A Framework of Successful E-Business Incubator for Indonesian Public Universities

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Abstract. *In many developed countries, many business incubators take part to help starts-up company to develop their own business; especially the baby born business cannot compete with the giant industries that have become the old business players. Universities play an important role in motivating young graduates to become technology entrepreneur. Unemployment in Indonesia is still the main issue for the government program to increase welfare in the future. In year 2014 the data from Statistic Center of Indonesia state that Indonesia has 4% unemployment from Indonesia' work generation. In Indonesia, incubators has been developed since 1992 initiated by the government, Cooperative Department and also universities. This effort continued in 1997 when there was a program called the Development of Entrepreneurship Culture in universities, and of its activity was New Entrepreneur Incubator. The objectives of the research are to investigate the success factor for e-business incubator, and to propose and develop a framework for successful e-business incubator for public universities in Indonesia. Research location is in Indonesia for the public universities that have their e-business incubator. This research will conduct quantitative and qualitative analyses based on data collection from incubator managers and business founders in Indonesia. The result of this research is a framework for successful e-business incubator in Indonesian public universities.*

Keywords: *E-business incubator, Public university incubator, Successful e-business incubator, Framework, Indonesia*

1. Introduction

In many developed countries, many business incubators take part to help starts-up company to develop their own business; especially the baby born business cannot compete with the giant industries that have been the old business player. It is widely accepted that the first incubator was created by Joseph Mancuso in Batavia, New York, in 1957 on a former Massey-Ferguson facility (Leblebici and Shah, 2004). Such as in 1959, United States Government wanted to develop small and medium enterprises, create new jobs, pull economy out of depression by subsidizing academics and individuals to integrate existing resources to supply what Small Medium Enterprises (SMEs) needed at the beginning (Wen, 2012). From the 1970s onward, business incubators have spread out all over the world (Albert and Gaynor, 2003). Estimates indicate that today their number worldwide

rises to 3000: one-third is located in North America; 30% in Western Europe and the rest is dispersed over the Far East (20%), South America (7%), Eastern Europe (5%) and Africa, the Middle East and other regions (5%) (European Commission, 2002).

The first Chinese Incubator was started in 1987 in Wuhan, Hubei Province by Minister of Science and Technology (Yan, 2003). As China embarked on the gradualist path to a market economy, business incubators became a key tool in Chinese Government's economic development strategy in the mid and late 1990s. At that time, a primary strategy of the Chinese government for fostering the sustainable high growth of its economy was to promote a range of high-tech industries (Xu, 2001). In January of 1995, Taiwan's Small and Medium Enterprise Agency (SMEA) of Ministry of Economic Affairs was assigned to launch SME Incubation Policy as one of the moves

under the macro policy of "Asia Pacific Operation Center". Half a year later, SMEA assigned Institute of Management of Technology of National Chiao Tung University to complete the "Planning Report for Small and Medium Enterprise Incubator Center".

In German, boom of technology and incubator centers that started in the 1980s and the spread to Austria (Todtling and Todtling 1990, Sternberg et al 1996, Galley 1997) and United Kingdom (Monck et al., 1988; Massey et al., 1992; Westhead and Storey 1994). And in Swiss, there was only a discussion about the necessity of an explicit technology policy in the beginning of the 1990s, but with almost no results (Thierstein and Wilhelm, 2001).

Even failure of new ventures in their early stages of development is a common occurrence (Watson et al., 1998; Zacharakis et al., 1999), the continuing growth since 1980, in the number of business incubator operating in North America. However, suggests that many government, local communities and private investors believe that it is desirable to try to help "weak-but-promising" firms to avoid failure by incubating them until they have developed self-sustaining business structure.

Universities play an important role in motivating young graduates to become technology entrepreneur. The increasing number of graduate entrepreneurs will reduce the unemployment rate and even will increase the number of field work. Many developing countries have experimented with a variety of programs and schemes supporting small and medium enterprises, often with assistance from multilateral and bilateral organizations.

