated startups are not fully participating in business incubation services offered by business incubation. In one of the observation event during the research period, some of the startups sent their representative to attend several training activities which unfortunately not utilized well as the startup representative seems to busy with their operational activities. As startup has limited resources to handle their business, the actions taken during the training may seem permissible. However, in the long run, the startup may miss some vital knowledge that may be beneficial for their business developments.

Thus, this research result shows that despite the experience, skill, and networks that the startup already have before joining business incubation programs, the benefit to fully participate in business incubation program will still help them improve their performance as a company. By showing the results, the benefit of business incubation to startups may motivate the startup to participate more in the business incubation programs.

Identifying most influential factors to startup performance

This research helps to identify the most impacting factors influencing startup performance. Several factors have been identified affecting startup performance such as startup characteristic, the usage of business incubation services and facilities, and the environmental factors. Those factors have been identified to influence startup performance within and outside business incubation programs directly.

By identifying the most impacting factors in startup performance, both of the startup and business incubator can use the result to focus on improving the most influential factor rather than tried to improve everything that has an impact to startup performance. One factor that can be considered as the most significant factor due to its high impact on startup performance is the usage of business and mentoring services provided by business incubation. This result has also been supported by incubated startups that choose business training and mentoring as one of the most useful services in the business incubation program. Business training and mentoring are considered as one of useful service due to startup characteristics that mostly lack experience, skill, and resources. Thus, the startup and business incubators can use this result to increase the startup participation in business training and mentoring and try to create a more

comprehensive training and mentoring system to improve startup performance. Other internal and external factors as shown in Section 5.4 can also be used to rank the priority of improvement for both the startup and business incubator.

Insight for startup and business incubation policy and development

Other than startup and business incubators, this research result can also be used as the base knowledge and information for the government or other relevant stakeholders for creating new supportive regulations and policies to improve startup performance and entrepreneurial ecosystem in general, especially in Indonesia. After all, the research has shown that external environmental factors have also significantly affected startup performance and the right policies and regulations can help to shape some of the factors to help startup prosper and grow. Based on the research result, human capital support, locational factor, and market structure aspects of the country entrepreneurial and industry ecosystem can be improved by the government to make it more advantageous and supportive for startup and other entrepreneurial activities. Based on the observation and interview result, some private and university business incubators also have challenges in providing high-quality services for the startup due to their limitation on funding, resources, and facilities. In this case, the government can also actively participate in the business incubation development by giving incentives to the business incubators to help them increase their support to startup.

6.5. Recommendations

This section presents the recommendations for startup, business incubators, and government as the stakeholder that can utilize the research results. First is the recommendation for startups to be able to improve their performance within and outside business incubation programs. Second, the next recommendations will be for business incubators to increase startup participation in business incubation programs. Lastly, several recommendations for the government to be able to create a more supportive ecosystem for startup and business incubator to grow and succeed.

6.5.1. Recommendation for Startup

As shown in the final model in Figure 6.1, business incubation programs have a significant impact on startup performance. Thus, as an incubated startup, regardless of the level of experience, skill, and network that the startup have, it is advisable to utilize the business incubation services and facilities that have been offered and prepared by the business incubator. After all, the decision to improve startup performance will be based on the action of the startup itself to participate in business incubation programs willingly. However, it is also advisable for startups to choose which service will most beneficial for them based on their current stage and needs and participate fully in those programs and activities to get the most benefit of it. In this case, the factor impact ranking which is shown in 5.4 can become guidance to choose which service will effectively affect their performance.

Furthermore, as startups need to prioritize their activities due to limited resources, time, and funding, it is also advisable for the startup to select their appropriate business incubators based on their current situations and needs. Each business incubators type (university, private, and government) have different characteristics, selection process, programs, goals, and support system. Thus, by selecting the most suitable business incubators, the startup can utilize the business incubation program well and hence may result in higher performance improvement.

In Indonesia, for example, university business incubators have access to research and development facilities and also to several technical experts which can help a startup with a high-tech background and in need of support on R&D facilities and advisors. A similar case also can be advisable for a similar characteristic of startup to search government affiliate business incubator that has access to national research facilities and supports. After all, most of the university and government business incubators are focusing on delivering research-based product to the market. By joining business incubators with R&D facilities and support, high-tech startups can save a lot of their research fundings as their respective business incubators will support it. They may use their limited fundings to other sources such as marketing and business development as some of university and government business incubators have limited support on their fundings, especially in Indonesia. Startups with government institution as their target may also choose to join university or government affiliate business incubators as they will provide direct access to their respective customers than other business incubator types.

Another example observed in Indonesia, the selection method of business incubators can also be implemented for private business incubators. Startup with goals to improve their business networks and mostly focus on digital or IT-related startup without in need of research facilities can choose to join private business incubators. In Indonesia, private business incubators have larger business networks due to their active participation in startup ecosystems. They often collaborate with startup communities and other startup support systems such as accelerators, angel investors, coworking space, and ecosystem builder to create a startup event. The extensive network access of private business incubator is shown by their prominent number of popular mentors and business experts and also extensive business and mentoring programs.

The highlight of business incubator categorization can be seen in Section 5.6.

By selecting the business incubators based on current startup needs, the startup will not only achieve what they most need at the moment so they will be motivated to participate in the business incubation programs. In this case, rather than only expecting business incubators to adjust their system to follow their incubated startup, a clear categorization of business incubation supports of each business incubators will be beneficial for the startup as they can choose which business incubator that can cater their needs and expectations.

6.5.2. Recommendation for Business Incubators

Based on the research result, the willingness of the startup to participate in business incubation programs are affected by the perception of importance and effectiveness over the business incubation programs. Thus, to improve startup participation in business incubator programs, the business incubator is advisable to improve the quality of their services and facilities. Hence, the startup's perspective on the program effectiveness and importance increase and it helps to motivate the startup to participate in the program. The improvement over business incubation facilities and services are not only on the availability of the services but also on the delivery of the services.

Other than creating extensive and frequent business activities, it will be more advisable to create timely activities based on the startup stage and needs. In this case, the business incubators can develop a customized program for each type of need or startup category. In this way, the program will fit the startup needs and expectations better rather than enforce the startup to follow all business incubation activities. As startup's time and resources are limited, by developing a customized program will attract the startup to follow the program better and may help them to achieve their targets and increase their performance.

Furthermore, business incubators can also define several essential services and activities

as mandatory for their tenants such as business training and mentoring as it has been proven to significantly improve startup performance within business incubation programs. In this case, more socialization on the benefit of the activities may be needed if the participation rate is low or demanded as ineffective. More socialization may also be needed to inform potential startups on what kind of supports that the business incubator support so they can align their expectation and needs to each respective business incubator. In the case of Indonesia, AIBI as business incubator association may provide support to help communicate the need of clear categorizations between a university, government, and private business incubators to the public. Clear standard and categorization of business incubators will not only help startups to select suitable supports but also help business incubators to focus on improving their supports and services based on their current resources and capabilities. Example of the business incubator categorization can be seen in Section 5.6.

Based on the interview result itself, business incubators and its program are expected to be flexible enough to adapt to both the changes in the industry and entrepreneurial ecosystem and also to the fast growth of startups. Thus, creating a flexible business incubation framework and system will be more beneficial. The flexible framework can be combined with services which have been enforced as standard and mandatory for business incubators in the country such as in Indonesia with its 7S necessary services.

6.5.3. Recommendation for Governments

Based on the research result, it can be seen that the role of government is quite important in shaping the entrepreneurial ecosystem to support startup growth and performance improvement. Thus, more aggressive approaches to create a supportive environment and ecosystem are needed by the government such as regulating the industry, creating supported system and facilities, and developing specific regulation and policies which will help startup and entrepreneurial ecosystem to grow.

As shown based on the research result, there are several recommendations that the government can use to support startup ecosystem development.

First, create an incentive system and program for startup development. The incentive program will cover several important factors identified in the research such as the people openness to a new product, customer preferences over product, availability of high-skilled employee, and the availability of professional business services. In term of people openness to a new product, primarily created by a local startup, the government may create incentives or system to support startup acceptability in the market if it can help to improve the local and national economy and development such as in high-tech related product and innovation.

For example, high-tech products are mostly harder to be accepted in the market and may not survive on its own. Thus, the government can help to give incentives to the customer or the market to adopt the product as long as it improves the country economic and social development. The incentive program can also help to improve the availability of high-skilled worker to the startup ecosystem.

The needs of the high-skilled employee for startups development has been shown in Section 5.2.4. Currently, in Indonesia, it is hard to get a high-skilled employee in several startups location, and it affects their business and product development speed. In this case, the government can help to prepare a program to introduce the startup ecosystem to a university or other higher education institution. Several countries such as the Netherlands implement technopreneurs and similar course to introduce the students to startup activities. Furthermore, to spread out the potential high-skilled employee for

startup development, the government can also create the incentive programs for the citizens who are joining a startup or other entrepreneurial activities primarily in the area that lack high-skilled worker. The incentive programs can also be used to induce professional service availability to support startup needs such as financial management and accounting services, patent support and advisor, and private business consultant.

Second, create supportive policies and facilities for startup development. Currently, in Indonesia, specific policies for startup and business incubation programs are still very limited. Thus, the government can help to create more comprehensive policies to cater to startup and business incubation need in Indonesia. The policy can help to support to shape heterogeneity in the industry and market, create a supportive financial market, and give easier access and supports to startup to develop and grow in the country. Product heterogeneity in the market can help to open a new possibility for startups to enter the market. In term of facilities support, the government can help to build scientific and research complex in the country and give more access to the startup to be able to use the facilities. After all, one of the challenges in high-tech or any other product-based startup is the availability of research and development facilities that can be used free or with lower charge achievable by startups.

As stated at the beginning of this section, the roles of governments and other policies maker to help startup growth and success are very critical. Without the support of the government, a supportive environment may not be available for startups to grow and will affect the probability of the startup to survive. Instead, with a supportive environment, startup and any other entrepreneurial activities may grow and prospers and directly contribute to the country economy and social development.

References

Aaboen, L., Lindelöf, P., von Koch, C., & Löfsten, H. (2006). Corporate governance and performance of small high-tech firms in sweden. *Technovation*, *26*(8), 955 - 968. Retrieved from http://www.sciencedirect.com/science/article/pii/S0166497205001069 doi: https://doi.org/10.1016/j.technovation.2005.07.004

Abduh, M., D'Souza, C., Quazi, A., & Burley, H. T. (2007, jan). Investigating and classifying clients' satisfaction with business incubator services. *Managing Service Quality: An International Journal*, *17*(1), 74–91. Retrieved from https://doi.org/10.1108/09604520710720683 doi: 10.1108/09604520710720683

Aerts, K., Matthyssens, P., & Vandenbempt, K. (2007). Critical role and screening practices of European business incubators. *Technovation*, *27*(5), 254–267. doi: 10.1016/j.technovation.2006.12.002

Al Mubaraki, M., & Busler, M. (2011). The development of entrepreneurial companies through business incubator programs. *International Journal of Emerging Sciences*, *1*(2), 95.

Albort-Morant, G., & Oghazi, P. (2016). How useful are incubators for new entrepreneurs? *Journal of Business Research*, *69*(6), 2125–2129. Retrieved from http://www.sciencedirect.com/science/article/pii/S014829631500644X doi: https://doi.org/10.1016/j.jbusres.2015.12.019

Aldrich, H. E., & Ruef, M. (2006). *Organizations evolving, second edition*. SAGE Publications. doi: 10.4135/9781446212509

Al-Mubaraki, H. M., & Busler, M. (2013). The Effect of Business Incubation in Developing Countries. *European Journal of Business and Innovation Research*, *1*(1), 19–25.

Amezcua, A. S. (2010). *Boon or Boondoggle? Business incubation as entrepreneurship policy*. Syracuse University.

Ayatse, F. A., Kwahar, N., & Iyortsuun, A. S. (2017). Business incubation process and firm performance: an empirical review. *Journal of Global Entrepreneurship Research*, *7*(1), 2. Retrieved from http://journal-jger.springeropen.com/articles/10.1186/s40497-016-0059-6 doi: 10.1186/s40497-016-0059-6

Ayuwuragil, K. (2017). *Program 1.000 Startup Terkendala Ketidaksiapan Ekosistem.* Retrieved 2018-01-30, from https://www.cnnindonesia.com/teknologi/20171102165238-185-253051/program-1000-startup-terkendala-ketidaksiapan-ekosistem

Bank Indonesia. (2006). Kajian inkubator bisnis dalam rangka pengembangan umkm. *Jakarta (ID): Tim Penelitian dan Pengembangan Biro Kredit BI*.

Barbero, J. L., Casillas, J. C., Ramos, A., & Guitar, S. (2012). Revisiting incubation performance: How incubator typology affects results. *Technological Forecasting and Social Change*, *79*(5), 888–902. Retrieved from http://www.sciencedirect.com/science/article/pii/S0040162511002782 doi: https://doi.org/10.1016/j.techfore.2011.12.003

Baum, J. A. C., Calabrese, T., & Silverman, B. S. (2000). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic management journal*, 267–294.

Baum, J. R., Locke, A. E., & Smith, K. G. (2001). Multidimensional Model of Venture Growth. *Academy of Management Journal*, *20742*(301), 1–25. Retrieved from https://pdfs.semanticscholar.org/eaad/53328aa2192acd08639e62c3022ec48ee7b9.pdf doi: 10.2307/3069456

Baum, J. R., & Locke, E. A. (2004). The relationship of entrepreneurial traits, skill, and motivation to subsequent venture growth. *Journal of Applied Psychology*, *89*(4), 587–598. doi: 10.1037/0021-9010.89.4.587

Becker, J.-M., Klein, K., & Wetzels, M. (2012). Hierarchical latent variable models in pls-sem: guidelines for using reflective-formative type models. *Long Range Planning*, *45*(5-6), 359–394.

Beebe, M. (2014). *Conducting Survey Research.* Retrieved 2018-01-30, from https://www.ieee.org/about/research/conducting{_}survey{_}research.html

Begley, T. M. (1995, may). Using founder status, age of firm, and company growth rate as the basis for distinguishing entrepreneurs from managers of smaller businesses. *Journal of Business Venturing*, *10*(3), 249–263. Retrieved from https://www.sciencedirect.com/science/article/pii/088390269400023N doi: 10.1016/0883-9026(94)00023-N

Bergek, A., & Norrman, C. (2008). Incubator best practice: A framework. *Technovation*, *28*(1), 20–28. Retrieved from http://www.sciencedirect.com/science/article/pii/S0166497207001046 doi: https://doi.org/10.1016/j.technovation.2007.07.008

Bhabra-Remedio, R., & Cornelius, B. (2003). Cracks in the Egg : improving performance measures in business incubator research. *16th Annual Conference of Small Enterprise Association of Australia and New Zealand*(October), 1–19.

Birley, S., & Westhead, P. (1994). A taxonomy of business start-up reasons and their impact on firm growth and size. *Journal of Business Venturing*, *9*(1), 7–31. Retrieved from http://www.sciencedirect.com/science/article/pii/0883902694900248 doi: https://doi.org/10.1016/0883-9026(94)90024-8

Blanchflower, D. G., & Oswald, A. J. (1998, jan). What Makes an Entrepreneur? *Journal of Labor Economics*, *16*(1), 26–60. Retrieved from https://doi.org/10.1086/209881 doi: 10.1086/209881

Bøllingtoft, A. (2012). The bottom-up business incubator: Leverage to networking and cooperation practices in a self-generated, entrepreneurial-enabled environment. *Technovation*, *32*(5), 304–315. doi: 10.1016/j.technovation.2011.11.005

Boyatzis, R. (1982). The competent manager: a model for effective performance. 1982. *John Wiley&Sons, New York*.

Brüderl, J., & Preisendörfer, P. (1998). Network support and the success of newly founded business. *Small business economics*, *10*(3), 213–225.

Bruneel, J., Ratinho, T., Clarysse, B., & Groen, A. (2012). The evolution of Business incubators: Comparing demand and supply of business incubation services across different incubator generations. *Technovation*, *32*(2), 110–121. doi: 10.1016/j.technovation.2011.11.003

Bull, I., & Willard, G. E. (1993). Towards a theory of entrepreneurship. *Journal of Business Venturing*, *8*(3), 183–195. Retrieved from http://www.sciencedirect.com/science/article/pii/0883902693900262 doi: https://doi.org/10.1016/0883-9026(93)90026-2

Campbell, C., Kendrick, R. C., & Samuelson, D. S. (1985). Stalking the latent entrepreneur: business incubators and economic development. *Economic Development Review*, *3*(2), 43–49.

Carland, J. W., Hoy, F., Boulton, W. R., & Carland, J. A. C. (1984). Differentiating entrepreneurs from small business owners: A conceptualization. *Academy of management review*, *9*(2), 354–359.

Carter, N. M., Gartner, W. B., & Reynolds, P. D. (1996, may). Exploring start-up event sequences. *Journal of Business Venturing*, *11*(3), 151–166. Retrieved from https://www.sciencedirect.com/science/article/pii/0883902695001298 doi: 10.1016/0883-9026(95)00129-8

Cassar, G. (2014). Industry and startup experience on entrepreneur forecast performance in new firms. *Journal of Business Venturing*, *29*(1), 137–151. doi: 10.1016/j.jbusvent.2012.10.002

Chandler, G. N., & Jansen, E. (1992). The founder's self-assessed competence and venture performance. *Journal of Business venturing*, *7*(3), 223–236.

Cheng, S., & Schaeffer, P. V. (2011). Evaluation without Bias: A methodological perspective on performance measures for business incubators. *Region et Developement*, *33*, 211–225.

Chrisman, J. J., Bauerschmidt, A., & Hofer, C. W. (1998, oct). The Determinants of New Venture Performance: An Extended Model. *Entrepreneurship Theory and Practice*, *23*(1), 5–29. Retrieved from http://journals.sagepub.com/doi/10.1177/104225879802300101 doi: 10.1177/104225879802300101

Churchill, N., & Bygrave, W. D. (1989). The entrepreneur ship paradigm (i): A philosophical look at its research methodologies. *Entrepreneurship Theory and practice*, *14*(1), 7–26.

Clausen, T., & Korneliussen, T. (2012). The relationship between entrepreneurial orientation and speed to the market: The case of incubator firms in Norway. *Technovation*. doi: 10.1016/j.technovation.2012.05.004

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences. 2nd.* Hillsdale, NJ: erlbaum.

Cohen, S. (2013). What Do Accelerators Do? Insights from Incubators and Angels. *Innovations: Technology, Governance, Globalization*, *8*(3-4), 19–25. Retrieved from http://www.mitpressjournals.org/doi/10.1162/INOV{_}a{_}00184 doi: 10.1162/INOV_a_00184

Cooper, A. C. (1981). Strategic management: New ventures and small business. *Long Range Planning*, *14*(5), 39–45. Retrieved from http://www.sciencedirect.com/science/article/pii/0024630181900066 doi: https://doi.org/10.1016/0024-6301(81)90006-6

Cooper, A. C. (1993). Challenges in predicting new firm performance. *Journal of Business Venturing*, *8*(3), 241–253. doi: 10.1016/0883-9026(93)90030-9

Cressy, R., & Olofsson, C. (1997). European SME financing: an overview. *Small Business Economics*, *9*(2), 87–96.

CrunchBase. (2017). *Indonesia Startup List.* Retrieved from https://www.crunchbase.com

Davidsson, P., Steffens, P., & Gordon, S. (2011). Comprehensive Australian Study of Entrepreneurial Emergence (CAUSEE): design, data collection and descriptive results. *Handbook of research on new venture creation*, 216–250.

Davila, A., Foster, G., & Gupta, M. (2003). Venture capital financing and the growth of startup firms. *Journal of Business Venturing*, *18*(6), 689–708. doi: 10.1016/S0883-9026(02)00127-1

de Leeuw, E. D., & Toepoel, V. (2018). Mixed-Mode and Mixed-Device Surveys. In *The palgrave handbook of survey research* (pp. 51–61). Springer.

Direktorat Perusahaan Pemula Berbasis Teknologi. (n.d.). *Model inkubasi bisnis teknologi di lingkungan ikm pada perusahaan pemula berbasis teknologi*.

Dong, Y., & Peng, J. (2013, 12). Principled missing data methods for researchers. , *2*, 222.

Dornberger, U., & Zeng, X. (2009). The locational factors and performance of the high-tech startups in China. *Int. J. Entrepreneurship and Small Business*, *7*(3), 312–323.

El-Masri, M. M., & Fox-Wasylyshyn, S. M. (2005). Missing data: an introductory conceptual overview for the novice researcher. *CJNR (Canadian Journal of Nursing Research)*, *37*(4), 156–171.