Business incubation programs or initiatives have arisen especially over the last decade, with varying degrees of success (Manan and Yunos, 2001). Business incubator is an organization that systemizes the process of creating successful new enterprise by providing them with a comprehensive and integrated range of services. Both in developed and developing countries, governments have been playing a key role in defining policies, programs and instruments which support the development of micro, small and medium enterprises.

Nowadays, Indonesian government put high attention in developing technology entrepreneurs (TE) among young graduates from all universities in Indonesia. Therefore every university in Indonesia was encouraged to have their own business incubator that could provide entrepreneurial activities and to facilitate the development of invention and innovation among potential student to become real TE. In Indonesia, the change can be seen from two contradictive sides, as an opportunity and as a threat. Looking at the ability Indonesia possesses, one possible positive change can be seen in middle sized and small industries. In Indonesia, incubators has been developed since 1992 initiated by the government, Cooperative Department and also universities. This effort continued in 1997 when there was a program called the Development of Entrepreneurship Culture in Universities and of its activity was New Entrepreneur Incubator. Up till now, in year 2012 there are 23 Incubators which still in operation. Most of business incubator in Indonesia was established by Universities (72%), which the rest was established by private sector (21%) and Government institution (7%) (Bank Indonesia, 2006).

The aim of this research is to investigate critical factors for successful e-business incubator in Indonesians universities.
The specific research objectives are as follows:
1. To determine the dimension of e-business incubators for university environment
2. To examine factors for successful e-business incubators in Indonesian universities.
3. To determine critical success factors that influence successful e-business incubators in Indonesian Public Universities.

4. To propose and develop e-business incubator framework for Indonesian Public Universities

2. Literature Review

In this section, the researcher explores the existing theories and models that are relevant to the research subject, as well as those theories and models that form the body of knowledge of the research. The theories and models which will be explored and used throughout the study are discussed in the following sub section. In its most literal sense, a business incubator is a building that houses tenant companies that are in their initial phases. However, a business incubator is more than just a building. Their goal is to assist in the development of new entrepreneurial organizations while they are in their initial phase. By doing this, business incubators are able to help these new companies survive and grow during a period in which they are most at risk for failure. The overall goal of any business incubator is to produce companies that are "successful." More specifically, the goal is for these companies to be able to "graduate" or leave the incubator in a financially stable state and be able to operate on their own upon graduation from the business incubator (NBIA4, 1997). E-business (electronic business) derived from such terms as "e-mail" and "e-commerce," is the conduct of business on the Internet, not only buying and selling but also servicing customers and collaborating with business partners (Margareth Rouse, April 2005).

Business incubation can have several definitions and approaches, for example "Business incubation catalyzes the process of starting and growing companies, providing entrepreneurs with the expertise, networks and tools they need to make their ventures successful. Incubation programs diversify economies, commercialize technologies, create jobs and build wealth. The environment programme with certain important characteristics: it offers a full array of business assistance services tailored to the client companies; it has an incubator manager on site who co-ordinate staff and outside professionals and organizations to deliver those service; it graduates companies out of the programme (though not always out of the incubator facility) once they meet the programme goals".

Incubators are generally characterized by some relevant features, which generally include:
1. A managed work space providing shared facilities, advisory, training and financial services, and a nurturing environment for tenant companies;
2. A small management team with core competencies;
3. Selection of start-up companies entering the incubator, 20 to 25 companies in the average, to be graduated generally after 3 years.

Four major types of incubator exits and the objectives of each type tend to vary as follows:
1. *Public-sponsored:* these incubators are organized through city economic development, department, urban renewal authorities, or regional planning and development commission. Job creation is the main objectives of the publicly sponsored incubators.
2. *Nonprofit sponsored:* these incubators are organized and managed through industrial development associations of private industry, chamber of commerce, or community based organizations with broad community support or a successful record in real estate development. Area development is the major objective of nonprofit-sponsored incubators.
3. *University-related:* many of these incubators facilities are spin-off academic research projects. Most are considered science and technology incubators. The major goal of university-related incubators is to translate the findings of basic research and development into new products of technologies.

4. *Privately sponsored:* these incubators are organized and managed by private corporations. The major goal is to make a profit and, in some cases, to make a contribution to the community.