Eshun, J. P. (2009, apr). Business incubation as strategy. *Business Strategy Series*, *10*(3), 156–166. Retrieved from https://doi.org/10.1108/17515630910956570 doi: 10.1108/17515630910956570

European Commission, E. D. G. (2002). Final report: benchmarking of Business Incubators. *Personnel*, *51*(February), 47. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/20657521 doi: 10.1086/656690

Fang, S. C., Tsai, F. S., & Lin, J. L. (2010). Leveraging tenant-incubator social capital for organizational learning and performance in incubation programme. *International Small Business Journal*, *28*(1), 90–113. doi: 10.1177/0266242609350853

Freeman, J., Carroll, G. R., & Hannan, M. T. (1983). The Liability of Newness: Age Dependence in Organizational Death Rates. *American Sociological Review*, *48*(5), 692–710. Retrieved from http://www.jstor.org/stable/2094928 doi: 10.2307/2094928

Freischlad, N. (2016). *Indonesia's growth in startup funding since 2011.* Retrieved 2017-12-11, from https://www.techinasia.com/ndonesia-startup-funding-up-to-2015

Galesic, M., & Bosnjak, M. (2009, jan). Effects of Questionnaire Length on Participation and Indicators of Response Quality in a Web Survey. *Public Opinion Quarterly*, *73*(2), 349–360. Retrieved from http://dx.doi.org/10.1093/poq/nfp031

Gartner, W. B. (1985). A Conceptual Framework for Describing the Phenomenon of New Venture Creation. *Academy of Management Review*, *10*(4), 696–706. Retrieved from http://connection.ebscohost.com/an/4279094 doi: 10.5465/AMR.1985.4279094

Gatewood, E. J., Shaver, K. G., & Gartner, W. B. (1995, sep). A longitudinal study of cognitive factors influencing start-up behaviors and success at venture creation. *Journal of Business Venturing*, *10*(5), 371–391. Retrieved from https://www.sciencedirect.com/science/article/pii/0883902695000357 doi: 10.1016/0883-9026(95)00035-7

Gatian, A. W. (1994). Is user satisfaction a valid measure of system effectiveness? *Information & Management*, *26*(3), 119–131.

Gozali, L., Masrom, M., Haron, H., Yuri, T., & Zagloel, Y. (2017, 01). Research gap of entrepreneurship, innovation, economic development, business incubators studies in indonesia.

Gozali, L., Masrom, M., Haron, H. N., & Zagloel, T. Y. M. (2015). A framework of successful e-business incubator for indonesian public universities. *The Asian Journal of Technology Management Vol*, *8*(2), 118–131.

Gozali, L., Masrom, M., Zagloel, T. Y. M., Habibah, & Haron, N. (2016). A framework of successful business incubators for indonesian public universities. *International Journal of Technology*, *7*(6), 1086–1096. doi: 10.14716/ijtech.v7i6.3351

Hackett, S. M., & Dilts, D. M. (2004a). A real options-driven theory of business incubation. *The journal of technology transfer*, *29*(1), 41–54.

Hackett, S. M., & Dilts, D. M. (2004b). A Systematic Review of Business Incubation Research. *The Journal of Technology Transfer*, *29*(1), 55–82. Retrieved from https://doi.org/10.1023/B:JOTT.0000011181.11952.0f doi: 10.1023/B:JOTT.0000011181.11952.0f

Hackett, S. M., & Dilts, D. M. (2008). Inside the black box of business incubation: Study B - Scale assessment, model refinement, and incubation outcomes. *Journal of Technology Transfer*, *33*(5), 439–471. doi: 10.1007/s10961-007-9056-9

Hair, J., Black, W., Babin, B., & Anderson, R. (2009). Multivariate data analysis 7th edition pearson prentice hall.

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011, apr). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, *19*(2), 139–152. Retrieved from https://doi.org/10.2753/MTP1069-6679190202 doi: 10.2753/MTP1069-6679190202

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance.

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014, mar). *Partial least squares structural equation modeling (PLS-SEM): An emerging tool in business research* (Vol. 26) (No. 2). Retrieved from http://www.emeraldinsight.com/doi/10.1108/EBR-10-2013-0128 doi: 10.1108/EBR-10-2013-0128

Hair Jr, J. F., Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on partial least squares structural equation modeling (pls-sem)*. Sage Publications.

Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*. SAGE Publications.

Hansen, M. T., Chesbrough, H. W., Nohria, N., & Sull, D. N. (2000). Networked incubators. Hothouses of the new economy. *Harvard Business Review*, *78*(5), 74–84, 199. doi: Article

Hudson, J., & Khazragui, H. F. (2013). Into the valley of death: research to innovation. *Drug Discovery Today*, *18*(13), 610 - 613. Retrieved from http://www.sciencedirect.com/science/article/pii/S1359644613000342 doi: https://doi.org/10.1016/j.drudis.2013.01.012

Hutabarat, Z., & Pandin, M. (2014). Absorptive Capacity of Business Incubator for SME's Rural Community Located in Indonesia's Village. *Procedia - Social and Behavioral Sciences*, *115*, 373–377. Retrieved from http://www.sciencedirect.com/science/article/pii/S1877042814019910 doi: https://doi.org/10.1016/j.sbspro.2014.02.443

Hytti, U., & Maki, K. (2007). Which firms benefit most from the incubators? *International Journal of Entrepreneurship and innovation management*, *7*(6), 506–523.

Ian Hathaway. (2016). *What Startup Accelerators Really Do.* Retrieved from https://hbr.org/2016/03/what-startup-accelerators-really-do

Indonesia Business Incubation Association. (n.d.). *Anggota AIBI.* Retrieved 2018-07-26, from http://aibinetwork.com/anggota-aibi/

Jarillo, J. C. (1989). Entrepreneurship and growth: The strategic use of external resources. *Journal of business venturing*, *4*(2), 133–147.

Kalantar, J. S., & Talley, N. J. (1999, nov). The effects of lottery incentive and length of questionnaire on health survey response rates: A randomized study. *Journal of Clinical Epidemiology*, *52*(11), 1117–1122. Retrieved from https://www.sciencedirect.com/science/article/pii/S0895435699000517 doi: 10.1016/S0895-4356(99)00051-7

Karabag, S. F., & Berggren, C. (2014, oct). Antecedents of firm performance in emerging economies: Business groups, strategy, industry structure, and state support. *Journal of Business Research*, *67*(10), 2212–2223. Retrieved from https://www.sciencedirect.com/science/article/pii/S0148296314000216?via{%}3Dihub doi: 10.1016/J.JBUSRES.2014.01.004

KIBAR. (n.d.). *KIBAR.* Retrieved 2018-07-26, from https://kibar.co.id/

Kohler, T. (2016). Corporate accelerators: Building bridges between corporations and startups. *Business Horizons*, *59*(3), 347–357. Retrieved from http://www.sciencedirect.com/science/article/pii/S0007681316000094 doi: https://doi.org/10.1016/j.bushor.2016.01.008

Kollmann, P. D. T., Stöckmann, D. C., Linstaedt, J., & Kensbock, J. (2015). *European Startup Monitor Report - 2015* (Tech. Rep.). European Startup Networks. Retrieved from http://europeanstartupmonitor.com/fileadmin/presse/download/esm{_}2015.pdf

Krosnick, J. A., & Fabrigar, L. R. (1997). Designing rating scales for effective measurement in surveys. *Survey measurement and process quality*, 141–164.

Kuratko, D. F., & Hodgetts, R. M. (1998). *Entrepreneurship : a contemporary approach*. Retrieved from http://lcweb.loc.gov/catdir/toc/97-66401.html

Lalkaka, R. (1996, dec). Technology Business Incubators: Critical Determinants of Success. *Annals of the New York Academy of Sciences*, *798*(1), 270–290. Retrieved from http://dx.doi.org/10.1111/j.1749-6632.1996.tb24870.x doi: 10.1111/j.1749-6632.1996.tb24870.x

Lasrado, V., Sivo, S., Ford, C., O'Neal, T., & Garibay, I. (2016). Do graduated university incubator firms benefit from their relationship with university incubators? *The Journal of Technology Transfer*, *41*(2), 205–219. Retrieved from https://doi.org/10.1007/s10961-015-9412-0 doi: 10.1007/s10961-015-9412-0

Low, M. B., & MacMillan, I. C. (1988). Entrepreneurship: Past research and future challenges. *Journal of Management*, *14*(2), 139-161. Retrieved from https://doi.org/10.1177/014920638801400202 doi: 10.1177/014920638801400202

Mas-Verdú, F., Ribeiro-Soriano, D., & Roig-Tierno, N. (2015). Firm survival: The role of incubators and business characteristics. *Journal of Business Research*, *68*(4), 793–796. doi: 10.1016/j.jbusres.2014.11.030

Mauer, R., Neergaard, H., & Linstad, A. K. (2017). Self-Efficacy: Conditioning the Entrepreneurial Mindset BT - Revisiting the Entrepreneurial Mind: Inside the Black Box: An Expanded Edition. In M. Brännback & A. L. Carsrud (Eds.), (pp. 293–317). Cham: Springer International Publishing. Retrieved from https://doi.org/10.1007/978-3-319-45544-0{_}19 doi: 10.1007/978-3-319-45544-0_19

Mcgee, J. E., Peterson, M., Mueller, S. L., & Sequeira, J. M. (2009). Entrepreneurial self-efficacy: Refining the measure. *Entrepreneurship: Theory and Practice*. doi: 10.1111/j.1540-6520.2009.00304.x

Miloud, T., Aspelund, A., & Cabrol, M. (2012). Startup valuation by venture capitalists: An empirical study. *Venture Capital*, *14*(2-3), 151–174. doi: 10.1080/13691066.2012.667907

Moore, C. F. (1986). Understanding Entrepreneurial Behavior: A Definition and Model. In *Academy of management proceedings* (Vol. 1986, pp. 66–70). Academy of Management.

Morales-Gualdrón, S. T., & Roig, S. (2005). The new venture decision: An analysis based on the gem project database. *The International Entrepreneurship and Management Journal*, *1*(4), 479–499.

Neyens, I., Faems, D., & Sels, L. (2010). The impact of continuous and discontinuous alliance strategies on startup innovation performance. *International Journal of Technology Management*, *52*(3/4), 392–410.

Nielsen, K. (2015). Human capital and new venture performance: the industry choice and performance of academic entrepreneurs. *Journal of Technology Transfer*. doi: 10.1007/s10961-014-9345-z

Nunberger, I. (2017). Business incubation and startups in the ICT sector. *Retrieved on*, *1*.

OECD. (n.d.). *Start-up and entrepreneurship.* Retrieved 2017-12-18, from https://www.oecd.org/sti/outlook/e-outlook/stipolicyprofiles/competencestoinnovate/start-upandentrepreneurship.htm

Patton, D. (2014). Realising potential: The impact of business incubation on the absorptive capacity of new technology-based firms. *International Small Business Journal*. doi: 10.1177/0266242613482134

Peake, W., & Marshall, M. (2009). Does Experience Determine Performance? A Meta-Analysis on the Experience-Performance Relationship. *Agricultural and Applied …*(765). Retrieved from http://ageconsearch.umn.edu/bitstream/49275/2/613108.pdf

Peters, L., Rice, M., & Sundararajan, M. (2004). The Role of Incubators in the Entrepreneurial Process. *The Journal of Technology Transfer*, *29*(1), 83–91. Retrieved from http://link.springer.com/10.1023/B:JOTT.0000011182.82350.df doi: 10.1023/B:JOTT.0000011182.82350.df

Pettersson, B., & Götsén, A. (2016). *Business Incubators-the savior of startups?: An exploratory study on knowledge acquisition in a business incubator from a startup perspective.*

Pittino, D., Visintin, F., & Lauto, G. (2017). A configurational analysis of the antecedents of entrepreneurial orientation. *European Management Journal*. doi: 10.1016/j.emj.2016.07.003

Porter, M. E. (1979). How competitive forces shape strategy. *Strategic Planning: Readings*, 102–117.

Porter, M. E. (1980). *Competitive strategy: techniques for analyzing industries and competitors.* New York: Free Press.

Porter, M. E., & Advantage, C. (1985). Creating and sustaining superior performance. *Competitive advantage*, *167*.

PT Telekomunikasi Indonesia. (2017). *Indigo: Building A Healthy Startup Ecosystem* (Tech. Rep.). PT Telekomunikasi Indonesia.

respondent 10. (2018, May). *Startup in business incubation service.* private interview.

respondent 11. (2018, May). *Startup in business incubation service.* private interview.

respondent 14. (2018, May). *Startup in business incubation service.* private interview.

respondent 15. (2018, May). *Startup in business incubation service.* private interview.

respondent 16. (2018, May). *Startup in business incubation service.* private interview.

Respondent 7. (2018, May). *Startup in business incubation service.* private interview.

respondent 9. (2018, May). *Startup in business incubation service.* private interview.

Ronstadt, R. (1985). *Entrepreneurship : text, cases and notes*. Dover, Mass.: Lord Pub.

Rothaermel, F. T., & Thursby, M. (2005, apr). University–incubator firm knowledge flows: assessing their impact on incubator firm performance. *Research Policy*, *34*(3), 305–320. Retrieved from https://www.sciencedirect.com/science/article/pii/S0048733305000156 doi: 10.1016/J.RESPOL.2004.11.006

Salamzadeh, A., & Kesim, H. K. (2015). Startup Companies: Life Cycle and Challenges. *Proceedings of the 4th International Conference on Employment, Education and Entrepreneurship (EEE)*.

Sandberg, W. R., & Hofer, C. W. (1987). Improving new venture performance: The role of strategy, industry structure, and the entrepreneur. *Journal of Business venturing*, *2*(1), 5–28.

Sarstedt, M., Ringle, C. M., Smith, D., Reams, R., & Hair Jr, J. F. (2014). Partial least squares structural equation modeling (pls-sem): A useful tool for family business researchers. *Journal of Family Business Strategy*, *5*(1), 105–115.

Schmiemann, M. (2008). Enterprises by size class-overview of SMEs in the EU. *Statistics in focus*, *31*, 2008.

Schwartz, M. (2011). Incubating an illusion? Long-term incubator firm performance after graduation. *Growth and Change*. doi: 10.1111/j.1468-2257.2011.00565.x

Schwartz, M. (2013). A control group study of incubators' impact to promote firm survival. *Journal of Technology Transfer*. doi: 10.1007/s10961-012-9254-y

Scillitoe, J. L., & Chakrabarti, A. K. (2010). The role of incubator interactions in assisting new ventures. *Technovation*, *30*(3), 155–167. Retrieved from http://www.sciencedirect.com/science/article/pii/S0166497209001734 doi: https://doi.org/10.1016/j.technovation.2009.12.002

Sekaran, U., & Bougie, R. J. (2016). *Research Methods For Business: A Skill Building Approach* (Seventh Ed ed.). John Wiley & Sons.

Simon, H. A. (1985). What we know about the creative process. *Frontiers in creative and innovative management*, *4*, 3–22.

Smilor, R. W. (1987). Managing the incubator system: critical success factors to accelerate new company development. *IEEE transactions on Engineering Management*(3), 146–155.

Soetanto, D. P., & Jack, S. L. (2013). Business incubators and the networks of technology-based firms. *Journal of Technology Transfer*, *38*(4), 432–453. doi: 10.1007/s10961-011-9237-4

Soriano, D. R., & Castrogiovanni, G. J. (2012). The impact of education, experience and inner circle advisors on SME performance: Insights from a study of public development centers. *Small Business Economics*, *38*(3), 333–349. Retrieved from https://link.springer.com/content/pdf/10.1007{%}2Fs11187-010-9278-3.pdf doi: 10.1007/s11187-010-9278-3

Stevenson, H., & Jarillo, J. C. (1990). A paradigm of entrepreneurship: Entrepreneurial management.

Stinchcombe, A. L. (1965). Organizations and social structure. In *Handbook of organizations* (pp. 153–193). Retrieved from http://www.emeraldinsight.com/10.1016/S0742-3322(00)17019-6{%}5Cn.{%}5CScannedPapers{%}5CStinchcombe(1965).pdf doi: 10.1016/S0742-3322(00)17019-6

Stuart, T. E., Hoang, H., & Hybels, R. C. (1999). Interorganizational Endorsements and the Performance of Entrepreneurial Ventures. *Administrative Science Quarterly*. doi: 10.2307/2666998

Tech in Asia. (2018). *Indonesia's startup list.* Retrieved 2018-01-30, from https://www.techinasia.com/startups?country{_}name{%}5B{%}5D=Indonesia

Teeratansirikool, L., Siengthai, S., Badir, Y., & Chotchai. (2013). International Journal of Productivity and Performance Management. *International Journal of Productivity and Performance Management Business Process Management Journal*, *62*(4), 168–184. Retrieved from https://doi.org/10.1108/17410401311295722//doi.org/10.1108/

The Global Entrepreneurship and Development Institute (GEDI). (2017). *2018 Global Entrepreneurship Index (GEI) [Interactive table showing countries GEI score].* Retrieved from https://thegedi.org/global-entrepreneurship-and-development-index/

Timmons, J. (1982). New venture creation: Methods and models. *Encyclopedia of entrepreneurship*, 126–138.

Toft-Kehler, R., Wennberg, K., & Kim, P. H. (2014). Practice makes perfect: Entrepreneurial-experience curves and venture performance. *Journal of Business Venturing*, *29*(4), 453–470.

Trott, P., van der Duin, P., Hartmann, D., Scholte, V., & Ortt, J. R. (2015). *Managing Technology Entrepreneurship and Innovation*. Routledge.

Ucar, G. G., & Koch, S. (2016). Exploring business incubation practices and relationships to drivers of start-up success in Turkey. *International Journal of Entrepreneurship and Innovation Management*. doi: 10.1504/IJEIM.2016.075296

Van de Ven, A. H., Hudson, R., & Schroeder, D. M. (1984). Designing new business startups: Entrepreneurial, organizational, and ecological considerations. *Journal of management*, *10*(1), 87–108.

van Weele, M., van Rijnsoever, F. J., & Nauta, F. (2017). You can't always get what you want: How entrepreneur's perceived resource needs affect the incubator's assertiveness. *Technovation*. doi: 10.1016/j.technovation.2016.08.004

Verschuren, P., & Doorewaard, H. (2010). *Designing a Research Project*.

Vesper, K. H. (1990). *New Venture Strategies* (Vol. 1). Retrieved from https://ssrn.com/abstract=1496217

Voisey, P., Gornall, L., Jones, P., & Thomas, B. (2006). The measurement of success in a business incubation project. *Journal of Small Business and Enterprise Development*. doi: 10.1108/14626000610680307

von Zedtwitz, M. (2003). Classification and management of incubators: aligning strategic objectives and competitive scope for new business facilitation. *International Journal of Entrepreneurship and Innovation Management*, *3*(1-2), 176–196.

von Zedtwitz, M., & Grimaldi, R. (2006). Are Service Profiles Incubator-Specific? Results from an Empirical Investigation in Italy*. *The Journal of Technology Transfer*, *31*(4), 459–468. Retrieved from https://doi.org/10.1007/s10961-006-0007-7 doi: 10.1007/s10961-006-0007-7

Weinberg, M. L., Allen, D. N., & Schermerhorn, J. R. (1991). Interorganizational challenges in the design and management of business incubators. *Review of Policy Research*, *10*(2□3), 149–160.

Wickham, P. A. (2006). *Strategic entrepreneurship* (4th Editio ed.). Pearson Education.

Wold, H. (1982). Soft modeling: the basic design and some extensions. *Systems under indirect observation*, *2*, 343.

A

Questionnaire

This appendix show the questionnaire that used for data collection process. The question section in the questionnaire is divided into five parts. In the beginning of the questionnaire, the introductory message for the respondent is shown to explain the purpose of the research, the confidentiality statement, the questionnaire duration, and the direction to fill in the questionnaire. The first part of the questionnaire covers general startup information as the demographic information to identify the type of the startup. The second part of the questionnaire covers the characteristics of the startup in experience, skill, network, and strategy area. The third part of the questionnaire covers the business incubation process which include the participation and perception of importance and effectiveness of the services and facilities provided by business incubation. The fourth part of the questionnaire covers the benefit of business incubation process to startup performances which perceived by the startup. And the last question part covers the environmental factors which experienced by the startup due to industry, location, and governmental factors. And in the end of the questionnaire, thank you message and also open feedback for the questionnaire and the research are provided for the respondent.

A.1. Introductory Message

In the beginning of the questionnaire, the research title, the purpose of the research, the confidentiality of the respondent information, and the time duration of filling the questionnaire are explained to the respondent. In this section, the direction of how to fill in the questionnaire is also shown.

The introductory section can be seen in Figure A.1.

Business Incubation Impacts on Startup Performance

This questionnaire is used to understand the impact of business incubation program and what can be improve from it to maximize startup performance growth. Because you are the one who can give us the correct picture of business incubation experience, I request you to respond to the question frankly and honestly.

Your response will be kept strictly confidential. No identifying information will be provided to business incubator or other institutions. The survey data will be reported in a summary fashion only and will not identify any individual person or company entity.

This survey will take about **25 minutes to complete**. A souvenir will be given as a token of our good will. In case you have any questions regarding the questionnaire, please call <researcher name> at <researcher phone number> or <researcher email.

Direction: Please fill in or check (✓) the answer based on your startup status and condition based on the given scales. If you want to change your answer, please cross your answer and check or fill in your new answer.

Figure A.1: Introduction message in the questionnaire

A.2. Part I: Startup Information

The first section covers the respondent or startup information. In this section, demographic informations are asked such as the year when the company is founded, the number of the employee the company had, the education background of the team, and so on.

The first section of the questionnaire can be seen in Figure A.2.

Part I: Startup Information

1. **When was the company founded?** Year: _____
2. **How does female and male composition of the team?** The team consists of:
   - ☐ Number of full-time male employee: _____
   - ☐ Number of full-time female employee: _____
3. **What is the number of initial employee when the company was founded?** _____ employee
4. **What is the team average education level?** The team mainly consists of:
   - ☐ PhD
   - ☐ Baccalaureate or advanced vocational
   - ☐ Master's Degree
   - ☐ Basic education (High school or elementary degree)
   - ☐ University Studies
   - ☐ No formal education
5. **Where is the company originally located?** City: _____
6. **What is the company ownership type?**
   - ☐ State owned
   - ☐ Joint Venture
   - ☐ Company Spin-off
   - ☐ Private
   - ☐ Foreign owned
7. **What is the amount of capital when the company is founded?**
   - ☐ IDR 0-50,000,000
   - ☐ IDR 100,000,001-150,000,000
   - ☐ IDR ≥200,000,001
   - ☐ IDR 50,000,001-100,000,000
   - ☐ IDR 150,000,001-200,000,000
8. **When did the company join business incubation?** The company join business incubation in year: _____
9. **Does the company receive any kind of business service outside business incubation?** ☐ Yes ☐ No

Figure A.2: First section of the questionnaire

A.3. Part II: Startup Characteristic

The second section covers the startup characteristics information. In this part,

The second section of the questionnaire can be seen in Figure A.3.

Part II: Startup characteristics

Could you tell us the **average level of company experience before joining business incubation**?

1	2	3	4	5	6	7
Totally inexperienced	Inexperienced	Slightly inexperienced	Neutral	Moderately experienced	Very experienced	Extremely experienced

	1	2	3	4	5	6	7
1a. Working experience in top managerial level (Vice president and above positions)	□	□	□	□	□	□	□
1b. Working experience in the same industry	□	□	□	□	□	□	□
1c. Experience in startup or entrepreneurial activities	□	□	□	□	□	□	□
1d. Subject-Matter Expert or technical experience	□	□	□	□	□	□	□

How do you rate your company team skill **before joining business incubation**?

1	2	3	4	5	6	7
Totally incompetent	Incompetent	Slightly incompetent	Neutral	Moderately competent	Very competent	Expert

	1	2	3	4	5	6	7
2a. Marketing, sales, and business development	□	□	□	□	□	□	□
2b. Finance and accounting	□	□	□	□	□	□	□
2c. Administration and Human Resource (HR)	□	□	□	□	□	□	□
2d. Engineering, Technology, and R&D	□	□	□	□	□	□	□
2e. Operational, Production, and Manufacturing	□	□	□	□	□	□	□

How many **alliances/partners** did your company have **before joining business incubation**?

1	2	3	4	5	6	7
Not at All	Very few	A few	Neither a few nor many	Many	Quite a Bit of	A Great Deal

	1	2	3	4	5	6	7
3a. Well developed informal alliances/partners such as friends, families, and acquaintances	□	□	□	□	□	□	□
3b. Business partnership with external institutions or governments	□	□	□	□	□	□	□
3c. Technical project collaborations	□	□	□	□	□	□	□
3d. Joining trade or business associations	□	□	□	□	□	□	□
3e. Contact with potential or targeted customers	□	□	□	□	□	□	□
3f. Contact with potential or established suppliers	□	□	□	□	□	□	□
3g. Contact with capital or funding sources	□	□	□	□	□	□	□

Could you inform us **your company business strategy**?

1 Completely False	2 Somewhat False	3 Slightly False	4 Neither True nor False	5 Slightly True	6 Somewhat True	7 Completely True

	1	2	3	4	5	6	7
4a. Our company have a clear planning and strategy formulation	□	□	□	□	□	□	□
4b. Our company have clear business goals and objectives	□	□	□	□	□	□	□
4c. Our product is the most unique in the market	□	□	□	□	□	□	□
4d. Our product is the most innovative in the market	□	□	□	□	□	□	□

Figure A.3: Second section of the questionnaire

A.4. Part III: Business Incubation Process

The third section covers the business incubation process experienced by the startup. In this part,

The third section of the questionnaire can be seen in Figure A.4.

Part III: Business incubation process

Could you inform us your experience when participating in business incubation programs, services, and facilities?

Frequency of usage	***imp = important**	****eff = effective**
1. Never	1. Not at all important	1. Totally ineffective
2. Rarely, in less than 10% of all time	2. Low importance	2. Ineffective
3. Occasionally, in about 30% of all time	3. Slightly important	3. Slightly ineffective
4. Sometimes, in about 50% of all time	4. Neutral	4. Neutral
5. Frequently, in about 70% of all time	5. Moderately important	5. Moderately effective
6. Usually, in about 90% of all time	6. Very important	6. Very effective
7. Every time	7. Extremely important	7. Extremely effective

	Frequency of usage Never - Every time	**Importance** Not imp - Extremely imp*	**Effectiveness** Not eff - Extremely eff**
	1—2—3—4—5—6—7	1—2—3—4—5—6—7	1—2—3—4—5—6—7
1a. Space and building facilities such as office and working space	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1b. Business (postal) address provided by business incubator	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1c. Shared office services and equipments such as meeting room and printer	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1d. Support on product sales and marketing	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1e. Assistance on administrative and secretarial services	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1f. Business training, seminar, and workshop	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1g. Business counseling and mentoring	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1h. Business planning and development support	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1i. Peer networking (sharing information, experience, business partnership, etc with other tenants)	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1j. Access to funding, grants, and loans	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1k. Access to potential customers	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□
1l. Access to external networks, information, and resources (experts, government, supplier, university, etc)	□—□—□—□—□—□—□	□—□—□—□—□—□—□	□—□—□—□—□—□—□

Figure A.4: Third section of the questionnaire

A.5. Part IV: Business Incubation Benefit

The second section covers business incubation benefit perceived by the startup. In this part,

The fourth section of the questionnaire can be seen in Figure A.5.

Part IV: Business incubation Benefit

What are the **impacts of business incubation** to your company?

1	2	3	4	5	6	7
Completely False	Somewhat False	Slightly False	Neither True nor False	Slightly True	Somewhat True	Completely True

	1	2	3	4	5	6	7
1a. There is increase in company sales turnover (revenue generation)	□	□	□	□	□	□	□
1b. Our employee number is increasing	□	□	□	□	□	□	□
1c. There is increasing number of investments and fundings	□	□	□	□	□	□	□
1d. We are confident that our company will survive after graduating from business incubation	□	□	□	□	□	□	□
1e. We see that our product potential profit has increased	□	□	□	□	□	□	□
1f. Our employee average wage has increased	□	□	□	□	□	□	□
1g. We improve our business knowledge and skill	□	□	□	□	□	□	□
1h. Our company team has become more professional	□	□	□	□	□	□	□
1i. We have established productive networking with other tenants	□	□	□	□	□	□	□
1j. Our company reputation and credibility in the market has increased	□	□	□	□	□	□	□
1k. Our company team become more productive	□	□	□	□	□	□	□
1l. Our product development time to market has become faster	□	□	□	□	□	□	□
1m. Our company competitiveness in the market has increased	□	□	□	□	□	□	□
1n. We have faster access to critical stakeholders (supplier, customer, professional support, etc)	□	□	□	□	□	□	□

Figure A.5: Fourth section of the questionnaire

A.6. Part V: Environmental Factor

The second section covers the environmental factors experienced by the startup in their business location. In this part,

The fifth section of the questionnaire can be seen in Figure A.6.

Part V: Environmental factor

How does the industry, geographical, and political condition where your company located on?

1 Completely False	2 Somewhat False	3 Slightly False	4 Neither True nor False	5 Slightly True	6 Somewhat True	7 Completely True

	1	2	3	4	5	6	7
1a. There is a lot of companies in the same industry with our company	□	□	□	□	□	□	□
1b. The industry has high potential profit	□	□	□	□	□	□	□
1c. There is a lot of different products offered in the market by competitors	□	□	□	□	□	□	□
1d. There is stable demand of our product in the market	□	□	□	□	□	□	□
1e. The industry is growing rapidly	□	□	□	□	□	□	□
1f. There is a lot of potential buyers and suppliers for our product	□	□	□	□	□	□	□
1g. Our product has become customers favorite in the market	□	□	□	□	□	□	□
1h. People are open to new product in the market	□	□	□	□	□	□	□
1i. There is a lot of professional business services offered	□	□	□	□	□	□	□
1j. There is a scientific or research complex where the company located on	□	□	□	□	□	□	□
1k. There is a functioning industrial or science park in the area	□	□	□	□	□	□	□
1l. There is a functional financial market where people can buy and sell equities, bonds, currencies and its derivatives	□	□	□	□	□	□	□
1m. The area attracts high and requisite-skilled employee whom the company need	□	□	□	□	□	□	□
1n. There is government policies for supporting entrepreneurs which benefit our company	□	□	□	□	□	□	□
1o. The technological and regulatory in the industry keep changing	□	□	□	□	□	□	□

Figure A.6: Fifth section of the questionnaire

A.7. Closing statement

This section provide the closing message and space for feedback regarding the research and questionnaire.

The closing section of the questionnaire can be seen in Figure A.7.

Thank you very much for taking the time to complete our survey. Your participation will help us to understand the impact of business incubation to startup performance in Indonesia.

Regarding this questionnaire and this topic, do you have any comments or suggestion you would like to share?

Figure A.7: Closing section of the questionnaire

B

Interview Question

This appendix show the questions that used during interview session for both business incubators and incubated startups in Indonesia.

The interview session was started by explaining the research objectives, state the confidentiality agreement, and permission to record the interview. The detail of the interview opening:

Introduction

This interview is used to understand the impact of business incubation on startup performance, identify what can be improved from business incubation programs, and to maximize startup performance growth in Indonesia. We ask you to answer the questions honestly.

Your answers will be kept in strictly confidential. No information will be provided to other institutions related to your identity. This interview will only be reported in a summary of the study results and will not reveal personal or corporate identity.

This interview, if allowed, will be recorded for the documentation purposes (without any identity of the respondents or institution).

This interview takes approximately 30-40 minutes. A souvenir will be given as a thank-you gift from us. If you have any questions about these studies and questionnaires, please feel free to contact <researcher name> at <phone number> or at <researcher email address>.

The following questions are used for interviewing business incubators in Indonesia:

Interview Questionnaire for Business Incubator

1. What kind of Business Incubator is being interviewed? (profit / non-profit)?
2. When was this Incubator Business established?
3. What is the number of tenants currently in shade by the incubator?
4. How many tenants are currently in the wall in the incubator?

5. Tenant / Startup / What industries are currently the focus of the incubator?
6. How does the incubator to reach or reach potential startups into a tenant?
7. The Government provides a list of 7 (7-S) standard incubator services available in Indonesia. What facilities and services are currently provided by the incubator?

   7-S including:

   - Space provision
   - Service office facilities (Shared)
   - Guidance and consultation (Support
   - Supporting research and development efforts and access to the use of technology (Service)
   - Skill Development and Skill Development;
   - Access to funding (Seed Capital);
   - Creating business networks and cooperation (Synergy)
8. What phase of the incubation process is given to startup now?
9. What are the selection criteria for startup in the Incubator?
10. How does the incubator approach to the problems facing startup? (aggressive / passive / dependent phase and startup type)
11. Does the incubator provide funding? If yes, from where is the source of the funding?
12. How long does incubation process in the incubator? (1 year, 2 years, 3 years, etc.)
13. Is there an evaluation and mentoring mechanism of the incubator for tenants?
14. If yes, how is the startup in evaluation?
15. Is there any cooperation or support from external parties for incubators (such as government, private, universities and others)

The following questions are used for interviewing business incubators in Indonesia:

Interview Questionnaire for Incubated Startup

1. What kind of startup is being interviewed? (profit / non-profit)?
2. When was this startup established?
3. What is the number of employees currently owned by the startup?
4. What is the product of this startup?
5. What industries are currently the focus of startup?
6. What is the startup motivation to join the incubator?
7. The Government provides a list of 7 (7-S) standard incubator services available in Indonesia. To the startup, which one is the most important? Why?
   7-S including:

   - Space provision;
   - Service office facilities (Shared);
   - Guidance and consultation (Support);

- Supporting research and development efforts and access to the use of technology (Service);
- Skill Development and Skill Development;
- Access to funding (Seed Capital);
- Creating business networks and cooperation (Synergi)

8. Which services are most used? Why?
9. Which services are most effective by startup? Why?
10. What changes are most felt by startup after entering the incubator? Explain
11. How does the startup approach to problems encountered during incubation? (aggressive / passive / dependent phase and startup type)
12. Which factors according to startup determine the success of startup in incubator?
13. What environmental factors that startup most determine the success of startup in the incubator?
14. How does a startup evaluate itself? What factors are used for this evaluation?
15. Is there any cooperation or support from external parties for startup (such as government, private, universities, etc.)

This page intentionally left blank.

C

Business incubation model implemented in Indonesia

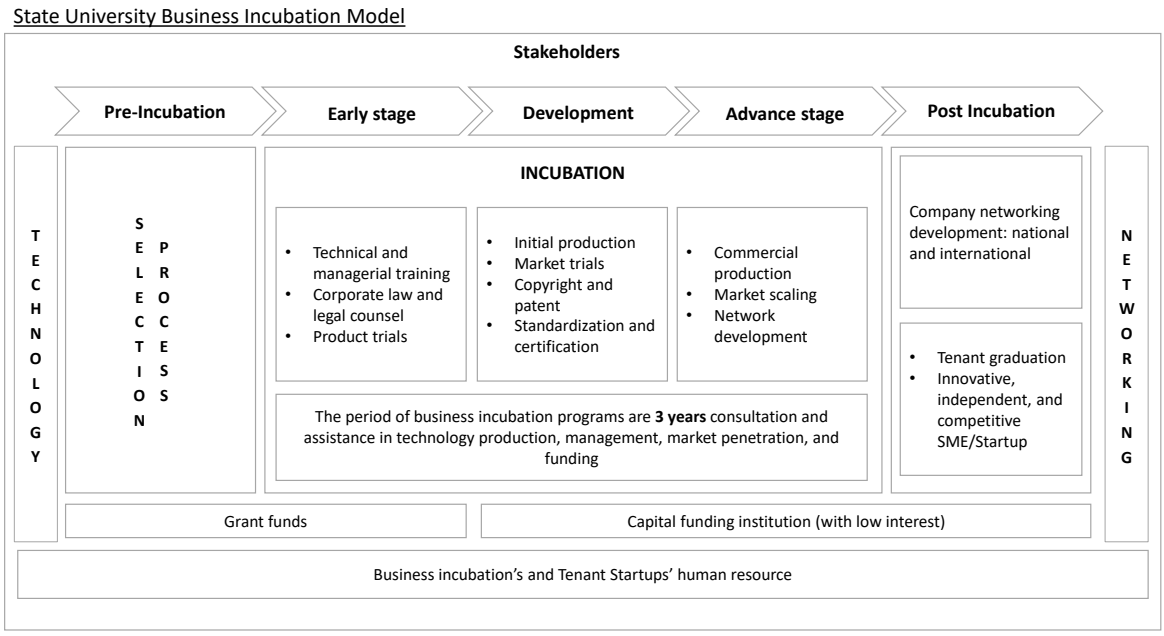


Figure C.1: Common incubation model used for state university business incubators in Indonesia (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.)

Figure C.1 shows the business incubation process implemented in university business incubators in Indonesia. Compares with other models, the university incubator has more complex structure and activities covered by the business incubation. Furthermore, graduated tenants are also supported in their tenure outside their business incubation programs. Based on the model, it can be seen that in term of business incubation services, university incubator may provide more support and resources than other business incubation. Other elements of the framework can be seen as a combination of several business incubation frameworks. In Indonesia, due to government programs, most of the university in Indonesia have business incubator (Gozali et al., 2015).

Figure C.2 shows the business incubation process implemented in state-owned business incubators. Compared to university business incubator, the model complexity is similar.

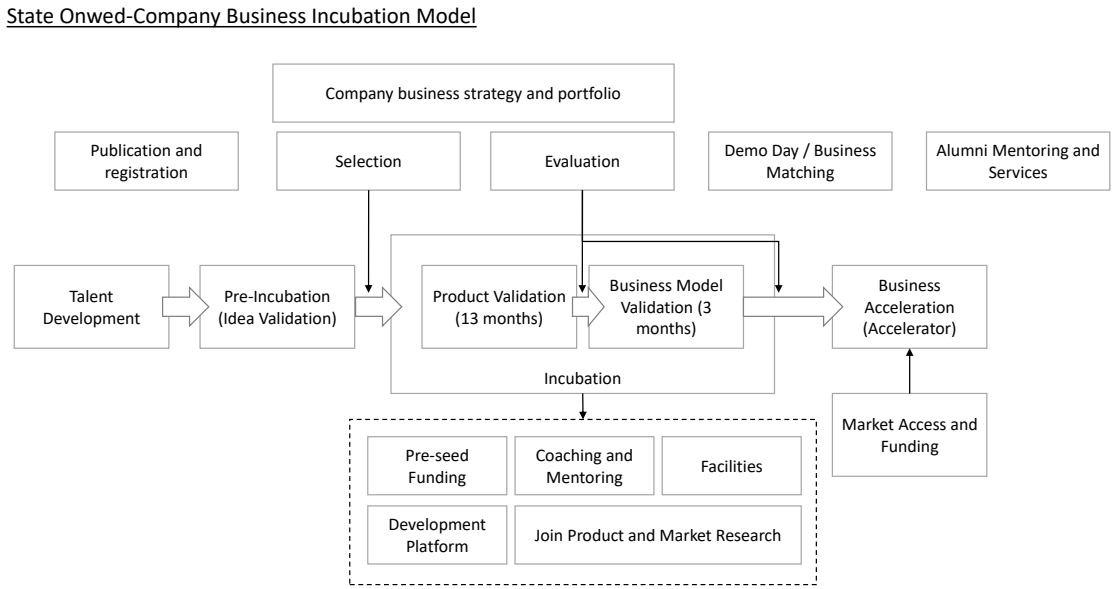


Figure C.2: Common incubation model used for state-owned business incubators in Indonesia (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.)

However, based on the model, it can be seen that state-owned business incubator have more comprehensive phases for their incubated tenant starting with talent development program until graduated or alumni program. Nonetheless, the model also incorporates all three incubation phases which are the pre-incubation phase, incubation, and post-incubation phase.

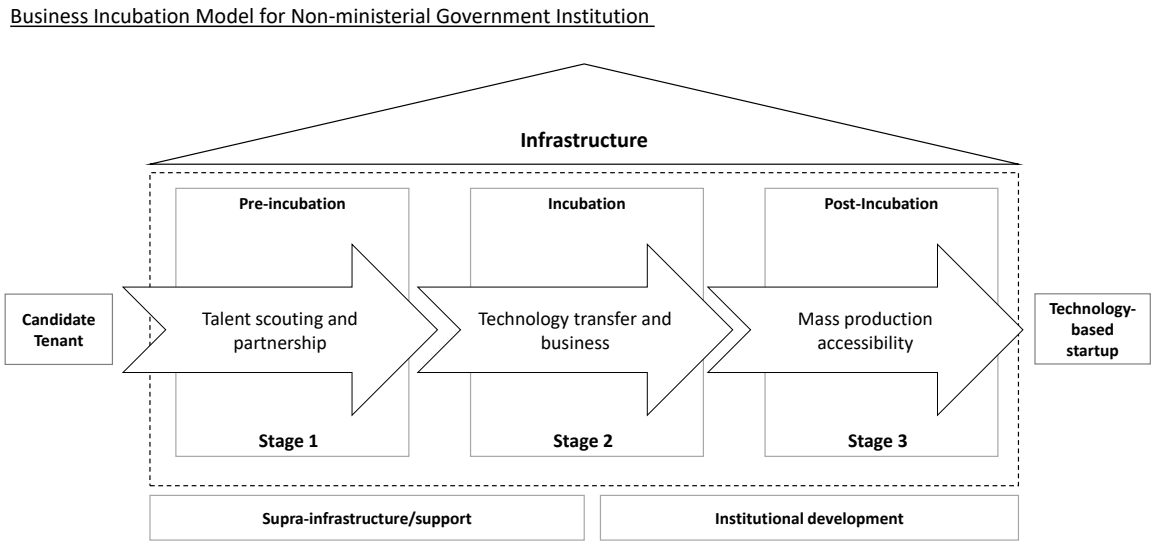


Figure C.3: Common incubation model used for non-ministerial government institution business incubators in Indonesia (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.)