Unemployment in Indonesia is still the main issue for the government program to increase welfare in the future. In year 2014 Statistic Center of Indonesia states that Indonesia has 4% unemployment from Indonesia' work generation, and Indonesia still has 11.5% people in poverty of economic condition. In supporting Government program to reduce the number of poor people, entrepreneurship project in many universities hope can be one of the solutions to reduce poverty.

According to Bank Indonesia, factors that make the development of incubators in Indonesia decreased among others are:

1. Limitation of operational facilities that causes the low rate of in wall tenants absorption ability.
2. The lack of seed capital support that makes incubator not professionally handled and there are significant numbers of in wall tenants that cannot obtain seed capital even though their business is feasible.
3. Commitment and government support is relatively lacking and inconsistent in developing incubators.

In Indonesia, Cooperative Department and Small Enterprises (1998/1999) and the Ministry of Cooperative and Small and Medium Enterprises (SMEs) of Indonesia (Menteri Negara Koperasi dan Usaha Kecil dan Menengah Republik Indonesia, 2002) stated that the basic concept of incubator is an institution that provides 7's:

1. Space.
2. Shared office facilities.
3. Service which is management counseling: marketing, finance, production, technology and others.
4. Support in terms of business research and development as well as access of technology usage.

5. Skill development which is training, business plan formulation, management training and others.
6. Seed capital and the effort to gain capital access to financial institution.
7. Synergy which is creating an adequate business network, local and international.

Some business models have been created that would be reference for this research are as follows:

Business Incubator model in Figure 1 developed by Campbell et al. (1985) suggests four areas where incubators-incubation creates value: the diagnosis of business needs, the selection and monitored application of business services, the provision of financing, and the provision of access to the incubator network. Implicitly, with this framework, Campbell et al. have normatively defined the incubation process. This is useful because it suggests in detail, and for the first time, how different components of, and activities within, the incubator are applied to facilitate the transformation of a business proposal into a viable business. Weaknesses in the framework center on the failure to account for failed ventures (the framework assumes that all incubator tenants succeed) and the ascription of the framework to private incubators only.
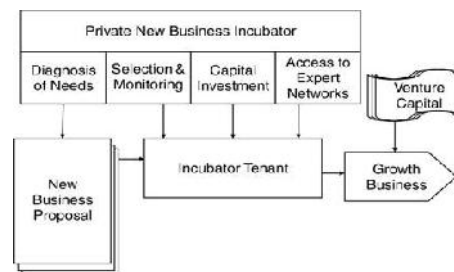

Figure 1. Campbell, Kendrick, and Samuelson framework (Campbell et al., 1985)

In Figure 2 Smilor extends the Campbell et al. framework by elaborating various components (incubator affiliation, support systems, and impacts of tenant companies)

of the incubator-incubation concept. Unlike Campbell et al., however, the Smilor framework takes an external perspective and fails to account for the incubation processes occurring internally. Utilizing data gathered from a national survey as well as from interviews, analysis of case studies, and observation, Smilor casts the incubator as a mechanism for reshaping the way that industry, government and academia interrelate (Smilor and Gill, 1986). He categorizes the benefits that incubators extend to their incubatees along four dimensions: (1) development of credibility, (2) shortening of the [entrepreneurial] learning curve, (3) quicker solution of problems, and (4) access to an entrepreneurial network (Smilor, 1987). Smilor also conceptualizes the incubator as a system that confers "structure and credibility" on incubatees while controlling a set of assistive resources: "secretarial support, administrative support, facilities support, and business assistance." (Smilor, 1987). Smilor's effort is perhaps the most comprehensive effort at identifying and explaining the various components of the incubation system.
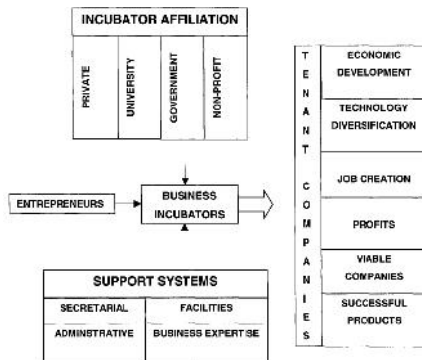