Figure C.3 shows the business incubation process implemented in government business incubators. In this model, the implementation of three standards phase of business incubation programs also is implemented. Even though the model show more a

simplified version of business incubation program, based on the model, the objective of the business incubation is still similar with other business incubators which is to assist the startup in developing their product and bring it to the market. The main differences with other business incubators are in the model, the pre-incubation phase is used to develop business networks rather than the idea or business plan development. Based on the model, it can be assumed that the tenant selected in the business incubators already have their idea proven and tested before joining the business incubator. Thus, the business incubators are more into helping the startup to develop their network, business capabilities, and mass-producing the product.

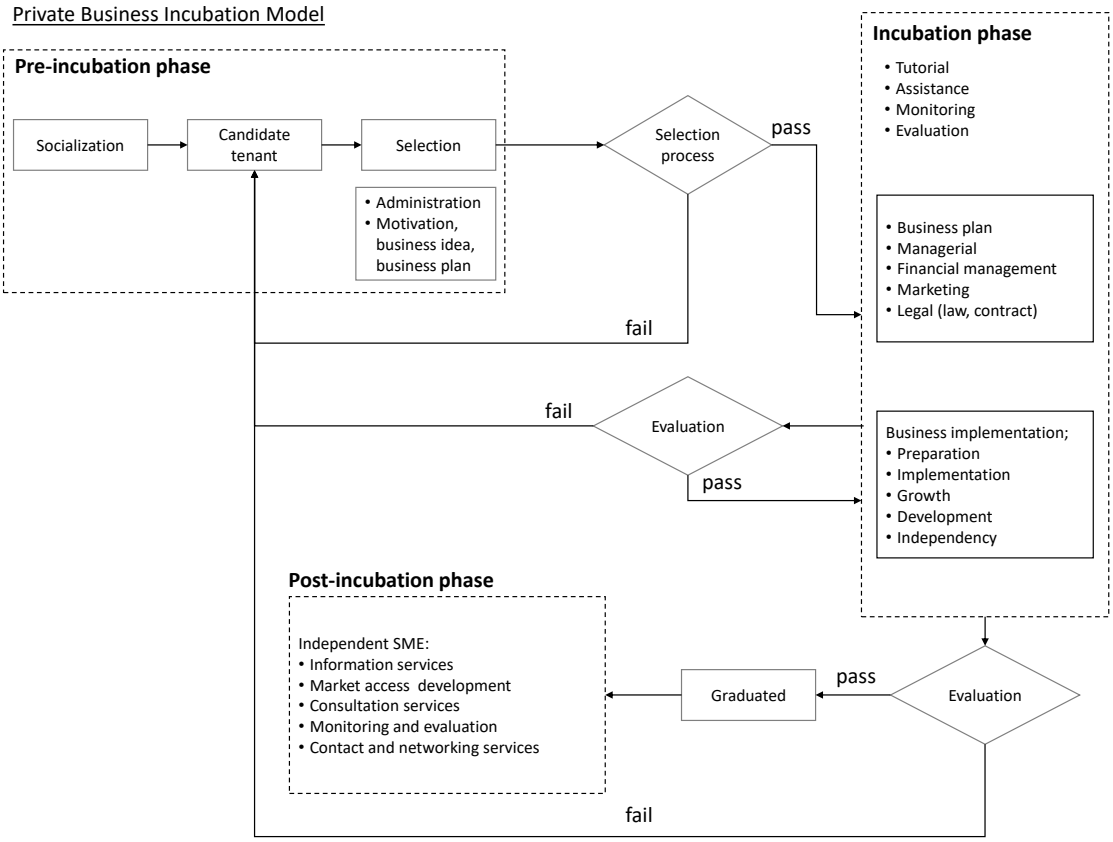


Figure C.4: Common incubation model used for private business incubators in Indonesia (Direktorat Perusahaan Pemula Berbasis Teknologi, n.d.)

Lastly, Figure C.4 shows the business incubation process implemented in private business incubators. In this model, the implementation of three standards phase of business incubation programs also is implemented. From the model, it can be seen that the focus of the business incubators is to develop the business aspect of the startup. Furthermore, in private business incubator, the evaluation process is conducted more extensively compares to other business incubators. The business incubators create an evaluation mechanism to ensure that graduated startup to pass all the criteria to ensure the survivability of the startups. The graduated startups are also provided with business support and assistance in their development as an independent company.

Based on the categorization, it can be seen that each business incubators have different mechanism and approach in handling their tenant. The differentiation of the approach may also be influenced by the characteristic, objectives, the resources, and the

capabilities of each business incubator startups. This categorization can be used to understand how the business incubator in Indonesia may manage their incubated startup.

D

Descriptive Analysis

This appendix cover the descriptive analysis on the 82 valid observation in 112 items in the research.

Table D.1: Descriptive Analysis part 1

Descriptive Statistics												
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
item	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
D1	82	1	0	1	0.22	0.046	0.416	0.173	1.381	0.266	-0.097	0.526
D2	82	9	2009	2018	2015.85	0.213	1.925	3.707	-1.308	0.266	1.890	0.526
D3	82	20	0	20	3.93	0.345	3.126	9.772	1.929	0.266	7.366	0.526
D4	82	25	0	25	2.28	0.383	3.465	12.007	4.128	0.266	23.044	0.526
D5	82	9	1	10	2.98	0.186	1.685	2.839	2.071	0.266	6.575	0.526
D6	82	4	1	5	3.13	0.085	0.766	0.587	1.117	0.266	2.391	0.526
D7	82	8	1	9	4.46	0.181	1.642	2.696	0.504	0.266	-0.049	0.526
D8	82	1	0	1	0.89	0.035	0.315	0.099	-2.544	0.266	4.581	0.526
D9	82	2	1	3	1.89	0.083	0.754	0.568	0.185	0.266	-1.202	0.526
D10	82	7	2011	2018	2016.67	0.158	1.432	2.051	-1.336	0.266	2.063	0.526
D11	82	7	0	7	1.32	0.158	1.431	2.046	1.365	0.266	2.133	0.526
D12	82	3	2	5	2.11	0.055	0.497	0.247	5.183	0.266	27.696	0.526
D13	82	4	1	5	2.02	0.161	1.457	2.123	1.135	0.266	-0.210	0.526
D14	82	1	0	1	0.73	0.049	0.446	0.199	-1.066	0.266	-0.887	0.526
D15	82	1	0	1	0.79	0.045	0.408	0.166	-1.471	0.266	0.167	0.526
E1	82	6	1	7	3.48	0.204	1.847	3.413	0.076	0.266	-1.252	0.526
E2	82	6	1	7	3.84	0.202	1.829	3.345	-0.008	0.266	-0.988	0.526
E3	82	6	1	7	4.04	0.194	1.753	3.073	-0.212	0.266	-0.805	0.526
E4	82	6	1	7	4.66	0.181	1.635	2.672	-0.559	0.266	-0.541	0.526
S1	82	5	1	6	4.10	0.153	1.384	1.916	-0.437	0.266	-0.410	0.526
S2	82	6	1	7	3.77	0.168	1.518	2.304	-0.139	0.266	-0.802	0.526
S3	82	6	1	7	3.91	0.168	1.517	2.301	-0.026	0.266	-0.623	0.526
S4	82	6	1	7	4.91	0.168	1.525	2.326	-0.666	0.266	-0.232	0.526
S5	82	6	1	7	4.52	0.146	1.326	1.759	-0.396	0.266	0.104	0.526
N1	82	6	1	7	4.33	0.187	1.693	2.866	-0.426	0.266	-0.504	0.526
N2	82	6	1	7	3.28	0.174	1.574	2.476	0.125	0.266	-0.805	0.526
N3	82	6	1	7	3.32	0.198	1.791	3.207	0.155	0.266	-0.993	0.526
N4	82	6	1	7	3.23	0.192	1.738	3.020	0.256	0.266	-0.753	0.526
N5	82	6	1	7	4.11	0.181	1.641	2.692	-0.318	0.266	-0.714	0.526
N6	82	6	1	7	3.71	0.194	1.753	3.074	-0.059	0.266	-0.934	0.526
N7	82	6	1	7	3.24	0.193	1.747	3.051	0.242	0.266	-0.932	0.526
CS1	82	5	2	7	4.74	0.161	1.456	2.119	-0.081	0.266	-0.932	0.526
CS2	82	5	2	7	5.46	0.132	1.199	1.437	-0.573	0.266	-0.070	0.526
CS3	82	5	2	7	5.28	0.139	1.260	1.587	-0.664	0.266	0.494	0.526
CS4	82	6	1	7	5.27	0.131	1.187	1.409	-0.904	0.266	1.914	0.526

Table D.2: Descriptive Analysis part 2

Descriptive Statistics												
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
Item	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
U1	82	6	1	7	4.71	0.235	2.129	4.531	-0.441	0.266	-1.244	0.526
U2	82	6	1	7	3.90	0.251	2.270	5.151	-0.019	0.266	-1.465	0.526
U3	82	6	1	7	3.66	0.234	2.121	4.499	0.232	0.266	-1.233	0.526
U4	82	7	0	7	3.82	0.196	1.772	3.139	-0.030	0.266	-0.566	0.526
U5	82	7	0	7	3.60	0.215	1.943	3.774	0.196	0.266	-0.954	0.526
U6	82	6	1	7	5.15	0.174	1.580	2.497	-0.670	0.266	-0.171	0.526
U7	82	5	2	7	5.22	0.158	1.432	2.050	-0.553	0.266	-0.551	0.526
U8	82	6	1	7	3.98	0.197	1.785	3.185	-0.176	0.266	-0.931	0.526
U9	82	6	1	7	5.05	0.192	1.735	3.010	-0.847	0.266	0.033	0.526
U10	82	6	1	7	4.51	0.200	1.807	3.265	-0.303	0.266	-0.873	0.526
U11	82	6	1	7	4.10	0.195	1.768	3.126	-0.275	0.266	-0.815	0.526
U12	82	6	1	7	4.50	0.199	1.800	3.241	-0.553	0.266	-0.793	0.526
I1	82	6	1	7	5.65	0.175	1.582	2.503	-1.254	0.266	1.106	0.526
I2	82	6	1	7	5.13	0.209	1.891	3.574	-0.816	0.266	-0.391	0.526
I3	82	6	1	7	5.26	0.184	1.669	2.785	-0.941	0.266	0.285	0.526
I4	82	7	0	7	6.18	0.136	1.229	1.509	-2.283	0.266	7.374	0.526
I5	82	7	0	7	5.50	0.187	1.694	2.870	-1.327	0.266	1.351	0.526
I6	82	5	2	7	6.29	0.110	1.000	1.000	-1.686	0.266	3.400	0.526
I7	82	5	2	7	6.41	0.107	0.968	0.937	-2.180	0.266	5.856	0.526
I8	82	4	3	7	6.17	0.115	1.040	1.082	-1.364	0.266	1.539	0.526
I9	82	5	2	7	6.23	0.124	1.125	1.267	-1.752	0.266	2.990	0.526
I10	82	4	3	7	6.38	0.112	1.014	1.028	-1.844	0.266	3.068	0.526
I11	82	4	3	7	6.40	0.107	0.967	0.935	-1.817	0.266	3.004	0.526
I12	82	3	4	7	6.05	0.111	1.005	1.010	-0.548	0.266	-1.010	0.526
Ef1	82	6	1	7	5.55	0.175	1.580	2.498	-1.082	0.266	0.302	0.526
Ef2	82	6	1	7	4.93	0.203	1.838	3.377	-0.587	0.266	-0.680	0.526
Ef3	82	6	1	7	4.76	0.203	1.836	3.372	-0.464	0.266	-0.721	0.526
Ef4	82	7	0	7	5.06	0.192	1.738	3.021	-0.848	0.266	0.157	0.526
Ef5	82	7	0	7	4.96	0.197	1.788	3.196	-0.781	0.266	-0.052	0.526
Ef6	82	6	1	7	5.83	0.148	1.341	1.798	-1.475	0.266	2.179	0.526
Ef7	82	6	1	7	5.80	0.139	1.261	1.591	-1.362	0.266	2.210	0.526
Ef8	82	6	1	7	5.13	0.185	1.676	2.809	-0.991	0.266	0.394	0.526
Ef9	82	5	2	7	5.80	0.145	1.309	1.715	-1.320	0.266	1.333	0.526
Ef10	82	6	1	7	5.70	0.173	1.569	2.461	-1.345	0.266	1.131	0.526
Ef11	82	6	1	7	5.24	0.177	1.599	2.557	-0.838	0.266	0.118	0.526
Ef12	82	5	2	7	5.00	0.134	1.217	1.481	-0.337	0.266	-0.207	0.526

Table D.3: Descriptive Analysis part 3

Descriptive Statistics												
	N	Range	Minimum	Maximum	Mean		Std. Deviation	Variance	Skewness		Kurtosis	
Item	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
HO1	82	6	1	7	4.70	0.190	1.719	2.955	-0.916	0.266	0.101	0.526
HO2	82	6	1	7	4.01	0.197	1.788	3.197	-0.484	0.266	-1.001	0.526
HO3	82	6	1	7	4.41	0.205	1.852	3.431	-0.632	0.266	-0.700	0.526
HO4	82	6	1	7	5.41	0.184	1.670	2.789	-1.290	0.266	1.132	0.526
HO5	82	6	1	7	5.17	0.191	1.727	2.983	-0.978	0.266	0.175	0.526
SO1	82	6	1	7	4.20	0.209	1.895	3.591	-0.388	0.266	-0.967	0.526
SO2	82	6	1	7	5.74	0.154	1.395	1.946	-1.457	0.266	2.224	0.526
SO3	82	6	1	7	5.41	0.169	1.531	2.344	-1.305	0.266	1.316	0.526
SO4	82	6	1	7	4.99	0.194	1.760	3.099	-0.969	0.266	-0.087	0.526
SO5	82	6	1	7	5.55	0.167	1.508	2.275	-1.445	0.266	1.777	0.526
SO6	82	6	1	7	5.29	0.173	1.567	2.456	-1.251	0.266	0.950	0.526
SO7	82	6	1	7	4.95	0.196	1.777	3.158	-0.939	0.266	-0.151	0.526
SO8	82	6	1	7	5.01	0.180	1.629	2.654	-0.986	0.266	0.153	0.526
SO9	82	6	1	7	4.91	0.199	1.800	3.240	-0.781	0.266	-0.337	0.526
IS1	82	6	1	7	4.17	0.212	1.917	3.674	-0.077	0.266	-1.092	0.526
IS2	82	6	1	7	5.74	0.142	1.284	1.650	-1.511	0.266	3.075	0.526
IS3	82	6	1	7	4.66	0.185	1.679	2.820	-0.531	0.266	-0.551	0.526
IS4	82	6	1	7	5.07	0.168	1.522	2.316	-0.730	0.266	-0.076	0.526
IS5	82	5	2	7	5.87	0.120	1.086	1.179	-1.090	0.266	1.392	0.526
BS1	82	5	2	7	5.41	0.134	1.217	1.480	-0.850	0.266	0.627	0.526
BS2	82	6	1	7	4.85	0.162	1.467	2.151	-0.558	0.266	0.196	0.526
BS3	82	6	1	7	4.82	0.143	1.297	1.682	-0.346	0.266	-0.089	0.526
LF1	82	6	1	7	4.52	0.163	1.476	2.178	-0.403	0.266	-0.367	0.526
LF2	82	6	1	7	4.06	0.213	1.933	3.737	-0.204	0.266	-1.103	0.526
LF3	82	6	1	7	4.07	0.214	1.936	3.748	-0.263	0.266	-0.965	0.526
LF4	82	6	1	7	3.76	0.196	1.775	3.150	-0.136	0.266	-1.005	0.526
LF5	82	6	1	7	4.52	0.176	1.596	2.549	-0.521	0.266	-0.450	0.526
GS1	82	6	1	7	4.27	0.196	1.778	3.162	-0.337	0.266	-0.753	0.526
GS2	82	6	1	7	4.63	0.163	1.478	2.185	-0.492	0.266	-0.062	0.526

D.1. Outliers

There is several outliers in the data as shown in the SPSS result in Figure D.1 and Figure D.2.

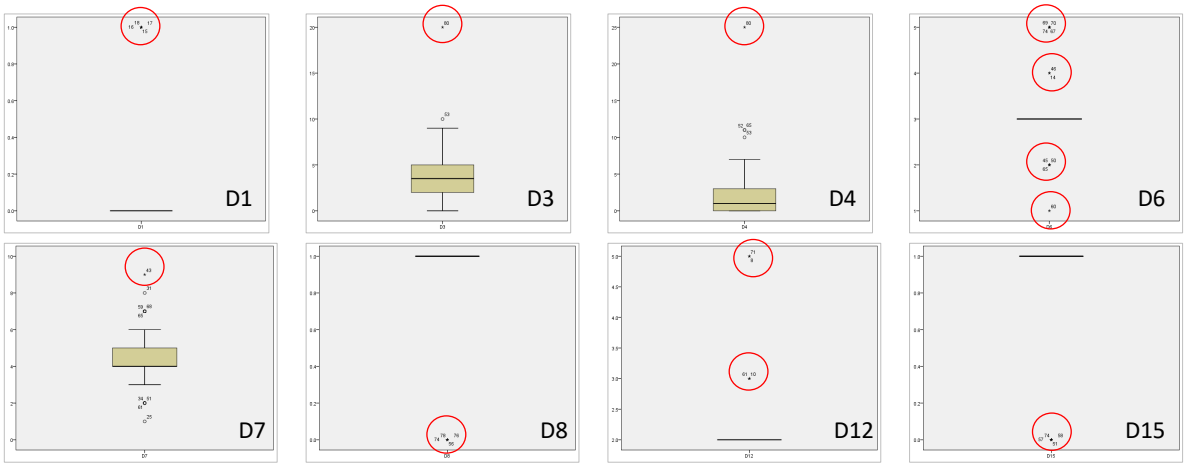


Figure D.1: Overview of the outlier data in demographic items

Figure D.2: Overview of the outlier data in other items

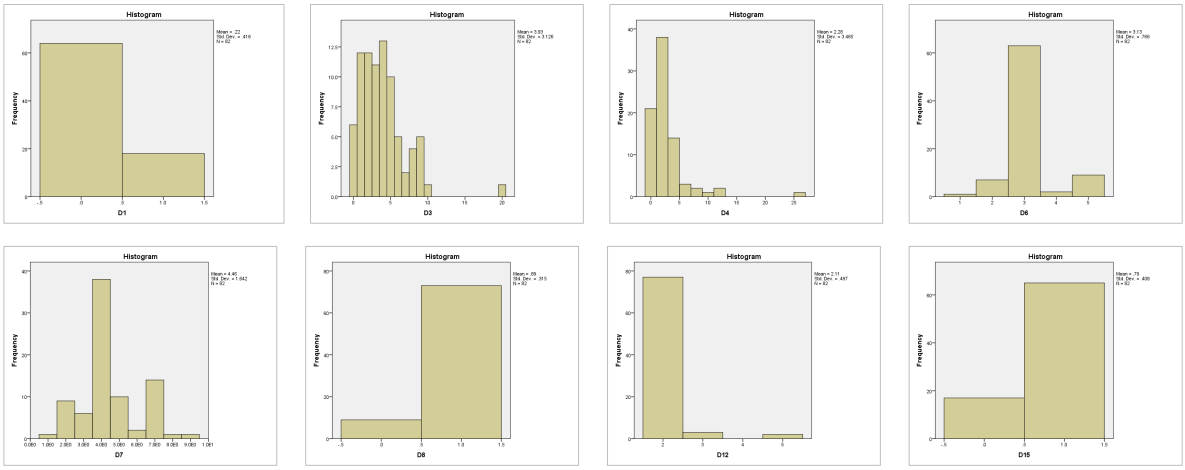
In Figure D.1 show the outliers in demographic data as shown with the D name in the item name. The description of these demographics items can be seen in Table D.4.

In these items, outliers are expected as the data is more into categorical data. But further analysis on what is the outliers in these categorical information still should be done. A histogram analysis is done to determine whether the data is data entry error or not. The result of the histogram analysis is presented in Figure D.3.