Figure 2. Smilor's Framework (Smilor, 1987)

In Figure 3 briefly, the model indicates that incubatees are selected from a pool of incubation candidates, monitored and assisted, and infused with resources while they undergo early stage development. Outcomes refer to the survival or failure of the incubatee at the time it exits the incubator. Controls include regional differences in economic dynamism, level of incubator development and size of incubator. The model is a temporal with arrows in the model indicating the relationships amongst the constructs. The arrows that lie between constructs represent the fact that we do not know whether these constructs overlap; because no one has conducted research using these constructs the possibility for interaction must be depicted. Arrows going backward from outcomes to the constructs of interest indicate feedback loops that occur over time and through experience, suggesting organizational learning effects.
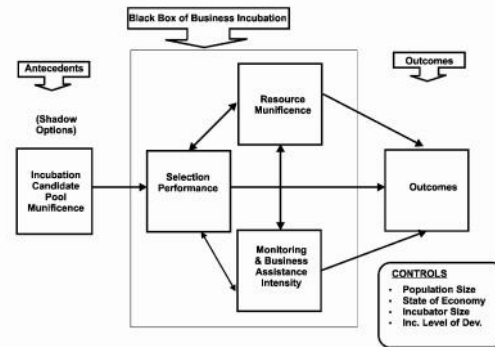

Figure 3. Incubation Process Model by Campbell et al.'s (1989)

In Figure 4 Verman (2004) developed a-prior model of incubator success factors. The model represents the theoretical framework for incubator success factors. The variable of primary interest, the dependent variable, is the degree of success of incubators. The framework explain the variance in this dependent variable through a number of independent success factors categorized as 1) shared services, 2) facilities and location 3) funding and support 4) incubator governance 5) tenant entry and exit criteria and 6) mentoring and networking.
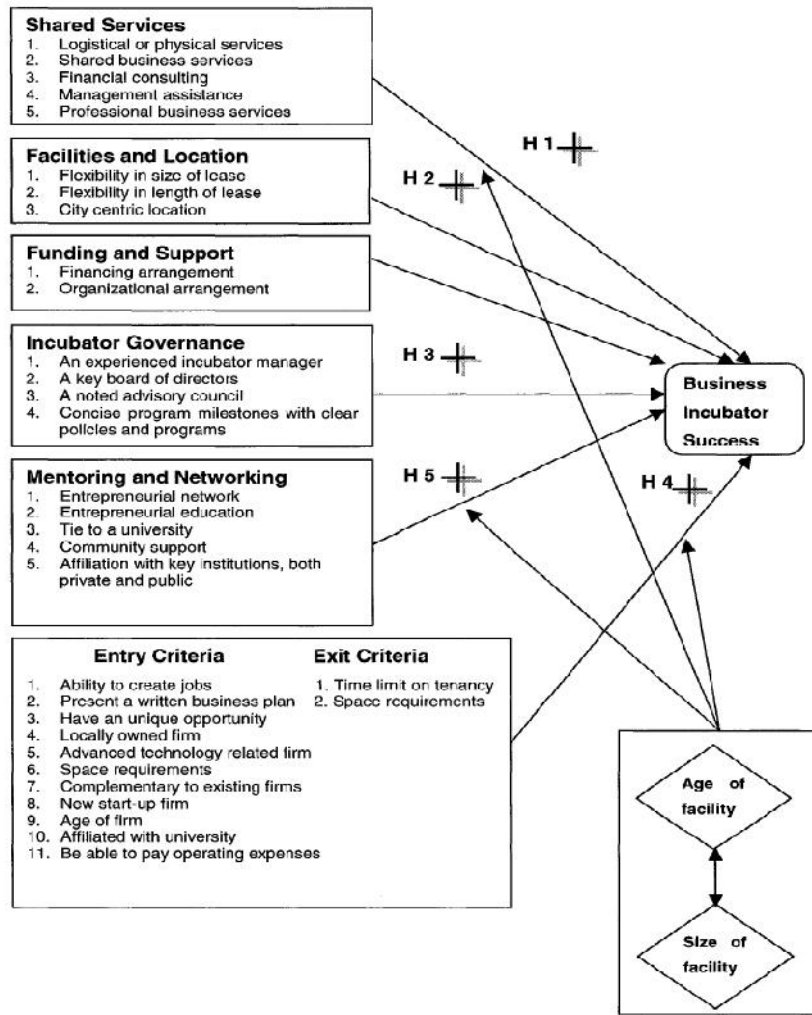
Figure 4. A Priori Model of Incubator Success Factors (Verman, 2004)