Item	Variables	Item name	Description of Items
D1	Demographic	Questionnaire	Whether the questionnaire is online or offline
D3	Demographic	EmployeMale	Number of full time male employee
D4	Demographic	EmployeFemale	Number of full time female employee
D6	Demographic	Education	Average level of education
D7	Demographic	Province	Location of startup
D8	Demographic	Urban	Whether startup location is in Urban area or not
D12	Demographic	startup_type	Startup type
D15	Demographic	Use_outsideService	Whether the startup has used business services outside business incubation

Table D.4: Outliers in demographic items

Figure D.3: Overview of the histogram information on the outliers data in demographic items



For demographic items, as shown in the histogram and analysis in the data in each item, there are no data entry error. Thus, there will be no other removal in data in these items. Different data are expected in demographic information as it mostly contains categorical data. For other outliers outside the demographic items, as shown in Figure D.2 before, there are 6 items which have significant outliers. Those items are described as in Table D.5.

Table D.5: Outliers in other items

Item	Variables	Items name	Description of variables
CS4	Company strategy	Strat_Innov	Innovative differentiation in the market
I6	Business support	Imp_BuTrain	Importance of Business Training & workshop
I7	Business support	Imp_BuCounsel	Importance of Advisory services
I9	Networking	Imp_PeerNet	Importance of Peer networking
SO3	Soft outcomes	Change_Proffes	Changes in startup professionality
SO6	Soft outcomes	Chane_Productivity	Changes in startup productivity

Histogram analysis also is done to those items to know whether the outliers are because the data entry or not. The result of the histogram analysis is shown in Figure D.4.

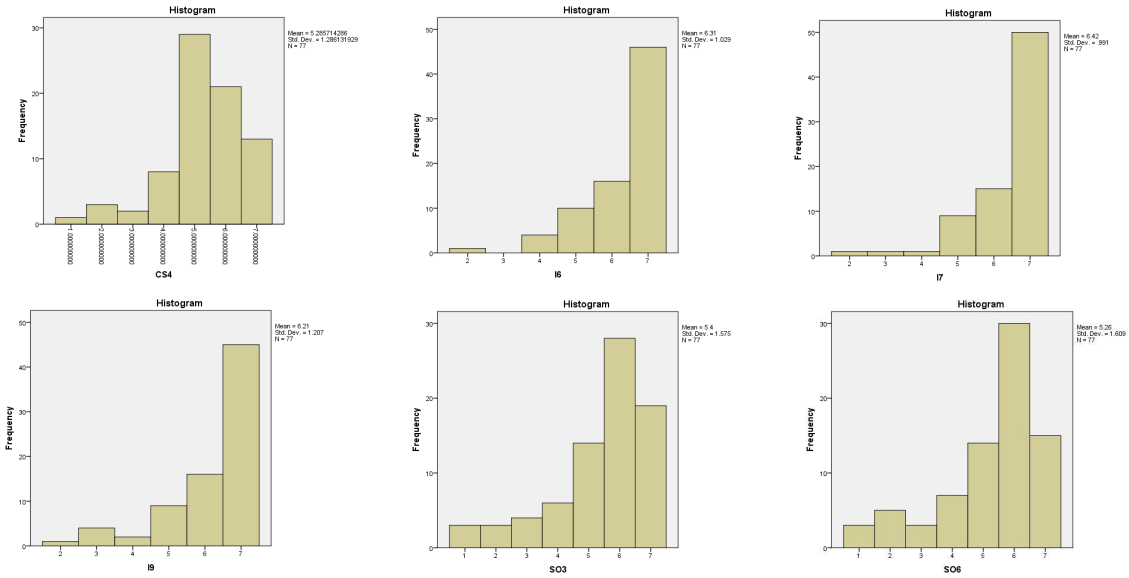


Figure D.4: Overview of the histogram information on the outliers data in other items

All the items in Figure D.5 are in 7-scale data. In this case, item I4, have data entry error as there is a 0 (zero) value in the item. In this case, as the case is relatively small. Thus, this observation data will be removed from future analysis.

Further analysis in non-demographic data are conducted in the interval data by analyzing the maximum and minimum value. In the 7-scale interval, the minimum value are expected to be 1 and the maximum value are expected to be 7. Thus, other data or information outside the scale is assumed as data entry error. The result of this extreme check found two cases that have one or more invalid value which is 0 (zero) as shown in Figure D.6. As there are only two cases with invalid value, the two cases then are deleted to make sure that all the data processed are valid.

Table D.6: Extreme value check result

Extreme Values												
		U4		U5		I4		I5		Ef4		Ef5	
Item		Case Number	Value	Case Number	Value	Case Number	Value	Case Number	Value	Case Number	Value	Case Number	Value
Highest	1	4	7	2	7	2	7	2	7	4	7	2	7
	2	18	7	4	7	4	7	4	7	8	7	4	7
	3	27	7	7	7	7	7	7	7	12	7	7	7
	4	32	7	16	7	8	7	8	7	15	7	8	7
	5	48	7[f]	29	7[f]	10	7[f]	14	7[f]	18	7[f]	15	7[f]
Lowest	1	1	0	5	0	1	0	5	0	1	0	5	0
	2	65	1	65	1	74	3	61	1	61	1	61	1
	3	64	1	64	1	21	3	37	1	40	1	40	1
	4	60	1	61	1	31	4	24	1	24	1	27	1
	5	54	1[h]	60	1[h]	13	4[i]	21	2[i]	42	2[i]	24	1

After the outliers analysis, thus the valid data reduced to only 80 observations. This data will be used for next statistical analysis. Descriptive analysis and histogram of all items is presented in Appendix D.

Table D.7: Extracted item, variable, and construct used in this research

Construct	Variables	Items	Description
Startup characteristics	Experience	Ex3	Experience in startup or entrepreneurial activities
		Ex4	Subject-Matter Expert or technical experience
	Network contacts	N5	Contact with potential or targeted customers
		N6	Contact with potential or established suppliers
		N7	Contact with capital or funding sources
	skill company	S1	Marketing, sales, and business development
		S2	Finance and accounting
		S3	Administration and HR
		S5	Operational, Production, and Manufacturing
	strategy	CS3	Our product is the most unique in the market
		CS4	Our product is the most innovative in the market
Environmental factor	Human capital support	BS3	People are open to new product in the market
		LF1	There is a lot of professional business services offered
		LF5	The area attracts high and requisite-skilled employee
	Customer preferences	BS2	The product has become customers favorite in the market
	Locational Factor	GS1	There is government policies for supporting entrepreneurs
		LF2	There is scientific or research complex where the company located on
		LF4	There is functional financial market
	Market structure	IS3	There is a lot of different products offered in the market by competitors

Table D.8: Extracted item, variable, and construct used in this research

Construct	Variables	Items	Description
Usage	Usage Infra	U1	Usage of space and building facilities such as office and working space
		U2	Usage of business (postal) address provided by business incubator
		U3	Usage of shared office services and equipment's such as meeting room, cafeteria, printer, and building security
	Usage network	U10	Usage of access to funding, grants, and loans
		U11	Usage of access to potential customers
		U4	Usage of support on product sales and marketing
	Usage of Adm	U5	Usage of administrative and secretarial services
		U6	Usage of business training, seminar, and workshop
		U7	Usage of business counseling and mentoring
Importance	Importance Infra	U1	Usage of space and building facilities such as office and working space
		U2	Usage of business (postal) address provided by business incubator
		U3	Usage of shared office services and equipment such as meeting room, cafeteria, printer, and building security
	Importance network	I11	Importance of Access to potential customers
		I4	Importance of support on product sales and marketing
	Importance of Business Support	I8	Importance of business planning and development support
		I9	Importance of peer networking (sharing information, experience, business partnership, etc with other tenants)
Effectiveness	Effectiveness Infra	Ef1	Effectiveness of space and building facilities such as office and working space
		Ef3	Effectiveness of shared office services and equipment such as meeting room, cafeteria, printer, and building security
	Effectiveness network	Ef10	Effectiveness of access to funding, grants, and loans
		Ef11	Effectiveness of access to potential customers
	Effectiveness of Business Support	Ef4	Effectiveness of support on product sales and marketing
		Ef5	Effectiveness of administrative and secretarial services
		Ef8	Effectiveness of business planning and development support
		Ef9	Effectiveness of peer networking (sharing information, experience, business partnership, etc with other tenants)

E

Initial Statistical Assumption Testing

E.1. Normality

Table E.1: Normality test result 1

Tests of Normality								
	Kolmogorov-Smirnov[a]				Shapiro-Wilk			
	Statistic	df	Sig.	Normal?	Statistic	df	Sig.	Normal?
E1	0.139	80	0.001	No	0.909	80	0.000	No
E2	0.116	80	0.010	No	0.934	80	0.000	No
E3	0.134	80	0.001	No	0.937	80	0.001	No
E4	0.190	80	0.000	No	0.921	80	0.000	No
S1	0.194	80	0.000	No	0.917	80	0.000	No
S2	0.163	80	0.000	No	0.935	80	0.001	No
S3	0.136	80	0.001	No	0.951	80	0.004	No
S4	0.200	80	0.000	No	0.914	80	0.000	No
S5	0.160	80	0.000	No	0.938	80	0.001	No
N1	0.151	80	0.000	No	0.929	80	0.000	No
N2	0.126	80	0.003	No	0.932	80	0.000	No
N3	0.161	80	0.000	No	0.910	80	0.000	No
N4	0.161	80	0.000	No	0.908	80	0.000	No
N5	0.176	80	0.000	No	0.934	80	0.000	No
N6	0.142	80	0.000	No	0.932	80	0.000	No
CS1	0.187	80	0.000	No	0.915	80	0.000	No
CS2	0.184	80	0.000	No	0.901	80	0.000	No
CS3	0.206	80	0.000	No	0.894	80	0.000	No
CS4	0.242	80	0.000	No	0.876	80	0.000	No

Table E.2: Normality test result 2

Tests of Normality

	Kolmogorov-Smirnov[a]				Shapiro-Wilk			
	Statistic	df	Sig.	Normal?	Statistic	df	Sig.	Normal ?
U1	0.178	80	0.000	No	0.868	80	0.000	No
U2	0.164	80	0.000	No	0.872	80	0.000	No
U3	0.144	80	0.000	No	0.899	80	0.000	No
U4	0.161	80	0.000	No	0.937	80	0.001	No
U5	0.139	80	0.001	No	0.921	80	0.000	No
U6	0.170	80	0.000	No	0.905	80	0.000	No
U7	0.211	80	0.000	No	0.900	80	0.000	No
U8	0.157	80	0.000	No	0.933	80	0.000	No
U9	0.198	80	0.000	No	0.875	80	0.000	No
U10	0.129	80	0.002	No	0.927	80	0.000	No
U11	0.149	80	0.000	No	0.936	80	0.001	No
I1	0.218	80	0.000	No	0.814	80	0.000	No
I2	0.199	80	0.000	No	0.853	80	0.000	No
I3	0.205	80	0.000	No	0.871	80	0.000	No
I4	0.326	80	0.000	No	0.733	80	0.000	No
I5	0.245	80	0.000	No	0.823	80	0.000	No
I6	0.323	80	0.000	No	0.724	80	0.000	No
I7	0.370	80	0.000	No	0.635	80	0.000	No
I8	0.282	80	0.000	No	0.757	80	0.000	No
I9	0.322	80	0.000	No	0.696	80	0.000	No
I10	0.377	80	0.000	No	0.656	80	0.000	No
I11	0.380	80	0.000	No	0.663	80	0.000	No

Table E.3: Normality test result 3

Tests of Normality

	Kolmogorov-Smirnov[a]				Shapiro-Wilk			
	Statistic	df	Sig.	Normal?	Statistic	df	Sig.	Normal?
Ef1	0.242	80	0.000	No	0.834	80	0.000	No
Ef2	0.194	80	0.000	No	0.891	80	0.000	No
Ef3	0.137	80	0.001	No	0.912	80	0.000	No
Ef4	0.178	80	0.000	No	0.897	80	0.000	No
Ef5	0.180	80	0.000	No	0.899	80	0.000	No
Ef6	0.255	80	0.000	No	0.804	80	0.000	No
Ef7	0.259	80	0.000	No	0.821	80	0.000	No
Ef8	0.197	80	0.000	No	0.872	80	0.000	No
Ef9	0.266	80	0.000	No	0.799	80	0.000	No
Ef10	0.258	80	0.000	No	0.788	80	0.000	No
Ef11	0.215	80	0.000	No	0.880	80	0.000	No
HO1	0.212	80	0.000	No	0.872	80	0.000	No
HO2	0.238	80	0.000	No	0.882	80	0.000	No
HO3	0.204	80	0.000	No	0.891	80	0.000	No
HO4	0.216	80	0.000	No	0.817	80	0.000	No
HO5	0.222	80	0.000	No	0.863	80	0.000	No
SO1	0.192	80	0.000	No	0.910	80	0.000	No
SO2	0.258	80	0.000	No	0.806	80	0.000	No
SO3	0.260	80	0.000	No	0.830	80	0.000	No
SO4	0.246	80	0.000	No	0.847	80	0.000	No
SO5	0.295	80	0.000	No	0.804	80	0.000	No
SO6	0.274	80	0.000	No	0.828	80	0.000	No
SO7	0.273	80	0.000	No	0.848	80	0.000	No
SO8	0.266	80	0.000	No	0.858	80	0.000	No
SO9	0.206	80	0.000	No	0.885	80	0.000	No

Table E.4: Normality test result 4

Tests of Normality

	Kolmogorov-Smirnov[a]				Shapiro-Wilk			
	Statistic	df	Sig.	Normal?	Statistic	df	Sig.	Normal?
IS1	0.137	80	0.001	No	0.927	80	0.000	No
IS2	0.265	80	0.000	No	0.811	80	0.000	No
IS3	0.169	80	0.000	No	0.915	80	0.000	No
IS4	0.196	80	0.000	No	0.902	80	0.000	No
IS5	0.246	80	0.000	No	0.840	80	0.000	No
BS1	0.237	80	0.000	No	0.881	80	0.000	No
BS2	0.153	80	0.000	No	0.926	80	0.000	No
BS3	0.162	80	0.000	No	0.936	80	0.001	No
LF1	0.175	80	0.000	No	0.938	80	0.001	No
LF2	0.131	80	0.002	No	0.919	80	0.000	No
LF3	0.160	80	0.000	No	0.909	80	0.000	No
LF4	0.136	80	0.001	No	0.927	80	0.000	No
LF5	0.157	80	0.000	No	0.924	80	0.000	No
GS1	0.147	80	0.000	No	0.931	80	0.000	No
GS2	0.162	80	0.000	No	0.931	80	0.000	No

a. Lilliefors Significance Correction

E.2. Homoscedasticity

Table E.5: Homoscedasticity test result 1

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Ex1	3.180	2	77	0.047
Ex2	1.999	2	77	0.142
Ex3	1.509	2	77	0.228
Ex4	0.339	2	77	0.713
S1	2.743	2	77	0.071
S2	1.948	2	77	0.150
S3	1.166	2	77	0.317
S4	0.646	2	77	0.527
S5	0.676	2	77	0.512
N1	1.667	2	77	0.196
N2	2.268	2	77	0.110
N3	2.260	2	77	0.111
N4	4.499	2	77	0.014
N5	1.669	2	77	0.195
N6	2.137	2	77	0.125
N7	1.241	2	77	0.295

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Ex1	0.395	1	78	0.531
Ex2	0.008	1	78	0.931
Ex3	0.659	1	78	0.419
Ex4	0.010	1	78	0.920
S1	0.329	1	78	0.568
S2	1.836	1	78	0.179
S3	0.655	1	78	0.421
S4	20.275	1	78	0.000
S5	4.831	1	78	0.031
N1	0.003	1	78	0.957
N2	8.198	1	78	0.005
N3	0.006	1	78	0.941
N4	0.082	1	78	0.776
N5	0.216	1	78	0.643
N6	0.140	1	78	0.710
N7	0.027	1	78	0.871

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
CS1	1.102	2	77	0.337
CS2	1.526	2	77	0.224
CS3	0.585	2	77	0.560
CS4	0.310	2	77	0.734
U1	0.450	2	77	0.639
U2	0.649	2	77	0.526
U3	2.871	2	77	0.063
U4	0.338	2	77	0.714
U5	1.169	2	77	0.316
U6	2.076	2	77	0.132
U7	2.963	2	77	0.058
U8	0.847	2	77	0.433
U9	2.169	2	77	0.121
U10	1.347	2	77	0.266
U11	0.184	2	77	0.832
U12	0.307	2	77	0.737
I1	1.805	2	77	0.171
I2	0.067	2	77	0.936
I3	2.559	2	77	0.084
I4	2.521	2	77	0.087
I5	1.786	2	77	0.175
I6	2.251	2	77	0.112
I7	3.449	2	77	0.037
I8	1.939	2	77	0.151
I9	0.246	2	77	0.783
I10	1.804	2	77	0.172
I11	1.669	2	77	0.195
I12	0.790	2	77	0.458

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
CS1	0.953	1	78	0.332
CS2	0.352	1	78	0.555
CS3	0.238	1	78	0.627
CS4	0.745	1	78	0.391
U1	0.107	1	78	0.744
U2	0.072	1	78	0.790
U3	0.621	1	78	0.433
U4	0.715	1	78	0.400
U5	0.115	1	78	0.736
U6	0.140	1	78	0.710
U7	0.049	1	78	0.825
U8	1.668	1	78	0.200
U9	3.498	1	78	0.065
U10	0.003	1	78	0.959
U11	0.210	1	78	0.648
U12	0.130	1	78	0.720
I1	0.335	1	78	0.565
I2	0.094	1	78	0.761
I3	0.041	1	78	0.840
I4	1.531	1	78	0.220
I5	0.000	1	78	0.992
I6	2.082	1	78	0.153
I7	4.025	1	78	0.048
I8	1.247	1	78	0.267
I9	3.655	1	78	0.060
I10	0.431	1	78	0.514
I11	6.394	1	78	0.013
I12	2.186	1	78	0.143

Table E.6: Homoscedasticity test result 2

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Ef1	1.820	2	77	0.169
Ef2	2.636	2	77	0.078
Ef3	0.847	2	77	0.433
Ef4	2.290	2	77	0.108
Ef5	1.924	2	77	0.153
Ef6	1.991	2	77	0.144
Ef7	1.399	2	77	0.253
Ef8	1.920	2	77	0.154
Ef9	1.080	2	77	0.345
Ef10	1.731	2	77	0.184
Ef11	2.725	2	77	0.072
Ef12	0.446	2	77	0.642
HO1	1.238	2	77	0.296
HO2	2.557	2	77	0.084
HO3	0.261	2	77	0.771
HO4	0.958	2	77	0.388
HO5	2.751	2	77	0.070
SO1	2.099	2	77	0.130
SO2	0.775	2	77	0.464
SO3	0.530	2	77	0.591
SO4	1.931	2	77	0.152
SO5	2.121	2	77	0.127
SO6	2.894	2	77	0.061
SO7	1.920	2	77	0.154
SO8	1.338	2	77	0.269
SO9	2.125	2	77	0.126

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Ef1	0.564	1	78	0.455
Ef2	2.804	1	78	0.098
Ef3	6.744	1	78	0.011
Ef4	0.664	1	78	0.418
Ef5	1.373	1	78	0.245
Ef6	0.114	1	78	0.737
Ef7	0.065	1	78	0.799
Ef8	0.369	1	78	0.546
Ef9	10.247	1	78	0.002
Ef10	0.634	1	78	0.428
Ef11	0.319	1	78	0.574
Ef12	0.025	1	78	0.874
HO1	10.152	1	78	0.002
HO2	0.680	1	78	0.412
HO3	1.832	1	78	0.180
HO4	3.122	1	78	0.081
HO5	12.024	1	78	0.001
SO1	3.280	1	78	0.074
SO2	3.879	1	78	0.052
SO3	10.056	1	78	0.002
SO4	5.564	1	78	0.021
SO5	8.521	1	78	0.005
SO6	19.052	1	78	0.000
SO7	5.962	1	78	0.017
SO8	6.436	1	78	0.013
SO9	7.274	1	78	0.009

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
IS1	1.096	2	77	0.340
IS2	1.778	2	77	0.176
IS3	0.875	2	77	0.421
IS4	1.125	2	77	0.330
IS5	1.387	2	77	0.256
BS1	0.741	2	77	0.480
BS2	2.477	2	77	0.091
BS3	2.728	2	77	0.072
LF1	0.097	2	77	0.908
LF2	0.549	2	77	0.580
LF3	0.050	2	77	0.951
LF4	3.199	2	77	0.046
LF5	1.755	2	77	0.180
GS1	0.276	2	77	0.759
GS2	1.901	2	77	0.156

Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
IS1	0.058	1	78	0.810
IS2	18.140	1	78	0.000
IS3	0.027	1	78	0.870
IS4	6.609	1	78	0.012
IS5	2.823	1	78	0.097
BS1	0.149	1	78	0.701
BS2	0.000	1	78	0.994
BS3	0.083	1	78	0.775
LF1	0.786	1	78	0.378
LF2	0.258	1	78	0.613
LF3	0.112	1	78	0.738
LF4	1.524	1	78	0.221
LF5	0.074	1	78	0.787
GS1	0.275	1	78	0.601
GS2	2.714	1	78	0.103

This page intentionally left blank.