Figure 5 indicates that the business incubator appears in the center. Its key functions are identified therein. Figure 5 proposes that business incubators must demonstrate a positive impact upon incubating enterprises, on their practices in terms of developing their customers base, increasing productivity and turnover. In parallel, the incubator must meet its own "hard" targets, purely objective in nature, as agreed with key stakeholders. However, it is apparent from this research and other literature that business incubators create other outputs, designated "outcomes" (WEFO, 2003) in addition to profit and costs improvements, which we shall classify as "soft measures" (see Figure 5). Soft measures are benefits such as increased business knowledge and skills, more

business awareness and increased client networking. These are subjective measures which are more difficult to ascertain and measure but nonetheless exist. This is highly significant as Hackett and Dilts (2004) have identified five distinct outcomes for incubating businesses, including viewing operating but stagnant businesses as failures, "Zombie Businesses" rather than successes (i.e. still trading); and early closure of non-viable businesses as success not failure (no great losses incurred). When applying purely "hard" business measures in these cases the picture looks quite different: in an assessment of the influence of business incubation practices on these enterprises no real benefit would be ascertained. However, in reality even these categories of client or incubatees benefit from the exposure to the

business incubator using the "soft" metric. These soft measures are particularly relevant in development of personal skills and business knowledge which might be applied in the future entrepreneurial activities Hackett and Dilts, 2004a). Thus it could be argued that business incubators provide clear advantages for progressive enterprises and a source of reference, knowledge and enabling skills in a "safe" environment, providing an incentive for immediate or future development of new enterprises. Business incubators must be available for future cohorts of currently nascent .

entrepreneurs, as well as those who have experience of ventures that may not have progressed and who bring that increased knowledge and awareness to a new venture (Hackett and Dilts, 2004a). By recognizing that the success of both the incubator and the incubatee in terms of "soft outcomes" and "distance travelled", after three years of operation the GTi incubator is an established part of the business support landscape and widely respected for its support of new businesses (Howard, 2005), a more complete picture of success emerges
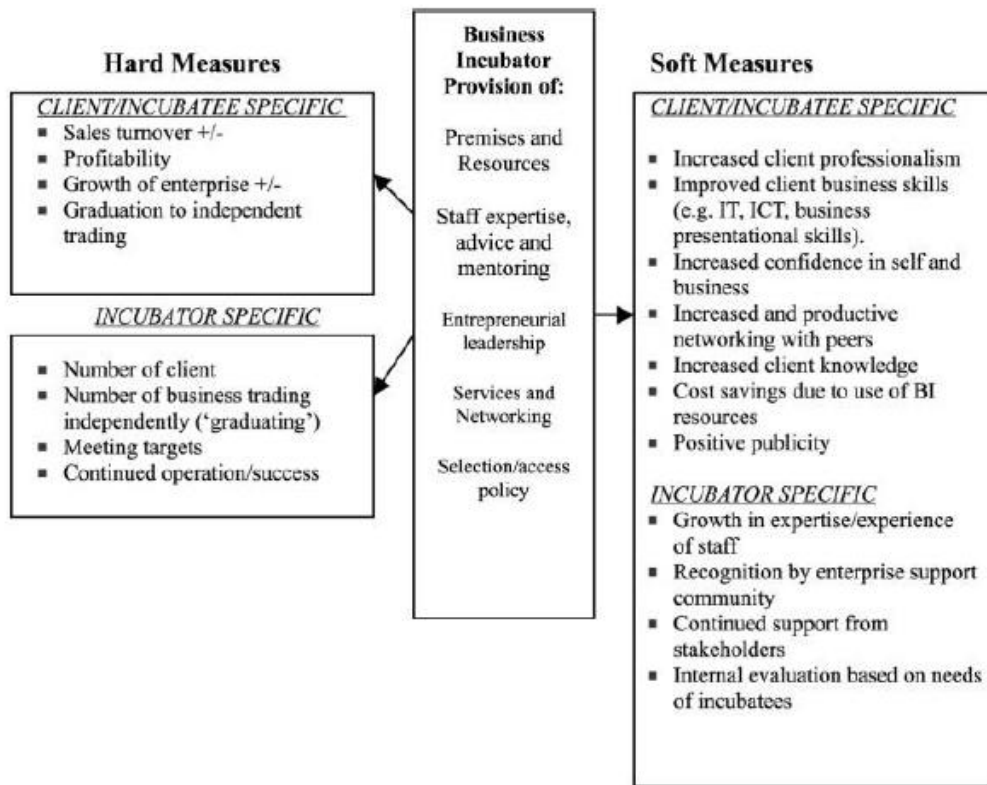

Figure 5. A Conceptual Framework for Identifying the Performance Measures of Business Practice within Business Incubators (Hackett and Dilts, 2004)

3. Research Methodology for Proposed Study

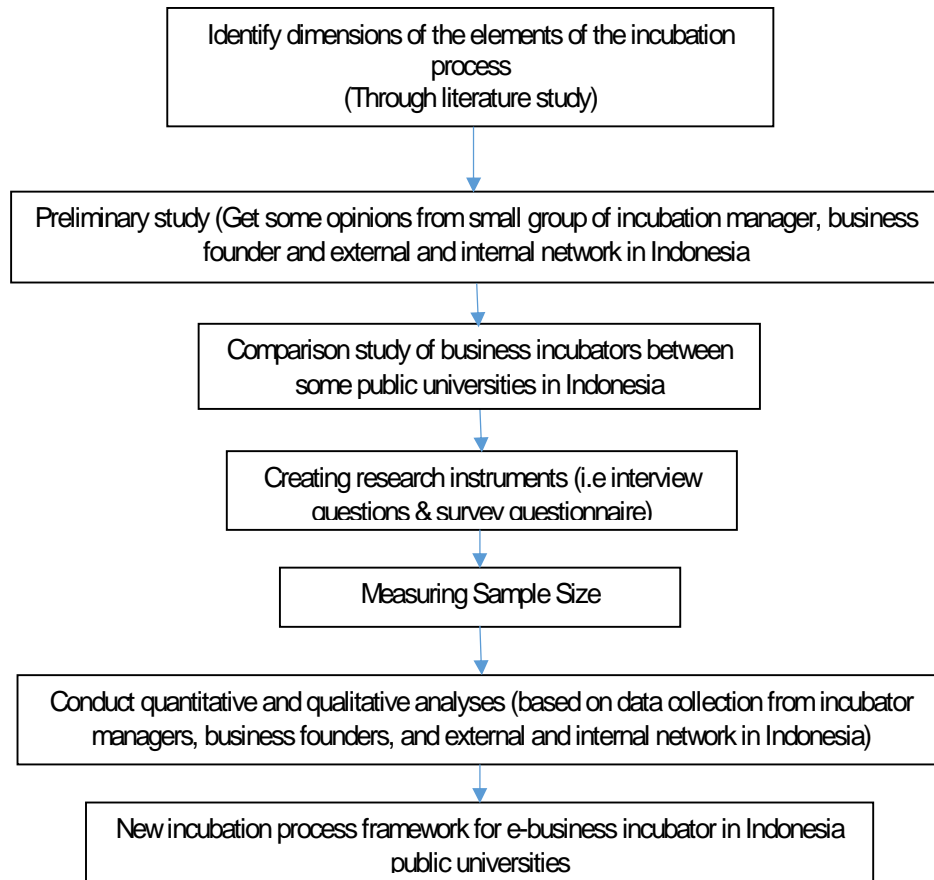Figure 6 illustrates the research methodology for the proposed study.