F

Factor Analysis Assessment Result

Table F.1: Measurement model test result

High order construct	AVE	Composite Reliability	Cronbach Alpha	Construct	Loadings	Reliability	Composite Reliability	Average Variance Extracted (AVE)	Items	Outer loadings	Reliability
Startup characteristics	0.593	0.812	0.743	Experience	0.652	0.726	0.879	0.784	Ex3	0.905	0.819
									Ex4	0.866	0.750
				Network contacts	0.769	0.851	0.856	0.77	N5	0.886	0.785
									N6	0.885	0.783
									N7	0.862	0.743
				skill company	0.873	0.854	0.901	0.696	S1	0.831	0.691
									S2	0.876	0.767
									S3	0.831	0.691
									S5	0.797	0.635
Environmental factor	0.725	0.900	0.729	Human capital support	1.052	0.771	0.771	0.531	BS3	0.791	0.626
									LF1	0.744	0.554
									LF5	0.642	0.412
				Customer preferences	0.685	1	1	1	BS2	1.000	1.000
				Locational Factor	1.11	0.775	0.776	0.536	GS1	0.700	0.490
									LF2	0.743	0.552
									LF4	0.753	0.567
				Market structure	0.303	1	1	1	IS3	1.000	1.000
Usage	0.899	0.964	0.836	Usage Infra	0.871	0.908	0.908	0.766	U1	0.847	0.717
									U2	0.871	0.759
									U3	0.907	0.823
				Usage network	0.961	0.846	0.848	0.653	U10	0.712	0.507
									U11	0.828	0.686
									U4	0.875	0.766
				Usage of Adm	1.008	0.838	0.837	0.631	U5	0.825	0.681
									U6	0.767	0.588
									U7	0.790	0.624
Importance	0.995	0.998	0.838	Importance Infra	1.048	0.831	0.83	0.62	I1	0.742	0.551
									I3	0.805	0.648
									I5	0.813	0.661
				Importance network	0.898	0.779	0.803	0.677	I11	0.671	0.450
									I4	0.950	0.903
				Importance of Business Support	1.04	0.669	0.67	0.504	I8	0.733	0.537
									I9	0.685	0.469
Effectiveness	0.915	0.970	0.845	Effectiveness Infra	0.879	0.818	0.821	0.697	Ef1	0.783	0.613
									Ef3	0.884	0.781
				Effectiveness network	0.895	0.824	0.829	0.709	Ef10	0.775	0.601
									Ef11	0.904	0.817
				Effectiveness of Business Support	1.082	0.862	0.866	0.619	Ef4	0.863	0.745
									Ef5	0.794	0.630
									Ef8	0.799	0.638
									Ef9	0.679	0.461

G

Variables list

Table G.1: List of variables part 1

Construct	Item	Description	Factor combined	Variables name	Cronbach alpha	Used/dropped
Startup characteristic	Ex3	Experience in startup or entrepreneurial activities	Startup Experience	Experience	0.726	Used
	Ex4	Subject-Matter Expert or technical experience				
	N5	Contact with potential or targeted customers	Business Network	Network contacts	0.851	Used
	N6	Contact with potential or established suppliers				
	N7	Contact with capital or funding sources				
	S1	Marketing, sales, and business development	Company skill	skill company	0.854	Used
	S2	Finance and accounting				
	S3	Administration and HR				
	S5	Operational, Production, and Manufacturing				
Environmental Factor	BS3	People are open to new product in the market	Human capital support	Human capital support	0.771	Used
	LF1	There is a lot of professional business services offered				
	LF5	The area attracts high and requisite-skilled employee				
	BS2	The product has become customers favorite in the market	Customer preferences	Customer preferences	n/a	Used
	GS1	There is government policies for supporting entrepreneurs	Locational Factor	Locational Factor	0.775	Used
	LF2	There is scientific or research complex where the company located on				
	LF4	There is functional financial market				
	IS3	There is a lot of different products offered in the market by competitors	Market structure	Market structure	n/a	Used
Usage	U1	Usage of space and building facilities such as office and working space	Usage of Infrastructure facilities	Usage Infra	0.908	Used
	U2	Usage of business (postal) address provided by business incubator				
	U3	Usage of shared office services and equipments such as meeting room, cafeteria, printer, and building security				
	U10	Usage of access to funding, grants, and loans	Usage of Network Access	Usage network	0.846	Used
	U11	Usage of access to potential customers				
	U4	Usage of support on product sales and marketing				
	U5	Usage of administrative and secretarial services	Usage of Administrative support	Usage of Adm	0.838	Used
	U6	Usage of business training, seminar, and workshop				
	U7	Usage of business counseling and mentoring				

Table G.2: List of variables part 2

Construct	Item	Description	Factor combined	Variables name	Cronbach alpha	Used/dropped
Importance	I1	Importance of space and building facilities such as office and working space	Importance of Infrastructure facilities	Importance Infra	0.831	Used
	I3	Importance of shared office services and equipments such as meeting room, cafeteria, printer, and building security				
	I5	Importance of administrative and secretarial services				
	I11	Importance of Access to potential customers	Importance of Network Access	Importance network	0.779	Used
	I4	Importance of support on product sales and marketing				
	I8	Importance of business planning and development support	Importance of Business support	Importance of Business Support	0.669	Used
	I9	Importance of peer networking (sharing information, experience, business partnership, etc with other tenants)				
Effectiveness	Ef1	Effectiveness of space and building facilities such as office and working space	Effectiveness of Infrastructure facilities	Effectiveness Infra	0.818	Used
	Ef3	Effectiveness of shared office services and equipments such as meeting room, cafeteria, printer, and building security				
	Ef10	Effectiveness of access to funding, grants, and loans	Effectiveness of Network Access	Effectiveness network	0.824	Used
	Ef11	Effectiveness of access to potential customers				
	Ef4	Effectiveness of support on product sales and marketing	Effectiveness of Business support	Effectiveness of Business Support	0.862	Used
	Ef5	Effectiveness of administrative and secretarial services				
	Ef8	Effectiveness of business planning and development support				
	Ef9	Effectiveness of peer networking (sharing information, experience, business partnership, etc with other tenants)				
Performance	HO1	There is increase in company sales turnover (revenue generation)	Startup performance in business incubators	Performance	0.92	Used
	HO5	Our employee average wage has increased				
	SO1	We are confident that our company will survive after graduating from business incubation				
	SO2	We improve our business knowledge and skill				
	SO3	Our company team become more professional				
	SO4	We have established productive networking with other tenants				
	SO5	Our company reputation and credibility in the market has increased				
	SO7	Our product development time to market has become faster				
	SO9	We have faster access to critical stakeholders (supplier, customer, professional support, etc)				

Table G.3: List of variables part 3

Construct	Item	Description	Factor combined	Variables name	Cronbach alpha	Used/dropped
Demographic Information	D1	Type of questionnaire	Type of questionnaire	D1	n/a	Dropped
	D2	Startup age	Firm age	D2	n/a	Used
	D3	Number of full time male employee	Number of male employee	D3	n/a	Used
	D4	Number of full time female employee	Number of female male employee	D4	n/a	Used
	D5	Number of initial employee	Initial employee	D5	n/a	Used
	D6	Average level of company employee education	Education	D6	n/a	Used
	D7	Province of company location	Location	D7	n/a	Dropped
	D8	Type of company location (Urban or Sub-urban)	Urban	D8	n/a	Dropped
	D9	Incubator where the company join	Business incubator	D9	n/a	Dropped
	D10	Year when the company still join incubator or not	When join incubator	D10	n/a	Dropped
	D11	Incubation duration	Incubation duration	D11	n/a	Used
	D12	Startup type	Startup type	D12	n/a	Used
	D13	Total of initial funding the startup had when established the company	Initial capital	D13	n/a	Used
	D14	Whether the company still join incubator or not	Join Business Incubation	D14	n/a	Dropped
	D15	Whether the company has used any proffesional services outside business incubator	Business services pre-incubation usage	D15	n/a	Dropped

Table G.4: List of variables part 4

Construct	Item	Description	Factor combined	Variables name	Cronbach alpha	Used/dropped
Startup characteristic	Ex1	Experience working in top managerial level (VP and above positions)				Dropped
	Ex2	Experience working in the same industry				Dropped
	N1	Well developed informal alliances/partners such as friends, families, and acquaintances				Dropped
	N2	Business partnership with external institutions or governments				Dropped
	N3	Technical project collaborations				Dropped
	N4	Trade/business associations				Dropped
	S4	Engineering, Technology, and R&D				Dropped
Environmental Factor	CS1	Our company have a clear planning and strategy formulation				Dropped
	CS2	Our company have clear business goals and objectives				Dropped
	CS3	Our product is the most unique in the market				Dropped
	CS4	Our product is the most innovative in the market				Dropped
	BS1	There is a lot of potential buyers and suppliers				Dropped
	LF3	There is functioning industrial or science park in the area				Dropped
	GS2	The technological and regulatory in the industry keep changing				Dropped
	IS1	There is a lot of companies in the same industry				Dropped
	IS2	The industry has high potential profit				Dropped
	IS4	There is stable demand of the product in the market				Dropped
	IS5	The industry is growing rapidly				Dropped
Usage	U8	Usage of business planning and development support				Dropped
	U9	Usage of peer networking (sharing information, experience, business partnership, etc with other tenants)				Dropped
	U12	Usage of access to external networks, information, and resources (experts, government, supplier, university, etc)				Dropped
Importance	I2	Importance of business (postal) address provided by business incubator				Dropped
	I6	Importance of business training, seminar, and workshop				Dropped
	I7	Usage of business counseling and mentoring				Dropped
	I10	Importance of access to funding, grants, and loans				Dropped
	I12	Importance of access to external networks, information, and resources (experts, government, supplier, university, etc)				Dropped
Effectiveness	Ef2	Effectiveness of business (postal) address provided by business incubator				Dropped
	Ef6	Effectiveness of business training, seminar, and workshop				Dropped
	Ef7	Effectiveness of business counseling and mentoring				Dropped
	Ef12	Effectiveness of access to external networks, information, and resources (experts, government, supplier, university, etc)				Dropped
Performance	HO2	Our employee number is increasing				Dropped
	HO3	There is increasing number of investments and fundings				Dropped
	HO4	Our product potential profit has increased				Dropped
	SO6	Our company team become more productive				Dropped
	SO8	Our company competitiveness has increased				Dropped

This page intentionally left blank.

H Hypotheses Testing Result

H.1. Hypotheses 1 Result

H.1.1. Path coefficient and significance testing

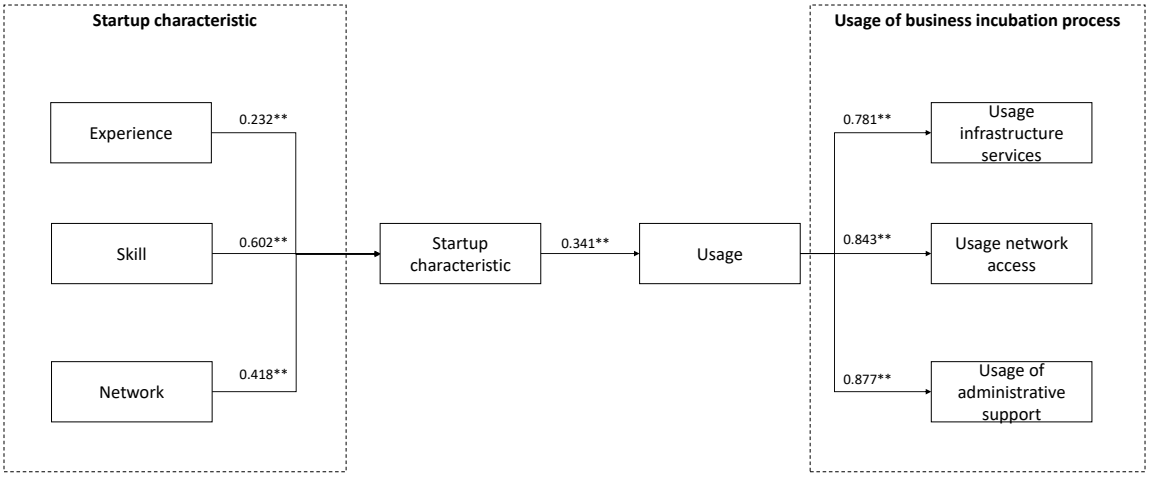


Figure H.1: Startup characteristics impact to business incubation service usage

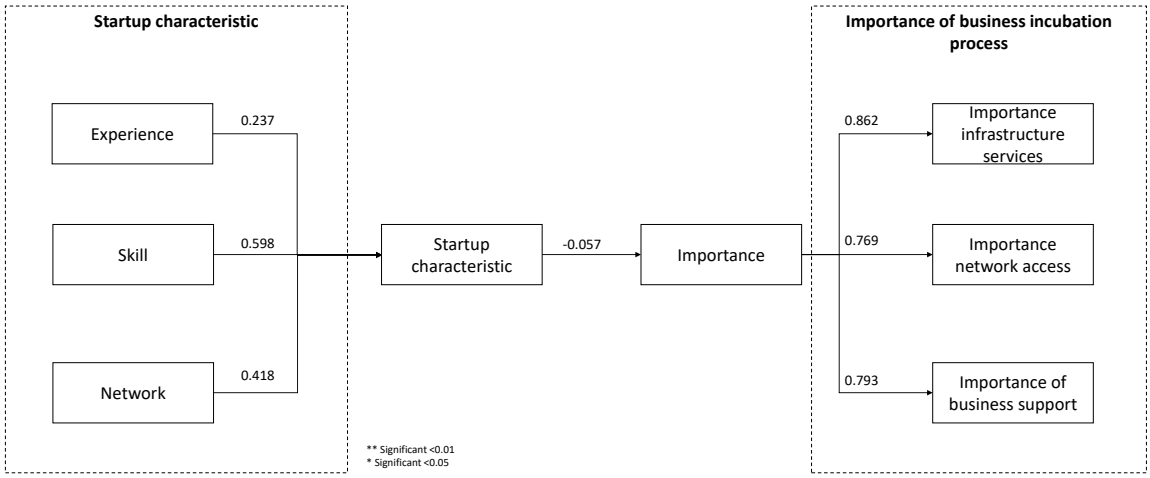


Figure H.2: Startup characteristics impact to business incubation service importance

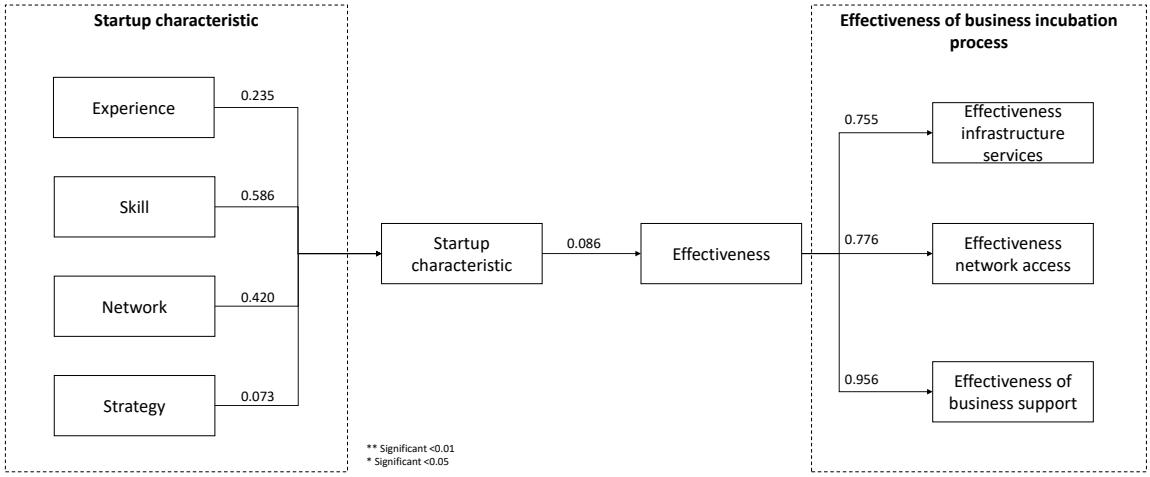


Figure H.3: Startup characteristics impact to business incubation service effectiveness

H.1.2. Total effect testing

Table H.1: Path coefficient and significant testing for startup characteristic impact to startup usage of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	Experience	0.062	2.835	0.005	[0.021-0.105]	**
		Network contacts	0.111	2.986	0.003	[0.038-0.183]	**
		Skill company	0.266	3.004	0.003	[0.082-0.428]	**
	Usage network	Experience	0.067	2.868	0.004	[0.022-0.112]	**
		Network contacts	0.120	2.988	0.003	[0.039-0.194]	**
		Skill company	0.173	2.950	0.003	[0.05-0.281]	**
	Usage of Adm	Experience	0.069	2.868	0.004	[0.022-0.115]	**
		Network contacts	0.125	3.000	0.003	[0.039-0.2]	**
		Skill company	0.180	2.972	0.003	[0.05-0.287]	**

Table H.2: Path coefficient and significant testing for startup characteristic impact to startup importance of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Importance	importance Infra	Experience	-0.012	0.519	0.604	[-0.054-0.035]	-
		Network contacts	-0.021	0.527	0.598	[-0.091-0.067]	-
		Skill company	-0.030	0.513	0.608	[-0.085-0.052]	-
	Importance network	Experience	-0.010	0.518	0.605	[-0.052-0.027]	-
		Network contacts	-0.018	0.527	0.598	[-0.085-0.052]	-
		Skill company	-0.026	0.511	0.610	[-0.083-0.062]	-
	Importance of business support	Experience	-0.011	0.516	0.606	[-0.05-0.032]	-
		Network contacts	-0.019	0.524	0.601	[-0.083-0.062]	-
		Skill company	-0.027	0.511	0.609	[0.331-0.521]	-

Table H.3: Path coefficient and significant testing for startup characteristic impact to startup effectiveness of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Effectiveness	Effectiveness Infra	Experience	0.016	0.615	0.538	[-0.034-0.07]	-
		Network contacts	0.016	0.615	0.538	[-0.034-0.07]	-
		Skill company	0.040	0.613	0.540	[-0.068-0.114]	-
	Effectiveness network	Experience	0.017	0.610	0.542	[-0.035-0.073]	-
		Network contacts	0.029	0.621	0.535	[-0.068-0.114]	-
		Skill company	0.041	0.616	0.538	[-0.084-0.135]	-
	Effectiveness of business support	Experience	0.020	0.614	0.539	[-0.043-0.087]	-
		Network contacts	0.035	0.624	0.533	[-0.084-0.135]	-
		Skill company	0.051	0.616	0.538	[0.323-0.516]	-

H.1.3. Moderator variables testing

Table H.4: Testing of moderator variables effect to startup characteristic relationship to startup usage of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup characteristic - Usage	Education	0.073	0.444	0.657	[-0.193-0.474]	-
	Female employee mod	0.023	0.094	0.925	[-0.36-0.572]	-
	Incubation duration mod	0.039	0.187	0.852	[-0.317-0.534]	-
	Initial employee mod	-0.087	0.556	0.579	[-0.37-0.246]	-
	Initial funding mod	0.111	0.935	0.350	[-0.112-0.345]	-
	Male employee mod	0.067	0.394	0.694	[-0.265-0.409]	-
	Startup age Mod	0.042	0.216	0.829	[-0.407-0.402]	-

Table H.5: Testing of moderator variables effect to startup characteristic relationship to startup importance of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup characteristic - Importance	Education	-0.002	0.008	0.994	[-0.315-0.516]	-
	Female employee	-0.118	0.522	0.602	[-0.651-0.271]	-
	Incubation duration	0.229	1.106	0.269	[-0.248-0.581]	-
	Initial employee	-0.072	0.408	0.683	[-0.346-0.424]	-
	Initial funding	0.043	0.327	0.744	[-0.239-0.263]	-
	Male employee	-0.095	0.534	0.593	[-0.408-0.277]	-
	Startup age	-0.205	1.003	0.316	[-0.721-0.13]	-

Table H.6: Testing of moderator variables effect to startup characteristic relationship to startup effectiveness of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup characteristic - Effectiveness	Education	-0.028	0.191	0.848	[-0.239-0.335]	-
	Female employee	-0.377	1.343	0.179	[-1.19--0.098]	-
	Incubation duration	0.387	2.000	0.046	[0.021-0.769]	*
	Initial employee	-0.106	0.589	0.556	[-0.323-0.36]	-
	Initial funding	0.022	0.160	0.873	[-0.257-0.249]	-
	Male employee	-0.140	0.796	0.426	[-0.435-0.218]	-
	Startup age	-0.150	0.735	0.462	[-0.709-0.078]	-

H.2. Hypotheses 2 Result

H.2.1. Path coefficient and significance testing

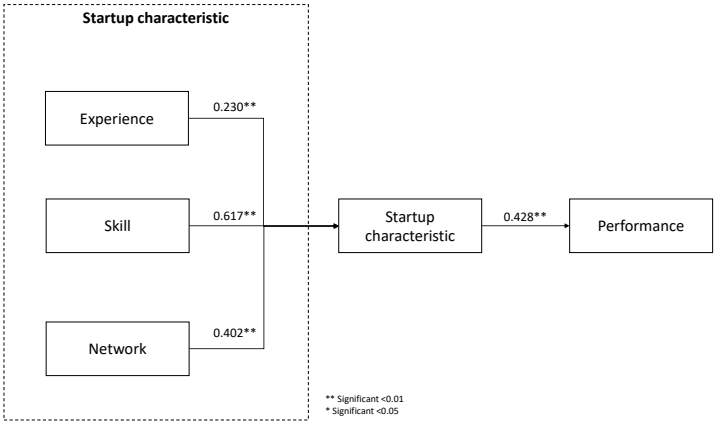


Figure H.4: Startup characteristics impact to startup performance

H.2.2. Total effect testing

Table H.7: Path coefficient and significant testing for startup characteristic impact to startup performance in business incubation services

Dependent Construct	Dependent Variables	Startup characteristic Variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Performance		**Experience**	**0.098**	**3.768**	**0.000**	**[0.05-0.148]**	**
		Network contacts	**0.172**	**4.601**	**0.000**	**[0.094-0.236]**	**
		Skill company	**0.264**	**4.395**	**0.000**	**[0.137-0.365]**	**

H.2.3. Moderator variables testing

Table H.8: Testing of moderator variables effect to startup characteristic relationship to startup performance in business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup characteristic - Performance	Education	0.081	0.468	0.640	[-0.248-0.412]	-
	Female employee	0.073	0.286	0.775	[-0.279-0.578]	-
	Incubation duration	-0.016	0.067	0.947	[-0.385-0.651]	-
	Initial employee	-0.086	0.561	0.575	[-0.397-0.173]	-
	Initial funding	0.117	0.864	0.387	[-0.132-0.383]	-
	Male employee	0.158	0.933	0.351	[-0.172-0.495]	-
	Startup age	0.079	0.368	0.713	[-0.406-0.478]	-

H.3. Hypotheses 3 Result

H.3.1. Path coefficient and significance testing

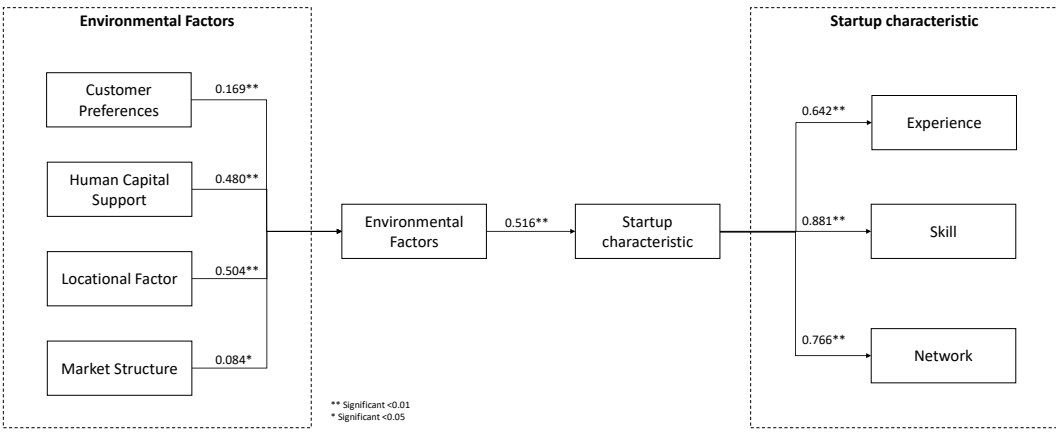


Figure H.5: Environmental factors impact to startup characteristic

H.3.2. Total effect testing

Table H.9: Path coefficient and significant testing for Environmental factors impact to startup characteristic

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Startup	Experience	Customer preferences	0.056	3.599	0.000	[0.027-0.088]	**
		Human capital support	0.159	5.335	0.000	[0.099-0.216]	**
		Locational factor	0.167	4.918	0.000	[0.1-0.232]	**
		Market structure	0.028	2.085	0.037	[0.004-0.055]	*
	Network contacts	Customer preferences	0.067	3.571	0.000	[0.03-0.103]	**
		Human capital support	0.190	4.969	0.000	[0.116-0.264]	**
		Locational factor	0.200	4.866	0.000	[0.116-0.278]	**
		Market structure	0.033	2.170	0.030	[0.004-0.063]	*
	Skill company	Customer preferences	0.077	3.905	0.000	[0.038-0.114]	**
		Human capital support	0.218	5.738	0.000	[0.14-0.29]	**
		Locational factor	0.230	5.482	0.000	[0.141-0.305]	**
		Market structure	0.038	2.190	0.029	[0.004-0.072]	*

H.3.3. Moderator variables testing

Table H.10: Testing of moderator variables effect to environmental factors relationship to startup characteristic

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)
Environmental factors - startup characteristic	Education	0.019	0.18	0.857	[-0.249-0.185]	-
	Female employee	0.011	0.054	0.957	[-0.454-0.391]	-
	Incubation duration	-0.142	0.907	0.364	[-0.496-0.12]	-
	Initial employee	-0.184	1.123	0.262	[-0.496-0.159]	-
	Initial funding	-0.008	0.065	0.948	[-0.262-0.23]	-
	Male employee	0.027	0.172	0.863	[-0.291-0.343]	-
	Startup age	0.008	0.061	0.951	[-0.194-0.251]	-

H.4. Hypotheses 4 Result
H.4.1. Path coefficient and significance testing

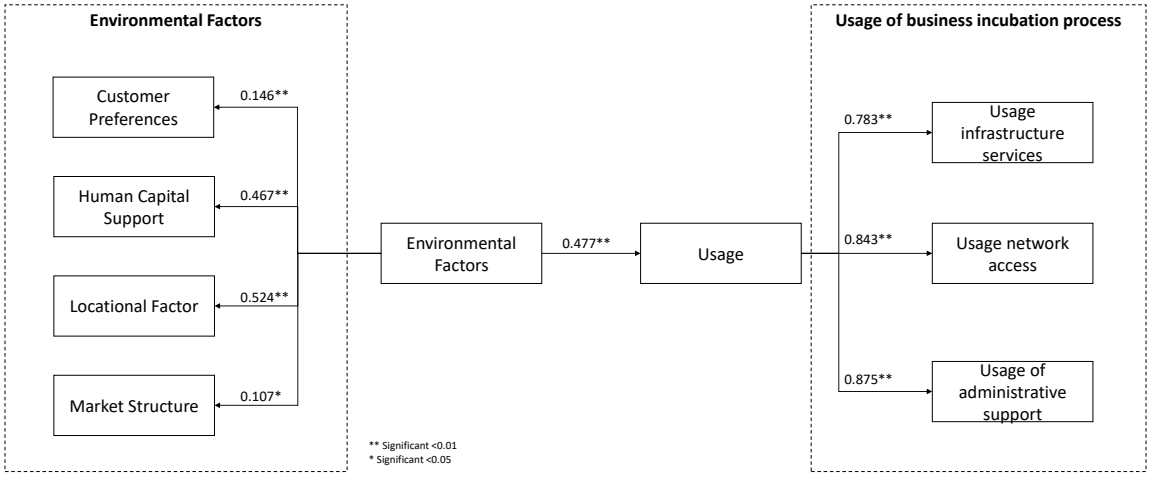


Figure H.6: Environmental factors impact to business incubation service usage

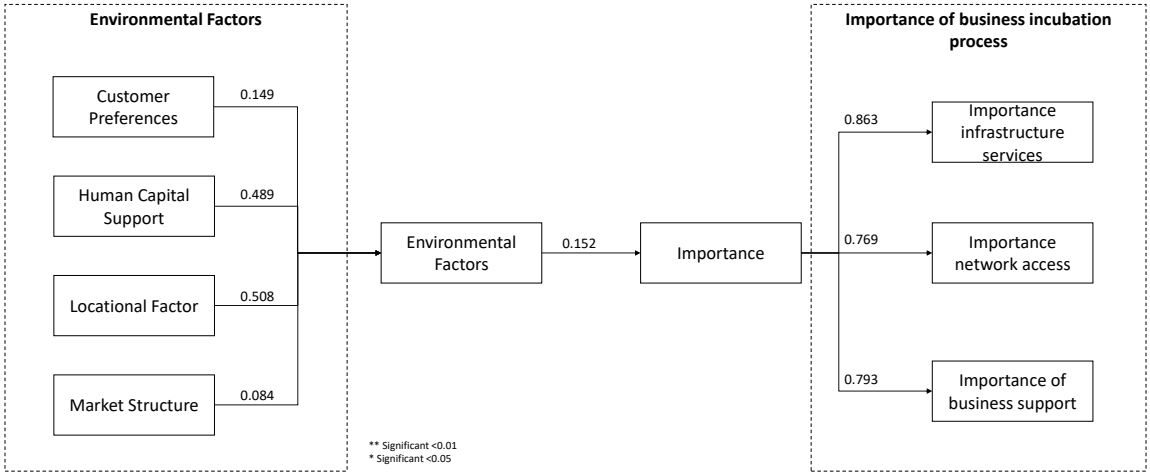


Figure H.7: Environmental factors impact to business incubation service importance

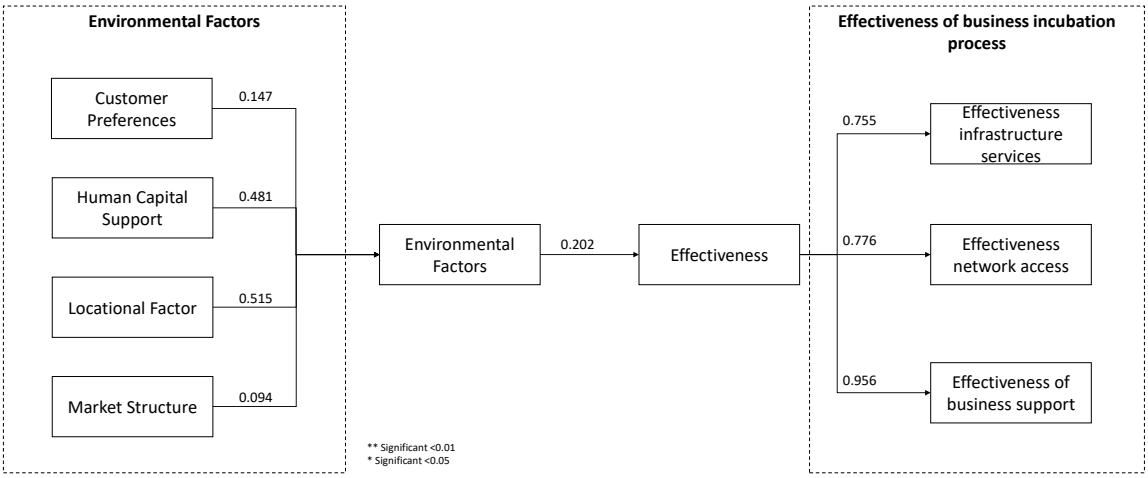


Figure H.8: Environmental factors impact to business incubation service effectiveness

H.4.2. Total effect testing

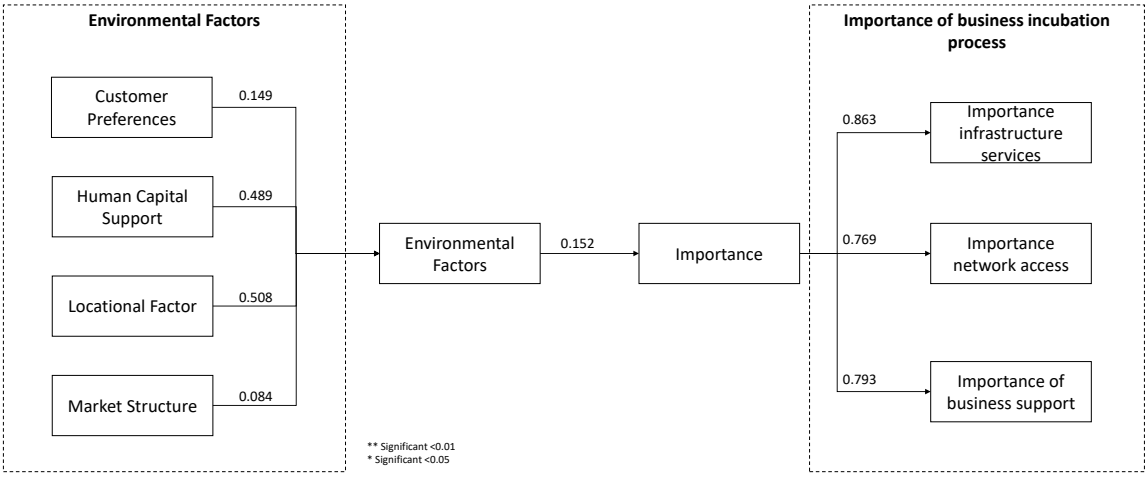


Figure H.9: Environmental factors impact to business incubation service importance

Table H.11: Path coefficient and significant testing for Environmental factors impact to startup importance of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Importance	importance Infra	Customer preferences	0.020	1.223	0.222	[-0.008-0.055]	-
		Human capital support	0.064	1.263	0.206	[-0.035-0.16]	-
		Locational factor	0.067	1.302	0.193	[-0.037-0.156]	-
		Market structure	0.011	0.956	0.339	[-0.003-0.041]	-
	Importance network	Customer preferences	0.017	1.225	0.221	[-0.007-0.049]	-
		Human capital support	0.057	1.235	0.217	[-0.031-0.147]	-
		Locational factor	0.059	1.280	0.201	[-0.033-0.146]	-
		Market structure	0.010	0.950	0.342	[-0.003-0.037]	-
	Importance of business support	Customer preferences	0.018	1.250	0.211	[-0.008-0.048]	-
		Human capital support	0.059	1.270	0.204	[-0.034-0.144]	-
		Locational factor	0.061	1.300	0.194	[-0.037-0.144]	-
		Market structure	0.010	0.945	0.345	[-0.003-0.038]	-

Table H.12: Path coefficient and significant testing for Environmental factors impact to startup effectiveness of business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Effectiveness	Effectiveness Infra	Customer preferences	0.022	1.478	0.139	[-0.002-0.06]	-
		Human capital support	0.073	1.508	0.132	[-0.025-0.166]	-
		Locational factor	0.078	1.472	0.141	[-0.026-0.183]	-
		Market structure	0.014	1.060	0.289	[-0.001-0.048]	-
	Effectiveness network	Customer preferences	0.023	1.424	0.154	[-0.002-0.065]	-
		Human capital support	0.075	1.549	0.121	[-0.028-0.162]	-
		Locational factor	0.081	1.487	0.137	[-0.026-0.188]	-
		Market structure	0.015	1.060	0.289	[-0.001-0.05]	-
	Effectiveness of business support	Customer preferences	0.028	1.494	0.135	[-0.004-0.073]	-
		Human capital support	0.093	1.543	0.123	[-0.036-0.201]	-
		Locational factor	0.099	1.509	0.131	[-0.036-0.222]	-
		Market structure	0.018	1.082	0.279	[-0.001-0.059]	-

H.4.3. Moderator variables testing

Table H.13: Testing of moderator variables effect to environmental factors relationship to startup usage of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Environmental factors - Usage	Education	0.082	0.671	0.502	[-0.126-0.359]	-
	Female employee mod	-0.245	0.957	0.338	[-0.797-0.195]	-
	Incubation duration mod	-0.039	0.183	0.855	[-0.417-0.373]	-
	Initial employee mod	-0.163	0.938	0.348	[-0.478-0.223]	-
	Initial funding mod	0.158	1.147	0.252	[-0.104-0.44]	-
	Male employee mod	-0.04	0.254	0.799	[-0.363-0.274]	-
	Startup age Mod	-0.019	0.097	0.923	[-0.383-0.32]	-

Table H.14: Testing of moderator variables effect to environmental factors relationship to startup importance of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)
	Education	0.121	0.648	0.517	[-0.207-0.531]	-
	Female employee	-0.168	0.568	0.570	[-0.803-0.372]	-
	Incubation duration	0.208	1.008	0.313	[-0.163-0.658]	-
Environmental factors - Importance	Initial employee	-0.033	0.161	0.872	[-0.37-0.442]	-
	Initial funding	-0.009	0.064	0.949	[-0.328-0.237]	-
	Male employee	0.082	0.518	0.604	[-0.231-0.403]	-
	Startup age	-0.287	1.759	0.079	[-0.608-0.048]	-

Table H.15: Testing of moderator variables effect to environmental factors relationship to startup effectiveness of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)
	Education	0.075	0.606	0.545	[-0.128-0.366]	-
	Female employee	-0.281	1.106	0.269	[-0.807-0.192]	-
	Incubation duration	0.097	0.562	0.574	[-0.221-0.482]	-
Environmental factors - Effectiveness	Initial employee	-0.084	0.407	0.684	[-0.47-0.343]	-
	Initial funding	0.288	1.653	0.098	[-0.073-0.615]	-
	Male employee	-0.045	0.241	0.81	[-0.433-0.288]	-
	Startup age	-0.093	0.645	0.519	[-0.352-0.231]	-

H.5. Hypotheses 5 Result

H.5.1. Path coefficient and significance testing

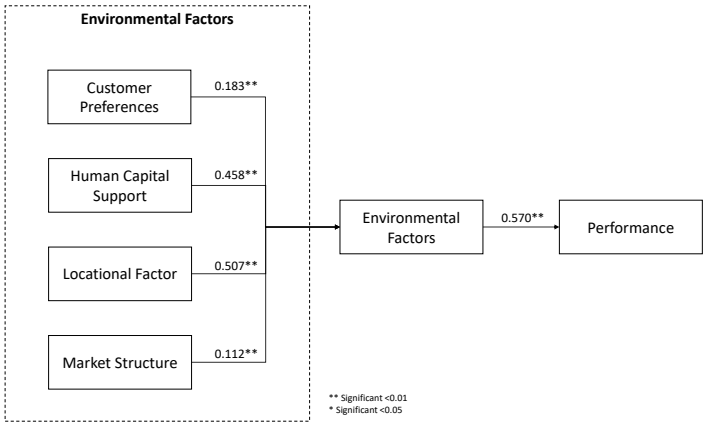


Figure H.10: Environmental factors impact to startup performance

H.5.2. Total effect testing

Table H.16: Path coefficient and significant testing for Environmental factors impact to startup performance in business incubation services

Dependent Construct	Dependent Variables	Startup charateristic Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
	Performance	Customer preferences	0.104	4.445	0.000	[0.051-0.147]	**
		Human capital support	0.262	6.698	0.000	[0.181-0.333]	**
		Locational factor	0.289	6.906	0.000	[0.203-0.364]	**
		Market structure	0.064	2.901	0.004	[0.018-0.104]	**

H.5.3. Moderator variables testing

Table H.17: Testing of moderator variables effect to environmental factors relationship to startup performance of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)
Environmental factors - Performance	Education	0.026	0.229	0.819	[-0.182-0.259]	-
	Female employee	-0.262	1.171	0.241	[-0.682-0.215]	-
	Incubation duration	-0.07	0.336	0.737	[-0.404-0.348]	-
	Initial employee	0.01	0.058	0.954	[-0.352-0.28]	-
	Initial funding	0.182	1.395	0.163	[-0.048-0.467]	-
	Male employee	-0.176	1.24	0.215	[-0.495-0.073]	-
	Startup age	0.079	0.406	0.685	[-0.421-0.36]	-