Figure 6. Methodology of the study

The research of the study will be through the investigation of the subsequent research issues by:

1. Investigating the incubation process in Indonesia by conducting qualitative research.
2. Benchmarking the incubation process model in some public universities in Indonesia with some incubation process model.
3. Finding the best practice for Indonesia business incubation process by conducting quantitative research.
4. Developing a new appropriate e-business incubation process model for some public universities in Indonesia

All the research steps that will be conducted by the authors are as follows:

1. *Data and Information Collection*

   Data collection is conducted through a literature review and some references that related to development of business incubator and SME's. In the other hand, the study will also review some regulations that related to business incubator and SME's in the form of laws or government regulation. The literature review and preliminary study also determine the factors that already validated from previous research.

2. *Focus Group Discussion (FGD)*

   Focus Group Discussion (FGD) will be held by inviting parties that have some competencies in giving some feedback of

business incubation process. Respondent will be determined by structured sampling method, start from the founder, incubation manager.

3. *Questionnaire Pre Testing*

Pre testing of the scale item is required prior to implementing the pilot of field test (Malhotra and Groover 1998). Questionnaire pre testing will be held among founder, incubator manager, networks related to business incubator activity with 8 public universities in Indonesia. Preliminary data analysis includes a visual inspection of the data, common methods variance testing, identification of outliers, and an assessment of the central tendencies of the data (Hair et al, 1998; Lewis Beck 1995, Rosenzweig, 2003).

4. *Field Study*

The period of the field study is approximately 12 months. Following generally accepted protocols in the use of mailed survey instruments (Dillman 1978; Fowler Jr. 1993) and online data collection (Simsek and Veiga 2001; Staton 1998; Staton and Rogelberg 2001). Author will contact the sample population by mail and email with a request for a meeting at their incubator facility and for their participation in the survey.

5. *Data Analysis*

Data analysis will use the Structural Equation Modelling. Structural equation models (SEMs), also called simultaneous equation models, are multivariate (i.e., multiequation) regression models. Unlike the more traditional multivariate linear model, however, the responsevariable in one regression equation in an SEM may appear as a predictor in another equation; indeed,variables in an SEM may influence one-another reciprocally, either directly or through other variables as intermediaries. These structural equations are meant to represent causal relationships among the variables in the model. Besides SEM, the analysis will use the qualitative analysis too.

The sample used for future study consisted of incubator managers in Indonesia Public University, involved in the day to day operations of the incubator and graduated tenant company. The sample was so proposed, as the respondents would have the necessary insights and experiences of managing incubators and in managing the relations within the incubator with tenant firms.

Recent research by Association Business Incubator in Indonesia (AIBI), suggest that the number of business incubators across Indonesia for Private, Public University and independent Business Incubator is over 70 incubators, consist of 30 Public Universities, 15 Vocational Academic Programs and 15 for Private Universities, and the rest is independent party. The sample targeted for this research is appointed for the Public University for about 35 Public Universities (Gozali, 2015).

4. Result

The result of the research will enrich the literature on business incubator topics, on issues concerning business incubation process. It will also be beneficial to the university, government and private sector in order to create a good e-business incubation process which aiming a good performance.

The significances of the study about e-Business incubator's success factors are: many universities get benefit to develop their own business incubator process, the universities can announce their capabilities to develop students for the entrepreneurship education. Many students can develop themselves in Business Practice Knowledge The government get benefit from the tax, minimize the number of unemployment, reduce the criminal action from the unemployment person, develop good economic environment.

Based on the literature review and preliminary study, then the proposed framework is developed for the research. The variable of primary interest, the dependent

variable, is the critical success factors of e-business incubator. An attempt is made in this study to explain the variance in this dependent variable through a number of success factors categorized as follows:
(1) Shared services and facilities
(2) Incubator governance
(3) Tenant entry and exit criteria
(4) Mentoring and networking
(5) Funding and support
(6) Government support and protection
(7) University regulation
(8) System infrastructure

Table 1. Proposed Critical Success Factors and Sub Dimensions for Indonesia Public E-business Incubators