H.6. Hypotheses 6 Result

H.6.1. Path coefficient and significance testing

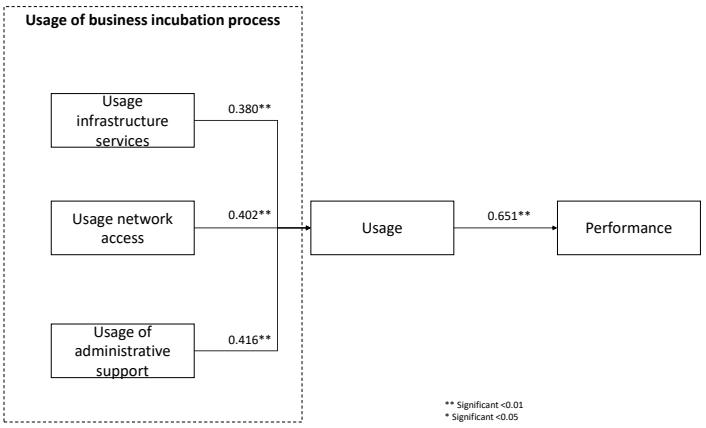


Figure H.11: Business incubation service usage impact to startup performance

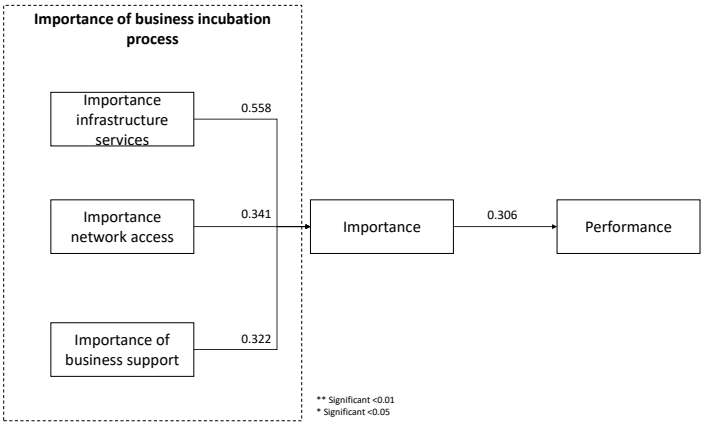


Figure H.12: Business incubation service importance impact to startup performance

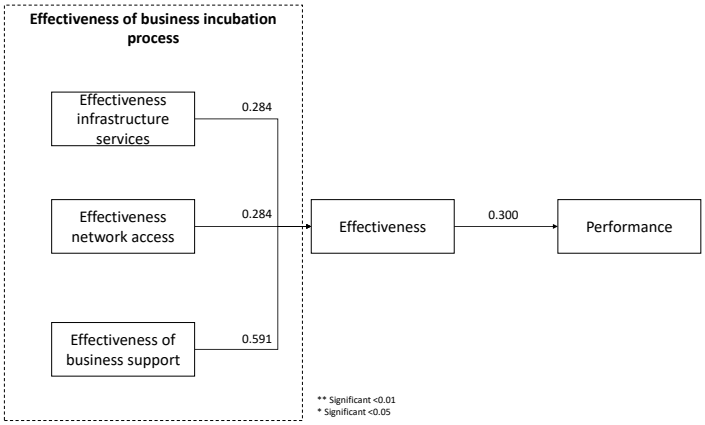


Figure H.13: Business incubation service effectiveness impact to startup performance

H.6.2. Total effect testing

Table H.18: Path coefficient and significant testing for business incubation service variables to startup performance

Dependent Variables	Business process Variables	Path coefficient	p value	Significant?	Sig level
Usage	Usage Infra	0.247	0.000	Yes	**
	Usage network	0.262	0.000	Yes	**
	Usage of Adm	0.271	0.000	Yes	**
Importance	importance Infra	0.099	0.223	No	-
	Importance network	0.171	0.197	No	-
	Importance of business support	0.105	0.146	No	-
Effectiveness	Effectiveness Infra	0.177	0.176	No	-
	Effectiveness network	0.085	0.175	No	-
	Effectiveness of business support	0.085	0.145	No	-

H.6.3. Moderator variables testing

Table H.19: Testing of moderator variables effect to usage relationship to startup performance in business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)	Significant (p<0.01)
Usage - performance	Education	0.15	1.05	0.294	[-0.159-0.412]	No	No
	Female employee mod	-0.059	0.198	0.843	[-0.643-0.44]	No	No
	Incubation duration mod	0.068	0.393	0.694	[-0.312-0.349]	No	No
	Initial employee mod	-0.081	0.526	0.599	[-0.444-0.182]	No	No
	Initial funding mod	0.12	0.939	0.348	[-0.134-0.387]	No	No
	Male employee mod	0.151	0.881	0.378	[-0.136-0.544]	No	No
	Startup age Mod	0.088	0.435	0.664	[-0.295-0.45]	No	No

Table H.20: Testing of moderator variables effect to importance relationship to startup performance in business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)	Significant (p<0.01)
Importance - performance	Education	0.121	0.648	0.517	[-0.207-0.531]	No	No
	Female employee	-0.168	0.568	0.570	[-0.803-0.372]	No	No
	Incubation duration	0.208	1.008	0.313	[-0.163-0.658]	No	No
	Initial employee	-0.033	0.161	0.872	[-0.37-0.442]	No	No
	Initial funding	-0.009	0.064	0.949	[-0.328-0.237]	No	No
	Male employee	0.082	0.518	0.604	[-0.231-0.403]	No	No
	Startup age	-0.287	1.759	0.079	[-0.608-0.048]	No	No

Table H.21: Testing of moderator variables effect to effectiveness relationship to startup performance in business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Significant (p<0.05)	Significant (p<0.01)
Effectiveness - performance	Education	0.075	0.606	0.545	[-0.128-0.366]	No	No
	Female employee	-0.281	1.106	0.269	[-0.807-0.192]	No	No
	Incubation duration	0.097	0.562	0.574	[-0.221-0.482]	No	No
	Initial employee	-0.084	0.407	0.684	[-0.47-0.343]	No	No
	Initial funding	0.288	1.653	0.098	[-0.073-0.615]	No	No
	Male employee	-0.045	0.241	0.81	[-0.433-0.288]	No	No
	Startup age	-0.093	0.645	0.519	[-0.352-0.231]	No	No

H.7. Hypotheses 7 Result

H.7.1. Path coefficient and significance testing

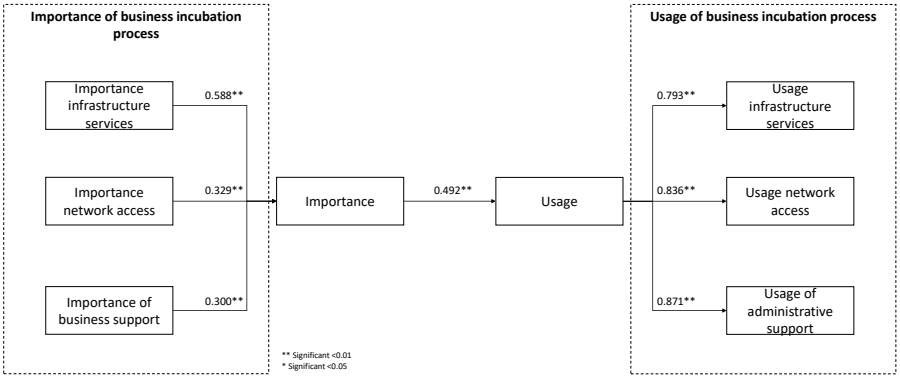


Figure H.14: Business incubation service importance impact to business incubation service usage

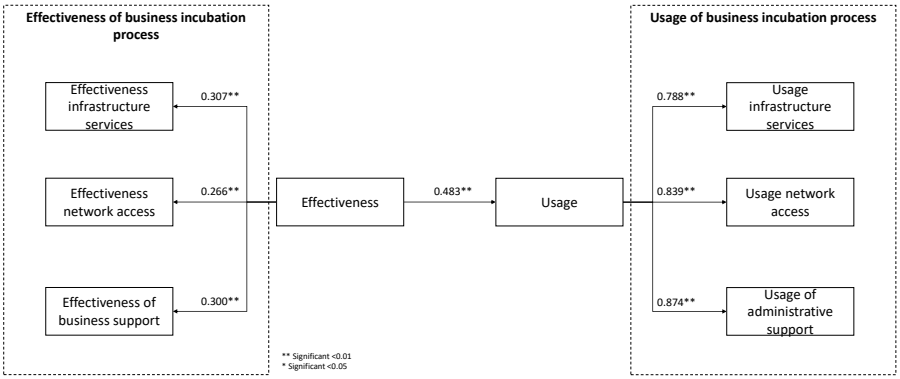


Figure H.15: Business incubation service effectiveness impact to business incubation service usage

H.7.2. Total effect testing

Table H.22: Path coefficient and significant testing for importance to business incubation service usage

Construct	Dependent Variables	Independent Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	importance Infra	0.230	3.906	0.000	[0.116-0.345]	**
		Importance network	0.128	4.114	0.000	[0.069-0.191]	**
		Importance of business support	0.117	4.474	0.000	[0.068-0.169]	**
	Usage network	importance Infra	0.242	4.336	0.000	[0.136-0.357]	**
		Importance network	0.135	3.979	0.000	[0.069-0.204]	**
		Importance of business support	0.123	5.167	0.000	[0.078-0.17]	**
	Usage of Adm	importance Infra	0.252	4.317	0.000	[0.136-0.363]	**
		Importance network	0.141	4.289	0.000	[0.078-0.206]	**
		Importance of business support	0.129	4.767	0.000	[0.077-0.182]	**

Table H.23: Path coefficient and significant testing for effectiveness to business incubation service usage

Construct	Dependent Variables	Independent Variables	Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	Usage Infra	Effectiveness Infra	0.117	4.289	0.000	[0.049-0.186]	**
		Effectiveness network	0.101	15.351	0.000	[0.057-0.149]	**
		Effectiveness of business support	0.223	0.000	0.000	[0.111-0.323]	**
	Usage network	Effectiveness Infra	0.124	4.114	0.000	[0.054-0.192]	**
		Effectiveness network	0.108	0.000	0.000	[0.06-0.156]	**
		Effectiveness of business support	0.237	0.000	0.000	[0.121-0.335]	**
	Usage of Adm	Effectiveness Infra	0.129	3.488	0.000	[0.057-0.203]	**
		Effectiveness network	0.112	4.379	0.000	[0.064-0.162]	**
		Effectiveness of business support	0.247	4.168	0.000	[0.12-0.352]	**

H.7.3. Moderator variables testing

Table H.24: Testing of moderator variables effect to importance relationship to startup usage of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Importance - Usage	Education	0.015	0.099	0.921	[-0.28-0.326]	-
	Female employee	-0.086	0.418	0.676	[-0.508-0.303]	-
	Incubation duration	-0.127	0.553	0.580	[-0.529-0.331]	-
	Initial employee	0.158	1.059	0.289	[-0.164-0.413]	-
	Initial funding	0.081	0.573	0.567	[-0.202-0.354]	-
	Male employee	-0.226	0.955	0.339	[-0.765-0.171]	-
	Startup age	-0.078	0.310	0.757	[-0.653-0.34]	-

Table H.25: Testing of moderator variables effect to effectiveness relationship to startup usage of business incubation services

Relation	Moderator Variables	Path Coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Effectiveness - Usage	Education	0.143	0.509	0.611	[-0.464-0.655]	-
	Female employee	-0.307	1.232	0.218	[-0.914-0.121]	-
	Incubation duration	-0.009	0.039	0.969	[-0.478-0.479]	-
	Initial employee	0.211	1.131	0.258	[-0.161-0.583]	-
	Initial funding	0.129	1.105	0.269	[-0.097-0.366]	-
	Male employee	-0.115	0.789	0.430	[-0.465-0.131]	-
	Startup age	-0.160	0.576	0.565	[-0.617-0.428]	-

H.8. Hypotheses 8 Result
H.8.1. Path coefficient and significance testing

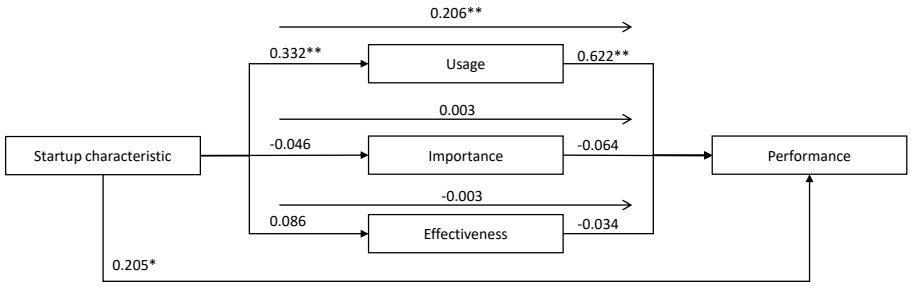


Figure H.16: Mediating effect of startup business incubation to startup characteristic and startup performance

H.8.2. Total effect testing

Table H.26: Total effects of relation between construct and variable

Dependent variables	Independent variables	Mediator variables	Path coefficient	t Values	p value	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Performance	Startup characteristic	**Usage**	**0.206**	**2.761**	**0.006**	**[0.066-0.366]**	**
		Importance	0.003	0.191	0.848	[-0.013-0.064]	-
		Effectiveness	-0.003	0.128	0.898	[-0.082-0.022]	-
		- (Direct)	**0.205**	**2.450**	**0.014**	**[0.046-0.372]**	*
Performance	Environmental factors	**Usage**	**0.255**	**3.374**	**0.001**	**[0.121-0.414]**	**
		Importance	-0.013	0.604	0.546	[-0.078-0.012]	-
		Effectiveness	-0.007	0.223	0.824	[-0.081-0.045]	-
		- (Direct)	**0.324**	**3.676**	**0.000**	**[0.147-0.492]**	**

H.9. Hypotheses 9 Result
H.9.1. Path coefficient and significance testing

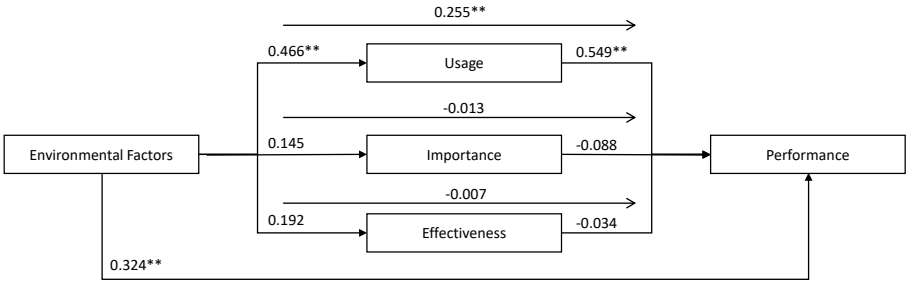


Figure H.17: Mediating effect of startup business incubation to environmental factor and startup performance

This page intentionally left blank.

Final Structural Model Assessment Result

I.1. Step 1: Collinearity Assessment

The first step is the collinearity assessment which will assess the collinearity of each construct or variable within the model (Hair Jr et al., 2016). In case of PLS-SEM model, the number of VIF have to be below 5 to be assumed as collinearity issue-free. In this case, all the items are passed the criteria value with all VIF value are below 5.

Table I.1: Collinearity Assessment Result

	Effectiveness	Environmental factors	Importance	Performance	Startup characteristic	Usage	incubation duration
Effectiveness						1.331	
Environmental factors				1.339	1	1.053	
Importance						1.332	
Performance							
Startup characteristic	1.009						
Usage				1.339			
startup char * incubation duration	1						

I.2. Step 2: Structural Model Path Coefficients

In this second step, the path coefficient and significance value will be tested. As have been done previously, the path coefficient and significance test result will be used to assessed whether the connection between each of the variables are significant to be included in the final model. In this case, the first result of this testing is shown in Figure I.2.

Based on the testing result, there are two insignificant connections shown in the model which are the connection between startup characteristic to startup usage and startup performance. Thus, these two paths will be removed and the path coefficient and significant testing are conducted again. Figure I.3 show the result of the second path coefficient and significant testing.

As shown in Figure I.3, the model have passed step 2 and will be tested in step 3 evaluation.

Table I.2: Structural Model Path Coefficients Result

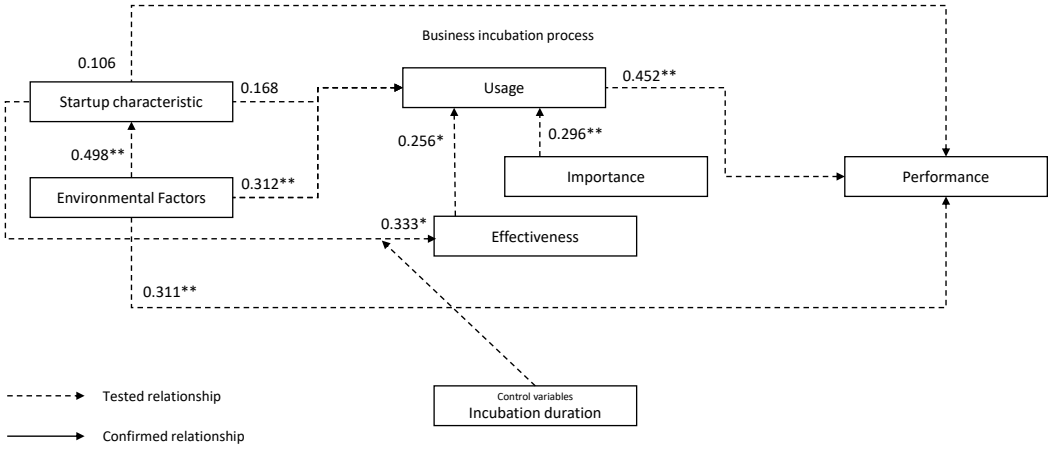


Table I.3: Structural Model Path Coefficients Result

Dependent variables	Independent Variables		Path coefficient	t Values	p Values	95% Confidence Intervals	Sig level (*<0.05,**<0.01)
Usage	environmental factors	Environmental factors -> Usage	0.400	4.260	0.000	[0.21-0.574]	**
	Importance	Importance -> Usage	0.265	2.904	0.004	[0.082-0.444]	**
	Effectiveness	Effectiveness -> Usage	0.269	2.632	0.009	[0.069-0.466]	**
Performance	Usage	Usage -> Performance	0.464	5.595	0.000	[0.284-0.617]	**
	environmental factors	Environmental factors -> Performance	0.358	4.045	0.000	[0.173-0.523]	**
Startup characteristic	environmental factors	Environmental factors -> Startup characteristic	0.498	5.767	0.000	[0.3-0.642]	**
Effectiveness	Startup characteristic	incubation duration -> Effectiveness	0.333	2.251	0.024	[0.061-0.641]	*

I.3. Step 3: Coefficient of Determination

This step 3 evaluation measure the R^2 value of the construct used in the model. R^2 or coefficient of determination is used to assess the model predictive power and calculated by using the square correlation of actual and predicted value of endogenous construct latent scores. As rules of thumb, value 0.2, 0.5, and 0.75 are stated as weak, moderate, and substantial (Hair Jr et al., 2016). In this case, all the R^2 value in this model are range from moderate to weak.

Table I.4: Coefficient of Determination Result

	R Square	R Square Adjusted
Effectiveness	0.097	0.061
Performance	0.511	0.498
Startup characteristic	0.248	0.239
Usage	0.454	0.433

I.4. Step 4: Effect size f^2

The f^2 is the impact size of predictor value to its endogenous construct. In this case, value 0.02, 0.15, and 0.35 are stated as small, medium, and large effects (Hair Jr et al., 2016).

All the value in this model are above zero and ranged in small to medium level of impacts.

Table I.5: Effect size f^2 Result

	Effectiveness	Environmental factors	Importance	Performance	Startup characteristic	Usage	incubation duration
Effectiveness						0.100	
Environmental factors				0.196	0.330	0.278	
Importance						0.096	
Performance							
Startup characteristic	0.088						
Usage				0.328			

I.5. Step 5: Blindfolding and Predictive Relevance Q^2

Q^2 is used to assess the model 'out-of-sample' predictive power. The predictive power in the model define the predictive relevance of the path model to the relevant endogenous variables (Hair Jr et al., 2016). As shown in Table I.6, all the endogenous construct in this model have Q^2 above zero which mean all the path model are predicted as relevant.

Table I.6: Blindfolding and Predictive Relevance Q^2 Result

	SSO	SSE	Q^2 (=1-SSE/SSO)
Effectiveness	80	75.041	0.062
Environmental factors	80	80	
Importance	80	80	
Performance	80	41.71	0.479
Startup characteristic	80	61.927	0.226
Usage	80	47.652	0.404
Startup characteristic*incubation duration	80	80	

I.6. Step 6: Effect size q^2

The last step is assessing q^2 value or the relative impact of predictive relevance. As q^2 measured from Q^2 value, the q^2 value in the model have to be above zero which is shown in Table I.7 has been fulfilled in this model.

Table I.7: Effect size q^2 Result

	Effectiveness	Performance	Startup characteristic	Usage
Effectiveness		0.00	0.00	0.06
Environmental factors	0.00	0.16		0.27
Importance	0.00	0.00	0.00	0.00
Performance	0.00		0.00	0.00
Startup characteristic	0.00	0.00		0.00
Usage		0.29	0.30	
Startup characteristic*incubation duration		0.00	0.00	0.00