No.	Factors		Dimensions
1	**Shared Services and Facilities**		
		1	Logistical or physical services
		2	Shared business services and equipment (laboratory)
		3	Financial and accounting consulting
		4	Management and marketing assistance
		5	Professional business service and business etiquette
		6	Human resource training and presentation skill
		7	E-commerce assistance and comprehensive business training
		8	Legal assistance
		9	Educational training
2	**Incubator Governance**		
		1	An experienced incubator manager
		2	A key board of director
		3	A noted advisory council
		4	Concise program milestones with clear policy and programs
		5	Dynamic and efficient business operation
3a	**Entry Criteria**		
		1	Ability to create jobs
		2	Present a written business plan
		3	Have a unique opportunity
		4	Locally own firms
		5	Advanced technology related firm
		6	Space requirement
		7	Complimentary to existing firms
		8	New Startup firms
		9	Age of firms
		10	Affiliated with university
		11	Be able to pay operating expense
		12	Business must have an innovative project
		13	Business must demonstrate the high growth potential

No.	Factors		Dimensions
3b	**Exit Criteria**		
		1	Time limit of tenancy
		2	Space requirements
		3	Achieved business target and objectives
		4	Fail to achieve business target and objectives
		5	Need more support that incubator cannot offer
4	**Mentoring and networking**		
		1	Entrepreneurial network
		2	Entrepreneurial education
		3	Access to educational resources
		4	Community support
		5	Affiliation with key institution, both private and public
		6	Finding the strategic and expertise partner
5	**Funding and support**		
		1	Financing arrangement (venture capital, commercial loan noncommercial loan)
		2	Organizational arrangement
		3	Good supporting data
		4	Intellectual property protection
		5	Help with regulatory compliance
6	**Government support and protection**		
		1	Grant or funding for the innovation and invention product research
		2	Good regulation for the public university business incubator
		3	Protection or tax holiday for the tenant companies
7	**University regulation**		
		1	Credit and reward for the BI manager, mentor, counselor.
8	**System Infrastructure**		
		1	Integrate clients in the largest technology development system
		2	Good service provider
		3	High speed broadband internet
		4	Technology commercialization

5. Discussion

The relationship between eight independent variables and one dependent variable could be influenced by three moderating variables (i.e. age of facility, credibility of the facility, and credit and rewards). Further, as the age of the facility increases, e business incubator size may also increase in terms of acquiring more space and tenants, but because this research is about e-business incubator, then it would be a virtual business incubator. These moderating variables influence the relationships between shared services and incubator success; tenant entry and exit criteria and incubator success; and mentoring and networking and incubator success.

Table 2. Summary of Independent, Moderating, and Dependent Variables

Independent Variable	Moderating Variable	Dependent Variable
Shared services and facilities	Age of facility	Incubator success
Incubator governance	Credibility of the facility	
Mentoring and networking	Credit and rewards	
Funding support		
Government support and protection		
University policy and regulation		
System infrastructure		
Tenant Entry and Exit Criteria		

Base on the proposed framework, the hypotheses of the research are as follows:

H1: The greater the focus on shared services provided by incubators, the more likely the incubators success for older facilities.

H2: The better the incubator governance, the more likely the incubator success.

H3: The stronger the enforcement of tenant entry and exit criteria, the higher the probability of incubator success.

H4: The greater opportunities for mentoring and networking among the tenants, the more likely the incubator success.

H5: The better financial funding and support for the tenants, the more likely incubator success.

H6: The better credit and rewards for faculty and support from university regulation make the better initiatives program and project for incubator success.

H7: The better funding for the innovation and invention, support and protection from the government, the more likely the incubator success.

H8: The better support system and infrastructure, the more likely the incubator success

6. Conclusion

From the literature review and preliminary study, the result indicates that the success factors for successful e-business incubator in Indonesian public universities are consisting of eight independent variables, three moderating variables, and one dependent variable. The eight (8) success factors are shared services and facilities, incubator governance, entry and exit criteria, mentoring and networking, funding and support, governance support and protection, university regulation, and system infrastructure. The three (3) moderating variables consist of age of facility, credibility of the facility, credit and rewards. Meanwhile, the dependent variable is incubator success. In future, the researchers will continue to do pilot test, actual study and analyze results of research hypotheses. Expected result for the research obtain the framework of E-Business Incubator in Indonesian Public University and described the related from all of the factors, variables and dimension.

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